

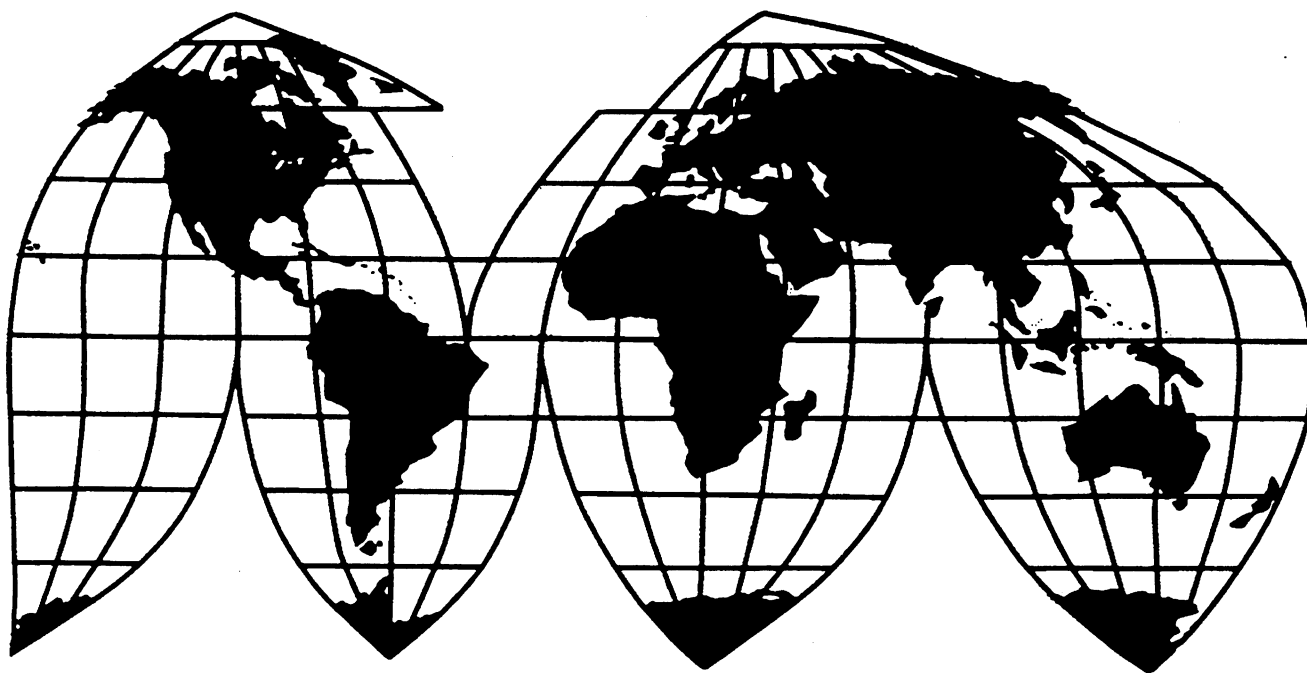
The Economic Implications of Liberalizing APEC Tariff and Nontariff Barriers to Trade

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U.S. International Trade Commission

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Preface

At the request of the United States Trade Representative (USTR), the U.S. International Trade Commission (USITC) organized a public symposium on tariff and nontariff barriers (NTBs) to trade and investment in the Asia Pacific Economic Cooperation (APEC) economies.¹ The request letter asked that the symposium include presentations of research on the trade-related aspects of various public and private policies and practices, as well as on the general equilibrium modeling of trade policy. A call for papers on relevant topics was published in the Federal Register on December 4, 1996 (Vol. 61, No. 234).

The symposium was held at the Commission on September 11 and 12, 1997. This report includes the papers, and abstracts of those papers, presented by participants at the symposium, followed by comments on the papers provided by researchers in the respective fields.

The papers, abstracts, and comments presented in this report are solely meant to represent the opinions and professional research of individual authors, including those presented by USITC staff. The opinions expressed in the symposium papers, abstracts, and comments are not meant to represent in any way the views of the U.S. International Trade Commission, any of its individual Commissioners, or the U.S. Government. Nothing in this report should be construed to indicate how the Commission would find or advise in any investigation.

¹ The APEC economies include Australia, Brunei, Canada, Chile, China, Hong Kong, Indonesia, Japan, Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, Philippines, Singapore, Taiwan, Thailand, and the United States.

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Introduction

At the request of the United States Trade Representative (USTR), the U.S. International Trade Commission (USITC) organized a public symposium on tariff and nontariff barriers (NTBs) to trade and investment in the Asia Pacific Economic Cooperation (APEC) economies. The request letter asked that the symposium present research on a broad array of policies and practices concerning deregulation, intellectual property rights, standards and customs procedures, oligopolistic behavior, services, and government procurement and the way these may form barriers to trade and investment. USTR also requested that the symposium include research on the types of general equilibrium models commonly used to evaluate the effects of trade policies, including tariff and other forms of trade barriers. Further, USTR requested that researchers recognized as experts in their fields be invited to provide a critical assessment of the research presented.

The symposium was held at the Commission on September 11 and 12, 1997 following a public call for papers on relevant topics. The symposium participants represent a broad spectrum of academic, research, and government institutions from a large number of APEC members. Collectively, the papers they presented include specific research on most of the APEC economies. The request letter from USTR asked that the report on this investigation consist of four parts: "... (1) an assessment of the principal results presented at the symposium, ... (2) a compilation of the technical papers submitted in the symposium, ... (3) a compilation of the written critiques of those papers, and (4) an objective summary and critical evaluation by the Commission of the analytical frameworks and of the main findings of these papers."

This chapter begins with a summary of the main findings of the symposium participants and then summarizes and critically evaluates the papers presented. Subsequent chapters include the abstracts from all papers presented and then the papers themselves, followed by comments on them provided by researchers in the respective fields.

Main Findings of the Symposium Participants

- Research presented at the symposium shows that nontariff barriers have a major impact on trade in APEC, far greater in scope than the impact of tariffs. Progress on nontariff issues is essential to meeting the goals of APEC's Bogor Declaration on trade liberalization and could be one of the most important global contributions of the APEC forum. In many of the cases examined, the economic welfare gains from liberalizing NTBs far exceed those from removing tariffs.
- NTBs, as identified by participants, vary greatly in nature across issues such as intellectual property rights, government procurement, investment, services, and competition policy. Yet in each case, detailed study of the issue yields some information on quantifying or measuring the relative importance of the barrier, and on the comparability of approaches in different countries.
- In many instances, symposium participants found that the nature and importance of NTBs depend directly on government practices, but they depend more often on

government choices of how to enforce the laws governing private markets. Even NTBs generated largely by private practices raised significant public policy questions.

- Based on their research, several of the authors draw tentative policy conclusions on particular issues. One of the most complex areas was domestic regulations governing competition policy, where the approach of several researchers was to rank issues according to the likely productivity of pursuing an international consensus.
- Recent general equilibrium (GE) modeling work has expanded on the measurement of economic gains from liberalizing both tariff and nontariff barriers by including new trade issues and new modeling techniques. The most general APEC liberalization scenarios indicate potential static gains of around 1 percent of APEC GDP.
- Trade issues more recently represented in GE trade models include trade facilitation, trade externalities, trade in services, and deregulation. In many instances, the estimated economic welfare gains from liberalization in these areas substantially exceed those from tariff elimination.
- Newer modeling techniques include the more regional focus of multicountry dynamic models with investment behavior, and improved parameterization of dynamic models using econometrics. While comparisons between static and dynamic model results can be difficult to make, dynamic gains from trade liberalization are likely several times as large as the static gains.

Summary and Assessment of Symposium Papers

Collectively, the papers presented at the symposium use a wide variety of analytical approaches in examining a wide variety of issues. The researchers who wrote comment reports on the papers raise a number of technical points and recommend modifications in the application of some of the respective analytical frameworks. These technical points have largely not been referenced here. However, it should be noted that the comment reports fundamentally support the basic thrust of the research in the respective papers and consider the analytical approaches to provide useful avenues for increasing understanding of relevant tariff and nontariff barriers.

Foreign Investment

The potential to attract increased foreign direct investment (FDI) is at the heart of expected gains from regional trade liberalization for many countries. As Blomström points out in his paper, the impact of regional trade and investment liberalization on FDI inflows depends on the motives for FDI in the region. FDI intended to avoid tariffs on traded goods is likely to decrease while that intended to help firms exploit firm-specific assets in foreign markets is likely to increase.

On net, Blomström concludes that under regional trade liberalization FDI inflows will probably increase, especially if the initial trade barriers are low (i.e., tariff-jumping FDI is small) and investment-related reforms are strong. Such reforms include reducing restrictions on FDI and offering national treatment, effective dispute resolution, and investor property rights to foreign investors while avoiding export requirements. Then regional trade liberalization leads to a large barrier-free market with other economic reforms "locked in," where such other reforms may include privatization of public firms and improved macroeconomic stability.

Blomström notes the potential for dynamic feedback between the FDI encouraged by an enlarged regional market and greater diffusion of technology, engendering higher growth, efficiency, and attracting even more FDI. He cautions that in a large region, FDI could concentrate in the locations offering the best advantages and would not necessarily be evenly distributed across countries.

The second half of Blomström's paper considers the evidence on investment from several specific regional integration agreements and, despite the complexity of events, finds evidence to support his precepts.

One of the best examples of Blomström's view of FDI expressed elsewhere in the symposium is in the paper by Park, Tan, and Toh treating ASEAN's strategic interests. They describe ASEAN as being "... heavily dependent on foreign direct investments (FDI) from outside the region to drive the industrialization process." (p. 8-4.) Among motives for promoting trade liberalization among ASEAN countries, they mention the competitive pressures in attracting FDI created by regional integration elsewhere, especially in the Americas.

In addition, the authors considered China's increased integration into the world economy, along with the return of Hong Kong, a great challenge. "The bulk of foreign direct investment from Taiwan, Hong Kong that flowed to Southeast Asia between 1987-91 has been diverted to China. Increasing amount of investment from Korea, Japan, US and Europe have also been attracted by the expanding China market." (p. 8-17). In response, "... each ASEAN member nation has been forced to enhance economic cooperation to strengthen collective market size and attractiveness to direct foreign investment." (p. 8-5.) In the conclusion to their paper, mentioned again in the section on GE modeling below, they recommend the broadest possible regional integration, i.e., APEC-wide rather than ASEAN-wide, as being most in ASEAN's interest.

Competition Policy

The types of reforms identified by Blomström as encouraging FDI – reducing restrictions on FDI, national treatment, dispute resolution, investor property rights – indicate how closely linked domestic market regulations are with the degree of openness to foreign investment, and therefore to trade. His paper thereby indicates how domestic market regulations can discriminate against foreigners and form barriers to trade. Yet assessing the magnitude of such barriers is difficult because these regulations play complex roles in domestic institutions that have not traditionally been made subject to international trade disciplines.

Richardson reports in his symposium paper on efforts to assess market regulations governing competition policy and how they affect trade. In acknowledging their relative importance he notes "... border barriers are waning in importance relative to entry barriers. More precisely, tariffs, quotas, and border discrimination are being negotiated away, while most regulatory and other barriers that protect incumbent firms, by keeping new suppliers from establishing themselves, are declining much more slowly, especially in large service sectors." (p. 1-27.)

Based on studies by a group of researchers, Richardson and his colleague Edward Graham rate competition policy issues according to the likely economic gains from increasing international convergence of practices and the political possibility of achieving convergence on the issue. In this rating according to the efficiency of taking action, the following issues top the list: cartelization, other horizontal restraints, mergers and acquisitions, price fixing, voluntary export restraints and orderly marketing arrangements, and national treatment for foreign direct investors and services.

Most of these fall in the category of market access issues. Focusing specifically on the Asian context, Richardson notes wider gaps across countries and greater potential gains from convergence on issues concerning vertical integration, strategic alliances, exemptions, and national treatment for investors. "Formal competition policies are in early gestation in some countries, which is almost to say that every sector is treated uniquely as an exemption, and formal acceptance of national treatment for investors is a long way off." (p. 1-37.)

Richardson points out an Asian tradition of honoring incumbents in a market and taking affront at new entrants. He sees the family-type social structure of Asian firms, the primacy of internal decision-making and the limited role of capital markets in monitoring and directing firms, as important regional characteristics. He predicts that as Asian financial markets liberalize and become subject to normal competition policy strictures, public information on corporate plans and performance, derived through the financial market, will help make other markets work more competitively.

Richardson argues that the World Trade Organization (WTO) cannot at present deal effectively with many competition policy issues, but could usefully pursue an agenda for multilateral trade-related antitrust measures (TRAMS) aimed at market access issues. In addition to such multilateral action, he proposes joint investigation and mediation of disputes by the relevant parties as a natural, constructive outgrowth of current practice. He suggests that "positive comity" could, over time, develop enough common ground to produce international "competition policy safeguards" that would be preferable to current trade measures. His proposals, as well as table 1, evaluating which issues present the most fruitful prospects for international convergence, could provide useful focal points for further investigation.

Deregulation

In his paper, Barfield also suggests adding certain market access issues to the WTO agenda. His topic is regulatory reform, and he begins by pointing out that both trade liberalization and regulatory reform aim to achieve truly contestable markets. He notes a number of examples of

how domestic regulations can be used to limit market access and discriminate against foreign suppliers. Japan's regulation of its insurance market and U.S. regulation of fuel are cases in point. He lists regulation of public and private monopolies, of environmental impact, of the financial sector, of public information requirements and product standards as areas where market-oriented approaches would improve regulations and increase domestic and international market access.

He believes the well-documented gains from regulatory reforms undertaken so far will spur reforms in other countries. Therefore he suggests harnessing these expected reform efforts to serve the ends of trade liberalization.

He proposes that, when reforming domestic regulations, countries should observe the principles developed in the multilateral WTO setting. These principles are: transparency, national treatment, minimal distortion of trade, and due process. He suggests extending discussions of mutual recognition agreements (MRAs) from the transatlantic forum to other regional fora such as APEC. Negotiating mutual recognition of regulatory systems, product testing, and trade and investment-related standards would help harmonize different country systems and lead toward a multilateral code of regulatory rules. "Mutual recognition has been called an extreme form of national treatment: it restricts the regulatory authority of member nations, but it does not involve a transfer of power to the supranational level." (p. 2-43.)

Barfield also notes that MRA's can increase market contestability by generating a competition between different regulatory systems. In his comments, Hoeckman largely concurs with Barfield's view, but doubts the WTO will be able to take on the proposed added responsibilities.

Deregulation in the United States

Winston's paper does not focus on trade issues, but deals with measuring the gains from deregulation using data from the U.S. experience. He details the adjustments that took place during deregulation of airlines, trucking, railroads, banking, and natural gas and estimates the likely future changes in telecommunications, cable television, and electricity. For each sector he evaluates how deregulation has affected the degree of competition, efficiency, technological innovations, and meeting consumer demands. Summarizing from table 3 in the paper, he reports that the deregulated industries have improved service quality and reduced real average prices from 30 to 75 percent.

His conservative estimate of the net benefits for consumers from deregulation of inter-city transport alone is roughly \$50 billion (1996 dollars) per year. Further, he shows that the process of how industries adjust to deregulation demonstrates how the benefits can accumulate and grow over time.

The evidence Winston presents for the United States indicates the potential gains from similar developments in the other APEC countries. While it might not seem appropriate to tally such potential gains under trade liberalization, as Barfield points out, regulatory reform can significantly improve market access. Moreover, as discussed during the symposium indicated,

international market access may be necessary for smaller or less developed countries to reap the full benefits of deregulation. Countries where technological and financial expertise are not sufficiently widespread to generate enough competitors in airlines or telecommunications, for example, would need foreign participants to help spark the improvements in efficiency and cost reduction observed elsewhere. While some countries would perceive this as a threat to the local industry, foreign participants could bring in needed technology while providing benefits to consumers and preserving an open market for local competitors that may develop over time.

Deregulation in China

Among all APEC members, China presents a unique case for deregulation, having started from a centrally planned economy. As Yu-shi Mao describes it in his paper, "Such economics has led to a distorted price system, where resources are allocated not by price signal but by the planners' subjective verdict. ... Due to this, shortage and surplus were prevalent." (p. 4-2) Mao demarks two important turning points in China's economic policy: the first beginning with increased market orientation in 1979 and the second beginning with substantial reforms of the international trade system in 1994.

Prior to 1994, China's international trade was largely conducted by state-owned trading companies guided by the state plan, not by comparative advantage. Foreign exchange was rationed while two different exchange rates were maintained. The system of import quotas, licenses, and inspections was applied extensively. Mao reports on a study of Chinese import barriers for 25 of the most heavily protected goods in 1994.¹ The unweighted average of the combined tariff and NTB tariff equivalents was 43.3 percent. Reporting on the same study, Ingersoll and Frankena note that the highest NTB tariff equivalents among these were about 70 to 110 percent on basic agricultural goods carrying tariffs from 0 to 30 percent.

In his comments on Mao and Ingersoll/Frankena, Tavares points out that traditional NTB measures, such as the Chinese measure derived from comparing import prices to a survey of wholesale prices, can be quite misleading in economies characterized by officially distorted prices, state-owned firms, and extensive subsidies. He suggests improving estimates of NTB measures by combining price gap data with other information, such as data on the profitability of companies allowed to exploit the gaps created by restricting access to imports.

One example cited by Mao illustrates Tavares' point. In 1987 a Chinese producer of polyethylene, seeking to obtain a higher price than the domestic planned price, sold to a dealer in Hong Kong. To alleviate the domestic shortage, Chinese consumers tried to import. "By chance, the same product, without moving an inch, was "exported" then "imported" to and from Hong Kong." (p. 4-2.) In this case, comparing the import price to the planned price would not fully indicate the size of the trade distortion, and the profitability of the Hong Kong dealer adds relevant information.

¹ Zhang Shuguang, Zhang Yansheng, and Wan Zhongxin, *Costs of Protection in China*, a project sponsored by the Institute of International Economics, 1997.

Nevertheless, Mao emphasizes progress. He notes dramatic changes in China since 1994 in allowing access to foreign exchange and maintaining a market exchange rate. He notes the reduction in tariffs and in the number of goods subject to quotas, licenses, and inspections, and he expects further progress to come.

Measures of Specific NTBs

Both Bosworth et al. and Ingersoll and Frankena discuss various methods of measuring NTBs using price gaps between imported and domestic goods. Both papers also propose methods for particular applications: Bosworth et al. for services in Australia and Ingersoll/Frankena for chemicals in ASEAN countries.

Ingersoll and Frankena report data on NTBs from two USITC studies of APEC economies. A comprehensive multi-industry survey and a public hearing associated with the studies helped Commission staff produce tables 1 and 2 in the paper. These tables designate the industries perceiving high tariffs and/or NTBs in the four ASEAN countries under study – Malaysia, Indonesia, Philippines, and Thailand. These data are used to identify the dozen or so U.S. industries facing trade barriers in three or more of the countries.

This initial screen leads the authors to focus on particular chemical products with well-defined physical quality traits. Using the specific examples of polyethylene, polypropylene, and polystyrene imports in Thailand, they note that differences between import unit values and domestic wholesale prices exist for all three products but have narrowed over time. For high density polystyrene, after relevant tariffs are deducted from the initial price gap, a 9 percent gap remains in 1996. In the paper this price gap is associated with government policies including restrictions on entry and expansion, along with other NTBs.

Among the symposium papers, the one by Bosworth et al. contains the most extensive description of various price gap measures and the advantages and shortcomings of applying them in different cases. The paper also provides a wide-ranging discussion of potential approaches to measuring the extent of trade barriers in such complex areas as services and foreign direct investment. The details are not easily summarized, so only a few examples will be included here. It is encouraging that the authors plan to implement their proposed techniques, beginning with a case study of telecommunications in Australia.

The authors explore various ways to construct a benchmark "free market price" for comparison with the domestic service price. One of these methods involves using industry data to estimate "frontier" or "best practice" production costs. The authors further propose to account for gaps between the benchmark and domestic prices by first registering all potential barriers to services trade, including those on modes of supply. Here they build on work done under the General Agreement on Trade in Services (GATS) and usefully evaluate the schedules of APEC member GATS commitments.

Bosworth et al. emphasize the need to relate specific barriers to observed price gaps and to account for how these barriers could contribute to higher prices. They further explore the potential

influence on prices of factors unrelated to policy and propose specific data measures for assessing these factors. These could include differences in costs, wages, service quality, etc.

As recognized by the authors, foreign investment is necessary for exporting services where sales depend on a local presence, and therefore, trade liberalization in many services requires liberalization of FDI. Yet the impact of FDI restrictions on services prices is difficult to isolate since it works through the rate of diffusion of new technologies. Nevertheless, the authors consider several possible approaches.

They begin with the GATS FDI schedules, which indicate that " ... less than one-quarter of all APEC service markets are open to [foreign] commercial presence." (p. 6-39) Moreover, they consider this an underestimate of FDI restrictions since many barriers are not identified. These schedules for APEC members are usefully graphed in figures 6 and 7 in the paper.

The authors consider the advantages and difficulties of estimating the rate of return impact of FDI barriers. They further discuss developing an index of FDI restrictiveness that would include weights on the different types of barriers according to the degree of restriction imposed. They acknowledge that these weights would need to be decided in some manner. One option might be to apply surveys of the type cited in Ingersoll/Frankena.

This paper concludes with a case study applying the authors' proposed methods of price gap measurement to the telecommunications sector in Australia. The case study includes references to specific data sources and presents substantial data analysis. They propose that once the price effects of various barriers can be identified, a general equilibrium simulation model should be used to estimate the impact of these barriers on economic welfare.

Quantifying the Effects of Public Practices

The papers by Park, Dixit and Josling, and by Evenett take up trade barriers generated by public practices. Park's study treats the protection of intellectual property rights. Dixit and Josling consider government ownership or control of commercial operations, and Evenett looks at the question of trade discrimination in government spending.

Government procurement

Evenett points out the surge in ongoing and expected infrastructure spending in many Asian APEC economies. Under these circumstances, the impact of government procurement policies on trade will grow in importance.

To quantify the impact of public discrimination against foreign suppliers, Evenett estimates a gravity model of bilateral import volumes. He modifies the model to distinguish public from economy-wide shares of spending on tradable goods. He further assumes that the government sector buys tradable goods exclusively from domestic suppliers. He then estimates the model with data for 14 APEC members in 1990. World Bank and International Monetary Fund (IMF) sources

are used for data on bilateral trade flows and proxies for the public-sector and GDP shares spent on tradable goods.

Finding the model to provide a reasonable fit for the data, he uses the coefficient on the public versus GDP shares on import spending to predict the likely change in import volumes if the government eliminates all discrimination against foreign suppliers of tradable goods. He finds these estimates to vary widely across APEC economies. For Australia, Canada, and the United States, increases in import volumes from full liberalization of procurement policies would be limited to about 1 percent, while the increases for Indonesia, Malaysia, and Singapore would be 11 to 12 percent. He concludes that the different APEC members would likely take different positions on any international agreement regarding government procurement, and those wanting to avoid import surges will seek more gradual changes.

Both commenters on this paper raise issues regarding econometric specification which are of general interest to applied economists using the gravity model. Nevertheless, they agree that more work along these lines can help indicate the costs that some economies may incur by restricting government purchases to domestic suppliers.

State trading

In their paper on state trading, Dixit and Josling point out that the issue has been discussed in the GATT forum since its inception. They note that in the recent Uruguay Round, state trading enterprises (STEs) were defined as government and nongovernment enterprises with exclusive or special rights over purchases and sales that influence imports or exports. They assert that state trading garners interest because STEs have a notable influence on agriculture markets; STEs can be used to circumvent commitments made in the Uruguay Round; and two large countries that use STEs extensively, namely China and Russia, are seeking to join the WTO.

Picking up on the second of these concerns, the authors note that STEs may be granted resources and market power that are not available to firms competing in the same market. For example, "... tariffs can be of very little meaning when a parastatal organization regulates total demand." (p. 7-27) The paper argues that the trade impact of such privileges can be quantified by calculating the relevant import-tax or export-subsidy equivalent. It proceeds with an extensive demonstration, on a case by case basis, of how the myriad forms of market influence from STEs of various types can be quantified by tariff equivalents, import/export subsidies, or producer and consumer subsidy equivalents, and how the trade effects can be derived from these.

After demonstrating this comprehensiveness and arguing in favor of making these calculations, the authors acknowledge the practical difficulties of getting relevant data and providing timely results. They suggest that progress can be promoted in the meantime by developing a classification scheme for STEs that would rank different types of STEs according to their capacity to distort international trade.

Dixit and Josling identify the following characteristics as key to such a ranking: whether the STE is an importer or an exporter; the degree of market control the STE exercises over

imports, exports, and domestic purchases and sales; whether the instruments of control are quotas or taxes and subsidies; whether the STE controls a narrow or broad range of products that include relevant substitutes; and finally, the ownership, objectives, and degrees of public assistance for the STE. The paper then concludes with a sample table (table 1) of what such a classification might look like and how a few specific STEs would be ranked according to this system. The authors propose specific policy goals for different types of STEs that are tailored to their ranking on degree of trade distortion. Thus the paper provides both a specific guide on quantification of STE trade effects and a practical device for pursuing freer trade in markets affected by state trading.

Intellectual property rights

Park also develops a qualitative estimate of trade effects from public regulation in his paper on patent systems. In this case the commodities in trade are inventions or intellectual property, and international variation in intellectual property rights (IPRs) affects the distribution of rents between inventors and consumers, who may be in different countries.

The world economy gains both by providing rewards to inventors and by disseminating the benefits of new technologies to consumers. Therefore it is difficult to define the optimal amount of protection for intellectual property. Moreover, as noted by Richardson, the best trade-off between inventors and consumers would differ across countries. It is for this reason that Richardson does not classify IPR among competition policy issues with the clearest direction for improvement. Yet most countries seem to be able to pursue their own interests along the spectrum of IPR protection by assessing whether they are more often inventors, imitators, or consumers. Even so, both Park and Blomström point out the value of offering certain basic IPR guarantees in order to attract foreign investors. They both, along with Ferrantino in his comments, cite research on the impact of IPR protection on trade and investment volumes.

Park poses the question of whether a country's patent system can be used as a means to prevent foreign companies from selling the products of their inventions in the home economy. He also examines whether the implementation of a country's patent rules can be used as a strategic trade policy. Thus he points out the potential for discrimination even when patent rules are transparent and applied equally to domestic and foreign inventors:

"Weak patent rights nations can, for example, by imposing compulsory licensing, providing lax enforcement, or citing public interest claims, divert the market away from foreign nationals who own patent rights to local domestic producers, and thus distort international trade. Weak patent rights nations can discriminate against foreigners even when adhering to the national treatment principle, provided the same low levels of protection are provided to both domestic and foreign innovators. This favours domestic producers (at the expense of foreign) if domestic producers are imitators." (p. 6-6)

The paper then illustrates this point with case studies of several patent disputes and the role played by features of the relevant patent systems. Four features in particular drove the outcome in many of the disputes, which were chiefly between the United States and Japan. These

features were patent examination, which governs the breadth of scope that the patent covers; pre-grant opposition, which can generate delays in granting patents; patent publication, which affects the dissemination of information about new inventions; and compulsory licensing.

Park notes that compulsory licensing is the main instrument of the government when it perceives certain sectors to represent a vital national interest. Park describes how the Japanese government promoted the domestic semiconductor and telecommunications industries by requiring certain U.S. firms to cross-license their patents to Japanese firms. In one of these cases a licensed technology for optical fiber cables leaked. Another Japanese company copied the technology and tried to export to the United States, where it was blocked by U.S. patent law.

In other examples from telecommunications and electronics, Park relates how Japanese examiners refused to grant patents to U.S. firms until the scope of the patents was substantially narrowed. These delays, along with those caused by pre-grant opposition and combined with the early publication of the patent application, made it easy for Japanese competitors to "patent around" the original technology. Holding a narrowly defined patent and surrounded by rivals with patents representing minor changes in design, shape, or structure, the original inventors will not be able to use their technology without infringing on one of the surrounding patents. They will have no choice but to cross-license with the foreign firms.

The paper points out that this practice of "patent flooding" also overburdens the patent system and causes further delays. In contrast, the United States, Canada, New Zealand, Australia, and China recognize the "doctrine of equivalents," which holds that technologies substantially the same as that in the original patent are covered by that patent.

Park notes that one of the main foreign complaints about the U.S. system has been the priority accorded to first-to-invent rather than first-to-file. This increases the chance that new product applications will infringe on the rights of an earlier inventor.

Park spells out the social and efficiency losses incurred from poor implementation of patent systems, and he cites both public and private practices as responsible for inefficient outcomes. Yet his recommendation for reducing the losses from costly private practices is not so much better patent law as better competition policy rules. This reintroduces the IPR question into the competition policy arena, not as an issue of optimal rights protection, but as a question of regulating private practices that manipulate patent laws in ways that are socially inefficient.

Private Practices

The next group of papers all deal with the way markets in certain APEC economies tend to work and how these traditions may affect trade. The first two deal with business practices in Japan, the second two with certain domestic and international business networks.

Case studies of Japan

In the first paper Tilton examines the detailed workings of Japan's cement and steel industries. He uses both statistical data and personal interview sources. For the intent and nature of business practices, including those admitted to be in violation of national antitrust laws, the statements of people actually involved in the Japanese businesses can be vital for forming the stylized facts.

Tilton cites a Japanese study using price gap measures of nontariff barriers in Japan. That study estimated the overall tariff equivalent of NTBs to be 174 percent. He then documents the significant price gaps between Japan's domestic price and world prices for cement and steel. He further documents that much of the gaps cannot be accounted for by international quality differences. He points out that despite the great price incentives to import, Japan's steel imports comprise only a small share of the market and its cement imports are almost nonexistent. At the same time, Japan exports substantial amounts of both commodities.

To help explain this outcome, Tilton describes the practice of group boycotts in both industries. In the case of cement, construction trade associations agreed to buy only from members of the Japan Cement Association. The cement association refused to supply any construction firm that bought any imported cement. The government, a major buyer, refused to buy imported cement for its construction projects. The Japanese longshoring companies refused to unload cement that was not directly authorized by the government. The cement manufacturers similarly pressured trucking firms not to carry cement imports. The threat of group boycott was also used to prevent foreign firms from buying Japanese firms in order to gain market access. When one regional concrete union felt competition from outsiders who were importing cheap cement, it arranged for a financial market loan to finance price cuts among its members, so they could drive the competitors out of business.

When a Korean firm tried to export cement to Japan, Tilton reports that the local manufacturers refused to allow them to use Japanese storage silos. When the firm tried to build its own, the government refused to sell the land. The government further insisted on separate and costly weighing and testing procedures only for imports. Tilton reports that Japan's Federal Trade Commission eventually fined the cement industry for price fixing, but overlooked the boycott on imports.

In a distinct but similar way, Tilton relates how Japan's large heavy industries sector relied on the steel industry to supply it with inputs and to purchase its machinery and ships. These and other interlocking relationships with construction companies, trading companies and others led to fear of retaliation for importing steel. After detailing some specific examples, Tilton concludes: "Thus, Japan's largest steel manufacturer thinks of its sales relationships as a broad, all-encompassing commitment rather than simply an agreement to buy specific products, and considers a customer's decision to switch to another buyer for one product a betrayal which should be retaliated against by withholding other products it alone can provide." (p. 3-21)

Tilton describes how various other institutions help protect the prices of downstream users in Japan so they can continue to pay high prices for cement and steel. For example, Japanese

surveys have established the pervasiveness of bid-rigging in both public and private construction projects. This, along with government-published price guidelines for construction materials, helped guarantee that the high prices would be met.

While large domestic/international price gaps indicate substantial nontariff barriers in Japan for cement and steel, one could not recommend changes without, as Bosworth et al. suggest, identifying the particular NTBs that might account for the price gaps. To that end, Tilton has marshaled an extensive array of historical and anecdotal data. Based on Tilton's numerous discussions, Japanese business groups reportedly concur with his description of private practices, though they offer no suggestions for reforms that would help Japan meet its obligations under international trade agreements.

Manifold picks up the story of inter-linked business relations in Japan and extends it to the behavior of Japanese affiliates abroad. Referring to a broad spectrum of sectors, she describes the nature of keiretsu business groups and the entrenched relationships they develop between suppliers and buyers, impervious to large price advantages offered by outside suppliers. She then considers how these relationships might affect market access in other Asian countries where Japanese firms have concentrated their overseas investments. She labels the trade effects of such business practices transferred abroad as "transplanted trade barriers".

Manifold uses data on Japanese FDI from the 1994-1995 *Directory of Japanese Affiliated Companies in Asia* published by the Japan External Trade Organization. These data are cross-referenced with Dodwell's *Industrial Groupings in Japan 1994/95* to identify keiretsu affiliations for Japanese overseas investments. As reported in table 7 of the paper, 61 percent of the Japanese affiliates in Indonesia are associated with one or more keiretsu, as are nearly half in Thailand and Malaysia.

According to surveys by the Export-Import Bank of Japan, sales in the host market is the leading reason for Japanese investments in the other East Asian economies. Further, data from MITI indicate that 59 percent of sales and 63 percent of purchases for Japan's Asian manufacturing affiliates are intra-firm transactions. Japanese electronics firms in Singapore buy almost 80 percent of their audio video components from other local Japanese companies. These data, along with sectoral and country detail, are reported in tables 8 through 11 in the paper.

Thus as Manifold points out, when examining nontariff barriers in Asian economies, a study of local systems may not give the complete picture. The complexity of intra-firm relations among foreign direct investors may play an important role. She concludes that to establish the importance of this feature of Japanese economic organization would require more investigation of intra-firm sales and how Japan's practices compare to those of other foreign investors.

Business networks

The next two papers on business networks provide a different view of private practices and suggest that Japan may be a unique case. Certain similarities exist between the Japanese system

and business groups found in Korea, but business networks in Taiwan and among overseas Chinese take on a less restrictive or even trade-promoting nature.

One form of business network is vertical integration between production of upstream intermediate goods and downstream final goods. Yet the ambiguous nature of vertical integration can generate uncertain outcomes and uncertain recommendations. Vertical integration can improve efficiency in some instances while also being exclusionary. These characteristics keep vertical integration off the "highest clarity" section of Richardson's list of competition policy issues.

Vertical integration can be efficient when firms produce differentiated products under increasing returns to scale. Certain varieties may not be produced in the most efficient quantities if there is uncertainty over the level of demand for them. Vertical integration provides a guaranteed level of demand for a given variety of input, and also allows the buyer to obtain a lower price for a product whose seller could otherwise exercise some market power over price.

Feenstra and Hamilton develop an analytical model of business groups where such price considerations lead to two main stable outcomes: one includes a few large, vertically integrated business groups; the other involves smaller business groups among suppliers of intermediate goods who sell to independent final goods producers. In the model, the price advantages of vertical integration are traded off against the governance costs of keeping the group together and covering the development costs of affiliates with unique varieties of inputs. Free entry and exit of new business groups, as well as independent firms, underlie the dynamic adjustment in the model. A key parameter is the degree of substitutability between different varieties of inputs.

The model produces several equilibrium solutions, but perhaps the most stable are the two described above. The authors find the solution with few large vertically integrated groups to be a close match for Korea and the solution with upstream business groups to closely resemble Taiwan. Using detailed country data to determine shares of within-group sales, the authors portray Korea as dominated by vertically integrated chaebols that cover nearly the entire manufacturing sector. Only a handful of these have been successful while a second rung has struggled. Feenstra/Hamilton find this reflected in their model, where the relevant solution becomes unstable as the number of large vertical groups starts to grow. In similar empirical work on Taiwan they find smaller groups in textiles, pulp and paper, chemical materials, minerals and metals selling to downstream sectors where business groups are virtually nonexistent. This pattern is also reflected in the corresponding model solution where instability arises as upstream groups increase their degree of vertical integration.

Since the model produces more than one solution, the authors conclude that economic factors alone do not predispose an economy toward any particular pattern of business networks. Both commenters on this paper considered it unlikely for Korea's corporate pattern to arise without government assistance. Yao offers that if a chaebol-type solution emerges from a model that has no government, this could indicate that it would survive without government help, after an initial public effort to put the system in place. Yao further remarks that while potential internal efficiencies could explain vertical integration, they did not explain observed chaebol involvement in unrelated industries. The remark is noteworthy given that heavy investments in unrelated industries was at the heart of instability among chaebol in the course of the 1997-98 Asian financial crisis.

Rather than study a particular country, Trindade and Rauch examine the international business network formed by ethnic Chinese populations in a number of countries. They consider the proposition that this network serves to provide information across countries on market opportunities for differentiated products. In other words, they serve as international matchmakers between buyers and sellers of goods in markets where detailed information on product features is important and costly to obtain. In this function, the network serves to increase trade volumes among countries where the network operates.

Trindade and Rauch hypothesize that the information-sharing role of the Chinese network will result in a greater influence on trade in differentiated products than on trade in products with well-organized international exchanges or those with easily found reference prices. They test their hypothesis using a gravity model of international trade volumes. They modify the model by adding, among other variables, a term representing the product of any country-pair's ethnic Chinese population shares. The model was estimated with data from 63 countries, both for 1980 and for 1990. Trade data were disaggregated to the four-digit SITC level and various sources were used to classify commodities into three categories: organized exchange, reference priced, and differentiated.

The authors find that their variable on Chinese population shares was positively and significantly correlated with bilateral trade volumes for differentiated products and more so for these than for the other two types of goods. Specifically, they find that ethnic Chinese networks increase trade volumes of differentiated products between the typical pair of APEC countries by 30.2 percent. Their analysis provides further evidence that this effect does not derive from cross-country similarities in taste caused by ethnic Chinese populations.

Trindade and Rauch emphasize that "... most studies show that ethnic Chinese are quite willing to include non-ethnic Chinese business partners in their network once they get to know them." (p. 5-11.) Indeed, they would reduce their usefulness as information-providers if they excluded businesses of other nationalities. The authors go on to recommend that governments can replicate the trade-enhancing role of coethnic networks by creating and extending access to other international information-sharing networks or trade promotion activities.

Discussants of this paper pointed out that the role of differentiated goods needed to be established as sufficiently different from that of other goods in order to endorse the information-sharing function assigned to the Chinese network. They further found that other, perhaps complementary, explanations for the model results are possible, such as that ethnic networks serve to reduce risk, or that national trade policies changed over the period. If a government were to follow the authors' recommendation on enhancing trade promotion activities, information on precisely how ethnic business networks help increase trade would be essential.

Modeling APEC Trade Liberalization

General equilibrium simulation models, and computable general equilibrium (CGE) models in particular, have often been used to evaluate trade policy changes and regional trade agreements. This is because trade liberalization is an inherently general equilibrium phenomenon, with trade

shocks in one sector affecting other sectors, wages, and incomes. The CGE class of models allows the simulation of potential policy changes. It also provides a systematic basis for measuring welfare gains from policy changes. Although each model will have unique features, they can all report some form of real income or welfare changes for the economy in question. Thus where nontariff barriers can be quantified, CGE models can be used to simulate their trade and welfare effects.

The following sections describe the six modeling papers presented at the symposium. The first two papers make assessments of overall APEC trade liberalization. The next two treat liberalization in the services sector. The last two evaluate trade policies in fully dynamic models, treating issues that can only be handled in the context of developments over time.

General equilibrium models of regional trade liberalization

Dee's paper on the comprehensiveness of APEC trade commitments treats a number of issues not often dealt with in studies of regional trade nor in trade modeling exercises. In particular, she evaluates the potential gains from trade facilitation measures, in light of APEC commitments in this area. She evaluates the limited research available on costs imposed by customs procedures, divergent standards and technical regulations, and other regulations. She finds estimates of the costs imposed by such procedures ranging from 5 to 15 percent of the value of trade. With a varying list of barriers considered, this research finds gains from trade facilitation in the range of 4 to 6 percent of GDP for some countries. Dee's modeling approach is to test two alternative values for the direct cost savings from trade facilitation: 5 and 10 percent of the value of total trade.

In addition to trade facilitation, the paper also focuses on agriculture trade and trade in services. These are both sectors with substantial degrees of protection, even after liberalization undertaken in the Uruguay Round and NAFTA. The measurement of protection in services trade is the more problematic of the two since data on trade in services are much less developed. Dee points out the shortcomings of allowing a large dispersion in protection across sectors by liberalizing those with low barriers and leaving high protection elsewhere. Then resources that move out of some liberalized sectors can move into less efficient activities.

The model used to evaluate the various trade measures is a global CGE model with 37 sectors. The 1992 GTAP (Global Trade Analysis Project) data form the model's data base, although the protection data were replaced with WTO sources on pre-Uruguay Round rates. Then, a preliminary experiment was conducted to reduce protection rates to post-Uruguay Round, post-NAFTA levels. A portrait of the remaining protection levels is given in table 1 of the paper. The model also uses an imperfectly competitive specification for most sectors. It further allows for a period of capital accumulation with limited possibilities for expanding foreign borrowing. In addition, total labor resources can grow in the economies with large shares of informal employment.

The results from simulating the elimination of all the identified barriers in APEC on an MFN basis are reported in tables 2 and 6 of the paper. The overall welfare gains amount to over

one percent of GDP, which is impressive given that the starting point is post-Uruguay Round. Clearly the allowance for expansion of the capital and labor resource base enhanced the estimated gains from liberalization. When agriculture is excluded from the experiment, the reduction in gains amounts to 60 percent of the original benefits from liberalization of traded goods. Countries with high protection in agriculture suffer especially from the exclusion as they no longer free up the resources to take advantage of liberalization in other sectors. The results from liberalization of services and from trade facilitation indicate the important role these measures would take in overall trade liberalization.

According to model simulation results, the annual real income gain for APEC members from the removal of all trade barriers could be \$300 billion. Trade facilitation measures could add from \$200 to \$400 billion more.

The paper by Park, Tan, and Toh also uses a global CGE model with data from 1992. The motives for their analysis of various regional trade groupings, which centered around the ASEAN countries, were described above in the section on foreign investment. Basically, the ASEAN countries found themselves among some of the fastest growing economies, but facing rapid global integration for China and regional trade agreements elsewhere that threatened to divert investment away from ASEAN countries. Forming a regional trade area seemed to have the potential for capturing the dynamism of the region while preserving its attraction as a destination for foreign investors.

Among the distinctive features of the model is the Almost Ideal Demand System (AIDS) specification for import demand. This feature allows the income elasticity of import demand to be higher than one, as has been empirically observed. The importance of specifying a varied responsiveness to income of different product demands, as the AIDS functions allow, is treated in the paper by Jorgenson, discussed below. The AIDS specification also allows the degree of substitutability between goods from different countries to vary according to the specific country-pairs.

In addition, the model also specifies three channels for "trade externalities," meaning changes in an economy's structure due to the experience of higher trade levels. The authors refer to empirical evidence that the imports of foreign capital and intermediate goods embody new technologies that can improve domestic efficiency. This mechanism is built into the model along with two externalities on the export side. These latter two are based on evidence from the Asia region that the experience of exporting, through the pressures to produce world class products, can help improve domestic productivity.

The authors use the model to simulate the effects of regional trade groupings among various combinations of East Asian countries and the United States. In each case, regional trade groups are formed by members cutting existing (1992) tariff and nontariff barriers to each other by 50 percent. In a useful summary table, table 4 in the paper, they compare outcomes across the different experiments. These results show that the ASEAN countries gain the most from the broadest possible regional liberalization, i.e. APEC-wide, rather than from forming any of the smaller sub-groups. The model results at both the aggregate and sectoral level highlight the important role of trade with the United States for the Philippines, and trade with Japan for

Indonesia. Therefore, neither of these ASEAN members would want their major trading partner left out of a regional trade agreement.

Barriers to trade in services

Benjamin and Diao also use a global CGE model to compare different types of trade liberalization. They focus on the treatment of services trade and compare liberalization in that sector with a general trade liberalization. The particular role of services as the largest sector in APEC economies, the single largest intermediate good, and a rapidly growing component of world trade draw attention to the sector.

The barriers identified as influencing trade in services include foreign market regulations, quotas, technical standards, certification requirements, government procurement rules, and the need to obtain foreign market information and maintain foreign distribution networks. The paper presents evidence that the expense of surmounting these barriers imposes fixed costs on firms that export services.

In the model, private tradable services are specified as imperfectly competitive products. The NTBs affecting services reduce international competition, segment markets and limit the scope for cross-border arbitrage by consumers. This leaves producers with a different degree of market power in each national market, including their own. Thus NTBs provide opportunities for service exporters to price discriminate across country markets. Model experiments simulate services trade liberalization by assuming that barrier reduction causes firms to switch from price discrimination to a single pricing strategy within APEC. The fixed costs of exporting services are also reduced in the experiment. These results are compared with a general tariff removal among APEC members on an MFN basis.

The results from the Benjamin/Diao model show that trade liberalization in other sectors has a strong impact on trade in services, and reveals a strong comparative advantage in services among the large western APEC economies. Thus while smaller East Asian economies gain the most in terms of real income from tariff elimination, the larger Western members gain most from reducing services barriers. For the United States, results show that when reduced service barriers lower fixed costs in the sector by five percent, the gains from service trade liberalization alone equal those from complete APEC tariff removal. (These gains are about 0.9 percent of real income for the United States and higher for the other APEC members.)

The results also show that tariff removal causes reductions in a number of the sectoral net trade balances, indicating trends counter to those that produced the base trade patterns. In contrast, services liberalization reinforces the existing sectoral trade balances. The authors find an explanation in the role of services as the major source of intermediate inputs to other sectors. In terms of primary factor use, services are relatively capital intensive and are used most by other capital intensive activities. Therefore, as liberalization reduces the cost and increases the use of intermediate services, the role of primary factors in determining sectoral comparative advantage will be reinforced.

Kawai and Urata use a single-country model with Japanese data to estimate the cost of regulation in the Japanese service industry. Although services in the model are not internationally traded, the authors use the greater influence that foreign productivity and foreign prices would have under deregulation as a means to simulate the reforms.

Kawai and Urata note the rapid expansion of the services sector from two thirds to three quarters of the Japanese economy over the last ten years. As examples of burdensome regulations, they report that new entry in most service sectors requires government approval and that most service prices must be either approved by the government or reported to it. These regulations limit competition and lead to low productivity and high prices. In table 2 of the paper they report Japan's 1990 total factor productivity (TFP) and price relative to that of the United States for 162 sectors. Among services, TFP is almost always lower in Japan and prices are often more than double those in the United States.

When the authors exogenously increase TFP in all their model's service sectors by ten percent, the overall price level falls and real GDP rises by more than five percent. Among all services, higher TFP in the construction and distribution sectors make the greatest contribution to GDP in this exercise. Kawai and Urata assume that if Japan deregulated the services sector, the TFP would converge toward the level of that in the United States. They then conduct two further experiments. First they reduce the gap between Japan and U.S. services TFP by half. Second, to simulate a more general trade liberalization, they reduce the Japan-U.S. TFP gap by half in the primary and manufacturing sectors and eliminate the gap between the Japanese prices of imports and U.S. prices. This last measure removes the price gap that is often measured in determining the total protection rate afforded by the combination of tariff and nontariff barriers.

In the services deregulation simulation, GDP rises by 9.3 percent. The authors find that investment rises by 13.3 percent and consumption by 4.2 percent. The welfare gains amount to 270,000 yen (\$2,300) for the average consumer. Production increases in all sectors of the economy. In the trade liberalization experiment, GDP rises by 2.2 percent while investment and consumption both rise by 3 percent. The authors allow that the responsiveness to lower import prices is limited, because these elasticities were estimated from data observed under a restricted trade regime. When the services and trade experiments are combined, GDP increases by 12.2 percent and consumer gains rise to 562,000 yen per person. (As above, this implies \$4,800 per person.)

Kawai and Urata conclude that the benefits of services deregulation and trade liberalization fully warrant making these policy changes. However, noting model results showing substantial shifts in sectoral output and employment, they suggest the adjustment costs may be large and they recommend adjustment assistance.

Dynamic modeling of trade liberalization

The last two papers consider trade liberalization in a dynamic setting. The models consider the path of adjustment over a period of time long enough for trade shocks to generate a new long run equilibrium. Consumers and investors are able to optimize saving and investment

behavior over the adjustment period subject to intertemporal budget constraints. Since saving and investment decisions are inherently functions of time, dynamic frameworks allow modelers to include rational behavior in these important aspects of adjustment to trade policy changes.

Ho and Jorgenson present a dynamic open-economy model of the United States. The most distinguishing feature to mention here is that they use time series data from 1947 on to develop full econometric estimates of consumer and producer behavior. These time series data are used to estimate production functions chosen from the class of flexible functional forms. Such a specification allows them to represent productivity growth in a way that more closely tracks past data, but it also raises other methodological issues.

On the consumption side, Ho and Jorgenson reject the common assumption that demands for goods rise proportionately with income, and instead specify varying income elasticities of demand for different goods, as the data indicate. They have econometrically estimated the price and income elasticities of demand for their 35 model commodities, for each of 672 types of households. On both the production and consumption side, the authors point out the major structural shifts in recent decades that would be missed without the detail they include in their model. Similarly with import demand, they point out that the current U.S. episode of rapid change in the share of imports is not well-captured by traditional models of import demand. Much of the paper, in fact, focuses on the methodological difficulties of accurately representing medium term adjustments with functional forms that will still allow convergence to a long run equilibrium.

In describing simulations of trade liberalization, they portray the detailed paths of the most important variables. One important development, noted in other dynamic simulations, is that trade liberalization causes the price of capital goods to fall and total investment to rise over the no-liberalization path. An indication of welfare, or real consumption gains, can be taken from one of their experiments which removes all U.S. and foreign tariffs as of 1980, and removes the tariff equivalents of U.S. quantitative restrictions on textiles, apparel, shoes, steel and autos. The results show an initial consumption gain of 0.36 percent and a long run gain of 1.08 percent, compared to the no-liberalization case. These gains increase if substitutability between imports and domestic goods is higher, indicating the value of refining econometric estimates of these parameters. The gains would also increase if the authors had estimates allowing them to simulate the impact of removing NTBs in other countries.

The simulation results in this paper illustrate the impact of trade liberalization on the United States. The liberalization is not APEC-specific, nor are the short run results of a dynamic simulation precisely comparable to those of a static model. Yet one relationship that should be noted among the Ho/Jorgenson results is how much greater long run gains are than short run gains. This point is echoed in McKibbin's dynamic results discussed below. Go, in his comments on Ho and Jorgenson, suggests that the margin of gains added by a dynamic specification may not be so high. Citing results from a model that can be run in both static and dynamic formats, he raises new questions on which factors may account for the added dynamic gains and what their relative importance might be. Kouparitsas, in commenting on McKibbin, also suggests greater comparability between static and dynamic model results.

McKibbin brings dynamic general equilibrium modeling into a global framework. This allows dynamic investment behavior to be extended to international capital flows drawn by cross-

country differences in rates of return. Thus countries can borrow abroad in the short run if their capital returns are higher and then build up trade surpluses to pay off foreign debts over time. Consumer and investor behavior is partly determined by dynamic optimization and partly by current income and profits. Also, while financial capital is fully mobile, physical investments are increasingly costly to install and costly to move once installed. Further, wages are not fully flexible, the degree of flexibility varying with labor market institutions in each country.

The author finds that these short term rigidities affect the initial adjustment to trade liberalization, reducing short term substitution possibilities in production. Long run substitution possibilities are higher, and for most of the economies simulated, the long run outcome contrasts with that of the short run.

In model simulations, McKibbin uses WTO data to set baseline tariff levels for APEC economies, and then reduces these gradually to zero by 2010 or 2020, for developed or developing APEC members, respectively. He finds that smaller countries with large trade shares and higher levels of protection gain most from their own trade liberalization, but welfare gains are even higher when the other members participate in the liberalization. In APEC-wide MFN liberalization, U.S. long run real consumption gains are 1.89 percent and most other economies show even greater gains.

The results show that under liberalization, aggregate world investment rises, but investment does not increase in every member economy. Even so, the income from investments made abroad guarantees consumption gains everywhere. Given the short term rigidities mentioned above, liberalization can lead to short run GDP losses and unemployment. Yet some of the long run gains can be tapped early on through access to forward looking asset markets. Moreover, if a number of other countries join in the liberalization, the collective efficiency gains and investment flows serve to reduce short term losses and increase long term gains. McKibbin emphasizes the sensitivity of the results to a number of parameter values and recommends further research.

Principal Lessons from the Symposium

When work on a variety of nontariff barriers is gathered together, it becomes clear that information is available to provide some measure of the size or relative importance of many barriers to trade. Specific estimates of most barriers would require more data gathering and analysis, but may not be necessary in many cases. Where researchers can agree that clear economic benefits will arise by moving trade regulations in a particular direction, the problem becomes one of finding the means to increase international convergence and cooperation in those areas.

Trade modelers similarly have much work to do in improving the precision with which they model markets hindered by trade barriers, including the estimation of relevant parameters. Nevertheless, general equilibrium model simulations have brought forward early indications of the great scope and value of liberalizing NTBs in addition to APEC tariffs. Modeling exercises presented at the symposium illustrate various approaches to trade issues such as trade facilitation, trade externalities affecting productivity, and trade in services. The modelers also demonstrated

and proposed new standards for fitting models to time series data and for including dynamically specified global capital flows.

As Dixit and Josling point out, there is much information on NTBs, even in complicated market environments, that ultimately shows up in price gaps measurable as tax or subsidy equivalents. However, as Mao and Tavares caution, the price distortions prevalent in many economies argue for taking account of a variety of information, such as profits or, as in Kawai and Urata, international productivity gaps, in addition to apparent price gaps. Taking the recommendation of Bosworth et al., price gaps need to be evaluated in terms of the specific barriers affecting the relevant markets and how these barriers might influence price.

The studies by Tilton and Manifold show that understanding the details of how markets work is essential to discerning the NTBs affecting various markets. If research on NTBs is confined to what can be explicitly quantified, the results will be unsatisfying. A number of public and private practices affect a variety of markets in ways that are difficult to isolate or quantify. Research discussed by Winston, Evenett, Dixit and Josling, Bosworth et al. and Dee, all indicate methods of quantifying trade barriers in complex circumstances, such as deregulation, public procurement, public monopoly power, international differences in service quality, or trade facilitation. Nevertheless, some important trade issues will not yield to this approach. It is especially problematic to try to measure a market distortion when there is no consensus on the "best practice" baseline against which a distortion is supposedly imposed.

Park points out divergent interests on patent protection with no obvious optimum for serving inventors as opposed to consumers and imitators. Richardson lists a number of issues where the standards of best practice are difficult to discern. One of these is the issue of vertical integration, posing potential trade-offs between efficiency and exclusion of other, perhaps more innovative, market entrants. The ambiguous role of vertical integration is prevalent in the papers on business networks. Richardson proposes ranking issues according to the productivity of pursuing international convergence on them. This productivity is a mix of clear, likely economic gains and political feasibility.

Richardson's study focuses on competition policy, yet this field covers most disputes under the description of "private practices." His paper concludes that, even if such trade barriers cannot all be quantified or even clarified, research can identify certain directions where economic gains are apparent, and policymakers should find ways of heading in those directions. He, like Barfield in discussing deregulation, proposes specific guiding principles for achieving productive international convergence on the most promising competition policy issues.

For NTBs that can be quantified, general equilibrium models provide a more standard metric for evaluating regional economy-wide welfare effects. These models can also indicate the structural effects of trade policy changes, and, in a dynamic setting, portray the nature of adjustment paths over time. Yet this capacity must be seen in light of the fact that these model estimates of effects of liberalization, commonly made and cited, are incomplete without further inclusion and evaluation of NTBs. As several of the symposium presentations have shown, modeling has progressed in these areas, but needs to keep pace with ongoing research on nontariff barriers.

SESSION I

TRADE POLICY MEASURES

Regional Integration and Foreign Direct Investment

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1. Introduction

Recent years have witnessed a deepening and widening of European integration and a proliferation of new regional integration agreements (RIAs) throughout the world, with acronyms such as APEC, EU, MERCOSUR, and NAFTA attracting increasing attention. Although some integration agreements have been motivated by political considerations, it is clear that economics is generally the driving force: countries enter into RIAs because integration promises various economic benefits. In the short run, integration is expected to stimulate intra-regional trade and investment; in the longer run, it is hoped that the combination of larger markets, tougher competition, more efficient resource allocation, and various positive externalities will raise the growth rates of the participating economies. This paper focuses on the investment effects of RIAs, and discusses how such arrangements may affect foreign direct investment (FDI) flows in the integrating region. With foreign direct investment, we refer to foreign ownership of a controlling share of a firm operating in a country's domestic market: FDI flows refer to changes in the foreign ownership of production factors.

The perhaps most serious challenge facing a study of the relation between regional integration and foreign direct investment is the multi-dimensional character of the issue. There is reason to believe that effects will vary between different integration agreements, and between countries and industries participating in any specific agreement. For instance, the degree of integration at the outset, and the significance and nature of the changes brought about by the RIA, will matter for the outcome. The patterns of trade and investment at the outset will determine how much adjustment is necessary after the agreement. Countries where outward FDI flows are initially very large are not likely to be affected the same way as countries where inflows of FDI are dominant. Integration between developed countries may differ from integration between developing countries or agreements between countries at different levels of development, depending on how competitive and complementary the economies are. For these reasons, we present a simple conceptual framework that provides a rough indication of what to expect from any specific RIA. Moreover, we cover several different examples of regional integration in the empirical part of the paper.

The paper is organized as follows. The next section discusses how regional integration can potentially affect investment patterns among countries, and presents an organizational template for examining the relation between RIAs and FDI. Section 3 reviews some earlier empirical studies of the investment impact of regional integration, with focus on evidence from the European Community, and presents three case studies focusing on different kinds of regional integration: North-North integration (Canada joining CUSFTA), North-South integration (Mexico's accession to NAFTA), and South-South integration (MERCOSUR). Section 4 provides a brief summary and some tentative conclusions.

2. Regional Integration Agreements and FDI: Some Theoretical Considerations

The term regional economic integration typically refers to reductions of regional trade barriers and investment restrictions. To identify and assess some theoretical linkages between RIAs and incentives to

undertake FDI, it is therefore convenient to structure the discussion along these two dimensions of integration. Hence, we begin by discussing effects of *trade liberalization*, and distinguish between the impact on FDI that is mainly a response to trade barriers, and FDI that is primarily motivated by the need to internalize firm-specific intangible assets that cannot be traded efficiently in arm's-length markets. We go on to consider the impact of special *investment provisions* and other institutional changes that are sometimes connected to integration agreements. The focus in this discussion lies on static effects: the possible dynamic effects of regional integration on investment flows are discussed separately. Finally, we suggest a template for classifying entire countries and specific sectors according to the expected impact on investments.¹

2.1 Effects of Trade Liberalization: Tariff-jumping and Internalization

The early theoretical and empirical literature on foreign investment tended to regard trade and capital movements as substitutable modes of serving foreign markets.² This view of the relationship between trade and factor mobility suggests that tariff barriers could motivate import-substituting FDI, and that general tariff reductions would reduce FDI flows or even stimulate a "repatriation" of foreign-owned assets to the home countries of MNCs. However, although much FDI is motivated by tariff-jumping arguments, there is a clear emphasis in more recent literature on exploitation of intangible assets as the major motive for foreign investment (see Caves 1996 for a review). In order to compete successfully in a foreign market - where local firms have superior knowledge of the local market, consumer preferences, and business practices - the internationally oriented firm must possess some firm-specific intangible asset, such as technological and marketing expertise, that gives it a competitive edge. The effective exploitation of these assets sometimes requires firms to "internalize" their international operations by establishing foreign affiliates, since other modes of international business, including exports and licensing of technology to foreign firms, carry relatively high transactions costs (Buckley and Casson 1976; Dunning 1977). Some FDI can therefore be expected to occur even when there are no formal trade barriers between countries.

These two views of the motives for FDI give partly contradictory predictions regarding the effects of regional integration, particularly for intra-regional investment flows. Regarding tariff-jumping FDI, we would primarily expect reduced investment flows because trade liberalization makes exporting from the home country relatively more attractive than FDI as a way to serve the regional market.³ However,

¹ It should be noted already at the outset that the discussion will not address the welfare effects of changes in investment flows. Although the underlying assumption is that increased FDI flows are beneficial to growth and development in the integrating region, it should be recognized that the welfare effects may in fact be negative if the RIA worsens the allocation of resources or adds new distortions, e.g. in the form of higher average protection of the regional market. For a classic reference, see Brecher and Díaz-Alejandro (1977). In addition, the welfare effects on the rest of the world may well be negative if the RIA diverts investment from other countries to the region in question.

² See e.g. Mundell (1957). Note, however, that these authors, writing in the Heckscher-Ohlin tradition, seldom refer specifically to foreign *direct* investment: the strict distinction between FDI and foreign portfolio investment did not become essential until it was recognized that the exploitation of firm-specific intangible assets is a major motive for FDI, whereas portfolio investment is mainly motivated by international differences in capital yields.

³ To the extent that regional integration results in trade creation, it may be necessary to temper this
(continued...)

regional integration would not create incentives to reduce investment or repatriate capital for projects that were primarily undertaken to internalize the exploitation of intangible assets. In fact, the reduction of regional trade barriers could instead stimulate overall FDI flows among the relevant trading partners by enabling MNCs to operate more efficiently across international borders. This argument applies in particular for vertically integrated FDI, where the operations of the MNC's different affiliates are specialized according to the locational advantages of the host country, and where a predictable and liberal trade environment is a prerequisite for the international division of labor at the firm level. Hence, the static effects on intra-regional FDI flows are subject to partially off-setting influences, and the net impact on any specific RIA or individual member country would tend to be determined by the structure of and motives for pre-existing investment. A reasonable generalization, however, is that countries with low initial trade restrictions are more likely to benefit from increased intra-regional FDI flows as trade barriers are reduced, since they are not very likely to host import-substituting FDI projects that might be withdrawn.

Turning to inter-regional FDI flows, both the tariff-jumping and internalization models suggests increased investment flows. The inflows of FDI from "outsiders" into the region could obviously go up if the average level of protection increases as a result of the RIAs, or if the establishment of a RIA raises fears about future protection (as in the debate on "Fortress Europe"). The inflows of foreign capital would also increase if the volume of incoming FDI was initially restricted by the limited size of the individual national markets. Contrary to the national markets, the integrated "common" market may be large enough to bear the fixed costs for the establishment of new foreign affiliates. This surge of inward FDI would probably not be evenly distributed, but rather concentrated to the geographical areas with the strongest locational advantages. In addition, Kindleberger (1966) has pointed to "investment creation" as a likely response to the trade diversion brought about by RIAs. The term refers to the strategic investment responses by outside firms who lose export markets when their former customers turn to suppliers based in the region, because regional trade is not obstructed by trade barriers.⁴

The potential effects of RIA on outflows of FDI from the integrating region are rarely discussed in formal models. This is mainly related to the simplifying assumption that nothing happens with trade barriers in the rest of the world. However, some changes in outward FDI are feasible even when trade policies in the rest of the world remain unchanged. For instance, it is possible that a firm's capacity to undertake new FDI projects is restricted by its administrative capability or the availability of investment

(...continued)

conclusion somewhat - intra-regional FDI in some member countries might well increase in response to changes in the regional production structure- but the general prediction would still be a reduction of intra-regional trade flows. The extent of these cross-border investment flows of course depends on the initial situation and the relative strength of the firms in the different member countries. This potential impact on intra-regional FDI flows has been termed "investment diversion" by Kindleberger (1966).

⁴ It is also possible to picture situations where RIAs could cause a reduction of FDI from outside the region. Specifically, if the initial stock of outside FDI consists of horizontally organized affiliates in several or all of the countries in the region, it is not likely that this structure would be optimal after the establishment of the RIA. A possible response to integration could then be a rationalization of the network of affiliates, so that the entire region could be supplied from a smaller number of affiliates located in the member countries with the most favorable economic conditions. In this case - which is similar to Kindleberger's (1966) investment diversion case - some countries could experience disinvestments as foreign MNCs concentrate their regional operations in other member countries. On balance, however, it appears that the arguments in favor of increased FDI inflows from outside the RIA are stronger.

capital (Stevens and Lipsey 1992). In that case, it is likely that FDI within and outside the region are substitutes. To the extent that integration reduces intra-regional FDI, it may therefore increase the scope for outflows of FDI from the integrating area to other regions. Yet, this impact is not likely to be very strong, and it is reasonable to expect that the trade liberalization element of RIAs results in a net increase in the inflows of FDI to the region. However, intra-regional FDI is subject to contradictory influences, as noted above, and we are not able to say much about the investment effects on individual countries - investment can be expected to cluster to those parts of the RIA where the investment environment is most favorable, and some countries may therefore be left with less FDI than before.

2.2 Explicit Investment Provisions and Other Influences

To the extent that RIAs also liberalize capital flows, an additional stimulus is provided to the FDI process. Capital flows can be liberalized in several ways. Most directly, restrictions on inward foreign direct investment might be reduced or eliminated. Inward FDI will also presumably be encouraged by "national treatment" provisions ensuring that foreign investors are treated no less favorably than domestic investors. Obviously, the practical relevance of such provisions depends on the scope and magnitude of pre-existing barriers to inward FDI, as well as the extent and nature of host government discrimination against foreign investors. Explicit dispute resolution mechanisms are also featured in many integration agreements. To the extent that such mechanisms are effective, they should reduce trade and investment disputes between the participating nations and encourage FDI.⁵

Inward FDI could also be stimulated by the elimination of trade-related investment measures (TRIMs), such as requirements for foreign affiliates to satisfy specific export targets, and by the presence of strong investor property rights which reduce the risk of direct or indirect expropriation. Both types of initiatives may be institutionalized in RIAs. In this context, it is possible that a significant effect of some RIAs may be that they "lock in" economic reforms in the participating countries. By raising reform decision from the national to the international level, the agreements may create a more predictable policy environment for foreign investors, who might otherwise fear that purely national reform efforts are temporary and that various kinds of restrictions may be reintroduced when the political regime changes. These effects are likely to be most important in agreements involving developing countries, where political risk is often considered to limit FDI inflows. Moreover, to the extent that "market forces" become a stronger influence on capital investment decisions compared to political risk, international differences in factor endowments should become stronger influences on investment location decisions. This strengthens the tendency for FDI to be concentrated to the most attractive investment locations in the integrating area.

2.3 Dynamic Effects of Regional Integration

In addition to the static effects discussed above, it is possible that the establishment of RIAs also generates various dynamic effects that affect FDI flows. For instance, analyses of the economic impact of the European Single Market have argued that this specific integration process has led to significant efficiency benefits that will raise the participating countries' growth rates over the medium or long term.

⁵ To the extent that potential trade disputes act as non-tariff barriers to trade, it is also possible that these mechanisms discourage some "tariff-jumping" FDI.

These dynamic benefits might increase the attractiveness of the integrated region as a location for domestic as well as foreign investment. The higher growth rates may be temporary, lasting while the economies adjust to the higher real income that comes about because of tougher competition and more efficient allocation of resources in the common market (see e.g. Emerson *et al.* 1989). It is also possible that there are permanent growth effects that occur as the initial gains in efficiency and output raise factor rewards and generate new savings and investments that contribute further to output growth (Baldwin 1989). However, the exact links between regional integration and dynamic growth effects are not well specified, and it is not uncommon that analyses and empirical estimates of dynamic benefits are considered vague or speculative (Smith 1992).

In many instances, FDI may actually be an essential catalyst for these dynamic benefits. Some of the improvements in economic efficiency associated with increased specialization, exploitation of scale economies, and greater geographical concentration of individual economic activities are likely to be driven by inter and intra-regional FDI. Increased FDI flows are also important forces behind the heavier competitive pressure that is expected to encourage local producers to adopt efficiency-enhancing strategies, such as rationalizing plant capacity or reducing slack in the production process (Smith and Venables 1989). In addition, it is likely that FDI will stimulate technology transfer and diffusion, both directly and through *spillovers* to local firms (see Blomström and Kokko 1997).

Furthermore, if regional integration creates a larger market, it is also conceivable that some dynamic effects occur because regional integration influences various firm characteristics, such as the stock of intangible firm-specific assets that facilitate FDI. A larger market may simply allow some firms to grow larger and stronger than what would have been possible in individual national markets. Alternatively, integration may motivate firms to seek strategic alliances or merge with former competitors in order to manage in the more competitive environment that is created when intra-regional trade barriers are removed. As firms become larger, they may be able to invest more in R&D and marketing, which may lead to the creation of new intangible assets that stimulate new FDI, within as well as outside their own region.

Including this kind of dynamic considerations into the analysis, it appears clear that there is a potential for significantly stronger effects on FDI than what static models imply. The main impact of dynamic benefits of integration is to make the integrating region a more attractive investment location, which should stimulate intra-regional FDI flows as well as inflows from the rest of the world.

2.4 Synthesis of the Discussion

Clearly, some FDI has been, and continues to be, motivated primarily by the desire to get behind trade barriers. Other FDI is motivated by foreign investors seeking to exploit input or output markets located abroad in activities where operating a foreign affiliate is the most efficient governance structure. In the discussion above, we have noted that regional integration is not likely to have the same impact on all types of FDI. For any individual country, the overall impact on investment will therefore reflect potentially offsetting influences. However, a reasonable generalization is that regional integration should enhance the attractiveness of investing in the region as a whole by creating a larger common market and contributing to improved overall efficiency and higher income levels in that market. The magnitude of the changes in investment will be related to the significance and nature of the trade and investment liberalization initiatives embodied in the RIA.

In addition to differences between RIAs, there are several reasons why the impact on investment decisions may vary across countries and industries. For instance, countries characterized by relatively unprotected and efficient domestic markets prior to regional integration are likely to enjoy the strongest increases in foreign as well as domestic investment. The reason is that countries with low trade barriers are not very likely to host import-substituting foreign investment that might be withdrawn or diverted to other locations as a result of regional integration. The *ex ante* structure of trade and investment flows is another determinant of the country and industry specific responses to RIAs. Countries and industries that are already closely linked to their RIA partners before the formal agreements - due to geography, historical conditions, or other reasons - are likely to face smaller changes than countries and industries with limited initial contacts with the other participants in the RIA.

In addition to the distinctions we have made regarding the motives for FDI, it may therefore be useful to specify a summary framework relating trade and investment liberalization initiatives to country and industry characteristics. Figure 1 provides an organizational template for thinking about the FDI process in the context of regional integration. The attribute labeled environmental change summarizes the degree to which trade and investment flows are liberalized by the integration agreements in question. This depends both on the nature of the specific agreement and the initial institutional environment in the region. As one moves down the rows of Figure 1, the degree of liberalization is considered to be "weaker". The attribute labeled locational advantage summarizes the degree to which it is advantageous from a profitability standpoint to locate an economic activity in a particular location. This characteristic refers to the availability and cost of various production factors as well as the country's geographic location with respect to major consumer markets and the general macroeconomic environment. As one moves across the columns (from left to right) in Figure 1, the locational advantages of a particular country - in relation to other members in the RIA and the rest of the world - are presumed to be weaker. Identifying the position of a specific country or industry in Figure 1, we will have a starting hypothesis for the investment impact of regional integration. More detailed predictions regarding FDI flows must, of course, also take into account trade and investment patterns prior to integration, the motives for pre-existing FDI, the competitive strength of domestic versus foreign firms, and so forth.

FIGURE 1. Classification Dimensions

	Locational Advantages (Positive to Negative ⇒)	
Environmental Change (Strong to weak ↓)	1	2
	3	4

Source: Globerman and Schwindt (1996).

The most pronounced positive impact on investment would presumably be experienced by those economic sectors falling into area 1. These activities experience the strongest degree of integration, and the country in question enjoys a strong locational advantage. Hence, for reasons noted earlier, one would anticipate relatively strong, positive capital flows from both foreign and domestic investors in these sectors. In area 3, the hypothesized impact on domestic investment is weaker, albeit still positive. Area 3 contains those economic activities for which the country in question has a strong locational advantage, but for which the impact of the integration agreement is relatively weak. Economic integration between OECD countries, where the formal and informal barriers to trade and investment are relatively low already at the outset, can be expected to provide many examples of industries falling into this category.

Moving to area 2, the expected impact on inward FDI is negative and the potential for actual disinvestment increases. Specifically, the activities in area 2 are strongly affected by the integration agreement, but the country in question suffers locational disadvantages in these sectors. Many countries and industries where the bulk of existing FDI has been established in order to avoid trade barriers would be classified in this area. Finally, we hypothesize that the impact of integration on activities in area 4 are likely to be small. While the country or industry in question suffers a locational disadvantage in terms of the activities in area 4, the impacts of the integration agreement on the overall economic environment are also quite weak. In other words, area 4 contains activities where investment decisions are not likely to be affected by the RIA, either because the sector in question is excluded from the agreement (such as agriculture in the EFTA or EEA agreements) or because the market is too small to attract the attention of foreign competitors.

3. Empirical Studies of Regional Integration and FDI

In the theoretical discussion, we concluded that it is difficult to make general predictions regarding the results of RIAs on foreign direct investment decisions, but that identifying the position of a specific country or industry in Figure 1 would provide a rough first hypothesis. The strongest positive effects on FDI are likely to occur in countries and industries where the integration agreement result in significant environmental change, and where we find some location advantages with respect to the other members of the RIA or the rest of the world.

In this section, we will review the empirical evidence on the investment effects of RIAs. To cover as many as different outcomes as possible, we have chosen to summarize some earlier empirical studies of the impact of European integration, and to examine three more recent cases of regional integration:

- North-North integration, as illustrated by the impact of the CUSFTA on Canada,
- North-South integration, focusing on Mexican participation in the NAFTA, and
- South-South integration, exemplified by the establishment of the MERCOSUR.

3.1 *The Early Evidence*

Earlier work on regional integration and foreign direct investment have dealt mainly with the effects of European integration on the size and structure of the activities of MNCs⁶. The period following the formation of the European Community coincided with a considerable inflow of US direct investment, and several studies from the 1960s and 1970s asked to what extent this was motivated by the European integration process (see Yannopoulos 1990 for a survey of the literature). The general conclusion of the debate was that the Common Market had attracted United States investment which might otherwise have been located in other European countries. Thus, the formation of the EC seems to have influenced the locational pattern of US direct investment abroad and lured US firms to increase their activities in the European Community. This empirical result is well in line with the theoretical hypotheses regarding the general effects of RIAs on inter-regional FDI flows discussed above: economic integration is likely to make the region a more attractive investment location for outside investors.

Studies of later stages in European integration have been more mixed in their findings about the effects on inter-regional foreign direct investment. For example, Dunning (1992), claims that the challenges of 1992 have led to a revitalization of US investment in the EC, while Lipsey (1990) concluded that the changes in the location of fixed investment by US MNCs were relatively small up through 1989. The upsurge in Japanese investment in Europe has also attracted much attention, and the conclusion seems to be that those investments have increased as a consequence of the 1992 program, in response to both the opportunities and threats created by the integration process (see e.g. Thomsen and Nicolaides, 1991 and Balasubramanyam and Greenaway, 1992).

Studies of the impact of economic integration on intra-regional investment are more rare and generally constrained by data shortages. Some relatively crude studies by Franko (1976) and Pelkmans (1984), focusing on the changes in the number of foreign manufacturing subsidiaries of EC-firms established in other Community countries, found that European integration coincided with a period of clear shifts in the location of production of multinationals of EC parentage. In other words, these studies found signs of "investment diversion" in the Kindleberger sense. A similar picture is suggested in a later study by Molle and Morsink (1991), based on FDI flows between EC countries during the period 1975-1983. The study suggests that intra-EC trade and intra-EC investment are complementary to each other, but only above a certain level of trade intensity.

Most of the literature linking RIAs to foreign direct investment focuses on investment effects for the region as a whole. Substantially less attention has been paid to the impact of RIAs on the foreign direct investment outcomes for individual countries within the region. The few earlier works focusing on individual countries include studies of the UK (e.g. Mayes, 1983 and Grant, 1983) and Ireland (O'Farrell, 1983). The results from these studies are mixed. While no investment effects were found in the case of the UK, Ireland's membership of the EC stimulated direct investment from both EC and non-EC sources. One possible explanation could be that many foreign investors (particularly US firms) had entered the relatively open UK market already during the 1950s and 1960s, before the country's accession to the EC, so that little additional investment was necessary to respond to the new situation. In other words, the UK

⁶ Some exceptions to the European focus are early studies of Latin American integration, including Behrman's (1972) study of LAFTA, Myltelka's (1979) study of the Andean Group, and Bulmer-Thomas' (1982) study of The Central American Common Market.

experience might illustrate a case that would be classified in area 3 of Figure 1. Ireland, by contrast, was not any major location for foreign investment prior to EC membership, and integration provided good opportunities for exploiting the country's locational advantages - this would be an example where area 1 dominates. Winters (1996) notes another distinction between Spain and Portugal, on the one hand, and Greece, on the other hand. Spain and Portugal benefited from significant increases in inward FDI as a result of EC membership, but Greece did not, largely because the country's macroeconomic policies did not provide an attractive environment for foreign investors. Hence, while Spain and Portugal can be classified as area 1 cases, Greece may illustrate area 2: weak locational advantages obstructed the potentially beneficial investment responses to Greek EC membership.

3.2. North-North Integration: Canada in the CUSFTA

The essence of the Canada-US Free Trade Agreement (CUSFTA), which came into effect on January 1, 1989, was the phased bilateral elimination of tariffs. In addition, a number of provisions reduced discrimination against bilateral foreign direct investment, including the extension of rights-of-establishment and national treatment. A range of prominent sectors, such as basic telecommunications, was effectively excluded from coverage under the investment liberalization provisions of the Agreement. Moreover, Canada's existing foreign investment screening procedures were left in place (Globerman and Walker 1993). Nevertheless, the thrust of the investment provisions of the CUSFTA was clearly to expand the legal scope for bilateral direct investment. Moreover, the inclusion of a relatively robust dispute resolution procedure arguably reduced the risks of either government acting in a discriminatory manner towards investors from the other country. In terms of the first classification dimension of Figure 1 (i.e., the degree of environmental change resulting from the RIA) it seems reasonable to characterize the Canadian position as an intermediate one, with moderate changes resulting from the agreement. In this context, it should be remembered that bilateral trade between Canada and the US had been substantially liberalized well before the event studied here, through successive GATT rounds as well as special bilateral agreements such as the Auto Pact and the Defense Sharing Agreement. Regarding the the locational advantages of Canada with respect to the US and the rest of the world, it is also reasonable to suggest an intermediate position. Hence, the position of Canada should be roughly at the center of Figure 1, which implies relatively moderate investment effects of the CUSFTA agreement. Does the empirical evidence support this hypothesis?

Bilateral trade between the United States and Canada has become relatively more important from 1988 onward which indicates that CUSFTA significantly liberalized the North American trade environment (see Globerman and Schwindt, 1996). It is, however, difficult to discern a consistent pattern in FDI flows between the two countries that would clearly be related to the CUSFTA.

Table 1 presents an overview of the Canadian foreign direct investment pattern between 1986 and 1995. Bilateral inward and outward direct investment refer to US direct investment inflows to Canada and Canadian direct investment outflows to the United States, respectively. Other inward and outward direct investment refers to non-US direct investment flows into Canada and Canadian direct investment flows to countries other than the United States. While there are substantial changes in FDI flows for individual years, the overall magnitude of bilateral direct investment was relatively stable (decreasing slightly in nominal terms) over the period 1988-1992. Substantial increases in the nominal value of inward direct investment from the United States emerged in 1993 and continued through 1995, while the nominal value of outward direct investment to the United States increased in 1994 and 1995 - but only back to levels

experienced in the mid-1980s. It is unlikely that these increases in investment flows are directly related to the CUSFTA, since they emerged in 1993, well after the implementation of CUSFTA, and coincided with a general boom in outward FDI flows from the US at that time. Furthermore, it is suggestive that a substantial decline in the value of the Canadian dollar began in 1992 following five years during which the Canadian dollar strengthened against its US counterpart. This decline in the value of the Canadian dollar may well have constituted an important motive for the increased US investments in the country.

Table 1
Inward and Outward Foreign Direct Investment for Canada
(millions of Canadian dollars)*

	Bilateral		Other	
1983	29	1686	2438	1558
1984	3196	3209	2960	1563
1985	-191	3144	1965	2130
1986	-743	3362	4607	1502
1987	6028	7278	4632	4044
1988	2052	2963	5899	1775
1989	2091	3510	3850	1918
1990	3246	2800	5917	2722
1991	1961	1925	1187	4553
1992	2719	1315	2673	3144
1993	5308	968	1117	6522
1994	7279	2456	960	4070
1995	10229	3570	5122	2996

Source: Statistics Canada, *Canada's Balance of International Payments*,
Ottawa: Ministry of Industry, various issues

* Net flows including reinvested earnings accruing to direct investors.

Inward direct investment from countries other than the United States exhibits no consistent pattern over the period studied, although the largest inflows took place between 1988 and 1990, right after the implementation of the CUSFTA. Certainly there is no consistent evidence of any lasting diversion of foreign direct investment flows to Canada in response to CUSFTA. However, there is an interesting pattern in the development of Canadian outward direct investment to countries other than the United States. Until 1990, Canadian outward FDI was primarily directed to the US, but the early 1990s saw a significant decrease in the relative importance of the United States as a destination for Canadian outward direct investment. This decreasing share of outward FDI destined for the US is mirrored by an increasing share (beginning in 1991) going to EU member countries other than the United Kingdom, and an even more dramatically increasing share going to regions other than the EU, the United States and Japan. The profitable opportunities encouraging a redirection of Canadian direct investment outflows presumably had nothing to do with CUSFTA. However, CUSFTA may have played an important role in that it guaranteed access to the US market, so that available FDI resources could instead be utilized to establish Canadian presence in other markets.

As a complement to the flow data on FDI, Tables 2 and 3 present some recently published data on the gross product of US foreign affiliates in Canada and Canadian affiliates in the United States. Table 2 focuses on the role of foreign affiliates in the Canadian economy. The second column of the table measures the share of US majority-owned foreign affiliates in Canadian GDP. The US share has fallen from well over 11 percent in the early 1980s to about 8 percent in the early 1990s. Coupled with the observation that bilateral trade with Canada has increased as a result of the CUSFTA, this suggests that regional integration has resulted in FDI becoming a relatively less important mode for US firms to serve the Canadian market.

Table 2.
Foreign Firms' Shares of Canadian GDP 1977-1993 (percent).

Year	US Affiliates in Canada/ Canadian GDP	All Foreign Firms in Canada/ Canadian GDP
1977	13.8	n.a.
1982	11.3	n.a.
1983	n.a.	16.2
1988	n.a.	15.6
1989	9.5	n.a.
1990	8.8	14.8
1991	8.0	n.a.
1992	7.9	14.3
1993	8.2	15.1

Sources: Mataloni and Goldberg (1994), Mataloni (1995), Fahim-Nader and Zeile (1995), Lipsey, Blomström, and Ramstetter (1995), and World Tables.

In other words, there is some indication that trade has substituted for inward FDI from the US. Another indication of the same development is that Canada's share of US MNCs' foreign production has fallen significantly since the implementation of the CUSFTA. The ratio of US affiliates' production in Canada to the aggregate production of all US affiliates abroad fell from 16.3 percent in 1989 to 12.6 percent in 1993.

At the same time, it appears that Canada has become a somewhat more attractive investment location for outsiders. The last column of Table 2 shows that aggregate output share of all foreign affiliates has remained roughly constant, at about 15 percent of Canadian GDP, which indicates that other foreign investors have made up for the reduction of the US share of Canadian production.

Table 3 shows the data on foreign affiliates' shares of US output since 1988. It can be seen that the share of Canadian affiliates has fallen slightly since the start of the CUSFTA, from 0.7 percent in 1988 to 0.6 percent in 1994, while the aggregate share of all foreign firms has increased from 3.9 percent in 1988 to over 4.6 percent in 1993⁷. The largest increases in the GDP shares of foreign firms seem to have

⁷ Data are not available for the period before 1988, which means that any conclusions regarding the relation
(continued...)

taken place in connection with the implementation of the agreement, in 1988 and 1989. These data suggest a similar development as in the Canadian case: regional integration seems to have reduced the relative importance of intra-regional FDI, but stimulated inflows of FDI from the rest of the world. Comparing the Canadian and US experiences, it also appears that the effects on FDI are not evenly distributed. For Canada, the net result appears to be close to zero, where increased inter-regional inflows barely make up for reduced intra-regional investment. In the US case, there seems to be a positive net effect, with the increases in FDI inflows from the rest of the world dominating the reduced Canadian shares.

Table 3
Foreign Firms' Shares of US GDP, 1988-1993 (percent).

Year	Canadian Affiliates in the US / US GDP	All Foreign Firms in the US / US GDP
1988	0.72.	3.89
1989	0.69	4.25
1990	0.69	4.31
1991	0.69	4.50
1992	0.57	4.42
1993	0.65	4.58
1994	0.62	n.a.

Sources: See Table 2.

Hence, Canada offers a potentially instructive case study of the impacts of a RIA on foreign direct investment flows for a small open economy. Since economic theory makes no compelling case for a strong linkage between RIAs and FDI patterns for individual countries, and since the environmental change connected with the CUSFTA was not dramatic, it is hardly surprising that the pattern of overall foreign direct investment into and out of Canada over the past years does not suggest a strong and consistent influence of the agreement.

3.3 North-South Integration: Mexico and NAFTA

Shortly after the establishment of the CUSFTA, Canada and the United States initiated negotiations with Mexico about a possible southern expansion of the integration agreement. In December 1992, the three countries signed the North American Free Trade Agreement (NAFTA). This agreement, which came into effect on January 1, 1994, was the first formal regional integration agreement involving both a developing and developed countries. In essence, the NAFTA is an extended version of the CUSFTA. In addition to the trade and investment liberalization measures introduced already in the CUSFTA, the new treaty includes major advances in areas such as government procurement (where coverage is extended to

(...continued)

between these changes and the establishment of CUSFTA should be treated with caution.

services and construction) and intellectual property and investor's rights (introducing binding investor-state arbitration), as well as more stringent rules of origin (see e.g. Hufbauer and Schott 1993 for details).

The overall effects on Mexico of a free trade arrangement with Canada and the United States are expected to be significant, for several reasons. One important determinant is Mexico's geographical location. In the 1970s, many Mexicans considered it to be a drawback to be "so far from heaven and so close to the United States". Today, when regional trade and investment barriers have been reduced as a result of the NAFTA, the situation is different. The North American share of Mexican exports has increased from around 70 percent in the late 1980s to over 86 percent in 1995 (UN Trade Tapes). The value of Mexican exports more than quadrupled over the same period as a result of the increasing sales to North America, with the largest increases occurring between 1992 and 1995. The North American share of Mexican imports has also grown over this period, but not quite as dramatically

Another reason to expect positive implications of the free trade arrangement for the Mexican economy is related to the significant policy changes that have taken place in recent years. Traditionally, Mexico has been a closed economy. In the mid-1980s, however, important market-oriented reforms were introduced in several sectors, and the economy began to open up. As a consequence of the NAFTA, the reform process has been "locked in" and extended to other sectors, such as autos, textiles and apparel, finance, telecommunications, and land transportation (see Hufbauer and Schott 1993). The coincidence of policy reforms, distinct locational advantages in the form of cheap labor, and free access to a substantial part of the Canadian and US markets, is very likely to promote economic growth in Mexico. In terms of Figure 1, it is reasonable to position Mexico in area 1, which suggests that the effects on FDI should be significant.

It is quite clear that foreign multinationals have noted and reacted on the recent changes in Mexico. As shown in Table 4 below, the inflows of FDI have risen significantly since the late 1980s, from less than USD 3 billion to nearly USD 8 billion in 1994.

Table 4
Foreign Direct Investment Flows into Mexico (USD million)

Year	1989	1990	1991	1992	1993	1994
FDI inflows	2,785	2,549	4,742	4,393	4,389	7,978

Source: IMF, International Financial Statistics (various issues).

Since US multinationals dominate the FDI scene in Mexico it is relevant to look specifically at their responses to the NAFTA agreement. Table 5 suggest that US firms have expanded their presence in Mexico, but that much of the investment increase took place before the formal discussions about NAFTA began. The US FDI position in Mexico has not increased much since 1992, and the share of Mexico in total US investment abroad has actually declined during the past years. This indicates that outsiders account for the bulk of the recent inflows of FDI to Mexico. To some extent, these investments are probably directed to the local market, in response to the country's improving economic and institutional environment, but the investment flows are also likely to reflect some degree of investment diversion and investment creation. To the extent that Mexico has become a relatively more important supplier to the US

market through trade creation or trade diversion, foreign multinationals are likely to respond by increasing their productive capacity in Mexico.

Table 5

US Direct Investment Position in Mexico on a Historical-Cost Basis at Yearend, 1992-1995
(Million USD; percent of total US foreign direct investment position in parentheses)

Year	1987	1992	1993	1994	1995
US FDI Stock	4,900	13,730 (2.73)	15,229 (2.72)	15,714 (2.53)	14,037 (1.97)

Sources: Survey of Current Business, Vol. 75, No. 8, August 1995, and Lowe and Bargas (1996).

Moreover, the timing and character of the changes in the US investment position suggest that NAFTA has perhaps not been the main determinant of the upswing in US investments in Mexico. An equally important stimulus must have been the comprehensive reforms of the country's FDI regulation that commenced already in the mid-1980s and eventually culminated with the NAFTA. The Mexican regulatory framework for FDI, which dated back to 1973, was very restrictive and served as a disincentive for investment from abroad (Blomström 1989). In the backwash of the Mexican debt crisis, these regulations were changed dramatically in 1989 to attract foreigners to invest in Mexico. It appears that US investors responded quite strongly to this first round of reforms. A few years later, the investment regime was further liberalized through the NAFTA (see Gestrin and Rugman 1994 for details). Among others advances, the agreement established a clear, rules-based framework for the impartial treatment of FDI and placed strict limits on the use of performance requirements. It also established dispute-settlement mechanisms specifically designed to deal with investment issues. The US response was relatively mild this time, since many US firms were already in place (and because the agreement guaranteed their access to the Mexican market anyway), but investors from outside the region perceived Mexico as a much more attractive investment location than before.

When it comes to the effects of foreign investment in Mexico, there is some evidence that multinational firms have played an important role in opening up the country to foreign trade, by converting import-substituting industries into exporting (Blomström and Lipsey, 1993). The rapid expansion of the *maquiladoras*, where foreign firms play an important role, has also speeded up the trade liberalization process (Kagami 1996). However, the main contribution of the presence of foreign firms presumably comes from technology transfer and technology spillovers. The Mexican economy seems to have reached a level of development and skills where local firms are able to absorb some of the new technology that is imported and used by foreign multinational firms (see Kokko 1994 and Blomström, Lipsey and Zejan 1994). This means that the foreign owned multinationals operating in Mexico may well act as catalysts in bringing about the kind of dynamic growth effects that have been discussed in connection with the European Single Market program.

The experience of Mexico suggests that North-South integration may be greatly beneficial for the Southern partners, and illustrates some of the prerequisites for achieving these beneficial effects. Firstly, membership in the NAFTA coincided with other reforms that liberalized the institutional framework of the country. Hence, the RIA contributed to a very significant and positive environmental change. Secondly, Mexico possesses strong locational advantages with respect to its northern neighbors. These are made up

of increasingly market oriented economic policies, geographical proximity, and cheap labor. Consequently, regional integration has been connected to significant increases in the inflows of foreign investment, in particular from countries outside the NAFTA region.

3.4 South-South Integration: MERCOSUR

Regional integration in the Southern Cone of the Western Hemisphere dates back to 1986, with a bilateral agreement between Argentina and Brazil, which stipulated the elimination of all trade barriers over a ten-year period. Five years later, in 1991, this agreement was extended under the Treaty of Asuncion, with the purpose of creating a Common Market in the region. The resulting agreement, known as MERCOSUR, also includes Paraguay and Uruguay as members. Intra-regional trade has gradually been liberalized since the early 1990s, culminating in the establishment of a Customs Union on January 1, 1995. The MERCOSUR Customs Union stipulates free trade in (most) goods among the four member countries and a Common External Tariff (CET) for trade with third countries (see Laird 1995). The CET has 11 tariff levels varying from 0 to 20 percent, but some important product groups, like automobiles, telecommunications, and computer equipment, are excluded from the agreement. However, it should be noted that the integration process has not led to an across-the-board reduction of external tariffs for all countries. On the contrary, in several product groups, the CET is a compromise between countries with domestic import-substituting producers (who start out with high tariffs that are reduced as a result of integration) and countries without domestic production (where low initial trade barriers have been raised). In some cases, such as the region's automobile industry, it is even appropriate to talk about a general increase in the external trade barriers as a result of the integration process. In addition to the trade arrangements, a partially new investment regime has also been established to promote and protect investment in the MERCOSUR region (IDB 1996).

Looking at the reforms of the trade and investment rules in the MERCOSUR region during the past decade, it is clear that there have been significant changes, although it is uncertain how much of the reforms should be credited to the formal integration agreement. As noted above, there are areas where unilateral liberalization has been important, and other field where reforms are mainly related to multilateral initiatives, such as the GATT. Yet, in terms of the classification dimensions of Figure 1, it is clear that the environmental changes coinciding with the MERCOSUR process have been strong in all of the participating countries. Regarding the investment environment, it can be argued that Argentina and Brazil are the two countries with the strongest locational advantages, mainly thanks to abundant natural resources, relatively well developed industrial sectors, and large domestic market. Considering the remaining barriers to inter-regional trade, these advantages apply in particular for production aiming at the regional market. Hence, at least for the cases of Argentina and Brazil, participation in the MERCOSUR should be classified in area 1 of Figure 1, which suggests that we should expect relatively significant investment effects for these two countries. The expected impact on the two remaining members, Paraguay and Uruguay, is more uncertain due to their smaller markets and weaker locational advantages.

The effects of the trade liberalization in the Southern Cone are evident from Table 6. During the first half of the 1990s, intra-MERCOSUR exports as a share of the region's total exports more than doubled, to reach nearly 20 percent in 1994.

Table 6**External Trade of MERCOSUR, 1988-1994 (Million USD and percent)**

	1988	1989	1990	1991	1992	1993	1994
Total Exports (USD million)	44,829	46,555	46,433	45,911	50,487	54,085	62,027
Intra-MERCOSUR Exports (percent)	6.5	8.2	8.9	11.1	14.3	18.6	19.3
Total Imports (USD million)	23,076	26,061	29,302	34,264	40,649	48,509	62,422
Intra-MERCOSUR Imports (percent)	13.3	15.1	14.5	15.5	18.4	19.6	19.6

Source: Laird (1995)

Intra-regional imports as a share of total imports increased significantly as well, from 13.3 percent in 1988 to 19.6 percent in 1994. It should be remembered that these changes refer to the period immediately before the establishment of the MERCOSUR Customs Union in 1995, and that the shares of intra-regional trade are likely to have increased further since then. Yet, the liberalization of intra-regional trade has been a gradual process, and most of the reforms in this area had already been completed by late 1994.

There is also a renewed interest in the MERCOSUR on the part of foreign investors. The inflow of foreign direct investment into the region more than tripled between 1989 and 1993, as shown in Table 7. As expected, Argentina and Brazil have been the favored localizations for FDI, while Uruguay and, particularly, Paraguay, have been lagging behind. Unfortunately, there are no aggregate data available to analyze FDI flows for the period after the establishment of the Customs Union in 1995.

Table 7**Foreign Direct Investment Flows into MERCOSUR Members (Million USD)**

Year	Argentina	Brazil	Paraguay	Uruguay
1989	1,028	1,131	12.8	37.7
1990	1,836	989	76.3	38.6
1991	2,439	1,103	83.1	30.3
1992	4,179	2,061	42.0	n.a.
1993	6,305	1,292	50.0	101.5
1994	n.a.	3,072	n.a.	170.0

Source: IMF: International Financial Statistics.

However, looking at home country data for the major foreign investor in the region, the United States, it appears that the real boom of FDI did not occur until after this event. Table 8 shows that in 1995 alone, the US stock of FDI in the region increased by more than 25 percent, which is significantly higher than the growth rate of US investment in the rest of the world. It should, therefore, be noted that we risk underestimating the investment responses to the MERCOSUR by restricting the analysis to the period for which data are available.

Table 8

US Direct Investment Position in the MERCOSUR on a Historical-Cost Basis at Yearend, 1992-1995.
(Million USD; shares of total US foreign direct investment position in parentheses.)

	1992	1993	1994	1995
Argentina	3,327 (0.66)	4,331 (0.77)	5,945 (0.96)	7,962 (1.12)
Brazil	16,313 (3.25)	16,822 (3.01)	18,798 (3.03)	23,590 (3.31)
MERCOSUR^{a)}	19,640 (3.91)	21,153 (3.78)	24,743 (3.99)	31,552 (4.43)

^{a)}Excluding Paraguay and Uruguay, for which no data are available.

Source: Survey of Current Business, Vol. 75, No. 8, August 1995, and Lowe and Bargas (1996).

The aggregate data do not distinguish between intra- and inter-regional investment flows, but the significant increases in the investment position of the United States, shown in Table 8, suggest that a significant share of the inflows come from outside the MERCOSUR. It is also obvious that the increases in FDI flows have occurred at different times in the individual countries, which may indicate that foreign capital has been attracted by other factors than regional integration. This motivates a closer look at the individual countries.

Argentina registered the largest increases in FDI inflows before 1994, and there is reason to expect that much of this was unrelated to the regional integration process. Chudnovsky, López, and Porta (1995) suggest three major explanations for the increases in foreign investment in Argentina since the early 1990s. The most important attraction for foreign investors was arguably Argentina's comprehensive privatization program, which opened several public service industries to foreign investment. Several public companies in the telecommunications and transportation sector were sold to foreign investors.

Another important determinant was the country's successful macroeconomic reforms, which managed to bring down public deficits, inflation, and interest rates, and ensured the convertibility of the currency. Unlike the present situation in Europe, where the members of the EU are obliged to fulfill certain macroeconomic "convergence criteria", economic integration in the form of MERCOSUR was not a motive for Argentinean macroeconomic stabilization. A third factor influencing foreign investors was the new wave of protectionism in the region's auto sector in the early 1990s. In 1991, Argentina introduced a system of quotas on imports of finished automobiles, which contributed to an increase in foreign investment inflows to the sector.

In the short run, it is likely that the effects of increased FDI inflows on the Argentinean economy will remain limited. For instance, the impact on the diversification and expansion of exports has been relatively modest so far, since a large part of the foreign investment has taken place in the nontradable sectors, in connection with the privatization of public services. In the long run, however, we should expect positive effects of these investment, since the efficiency of public services is likely to improve and strengthen the country's international competitiveness. In the auto sector, by contrast, it is apparent that the recent FDI inflows have contributed significantly to technology transfer and modernization, but the long-run effects on the country's competitiveness and welfare remain questionable. As in other cases of import substitution,

protectionism distorts the allocation of scarce resources and allows local producers to operate less efficiently than foreign competitors.

The foreign investment in Brazil has fluctuated widely during the past years, and the inflows of FDI have fallen well short of those to Argentina, although the Brazilian market is about four times larger. One reason is that market-oriented reforms were introduced later and macroeconomic stabilization was achieved later in Brazil than in the other countries in the region. Consequently, the positive prospects connected with regional integration were tempered by an unpredictable macroeconomic environment. However, the recent years have witnessed successful reforms and stabilization in Brazil as well and the inflows of FDI have increased markedly. For instance, Brazil replaced Argentina as the favored MERCOSUR location for US direct investment in 1994 and 1995 (see Table 8). The strong locational advantages of Brazil - in terms of its large market and supply of labor and natural resources - suggest that we should expect substantial inflows of foreign investment in the medium run, assuming that the country's macroeconomic environment remains stable.

The experiences of the two smaller countries in the region, Paraguay and Uruguay, are mixed. While the flows of FDI to Uruguay seem to have increased, there is no clear trend for Paraguay. Uruguay is arguably more attractive for foreign investors because of its geographical location between Brazil and Argentina, while the locational advantages of Paraguay are weaker. In both cases, foreign investment can be expected to be directed to industries where economies of scale are not important - industries relying on scale economies are more likely to locate in either Argentina or Brazil, where they can benefit from proximity to larger consumer markets. However, neither Uruguay nor Paraguay is likely to be influenced greatly by static investment effects. Instead, their benefits of economic integration are likely to derive from possible dynamic effects, that lead to growth and increased demand for their exports in the entire MERCOSUR region. It is also possible that economic integration will have a stabilizing impact on the political and macroeconomic environment in both countries, in the sense that radical policy changes are less likely because of the commitments to the neighboring countries.

Given that the MERCOSUR Customs Union was not established until 1995, it is obvious that it is too early to accurately describe even the static effects of that specific RIA on foreign investment. Yet, less ambitious forms of regional integration have been pursued by the MERCOSUR countries since the mid-1980s, so that much of the intra-regional trade had been liberalized in 1994, and it is possible to draw some tentative conclusions from the region's experience to date. The following generalizations are suggested by the analysis above.

First, macroeconomic stability is likely to be a more important determinant of FDI inflows than is regional integration. Both the Argentinean and Brazilian experiences illustrate that foreign investors have responded stronger to successful stabilization programs than to the early stages of the MERCOSUR project. Second, comprehensive integration, as in the case of the MERCOSUR Customs Union, may stimulate significant investment responses. In our data, this has mainly been illustrated by the changes in the US investment position in the region between 1994 and 1995, but there are indications that investors from other countries have also reacted strongly, as discussed above. Third, the inflows of FDI to the region are not likely to be distributed equally to all participating countries. Argentina and Brazil possess relatively strong locational advantages and will also be the main beneficiaries of increased FDI inflows in the short to medium run. Finally, as illustrated by the development in the MERCOSUR auto sector, it is not evident that the welfare effects of all FDI increases will be positive. To the extent that regional integration contributes to increased distortions, e.g. in the form of higher tariff barriers or market sharing

agreements between oligopolistic producers, it is possible that the resulting inefficient allocation of resources outweighs the various benefits of FDI inflows, such as technology spillovers.

4. Summary and Conclusions

The relation between regional integration agreements and foreign direct investment is neither self-evident nor straightforward, as illustrated by the first part of this paper. In our attempt to set up a conceptual framework for thinking about the impact of RIAs on FDI flows, we touched upon several characteristics of countries and investors that contribute to the confusion surrounding the issue. For this reason, we proposed an eclectic approach for examining the impact of regional integration on individual countries or industries, and a rough working hypothesis: the stronger the environmental change and the stronger the locational advantages of the individual industry, the more likely it is that the RIA will lead to inflows of FDI from the outside as well as from the rest of the integrating region (see Figure 1).

The empirical evidence in the second part of the paper provided some support for this rough hypothesis, although the cases also highlighted some of the cross-country differences in the investment effects of regional integration. The first case focused on the Canadian participation in the CUSFTA, and illustrated a situation where the RIA did not appear to cause any radical changes in the inflows of FDI to the country in question. The main reason for the moderate impact of the CUSFTA are probably that the environmental change connected with the agreement was not dramatic (since trade between Canada and the US was already relatively free due to GATT commitments and various bilateral treaties) and that there was already considerably cross-investment between the two countries. The relatively modest investment response to this specific RIA may well be a general characteristic of many North-North agreements, where the trade and investment regimes are relatively open and markets are *de facto* integrated already before the formal RIA.

The second case examined the impact of the NAFTA agreement on foreign investment in Mexico, and suggested that this specific RIA has had a profound impact on the inflows of FDI. The establishment of the NAFTA coincided with and deepened other reforms that liberalized the institutional framework of the country. Hence, the agreement contributed to very significant and positive environmental changes: an added bonus is that these are likely to be perceived as more permanent improvements in the investment environment than purely domestic reforms. Thanks to its increasingly market oriented economic policies, geographical proximity, and supply of cheap labor, Mexico also possesses strong locational advantages with respect to its northern neighbors. Consequently, regional integration has created an abundance of new commercial opportunities for domestic and foreign investors, in the domestic Mexican market as well as in the US and Canadian markets. The response has been a significant increase in the inflows of foreign investment, in particular from countries outside the NAFTA region. The Mexican experience may capture some general characteristics of North-South agreements, primarily related to the potential for improved policy credibility and gains from guaranteed access to large northern markets.

The third case examined the impact of regional integration in the Southern Cone, involving Argentina, Brazil, Paraguay, and Uruguay. Although the MERCOSUR Customs Union was not formally established until the beginning of 1995, a gradual liberalization of intra-regional trade commenced in 1991, and most internal trade barriers had been removed by 1994. The available evidence, although patchy, show that a strong investment expansion has coincided with this integration process, and it is reasonable to assume that comprehensive integration, as in the case of the MERCOSUR Customs Union, may stimulate

further significant investment responses. However, the inflows of FDI to the integrating region are not likely to be distributed equally to all participating countries. In the case of the MERCOSUR, the two countries with the strongest locational advantages, Argentina and Brazil have also been the main beneficiaries of increased FDI inflows in the short to medium run. The experience of the MERCOSUR region also suggests an important caveat that may be relevant for many other instances of South-South RIAs. Macroeconomic stability may have been a more important determinant of FDI inflows to both Argentina and Brazil than is regional integration: both the Argentinean and Brazilian experiences illustrate that foreign investors have responded stronger to successful stabilization programs than to the early stages of the MERCOSUR project. Finally, the structure of the MERCOSUR agreement - with some sectors like autos and telecommunication, where controls and trade barriers have been raised rather than reduced - suggests another important caveat. It is not evident that the welfare effects of all FDI increases stimulated by regional integration agreements will be positive. To the extent that regional integration contributes to increased distortions, e.g. in the form of higher external trade barriers or market sharing agreements between oligopolistic producers, it is possible that the resulting inefficiencies will surpass the various potential benefits of increased FDI inflows.

This brings us to some of the limitations of the present paper. The analysis has focused on the impact of RIAs on FDI flows, but the more general welfare effects have not been discussed in detail, neither for the integrating region nor for the world at large. Moreover, we have concentrated on ownership issues, interpreting FDI flows as changes in the ownership of production factors. Future research should of course consider welfare effects in closer detail, and also take into account factors that determine production location rather than ownership issues alone. Regarding the empirical cases, the discussion has focussed on entire countries, and individual sectors and industries have seldom been addressed. However, the conceptual framework presented in the paper suggests that the impact of RIAs is likely to differ between countries and industries, and more detailed sectoral studies are clearly called for.

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Competition Policies and Trade in an Asia-Pacific Context¹

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I. OVERVIEW

Today's generation, far more than its immediate predecessors, respects and pursues the rewards from highly competitive, global markets. World-wide momentum is still strong toward more open market organization of economic activity. Admittedly there is resistance. Some is ideological (especially in Asia); but much is structural. The most important structural resistance involves border barriers that remain to fully global market integration, such as tariffs, and entry barriers ("behind the border") to fully competitive market structure, such as restrictions on the number and nationality of suppliers of banking, insurance, transportation, and telecommunications services.

Which are the most important remaining barrier to openness? No one has a persuasive answer. But most agree on the relative trend: border barriers are waning in importance relative to entry barriers. More precisely, tariffs, quotas, and border discrimination are being negotiated away, while most regulatory and other barriers that protect incumbent firms, by keeping new suppliers from establishing themselves, are declining much more slowly, especially in large services sectors. Even privatization sometimes replaces a public monopoly with a private monopoly. As a consequence, many commentators would agree that trade has opened over the past several decades at a faster rate than markets themselves have.

Graham and Richardson (1997a,b) tries to answer the questions that follow from these observations. If open global markets are still to be sought, what is the most promising route: via freer trade, freer entry, or some artful combination of the two? What provides the greatest resistance: public border barriers, private anti-competitive practices, pro-incumbent regulation, or some reinforcing mix of these? What are the most feasible and attractive ways of enhancing market access world-wide -- what we will call "contestability" -- access for exporters, foreign investors, and new home suppliers alike? Or is there already too much contestability, openness, access? In what sense and under what circumstances? What are policy supports for ideal openness, both within and among countries?

We believe that the answers lie in judicious experimentation with a blend of principles, policies, and institutions. The ingredients are extracted and mixed from the worlds of "competition policies" and international trade policies. Graham and Richardson (1997a,b) describe the fundamental purposes of competition policies, how they interact with trade policies, and why that interaction has become an international concern. Efficiency, fairness, and conflict are the key features.

We summarize that material very briefly here, and outline a corresponding set of policy initiatives that we find simultaneously desirable and feasible for the Asia-Pacific context. They begin with sensible first steps toward international cooperation -- fact-finding, consultation, dispute settlement, and maintenance of sovereign initiative. In the longer IIE monographs, we then propose for the world system a tougher, but more rewarding, negotiation of an agreement on Trade-Related Antitrust Measures, a TRAMs agreement patterned on the Uruguay Round's TRIPs (Trade-Related Intellectual Property) agreement. There, we also explore the long-run potential for replacing anti-competitive aspects of current "trade remedies" (anti-dumping and countervailing duties) with a new set of competition-policy safeguards, that would be more efficient and more equitable than the current mechanisms.

The ingredients of competition policy and international trade policy are in fact already being blended in reality. This is happening via two routes. First, a formal working group on Trade and Competition Policy has been established in the World Trade Organization to examine many of the issues we examine here. Second, many recent international "trade" disputes fundamentally spring from issues of

competition policy, such as those between Japan and the United States over so-called vertical relationships among manufacturers, users, and distributors of auto parts, memory chips, and photographic film and paper.

II. PROFILE AND OBJECTIVES OF COMPETITION POLICIES IN OPEN ECONOMIES

The concern with competition policies as a new issue in global trade negotiations has mushroomed.¹ Competition policies are at the root of negotiating issues in airlines, basic telecommunications, financial services, insurance, and intellectual property. In all these areas, international differences in regulatory regimes and rules have created highly varied competitive structure. We ourselves have contributed to the growing literature.²

Market Competition and Competition Policies: A Profile

In the broadest sense, competition policies trace institutional boundaries between competition and cooperation.

What is called the "market system" is in fact a peculiar mix of competition and cooperation. Everyone is familiar with the competition. But few reflect very deeply on the cooperation. Almost all the agents that compete are "firms" -- social groupings, whose internal organization is for the most part cooperative, not competitive. Firms are not only the suppliers of most products and services; they are also the principal buyers. Consumers (households) are generally buyers only of final goods, assembled from materials and components that have already been bought and sold many times by firms, through a long series of exchanges in both input markets and in internal, intra-firm transactions. The effectiveness of those enormous intermediate transactions contributes heavily to the productivity of workers and other primary inputs. The "economic man/woman" so common in elementary textbooks is really a stylized fiction; so is the mythical individual entrepreneur; typical real market transactions involve competition among cooperative social groups. Many of these groups, including sub-types of firms and labor unions, have legal status that grants them the right to collectively own and exchange property, and to differentiate and isolate their legal liability as group members from their liability as individuals.

¹ Scherer (1994) and Green and Rosenthal (1996) are close to Graham and Richardson (1997a,b) in coverage, including coverage of comparative competition policy regimes over time and in multiple countries, as well as policy recommendations. Graham and Richardson (1997a,b), however, emphasizes more the fundamental economics and institutions, as well as the integration of existing competition-policy and trade-policy structures at the global level. Scherer's book and Levinsohn (1996) are excellent introductions to economic aspects of competition policies in a global economy. Kuhn et al. (1992) and Ordober (1990) are equally good general introductions to the economics of competition policy, but include less attention to the global economy). First, Fox, and Pitofsky (1991), Gifford and Matsushita (1996), and Matthewson et al. (1990) are excellent introductions to legal aspects, and Hindley (1996), Hoekman (1995,1996), Hoekman and Mavrodies (1994), and Lloyd and Sampson (1994) to political and diplomatic aspects.

² See Graham (1994, 1995, 1996b), Graham and Lawrence (1996), and Richardson (1995, 1997).

What is called the market system is thus socially populated, socially rooted, socially conditioned, and socially constructed. It is far, far away from the chaotically competitive "law of the jungle" with which it is sometimes rhetorically confused. Correspondingly, a global market system will be socially constructed and conditioned, too, by both policy design and cultural inertia.

Competition policies are formal social regulations by which this competitive-cooperative market system is governed. They aim to make the market work better. Designed properly, they are market-perfecting and part of the social infrastructure. They regulate the intensity of competition, the scope of cooperation, and define what are impermissible versions of both. Examples of impermissible competition and impermissible "cooperation," respectively, are predation (the equivalent of a premeditated murder of a market competitor) and coercive collusion (one firm being forced to join a group of others).

Like all social regulations, competition policies reflect history and culture. That is why they are constantly changing and always differ across countries. Not all countries have formal competition policies.³ But all countries have competition conventions, even though many do not codify them. As markets have grown toward global scope, however, differing competition conventions and policies have come into growing contact. Some of this contact has led to conflict, for example, over market access in China; some has led to constructive comparison of alternative policies, with an eye to which might be the "fittest" for growing global markets, such as in deciding the type and duration of protection that an innovator needs from rivals who would copy his intellectual property.

We will begin by describing the two broad objectives of competition policies everywhere and how their interpretation and relative importance differ from country to country. To meet these objectives, every country has developed conventions or rules of conduct for firms acting alone and together, over short intervals of time and over their entire corporate lifetime. In Graham and Richardson (1997a,b) we group these conventions into four "concerns" of competition policies. It turns out, unsurprisingly, that what is welcome competition policy from the perspective of one firm, one industry, or one country is not always welcome in other firms, industries, or countries. In our monographs, we describe the ways that competition-policy objectives and concerns differ for an economy as a whole and for multiple economies in global interaction.

Objectives of Competition Policies: Efficiency and Fairness

One of the most surprising aspects of competition policies is that competition is not their real goal! Efficiency and fairness are the goals. And when these conflict, the goal is to evaluate the tradeoff between them.

³ The number of countries implementing a formal competition policy in recent years has risen sharply: see Green and Rosenthal (1996) and Tineo (1997). Most Eastern European and Latin American countries, Korea, Mexico, and Taiwan have recent legislation in place, or have recently revised it. A number of others are in planning or drafting stages.

Competition policies around the world seek a blend of efficiency and fairness⁴ in their markets. Efficiency has a fairly clear economic meaning. It is a conservation objective; it aims to minimize waste. Efficiency is the ideal of getting the most out of the resources at hand. An efficient market generates goods that buyers really want at least cost. An efficient charity makes sure to move persons from one project to another when the value of the good that their effort generates is quite different across projects. An efficient society seeks the highest standard of living (material and nonmaterial) consistent with its available resources. If "society" is taken to include only those persons currently living, and the relevant time frame is quite short (days, months, or even a few years) then the efficiency it pursues is called "static efficiency". But if "society" includes future generations, and the relevant time frame is longer (five years, a decade, a new generation) the relevant concept is "dynamic efficiency". Practices that are statically efficient may not be dynamically efficient, and conversely. Thus, the simultaneous pursuit of dynamic and static efficiency involves tradeoffs.

Fairness, by contrast, is nuanced and culturally distinctive. In the United States, it often means equality of opportunity, or (in our context) free entry into business endeavor. In other countries, it sometimes has a more meritocratic meaning (favored activity or loyalty should be rewarded), or sometimes means equity of process or outcome (market division according to historic shares). Japanese auto and consumer electronics firms characterize loyalty toward and from their traditional suppliers as "only fair," while potential American rivals find it to be an unfair foreclosing of their market access, as years of acrimonious bilateral negotiations have revealed.

Indeed, to emphasize "fairness" is almost to invite contention, acrimony, and even international conflict when the protagonists are of different nationalities. To emphasize "fairness" is almost to invite abuse of internal political process, in which weak performers blame their faults on unfair treatment by foreign scapegoats. But there is no denying the importance of fairness as a motive for competition policies, and hence there is a clear need for definition of what is and what is not minimally "fair" in a market system and mutual recognition of some range of threshold standards of fairness in international competition. This need is particularly great because the concepts of fairness and, especially, "fair trade" have been much abused by special interest groups.

Because the real goals of competition policy are efficiency and fairness, competition is in fact a means for attaining these goals. For example, "perfectly" competitive market structure -- where there are large numbers of very small firms that freely enter and exit an industry that produces a standardized product -- does often achieve efficiency and equality of opportunity. But this is not always the case. For example, in the "market" for innovation, perfect competition is generally believed to deliver (inefficiently)

⁴ Some countries de-emphasize fairness as an explicit goal of competition policies, for example the United States today. Others give it more prominence, for example Britain and France, as seen in Donald Hay's and Frederic Jenny's chapters in Graham and Richardson (1997b). Virtually all countries, however, include fairness considerations implicitly and in practically implementing their competition policies. Nevin, Nuttall, and Seabright (1993), p. 11, remark that an effective competition authority "must assist in the enfranchisement in the economic process of many of the interests that are naturally underrepresented in the alliance of managers and politicians that makes up the modern corporatist state. Shareholders, consumers, and potential employees an effective competition authority is the ally of all these excluded groups"

too little.⁵ For products characterized by "natural monopoly," the efficient structure is a single supplier for the entire market. Where buyers of a product have varied needs and specifications, such that efficiency requires a multitude of varieties, rather than one standardized product, the efficient structure is a multitude of quasi-monopolistic suppliers of the necessary varieties.⁶ And perfect competition makes no promise about fairness of process or outcome, only fairness of opportunity.

Efficiency and fairness are thus the prize for competition policy; at best competition is a secondary goal or, most accurately, it is an instrument.⁷ It will, however, be convenient to use the term "anti-competitive" (somewhat like the term anti-social) to describe practices and structures that interfere with the objectives of efficiency or fairness. A corollary concept is "rule of reason", which is a legal concept that is used in many cases where considerations of fairness or efficiency (and tradeoffs between these) require subtle judgements and balancing of contentious arguments. Under rule of reason, these judgements are made on the basis of circumstances and probable outcome rather than against fixed *per se* rules.

Efficiency-Fairness Tradeoffs and Cross-Country Conflicts

Efficiency and fairness, like oil and water, do not always mix well. Under most circumstances, neither can be met fully without sacrificing some of the other. Conflict between these objectives occurs within countries and among them.

Within countries, conflict occurs when business practices that enhance the efficiency of some firms appear unfair to others, or when policies that treat all situations even-handedly have a very high efficiency cost. Mergers between firms, for example two large telecommunications companies, often involve efficiency for insiders at the apparent cost of inequity to outsiders, as do grants of exclusive property rights to patented innovations and unique industrial processes. Yet apparently even-handed bans on all forms of "collusion" can force fairness at the cost of efficiency. For some purposes, such as product-standard-setting, cooperation among firms (collusion to a cynic) can reduce resources expended on competing standards, as characterized the early competition between VHS and "Beta" formats for videotapes. Corresponding global cooperation among firms and their governments, such as occurs in Mutual Recognition Agreements (MRAs) over the standards each country sets for various products, can also reduce resource waste.⁸

There are increasing cross-country conflicts in competition policies. These often spring from different conceptions of fairness. Some of these differences are endemic (cultural). Some are generic.

⁵ See Graham and Richardson (1997a,b) and Scherer (1992), pp. 22-40 and Scherer and Ross (1990), Ch. 17.

⁶ Then efficiency calls for a market structure called monopolistic competition (with free entry).

⁷ Countries differ to the extent that this is true. The United States has sometimes made large numbers of small competitors the chief goal of competition policies, as in the days of "trust-busting." Japan, by contrast, explicitly worries about "excessive" competition, as described in Suzumura's chapter.

⁸ See the recommendation of APEC's Eminent Persons Group (1995, pp. 23-26) for an agreement on product standards and testing.

Examples of endemic differences include U.S. insistence on due legal process vs. preferences in continental Europe and Asia for administrative process. Examples of generic differences include differences between fairness seen by would-be entrants and by incumbents, between firms that are small and large, between single-product and diversified firms, and between privately-owned, publically-owned, and state-owned firms. Differences in perceived fairness correspondingly arise when generic varieties of firms differ from country to country. China, for example, has far more state-owned firms than the United States. Chinese entry barriers in sectors dominated by such firms are highly contentious current issues. The United States requires scrupulous financial reporting because most large firms' equities are widely held in public stock markets; but such reporting seems burdensome and unfair to firms that are partly family-owned (as in Taiwan) and corporately owned through a tight network of cross-firm shareholdings (as in Japan).

Sometimes efficiency issues also cause international conflict over competition policies. For example, countries differ in whether the efficiency they seek is primarily for living generations (sometimes called "static" efficiency) or for living and future generations together (so-called "dynamic" efficiency). The former countries may have stricter regulation of cooperative high-technology activities than the latter countries;⁹ the latter countries may subsidize innovation, but then force innovating companies to license imitators at a regulated price ceiling. These differences cause conflict when different countries' firms compete with each other on seemingly uneven playing fields, such as existed in the early 1980s between American and Japanese firms, prior to changes in U.S. competition policies that loosened restrictions on consortia for research and development.

An even more important example is that what's efficient for one country isn't always efficient for the world. Export cartels and monopoly marketing boards are prime examples. Every country can by itself achieve national efficiency -- the most output from its national resources -- when its internal competition is intense, but when its exporters charge foreign buyers a monopolistic price in export sales. The country's residents then earn monopoly rents from foreign buyers, but do not pay any efficiency cost for them.¹⁰ But if every country follows this practice, then efficiency costs for everyone in the world loom large because of the collective inefficiencies in world export sales. Such differences in effects on national efficiency were well illustrated in the treatment of the proposed merger of McDonnell-Douglas and Boeing. These differences led European competition-policy authorities initially to conclude that the merger might be anti-competitive for Europe whereas American competition-policy authorities apparently found that it was efficient for the United States. The outcome of the conflict was an uneasy compromise that had some effect of reducing potential efficiency in the United States (e.g., by undoing exclusive selling agreements Boeing had concluded with certain US airlines that might in turn have led to cost reductions in aircraft

⁹ See, for example, Katz and Ordover (1990). Jorde and Teece (1992) contain many papers arguing that US competition policies are insufficiently future-oriented for either long-run US welfare (i.e., future gains are inefficiently foregone) or for the ideal US position in the global economy. But competition among firms to arrive at the ideal type and timing of innovations is on balance favorable, and strong competition policies that insure entry by energetic new firms often deliver dynamic efficiency best. For a detailed review of the evidence on how market structure affects dynamic efficiency, see Scherer and Ross (1990), Ch. 17.

¹⁰ Or to be maximally efficient, a country by itself could offer foreign sellers a monopsonistic price on imports it buys. That is essentially what the economists' famous "optimal tariff" does. It beats down world supply prices of imports to the level that a sole national buyer would offer, and collects rent (monopsonistic surplus) from the world's sellers of those imports. Alternatively, in a few cases, a government makes itself essentially the sole buyer of imports on behalf of its own constituents, as in certain import-licensing schemes.

maintenance) but reducing what was perceived in Europe as anticompetitive behavior (e.g., these same agreements, when undone, opened the possibility of increased market access for Boeing's European rival, Airbus Industrie).

Finally and fundamentally, conflict among nations exists for one simple, yet easy-to-forget lesson: competition is never the preferred system of any one firm as a seller. However successful competition may be as an instrument for delivering efficiency and fairness to a market system as a whole (sellers, buyers, and final consumers together), each firm would rather have less of it as a seller.¹¹ Each firm would rather have the entire output market to itself, that is, monopolistic market power, and the more the better. This is as true of market-leading firms as for those hanging on for survival. It is also true for every country's firms, taken together, as they face global competition. They prefer market dominance to intense global competition. So skepticism is appropriate whenever one firm complains about the "anti-competitive behavior" of a rival (each would usually love to do the same if they could get away with it), and also when one country's firms complain collectively about the unfair, anti-competitive behavior of foreign rivals as a group. But the skeptic should not be surprised at the complaint, nor, for that matter, be unsympathetic. Global competition policies are an issue precisely because some of these complaints are well taken.

A Brief Efficiency-Fairness Inventory

In almost every country, competition policies aim to reduce inefficiencies. One of the most familiar inefficiency is the wasteful underproduction and over-pricing of a monopolist (a sole seller) with market power. Almost as familiar are "distortions" in relative prices and costs that mislead investors and buyers. Less familiar inefficiencies are: excessive product standardization or (its alter ego) wasteful product differentiation; unduly sluggish innovation or unnecessary duplication of research effort; inadequate realization of scale and scope¹² economies; and under-provisioning of future generations. These are all discussed in Graham and Richardson (1997a,b).

There is also a distributional economics of competition policies, concerned with process and fairness in markets. Its most obvious expression is in policies that oppose coercion and various "abuses of market power" terms that convey the strong sense of involuntary action. When economists defend the market system, they require volunteerism. That is, they rule out coercion from the start (no reputable economist recommends markets for slavery, for contract murder, or for mercenaries to fight wars of territorial aggression). Many competition policies are the legislative expression of the anti-coercion principle.¹³ Other policies prohibit abuses of market power, such as boycotts of distributors by members of "horizontal cartels" if the distributors deal with outsiders or new suppliers. Japanese producers of flat glass were found to practice such abuses several years ago, and are accused of continuing to do so despite a

¹¹ As buyers of inputs, of course, firms prefer input-market competition, including that created by free opportunities to import and outsource inputs.

¹² Scope economies are those which come from the ability of several different product lines to draw on the services of common inputs (for example, legal services or brand name advertising) without depriving other product lines of the same services from the same common inputs.

¹³ From this point of view, for example, laws against employment of under-age (child) workers is a species of competition policy.

1995 agreement between the governments of Japan and the United States that the practices would be ended.¹⁴ Similar issues are at the heart of the ongoing Japan-U.S. dispute in the World Trade Organization over alleged abuses in the markets for film and other photographic supplies.

Other process-oriented competition policies include those that outlaw fraud, criminalize theft of intellectual property and industrial secrets, discipline predation, regulate price discrimination (in which a supplier charges different prices to different buyers), and ban "foreclosure" (contracts and other arrangements with suppliers or distributors that completely exclude new firms). The last was the European Union's accusation toward Boeing's recent 20-year exclusive-supplier contracts with American Airlines, Continental, and Delta, though some reports suggest that Europe's Airbus had equal chances to compete for and win those and any other contracts.

There are several levels at which the efficiency and fairness objectives of competition policy are discussed. The most familiar is in the context of a single market for one product. We start there in Graham and Richardson (1997a,b), and then move to the less familiar competition-policy concerns of a whole economy in which many products and services are sold and, finally, of multiple economies in international contact. We shape our discussion to flow from fundamentals, yet try to provide a fresh enough account that the fundamentals, though familiar, appear in new light and new context. There is a wealth of important detail to master on these issues. In this paper we strive instead for integration, definition, and motivation.

That discussion supports our broad policy recommendations. The rest of the current paper focuses on that portion of them that we find most likely to be feasible and desirable in an Asia-Pacific context.

III. POLICY CONSIDERATIONS IN AN ASIA-PACIFIC CONTEXT

Cross-national differences in competition policies are increasingly significant irritants to global trade and investment, and will cause growing inefficiencies in global markets.. The conflict is almost always due to differences in perceived fairness. The inefficiencies will grow as investment and services liberalization leaves uncompetitive firms exposed, and as changes in technology and communications continue to make all markets more global in scope.

Our conclusion in Graham and Richardson (1997a,b) is that there is wisdom and promise in sequential policy initiatives. The first set would involve active "cooperative unilateral" efforts to alleviate these problems. The second would involve multilateral action on a "market-access-oriented" sub-set of Trade-Related Antitrust Measures (TRAMs). We think that the former is especially promising in the near term for the Asia-Pacific context.

We also believe that successful steps in these two will establish the networks and trust and information that would allow a more challenging attempt -- to develop "competition-policy safeguards" for declining industries that would be preferable to antidumping mechanisms and subsidies in the eyes of most constituencies, thereby allowing some existing procedures to be rationalized and others to be phased out

¹⁴ Inside U.S. Trade, August 15, 1997, pp. 6-7.

The Broad Policy Issues: Desirability and Feasibility

In our longer monographs, we have identified what we believe are the priority trade and investment issues in international competition policies and grouped them in Tables 1 and 2 below. Here, unlike our discussion above, we use conventional terminology and classifications. We consider Tables 1 and 2 first from a global perspective, then from an Asia-Pacific perspective.

Table 1 summarizes our provisional categorization in full detail. Table 2 crudely averages Table 1 into five rows for each of the five broad issue areas.

The first column in each table indicates the issue classified as to whether it falls under "market structure", "firm conduct", "exemptions", "trade policy", or "other". These issue areas are not always mutually exclusive. We nonetheless put substantively similar issues in separate categories if the typical regulatory process treats them separately.

The second column in each table represents our effort to categorize these issues by criteria of economic clarity detailed in Graham and Richardson (1997a,b) -- whether there is strong consensus among antitrust specialists (typically lawyers and economists) as to what substantively is best practice towards the issue. If there is such a consensus, we label the issue as "clear", whereas if there is no such consensus, we label the issue as "murky". On some issues where there is a majority consensus but also a minority of specialists who disagree with the consensus, we place the label "clear minus".

The problem underlying the need for this column is, of course, complexity. Whether there is really an abuse or inefficiency in a number of alleged "anti-competitive practices" is a judgment call. The frequency with which such judgment calls are encountered is why competition policies worldwide generally employ a "rule of reason" in deciding whether practices such as entry deterrence, price discrimination, and vertical practices do or do not involve predation, exclusion, or other distortions and inequities.

If there is to be any sort of international convergence on the issues listed, the best practice with respect to the issue should be "clear" or, minimally, "clear minus".¹⁵ If there is no intellectual consensus on what is the best practice, international convergence would serve no function or, possibly worse, could be counterproductive (i.e., what is the point of converging on a bad practice?).

The remaining columns of the tables describe aspects of convergence with respect to each practice. The middle columns describe the status quo; the right columns describe the feasibility and desirability of changing the status quo. Desirability is assessed with respect to reducing both inefficiency and international conflict.

¹⁵ In what follows, we should note, "convergence" pertains both to convergence among the laws and policies of nations (necessary if any sort of international accord is to be reached) and convergence between trade policy and competition policy positions on issue areas where there is substantial overlap (e.g., predation and antidumping). Presumably what is desired is convergence (in both contexts) towards best practice rather than convergence for its own sake!

The third and fourth columns record our assessment of the current state of convergence, first towards best practice (when a consensus exists), and second across national practices.

The fifth column indicates "feasibility of further convergence". By "feasibility" in this context, we mean specifically political feasibility, i.e., is there any consensus among policy officials and legislatures as to what would be normatively better practice? We classify issues as "low" feasibility if either (1) there are substantial difference among officials of different nations on desirable practice; or (2) there is a substantial difference between branches of a single government as to desirable practice.¹⁶ If an issue is not characterized by a high or at least a moderate level of feasibility in this sense, there probably is little hope at this time of any sort of reasonable convergence.

The sixth column represents an effort to judge what might be gained, in terms of economic efficiency, from moving from the present policy regime to one where there was some sort of convergence upon best practice. In areas where we judged the substantively best practice to be "murky", we attempted to judge what would be the efficiency implications for continuation of practices that economists agree lead to inefficiencies. One way of looking at this judgment is as follows: "if we could agree on what is substantively best practice, and this agreement had economic merit, what would we gain". The final column indicates issues for which we judge that failure to reach any sort of convergence will lead to high or growing international tension.

The issue areas marked by a triad of at least moderate clarity, feasibility, efficiency, and conflict-reduction are the following. The common thread through most of them is market access. Virtually all involve barriers to the contestability of markets.

- cartelization;
- other horizontal restraints;
- mergers and acquisitions;
- price fixing;
- VERs, OMAs, etc.
- national treatment for foreign direct investors and services.

A number of issues do not make this list, but have high efficiency and conflict-reduction implications. These include predation/antidumping and VIEs (for which likely efficiency gains would be substantial if there were the political will to implement significant reform of the existing system);¹⁷ vertical practices (for which the underlying economics remains murky);¹⁸ intellectual property and related issues (for which the debate over the welfare tradeoff between strong intellectual property protection and greater rivalry among innovators will likely never be fully resolved); and state aids to industry (is there such a thing as a good subsidy?). Of these issues, the first does not make the list because of feasibility. The last

¹⁶ For example, trade policy officials may defend existing antidumping statutes, but competition policy officials may see these as irrational when evaluated by standards for predation or price discrimination.

¹⁷ See chapters by Itoh and Nagaoka and by Lipstein in Graham and Richardson (1997b).

¹⁸ For example, there has always been debate as to whether vertical keiretsu in Japan are efficiency-enhancing or otherwise. The Sheard chapter in Graham and Richardson (1997b) argues, after considering pros and cons, that efficiency-enhancing effects dominate on balance.

three do not make the list because the underlying economics of each issue remains murky and hence what is normatively best practice is difficult to determine.

The Policy Issues in an Asia Pacific Context

How would Table 1 and 2 look if it were restricted to the Asia-Pacific theater? What would be the priority international issues in competition policies?

An answer might begin with: "the tables would certainly be different, because of variant conceptions of firms, markets, competition, conglomerates, alliances, and correspondingly variant philosophies of competition policy."¹⁹ Asian firms are sometimes historical extensions of families, or else socially construct themselves that way (sometimes even providing social services and political voice to employees). Even today, external capital markets play less of a role in monitoring and directing Asian firms; internal discussion and decisionmaking more (hence the characterization of Japan as a "market economy, but not a capitalist one"). Incumbency is usually honored; attempted entry is often seen as a affront. Market-share maximization is sometimes explicitly pursued;²⁰ its opposite face is foreclosure or exit (due, arguably, to predation, however innocent). The largest Asian firms are usually diversified conglomerates, much more so than elsewhere in the world. Conglomeration does not automatically imply either horizontal or vertical concentration. Hence conglomeration is not in itself a focus of competition policy -- only as it affects market power and its abuse. Yet it raises unique issues of: whether there are institutional barriers to external takeovers of one or another narrow product line, whether certain product lines "protect" others from competition via cross-subsidization; whether conglomeration in general is an entry/access deterrent, and if so, whether the deterrence is especially severe for (discriminatory against) foreign firms.

In terms of specific entries in an Asia Pacific version of Tables 1 and 2, our opinion is that there are wider gaps and larger gains from further convergence on several sub-issues: 1. vertical arrangements, especially foreclosure (both efficiency gains and conflict reduction); strategic alliances; 2. Sectoral and functional exemptions, such as for communications and cultural industries; and 3. national treatment for investors. On exemptions and national treatment, the gaps are sometimes quite large. Formal competition policies are in early gestation in some countries, which is almost to say that every sector is treated uniquely as an exemption, and formal acceptance of national treatment for investors is a long way off. An important type of exemption to normal competition policies in the Asia-Pacific context is the degree of reliance on export processing zones with special or uniquely advantageous competition-policy rules -- an example of a geographical exemption from normal competition policy.

The investment disparity may be eased as more Asian economies apply to join the Organization for Economic Cooperation and Development (OECD), and a reduction in competition-policy exemptions may take place as part of the process of negotiations that we describe below. In addition, if and as Asian financial services markets open, liberalize, and become subject to normal competition-policy strictures,

¹⁹ But differences are perhaps not so marked as they appear. See the Matsushita and Rosenthal chapter in Graham and Richardson (1997b).

²⁰ Examples of declarations to that effect by Japanese firms are numerous, especially during Japan's catch-up growth; for a Korean counterpart, see, for example Cho Soon (1994), Ch. 4.

there will be a natural tendency for "information markets" to work more swiftly and predictably -- especially for information about corporate plans and performance, supplied by accountants, brokers, and industry specialists, bond- and credit-rating agencies. More perfect information markets, in turn, almost always make other markets work more competitively, one of the most common goals of competition policy.

All of these should help prepare a foundation for regional and multilateral competition-policy initiatives.

Alternatives for a Broad International Competition-Policy Process

The World Trade Organization (WTO) is at present, in our opinion, unable effectively to deal with many of these issues. We think there is good potential for modest growth in WTO capability, however, and outline our agenda for a multilateral TRAMs Agreement (Trade-Related Antitrust Measures) in Graham and Richardson (1997a,b). In the meantime there are many alternative means for filling the gaps, some of which can be carried out bilaterally or regionally, and some of which seem to us to have special promise in an Asia-Pacific context.

There are three generic alternative means by which competition policies can be carried into international markets, to reach situations that fall outside or spill over any particular nation's borders: (1) via noncooperative unilateral actions; (2) via cooperative unilateral actions, sometimes bilateral, sometimes regional, sometimes multilateral; or (3) via variants of supranational mechanisms.

Alternative (1) is the *status quo* default option. It includes all unilateral actions or efforts undertaken by one nation to reach objectionable practices in some other nation.²¹ The shortcomings of noncooperative unilateralism are immediately apparent. There is no consensus among national authorities as to what action, if any, is warranted, and if the differences in the objectives of nations are substantial, the actions of one could generate severe frictions. The target might respond with blocking statutes or other measures designed to frustrate the nation initially taking action. Indeed, the final column of Tables 1 and 2 could be seen as a judgment as to how much friction is, or could be, generated by unilateral actions on issues of competition policy.

Alternative (3) has been implemented within the European Union. The major reason is that early on, the member states of what is now the European Union were willing to allow the European Court of Justice to act as final arbiter of competition policy cases.. This willingness has allowed competition issues within Europe, to some considerable extent, to transcend national sovereignty. It is very unlikely that sovereign states not presently members of the European Union or seeking to become members would be willing at any time soon to cede sovereignty to a supranational agency to a similar extent.

²¹ For example, efforts to enforce domestic law or policy on the non-domestic activities of firms via some concept of "effects" doctrine, without working with or through the relevant authorities in the nation where the practices actually take place. Both the United States and the European Community (but especially the former) have periodically attempted such an approach.

Far more promising, we believe, is our alternative (2), cooperative unilateralism.

Cooperative Unilateralism: A Promising Asia-Pacific Alternative

What might be achievable under cooperative unilateralism is some combination of the following three items:

i. Positive Comity and Joint Investigations. Under positive comity, a national government which held a grievance that pertained to another nation's competition policy (e.g., private practices that created barriers to imports or direct investments) would appeal to the authorities of that nation to investigate and, if appropriate, to take action under their own competition laws to address the grievance. In responding to the complaint, these authorities would take into account the interests of the complaining nation. Both the NAFTA Agreement and the September 1991 "Agreement Regarding Application of Their Competition Laws" between the United States and the EC Commission provide guidelines for positive comity.²²

One extension of positive comity might be to increase the scope for cooperative investigation and regulation of conduct that crossed national boundaries (e.g., where mergers or alliances were transborder in nature). Thus, for example, the EU's concerns over the Boeing McDonnell Douglas merger might have led to joint review between the United States and the European Union. The same approach might have been used in the auto parts dispute between the United States and Japan: the case might have been remanded by trade policy officials to a joint effort between the US authorities and the Japanese Fair Trade Commission. Joint report-drafting, as practiced in the U.S.-Japan Structural Impediments Initiative, might be a fruitful way to begin exploring thornier substance such as anti- and pro-competitive aspects of vertical arrangements and the value of private access and judicial oversight. Among other things, such joint studies might allow the time and place for apolitical²³ reflection on competing models of both competition and competition policies.

ii. Extension of Consultation and Mediation Procedures into the Domain of Competition Policy. Consultation provisions are a natural and necessary companion of positive comity. Dispute settlement that emphasized mediation, rather than adjudication or arbitration, seemed to us one of the wisest recommendations of the APEC Wisemen's last report (EPG (1995), pp. 12-15 and Annex 1). It was to be voluntary, non-legalistic, non-coercive, and therefore distinct from WTO dispute settlement. Failure of the mediation process led only to a written assessment of the dispute by a specially constituted review board. Failure of either party to follow the review board's report simply led to its publication after a suitable period (otherwise it remained confidential). There was to be no sanctioned retaliation or withdrawal of concessions. Diplomatic moral suasion was the only mode if mediation failed. But to our knowledge, no action has been taken along these lines.

²² See Joelson (1993) in the NAFTA context, and the chapter by Vernon and Nicolaïdis in Graham and Richardson (1997b) in the EC-US context. In 1994 the United States adopted a law that would allow the US Department of Justice and the Federal Trade Commission to negotiate mutual legal assistance agreements with foreign antitrust authorities. So far, only Australia has signed such an agreement. Other nations are wary about what they see as excessively aggressive US penal antitrust remedies.

²³ National exceptionalism in competition policies seems to be as strong as in trade policies.

We find these proposals attractive. In practice, they are not toothless. But neither positive comity nor consultation/mediation rights and obligations need be threatening, and both are naturally implemented on a bilateral basis. More aggressive recent alternatives seem to us to have been failures. Extreme attempts at "grievance bilaterals," especially by the United States in the Structural Impediments Initiative and "framework" talks with Japan and in their counterparts with Korea, have been at best only modestly successful, and most recently failures. They may have increased grievance rather than resolving it.

iii. Strategic Cooperation Toward a Multilateral Agenda. Finally, we view the experience gained through bilateral and regional experiments in positive comity, joint study, consultation, and mediation as the necessary groundwork for a more ambitious multilateral experiment in negotiating trade-related competition-policy measures. Asia-Pacific relationships, especially APEC regimes, are sufficiently new and flexible to be ideal theaters of experimentation.

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TABLE 1
CRITERIA FOR A GLOBAL COMPETITION-POLICY AGENDA : DETAIL

	<u>Economic Clarity</u>	<u>State of Convergence</u>		<u>Feasibility of Further Convergence**</u>	<u>Gains from Further Convergence**</u>	
		<u>Toward Best Practice*</u>	<u>Toward Each Other</u>		<u>Efficiency Gains</u>	<u>Conflict Reduction</u>
<u>I. Issues Pertaining to Market Structure</u>						
Cartelization	clear	low	high	moderate	high	moderate/high
Unwarranted Horizontal Restraints	clear	moderate	moderate	moderate	high	low/moderate
Vertical Arrangements						
resale price arrangements	murky	...	low	moderate	low	low
foreclosure	murky	...	low	low	moderate	high
Strategic Alliances	murky	...	low	??	moderate	??
Mergers and Acquisitions Regulation	clear minus	moderate	moderate	moderate/high	moderate	moderate
<u>II. Issues Pertaining to Firm Conduct</u>						
Predation	clear minus	...	moderate	low	high	high*
Price Fixing	clear	high	high	high	high	low
Price Discrimination	clear minus	...	moderate	low/moderate	low	high
Abuse of Market Power	murky	...	low	low	indeterminate	low
<u>III. Exemptions</u>						
Functional (e.g., for research and development)	murky	...	moderate	moderate	low/moderate	high
Sectoral (e.g., for telecommunications)	murky	...	moderate	low but improving	moderate	high
Temporal (e.g., for recession cartels)	murky	...	low	moderate	moderate	moderate

	<u>Economic Clarity</u>	<u>State of Convergence</u>		<u>Feasibility of Further Convergence**</u>	<u>Gains from Further Convergence**</u>	
		<u>Toward Best Practice*</u>	<u>Toward Each Other</u>		<u>Efficiency Gains</u>	<u>Conflict Reduction</u>
"Efficiency Defense"	murky	...	low	low	indeterminate	moderate
<u>IV. Trade Policy Measures Raising Competition Concerns</u>						
VERs, OMAs, etc.	clear	low	low	high*	high	moderate
VIEs	clear minus	moderate	low	??	high	high
Antidumping	clear	low	low but becoming higher	low	high	high
<u>National Treatment Issues</u>						
for imports	clear	high	high	(in place)	low	low
for foreign direct investors	clear	moderate	moderate but becoming lower	moderate	moderate/high	moderate but growing
<u>V. Other Related Issues</u>						
Intellectual Property Protection	murky	...	moderate but becoming higher	moderate/high ***	moderate	high
<u>State Aids to Industry/Subsidies</u>						
research and development	murky	...	low	moderate ***	moderate	moderate/high
production	clear minus	moderate	low	moderate ***	moderate	moderate/high

* Ellipses indicate that best practice is not clearly delineated and/or controversial.

** Toward each other and/or towards best practice.

*** Based on successes and failures in GATT negotiations during the Uruguay Round.

TABLE 2
CRITERIA FOR A GLOBAL COMPETITION-POLICY AGENDA : SUMMARY

	<u>State of Convergence</u>			<u>Gains from Further Convergence**</u>	
	<u>Economic Clarity</u>	<u>Toward Best Practice*</u>	<u>Toward Each Other</u>	<u>Feasibility of Further Convergence**</u>	<u>Efficiency Gains</u> <u>Conflict Reduction</u>
<u>I. Issues Pertaining to Market Structure</u>	clear minus	moderate	moderate	moderate	moderate
<u>II. Issues Pertaining to Firm Conduct</u>	clear minus	...	moderate	low	moderate
<u>III. Exemptions</u>	murky	...	low	moderate	high
<u>IV. Trade Policy Measures Raising Competition Concerns</u>	clear	low	moderate	moderate	high
<u>V. Other Related Issues</u>	murky	...	moderate	moderate	high

* Ellipses indicate that best practice is not clearly delineated and/or controversial.

** Toward each other and/or towards best practice.

*** Based on successes and failures in GATT negotiations during the Uruguay Round.

Comments by Robert Weiner on
Regional Integration and Foreign Direct Investment
by Magnus Blomström
and
Competition Policies and Trade in an Asian-Pacific Context
by David Richardson

MR. WEINER:

On behalf of the first panel, welcome to our symposium. We have two presentations in the general policy areas of trade and investment: The first by Professor Magnus Blomström on investment, and then by Professor Richardson on trade policy.

I will make two comments. The first comment is that neither presenter says much about Asia Pacific in general or about APEC in particular. The second comment is that where the papers overlap, which is basically in Professor Richardson's mergers and acquisitions regime, Professor Richardson's assessment of the economic clarity is "clear minus," and I would guess that Professor Blomström's assessment, based on his presentation, is "murky." And so, we are not operating in the "clear zone."

I have a few general comments about the first paper. I think that the most important aspect of Professor Blomström's paper is clearer in the paper than in his presentation: that he is not clear about the welfare implications of foreign direct investment: whether we should in general encourage or discourage foreign direct investment. His point is that whether to encourage or to discourage really depends on whatever the original reasons and initial cases for foreign direct investment were.

One thing that I like about Professor Blomström's paper is that he gives us some examples from other areas of the world, examples of different effects that we might see from foreign direct investment. And if we press Professor Blomström here, we might ask him to speculate about APEC: what the implications for APEC might be, where APEC stands now, and where the Asia Pacific region stands now. He does not really say what kind of speculations he would make, basing them on the experience of MERCOSUR, the United States-Canada Trade Agreement, and NAFTA. We need some directions for thinking about policy and research. Professor Blomström might think in terms of APEC regions, after his experience in those other regions.

As Professor Blomström pointed out, it is hard to know what effects these agreements have had on foreign direct investment. He also points out there is no reason in general to expect either more or less. The effects depend on whatever particular reasons there were for the amount of foreign direct investment in the initial case and in practice. For example, he points out that there were many reasons for an increase in foreign direct investment in Mexico. It is hard to know relationship between NAFTA and the increase in foreign direct investment. Possibly there is none.

One direction for research might be to look at "higher frequency" data. Another direction might be to look at the effects of the signing of the agreement, or the specific effect of the passing of the agreement on the value of companies that do business in Mexico or the value of the Mexican stock market.

For instance, we may get some news, such as that Congress passed NAFTA. We may hope that not too many other big things happen that would affect the value of the companies that, for example, operate maquiladora workshops or do business in Mexico. We ought to study what happens to their stock prices. We ought to take a look at what happens to the Mexican stock market, while we control data for what happens in the rest of the world. These are "high frequency" data. Then we would have some idea of what people expect these agreements to lead to: the signaling aspect of these agreements.

Another big problem with foreign direct investment is rule changing, which has been a concern of the United States and other source countries for foreign direct investment. One aspect of foreign direct investment is quite unlike portfolio investment: foreign direct investment tends not to be mobile. After you put the plant down in Mexico or buy a plant there, if the Mexican Government changes the rules, for instance, to double your tax rate, or to increase local regulations, you cannot just lift up your plant and go home.

Some agreements make it much harder for countries to renege or to go back, both in a formal legal sense, and in an informal sense. We do not use the term *expropriation* anymore, but we still see such rule changing on a smaller scale. For example, foreign direct investment in Russia sees the rules change constantly, much to the chagrin of many U.S. companies that have put foreign direct investment into Russia, who cannot now easily get it out.

Another recent specific example from another country is Enron, a big U.S. petrochemical company, trying to build a big petrochemical and electric plant in India. The state government kept changing the rules and terms. So signing these agreements might be mistake--might tie our hands. Or signing might make it more difficult for governments to try to expropriate some of the surplus from foreign direct investment. And that insight into rule changing comes through much more clearly in the paper than in the presentation.

It is not useful to look at foreign direct investment as an end in itself. Whether to try to encourage it or try to encourage countries to change their rules depends on the original conditions. And it may be useful in the discussion period to talk about where APEC stands.

In some sense, Professor Richardson's viewpoint is opposite to Professor Blomstrom's. Richardson is interested only in welfare. And his paper is really a table, table 1, which tries to take all these different nontariff barriers and put them on some common footing. The table shows their importance in terms of possible benefits and the likelihood or feasibility of coming to some kind of agreement.

Table 1 is both the strength of the paper and its weakness, because it does not spell out whence Professor Richardson's assessments come. I want to know whether those assessments represent his opinion, the result of his work, other people's work, other people's opinion, or just something that he made up on the way here. I understand that his paper is an excerpt from a larger study, but even an excerpt must have footnotes or some other documentation.

There are also some places where the profession does not have a consensus, where not even Professor Richardson claims that we have a consensus. It would be nice to know his basis for concluding that we even have a consensus. These areas are controversial in themselves, even within the

United States.

For instance, many years ago there was an argument about monopoly between the Chicago School and the Everybody Else school, about the worth of regulating monopoly. A few dead weight loss triangles were calculated by the Chicago School, which argued "Let us forget about monopoly regulation. When we compare this to US GNP, it's nothing." And then the Everybody Else School replied, "Wait a minute. There might be some dynamic effects. There might be effects in other industries as some of these prices are transmitted through the economy."

There is controversy, and I suspect that some of the things that are described as "clear" in the table, may be "clear- minus, or murky," You just see one example in terms of the mergers and acquisitions regulation, as mergers and acquisitions are the main forum for foreign direct investment.

It is important to assess the value of working on each issue because we can't--as policy-makers--go and attack everything. It would be nice to know where we can get the most bang for the buck.

One last comment about the table is that a table like this necessarily tends to obscure any possible important interactions among the categories. Neither Professor Richardson's presentation nor the paper mentions this fact. If we deal successfully with some types of competition policy and liberalization somewhere, the distortions may just migrate somewhere else. We can see unintended consequences of regulation and deregulation in the United States.

Usually we expect to see a relationship between the structure of markets and the conduct of the companies competing in the markets. The cartelization issue and the horizontal restraint issue are two clear categories at the top of Professor Richardson's table. Progress on these two issues might make some of pricing issues a lot easier to deal with. Firms that have less market power are less able to price significantly away from efficient levels.

It is important also to discuss linkages, or some potential linkages that might affect the direction of research and policy. In terms of research, it is hard to say here because I do not have a good sense. There has so many little boxes and all we have is Professor Richardson's word for which ones are agreements and which are not. Without citations in his paper it is hard to know where more research is needed. But one suspects that there are areas where almost nothing has been done.

Comments by John Dunning on

Regional Integration and Foreign Direct Investment by Magnus Blomström

Magnus Blomström has written an encapsulated, yet incisive and well researched paper on the theoretical and empirical implications of regional integration for foreign direct investment (FDI) and the activities of multinational enterprises (MNEs). In it, he critically evaluates some of the more important analytical issues of interest to contemporary scholars. He also presents some persuasive evidence on the changing interface between trade and FDI, consequential upon the main regional integration agreements (RIAs) of recent years, though I was disappointed he did not survey the more recent evidence on the effects of the completion of the European Internal Market Programme (IMP).

In this brief comment, I will contain my attention to the theoretical part of Dr Blomström's paper. While I found his application of the classification dimensions originally set out by Globerman and Schwidt (1995) quite illuminating, I think, from the perspective of his own analysis, a 2 x 2 matrix based on the competitive (or ownership) advantages of countries, - and how each has been affected by regional integration, and in turn affects FDI, might have been more useful.

However, perhaps more importantly, I would have liked Dr. Blomström to have given more attention to (a) the difference between the approaches of trade and FDI scholars on the likely consequences of regional integration-and there *are* important differences¹ and (b) how regional integration impacts on the various types of FDI.

Let me concentrate on (b). At the beginning of his paper, Dr. Blomström rightly identifies some of the contextual variables which might be expected to influence the impact of RIAs on FDI. He distinguishes - but does not follow through - the differences in the effects of regional integration on *intra* and *inter* - regional FDI. And he correctly argues that one would expect a different response to RIAs from tariff jumping MNEs than from those seeking to aggressively exploit a unique competitive advantages. But I think one needs to delve more deeply into the changing motives for, and types of, FDI in our contemporary knowledge-based economy, as these affect not only the reaction of MNEs to the liberalization of cross-border markets, but also the interface between trade and FDI.

Space does not permit me to give more than a couple of examples: and I will do so from the viewpoint of US FDI in the European Union (EU) (previously the European Community).

The first distinction I wish to make is between an *initial market seeking FDI* and a *sequential efficiency seeking FDI*. In the former case, the IMP appears to have had a ambivalent affect of US MNE activity in the EU, with the outcome depending on the extent and content of the competitive advantages of U.S. of EU firms, and attractions of the US of the EU as a locational base for exploiting these advantages. But, in general, trade and FDI continue to be alternative ways for US firms to service the European market; although it is possible that FDI might replace trade for the supply of some goods and services (e.g. final products) while it increases it for others (e.g. intermediate products). However, given that US firms had established plants in the EU well before the initiation of the IMP, its affect on the location and organization of these plants, and what is produced in each plant, is likely to be very different from that likely to follow

¹ As summarized for example in a recent article of mine via Dunning (1997).

initial market seeking FDI. Such research as has been conducted (EAG 1998) suggests that the IMP has led to increase in US efficiency seeking FDI in the EU; and a corresponding increase both in trade between the US and the EU, and intra EU trade conducted by US subsidiaries.

The second distinction is between FDI intended to add value to an existing competitive advantage of an investing firm and to do so from a foreign location: and that intended to protect or augment that advantage by acquiring a foreign firm. Dr. Bloomström's analysis concentrates entirely on the first kind of FDI. Yet it is known that a sizeable (but beyond that unknown) amount of recent US FDI in the EU has taken the form of mergers with, or acquisitions of European companies, the specific intention of which is to harness to specific knowledge-based assets, to promote organizational synergies and to safeguard or gain access to intermediate or final product markets. While the consequences of European integration by affecting both the competitive advantages of US of EU firms and by removing many of the barriers to trade and competition within the EU are tending to make for more strategic asset seeking FDI, though as yet, this is an under-researched area and it is sometime difficult to disentangle the EU affects from other factors, e.g. globalization which have occurred at the same time.

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Comments by James R. Markusen on

"Competition Policies and Trade in an Asia-Pacific Context"

by David Richardson

I am very much an outsider to the area of competition policy, and I did not attend the conference for which the paper was produced. So my first task is to apologize for not being in a position to relate this paper to the broader themes and issues of the conference. I will instead focus narrowly on the paper, and give my impressions as a novice to the topic.

Richardson's paper is very much a "let's get back to basics" sort of exercise. On first reading, the paper seemed long on generalities and lacking in the real meat of specifics and individual policy suggestions. On second reading and upon pondering the broader context, I felt that this was indeed both useful and appropriate. There has been considerable confusion and hot air over competition policy and perhaps that is due in part to an excessive focus on specifics at an early stage, especially manifest in legalistic foci and jurisdictional battles adopted by some participants. Richardson's paper may therefore be a much needed attempt step back and try to look at the fundamentals. We don't want to debate legalistic fine points nor engage in jurisdictional battles until we know what we are talking about and where we want to go.

The paper begins with the most basic questions of all, what is the domain and the objectives of competition policy, and how do the answers to these questions enlighten us as to the sources of the current policy controversies. Richardson does a pretty good job of stating what competition policies are all about: "formal social regulations by which this competitive-cooperative market system is governed". The author is fairly convincing that competition policy is rarely actually about competition at all, often being about fairness and efficiency instead. This seems to me to be a crucial insight in helping us understand many of the controversies.

I like the discussion about fairness. I generally dislike the word, since people often tend to identify "fair" with their own best interests. Therefore, it is often impossible in specific situations to arrive at any consensus about what is fair. Richardson seems to have a similar idea, and makes a convincing case that it is precisely this problem which explains a great many controversies. What is fair to an incumbent is hardly fair to a potential entrant for example. He also makes some persuasive points about the extent to which the notion of fairness is culturally rooted. It can mean equality of opportunity, fairness of process, equality of outcomes, or loyalty in long-term relationships. In an international context, one country might see fairness in terms of one definition which conflicts with the views of its neighbors. Richardson then notes that fairness, by whatever definition, and efficiency may often conflict. This point is much better understood, but it is good to see it integrated into the broader context. Finally, there are a couple of nice observations or caveats to the effect that efficiency, much less fairness, are not synonymous with competition. Departures from strict competition in the areas of natural monopolies, research consortia internalizing knowledge externalities, and intellectual property protection may be efficiency enhancing. Again, competition policy is not primarily about competition.

I was somewhat less happy with section III. I found the table useful, since at least there I was able to find out what is in fact a competition policy. I would have enjoyed more specifics on this, but perhaps a strict page limit interferes with that objective. I would have liked a little more structure and specifics about what exactly are the set of policies that we call "competition policies" and what precisely are the disagreements about what is the "best practice" policy in each case.

Let me give one example. At the time of writing this review, I had just purchased a set of airtickets too and within Europe and paid the usual absolutely astonishing prices for the flights within Europe (Stockholm-Copenhagen-Barcelona-Hamburg-Dublin on one airline, over-Saturday-night fares costs triple the Denver-London return fare). We are also repeatedly told by United, our principal airline in Denver, that they currently have no non-stopped flights to Europe from Denver because they cannot obtain gates in their principal European destinations. This is obviously an excellent example of a situation in which the US and Europe hold different views about what is both efficient and fair. Yet I had a difficult time fitting this example into Richardson's framework, and finally gave up trying to figure out exactly where it would be placed in his Table 1 ("unwanted horizontal restraints"?). What is the economic clarity of airline regulation and what is best practice?

The paper has not helped me as much as I had hope to better understand my personal international-competition-policy irritant.

Turning to the section on the Asia-Pacific context, I had a lot of trouble with "cooperative unilateralism", since the term is never explicitly defined. I tried to figure it out from the discussion in the text. This is not easy since the term is inherently an oxymoron. Just in case other illiterates besides me read the paper, I also confess to having only a vague notion of what "comity" means. As is the case with my airline regulation example from above, I really see little or no hope of *any* cooperative process being useful until nations can come into full agreement on best practice and where we want to go. It seems to me that, in the absence of agreements over best practice and a coincidence of (at least long-term) objectives, we are going to be stuck with tough non-cooperative bargaining in which issues are linked together so that there are gains from trade or worse, unilateral threats (as in the EU's objections to the Boeing, McDonald-Douglas merger or the US's Helms-Burton Law). It strikes me that an economic understand is a prerequisite to a genuine cooperative process and it is this economic consensus that we must seek.

SESSION II

Deregulation

Forthcoming, Journal of Economic Perspectives

U.S. Industry Adjustment to Economic Deregulation

Clifford Winston

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Abstract: This paper develops a framework to analyze the long run adjustment of U.S. industries to economic deregulation, highlighting the role of intensified competition, innovations in operations, marketing, and technology, and adjustments to external shocks. I apply this framework to industries that have recently undergone substantial deregulation--airlines, motor carriers, railroads, banks, and natural gas--and conclude that these industries have become far more efficient because of deregulation and provided large benefits to consumers. I conclude that the same adjustment process and positive outcome for consumers will result from the forthcoming deregulation of communications and electricity.

Ad astra per aspera--through adversity we reach the stars.

Introduction

Economic deregulation does not happen overnight. It takes time for lawmakers and regulators to dismantle regulatory regimes, and then it takes more time for the deregulated industries to adjust to their new competitive environment. Federal regulatory agencies and the U.S. Congress began liberalizing pricing, entry, and exit in the transportation, financial, energy, and communications industries during the mid-1970s. But while some smaller industries such as intercity bus transportation and air cargo have been fully deregulated during that time, the only major American industries fully deregulated to date are airlines and motor carriers.

What about the industries' adjustment? Consider airlines. Economic deregulation of the airline industry began in 1974 when the Civil Aeronautics Board first encouraged experiments with discount fares. It was completed in 1983 when all regulations on fares, entry, and exit were eliminated. Yet more than 20 years after the deregulatory process began, the airline industry continues to shed inefficiencies that accumulated over decades of regulation and to find new ways to market their service. Indeed, the airlines' latest marketing innovation -- selling discount fares on the Internet -- would be illegal if fares were still regulated.

It is not surprising that deregulated (or partially deregulated) industries are slow to achieve maximum efficiency. When regulatory restrictions on pricing, operations, and entry, especially from new firms, have been enforced for decades, managers and employees of regulated firms settle into patterns of inefficient production and missed opportunities for technological advance and entry into new markets. Deregulation frees an industry from the state's control over prices, entry, and exit, although, of course, firms are still subject to antitrust laws and safety regulations. After deregulation, some costs usually fall in short order, but it takes firms a long time to tear down decades-old barriers to efficiency and to adopt more efficient production and marketing practices.

Deregulation is a long-term process, from which society will continue to reap benefits as firms continue to adjust to free market competition and as more and more industries are more fully deregulated. Policymakers, however, take a more myopic view -- and often place a greater weight on minimizing disruptions to the public than on maximizing economic efficiency¹. This emphasis may play a useful role in gaining passage of deregulatory legislation. Nonetheless, the concern over disruptions can also lead to counterproductive outcomes. For example, the Essential Air Services program was established in 1978 to assuage congressional fears that airline service to small communities would disappear under deregulation. However, Morrison and Winston (1986) suggest that the subsidies provided under this program were not only unnecessary, but may have been responsible for reducing the potential benefits that could be generated in these markets.

Policymakers are impatient, and when deregulation fails to produce insufficient immediate benefits to their constituents, they face temptation to reregulate or to limit further deregulation. For example, Congress deregulated cable television in 1984 and then reregulated it in 1992, even though the reregulation in all likelihood resulted in a loss in consumers' welfare (Crandall and Furchtgott-Roth, 1996). Similarly,

¹ Hahn and Hird (1991), Winston (1993), and Joskow and Noll (1994) provide comprehensive overviews of regulatory reform. Peltzman (1989), Noll (1989, 1996), and Winston and Crandall (1994) assess political forces underlying regulatory reform.

some policymakers were expressing concern early in 1997 that the 1996 Telecommunications Act had not already led to declines in rates -- while failing to acknowledge that this legislation still left the telecommunications industry substantially regulated.

Policymakers and the public tend to notice only what deregulation has done for them lately, forgetting that society will continue to reap benefits from deregulation as industries continue to adjust to the new competitive order. As a result, they often undervalue the benefits of deregulation. To make sure that policymakers and the public do not sell deregulation short, it is useful to examine how the long-run efficiency benefits of deregulation are achieved. In doing so, it will become clear that the U.S. industries' adjustment to deregulation is marked by many common elements. These same elements will probably govern the evolution of other industries -- telecommunications, cable television, and electricity -- that are now embarking on substantial deregulation. It appears likely that each will become far more efficient than it was under regulation and in the process generate substantial benefits to consumers.

Although I believe that the academic community has reached a consensus that deregulation's net-benefits to consumers are substantial, I recognize that this view may not be compelling to certain policymakers who do not care about the average consumer in the country, but only about their constituents. For example, at a recent hearing on the airline industry in the U.S. House of Representatives, Congressman Conyers from Detroit, Michigan, ignored estimates of the large nationwide benefits of airline deregulation and questioned the wisdom of the entire policy because he felt fares at Detroit's Wayne airport were "too high." Setting aside the accuracy of Conyers' assessment, his perspective illustrates that public debates about deregulation persist after it has long been in place. It is therefore important to identify the long run benefits of deregulation to respond to policy proposals that may emerge from these debates.

Theoretical and Empirical Considerations

Neoclassical economic theory predicts that both a profit-maximizing monopolist and a perfectly competitive firm will operate on the technologically efficient production frontier; that is, any profit-maximizing firm should always wish to minimize its costs, regardless of how much competition it faces. But a regulated firm is in a different situation. Although regulated firms can choose their technologies and operating practices, these choices are made subject to the state's control over prices, entry, and exit and without the challenges posed by unrestricted competition from incumbent firms and new entrants, hence managers and employees face a rather different set of incentives in searching for greater efficiency. I am not aware of a formal model of industry adjustment to deregulation that provides theoretical guidance on this issue. Predictions of the effects of deregulation were generally guided by static models that assumed technology and operations would not be significantly affected by the change in the regulatory regime (Winston, 1993). Nonetheless, one can draw on some basic theoretical ideas to identify the central factors that will cause an industry to become more efficient as it adjusts to deregulation.

First, an old-fashioned view is that regulation improves welfare because it helps control monopoly. This view has been discredited because it is clear that regulation primarily limits competition among firms, and this lack of competition causes an industry to accumulate substantial managerial slack or "X-inefficiency"; that is, firms do not minimize the cost of producing a given level of output. When an industry is deregulated, unrestricted competition among incumbent firms and from new entrants forces the industry to shed such inefficiencies and to seek out innovations in marketing, operations, and technology.

Nickell (1996) presents empirical evidence that shows that increased numbers of competitors are associated with a significantly higher rate of total factor productivity growth.

Second, particular regulations can force firms to operate in an inefficient manner. In a seminal paper, Averch and Johnson (1962) showed that a hypothetical form of regulation, rate-of-return regulation, forced regulated firms to choose their inputs in an inefficient manner; because the regulators determined a firm's profits as a percentage of the firm's capital investment (or "rate base"), firms had a strong incentive to overcapitalize. One could modify this model to characterize situations where an actual regulation leads to an operating inefficiency. For example, entry barriers prevented firms, such as airlines and motor carriers, from optimally developing their networks; exit barriers prevented firms, such as railroads, from shedding excess capacity; and price regulations prevented firms, such as natural gas pipelines, from efficiently marketing their capacity during peak and off-peak periods.

Finally, regulations also prevent firms from responding effectively to external disturbances, such as a recession or a large unanticipated change in prices or interest rates. An industry subject to regulation may, because of its cartel status, be somewhat insulated from these shocks. For example, if fuel prices rise, regulated electric utility firms could appeal to regulators to raise prices. But if regulators refuse such appeals, regulated firms lack the flexibility to respond to shocks (Joskow, 1973). Deregulated firms gain the ability to respond more effectively to external disturbances.

To sum up: an industry's adjustment to deregulation will, in theory, be shaped by intensified competition and increased operating freedoms that will cause the industry to become more technologically advanced, to adopt more efficient operating and marketing practices, and to respond more effectively to external shocks. Moreover, one must remember that deregulated industries are facing these challenges and opportunities for the first time, often with a burden or legacy of investments, operating practices, and sunk costs that inhibit change and competition. In what follows, I will present empirical evidence from the airline, trucking, railroad, banking, and natural gas industries that illustrates how these factors govern an industry's adjustment to deregulation. Regulatory reform of the former industries began in the mid-1970s, and their current regulatory status is summarized in Table 1. I focus on these industries because they are major industries that have been subject to regulation for decades and have recently experienced substantial regulatory reform. Thus I do not consider the intercity bus industry because it is comparatively very small (its annual revenues are only \$900 million), nor do I consider petroleum production, because it was regulated for a short period. The experience drawn from the industries in Table 1 will constitute evidence that I will use to assess the likely adjustment of other industries to deregulation.

Some of the evidence that I report should be qualified at the outset. The appropriate way to measure the effects of deregulating an industry is a counterfactual analysis that estimates the price, cost, and service changes that are solely attributable to deregulation, and thus would not have occurred had an industry still been regulated. But such an analysis can be complicated. It may need to account for the business cycle, for those elements of technological change due to deregulation and those not, and for changes in the characteristics of products, including service quality. Some argue that an appropriate counterfactual should also allow for regulators to learn from past errors and for regulation to have improved as it hypothetically continued, although there is little evidence that regulators learn and change in this way. To sidestep such complications, a simpler approach is to evaluate changes in real costs and prices over time; for example, one can compare real airline costs in 1977 the first year before deregulation

Table 1
Current Status of Regulatory Reforms

<i>Industry</i>	<i>Regulatory Status</i>
Airlines	Pricing, entry, and exit have been fully deregulated.
Motor Carriers	Interstate and intrastate rates, entry, and exit have been fully deregulated.
Railroads	Most rates, including contract rates, have been deregulated, but "tariff" rates for certain commodities are still subject to maximum rate "guidelines."
Banking	Ceilings on interest rates (except for demand deposits) have been eliminated by deregulation, and Congress has authorized interstate banking to take place during the next few years. Thrift institutions have been allowed into consumer and business lending, while affiliates of banks have been permitted some degree of securities underwriting.
Natural Gas	Prices at the wellhead have been fully deregulated. Independent shippers now have access to pipelines at rates regulated by the Federal Energy Regulatory Commission. By obtaining "interruptible" service (i.e., a pipeline owner can stop service to a customer when demand is high under conditions specified by a contract), shippers can obtain discounts from these rates. Shippers can also sell their surplus pipeline capacity to other entities. This competitive re-selling has also led to rates below the tariff rates. Finally, market-based or negotiated rates for pipeline storage service, hub service, and even transportation services are being allowed.

with real airline costs for the most recent period during which cost data have been collected. This simpler approach is taken in many studies of deregulation, thus I will draw on these estimates here. Although these analyses do not constitute a rigorous counterfactual, their conclusions are strongly suggestive and qualitatively consistent with the few rigorous counterfactuals that have been performed, typically using less recent data.

Changes in Entry and Exit and the Extent of Competition

As the airline, trucking, railroad, banking, and natural gas industries have been deregulated, competition has intensified, both among incumbent firms and because of new entrants.

Many of the new entrants that have made their presence felt have come to be identified as "low-cost" or "independent."² In the airline industry, Southwest Airlines, the premier low-cost carrier, is generally acknowledged to have set the standard for efficiency and consistent service that other carriers are striving to reach. ValuJet, another low cost carrier, also played an important competitive role until its license was suspended in June, 1996 because of safety concerns (it has subsequently returned and is now known as AirTran); its presence in Atlanta influenced Delta to lower its costs and prices. The trucking industry is composed of two sectors: "less-than-truckload" (LTL), which uses a network of terminals to consolidate shipments of more than one shipper's goods on a truck, and "truckload" trucking, which provides point to point service for one shipper's goods that fill an entire truck. In the LTL segment, low-cost non-union regional carriers, such as Con-Way Transportation Services, have become an important competitive force. In response to this challenge, the national LTL carriers, such as Roadway, have pursued an aggressive policy of purchasing regional (non-union) carriers and operating them as independent business units. The dominant force in Truckload trucking has become the "Advanced Truckload" or "High Service" mega-carrier, such as Schneider National. These carriers have become so efficient that they are capturing substantial traffic from firms that historically, in response to high regulated truck rates and poor service, provided their own trucking services. For-hire trucking operations are now roughly 25 percent less expensive than private carriage, which relies primarily on (more costly) unionized labor, according to estimates from DRI/McGraw-Hill (cited in Corsi, 1996b). In the rail industry, no large carrier has entered for several decades, because of the huge capital requirements to start a railroad and the ubiquitous coverage of existing networks. But since deregulation there has been a substantial increase in the number of smaller low-cost (non-union) railroads such as Montana Rail Link, which have formed a small system from track that they purchased from large railroads. And competition among incumbent railroads is much more intense. Darius Gaskins has frequently pointed out that when he was a Berkeley economics professor, he taught theories that predicted that duopolists had considerable ability to maintain high prices. But as the CEO of Burlington Northern railroad, he learned that duopolists' prices often reflected fierce competition. In banking, new competition has arisen from interstate bank expansions and from non-bank intermediaries, mutual funds, insurance and financial companies, and corporations issuing debt. Finally, in the natural gas industry, independent producers have increased their share of gas production since deregulation, and independent shippers now have competitive access to pipelines.

² For more detailed discussion of the material in this section, see Morrison and Winston (1995) for the airline industry; Corsi (1996a) for the Less-Than-Truckload trucking industry; Corsi (1996b) for the Truckload trucking industry; Grimm and Windle (forthcoming) for the railroad industry; Berger, Kashyap, and Scalise (1995) for the banking industry; and DeVany and Walls (1994), Herbert and Kreil (1996), and Energy Information Administration (1995) for the natural gas industry.

Substantial merger activity has generally occurred within a decade of an industry's deregulation. As in any industry, whether recently deregulated or not, the contribution of these mergers to social welfare has been subject to controversy. For example, end-to-end mergers have helped railroads become more efficient, but parallel mergers may have reduced competition between railroads while producing few efficiency gains. Similarly, some airline mergers have been found to enhance social welfare, while others have not.³ Major mergers often continue as firms adjust to deregulation. In the airline industry, US Airways, Northwest, TWA, and Continental are presently candidates for some type of merger. In the railroad industry, the imminent absorption of Conrail by Norfolk Southern and CSX may lead to other merger proposals. In the trucking industry, national carriers continue to acquire regional carriers, and in the wake of the UPS strike, Federal Express has acquired RPS to compete more effectively for small freight shipments. The growth of nationwide banking has already led to a great deal of merger activity in the banking industry, and seems likely to lead to more.

In some cases, incumbent firms, particularly in the airline, banking, and railroad industries, have seen mergers as the way to enter new markets. Conversely, because regulation enabled many inefficient firms to stay in business, it is not surprising that mergers have also facilitated large-scale exit, especially in the LTL trucking industry and in the banking industry, as weaker firms that were unable to compete effectively in a deregulated environment sought a merger partner to remain in business.

Following deregulation, the net result of entry, exit, and mergers has generally been that competition in actual markets becomes more intense, although the total number of firms in an industry nationwide may either rise or fall. That is, travelers can choose among more airlines when taking a trip; consumers can choose among more lending institutions when seeking a loan; shippers can choose among UPS, Federal Express, or revitalized rail, truck, or intermodal (truck-rail) carriers to ship their goods; and companies can choose among more utilities or an array of marketers to purchase their natural gas.

After deregulation, competition has even developed in markets once thought to have "natural" entry barriers. In other words, experience rather than theory is more instructive about which parts of an industry are competitive and which parts are subject to natural monopoly. Some rail shippers that may appear to be captive to one major railroad have the option of using railroads that have formed a small system or using another major railroad with trackage rights over the "monopoly" carrier's track. In addition, firms contemplating a new plant location or expansion can sign long-term railroad rate contracts before committing to new investment, thus exploiting competitive alternatives before making a decision. Thousands of natural gas end users now contract with pipelines to ship and store their gas and they can release (sell) their unused capacity to other entities. Natural gas end users and rail shippers can benefit from source competition -- for example, Alabama utilities that face rate increases on coal shipped from Colorado can switch to coal from Kentucky if they can access a different railroad -- and from product competition -- for example, utilities that face rate increases on natural gas can shift to coal or oil if their technology permits such substitution.

³ Winston, Corsi, Grimm, and Evans (1990) discuss railroad mergers in the deregulated environment, while Morrison and Winston (1989) and Werden, Joskow, and Johnson (1991) estimate the effects of airline mergers since deregulation.

Innovations in Marketing, Operations, and Technology

The intensified competition resulting from deregulation causes firms to make innovations in marketing, operations, technology, and governance that enable them to become more efficient, improve their service quality, introduce new products and services, and become more responsive to consumers' preferences.⁴ One might suspect that regulation could foster innovations because firms were more profitable in this environment and thus had the resources to devote to innovative activity. I point out, however, that regulation generally did not significantly increase industry profitability.

One way that deregulated firms have marketed their services more effectively is by offering an array of price-service packages to potential customers. Airlines now offer travelers a wide range of fares from discount fares with various travel restrictions -- some of the lowest discount fares are exclusively available on the Internet -- to much higher fares with no travel restrictions. This has contributed to planes flying with a higher percentage of seats filled -- a rise in the so-called "load factor." Railroads and motor carriers now often negotiate price-service packages with shippers directly. During regulation, railroad traffic was effectively prevented from moving under contract rates. Today, more than half of all rail traffic moves at a negotiated contract rate, which has facilitated more efficient use of capacity and services that are tailored to shippers' production and inventory policies. Banks have greatly expanded the scope of financial services they offer customers and provided new tools, such as derivative securities and financial guarantees, to help their customers diversify risk. In the natural gas industry, the development of market centers and hubs has enabled marketers to help business consumers contract for rates and service that match their specific requirements.

Deregulated firms have made a number of innovations in their operations and technology. Among these innovations to date are the airlines' accelerated development of hub-and-spoke networks that have enabled carriers to increase their load factors. Also, the hub-and-spoke system has brought much greater service frequency, which was a dramatic surprise to many. When fares were regulated, airlines competed excessively in flight frequency. It was thus expected that flight frequency would fall when airlines were deregulated. But with the connections made possible by hub-and-spoke networks, one additional aircraft departure from a spoke airport to a hub airport provides many alternatives on connecting flights, so that service frequency has actually risen. Airlines' development of computer reservation systems has also facilitated improvements in scheduling and handling flight reservations. In the trucking and railroad industries, improvements in network design, the expanded use of intermodal operations, double stack rail cars, and increased use of computer systems have enabled faster, more reliable service. For example, Norfolk Southern once tracked its cars and locomotives by posting a video camera at the entrance to each rail yard; now, an electronic scanner automatically tracks each car's arrival. Truck drivers for Schneider National used to have scheduled check-in phone calls to headquarters; now, they roam the highways with small satellite dishes attached to their cabs, and use the data transmitted by technicians in the company's headquarters to track maintenance needs and the location of shipments. Banks have applied advances in information processing and communications to lower consumers' and their own transactions costs. Natural gas companies have used computer technology to lower their operating and maintenance expenses, and have improved their service to customers by unbundling production, transportation, and distribution.

⁴ For more detailed discussion of the material in this section, see Morrison and Winston (1995) for the airline industry; Corsi (1996a, 1996b) for the trucking industry; Winston, Corsi, Grimm, and Evans (1990) for the railroad industry; Berger, Kashyap, and Scalise (1995) for the banking industry; and Henning, Tucker, and Liu (1995) and Herbert (1996) for the natural gas industry.

It could be argued that many of the innovations by deregulated firms have been the direct result of advances in information technology, and thus would have occurred regardless of whether their industries were deregulated. The argument, of course, is not that deregulation was a primary force in the information technology revolution. But the benefits from these advances were realized only because firms had the incentive and operating freedom to design new production systems and write computer programs to optimize operations. Under regulation, these firms had little incentive or competitive pressure to do so, and regulators did not design regulations to stimulate innovative activity.

Deregulated firms have also been spurred by external shocks to improve the efficiency of their operations, and in particular to match their capacity with consumer demand. The airline industry, for example, has traditionally made capacity commitments roughly two years in advance because of the lead times to acquire aircraft. However, the high income elasticity of demand for air travel -- together with a dose of unpredictability -- created overcapacity in the early 1990s, which led to intense fare wars and huge industry losses (Morrison and Winston, 1996). Carriers have subsequently adjusted their operations by expanding their capacity more slowly in the face of growing demand. In addition, American and Delta Airlines have made long-term purchasing commitments to Boeing Aircraft, in return for expedited delivery of planes, which puts American and Delta in a better position to tailor their capacity to demand.⁵ Railroads have used contracts to align their cars and equipment with shippers' demand and reduced their vulnerability to problems caused by overcapacity. Contracting for natural gas pipeline storage and capacity, and the development of spot and futures markets have helped the gas industry respond effectively to the business cycle.

The experience of the banking industry with external shocks differs from that of other deregulated industries, because deregulation was followed by a crisis for the savings and loan industry and for many banks, culminating in substantial costs for taxpayers to bail out the S&L deposit insurance fund. But deregulation -- which in this industry meant freeing up the interest rates that savings and loans can pay, and allowing interstate banking and new financial instruments -- can be held responsible for only a fraction of the S&L debacle. The earlier regulations, under which S&L's were limited in the interest they could pay and the loans they could make, could have literally meant the annihilation of the S&L industry when market interest rates climbed sharply in the late 1970s. The S&L disaster was caused by a sequence of events: the legacy of previous regulation, unfavorable interest rate movements, partial deregulation, lax regulatory supervision, moral hazard problems created by federal deposit insurance, and unwarranted optimism over real estate prices in certain areas. The lesson here is not to fear deregulation itself; indeed, the deregulated banking and S&L industries are today vibrant and healthy. However, deregulation can be undermined if it is not supplemented with appropriate policies. In the case of a deregulated banking industry, a vigilant safety-and-soundness regulatory regime was essential, given federal deposit insurance. In other industries, the appropriate supplemental policies mean that deregulated industries continue to be subject to antitrust laws, safety regulations, and so on.

Finally, deregulation has also led to improvements in corporate governance that contribute to innovative activity. Winston, Corsi, Grimm, and Evans (1990) report that under deregulation railroad managers are younger, better educated, and have fewer years of company service than under regulation,

⁵ Boeing has agreed not to enforce these commitments as a condition for obtaining the European Commission's approval of its merger with McDonnell-Douglas. American and Delta, however, are unlikely to change their commitments.

and Kole and Lehn (1996) and Meyer and Oster (1984) argue that airline managers have become much more entrepreneurial in the deregulated environment.

Improvements in Industry Efficiency and Consumer Welfare

By stimulating competition and giving firms greater incentives and freedom to seek out efficiency, deregulation has generated substantial improvements in consumer welfare that will continue over time. Because firms will continue to innovate in ways that they would not have under regulation, it is important to bear in mind that any current summary of the gains from deregulation is likely to be a lower bound.

Industry Efficiency

The evidence to date suggests that since deregulation each industry has substantially improved its productivity and reduced its real operating costs from 25 percent to 75 percent. Table 2 gives some examples of what has happened in the main industries considered here. Of course, deregulation should not be given total credit for all of the decline in each industry's real operating costs. For example, some of the decline in rail operating costs can be attributed to the long-run trend in railroads' traffic mix to include a greater proportion of low-cost bulk traffic. Some of the decline in truckload carriers' operating costs can be attributed to these carriers largely eliminating the more costly less-than-truckload traffic from their traffic mix. Nonetheless, deregulation does deserve credit for most of the fall in costs. In general, these cost savings have not significantly increased industry profitability. Rather, the intensity of competition under deregulation has forced much of the savings to be passed on to consumers in lower prices. The one industry where profitability has increased substantially is the railroad industry, which had earned low profits under regulation and experienced many bankruptcies. As hoped for by the architects of the 1980 Staggers Act deregulating the railroads, rail has profited greatly from deregulation. During 1971-80, the industry's return on equity was less than 3 percent, which along with widespread bankruptcies in the Northeast and Midwest heightened concerns about whether this industry could be financially viable in the private sector; during the mid-1990s, it has been more than 8 percent.

The intertwined pattern created by deregulation -- more competition, restructuring, opportunities for new markets, and further cost reductions -- seems likely to continue. The deregulation of international airline markets, which is slowly proceeding through bilateral negotiations between the United States and other countries, will bring new competition to U.S. carriers, along with new possibilities for route networks and marketing. Airlines are currently exploring a number of options to raise labor productivity such as having (lower cost) pilots who work for their affiliates fly smaller (regional) jets that have been recently introduced on short haul routes. The trucking industry has experienced a serious shortage of long-distance drivers, but the increasing use of intermodal operations has helped to alleviate this problem. Of course, intermodal operations also bring more competition in freight markets. Although truckers have significantly reduced their empty mileage, more progress can be made through further load consolidations, and by for-hire motor carriers making further inroads into private trucking operations (Corsi, 1996b). Although

Table 2
Improvements in Industry Efficiency

<i>Industry</i>	<i>Improvements</i>
Airlines	Average industry load factors have increased from roughly 52 percent the decade preceding deregulation to roughly 62 percent since deregulation. Real costs per revenue ton-mile have declined at least 25 percent since deregulation. Industry profits have been very volatile during deregulation, although higher, on average, than they would have been under regulation.
Less-Than-Truckload Trucking	Carriers have substantially reduced their empty miles since deregulation. Real operating costs per vehicle mile have fallen 35 percent, but operating profits are slightly lower than they would have been under regulation.
Truckload Trucking	Carriers have substantially reduced their empty miles since deregulation. Real operating costs per vehicle mile have fallen at least 75 percent, but operating profits are slightly lower than they would have been under regulation.
Railroads	Railroads have abandoned one third of their track miles since deregulation. Real operating costs per ton-mile have fallen 60 percent, and rail profits are much higher than they would have been under regulation.
Banking	The real cost of an electronic deposit has fallen 80 percent since deregulation. Current industry returns on equity exceed those just before deregulation.
Natural Gas	Pipeline capacity has been much more efficiently utilized during peak and off-peak periods since deregulation. Real operating and maintenance expenses in transmission and distribution have fallen roughly 35 percent.

Sources: For airlines, Morrison and Winston (1998); for less-than-truckload trucking, Corsi (1996a); for truckload trucking, Corsi (1996b); for railroads, Winston, Corsi, Grimm, and Evans (1990) and Association of American Railroads (1996); for banking, Berger, Kashyap, and Scalise (1995); and for natural gas, Henning, Tucker, and Liu (1995) and Herbert (1996).

railroads have abandoned a lot of track already, they will continue that process. Railroads can also improve their fleet by taking advantage of technological innovations that have made locomotives more powerful and enabled rail cars to carry heavier loads without wearing out track. The spread of smaller low-cost rail carriers should spur the industry to continue to reduce its labor costs. Finally, it is possible that rail mergers will continue to the point where only two large transcontinental railroads, both highly efficient, would remain in the industry. But even this restructuring (if it comes to pass) would still leave two large railroads in the east and two in the west, and thus have little effect on the current level of rail competition between any two given destinations. The growth of nationwide banks and securitization will lead to more consolidations in the banking industry, but also to more competition in local banking markets. And the recent development of electronic banking is opening up a new set of markets where banks are likely to compete with computer and phone companies, according to the American Bankers Association. Finally, continued unbundling of natural gas production, transportation, and distribution will increase competition in this industry, particularly at the distribution level.

Innovations in marketing, operations, and technology are often difficult to anticipate, so the path of any particular industry as it adjusts to deregulation will be unpredictable. Nonetheless, it is striking that nearly 20 years after deregulation began, even industries with low sunk costs and a simple technology, like truckload trucking, are continuing to adjust to deregulation in much the same way as industries with large sunk costs and a more complicated technology, like railroads.

Consumer Welfare

Consumers have turned out to be the primary beneficiaries of deregulation. The evidence to date suggests that since deregulation each industry has significantly improved its service quality and reduced its real average prices from 30 to 75 percent, as summarized in Table 3. As in the case of the decline in operating costs, one can attribute most but not all of the decline in prices to deregulation. Some alternate reasons for lower costs in rail and trucking, which also apply to prices, were given earlier. Certain critics of airline deregulation have argued that fares were already declining before deregulation and that the decline in real fares since deregulation would have occurred anyway. However, Morrison and Winston (1995) show that deregulation has accelerated the decline in real fares, and that the decline would have been much less had fares still been regulated.

It is difficult to itemize the sources of the price declines in each industry according to changes in competition supplied by incumbent firms and new entrants and by improvements in efficiency. Morrison and Winston (1998) are able to provide such a decomposition for the airline industry. They report that competition supplied by incumbent carriers accounts for 18 percent of the savings from lower real fares since deregulation, competition supplied by Southwest Airlines accounts for 31 percent of the savings, competition supplied by other new entrants accounts for 10 percent of the savings, and improvements in carriers' operating efficiencies account for 41 percent of the savings.

Table 3
Improvements in Consumer Welfare ^a

<i>Industry</i>	<i>Improvements</i>
Airlines	Average fares are roughly 33 percent lower in real terms since deregulation, and service frequency has improved significantly.
Less-Than-Truckload Trucking	Average rates per vehicle mile have declined at least 35 percent in real terms since deregulation, and service times have improved significantly.
Truckload Trucking	Average rates per vehicle mile have declined at least 75 percent in real terms since deregulation, and, because of the emergence of "Advanced Truckload" carriers, service times have also improved significantly.
Railroads	Average rates per ton mile have declined more than 50 percent in real terms since deregulation, average transit time has fallen at least 20 percent, and the standard deviation of transit time has fallen even more than 20 percent.
Banking	Consumers have benefitted from higher interest rates, from better opportunities to manage risk, and from more banking offices and automated teller machines.
Natural Gas	Average prices for residential customers have declined at least 30 percent in real terms since deregulation, and average prices for commercial and industrial customers have declined even more than 30 percent. In addition, service has been more reliable as shortages have been almost completely eliminated.

Sources: For airlines, Morrison and Winston (1998); for less-than-truckload trucking, Corsi (1996a); for truckload trucking, Corsi (1996b); for railroads, Winston, Corsi, Grimm, and Evans (1990) and Association of American Railroads (1996); for banking, Berger, Kashyap, and Scalise (1995); and for natural gas, Costello and Duann (1996) and Crandall and Ellig (1997).

Deregulation's considerable success has surprised the economics profession in at least some respects. The profession correctly predicted that consumers would gain from lower airline, motor carrier, and natural gas prices, and from higher interest rates on bank deposits, but the profession expected rail rates to rise (or at least not to fall very much), and failed to predict the large gains from improved service quality in all industries (Winston, 1993). Accounting for changes in prices and service quality, a conservative estimate of the annual net benefits that consumers have received just from deregulation of intercity transportation--airlines, railroads, and motor carriers-- amounts to roughly \$50 billion in 1996 dollars (Morrison and Winston, 1998). These benefits have been achieved without compromising safety.⁶

To be sure, consumers have not shared equally in the gains from deregulation. Long distance air travelers on high density routes have benefitted more than short-distance travelers on low density routes; large rail and truck shippers have benefitted more than small rail and truck shippers; large savers have benefitted more than small savers; and commercial and industrial natural gas customers have benefitted more than residential natural gas customers. But this distribution of benefits has generally had a rational economic basis. Because one objective of economic regulation is commonly to "equalize" prices and services across all consumer groups and geographical areas, it is not surprising that the transition from regulation to market forces has not "equalized" deregulated prices and services for all customers. In any industry, buyers who make large purchases or reside in markets with many competitors or lower costs will generally receive lower prices and better service than buyers who make small purchases or reside in markets with few competitors or higher costs. In the airline industry, for example, Morrison and Winston (1997) show that roughly 90 percent of the difference in the gains to travelers on high traffic density routes and low traffic density routes can be explained by the higher costs of serving travelers on low density routes, which are attributable to the lesser economies of scale of smaller planes and lower load factors on such routes.

As in other industries, institutions are evolving to maintain competitive forces in many deregulated markets. In shipping, third-party logistics firms have sprung up to analyze shipper distribution patterns and logistics costs and, with the aid of sophisticated software, to determine the lowest-cost routes and the carriers with the lowest rates. These firms are also able to achieve cost savings for shippers by leveraging the volumes of all of their clients to obtain discounts from carriers. Travel agents can obtain lower fares for travelers who can be organized into a bargaining unit. Marketers can obtain lower natural gas prices for an aggregate of residential users, and so on. Many of these institutions are just developing. In the future, they are likely to become more prominent in deregulated markets and enable more consumers to share in the ongoing efficiency gains from deregulation.

Implications for Other Industries

The evidence suggests that deregulation has been and continues to be a success, and further, that this success is the result of an adjustment process that is common to all major industries that have been completely or partially deregulated. Is this conclusion likely to apply to the major industries --

⁶ The effects of deregulation on wages and employment vary by industry. For example, truckers have experienced significant losses in wages but railroad workers have not, while railroad employment has been cut but airline employment has risen. In general, the losses to labor from deregulation represent at most a modest fraction of consumers' gains, see Winston (1993) and James Peoples' accompanying article in this issue.

telecommunications, electricity, and cable television -- that are currently facing substantial regulatory reform?⁷

Deregulation in these areas is barely underway and moving very slowly. In telecommunications, prices for interstate long-distance service have been deregulated for incumbent carriers -- subject to various restrictions on geographic conformity of rates and interconnection charges that are kept above costs by state and federal regulators to cross-subsidize local service. The prices of intrastate long distance and local service are still regulated by state regulatory commissions. The 1996 Telecommunications Act envisioned widespread entry by the many players in telecommunications and cable TV into each other's markets, but also left in place a number of existing regulations, including those at the state level, and set up some new preconditions and restrictions on such competition. In electricity, states are exploring deregulation of generation, and allowing access to transmission and eventually to distribution. Cable television rates were deregulated in 1984 and then reregulated in 1992, but, in accordance with the 1996 telecommunications legislation, rates for smaller systems have now been deregulated again. Remaining cable television regulations are to be phased out by 1999. Some in the policy-making community and the press are attempting to assess the overall benefits of deregulation by looking at the short-term effects of these partial steps toward deregulation. I will take a long run perspective, which begins by assessing whether the greater operating freedoms afforded by deregulation will be accompanied by intensified competition in these industries, and then considers both the likely problems of transition and the possible innovations that may benefit the public.

Competition and Potential New Entry

Until recently, many economists would have said that the telecommunications, electricity, and cable TV industries were natural monopolies on the grounds that they have substantial economies of scale, making entry difficult. But recent technological advances have changed the rules of competition in these industries. In telecommunications and cable TV, digital transmission technologies over fiber optics or the electromagnetic spectrum are creating new opportunities for competition in parts of these industries. In electricity, the advent of small scale combined cycle gas turbine (CCGT) technology is doing the same. In all three industries, both incumbents and potential entrants are providing a potentially large source of competitors.

The current incumbent players in telecommunications include both local service companies, like the regional Bell operating companies, several independent companies, and a number of small rural companies; and long distance telephone service, like AT&T, MCI, Sprint, and some smaller carriers. They are potential entrants into each other's markets. Other potential entrants into both the local and long-distance markets include cellular and other wireless companies, cable TV companies, and electric utilities, who often own fiber optic cable networks that could carry phone calls. Even Internet services now offer long distance and international voice calls. Similarly, cable TV companies could face competition from telephone companies, electric utilities, and cellular systems, as well as from direct broadcast satellite (DBS) systems and multichannel microwave distribution services.

⁷ For more detailed discussion of the material in this section see Crandall and Waverman (1995) and Harris and Kraft (1997) for the telecommunications industry; Crandall and Furchgott-Roth (1996) for the cable television industry; and Smith (1996), White (1996), Joskow (1997), and Kwoka (1997) for the electricity industry.

Competition arises in electricity when services are unbundled, so that a single company no longer provides power generation, transmission, and retail distribution services. Independent power producers are potential entrants in generation; retail power merchants and generation companies are potential entrants in transmission; and municipalities could become potential entrants in distribution. An additional source of competition will arise if customers can negotiate with generation companies for power and arrange their own transmission, as has occurred in natural gas.

As in the case of other deregulated industries, the strongest competitive forces could be provided by new low-cost competitors, who are already starting to emerge. For example, "dial around" long distance firms, which can be accessed by dialing a five-digit code, are offering lower long distance rates than larger carriers because they have much lower marketing and promotional expenses. In electricity, pilot experiments in certain states will enable consumers to obtain lower electricity prices from independent start-up companies, which use the latest technologies and have much lower costs than older incumbent utilities. The incumbent utilities have enormous sunk costs of plant already installed and contractual commitments to buy independently generated power at very high rates. Free entry may even create markets for a generic service, such as communications or energy, which could eventually enable consumers to choose among several firms to supply all their energy and communications services. The Potomac Electric Power Company has recently announced a new venture with RCN Corporation of Princeton, New Jersey to offer Washington DC area consumers alternative local telephone service, high-speed Internet connections, and cable television.

The rapid pace of merger activity in the communications and energy industries suggests that firms in these industries are positioning themselves for deregulated competition. Long distance and local telephone companies, regional Bell operating companies, and cable and telephone companies are proposing mergers. The value of mergers between electric utilities and between electric and natural gas utilities rose from \$2 billion in 1982 to nearly \$20 billion in 1996. Antitrust authorities will again be required to mediate between the private interests of firms and the efficiency objectives of society. However, most of the proposed restructuring is likely to help industries shed inefficiencies developed over decades of regulation. The probable pattern is that the number of competitors may fall over time, but the intensity of competition in communications and electricity markets should become much greater than it was under regulation.

Potential Problems of the Transition

It is clear that intense competition can develop in communications and electricity markets. But the legacy of sunk costs created by regulation presents problems for the transition from regulation to deregulation of these industries. Meyer and Tye (1988) argue that the transition should encourage suppliers to sign the same kind of contracts with each other and with customers that they would have signed had there been no sunk cost legacy of regulation, thereby causing regulatory institutions to wither away. In practice, the competing interests of incumbent firms, new entrants, and consumers -- as mediated through the existing regulatory and legislative structure -- is likely to inhibit prompt or fully efficient solutions. The major problems to be addressed include competitive access, stranded assets, and universal service.

The competitive access issue begins with the observation that to facilitate competition in telecommunications and electricity, competitors must have the option of interconnecting with existing phone networks and electricity transmission lines. As one can imagine, incumbent carriers and new entrants often

disagree as to what charge is reasonable; the new entrants argue that they should be charged only at marginal cost, while the incumbent carriers argue for higher charges that would allow them to recover their earlier capital costs. Parties have been able to agree on access charges in the railroad, natural gas, and airline industries, and market mechanisms have also developed to promote access. In Canada, railroads have engaged in "reciprocal switching," thus enabling shippers to have access to more than one railroad. In natural gas, re-selling of capacity has facilitated access to pipelines. To facilitate entry at airports, airlines are now able to buy or lease slots and gates from each other. The Federal Communications Commission has been trying to issue legally binding guidelines, without much success, on how the regional Bell operating companies and other local exchange companies must open their markets to competition and under what conditions the regional Bell companies can enter long distance markets. And congressional legislation has been introduced that would require the federal government to phase in competition in electricity at the consumer level in any state that has not done so by the year 2000.⁸

The "stranded assets" problem arises because incumbent firms are concerned that with deregulation, they will be stuck with uneconomic capital investments urged upon them by regulators in the past, while having to compete against firms that are using more efficient technologies. The appropriate compensation, if any, for these stranded assets has emerged as a controversial issue in electricity and telecommunications; Kahn (1997) provides a balanced perspective on this issue in the electricity industry. But the issue is not new. In the natural gas industry, deregulation forced pipeline owners to accept from producers contractually priced gas supplies that they were unable to sell to utilities, because the utilities could find lower-cost sources of natural gas. Pipelines were allowed to recover, through a temporary fixed charge on consumers, as much as half the cost of "buying out" existing commitments to producers. In fact, based on data furnished by pipelines, transition costs predicted by the Federal Energy Regulatory Commission to be \$44 billion turned out to be only \$13 billion (Crandall and Ellig, 1997). After the break-up of AT&T, the depreciation rates for the obsolete capital caused by the break-up were generally allowed to increase (Costello and Graniere, 1996). When competition accelerated the obsolescence of existing investments, regulators resorted to price caps, but these price caps were not explicitly set to allow the further recovery of stranded assets. Instead, telecommunications firms were responsible for recovering the undepreciated portion of obsolete capital through the increased profitability allowed by price cap regulation. The stranded cost stakes in electricity are huge, because incumbent utilities have been prodded by regulators to make suboptimal investments and sign long-term contracts that involve costly technologies, like nuclear power and some alternative energy sources, so that their costs will be much higher than new entrants' costs. But several states have already proposed ways to help utilities pay off their construction debts, usually through some fixed charge on consumers' monthly bills, thus enabling deregulation to move forward. Indeed, regulators in California have approved a plan to allow all utility customers to buy electricity from any supplier of their choosing by 1998.

The provision of universal service is not only important to policymakers, but to many supporters of deregulation as well. But if the goal is to provide reasonable prices and service to an area on an ongoing basis, firms need to have incentives to do that, and universal service requirements tend to reduce those incentives. For example, in airline and railroad deregulation efforts were made to "protect" air travelers in rural areas by subsidizing carriers to serve these small communities and to "protect" shippers of certain bulk commodities like coal by instituting maximum rate guidelines. In fact, the airline subsidy program

⁸ In the case of communications, regulatory authorities can also enhance social welfare by continuing to reallocate spectrum capacity to facilitate competition in cellular service (Kwerel and Williams, 1992).

reduced carriers' incentives to provide high-quality, low-cost service to small communities (Morrison and Winston, 1986), while maximum rail rate guidelines have had little effect on prices because only a handful of rates have ever been successfully challenged. Another way of providing universal service is to require that large companies cross-subsidize certain users. Such cross-subsidies are difficult to sustain in a competitive market, where services can often be unbundled. Moreover, the gains to the community may not be as large as expected. In telecommunications, for example, Crandall (1997) finds that the inefficient cross-subsidization of local service through supra-competitive long-distance rates has provided very small benefits to low-income consumers because many of these consumers are heavy users of long-distance service. In these ways, policies to preserve universal service have a tendency to undermine the competitive forces that can enable consumers to obtain reasonable prices and service.

Opportunities for Innovations

Deregulation should not receive credit for the technological changes that have opened the possibility of intense competition in the communications and energy industries. But deregulation should allow and encourage more rapid application of these innovations, and by providing greater operating freedom and a more competitive environment it should stimulate new innovations. For example, communications regulation has cost consumers by delaying the introduction of new services, such as voice messaging and cellular telephone (Hausman, 1997). But after just partial deregulation, communications firms' demand for fiber-optic cable to provide an array of services at lower cost has already exceeded expectations. There is also evidence that countries with several competitive telecommunications firms have much greater penetration of cellular phone service than countries with state-run monopolies, and that state regulatory reforms, such as rate caps, have had a beneficial impact on companies' deployment of new technologies that allow much higher speed service, such as high-speed Internet connections (Blustein, 1997; Taylor, Zakardas, and Zona, 1992; Greenstein, McMaster, and Spiller, 1994). Low orbiting satellites represent another technology that could lead to lower costs, and new and improved services. Unbundling electricity production and emerging third parties could lead to various innovations; for example, consider a power marketing firm that also offers a bundled service of optimal climate control and conservation, together with the sale of power.

So what can we expect from deregulating communications and electricity? As with other deregulated industries, the adjustment process will be long and difficult, but the potential benefits to consumers appear to be huge. Remember, real operating costs in other industries fell roughly 25-75 percent following deregulation. Costs should also fall substantially in deregulated communications and electricity industries, as firms are free to shed inefficient technologies and are stimulated by new competition to develop and implement cost-reducing innovations, which should bring prices much closer to marginal costs. In telecommunications, the annual benefits from optimal pricing alone have been estimated to be as high as \$30 billion (Crandall and Waverman, 1995). Deregulation of cable television is likely to lead to a more rapid expansion of viewing options (Crandall and Furchtgott-Roth, 1996). The electricity industry will come to be characterized by a competitive generation market, access to the transmission network for all transactions, and a high degree of service unbundling. Although incumbent utilities are likely to suffer losses, new entrants are likely to be profitable, and residential and commercial consumers of electricity are likely to gain considerably more than \$10 billion annually from price and entry deregulation (White, 1996). Some gains are already taking place as public transit companies are negotiating contracts with alternative suppliers of electricity or renegotiating contracts with current suppliers that substantially lower their electricity costs.

Conclusion

Some policymakers and economists appear reluctant to draw generalizations from the U.S. experience with deregulation over the last two decades. Industries, it is said, are different: they have different technologies, entry requirements, and so on. That deregulation works in one industry does not imply it will work in others.

This paper suggests, however, that industries are likely to behave quite similarly when it comes to adjusting to deregulation, and that their adjustment, while time-consuming, will raise consumer welfare -- significantly even at first, and increasingly over time. Markets will become more competitive. Firms will develop innovations to become more efficient and more responsive to consumers. The benefits to society will grow as the adjustment continues. Indeed, the success of the U.S. deregulation experiment has gained attention throughout the world as evidenced by countries such as Japan and members of the European Union embarking on policies to liberalize competition in transportation, communications, and banking.

In the absence of any real, accumulating evidence about the impact of regulatory reform, the ideological overtones in the past debate over deregulation have been understandable. But we now have some 20 years of evidence. It is time to refocus the debate directly on that evidence and broaden our vision of where markets can replace governments in determining the most efficient way to create and sell products and services. This process is taking place in telecommunications, electricity, and cable TV. Looking ahead, government control over prices, entry, and exit in ocean transportation clearly warrants the deregulatory reforms proposed by the Clinton Administration. Similar proposals are also warranted at the state and local level for taxis, limousines, and occupational licensure. It may be even more important to question the extent of the government's quasi-monopolist role in providing and regulating urban transportation (Lave, 1985; Winston and Shirley, 1997) and education (Chubb and Moe, 1990). These are big steps. But most of the theoretical arguments for greater competition in these activities parallel the arguments for deregulation. The empirical evidence may also turn out to be the same.

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Regulatory Reform and Trade Liberalization*

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As tariff and other border barriers have fallen over the past several decades, national regulatory system—particularly for services, investment, and energy—have assumed greater importance in trade negotiations. This is because, depending on how they are structured, national regulatory systems can create formidable barriers to the operation of truly "contestable markets" for both domestic and foreign firms. Thus national efforts to introduce more market-based domestic regulatory systems have important implications for the multilateral system.

Regulatory reform encompasses a spectrum of policy changes, ranging from the breakup of public and private monopolies and oligopolies to more efficient and focused regulation and even in some cases complete deregulation. Trade liberalization reinforces and extends domestic regulatory reform by allowing the introduction of more competition in national markets and by providing the opportunity for domestic firms to expand into other national markets. In addition, trade negotiating principles are *national treatment*, or the commitment to equal treatment for both foreign and domestic firms, and *due process*, meaning full consultation before the promulgation of regulations and a fair and expedition adjudication process.

WHAT IS REGULATION REFORM?

Led by the United States, most industrial nations have undertaken extensive programs of regulatory reform over the past two decades. Particularly since the late 1980's, both the new industrial economies (NIE's) of East Asia and Latin America and the formerly command-and-control states of Eastern Europe and the Soviet Union have joined the movement. Given the diverse history and nature of these countries, it is no surprise that regulatory reform has taken different forms and meanings.

In its broadest reach, the concept of regulatory reform has the goal of introducing more efficient methods of public intervention into national market economies—assuming that such intervention is necessary at all. Within this broad definition are core goals that aim to increase the efficiency of rules governing market entry, production methods, transactions between producers and suppliers, and firm responses to competition.

Regulatory reform encompasses a spectrum of public policy changes, from privatization of public monopolies, particularly in the NIEs and former communist states, but also in some industrial economies, such as the telecommunications monopolies in Germany and France; the breakup of private monopolies, such as AT&T in the United States; more efficient and focused regulation of an existing private market, such as airline deregulation in the United States and in the European Union (EU); and virtually complete deregulation, such as the United States has done in trucking and railroads, including abolition of the Interstate Commerce Commission.

In most such cases, regulatory reform has not resulted in the complete withdrawal of government oversight. Even after sweeping sectoral deregulation, firms are still subject to national competition and antimonopoly laws and regulations. The fact that complete *laissez-faire* is not the endpoint of most regulatory reform has led some observers—implicit skeptics of the whole process—to introduce the term

"reregulation" to describe much that is taking place.¹ Use of this term is flawed on several counts: First, proponents of regulatory reform do not deny the necessity for government oversight in some situations: They just want less intrusive and distortive intervention. Second, characterizing the result of many national economic deregulatory effort as reregulation inaccurately describes the thrust and direction of what is taking place. In all cases, the movement has been from either total monopoly or tight oligopoly, combined with public regulations that aid collusion, to a more truly competitive market, accompanied by less regulatory oversight.

Unfortunately, when government has been a "pervasive participant" in strategic sectors, rent-seeking by firms and individuals is also "pervasive," and thus the path to regulatory reform is strewn with pitfalls. Specifically, economist Robert Rogowsky has written, "rather than directing energy toward improved products and distributional efficiency, [firms have directed] their resources toward maintaining their politically favored or protected position."²

BENEFITS OF REGULATORY REFORM

Despite uneven progress, the overwhelmingly positive results have created a strong consensus for wide-ranging national regulatory reform programs. These results span differing political regimes, national levels of development, and regional boundaries. Thus in the United States, estimates of the welfare gains to consumers from regulatory reform in the airline, trucking, and gas industries were \$5 billion, \$8 billion, and \$3 billion respectively.³ A study of privatization in the telecommunications sectors of Chile and Mexico found economy-wide efficiency gains of 50 percent for Telmex and 155 percent for Chile Telecom. A similar study found gains of 12 percent for British Telecom after privatization. In New Zealand, the cost of long-distance calls has declined almost 11 percent each year since telecommunications reform was completed in 1988, and over \$4 billion has been invested in capital improvements by the main competing firms.⁴

The list could go on at some length, but the central point is that there is now little dissent from the proposition that domestic regulatory reform boosts national economic growth and welfare. Extending these benefits to foreign firms engaged in international trade and investment, however, presents a separate set of challenges.

¹Jonah Levy, "Globalization and National Systems" (BRIE Working Meeting on Globalization, University of California, Berkeley, March 1996, photocopy); Steven K. Vogel, "The Bureaucratic Approach to Financial Revolution: Japan's Ministry of finance and Financial System Reform," *Governance: An International Journal of Policy and Administration* 7, no. 3 (July 1994), pp. 35-36.

²Robert Rogowsky, "The Benefits of Regulatory Reform" (OECD Symposium on Regulatory Reform and International Market Openness, Paris, July 1996, photocopy).

³Clifford Winston, "Economic Deregulation: Days of Reckoning for Micro economist," *Journal of Economic Literature* 31, no.3 (September 1993), pp. 1420-61.

⁴Ahmad Galal, Leroy Jones, Pankaj Tandon, and Ingo Vogelsang, *Welfare Consequences of Selling Public Enterprise: An Empirical Analysis* (New York: Oxford University Press, 1994).

THE LINK BETWEEN REGULATORY REFORM AND TRADE LIBERALIZATION

Trade liberalization complements and reinforces domestic regulatory reform: Both aim for the achievement of truly "contestable markets." Unfortunately, in many instances domestic regulatory rules and apparatus have the effect of thwarting competition and market entry by more innovative firms both domestic and foreign, often in the name of protecting employment. Because inefficient regulation can harm the performance of domestic firms, firms are likely to enlist strong sympathy from elected officials when they seek protection from foreign competitors.

Further, each sector presents a complex set of issues and delicate questions of timing as public regulatory bodies construct strategies to introduce more competition. At many junctures, there is the danger that foreign competitors will be thwarted by both the method and content of reforms instituted in the name of deregulation.

An excellent example of the potentially negative consequences of mismanaged or rigged deregulation is now unfolding in the Japanese insurance market.⁵ This \$400 billion market is one of the most tightly regulated in the world, with rules forbidding price and product competition that include restraints on innovative marketing and distribution practices. Foreign firms have been able to establish a presence only in the so-called Third Sector, consisting of niche products such as personal accident and cancer insurance and long-term disability. This sector comprises only 3 percent of the total Japanese insurance market.

In 1994 the Japanese Ministry of finance agreed not to introduce new competition into the Third Sector until the much larger life and nonlife insurance sectors were opened up to competition. Since then the ministry has taken no significant steps to accomplish this goal. Despite this failure, in early 1996 it announced plans to allow the huge, domestic Japanese insurance firms to compete in the niche markets. Without real regulatory reform across the entire insurance sector, these firms will almost certainly wipe out the foreign presence in the third Sector.

The United States and other nations vigorously opposed this manipulation of market liberalization to favor domestic firms, and ultimately the Ministry of Finance backed down. Ironically, by refusing to distinguish between private restrictive practices (in automobiles and semiconductors) and public regulatory actions (in insurance and other financial service), the United States has clouded its own case for strong retaliatory measures. At this juncture of World Trade Organization (WTO) jurisprudence, public actions are far more likely to be found inconsistent with multilateral trading rules than private actions.

ANALYZING REGULATORY REFORM

As tariff and other border trade barriers have fallen over the past several decades, national regulatory systems—particularly for the service sectors, but also importantly for energy—have assumed a greater importance in trade negotiations, not the least because they now represent the greatest impediments to the free flow of trade and investment.

⁵Claude Barfield, "Principles Needed in U.S. Japan Trade," *Journal of Commerce* (September 5, 1996).

In effect, service, investment, and energy trade negotiations represent negotiations between competing regulatory systems, and these systems can be analyzed in ways similar to standard microeconomic analysis of competition among firms. The economic analysis of the efficiency of regulatory systems focuses both on market failure—such as market power, externalities, and imperfect competition—and on government failure.

Market Power

Market power refers to situations in which one or a few sellers control the market, with the result that the quantity of goods sold is smaller and the price greatly exceeds production costs. Market power can arise through explicit or implicit collusion among producers, through mergers, or even through government restrictions that prevent or impede market entry.

Examples of market power have abounded in key traded sectors such as financial services and telecommunications. In financial services, often in the name of consumer safety and protection, firms were protected by geographic restriction such as on the number of branches, by limits on rates of interest paid on savings accounts and charged on loans, and by restrictions on technology that could expand the range of competition (e.g., automated teller machines). More recently, rapid advances in technology have enabled individual firms to increase their scope vastly. Thus in almost all countries, including the United States, despite the arcane limitations of the Glass-Steagall Act, there has been a merging of the separate banking, securities, and insurance sectors.

In a number of sectors, the issue of regulation has been complicated by historic arguments that a monopoly is "natural"; that is, the technological and economic underpinning of the sector is such that only one company can serve the market. Natural monopoly conditions have been asserted in energy, petroleum extraction and distribution, electric and gas utilities, and telecommunication, among others, as a rationale for economic regulation that supported regulated or nationalized monopolies. Over the past decade, economic research has undercut the basic premise of many "natural" monopolies, demonstrating that there is little evidence of the economies of scale necessary to justify continued monopoly. Moreover, nations that have introduced competition and less restrictive regulation have experienced lower prices and higher productivity. In the United States, for example, more efficient regulation in telecommunications and railroads saves consumers an estimated \$2 billion annually.⁶

On both the domestic and the international fronts, however, the most significant recent activity in regulatory reform has been the attempt to manage relations between regulated public and private monopolies and potential new market entrants. The aim is to construct rules that will constrain the market power of the monopolies. For instance, in the telecommunications area, key areas for reform include equipment sales to regulated monopolies and conditions of entry for competing service providers. Specifically, policy reforms aim to achieve nondiscriminatory access to communications networks, reasonable rates for leased lines for new service providers, and transparent, open bidding for equipment suppliers to national monopolies.⁷

⁶Winston, "Economic Deregulation."

⁷Greg Sidak, *International Competition in Telecommunications* (Washington, DC: AEI Press, 1997).

Externalities (Spillover Effects)

Positive and negative externalities occur when the consequences of one entity's production or consumption decisions result in uncompensated effects on others. Of particular concern are the consequences of negative externalities in areas such as the environment, where the result will be too much of a good or service, at too low a price, and with too few resources being devoted to reducing or correcting the negative externality, such as increased pollution.

The World Trade Organization is now moving to place environmental issues on the multilateral trade agenda; therefore national environmental regulatory systems will come under increasing scrutiny. The major challenge is to move toward a consensus on procedures and methods of regulating the environment by means of flexible, market-based policies.

The move toward multilateral trade discussions on the environment comes at a time when many nations are rethinking their approaches to pollution regulations, although real changes are still sporadic. For most nations, the traditional means of environmental regulation entails setting rigid technical standards that prescribe specific allowances by source or mandating particular technologies, such as particular kinds of wastewater treatment plants. These standards almost always introduce distortions by discriminating between old and new plants and between different industries.

As the costs of such regulation have become more evident and the lack of progress more glaring, some nations have begun to experiment with more economically productive alternatives, including incentives and taxes. The two main experiments to achieve greater economic efficiency have been the use of emissions trading and effluent fees.

The United States has experimented with emissions trading since the late 1970s, although often the process has been burdened with cumbersome constraints. The first major experiment in the early 1980s consisted of trading options for six air pollutants whereby two or more companies that were the sources of the particular pollutant could propose regulations to reallocate pollution among themselves. More recently the United States and Singapore both have used emission trading to meet the requirements to reduce fluorocarbons under the Montreal Protocols.

Effluent fees or taxes have been used more extensively, with mixed results. The challenge is to set the tax high enough both to cover the cost of the potential environmental damage and to create an incentive for polluters to minimize damage. While political pressures often have thwarted this result, more and more nations are adopting the principle behind it: the polluter pays.

The principle of "polluter pays" is the entering point for international negotiations on trade and the environment, for in a number of areas environmental pollution transcends national boundaries and externalities necessarily become subjects of international concern.

Negative externalities also can be found in the financial services area.⁸ For banks, a depositor run represents a major negative externality. Depositors either fear that their bank is really insolvent or fear that other depositors fear that the bank is insolvent—and either fear can cause depositors to withdraw their deposits. For international negotiators, there is also the fear of "systemic risk"; that is, that the failure of a large bank or the entire banking system of one country will have negative effects on the entire international banking structure. Recent research has underscored that such fears should not cause elaborate financial regulation at either the national or international levels but that a few basic regulatory requirements, such as adequate capital levels and limitations on a bank's exposure to one or a few borrowers, will suffice to maintain the safety and integrity of the system.⁹

A second key factor in warding off systemic risks is full and timely information about the structure and operations of banking firms in the system—and this leads to the third potential cause of market failure; asymmetric or inadequate information.

Information Requirements

Problems of "asymmetric information" arise when a party on one side of a transaction has information that a party on the other side does not possess. For instance, a borrower may know more about his or her ability to repay a loan than the lender; a manufacturer of a product will know more about the safety of the product than the consumer; and a drug manufacturer will know more about the efficacy of a drug than either a doctor or a patient.

Remedies for this type of market failure include various disclosure requirements as well as protective standards. In both cases, costs will be incurred, and the challenge to regulators is to find the most effective and least costly alternatives among competing regulatory options. Mandatory product standards, for instance, run the dangers of thwarting technological change by fixing on a particular design or product and of preventing flexible responses to differing local problems. Of equal concern from a trade policy perspective is their vulnerability to capture by local firms and interests that tailor the specifications to local advantage and exclude foreign competition.

Several alternative public interventions offer more market-oriented solutions, less vulnerable to capture. First is the shift from product to performance standards that do not mandate specific technologies or designs and instead lend themselves to open competition. More important are steps to ensure full disclosure to all participants in the process, including foreigners. With each participant able to have a voice in setting standards, routine market bargaining can determine the outcome.

Finally, of particular importance for international transactions, some progress has been made toward the internationalization of standards and product certification. The most important and advanced efforts are being pushed by the business sectors in Europe and the United States, but the members of the

⁸Lawrence White, "Competition vs. Harmonization: An Overview of International Regulation of Financial Services," in Claude E. Barfield, ed., *International Financial Markets: Harmonization: An Overview of International Regulation of Financial Services*, pp. 5-18.

⁹Jean Dermine, "International Trade in Banking," pp. 49-83, and Ingo Walter, "Global Competition and Market Access in the Securities Industry," pp. 84-150, in Barfield, *International Financial Markets*.

Asia Pacific Economic Cooperation forum (APEC) also are holding a series of consultations with the aim of mutual recognition agreements (MRAs) and possible harmonization of some aspects of the standards-setting process. Among the barriers they are addressing are: testing and certification requirements that are higher for imports than for domestic goods and services; discriminatory product labeling rules; manipulation of domestic laboratory accreditation to block imports; and mandatory compliance with quality system registration schemes.

In June 1997, pursuant to the much-publicized "New Transatlantic Agenda," agreed to by European Union and U.S. corporate groups, the United States and the European Union negotiated mutual recognition agreements for five sectors: pharmaceuticals, electrical equipment, medical devices, telecommunications equipment, and marine recreational craft. The products covered involve about \$50 billion in U.S.-EU trade.

GOVERNMENT FAILURE

The case for public intervention to remedy the consequences of market failure must be balanced against the equal potential for government failure. While government regulation can increase the efficiency of imperfect markets, governments also can fail to meet their goals and intervention can worsen the efficiency of already imperfect markets.

While a number of factors can cause government failure, four problems are particularly relevant.

Conflicting Goals

Often legislatures and political leaders mandate vague and even conflicting goals to regulators, making it difficult to establish and carry out clear programs. For instance, regulators may be required simultaneously to protect the environment, enhance economic growth, advance goals of racial diversity, and guard consumer interests—with little guidance as to priorities or methods of achieving balance. This can lead to disguised protection, as was the case when the U.S. Environmental Protection Agency, in the name of safekeeping the environment, discriminated against non-U.S. oil refineries in regulating emissions, and when Congress, in creating fuel economy standards for motor vehicles, clearly favored the Big Three U.S. automakers.

Asymmetric Information

Even with able personnel, government agencies have difficulty obtaining and utilizing the information necessary to understand market developments in complex sectors such as telecommunication and financial services. The problem of inadequate information is likely to lead to the same problems encountered by private sector entities in overcoming market failures.

Income Distribution

Domestic regulatory agencies often are asked to ameliorate perceived inequities in a nation's income distribution. More efficient methods of addressing inequities would entail taxes and subsidies, but regulation is often the preferred policy choice, particularly through the use of cross-subsidies. Examples of the inefficiencies introduced for such purposes are "must-serve" mandates to insurance companies and the similar mandate for banks to establish branches in poor districts set forth in the U.S. Community Reinvestment Act. In Europe, the "must-serve" mandates have been used as a means of slowing down and blocking the opening the telecommunications markets to non-EU firms.

Rent-Seeking and Capture

Finally, the greatest threat to both efficient and equitable public regulation stems from the lobbying activity of affected individuals and firms that will expend considerable resources to bend policies and regulations in their favor. In many countries the history of economic and health and safety regulation has seen the gradual capture of the regulatory authority by the producers and groups at whom the regulations were originally aimed.

After analyzing the dynamic of both market and government failure, a recent study concluded:

(t)he real world imperfections of government have yielded numerous instances of the regulatory processes being used for abusive purposes and reaching inefficient outcomes. Indeed the deregulation movement of the late 1970s and 1980s was a reactions to these abusive purposes and inefficient outcomes. These abuses need not lead to the conclusion that all government regulation should be forsaken. But they do point toward constant caution in embracing new regulation-national or international-and toward the value of frequent reassessments of the motives, methods, and outcomes of existing regimes.¹⁰

HARNESSING REGULATORY REFORM TO TRADE LIBERALIZATION

Despite the warning message of recent Japanese experience with insurance reform, the goal of harnessing domestic regulatory reform to trade liberalization will be attainable over time. Given the myraid of regulatory regimes, political traditions, levels of economic development-and the very particular technological and competitive challenges that each sector represents-progress will be varied and programs will have to be tailored to national priorities.

As they move in future years to revise their regulatory systems, individual national regulatory systems and national policymakers should keep their eyes on the following guidelines: WTO procedural principles and mutual recognition agreements.

¹⁰White, "Competition vs. Harmonization," pp. 23-24.

WTO Procedural Principles

Because virtually all nations belong to, or soon will belong to, the World Trade Organization, a sensible beginning to the linkage of regulatory reform to trade liberalization would be a commitment to apply certain multilateral principles in reconstructing national regulatory systems. Among these would be the following.

Transparency. This includes the commitment to publish all rules governing sectoral regulation and to see to it that all affected parties—both domestic and foreign—have access to these rules.

National Treatment. This involves the commitment that foreign and domestic firms be treated equally in the construction and application of regulatory regimes.

Minimal Distortion of Trade. This is a commitment to observe the WTO requirement that governments will adopt the method or policy that is the least trade distorting to achieve a social, economic, or political objective.

To these basic WTO rules, the following procedural safeguards should be added:

Due Process. Governments should commit to full consultation with all interested parties—both domestic and foreign—before proposed standards or regulations are put in place. Provision also should be made for open and expeditious appeals process when affected parties feel that unwarranted economic burdens will result from new or revised regulations.

Mutual Recognition Agreements

Moving beyond general principles, a number of plurilateral negotiations are taking place that aim for a series of MRAs that will enhance regulatory reform. Indeed, one recent study predicted that "MRAs will likely be at the heart of trade diplomacy in the coming decade."¹¹ The high interest in MRAs stems from the continuing drive to reduce trade barriers and the recognition that there exist wide and deeply rooted differences in national regulatory systems based on social preference, level of development, income distribution, tolerance of risk, geography, and government-societal relationships.

As a way station to harmonization, mutual recognition is based on a principle of "equivalence" or at least "acceptability" of each nation's regulatory systems. From this flows the rule that if a product or service is sold (or tested) lawfully in one jurisdiction, it can be sold (or tested) in all member jurisdictions without meeting separate standards or undergoing additional testing. Mutual recognition has been called an extreme form of national treatment: It restricts the regulatory authority of member nations, but it does not involve a transfer of power to the supranational level. (The European Union in its present form blends mutual recognition in some areas with complete harmonization in others. The Maastricht Treaty, and likely the results of the recent Intergovernmental Conference, will move the European Union toward greater harmonization).

¹¹Kalypso Nicolaidis, "Mutual Recognition of Regulatory Regimes: Some Lessons and Prospects" (OECD Symposium on Regulatory Reform and International Market Openness, Paris, July 1996, photocopy).

MRAs also can be powerful tools to increase market contestability. They inevitably introduce competition between regulatory systems while also introducing the possibility of a single rule toward which all producers of a product or service will trend. It is for this reason that national regulators remain chary and even skeptical of MRAs in strategic sectors such as financial services and telecommunications.

The two most important specific principles that governments can adopt in the furtherance of mutual recognition are mutual recognition of testing results and the mutual recognition of trade- and investment-related standards. Obviously, each nation still must decide which of its health, safety, and environmental standards are too sensitive or critical for inclusion in MRAs.

Mutual Recognition of Testing. It is universally recognized that there are high costs associated with the duplication of test results that are necessary to certify that various products, production processes, and services meet individual national standards. Commerce is also impeded when professionals—lawyers, accountants, and the like—working for multinational companies are blocked from practicing their professions because of differing educational and profession accrediting organizations. In order to remove these roadblocks, governments, through MRAs, can establish procedures and joint bodies to achieve mutual recognition of both testing and professional certification.

As an important part of the transatlantic business dialogue (TABD), the United States and the European Union negotiated an MRA for pharmaceutical testing. This groundbreaking negotiation focused attention on both the possibilities and the problems inherent in melding different regulatory systems. Among generic problems the negotiators had to overcome were: different definitions of what constitutes the industry—the United States wanted to include medical devices, the European Union did not; level of detail in testing—the U.S. Food and Drug Administration demanded copies of all relevant documents; criteria for judgment—the United States wanted only health and safety, the European Union wanted some economic judgment; and competing bureaucratic perspectives—in both the United States and the European Union, trade and commerce bureaucracies often are at odds with drug regulators.¹²

Mutual Recognition of Trade and Investment-Related Standards. Mutual recognition of actual substantive standards presents somewhat more sensitive issues, particularly when political and social as well as economic objectives are intermixed in regulatory regimes. But as with testing and certification, the costs of differing levels and means of regulation constitute major impediments to trade and investment. The aim of the negotiations is first to induce governments to review their regulatory systems to determine elements of criticality and noncriticality in the achievement of fundamental social and political goals. Rules not deemed central to these goals should become candidates for mutual recognition, relieving producers, exporters, and importers of substantial costs—and ultimately resulting in more varied goods and services at less cost for national consumers.

Harmonization: Negotiated Multilateral Rules. The highest level of integration would be achieved by international negotiations to create some form of multilateral code of regulatory rules. This goal is far down the road, but there are precedents in previous multilateral negotiations and in the current rules governing the WTO. Indeed, it can be argued that all of the nontariff codes (now binding obligations) established during the Tokyo and Uruguay Rounds are precedents for a more wide-ranging code for

¹²FDA Week, November 8, 1996 (Washington, DC: Bureau of National Affairs).

regulatory actions. These would include, for example, existing rules for subsidy, government procurement, and the new multilateral regimes for services and intellectual property.

At the moment, the most import work linking regulatory reform to trade liberalization has been undertaken by the Organization for Economic Cooperation and Development (OECD). In March 1995 the OECD issued a preliminary set of guidelines for member governments to consider before establishing new domestic regulations entitled "Recommendations on Improving the Quality of Government Regulation." The guidelines consist of a series of questions governments should ask when considering new regulations. The questions include such issues as: Is government action justified? Is regulation the best form of government action? What is the appropriate level of government for this action? Do the benefits justify the costs? Are the distribution effects across society transparent? How will compliance be achieved?

Also in 1995, Japan proposed that a number of existing OECD committees should analyze issues presented by domestic regulatory systems with the goal of distilling a set of core principles to guide governments in the future and to minimize barriers to trade. Work is under way in several OECD committees, although as yet no results have been published.

If some consensus can be reached regarding overall principles, the OECD guidelines could very well provide great assistance to ongoing negotiations for specific WTO service sector agreements and for what are likely to be quite difficult and complicated negotiations in the areas of competition policy and the environment.

It also should be noted that regional negotiations in both APEC and through the transatlantic business dialogue are proceeding simultaneously; and if negotiations begin again in the next few years for a Free Trade Area of the Americas, the issue of regulatory reform with at least some attempt of mutual recognition will almost certainly be high on the agenda.

WTO Role. Any future multilateral code for regulatory activity would build on and incorporate the principles and rules for mutual recognition.

Thus existing WTO principles regarding transparency, national treatment, minimum distortion of trade, and due process would form a bedrock set of safeguards. In addition, the WTO could provide the framework for future negotiations to achieve mutual recognition of testing results and standards in an increasing number of substantive areas. These negotiations likely would consist of agreement not only among individual WTO members but also between regional trading groups, if the regional groups reach agreement earlier.

Finally, in some areas—services and investment are key examples—WTO negotiations will involve the establishment of minimum substantive standards. For instance, in the telecommunications sector, questions relating to specific rules for competition between public and private monopolies and outside competitors, and rules for interconnection and equipment procurement necessarily will be included in any multilateral agreement. It should be noted that with regard to both services and investment rules—as well as potential agreements in high-technology sectors—many developing countries will need assistance and competence-building aid because they currently lack the ability to create and maintain sophisticated regulatory systems.

This point leads to a final caveat: Whether through bilateral, regional, or multilateral negotiations, it should be understood that the substantive issues raised by changes in national regulatory systems reflect social, political, and economic beliefs and practices that often are deeply embedded in particular national histories and experiences. Thus, despite sweeping technological changes that are driving pressure for reform and harmonization, progress is not likely to be swift. And to be successful, any proposals for systemic reform will have to accept the necessity for wide variations in approach and substantial leeway for national idiosyncrasies.

Comments by Robert Hahn on

**U.S. Industry Adjustment to Economic Deregulation
by Clifford Winston**

and

**Regulatory Reform and Trade Liberalization
by Claude Barfield**

MR. HAHN: I want to spend a couple of minutes framing the discussion, building on Cliff's paper related to regulation, and on Claude's synthesis of trade and regulation. As I see things, there have been three fairly profound changes in the areas of trade and regulation. First, trading barriers are coming down. The area of regulation as a trade barrier has seen two distinct trends: Deregulation, primarily in the United States. Outside the United States, we see not only deregulatory efforts, but we see a second fairly profound change: Privatization, in particular, privatization of state-owned enterprises in the developing world and in transitional, so-called transitional economies. So in essence, we see the walls coming down around regulation of specific industries and trade flows, seeing restrictions on trade flows across national boundaries begin to disappear.

And I think we are seeing a third profound change: reregulation, which is a countervailing trend in such areas of regulation such as environment, health and safety regulation, and in labor, perhaps, to a lesser extent. We see an increase in many of these types of regulation, both domestic but international. I think this reregulation is in part a political response to the decline in the other regulatory barriers that I just spoke of, in trade and industry-specific regulation. These three changes are my framework for any discussion in the next minutes.

Let me turn specifically and briefly to the two papers. I think Claude's paper presents a nice overview of the linkage between trade and regulatory issues. It identifies possible institutional approaches to the emerging problem of what I call nontariff barriers, which in this case are regulatory barriers that could affect trade patterns. My question is, under what conditions can you expect an organization like the World Trade Organization to effectively address nontariff barriers? Trade policy scholars often say, "Oh, well, the WTO can handle this because it has a set of principles." I am a bit suspicious of putting too much emphasis on a global agreement or on the bureaucrats who enforce that agreement, or on the civil servants in this building who enforce that agreement. So again, my question is, under what conditions should we use the WTO as opposed to other instruments to reduce either barriers to trade, or to reduce these nontariff barriers, such as regulation?

On turning to Cliff's paper, I must say that it calls to mind George Stigler, a Nobel laureate economist, who once wrote a paper that said economists ought to do better benefit-cost analysis and to tell it to all of the world; and then the world would embrace it. And later Stigler confessed that he had "figured out there are politics in the real world, and there may be strategic reasons, good political reasons why legislators and civil servants and what have you, do not listen to the great insights put forth by economists."

Cliff's paper is a different kind of followup confession. Cliff is the foremost authority in the United States and in my view, in the world on measuring the net benefits of deregulation or partial deregulation in

a variety of industries. Now Cliff comes here and says, "Well, I made a mistake. I figured out that things do not adjust as fast as I thought, and we are getting a heck of a lot more benefits than I had thought."

I think that his is a very important insight, if it is correct, as it appears to be. In a sense, the key policy contribution is to say we no longer need to do this industry-by-industry analysis every time the issue of deregulation comes up. We have some 20 years of evidence to support the view that deregulation clearly brings benefits to the large majority of consumers.

I want to ask Cliff two questions. The first is, how can practitioners who are trying to estimate the benefits, or the potential benefits of deregulation, take your insight into account in doing quick estimates--given your insights about adjustment, and given that the world economy is not entirely deregulated in different industrial sectors,? Can they apply a fudge factor?

My second question is whether you think that deregulation is generally a good thing--given that as a political economist you can list situations in which deregulation or attempts at deregulation can lead to perverse outcomes. How would you qualify your conclusion: that we have 20 years of evidence, *so damn the torpedoes, full speed ahead*, for developing countries, or for countries or for particular situations where the political economy might not be ideal for the outcomes that economists might desire?

Comments by Howard Pack on

U.S. Industry Adjustment to Economic Deregulation by Clifford Winston

Clifford Winston's paper on the benefits from deregulation of several industries will warm the heart of most economists. By the seventh week of most introductory courses on economics, the virtues of competition are firmly instilled in students' minds. For those who go on to obtain Ph.D.s, to say nothing of pursuing a career in economics, it would be startling indeed if it were found that deregulation did not produce benefits. Winston's survey of the literature confirms this. Assuming that the underlying studies are correctly executed, and the venue of their publication suggests they are, it is clear that deregulation has had positive effects.

Several questions are not explicitly addressed, however, and answering these would increase one's confidence in the ultimate importance of deregulation.

The first issue is how large are the aggregate benefits that have been obtained, increases in both producer and consumer surplus. The decrease in unit costs reported suggest that producer surplus certainly increased but it is difficult to obtain a sense of the order of magnitude such cost saving as a percentage of the aggregate cost of the industries involved. Table 2 provides some of the ingredients of the required calculation but it is not clear if the cost reductions cited mainly refer to variable costs or whether they also include fixed costs. Presumably, as shown in Table 3, the cost reductions have been passed forward to consumers, directly or indirectly in the case of intermediate services such as trucking. Nevertheless, it would be interesting to know the evolution of the rate of return on equity capital in the deregulated sectors to allay any suspicions that Naderites and others continue to hold that the entire effort was designed to harm consumers. While it is stated on pp. 14-15 that deregulation has not significantly increased profitability, this leaves open two questions. (1) Does this refer to profits as a percentage of revenue or to rates of return on capital. It is presumably the latter which is of interest. (2) Assuming that the statement refers to rate of return, what has been the absolute effect - an increase from 12 to 17 % would be significant though small in absolute amount.

The section on cost reduction is perhaps too modest in assessing the benefits. Given the record of relatively slow growth of total factor productivity in the broad sectors of which the deregulated ones are components, the decline in unit costs implies that in these sub-sectors, TFP growth was significant. Most of the deregulated sectors have not benefited from any major technological advance and hence the reduction in cost must have reflected the growing efficiency of using existing resources, disembodied technological progress, unless the costs of inputs declined. It would be interesting to know if the reduction of unit costs is reflected in its presumed mirror image, TFP growth for these subsectors. This is of particular interest as the reduction in costs could also be ascribed to a decrease in rents accruing to factors employed in the sectors. For the national economy, the latter is a transfer among producers and consumers whereas TFP growth would indicate an improvement in the potential GDP, the policy variable of ultimate interest.

While Table 3 provides quite plausible estimates of the price declines or service improvements, only one estimate is given of the increase in consumer surplus, \$50 billion per year as a result of deregulation of intercity transportation. If I interpret the number correctly as representing the reduction in expenditures which should ultimately be passed on to consumers, the figure is startling, even to one who believes in the benefits of deregulation. It is roughly 3/4 of 1% of GDP. Assuming it is accurate, this is a result to be trumpeted as a singular success. If magnitudes such as this were typical, it would imply that economy wide TFP derived a substantial push from deregulation, something that does not show up in TFP calculations, perhaps because of measurement problems.

While the magnitude of the price declines implies that all groups must have derived absolute benefits, it is also the case that some of the benefits enumerated mainly accrue to the better educated or higher income groups. For example, ATMs and higher interest rates on deposits are likely to largely benefit those with high opportunity cost of time and financial assets, those in the upper quintile of the income distribution. Better airline prices for those able to use the internet have similar effects. Of course, some effects of deregulation work in the opposite direction - the hub and spoke system may increase travel time which adversely affects those with high opportunity cost of time. None of this is to imply that any distributional effects will outweigh the benefits received by most almost all income groups. It does suggest that deregulation in some sectors may have generated some redistribution, both in income and time, which is not easy to measure and may slightly mute the overall rosy picture.

Comments by Bernard Hoekman on
Regulatory Reform and Trade Liberalization
by Claude Barfield

As requested, I have read Claude Barfield's paper "Regulatory Reform and Trade Liberalization" which was presented at the ITC symposium Evaluating APEC Trade Liberalization. The paper discusses regulatory reform in the trade policy context, arguing that international cooperation on trade policy can help support the regulatory reform process. The paper is well written and accessible to the non-specialist. Although I fully agree and support the thesis, more could have been done to amplify and expand on the links between regulation reform and trade policy, both in terms of how one can support the other and in terms of how the two may give rise to inconsistencies.

For example, Barfield notes that regulation may impose excessive costs on domestic industries and give rise to sympathy from elected officials when these industries seek protection from import competition (p.3), but does not discuss what can/should be done to ensure full consistency between the two policy areas. Trade liberalization is certainly consistent with regulatory reform. However, the fact is that trade policy (e.g., antidumping) may also be used to offset the effects of regulatory reform; this should be recognized. Trade policy is alive and well; regulatory reform could (should) be defined to include the regulation of trade as well.

The proposal to seek agreement in the WTO to apply a minimal set of principles to regulatory regimes--national treatment, transparency, and minimal distortion of trade--is a fine one; it would enhance the efficiency of regulation. However, it is worth noting that these principles do not yet apply in the trade policy area--in services national treatment is the exception rather than the rule. This suggests the trading system still has some way to go before it is ready to tackle policies that have primarily a domestic focus.

I have some doubts about the ability of MRAs to enhance regulatory reform. A fundamental feature of MRAs is that they take regulation as given--the issue is instead to achieve agreement that another country's standards are as good as your own. This may be as difficult to achieve as harmonization of standards; indeed, in effect the terms of negotiation shift to a determination of what are the minimum acceptable standards in a specific area. One way of extending the reach of MRAs would be to seek to apply the MFN principle. Currently, if country A has a MRA with country B, and B has a MRA with C, it is not the case that A will accept products produced in C or accept testing certification of entities located in country C. This is currently not required.

It was unclear to me what was meant with mutual recognition of trade and investment related standards. I do not see how or why a government would not apply its standards in a particular area to a foreign investor simply because the investor is not subject to such standards in its home market. Some specific examples that illustrate what the author has in mind in this connection would be helpful.

In my view it is too strong to state that harmonization in some areas has already occurred in the WTO context and that the Tokyo/Uruguay round agreements are precedents. There is very little in the way of constraints on the substance of government rules/requirements in the areas covered by WTO agreements. The agreements are procedural and focus largely on preventing discrimination (the procurement agreement incidentally binds only signatories, not all WTO members). I find it very difficult to envisage a WTO agreement under which governments will be subject to second guessing by WTO members regarding the justification of regulation; whether benefits exceed costs; distributional effects are transparent, etc. These

are all laudatory objectives and principles; they are very unlikely to be adopted in the framework of the WTO. Indeed, such principles have yet to be adopted by most governments, and do not figure in major regional agreements, including the EU. The difficulties of attaining agreement on objectives and methodics are nicely reflected in the ongoing work of the WTO working group on trade and competition policy, where some countries, including the United States, are opposed to discussing the competitive implications of trade policies such as antidumping.

Although the proposal made in the paper for a set of WTO principles on regulation is innovative and far-reaching, at the same time it may not be far-reaching enough. An important question that arises in this connection is whether regulatory disciplines should be kept horizontal, or whether they are best pursued in issue or sector specific talks. The author appears to be advocating a general agreement on regulatory principles, supplemented by specific rules in some areas, e.g., services and investment. However, services and investment account for a large share of "the action" in most economies. It may be more effective to pursue sector or issue specific disciplines from the outset.

This is a question that will also arise when considering the need for a possible general agreement in the WTO on competition law (antitrust), a topic that addressed only tangentially in the paper. Here also it is an open question whether general rules will be deemed desirable or effective by negotiators. Greater discussion of these "strategic" issues would have been useful.

SESSION III

CASE STUDIES A

**Japanese Group Boycotts and Closed Government
Procurement as Barriers to Trade**

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I would like to express my gratitude to the Japan-United States Friendship Commission to the Abe Fellowship Program of the Social Science Research Council, and to the Japan Information Access Project for their support and assistance with this research.

The goal of international trade agreements is to expand trade, and to do so in a manner that appears fair and reciprocal to all parties so that all have an incentive to support the agreements. Nevertheless, promises of reciprocity in formal agreements may be undermined by the very different ways in which domestic institutions shape the implementation of trade policy. Many prominent Japanese observers have argued that Japan presents a number of non-tariff barriers that prevent fair access to the Japanese market. The Mitsubishi Research Institute reports that, "we must recognize that the framework of Japan's economy is, by international standards, so far divorced from market economic principles that it not only creates friction with other countries, but also stands in the way of Japan's growth in the 21st century."¹ Keidanren Vice-Chairman Kumagai Naohiko warns that international trust in Japan has weakened because of regulations and other invisible barriers that block trade and investment from overseas.² Economist Shimada Haruo argues that the lack of open markets for goods and services keeps prices high and imports out: "The market does not function rationally; that is, there are a number of barriers preventing free competition, so that despite the rise in the yen, cheap goods and services are not being imported from overseas in sufficient quantities."³

Shimada's comment points to a troubling symptom of closed Japanese markets: a persistent gap between domestic and international prices. A number of sources have documented this gap. A 1994 MITI survey of business costs found Japanese prices for raw materials, intermediate goods, and capital goods to be 30 percent higher than in the U.S., 19 percent higher than in Germany, and 46 percent higher than in South Korea.⁴ A November 1995 survey by Japan's Economic Planning Agency estimated that prices for durable goods were 47 percent above US prices, though 8 percent below German prices. Clothing and shoes were 93 and 35 percent higher respectively, and other manufactured goods 54 and 15 percent higher respectively.⁵ Sazanami, Urata, and Kawai concluded from their comparison of Japanese domestic and import prices that non-tariff barriers add 174 percent to the prices of tradable goods in Japan. For machinery the "implied non-tariff barrier rate" was 140 percent, for chemicals 127 percent, and for metal products 60 percent.⁶

It is often difficult to sort out the reasons that foreign firms have a hard time selling in Japanese markets despite a strong price advantage over Japanese suppliers. Typically, there is some quality or

¹Mitsubishi Sôgô Kenkyû Jo, *Nihon Kaikaku* (Reforming Japan), (Tokyo: Daiyamondo Sha, 1996), p. 44.

²Kumagai Naohiko, "Nihon ni shinrai o torimodose" (Let's bring back trust in Japan), *Gekkan Keidanren*, July 1996, p. 48. On the larger problem of Japanese regulatory barriers to trade to see my paper, "Why Regulatory Reform Won't Open Japan's Markets to Imports," in *Japanese Deregulation: What You Should Know*, Proceedings of conference sponsored by the Japan Information Access Project and the Japan-U.S. Friendship Commission, April 4, 1997, Washington, D.C., pp. 1-20, also available at the Japan Information Access Website: <http://www.nmjc.org/jiap>

³Shimada Haruo, *Japan Crisis* (Tokyo: Kodansha, 1995), p. 101.

⁴MITI, *Tsûshô hakusho* (Trade and industry white paper), 1995, p. 140.

⁵Keizai Kikakuchô Bukka Kyoku, *Seikeihi chôsa (1995 nen) ni yoru kôbairyoku heika oyobi naigai kakakusa no gaikyô* (Purchasing power parity and domestic/international price gap based on the survey of living costs (1995) (Based on November 1995 prices), May 1996.

⁶Yoko Sazanami, Shujiro Urata, and Hiroki Kawai, *Measuring the Costs of Protection in Japan* (Washington, D.C. Institute for International Economics, 1995), pp. 6-7. For additional analysis of the causes of high Japanese prices see, "Retail Price Differences in the United States and Japan," in *Japanese Deregulation: What You Should Know*, Proceedings of conference sponsored by the Japan Information Access Project and the Japan-U.S. Friendship Commission, April 4, 1997, Washington, D.C., pp. 83-91.

delivery disadvantage to foreign products that apologists for Japanese trade policy may use to discount evidence of unfair barriers to imports. Another problem with assessing trade barriers is that much of it is informal, illegal, and secret and therefore difficult to research. The secret nature of much of Japan's trade policy makes it impossible to provide an accurate overall assessment of Japan's trade openness, except through Sazanami, Urata, and Kawai's method based on price measurements. Certainly a mere review Japan's formal barriers to trade would be of little use in genuinely measuring Japan's trade openness.

This paper will draw on my book, *Restrained Trade: Cartels in Japan's Basic Materials Industries* to look at two industries in which Japan has high domestic prices, but few imports and a large volume of exports.⁷ The study considers arguments that quality problems account for low import penetration in Japan, but finds it is not a sufficient explanation. Rather, in both the cement and steel cases a host of non tariff barriers block imports into the market. Private barriers, that by rights ought to be dismantled by Japan's Fair Trade Commission, include group boycotts or refusals to deal, in which an industry as a group agrees to deny sales to a firm in order to prevent it from going around the industry's cartel. Far from stamping out private non-tariff barriers, the weight of the Japanese government's policies has been to support and supplement them. The Construction Ministry, for instance refuses to buy goods not produced by Japanese insiders to the domestic steel and cement cartels, but the Construction Ministry has not acted as a lone, rogue ministry. The Ministry of International Trade and Industry (MITI) has also supported price cartels and blocked imports.

There are two main arguments as to why industries in Japan are protected, and it is important to think about these in order to understand the obstacles to breaking down non-tariff barriers. One argument is that interest group influence is responsible for government protectionist policies and tolerance for private protectionist actions.⁸ Certainly political "pork barrel" is often a reason for government support of protectionist non-tariff barriers, but both business and the state support protectionism as well because they think it will help preserve the manufacture of key products in Japan. Surprisingly, even industrial buyers of expensive inputs express support for cartels that keep their prices high. Recognizing the legitimacy that mercantilist policies enjoy is crucial for understanding these policies' durability.

Standardized technologies and high levels of industrial concentration make the basic materials industries, such as chemicals, steel, and cement, one of the most successful areas for cartels. Though the basic materials sector is often overlooked because it does not involve the kind of rapid technological innovation of the electronics or machine sectors, it is nevertheless an important source of jobs for Japan's workforce and profits for Japanese firms, and makes up one-third of Japan's value added in the production of manufactured goods.⁹ In most of Japan's basic materials industries, domestic prices are high, while both export and import prices are low and this price disparity holds even for completely standardized

⁷The book looks at how Japanese cartels work and how the state supports them, and at cartels' contribution to industrial policy, and analyzes long-term relational contract between upstream and downstream industries. It includes detailed case studies of the aluminum and petrochemical industries. Mark Tilton, *Restrained Trade: Cartels in Japan's Basic Materials Industries* (Ithaca, NY: Cornell University Press. 1996).

⁸ Robert Uriu, for example, while focusing on formal rather than informal protection, argues that interest group pressure is the main reason for such policies. Robert Uriu, *Troubled Industries: Confronting Economic Change in Japan* (Ithaca, NY: Cornell University Press, 1996).

⁹MITI, *Kôgyô tôkei hyô, sangyô hen* (Census of manufactures, report by industries). 1992.

products. Despite its price structure, Japan is a net exporter of basic materials.¹⁰ This paper will explore the system of cartels and informal trade barriers that enable Japan to keep its prices high while avoiding imports.

THE JAPANESE CEMENT MARKET

Japan has long considered cement a strategic industry because it is key to building industrial infrastructure, and because it is one of the few industries that produces manufactured goods for export from domestic raw materials. Japan, like most countries, has ample supplies of limestone and clay. The Japanese cement industry, like most basic materials industries, is vulnerable to competition from newly industrializing countries because both its technology is standardized and its production process labor intensive. Transportation costs present a certain barrier to international trade and effectively close the inland U.S. market, for example, to imports, but ocean transport makes cement readily transportable to coastal markets all over the world. The location of much of Japan's population and industry near seaports makes the Japanese market especially accessible to imports, and in fact half of the domestic cement used inside Japan is transported by sea.

Japan's own success as a cement exporter bears witness to the ease with which cement can be shipped long distances. Japan has long been the world's largest exporter of cement, shipping much of it as far as the Middle East, and stands out as the only advanced industrialized country to export much cement. Unlike the United States, which exports almost no cement but imports large amounts of it, Japan has bought little cement from overseas. Except for a brief episode in 1973, Japan imported no cement from the end of World War II until 1984 and while imports rose to 4.5% of the domestic market in 1989, they fell again to 0.7% by 1995 (See Figure I). Japan's success at resisting cement imports is particularly impressive given that Japanese domestic prices are quite high by international standards. From 1986 to 1995, Japanese domestic undelivered cement prices were on average two-and-a-half times as high as its export prices and 72 percent over import prices during the same period. One might imagine that, in the absence of formal import barriers, cement producers in other countries would want to take advantage of Japan's high prices. One might also be surprised that Japanese producers are willing to sell cement overseas so cheaply when domestic prices are so temptingly high. How has the Japanese cement industry managed to maintain its high domestic prices and compete so successfully in world markets?

GROUP BOYCOTTS BY THE CEMENT INDUSTRY AND ALLIED INDUSTRIES

The cement industry has a long history of government-sponsored cartels, designed to manage production levels and support prices. The last incarnation of this was the Structurally Depressed Industry Cartel, from 1983 to 1987. This production cartel was discontinued in 1987, and in 1991 the FTC cracked down on the industry's illegal price cartel by slapping the industry with the largest fines for violating the Anti-Monopoly Law in Japan's history. This FTC ruling had a dampening effect on Japan's high prices, but the FTC completely ignored the most import industry price-supporting mechanism: the use of group boycotts to keep imports out of the Japanese market.

¹⁰*Restrained Trade*, p. 10.

Figure 1: Ratio of Japanese Domestic Cement Prices to Import and Export Prices

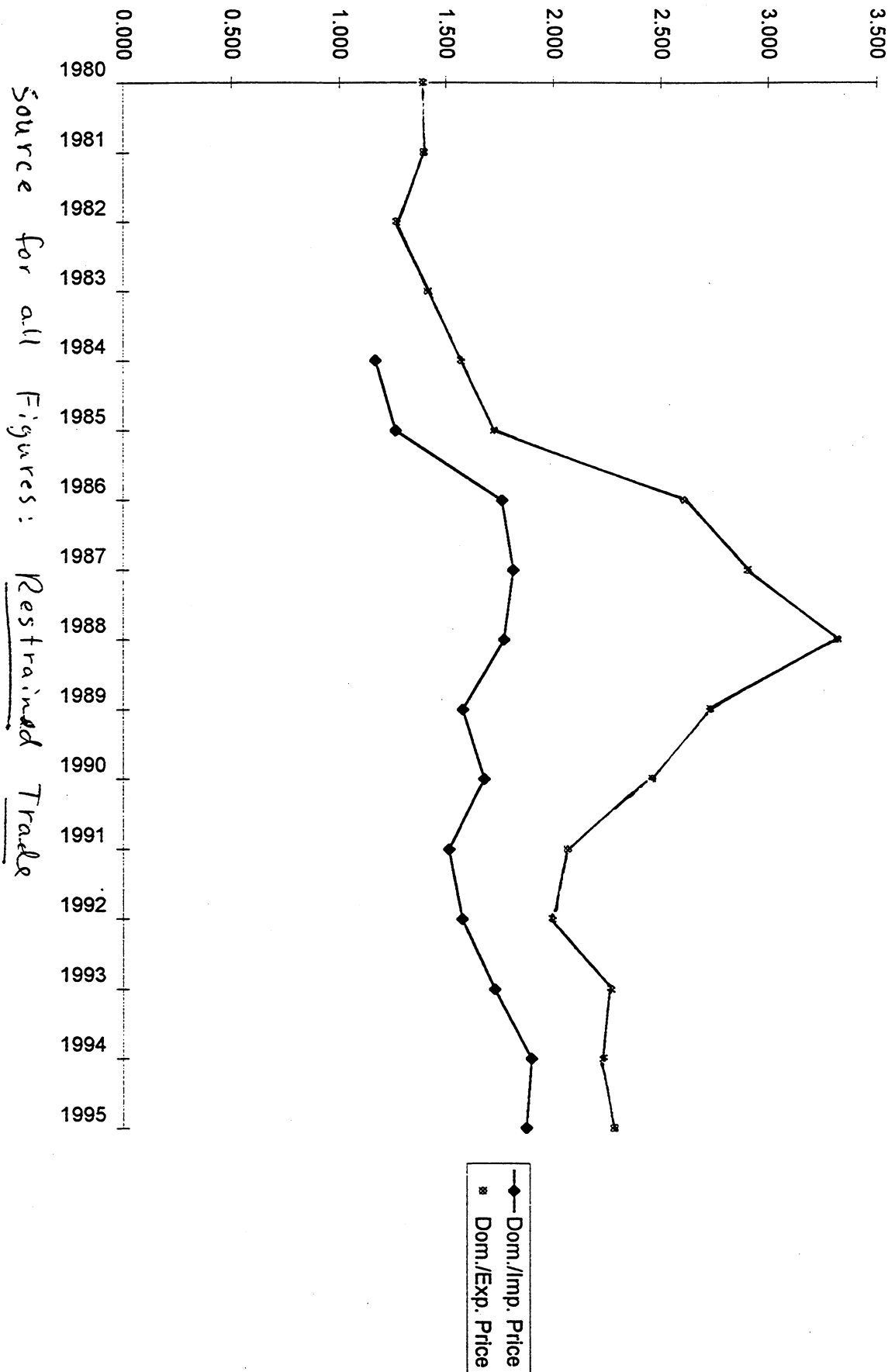
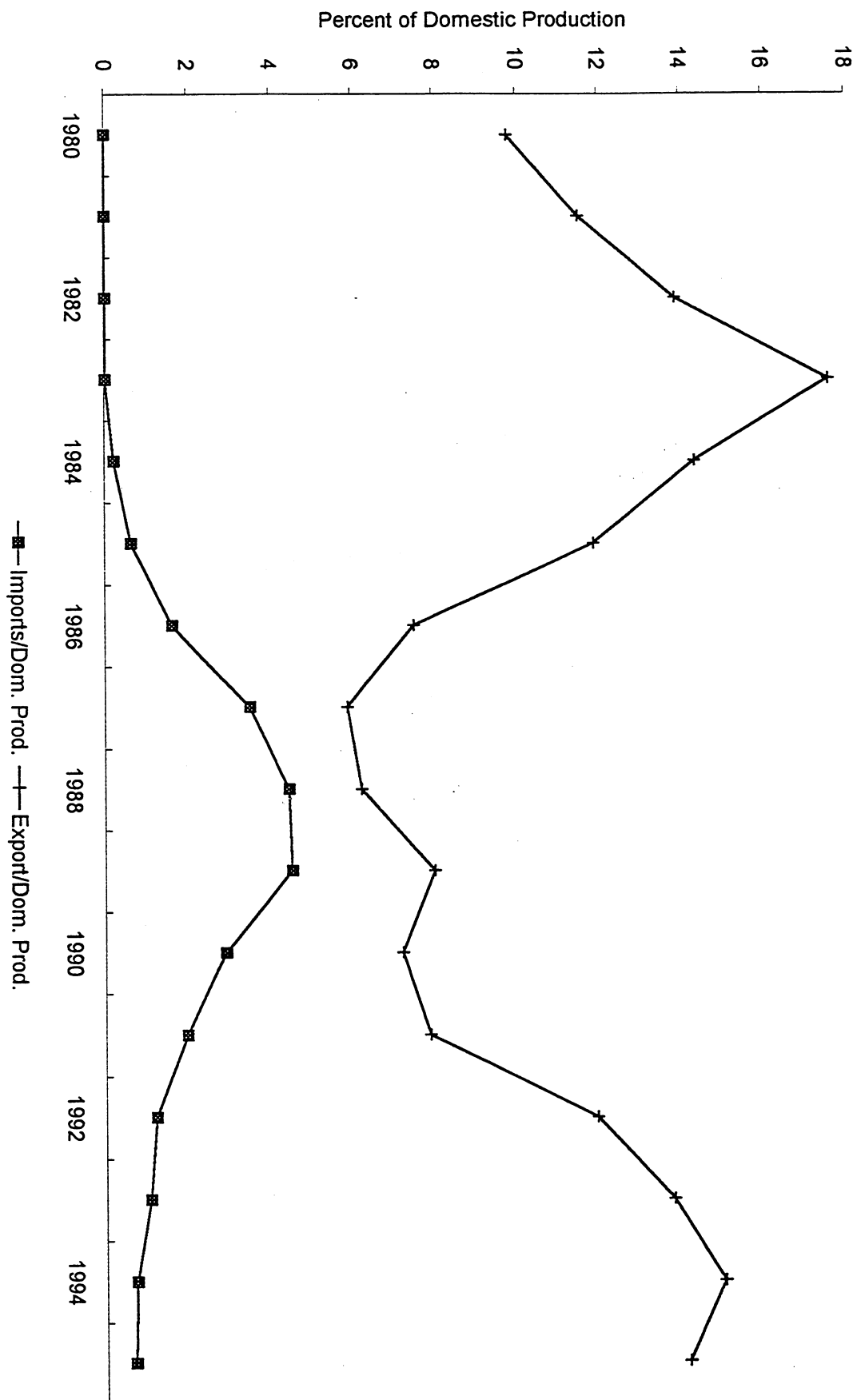


Figure 2: Japan's International Cement Trade
Imports and Exports Compared to Domestic Production



The core policy which restricts the flow of imports into the Japanese market is a refusal-to-deal agreement between the Japanese cement and construction industries. I learned about the group boycott in most detail from an interview with two top executives at one of Japan's largest cement firms in 1988. In 1991 both the FTC ruling and American anti-dumping penalties against the Japanese cement industry politicized the issue, and I doubt it would now be easy to get such a frank discussion on of collusive activities from an industry insider.¹¹ More recent newspaper reports, however, suggest that industry actions to keep outsiders out of the market have continued after 1991, as I shall show below.

According to the 1988 interview, the group boycott threat was carried out directly by the Distribution Committee of the Japan Cement Association. In order to implement the agreements, the five members of the Distribution Committee met monthly with representatives of the five big construction trade associations, and separately with representatives of the Ready-Mix Concrete Federation as well (ready-mix concrete is the wet preparation made up from cement, sand, gravel, and water). The cement industry promised the smooth delivery of cement at stable prices in return for the construction industry's loyalty as a customer. The cement industry's commitment to stable prices included a promise to control attempts by local ready-mix concrete cooperative unions to exploit their local monopolies to extract a higher price. The tactic these local cooperative unions often use is to stop production to force construction firms to pay higher prices. The monthly meetings between the construction trade associations and the Cement Association provided a forum for the construction trade associations to ask the Cement Association to pressure local ready-mix concrete cooperative unions to resume production.¹²

In return for the Cement Association's control of the ready-mix cooperative unions, the construction trade associations promised that their members would only buy cement from members of the Cement Association, which includes only domestic firms. The Cement Association enforced this agreement through two layers of refusals to deal. If a construction firm bought ready-mix concrete from an outsider to the Ready-Mix Concrete Federation, then insiders to the Federation refused to deal with that firm. The Cement Association members agreed among themselves not to sell to outsiders to the Ready-Mix Concrete Federation in order to choke off the outsiders' supply.¹³ Thus, if a construction firm wanted to be able to buy domestic cement, it had to refrain from buying any imported cement. Small construction firms working in some urban areas were willing to risk being cut off from domestic supplies, but large construction companies that work in more than one locale and which need access to ready-mix concrete in different areas were unwilling to risk losing supplies from members of the Ready-Mix Concrete Federation. Thus, the threat of refusals to deal did not always prevent small firms from buying from outsiders, but it has kept the vast majority of the domestic cement market under the control of the Cement Association.

An important factor which makes cement relatively easy to cartelize is that the construction industry, which buys the cement, is also highly cartelized. Prices in the construction industry are governed by *dangô*, that is, price-fixing by competitors before submitting bids for government construction projects, which account for half of construction projects. Because the construction firms are not under strong

¹¹Because the interview material is from 1988, I will discuss the governance mechanisms described in it in the past tense. However, I have no reason to think that the same mechanisms don't continue.

¹²Interview with cement company officials, 1988.

¹³Interview with Japan Cement Association official, 1988. Use of refusals to deal against construction firms that use imports confirmed in Semento Nenkan, Vol. 37 (1985), p. 28, and Semento Nenkan, Vol. 38 (1986). pp. 16 and 17.

competitive pressure among themselves, they are able to absorb the high cost of domestic cement. According to a recent study the Citizen's Ombudsman Conference, *dangô* still appeared to be almost universal in bidding for public works contracts in 1995 and 1996.¹⁴ Competition among construction companies is weak not only for government contracts but for private building contracts as well. Japanese construction costs for a 200 square meter house, not counting the cost of land, were 2.19 times the U.S. cost in 1989 at 130 yen/dollar.¹⁵ The *Shûkan Tôyô Keizai* writes that labor productivity in the construction industry is so low that "it is difficult to believe it is in the same country as the auto and electronics industries."¹⁶ The journal hypothesizes that the reason for the lack of competition to spur improved efficiency is spillover from bureaucrats discouraging productivity increases by fixing cost formulas for public works. This lack of competition among construction firms also gives them some slack for buying expensive domestic materials.

The threat of group boycotts by the Japan Cement Association is the most important anti-import measure, however it does not exist in isolation. Rather, it is part of a long-standing anti-import program supported and carried out by the cement industry, other allied industries, MITI, the Construction Ministry, and the Customs Bureau. Although Japan imported cement from Korea when it was a colony of Japan, Japan imported no cement between World War II and 1973, when the Japanese government brought in a tiny amount of Korean cement in order to goad an uncooperative domestic cement cartel into increasing production. This crack in the door invited in a flood of would-be cement importers from all over Asia, only to find that the Japanese longshoring companies refused to unload any cement not directly-authorized by the government.¹⁷ Except for the government-sponsored trickle in 1973, the Japanese market was hermetically sealed against imports again through the rest of the 1970s, though according to one Korean cement company official posted in Tokyo in 1978, "everyone wanted to sell cement in Japan."¹⁸ Although domestic ready-mix concrete firms were afraid of the Cement Association's sanctions against buying foreign cement, outsiders to the ready-mix concrete cartel which were refused cement by domestic cement producers wanted alternative supplies from overseas.

In 1980 a Korean resident in Japan who owned a ready-mix concrete asked the Korean firm, Ssangyong Cement, to sell it cement. Ssangyong attempted to send cement, but death threats from Japanese gangsters convinced it to give up selling cement to Japan for several years. Because domestic cement makers continued to refuse cement to ready-mix concrete companies which were outside the ready-mix concrete joint cooperatives, these outsiders continued to try to get imported cement.¹⁹ In 1984 both Korean and Taiwanese firms began campaigns to sell larger amounts of cement to Japan to firms shut out of the Japanese cement market. Although they managed to sell some cement, they encountered a series of barriers which limited their success, some put up by the Japanese cement industry, and some by the Japanese government. The first barrier was the one which had kept cement imports out in 1973, refusals to deal by longshoring companies. Ssangyong contracted with a longshoring firm to unload its first shipment to Osaka, but the day before the shipment's arrival the longshoring company said it could not do the work

¹⁴ *Asahi shinbun*, July 21, 1997. Thanks to Ron Bevacqua for sharing this with me.

¹⁵ Uchida Michio and Ôzaki Akiko, "Jûtaku kenchiku hi wa gowari yasuku dekiru" (Construction costs could be fifty percent cheaper), *Shûkan Tôvô Keizai*, September 4, 1993, p. 7.

¹⁶ *Ibid.*

¹⁷ *Semento Nenkan*, Vol. 26 (1974), p. 54.

¹⁸ Interview, 1988.

¹⁹ *Nihon Keizai Shinbun*, May 29, 1985; *Semento Nenkan*, Vol. 37 (1985), p. 28.

because Japanese cement companies had told it they would no longer give it work if it handled foreign cement. This was a serious threat to the longshoring companies because they handled not only Japanese cement companies' exports, but much of their domestic shipping as well. But a friendly longshoring company told Ssangyong that under the terms of its government license the longshoring firm could not refuse its services. Ssangyong was able to use the threat that it would get the longshoring firm's license revoked to force the issue, but had to struggle anew at each new port I wanted to ship to.²⁰

According to a Korean government official handling trade matters in Japan, Korean cement companies encountered similar problems with trucking firms. Just as they pressured longshoring firms, cement manufacturers also pressured trucking firms not to handle cement imports. Korean firms complained to the FTC, but the trucking firms were unwilling to testify to the FTC that cement companies had pressured them.²¹ If the cement importers did manage to find a truck to transport their cement, domestic cement makers would try to track the trucks to find out which ready-mix concrete firms were buying imports so that they could intimidate them into stopping their purchases. When the first sizable quantities of cement imports entered Japan in 1984, the *Nihon Keizai Sangyô Shinbun* reported that "the Japanese cement firms are excitedly looking for the criminals' who are buying imported cement..."²² The Japanese cement firms sent cars out to tail truckloads of imported cement to find out who was buying it, took pictures of the delivery, and then cut off cement to the companies involved.²³

Like ready-mix concrete companies, truckers, and longshoremen, trading companies also had long-term relations with the cement companies that they were reluctant to jeopardize by getting involved with cement imports. Even three-and-a-half years after large-scale imports began, Sumitomo Trading Company was saying that, "Given our relationship with the domestic producers we cannot start importing immediately. But the import business is certainly attractive."²⁴ Eventually, however, trading companies that were not involved with domestic cement manufacturers did cooperate with cement imports.²⁵

The Cement Association's response to imports was openly hostile. Moroi Ken, a prominent leader within the cement industry and within Japanese business more broadly said,

Since it looks like demand will continue to stagnate or decline over the long term, we are working to establish a hundred year plan of industrial restructuring. Given this, in principle there should be zero imports. If other countries continue exporting, then it follows that we'll have to export too, but it would not make any sense to go and throw each other's markets into disarray.²⁶

In the spring of 1984 Imamura Kazusuke, acting head of the Cement Association's Committee on Special Measures to deal with Imports and Exports, declared that none of the 23 Japanese cement companies would cooperate with importers:

²⁰Interview with Ssangyong official, 1988.

²¹Interview, Korean trade official, 1988.

²²*Nihon Keizai Sangyô Shinbun*, November 1, 1984.

²³Uesugi Yoshimasa, *NIES seihin de nihon no sangyô wa dô naruka* (What Will Imports from the NIES Do to Japanese Industry?), Eeru Shuppansha, 1988, p. 50; interview with Korean cement company official, 1988.

²⁴*Nihon Keizai Shinbun*, November 10, 1987.

²⁵*Nihon Keizai Shinbun*, November 10, 1987.

²⁶*Nihon Keizai Sangyô Shinbun*, November 2, 1984.

Japanese importers will have to bear all the costs of facilities for imports and sales on their own. They will have no support from [domestic cement] makers. Even if they bring in cheaper imports, there will be high costs for them, and the price will end up being the same as for domestic cement.²⁷

Thus, despite the fact that Japanese firms were not competitive with imports, there was no chance Korean firms, would be able to form joint ventures with Japanese firms to use their distribution facilities. Contacts and networks to distribute Korean cement, much less buy out a Japanese cement maker to achieve the same goal. No Japanese cement firm had to rush to form a joint venture contract with a Korea firm for fear they would be left behind, because the trade association was able to forge an agreement ensuring no firm would cooperate. The marketing of cement requires considerable investment in distribution infrastructure, such as silos to store bulk cement. Since the entire network of silos owned by the twenty-three Japanese cement firms was closed to Korean and Taiwanese firms, they would have to build their own silos if they wanted to enter the Japanese market. Thus, the cement industry used a group boycott to prevent any of the tie-ups or buy-outs that Japanese firms were using at the same time to penetrate the American cement market.

THE STATE BACKS UP THE CEMENT ASSOCIATION WITH NON-TARIFF BARRIERS

When Ssangyong tried to build a silo it ran into a series of governmental barriers. First, it had a difficult time buying land on which to build a silo since most harbor land is owned by local government authorities, who refused to sell to it. But Ssangyong however found some private land where the water was too shallow for access by ships and had it dredged. After the firm built the silo it took three months to get a license from the port authority to use it.²⁸

Once Ssangyong built its silo and obtained its license to use it, it ran into opposition from the Customs Bureau. Cement is shipped in bulk and the standard international practice for establishing the volume of a shipment of cement is to use a "draft survey" to determine the weight of the cargo by seeing how low the ship rides in the water, figuring out how much water is being displaced, calculating the total weight of the load on board, and then subtracting the weight of fuel, personnel, etc. It is considered accurate and is used in all the countries to which Japan exports cement. The Japanese customs agents however told Ssangyong that they could not use this standard method but would have to actually weigh all of their cement on a scale. The only available scales were truck scales and to use these would have been prohibitively expensive. Ssangyong got around this non-tariff barrier by having a "hopper-scale" custom built for 50 million yen (approximately \$250,000 at the time), into which cement was dropped and weighed before being released into trucks. MITI eventually gave in and allowed the normal draft survey method to be used, but only after a delay of six months.²⁹ The Tokyo office of the Customs Bureau defended its requirement that the Koreans physically weigh their cement by saying it had the discretionary power to withhold permission to use the draft survey method, even though it is customary.³⁰

Once the cement was finally imported MITI again supported the trade association by creating new cumbersome and expensive testing procedures for imports. When Japan first began importing cement, the

²⁷Nihon Keizai Sangyô Shinbun, May 27, 1986.

²⁸Interview, Ssangyong official, 1988.

²⁹Interview, Ssangyong official, 1988.

³⁰Telephone interview, 1988.

procedure for receiving the Japanese Industrial Standards (JIS) approval was the same for foreign as for Japanese cement. The procedure for a Japanese cement manufacturer is to do in-house tests once a year and give the results MITI.³¹ In December 1984 MITI mandated that imported cement be tested twice instead of once a year.³² Furthermore, instead of a single test by the manufacturer, each ready-mix concrete company that wanted to use foreign cement had to arrange for and pay for its own tests by one of the "semi-public" organizations which do the testing. The tests took 45 days and cost 200 to 250 thousand yen (approximately \$1,400 - \$1,700). Since Japan's 4,000 ready-mix concrete companies are small firms, the expense and trouble of having imported cement tested were not insignificant.³³ Not only was the testing a time-consuming financial burden, but the JIS inspection procedure made it easier for Japanese cement manufacturers to figure out which ready-mix concrete companies were buying imported cement. Japanese ready-mix concrete companies pass a JIS inspection by MITI and are given JIS approval for their ready-mix concrete *on the condition* that they use not just any cement which meets JIS specifications, but cement from a specific cement company. If they want to use another company's cement they have to re-register, thus subjecting themselves to the scrutiny of the Japanese cement cartel.³⁴ Thus, MITI's procedures helped the Cement Association check up on the ready-mix concrete companies so that they could pressure them not to buy imports.

THE CEMENT ASSOCIATION TRIES TO BROKER IMPORTS

Although the Cement Association defended the market with government support, imports managed to take 0.3% of the market in 1984. At the same time it continued to use its ties with ready-mix concrete companies. Longshoremen, truckers, and construction companies to keep imports out, the Cement Association negotiated with the Korean and Taiwanese cement trade associations to convince them to restrain their exports.³⁵ Although the Koreans would not agree to restrain exports to Japan in 1984, they did agree to do so later when they had established a stronger foothold in the Japanese market. In the fall of 1986 the Korean and Japanese cement trade associations agreed that Japanese cement companies would import one million tons per year of Korean cement while the Koreans would import an additional 1.2 million tons of cement into Japan.³⁶ The Cement Association hoped that, if guaranteed a certain level of exports, the Koreans would cooperate in "developing an orderly market."³⁷

The majority share being given to the Koreans was a concession to the Japanese FTC, which said it would not allow the Cement Association to control over half of Korean cement imports into Japan. Nevertheless, even with this precondition the deal did not go through, because of FTC, and more importantly, MITI, disapproval. A MITI official's comment was that "for domestic producers to import when they've lost the ability to sell their own cement is doubtful from the point of view of structural adjustment."³⁸ MITI thus made very clear that the purpose of its industrial policy was to foster domestic manufacturing rather than to benefit domestic firms. By opposing the industry's plan, MITI indicated it

³¹Interviews with officials from Korean Ministry of Commerce and Industry and Ssangyong. 1988.

³²1985 Nenkan, pp. 30-31.

³³Interview with Ssangyong official, 1988.

³⁴Interview with Ssangyong official, 1988.

³⁵Ibid.

³⁶Nihon Keizai Shinbun, September 2, 1986.

³⁷Nihon Keizai Shinbun, September 1, 1986.

³⁸Nihon Keizai Sangyô Shinbun, October 9, 1986.

was against firms taking advantage of MITI-sponsored cartels to raise prices, but then exploiting the market control mechanisms that MITI had helped foster over the years merely to generate profits from cheap imports. MITI's opposition to imports shows its policies supporting high cement prices were not aimed simply at filling cement company coffers, but at maintaining domestic cement manufacture.

Although the Cement Association was not allowed to broker Korean imports, it did convince Korean cement companies and their agents to cooperate with the domestic cartel by keeping their prices fairly high. Ishihara Mitsue, the Building Materials Department Head of Hanwa Kôgyô, the Steel Trading Company which handled Ssangyong's cement imports, stated clearly that his firm would moderate its price competition with Japanese firms:

It is true that the sales price of imported cement is cheaper than that for domestic cement, but we will not set prices so as to provoke domestic manufacturers. It is a distribution company's duty (*shimei*) to make sure a situation does not develop where bad money drives out good money by selling cheaply and driving down prices, and I intend to live up to this duty.

Though of course Ishihara's client had introduced some change into the market, Ishihara implied that collusion among sellers to avoid driving down prices was ethical and that his company would take the moral high road by following this principle. Such statements do not normally produce an outcry from consumers or an investigation by the FTC, but are part of the normal language of public discourse about the market in Japan.

THE CONSTRUCTION INDUSTRY CARTEL AND CLOSED GOVERNMENT PROCUREMENT

As shown above, while it is the Cement Industry Trade Association that has made and implemented the core policies which keep prices high and imports out, MITI has supported the trade association's policies, and guided trade association policies to fit MITI's strategic goals. In addition, MITI has provided strong leadership for the building and strengthening of the cement cartel.³⁹ However, politicians have also supported market governance, first of all, by padding construction industry profits. Construction companies use *dangô*, pre-bidding negotiations among themselves, to keep construction prices high. A government audit found that *dangô* was used in over 90% of projects funded by various national and local government agencies in 1992 and 1993, and as we saw above, this practice appears unchanged through 1996.⁴⁰ According to one construction firm director in 1993 it was standard for politicians to receive one percent of the value of a government contract as a kickback from construction companies. These kickbacks were also often awarded for private sector contracts.⁴¹

The LDP's support of large profits in the construction industry has in turn has made it easier for the construction industry to swallow the cement industry's high prices. LDP dietmembers also intervened

³⁹See Tilton, *Restrained Trade*.

⁴⁰Nihon Keizai Shinbun, November 4, 1993, cited in the *Weekly Japan Digest*, November 8, 1993.

⁴¹Jun Mamiya, "The Iron Triangle and Corruption in the Construction Industry," Tokyo Business Today, Vol. 61, No. 11, (November 1993), pp. 10-13.

more directly in cement. Nearly half of the demand for cement is for public works and, as in construction, dietmembers often tell the Construction Ministry which cement company should get the contract for a particular project in exchange for campaign donations. Public works projects have been completely off limits to imported because domestic cement purchases have provided the LDP with campaign contributions.⁴²

LIMITED RESTRICTIONS ON THE CEMENT CARTEL IN THE 1990S

In 1991 the FTC cracked down on the industry's price cartel and levied the heaviest fine ever for violation of the Anti-Monopoly Law. The FTC found that joint sales companies in Hokkaido and the Chûgoku region in Western Japan were holding back production and fixing prices. The FTC appears to have been prompted both by general U.S. pressure to get rid of structural protection and by US Commerce Department findings that Japanese firms were dumping cement in the U.S. market. Another factor was accusations that the industries cartel practices were increasing the costs of the new Kansai International Airports.⁴³

One result of the FTC crackdown was to push the largest firms into mergers. In 1991 Mitsubishi Materials acquired Tôhoku Kaihatsu and in late 1993 Onoda and Chichibu Cement announced they would merge.⁴⁴ The FTC ruling, along with a fall in demand for cement due to economic recession, may have also contributed to the decline in domestic cement prices by 19% from 1990 to 1995. This price decline, however, was a continuation of a long-term fall in prices in yen terms, though it should be remembered that due to the rise the value of the yen Japanese cement prices have risen in international terms. The failing of the FTC ruling was that it overlooked the trade association's boycott of firms buying imported cement. As a result, the gap between domestic and import prices remained just as wide and imports actually dropped (See Figures 1 and 2). The direct cause of the drop in imports was increased demand in other Asian countries. But the continued price gap between imported and domestic cement suggests that the threat of boycotts by domestic cement firms continues to scare domestic builders from buying imports.

Another reason the cement industry was still protected from strong domestic competitive pressures and from imports was the powerful ready-mix concrete cartel, built up by MITI and the Cement Association in the 1970s. Ready-mix concrete companies are under no pressure to buy imports because, due to their joint sales operations, set up by MITI in the 1980s, they do not compete over prices. The only price competitors are outsiders to the industrial unions, who rely on imports.

The ready-mix cartel uses powerful informal governance to suppress competition from outsiders who import cheap cement. A March 1993 investigation by the FTC and the Saga prefectural police found that the Saga Ready-Mix Concrete Industrial Union used gangsters a number of times, beginning in 1984, to force outsiders to sell their operations to union members. Later in 1993 the Nagoya Ready-Mix Concrete Cooperative Union decided members would cut prices by 11% to undercut outsiders' prices and drive them out of business. Although members complained this would push prices below production costs,

⁴²Interview with employee of Japanese "tied agent" firm (*tokuyaku ten*), 1987.

⁴³*Japan Econom Almanac*, 1992, p. 150.

⁴⁴*Japan Economic Journal*, 1992, p. 150. *Nihon Keizai Shinbun*, November 12, 1993, cited in *The Weekly Japan Digest*, November 15, 1993.

the Ready-Mix Concrete companies were not left to fight off cheap imports on their own. The industrial union arranged to borrow money from financial institutions to compensate member firms for two-thirds of the price cut.⁴⁵ This revelation that Japanese financial institutions would loan a cartel money for the specific purpose of driving companies out of business that dared to bring in imports suggests that cooperation among core Japanese economic institutions to informally protect the domestic cement market continued strong at least as late as 1993.

Throughout its coverage of Japanese cement imports, Japanese newspapers have reported the Japanese cement industry's line that the reason foreign cement has made so little headway is that it is of inferior quality. One of the Ready-Mix Concrete Federation's first moves against cement imports was to mount a campaign warning local government officials not to buy imported cement because of inferior quality. The Korean and Taiwanese cement industries countered that their cement was made with the latest Japanese technology and equipment and passed all of Japan's quality tests.⁴⁶ One Japanese journalist specializing in cement said that Japanese cement buyers were genuinely concerned that, even if imported cement passed all of the tests, it might not stand up for fifty or sixty years the way Japanese-made cement would.⁴⁷

Nevertheless, a highly placed executive in one of Japan's largest cement companies said in an interview that there was no real difference in quality between Japanese and Korean cement, except for color.⁴⁸ The fact that Japanese cement makers were proposing as early as 1984 that they themselves broker Korean cement imports is further evidence that the Japanese cement industry was not really concerned with the quality of Korean cement. The Cement Association's proposal to broker and guarantee Korean cement implied that through scientific testing one could indeed verify quality and durability. Of course it still might be the case that, even if there was no genuine difference in quality between Japanese and imported cement, the cement industry had succeeded in convincing its buyers that there was one. If that were the case, however, Japanese buyers would have had no interest in imports and MITI and the Cement Association would have had no need to harass cement importers.

THE JAPANESE STEEL MARKET

With MITI's support, the steel industry grew rapidly in the postwar period and by the 1970s became the world's most efficient producer.⁴⁹ As in other heavy industries, however, demand dropped in the early 1980s, both because the economy began growing more slowly and because industries learned to use materials more efficiently. Not only did the steel industry face stagnant domestic demand, it lost competitive advantage to developing nations such as Korea, Taiwan, South Africa, and Brazil.

The steel cartel is not as elaborate or visible as the cement cartel, yet is at least as strong and its existence is an open secret. In 1996 I asked a marketing executive in a large Japanese steel firm who had

⁴⁵ Asahi Shinbun, August 20, 1993.

⁴⁶ Nihon Keizai Shinbun, August 22, 1987; interview with Ssangyong official, 1988.

⁴⁷ Interview, 1988.

⁴⁸ Interview with cement company official, 1988.

⁴⁹ Ira C. Magaziner and Thomas M. Hout, Japanese Industrial Policy, Policy Papers in International Affairs. Institute of International Studies, (Berkeley, California: University of California, 1981).

been posted by his firm for several years to the U.S., about how competition in the Japanese steel market compared with that in the U.S. He replied, "Oh, it's totally different. In the US you have free competition. Here it's like we're violating the Antimonopoly Law everyday. The steel companies get together and talk about what the price ought to be."⁵⁰ A retired steel executive from one of the big insider steel firms told me the Japanese steel industry has an "unseen cartel" (*miezaruru karuteru*).⁵¹

A distinctive feature of the Japanese steel market is that approximately half of total sales, or about two-thirds of sales by the large blast furnace steel makers, are at "big buyer" prices. These apply to sales between the steel industry and their long-term customers, are set oligopolistically and are high compared to Japan's export, import and domestic market, or "dealer" price (See Figure 3). As can be seen in Figure 4, Japan cut its exports significantly due to its own uncompetitive costs, and imports have made some inroads. Yet, despite the large price differential between Japanese and foreign prices, imported ordinary grade steel rose to a peak of only 9 percent of the domestic market in 1991 and dropped back to 8 percent by 1995 (See Figure 4). Japan continued to export 20 percent of its production in 1995, making it a net exporter of 12 percent of its production.

The steel industry is dominated by five blast furnace makers, who produce 68 percent of Japan's crude steel. These blast furnace makers produce steel from iron ore through a continuous casting process, while electric furnace mini-mills produce 32 percent of Japan's steel by melting down scrap.⁵² These integrated steel producers make a number of products that electric furnace minimills cannot and thus are somewhat buffered against competition from the minimills, though the minimills recently have begun encroaching on their territory by producing such items as H-bar steel. The blast furnace producers are the oligopolists of the market. They sell most of their steel to long-standing customers at long-term contract prices, though they sell some steel on the domestic spot market as well at "dealer" or "market" prices. Minimills sell most of their steel at dealer prices.

The long-term contract market in Japan is distinct from long-term contract markets for commodities in the West in that it does not involve individual companies taking a gamble by locking in a price for a specific period, but rather reflects permanent commitments by buyers to domestic producers and their acceptance of cost-based prices. As we saw in Figure 3, the big buyer price was much higher than either the dealer, export or import price. It was 19 percent above the export price from 1981 to 1984 and 46 percent above the export price from 1985-1995. By 1995 it was still 35 percent above the export price. The big buyer price was 15 percent above the domestic dealer price from 1981 to 1984, and 35 percent above it from 1985 to 1995. By 1995 it was 53 percent higher than the dealer price. The domestic big buyer price was also 31 percent above the import price from 1981 to 1984 and 57 percent above it from 1985 to 1991. The comparison between the big buyer and import price may exaggerate the difference since the import price listed here is only for the most common grade of steel plate and does not include the delivery charges included in the big buyer prices. However, even if the gap between big buyer prices and import or dealer price were fully justified by quality or delivery charges in the early 1980s, the increase in

⁵⁰Personal interview, Tokyo, September 1996.

⁵¹Personal interview, Tokyo, March 1997.

⁵²Tekkô Shinbun Sha (Steel Newspaper Company), Tekkô Nenkan (Steel Annual) (Tokyo: Tekkô Shinbun Sha, 1993).

Figure 3: Big Buyer Steel Prices/Export, Import and Dealer Prices

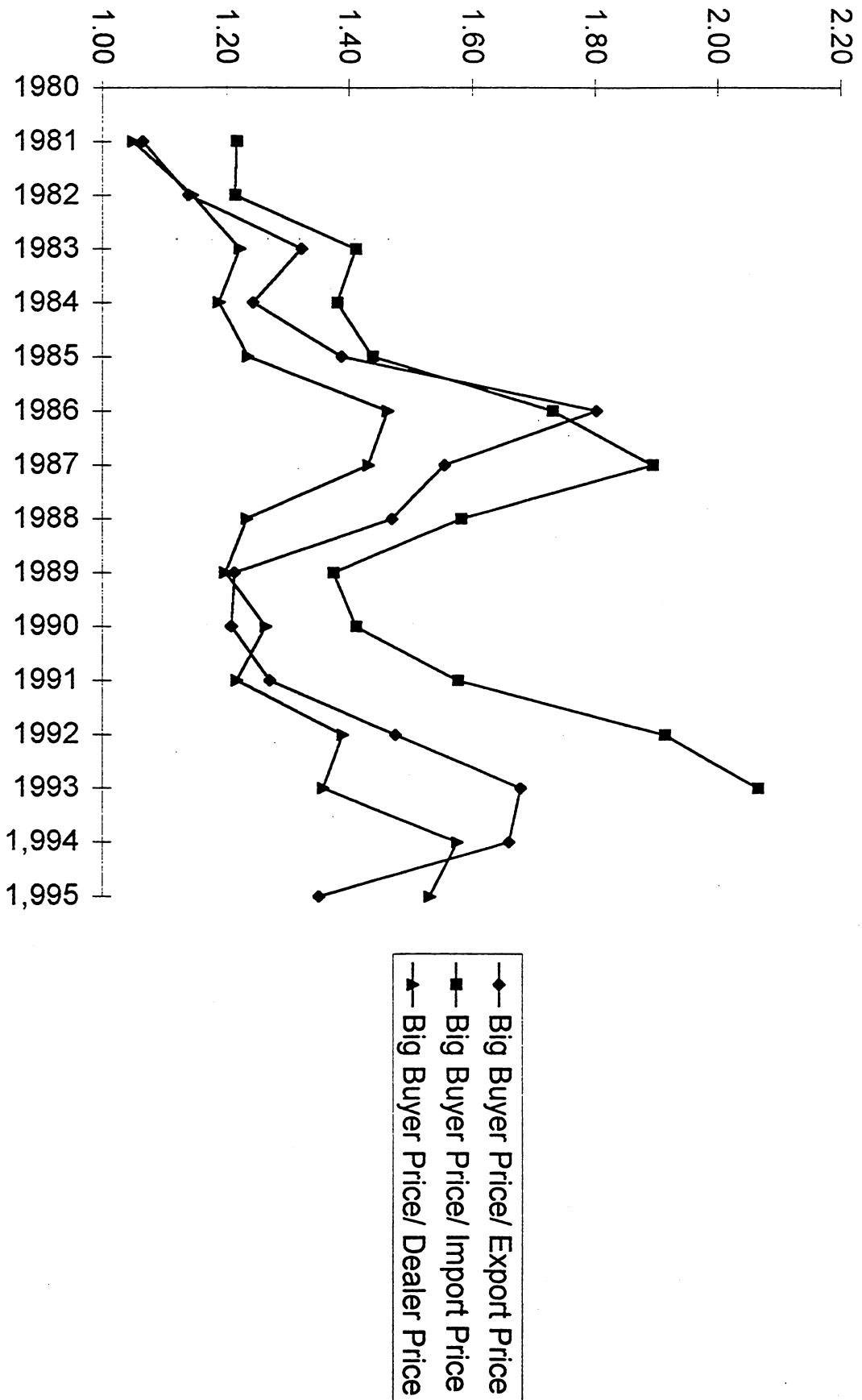
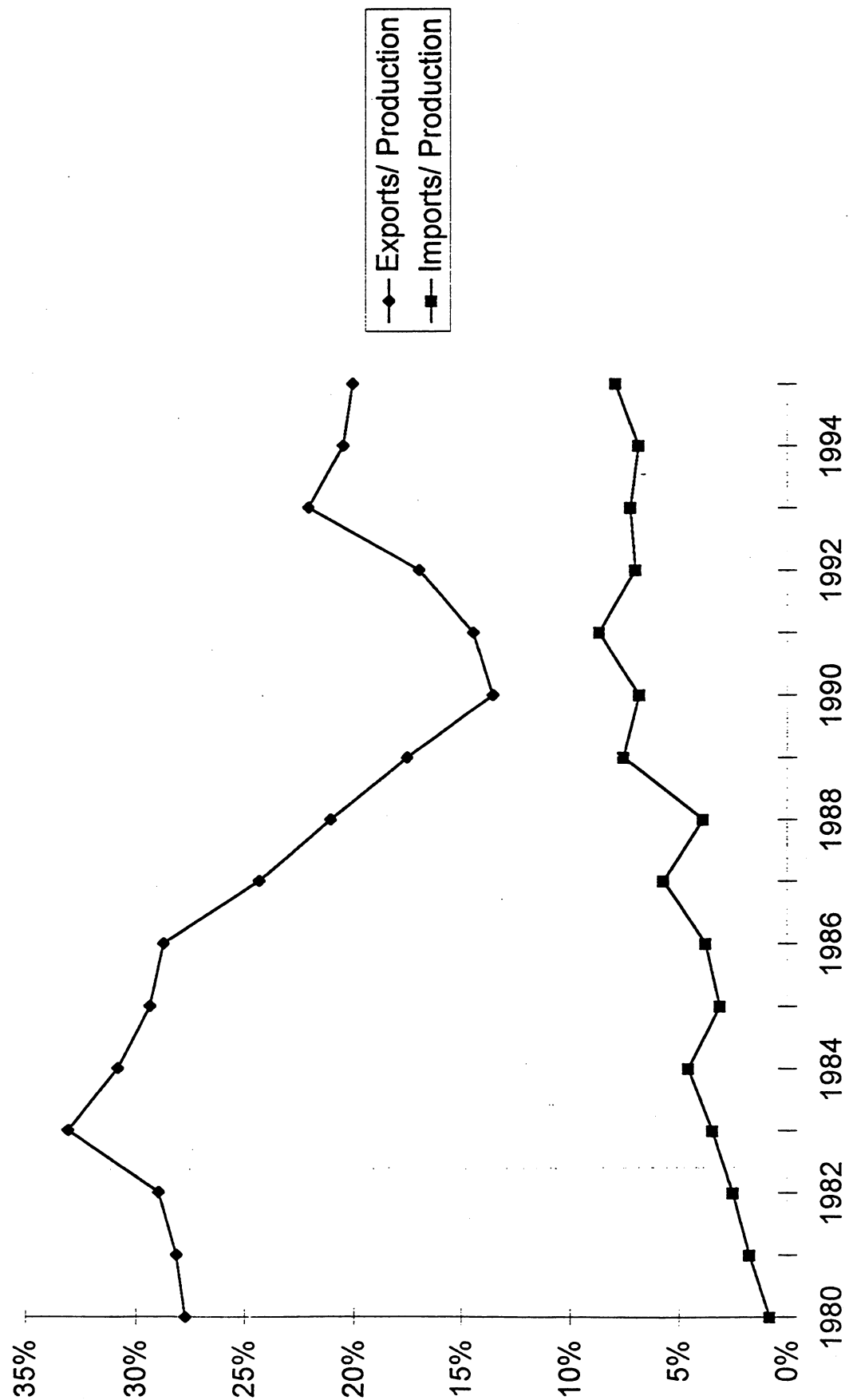


Figure 4: Ratio of Steel Exports and Imports to Domestic Production



the gap since 1985 shows that big buyers tolerated a large increase in the price of domestic steel relative to domestic market prices or import prices. And newspaper reports confirm that there are in fact large real price differentials between imported and big buyer steel prices.⁵³

The reason steel makers are able to keep their prices so high was in part because of the industry's strong price cartel. It is universally said that blast furnace sector of the steel industry is very cohesive, both in the sense that firms do not compete with one another over prices and that they speak with a single voice with the bureaucracy, banks, and other firms.⁵⁴ Japanese steel firms' strong discipline keeps them from undercutting one another in the domestic market at the same time they sell cheaply overseas. And the power this cohesion gives them vis-a-vis their buyers helps keep them from cutting prices in the face of cheap imports. As in the other basic materials industries, the industry used government led capacity cutting cartels in the 1980s to reduce capacity and support prices.⁵⁵

Big buyer sales take place directly between steel maker and user, with trading companies as intermediaries. Prices do not float, but are negotiated on an industry-to-industry basis once a year or less often if markets are relatively stable. Japan's basic steel price is negotiated between the two price leaders, Nippon Steel and Toyota. Although steel companies are careful not to be too quick to copy the Nippon Steel price for fear of being accused of joint sales increases by the FTC, in fact they follow Nippon Steel's lead.⁵⁶ Steel companies are disciplined enough in their cartel that they all charge exactly same price.⁵⁷ The blast furnace makers do make as much as a third of their sales at market prices, but not normally to their big buyers.⁵⁸

Materials buyers for one of Japan's largest auto companies say that there is a single industry-wide, cost-based price for steel.⁵⁹ Once the auto industry establishes the base price, other user industries follow their lead with minor adjustments depending on the specific prices.⁶⁰ Although the steel makers' costs are the basic determinant of the price, the financial situation of the users is also taken into account. Because of this, for instance, the hard-pressed shipbuilding industry receives discounts on its steel. Negotiations to determine the amount of this discount are carried out on an industry-to-industry basis. When I asked one of the shipbuilders about price leadership he corrected me and told that Mitsubishi Heavy Industry and Nippon Steel acted as "representatives" of the two industries in negotiating the price of Steel.⁶¹ This is an important difference of meaning. Whereas the term "price leadership" suggests impersonal and independent action by the most powerful firms, "representation" suggests that the firms act in cognizance of their responsibility as governing agents of the industry as a whole.

⁵³Nikkei Sangyô Shinbun, April 6, 1987; Nihon Keizai Shinbun, April 22, 1994.

⁵⁴Interviews with retired steel executive, shipbuilding and electronics makers, Tokyo, 1994; Itami, Naze Nihon ga tachiokureta no ka, 1992. A retired executive from one of the large integrated steel producers told me, that none of integrated steel producers cheat on the cartel. Personal interview, Tokyo, March 1997.

⁵⁵The Economist, August 29, 1987, p. 59; Tsûsanshō Seisaku Kyoku (MITI Policy Bureau), Kôzô tenkan enkatsuka hô no Kaisetsu (Commentary on the Law to Facilitate Structural Change), p. 32-33.

⁵⁶Interview, retired steel executive, Tokyo, 1994.

⁵⁷Interview, shipbuilding executive, Tokyo, 1994. Asahi Shinbun, 22, 1986; Japan Economic Almanac, 1992, p. 142.

⁵⁸Interview retired steel executive, Tokyo, 1994.

⁵⁹Interview, February 1992.

⁶⁰Interview, electronics executive, Tokyo, 1994.

⁶¹Interview, Tokyo, 1994.

NATIONALISM AND STEEL USER LOYALTY

We've seen in the case of cement that Japanese construction companies, because of their own strong cartels, can afford to pay high prices for the sake of security of supply, though in fact, many construction companies used market-price or imported steel. But why did Japan's major export industries, such as shipbuilding, electronics and autos, competing with producers all over the world, continue to pay high prices for Japanese steel? It is hard to think of an industry harder pressed to cut costs than shipbuilding, an industry dependent on exports for 60 percent of its sales, and competing with Korea, whose costs are as much as 25 percent below Japan's. The price differential to ship builders between Korean and Japanese steel was roughly unchanged from 1987 to 1994, with Japanese firms paying 40 percent more for steel than their Korean competitors. In 1994 the cost of Japanese steel alone put Japanese shipbuilders at an eight million dollar cost disadvantage per oil tanker.⁶²

Interviews with steel users made clear that the reason steel users pay high prices for Japanese steel and resist switching to imports is partly that they are committed to commitments to firms but also that they choose to honor a larger commitment to support the entire domestic steel industry. Prices, as we have seen, are supported by the steel industry cartel, but they are also supported by buyers' willingness to pay what it costs to keep the domestic steel industry going.

It does not appear that the price gap between domestic and international prices is due to quality differences between Japanese and foreign steel. Fine gradations of quality are not important for the ordinary grade steel used in construction, which accounts for half of all Japanese steel demand.⁶³ One Japanese scholar with whom I spoke and who is very familiar with the shipbuilding industry was vehement in saying that quality was decisive for explaining Japanese shipbuilders' purchases of expensive domestic steel. He argued that it was only in 1993 and 1994 that import steel prices had genuinely become attractive to shipbuilders, given the lower quality, lack of fine size gradations, and less convenient delivery of foreign steel.⁶⁴ However, 75 percent of the steel shipbuilders use is thick plate, a basically standardized commodity. Two shipbuilders I interviewed said there was no quality problem with ordinary grade Korean steel. One of them pointed out that the steel from Korea's Pohang steel plant was essentially the same as Japanese steel since it was made with equipment supplied by Mitsubishi Heavy Industries.⁶⁵ It is true that Japanese steel makers produced steel plate in some four hundred different sizes for their various customers, and that the shipbuilders valued this. By 1994, however, the shipbuilders were begging the steel companies to standardize these sizes but to give them some price relief in return. Though the large number of sizes was supposed to simplify shipbuilding, some argued that fewer sizes would actually increase shipbuilders' efficiency and save them more money in building costs than the steel companies would save by standardizing sizes.⁶⁶ If this is true, it suggests that the proliferation of sizes in the steel market has acted more as a barrier to imports than as a genuine contribution to production efficiency.

⁶²Peter Marcus, April 5, 1991, p. 223; Nihon Keizai Shinbun, August 6, 1994; Nikkei Sangyô Shinbun, April 6, 1987.

⁶³Interview, retired steel executive, Tokyo, 1994.

⁶⁴Conservation, Tokyo, 1994.

⁶⁵Interviews with two executives of shipbuilding companies (one of them retired), Tokyo, 1994.

⁶⁶Nihon Keizai Shinbun, August 6, 1994.

Auto manufacturers had a greater reason to prefer Japanese steel since forty percent of their steel was surface treated, a product category in which Japanese quality was said to be superior. However, the other sixty percent is hot and cold rolled steel plate, products which most in the auto industry say Korea produces perfectly adequately. And in recent years car makers have questioned whether they have exaggerated their needs for high quality steel and have asked steel makers to shift to cheaper grades.⁶⁷

I asked one shipbuilder, whom one would expect to represent the epitome of internationalized Japanese business, having spent many years selling ships in the West, why his firm didn't buy cheaper Korean steel given the competitive pressures from Korean shipbuilding companies. Although he acknowledged that imports were of sufficient quality to provide most of the ordinary quality steel the industry needed, he said that it was important to have a domestic industry for the sake of security of supply. He went on to say, "People often say 'Steel is the state' (tetsu wa kokka nari), or 'Steel is the rice of industry.' It's true. If steel gets weak all of industry will get weak. If we switch to imported steel, the country will stop developing."⁶⁸ That is, the shipbuilder believes that his company should suppose steel because it is important for the economy as a whole. He also acknowledged that the shipbuilding industry benefits specifically by having a domestic steel industry that has provided it with good quality steel and convenient delivery. In return for these long years of service, he said his firm owed a great moral debt (onkei) to the steel industry.

An electronics maker also argued individual companies should buy domestic steel in order to preserve key industrial linkages in the domestic economy. "[Although we might buy tiny amounts of imported steel and might conceivably even buy 10 percent foreign steel], it's hard to imagine buying 30-50 percent of our steel from overseas. Buying our supplies overseas would be a last stage. If we and other big companies buy our steel overseas, then the steel companies would go out of business and we would lose our customers. Our company would have to leave Japan too. And then we wouldn't be able to use Japanese trading practices anymore."⁶⁹ This buyer clearly conceives his relational contract with the Japanese steel industry as a whole, and not with particular firms. Failing to support the Japanese steel industry would mean the loss of the vital linkages that support his company. Having to leave Japan would be a disaster because it would mean destroying the system of long-term relations that Japanese firms have thrived on.

Users also said it would be a mistake to choose supply sources based on price. The shipbuilder just cited said, "Japanese steel is number one in the world. Its only problem is price. There's no reason to destroy the industry."⁷⁰ And the electronics maker said that even if market prices for steel are lower in the short term, over the long term the big buyer's price is a better deal because it buys security of supply.⁷¹

STEEL INDUSTRY REFUSAL-TO-DEAL THREATS

In addition to users' interest in security of supply and overall national economic vitality, they also avoid imports because they fear retaliation from steel makers. Threats of industry-wide boycotts are

⁶⁷Nihon Keizai Shinbun, April 21, 1994.

⁶⁸Interview, shipbuilding executive, Tokyo, 1994.

⁶⁹Interview, Tokyo, 1994.

⁷⁰Ibid.

⁷¹Interview, Tokyo, 1994.

strongly suggested by a *Nikkei Sangyô Shinbun* article on Mitsubishi Heavy Industries' (MHI) first purchases of imported steel from Pohang Steel in Korea. Based on an interview with an official of the Materials Division of MHI, the article reports that the company had wanted to buy Korean sheet steel for some time because Japanese steel, at 80,000 yen per ton, cost 60 percent more than Korean steel. Although MHI was concerned that Korean steel might be somewhat inferior to Japanese steel and delivery less convenient, the quality of the Pohang steel was "quite sufficient" for all but the most exacting uses. However, the article reports that "Mitsubishi Heavy Industries has been unable to [buy Korean steel] because it has been concerned with the fact that [Japanese] steel manufacturers were both its suppliers and among its principal customers."⁷² That is, MHI feared that buying Korean steel would endanger both its sales of steel making machinery and its supplies of steel from the Japanese steel industry. It is crucial to note that MHI was not simply concerned with a relational contract with a specific individual firm, but was afraid that it might be shut out of dealings with the entire steel industry.

The article quoted a Nippon Steel official was saying, "There is no mistake that [MHI] is importing steel in Nagasaki.... What we'd like to tell them is, Fine. In return we will not supply you with any of the high quality steel that Korea can't produce."⁷³ Thus, Japan's largest steel manufacturer thinks of its sales relationships as a broad, all-encompassing commitment rather than simply an agreement to buy specific products, and considers a customer's decision to switch to another buyer for one product a betrayal which should be retaliated against by withholding other products it alone can provide. And Mitsubis Heavy Industries, the steel buyer and one of Japan's largest manufacturing firms, also seems to think in terms of inter-industry relational contracts which are enforceable with refusals to deal.

However, much as Nippon Steel would have liked to use a-refusal-to-deal threat to keep MHI from buying Korean steel, it demurred because it feared that making MHI's imports an issue might lead other buyers to push harder for price cuts and possibly desert domestic suppliers altogether in favor of imports. Therefore the company officially treated MHI's imports as a matter of little importance, both because the purchase was small in volume and because MHI had been asked to buy the steel by Pohang under special circumstances in exchange for Pohang's purchase of steel making machinery from MIH.⁷⁴

Mitsubishi never increased the percentage of imports over 10 percent and Japan's other shipbuilders have remained completely loyal to the domestic industry. In interviews, two shipbuilders and a retired steel executive confirmed that the threat of retaliation was an important factor deterring shipbuilder plans to buy imports. In describing the relationship between steel and shipbuilding companies no one used such strong terms as "retaliation," but rather used language of "mutual obligation" and "power" on the part of steel companies to make sure shipbuilders don't abandon them. This power is also used to make sure buyers don't try to play domestic steel companies off against another to get lower prices. For most of the major shipbuilders, such as Mitsubishi Heavy Industries, Ishikawajima Harima, or Sumitomo Heavy Industries, shipbuilding is only a small part of their larger operations in industrial machine production. The retaliatory power of the steel companies vis-à-vis these firms is to cut off purchases of new manufacturing equipment or to tell the shipping companies which handle their raw materials imports and steel exports to stop buying ships from particular firms. As one shipbuilder put it, "The shipbuilding industry can't do much about getting the steel industry to lower its prices. If we increase purchases from one steel company

⁷²Nikkei Sangyô Shinbun, April 6, 1987.

⁷³Ibid.

⁷⁴Ibid.

to try to get lower prices, then the steel company whose purchases were cut wouldn't have its shipping company buy ships from our firm."⁷⁵ A retired steel executive also acknowledged the "power" the steel industry had to oblige shipbuilders to reject imports, and added that steel companies had some similar power over construction companies, whose services they used when they built new production facilities. He noted, however, that the industry's recent stagnation had weakened its ability to coerce these industries.⁷⁶

The threat of retaliation also appears to affect the small intermediary shearing and coil center firms that cut and process steel, as well as the large trading firms that buy and sell steel. The *Nihon Keizai Shinbun* reported that "[i]t is common knowledge that the domestic steel makers use tacit pressure to keep out imports and support the price structure. The ... shearing and coil center firms haven't spoken openly about using imported steel because of fear of reaction from the blast steel makers. The big trading firms haven't handled imports openly."⁷⁷ A retired executive from a large Japanese steel firm told me that the coil centers are pressured not to buy from Korea, and that the coil companies worry is that they will be denied supplies of high quality steel from Japanese producers if they buy cheap steel from Korea. He said that the coil companies get around it by buying through small intermediary trading companies.⁷⁸

An electronics maker I spoke with said that his company's fear of the reaction of steel companies to imports was much less in 1994 than it had been twenty years ago. He said that although his firm was reluctant to buy any imported steel itself, it did arrange for some of its subcontractors to buy imported steel. Although steel companies would have protested before, now they accept small subcontractors' buying imports. And although his large electronics firm does not actually buy any imported steel directly, he thought it could if it gave domestic steel makers advance warning and gave them a chance to match import prices. He said that the threat of buying imports can persuade steel makers to provide discounts on the portion of steel the user might have bought from overseas. In this way, although users buy the vast majority of their steel at standard big buyer prices, they may get discounts on five percent or so of the steel they tell steel companies they are tempted to buy from abroad.⁷⁹

Iketani Masanari, president of Tokyo Steel, the largest of the mini-mills attempting to compete with the steel oligopoly, laughed at the suggestion that the FTC played any role in preventing the steelmakers from bullying their buyers and said that, "To sell your products, you have to find some person at each company who is not afraid of retaliation [from the big steel companies]."⁸⁰ Iketani told me in November 1995 that nothing had changed. He added that overseas the Japanese steel firms had actually retaliated against those going around the cartel. According to Iketani, Japanese five big steel companies have handled their exports as a cartel. In China for instance, the five companies negotiated a single price with Min Metal, the state trading company handling most of China's steel imports, and allocated sales among both among themselves and among the Japanese trading companies which served as intermediaries. In 1993 the Mitsubishi Corporation, one of the trading companies, offered Tokyo Steel a contract to sell 20,000 tons of hot rolled coil to Min Metal. Though Tokyo Steel had been selling bar steel in China. Its hot coil sales

⁷⁵Interview, shipbuilding executive, Tokyo, 1994.

⁷⁶Interview, retired steel executive, Tokyo, 1994.

⁷⁷*Nihon Keizai Shinbun*, May 10, 1994.

⁷⁸Personal interview, March 1997.

⁷⁹Interview, Tokyo, 1994.

⁸⁰James Sterngold, "Elusive Price Cuts Intrigue Japan," *New York Times*, November 9, 1994, pp. C1, C11.

were seen as a threat to the cartel. The five major steel companies retaliated against the Mitsubishi Corporation by excluding it from rail sales to China. Joint sales negotiations by the five companies with Min Metal were officially stopped as of 1995, but Iketani thinks that in fact they still continue.⁸¹

In addition to pressuring Japanese buyers not to buy foreign steel, as in the cement case, Japanese producers also appear to have negotiated directly with Korean producers not to export to Japan. One of my retired steel industry informants told me, "I think there was an agreement [with Nippon Steel] that POSCO wouldn't export to Japan. Inayama [of Nippon Steel] was a close friend with Park of POSCO." My informant commented that, in the United States such an agreement would constitute an illegal dividing up of markets, but that in Japan "policies are looser."⁸²

CUSHIONS FOR DOWNSTREAM INDUSTRY

Finally, buyers are able to pay the high prices for expensive domestic steel in part because of the weakness of domestic price competition for downstream goods. As noted in the first chapter electronics firms still benefit from the lack of a large network of discount stores. A 1991 survey found that the lowest available price (typically at discount stores) for electronics and optical goods was 3.3 percent higher in Japan than in the US. However, while discount prices in the two countries are similar, restrictions on building discount stores have limited consumer access to discount sales and while the Large Store Law has been relaxed somewhat it still impedes the building of the Wal-Mart style mass retailer that has produced very cheap prices in the U.S. Though Japan in mid-1994 was widely touted to be in the midst of a retail revolution, an executive at a large electronics maker told me that discount sales were still only 10 percent of total sales. He said, "There is not much discount selling yet in Japan. Japanese consumer can't buy at cheap prices like in the US. In the US you have to sell at cheap prices." Thus to this electronics maker's understanding there is little price competition in the Japanese electronics market compared to the U.S. market.⁸³

In the U.S.-Japan price survey, electronics, along with autos is the sector in which Japanese prices were closest to U.S. prices. As the report itself points out, its survey method does not reveal actual average prices, which are likely lower in the U.S. because of the greater freedom there to open discount stores. However, if even electronics manufacturers feel Japan lacks a truly price competitive market, then the protection of manufacturers from price competition in other markets, such as auto parts and capital goods, is even more generous (See Figure 6-9). The electronics maker who said there was little discount pricing of electronics goods in Japan pointed out that the cohesion of the electronics and electrical appliance industries was weak compared to that of the powerful heavy electric machinery industry. The three firms in this industry, Hitachi, Mitsubishi, and Toshiba, have "oligopolistic power" and speak with their customers, the

⁸¹Personal interview, November 1995.

⁸²Personal interview with retired executive of large Japanese integrated steel firm, March 1997. For a discussion of broader international market dividing strategies, see Thomas R. Howell, William A. Noellert, Jesse G. Kreier, and Alan Wm. Wolff, *Steel and the State: Government Intervention and Steel's Structural Crisis*, Economic Competition Among Nations Series (Boulder and London: Westview Press, 1988).

⁸³Years after the yen's sharp rise in 1986, weak price competition among domestic electronics makers enables them to maintain high prices at home while selling products more cheaply abroad, promoting many Japanese to continue to go overseas to buy Japanese products. Naoko Yoshida, "Makers Fail to Explain Price Differences in Electronic Prices," *Tokyo Business Today*, No. 60 (January/February 1993)

electric power companies, as a group.⁸⁴ In 1994 MITI admitted that it had been protecting this industry from imports with its performance standards and that, because of U.S. pressure, it would gradually lift its restrictions by the year 2000.⁸⁵ Thus, in this case, downstream industry enjoyed oligopolistic power in domestic price negotiations and informal trade protection by MITI and thus was under no pressure to switch to cheap imported steel supplies.

Although the shipbuilding industry relies on exports for sixty percent of its sales, the insulation of the domestic market from imports appears to help it pay the high price of domestic steel. After the shipbuilder cited above told me his industry could not buy imported steel because it would be bad for the country as a whole, I asked him why his firm did not just abandon the Japanese steel industry, buy Korean steel, let the other Japanese shipbuilders worry about supporting the steel industry, and undercut them on price? His answer was straightforward: "If Japanese companies wanted cheaper ships, they could already buy them from Korea." It is true that although Korean ships are much cheaper than Japanese ships and although Korea commands 35 percent of the world market, Korea has not sold a single ship to Japan in recent years.⁸⁶ The weakness of price competition in downstream markets is an important reason Japanese manufacturers can pay high domestic prices for steel.

CLOSED GOVERNMENT PROCUREMENT AS A BARRIER TO TRADE

Closed government procurement is also important in restricting steel import access to the domestic market. The Construction Ministry provides regulatory barriers to keep outsiders to the steel cartel out of the construction market, which absorbs half the nation's steel. Although in principle public works projects are supposed to be open to all, the Construction Ministry indirectly fixes prices and designates suppliers. Groups affiliated with the Construction Ministry publish two books that list prices for construction materials and lists companies that are allowed to supply them.⁸⁷ Tokyo Steel, a Japanese minimill producer that does not belong to the cartel, complains that this informal rule about construction supply sources restricts government steel purchases to firms that belong to the cartel, even though Tokyo Steel sells more cheaply than cartel members. For example, Tokyo Steel has a MITI license to make sheet piles, interlocking pillars used to support building foundations, and sells them for 55,000 yen a ton, far below the 87,000 yen official price. But the company is kept out of the market for government projects.⁸⁸ A retired steel executives from one of the large cartel insider firms confirmed Iketani's story on sheet piles and on steel products more generally: "Government construction projects will never buy from the minimills, even though they can supply the products."⁸⁹ Iketani Masanari, president of Tokyo Steel, says that this discrimination carries over into the private sector as well. Since sheet piles are often pulled up and reused, they are commonly leased. But because the leasing companies are punished in the private sector if they use cartel outsiders' sheet piles in the public sector, they stick to cartel insiders in the private sector as well. Some small leasing companies and trading companies will use Tokyo Steel sheet piles, but the large

⁸⁴Interview, electronics firm executive, 1994.

⁸⁵*Nihon Keizai Shinbun*, August 8, 1994.

⁸⁶*Nihon Kanzei Kyôkai* (Japan Tariff Association), *Nihon bôeki geppyô*, December issues, 1990-1993.

⁸⁷The books are *Kensetsu bukka*, put out the *Kensetsu Bukka Chôsa Kai*, and *Sekisan Shiryô*, put out by the *Keizai Chôsa Kai*.

⁸⁸Personal interview, with Iketani Masanari, Tokyo, November 1995.

⁸⁹Personal interview, retired steel company executive, March 1997.

companies avoid them for fear of retribution.⁹⁰ The retired steel company executive pointed out that the private leasing companies that handle the sheet piles have capital from the trading companies, who wouldn't want to disturb their relationships with steel companies by handling goods from outsiders to the cartel. The reason that the Construction Ministry is uninterested in getting cheaper prices for its construction projects, according to the retired executive, is that it wants the construction companies to make large profits so that it will continue to give retired Construction Ministry officials jobs as *amakudari*, both in the firms and in special public-private corporations (*tokushû hôjin*).⁹¹

MITI GUIDANCE OF THE STEEL CARTEL

While the Construction Ministry block sales of steel from outside the domestic steel cartel, MITI guides and protects the cartel. According to the retired steel executive, "MITI does administrative guidance of how much steel should be produced by the industry, . . . MITI asks each steel company to submit a projection of production. If a company wants to expand production, it has to give MITI a reason to do so. This still goes on." He argues that one of the reasons the industry welcomes MITI guidance is that it protects it from the FTC: "One of the principles in Japanese government is that one agency can't get involved in another agency's affairs. What the Steel Federation does is get MITI involved so that it can avoid an investigation by the FTC."⁹² Formally, of course, MITI involvement does not guarantee protection from FTC prosecution, as was established under the oil cartel case of the 1970s, but in practice MITI appears to still be able to give the cartel legitimacy.⁹³ As evidence of the steel cartel's effectiveness, he points to recent production figures, which do not look like the result of market forces. In 1995 Kawasaki and Sumitomo both produced the exact same amount of steel, 10.44 million tons, while in 1996 they differed only slightly, at 9.89 and 9.69 million tons respectively. Figures for other producers appear similarly carefully calibrated.⁹⁴ While supporting the cartel with pressure to help cartel members cooperate, MITI also monitors the cartel to prevent price gouging and excessive withholding of production. For instance, when steel makers held back production of H-steel and bar steel in 1987 in order to force prices up, MITI asked the industry to increase production.⁹⁵ As in cement, MITI permits the cartel with the understanding it must contribute to the provision of adequate domestic supplies at what MITI considers reasonable prices.

CONCLUSION

The steel and cement cases show us that informal cartels and group boycotts keep Japanese prices high imports out, and that they are backed up by the Japanese government. As was pointed out at the outset, the basic materials industries enjoy conditions that make it especially easy to organize cartels, and we should not expect that such cartels of exactly this pattern characterize most of the economy. However, the tolerance of the FTC, and the active support of the LDP, MITI, the Construction Ministry, and the

⁹⁰Personal interview, with Iketani Masanari, Tokyo, November 1995.

⁹¹Personal interview, retired steel company executive, March 1997.

⁹²Personal interview, retired steel company executive, March 1997.

⁹³Frank K. Upham, *Law and Social Change in Postwar Japan* (Cambridge, Massachusetts: Harvard University Press, 1987).

⁹⁴*Tekkô Shimibun*, March 12, 1997.

⁹⁵Japan Economic Almanac, 1988, p. 183.

Customs Bureau suggest that numerous branches of the state are eager to support high prices and trade protection for domestic industries when they can. Similar issues of trade association and ministerial cooperation to exclude outsiders are also problems in other markets such as film and pharmaceuticals.⁹⁶ Japan's high prices across the board suggest that various forms of informal market governance may protect large parts of the economy. This study also emphasizes the links between industries and the spillover effects that weak competition in one economic sector can have on another. While we tend not to think of construction as a key sector for tradable manufactured goods, cartels in the construction sector provide critical support for Informal trade protection for the Japanese steel industry.

The study also helps explain the durability of informal market protection in Japan. While American scholars like to think that cartels are fragile because of the tendency of individual firms to cheat on them, interviews with buyers of expensive goods from the cartels show considerable support for high prices and import protection because of nationalist beliefs that Japan must retain domestic protection of key industries. Sung Joon Roh argues that managers of Japanese corporations are able to indulge their mercantilist impulses because widespread cross-shareholding of Japanese firms relieves them of strong pressures to produce high profits.⁹⁷

An additional issue that comes to light in this study which is of particular concern in evaluating trade liberalization within APEC is the troubling problem of Japanese and Korean trade associations and firms negotiating over limiting Korean imports to Japan. This would seem to have the effect of creating high price sanctuaries in Asia and diverting exports towards third markets, such as the United States.

While formal import protection of weakened industries, such as cars, steel and textiles, through quotas and the Trigger Price Mechanism has been much studied and much bewailed, American formal protection has been much less effective than informal Japanese protection of its own weak industries. Japan has not given the kind of trade opportunities the United States has long provided in markets such as steel, cement, or chemicals to developing nations or for that matter to the U.S. now a cheaper producer of all these goods than Japan. An American recently contacted me for advice on exporting cement to Japan. I told him I thought there were enormous profits to be made, but that he would have to go through an extraordinarily difficult political battle to get access to the Japanese market.

Earlier this year I traveled around various cities in Japan, sponsored by the American Centers, giving frank talks to business groups on the subject matter covered in this paper. I spoke in Japanese and had lively question and answer sessions after the talks. Japanese businesspersons almost universally acknowledged the accuracy of my account of Japanese cartels and informal trade protection, but tended to throw up their hands and say, "What can we do? It's our culture and we can't tolerate the kind of economic upheavals Americans can. You have your way of doing things and we have our way." The problem is that Japan's informal regulation of domestic prices and international trade represents a betrayal of its international trade agreements, and supporters of informal regulation have no good suggestions for how Japan can live up to these agreements.

⁹⁶*Nikkei Weekly*, July 11, 1995.

⁹⁷Sung Joon Roh, "Agency Capitalism: The Logic of Managed Competition in Japan," MITI Doctoral Dissertation, August 1996.

Japanese Corporate Activities in Asia: Implications for U.S.-Japan Relations

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Abstract

In Japan, certain business practices that are employed by the keiretsu to maintain stability and prices have the effect of raising the costs and risks of doing business for outsiders, and of making it difficult to access the market. A central question about Japanese investments abroad is whether similar organizational structures and practices of keiretsu are in evidence in markets with extensive Japanese investments. If this is the case, what are the likely implications for foreign market access as a result of such activities? There is a possibility that the keiretsu integrated across borders and operating in downstream distribution channels could become exclusive or closed to non-keiretsu companies. In both cases, from an international trade policy viewpoint, this could constitute a "Transplanted Trade Barrier" (TTB) or measures, policies or practices which, when transferred from one economy to another may have the impact of impeding imports or market access. This paper provides additional insight into the organization and functions of keiretsu in selected countries, particularly with regard to their implications for market access. Based on a survey of Japanese companies in three Asian economies, a majority of Japanese affiliated companies have ties to the keiretsu in Japan. The companies include manufacturers, suppliers, retailers, banks and trading companies which are involved in the production and distribution of both capital and consumer goods. The "keiretsufication" of certain industries may affect market opportunities in Asia for non-keiretsu suppliers and distributors, including both domestic and foreign firms.

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JAPANESE CORPORATE ACTIVITIES IN ASIA: IMPLICATIONS FOR U.S.-JAPAN RELATIONS

Introduction

There are complex and overlapping patterns of trade and investment in Asia, much of which is associated with Japanese foreign direct investment (FDI). Numerous studies have been conducted on the role of Japan's FDI, trade and foreign aid as a contributor to regional economic growth and integration. Recently more attention has been given to Japanese corporate activities in Asia.¹ According to several studies, Japanese investments are promoting intra-industry trade and vertical integration in Asia, particularly in the manufacturing sector. Japanese firms have integrated their Asian affiliates on a regional scale, invested in complementary production or assembly operations in different countries, and many have established their regional headquarters in Singapore. Japanese firms' global production and trading activities are supported by networks of suppliers in Asia. These networks, especially prominent in electronics and auto industries, are often intended to serve the regional markets as well as export bases and "are hierarchically organized, with much of the decision-making authority, technological capabilities, and sourcing remaining in Tokyo."²

A central question about the movement of Japan's production networks³ offshore is whether the organizational structures and practices of Japanese corporate groupings (keiretsu), are in evidence in those Asian markets with extensive Japanese investments. If so, what are the likely economic implications, particularly regarding market access? and for U.S.-Japan relations? While previous research has largely focused on upstream manufacturer-supplier relations, there is also a possibility that the keiretsu, integrated across borders and operating in downstream distribution channels, could become exclusive or closed to non-keiretsu companies. If so, from an international trade policy viewpoint, this could constitute a "transplanted trade barrier" or TTB. A TTB is a measure, policy or practice which, when transferred from one economy to another, singularly or in combination with others, may have the impact of impeding imports or market access to outside firms.⁴

There are divergent views among economists, industrial organization and management specialists, antitrust or legal specialists, and international trade analysts about the implications of Japanese corporate organization and operations (including keiretsu) for performance and market access.⁵ The debate among

¹ See Wendy Dobson, *Japan in East Asia* (Singapore: Institute of Southeast Asian Studies, 1993) and Richard Doner, "Japan in East Asia: Institutions and Regional Leadership," Workshop on Japan in Asia, Cornell University, March 31-April 2, 1995.

² Eileen M. Doherty, with Dieter Ernst, Michael Borrus, Stephen S. Cohen, and John Zysman, "Production Networks in Asia: International Production Networks in a Rapidly Changing World" (Berkeley University of California at Berkeley: Berkeley Roundtable on the International Economy, September 1994).

³ Doherty has defined networks as "the organization across borders of research and development activities; product definition and design manufacturing; distribution; and service activities".

⁴ This paper focuses on the structures and practices associated with keiretsu. However, TTBs could also include discrete items such as standards or design specifications or packages of assistance such as financial incentives, administrative guidance and other policies which support firms' overseas activities.

⁵ Paul Sheard, "The Economics of Japanese Corporate Organization and the Structural Impediments Debate: A Critical Review," *Journal of Japanese Economic Studies* (Summer 1991): 30-77.

representatives of these various disciplines centers on whether the interdependent, long-term relationships and practices of keiretsu firms result in efficiencies and welfare enhancement with pro-competitive consequences, or inefficiencies, exclusivity and market closure.⁶ The tradeoffs, however, are not mutually exclusive, i.e., some practices may be efficiency enhancing in the short-run, yet exclusionary. With regard to downstream distribution operations, research has shown that certain business practices associated with keiretsu operations, at least within Japan, may be efficiency enhancing in terms of providing assured supplies, increased customer service and accurate product information to consumers. However, these same practices (particularly exclusive dealings, territorial restrictions, refusals to deal and rebates) may also have exclusionary effects for non-keiretsu firms, both foreign and domestic.⁷ Japanese manufacturers utilize such practices in order to control distribution and supply activities and to support their sales and pricing policies. The result of these practices, in many industries characterized by keiretsu relations is that Japanese suppliers and purchasers are less likely to switch to new suppliers solely on the basis of price. Vertical and horizontal practices have the effect of raising the costs and risks of doing business for outsiders.

Keiretsu structure and organization have been the subject of previous trade negotiations between the United States and Japan. During the Structural Impediments Initiative (SII) from 1989 to 1991, U.S. negotiators raised specific aspects of keiretsu buyer-supplier relations and Japanese competition policy.⁸ In response, Japan agreed "to make keiretsu relationships more open and transparent" so that they will not hinder fair competition and the entry of foreign firms into the Japanese market. Subsequently, short-term or limited changes were made with regard to stricter enforcement of the Antimonopoly Law. However, many of the same issues resurfaced during the Framework talks which began in 1993 and more recently during the Kodak-Fuji film dispute. In general, U.S. negotiators remain concerned about the perceived non-transparencies and potentially exclusive effects of keiretsu relations for non-keiretsu firms in Japan and

⁶ According to one set of views, Japanese corporate organization and behavior (specifically long-term, buyer-supplier relations) are recognized as potentially efficiency enhancing, encouraging long-term adjustment, promoting innovation and contributing to higher economic growth. Aoki [1984] and Dore [1986] are among those who have pointed to certain Japanese management corporate practices such as life-time employment, close inter-firm ties, quasi-integrated subcontracting networks, and long-term trading arrangements as providing positive benefits such as provision of information and risk-sharing. The theory of industrial organization suggests that the effects of buyer-supplier relationships among keiretsu members are comparable to full vertical integration and therefore should not be objectionable from a foreclosure perspective. [Williamson, 1985] Another set of views, however, holds that many of the same characteristics of Japanese corporate organization and operation result in exclusionary behavior that make it difficult for outside firms to enter the markets in which Japanese keiretsu operate and lead to distorted trade patterns and markets. Tyson and Zysman [1989] have argued that long-term contractual arrangement associated with Japanese corporate organizations make it difficult to gain access to Japan's market and give Japanese industry a type of "natural immunity" to imports. Lawrence [1991] has examined the impact of keiretsu on intra-trade flows to Japan and found that while vertical keiretsu tend to increase exports, the horizontal keiretsu lower imports.

⁷ The existence of such practices has been well-documented in studies by Japanese government agencies including the Japan Fair Trade Commission (JFTC), the Ministry of International Trade and Industry (MITI), and the Economic Planning Agency (EPA). Other scholars who have examined the role of both horizontal and vertical business practices and the legal system in Japan include: Matsushita [1978], Yamamura [1982], Ishida [1983], Hahn [1984], Iyori [1995], Batzer and Laumer [1989], and Young [1990].

⁸ See for example, *Joint Report of the U.S.-Japan Working Group on the Structural Impediments Initiative*, June 1990.

elsewhere. A major question for consideration is which, if any, keiretsu business practices are employed in Asia and whether similar effects regarding limitations on access to distribution channels or supplier opportunities might be expected. Given the different conditions of competition within industries and legal systems in each country, the impact of such practices would necessarily have to be evaluated on a country-by-country, industry-by-industry basis. To the extent that keiretsu structures and exclusive interfirm transactions are found to be associated with Japanese FDI in Asia, these concerns may be heightened and U.S. policymakers may be pressured by U.S. businesses to respond.

This paper seeks to provide additional insight into several of the topics above relating to Japan's role in Asia. Most importantly, it analyzes the potential implications of Japanese corporate activities, particularly those associated with keiretsu in selected Asian economies, from an international trade policy viewpoint, for U.S.-Japan relations and foreign market access. Based on an analysis of statistical information and other evidence, it appears that a majority of Japanese affiliates in selected Asian economies are associated with one or more keiretsu. In industries where there is an extensive keiretsu presence, there may be a high degree of intra-keiretsu purchasing. Anecdotal evidence suggests that some exclusive business practices associated with the keiretsu in Japan are being replicated in Asia. These practices may affect market opportunities and access for non-keiretsu suppliers and distributors.

Overview of Keiretsu Structure and Operations

Keiretsu in Japan's economy

The structure and operations of the keiretsu in Japan's market and their importance to Japan's economy has been studied extensively.⁹ Certain characteristics of keiretsu organization and behavior may also be applicable to an analysis of the impact of their activities on market access in Asia. The keiretsu are a key feature of Japan's economy, directly or indirectly affecting economic transactions in both upstream and downstream channels, within and across industries.¹⁰ According to the Japan Fair Trade Commission

⁹ For a comprehensive analysis of keiretsu structure and operations see, Michael Gerlach, *Alliance Capitalism* (University of California: Berkeley, 1992) and Kenichi Miyashita and David Russell, *Keiretsu: Inside the Hidden Japanese Conglomerates* (New York: McGraw-Hill, 1994). Some of those scholars who have analyzed keiretsu and Japanese corporate behavior in general from a transactions cost, risk-sharing, or sociological approach are as follows: Richard E. Caves and Masu Uekusa, *Industrial Organization in Japan* (Washington, D.C.: The Brookings Institution, 1976); Michael Yoshino, *Japan's Multinational Enterprises* (Cambridge, MA: Harvard University Press, 1976); Masahiko Aoki and Ronald Dore, *The Japanese Firm* (New York: Oxford University Press, 1994); Masahiko Aoki, ed. *The Economic Analysis of the Japanese Firm* (New York: Oxford, 1984); and Rodney Clark, *The Japanese Company* (New Haven, Conn.: Yale University Press, 1979). See, also, various chapters of *Inside the Japanese System*, eds. Daniel I. Okimoto and Thomas P. Rohlen (Stanford: Stanford University Press, 1988) including Rodney Clark, "Industrial Groups," Hiroshi Okumura, "The Closed Nature of Japanese Intercompany Relations," and Kenichi Imai and Itami Hiroyuki, "Allocation of Labor and Capital in Japan and the United States."

¹⁰ Although some variations have been suggested by observers, in general, keiretsu can be categorized into three types. The first type is known as the intermarket, horizontal, or financial keiretsu which are descended from the prewar zaibatsu and are typically organized around a major bank, trading company, insurance company, (continued...)

(JFTC), almost 20 percent of Japan's capital was held by the six major corporate groupings (Mitsui, Mitsubishi, Sumitomo, Fuyo, Sanwa and Dai-Ichi Kangyo or DKB) and their subsidiaries in JFY 1992.¹¹ By another estimate, approximately 50 percent of Japan's capital is controlled by all of the keiretsu.¹² The keiretsu are composed of firms from a wide range of commercial and industrial fields, including trading companies, banks, suppliers, distributors and retailers. The groupings often have overlapping relationships with members of their own group, other groups and nominally independent firms. Approximately one-half of small and medium-sized manufacturing firms serve as subcontractors to large manufacturers associated with a keiretsu.¹³ Through their extensive networks of affiliated firms, few areas of Japan's economy are untouched by keiretsu activities.

Keiretsu members are linked together through various formal and informal practices. Some of the most common means of integrating firms in the horizontal keiretsu or in controlling subsidiaries or affiliates in the other two types of keiretsu are: stable shareholding and cross-shareholding; networks of debt capital; shared directorships and mutual appointment of key personnel;¹⁴ and common traditions and practices. Even in cases where capital or equity ties are absent or minimal, business transactions serve to link the companies together. A firm may own only 10 percent of a smaller company's stock, but still manage to wield control over the small company as if it were a subsidiary through control of parts or supplies, loaning of debt capital or personnel.¹⁵

By several measures, despite press reports to the contrary, keiretsu ties appear to have strengthened somewhat rather than weakened in recent years. The ratio of cross-shareholding for the six keiretsu groups rose from 43.3 percent in JFY 1989 to 44.1 percent in FY 1991 and then declined slightly to 44.0 percent in JFY 1992 (table 1).¹⁶ The ratio of stock held by members of the same group ranking among the top 50 stockholders rose from 35 percent to 36 percent during JFY 1989 to 1992. The intra-group business relations ratio for the major horizontal groups in 1992 ranged from a high of approximately 64 percent for Sumitomo to a low of just over 30 percent for Sanwa and Fuyo. Mitsubishi and Mitsui exhibited relatively high intra-business relations ratios of 51.3 percent and 45.3 percent

¹⁰ (...continued)

and large manufacturing company. The second type, variously known as intramarket, industrial, production or vertical keiretsu (firms representing successive stages of production or closely connected industries) are usually organized around a large independent company and its subsidiaries and affiliates. These types of keiretsu are generally found in the auto, steel, and electronics industries and are characterized by extensive subcontracting networks. The third type, distribution or marketing keiretsu include distribution, sales, and marketing firms in the wholesale and retail sectors. For additional information on the different types of keiretsu, see USITC (1990), Caves and Uekusa (1976) and Douglas Ostrom, "Keiretsu and Other Large Corporate Groups in Japan," *Japan Economic Institute Report* (January 12, 1990).

¹¹ Japan Fair Trade Commission, *FTC/Japan Views*, No. 20, March 1995, 31.

¹² David W. Edgington, *Japanese Business Down Under* (London: Routledge, 1990), 23.

¹³ Gerlach, xvii.

¹⁴ In addition, high-level government and public corporation officials are often employed by keiretsu firms upon their retirement. According to Miyashita and Russell, the Minister who supervises an industry is actually a member of its keiretsu. Miyashita and Russell, 182.

¹⁵ Miyashita and Russell, 80.

¹⁶ Japan Fair Trade Commission, *FTC/Japan Views*, No. 20, March 1995, 31.

Table 1. Cross-shareholding ratio of major keiretsu, JFY 1989, 1991, 1992.

	JFY	Mitsui	Mitsubishi	Sumitomo	Fuyo	Sanwa	DKB	Average of Six Major Groups
Ratio of Intra-Group Stock Shareholding Relations (percentage)	1989	59.6	72.7	93.6	45.4	27.0	29.5	54.6
	1991	58.1	75.1	94.5	46.6	27.4	30.4	55.3
	1992	57.6	75.3	94.5	46.8	27.5	29.4	55.2
Ratio of Intra-Group Stock Shareholding (percentage)	1989	19.5	35.5	27.5	16.4	16.5	14.6	21.6
	1991	19.3	38.1	28.0	17.1	16.8	14.6	22.3
	1992	19.3	38.2	28.0	16.9	16.7	14.2	22.2
Ratio of Intra-Group Stockholding: Cross-Shareholding (percentage)	1989	46.1	59.7	83.7	34.7	17.6	17.8	43.3
	1991	46.1	61.0	85.3	36.0	18.2	18.4	44.1
	1992	45.8	61.2	85.3	36.0	18.3	17.3	44.0

Source: Japan Fair Trade Commission, *FTC/Japan Views 20* (March 1995): 47.

Note: Averages have been rounded.

respectively (table 2).¹⁷ A majority of intra-group transactions involve the trading companies, according to the JFTC.¹⁸

In general, the relationships among keiretsu members, and other Japanese companies for that matter, can be characterized as being long-term and mutually beneficial, based on loyalty and obligation.¹⁹ The benefits of membership in the group include insulation from external market forces,

¹⁷ In JFY 1992, the ratio of dependence on borrowing from financial institutions of the same group ranged from a low of 13 percent for DKB to a high of 29 percent for Sumitomo. The ratio of companies receiving executives dispatched from other keiretsu members ranged from a high of 100 percent for Mitsubishi to a low of 34.6 percent for Mitsui in JFY 1992. Japan Fair Trade Commission, *FTC/Japan Views*, No. 20, March 1995, 50.

¹⁸ Japan Fair Trade Commission, *FTC/Japan Views*, No. 20, March 1995, 49.

¹⁹ Long-term transactional business relations also exist outside of the keiretsu where there are no equity or personnel linkages.

Table 2. Intra-Group Business Relations Ratio, JFY 1989 and JFY 1992.

	(percentage)					
	Mitsui	Mitsubishi	Sumitomo	Fuyo	Sanwa	DKB
JFY 1992	44.2	51.7	60.8	29.3	27.6	32.8
JFY 1989	45.3	51.3	64.2	30.8	30.9	34.5

Source: Japan Fair Trade Commission, *FTC/Japan Views 20*, (March 1995):49.

sharing of risks, easy access to funds, and stabilizing corporate performance.²⁰ The sharing of information about developments in technology and management provides members with benefits under changing competitive conditions.²¹ While keiretsu members may not experience improved profitability or efficiency in the short-term, they may benefit from stability in performance over the long-term. Various business practices that may be economically rational or efficient, but nonetheless exclusionary and nontransparent, are employed by keiretsu firms to ensure allegiance to the group. These practices include, but are not limited to, abuse of purchasing power, reciprocal transactions, exclusive dealings, paying of rebates, resale price maintenance and purchasing codes of conduct. Non-price considerations, including a preference for Japanese products and firms, appear to play an important role in purchasing and other types of business decision-making. In industries dominated by keiretsu, the net effect of keiretsu business practices and relations is to maintain stability and prices, to lower the costs and risks of doing business for those inside the "group" and to raise them for other "outside" firms. Foreign firms, in particular, may be excluded or limited in their ability to buy or sell to keiretsu firms.

For both Japanese buyers and sellers, the opportunity cost of ending their long-term business dealings are high.²² In order to break into a keiretsu relationship, according to the Tokyo Chamber of Commerce and Industry, an outside firm must offer a product or service to the parent that is not offered by the existing supplier. According to anecdotal evidence, sometimes even price discounts of 30 to 40 percent are not enough to convince parent companies to switch to a new supplier.²³ A major question for consideration is which if any of the practices discussed above are employed in Asia and what are the effects of such practices on market access.

Trading Companies

The trading companies, along with the banks and insurance companies, provide leadership and integrating functions to the keiretsu, both horizontally and vertically. The role of Japanese trading companies within Japan's economy in serving as intermediaries in trade, investment, distribution, finance,

²⁰ Miyashita and Russell, 197.

²¹ Ibid.

²² Hisashi Yaginuma, "The Keiretsu Issue: A Theoretical Approach," *Japanese Economic Studies* 21 (New York: M.E. Sharpe, 1993), 3:33.

²³ Tokyo Chamber of Commerce and Industry, "Building a New Corporate Network," *World Trade Materials*, (April 1993), 48.

resource development, business organization and information collecting has been well-documented.²⁴ There are approximately 10,000 companies in Japan classified as trading companies, including the 17 largest ones, known as *sogo shosha* or general trading companies. The six largest general trading companies are Mitsui, Mitsubishi, Sumitomo, Marubeni, Nissho Iwai and Itochu. Their total sales amounted to \$772.4 billion in JFY 1993 (table 3).²⁵

With ties to tens of thousands of Japanese companies, including the keiretsu, the trading companies play a significant role in Japan's exports and imports, including domestic distribution activities. They are essentially gatekeepers for Japan's economy. In JFY 1993, the nine top trading companies (includes Tomen, Nichimen and Kanematsu, in addition to the six largest companies) handled \$123.8 billion or 34.8 percent of Japan's exports and \$134.2 billion or 60.8 percent of Japan's imports. Their total trade accounted for \$258.0 billion or 44.7 percent of Japan's total worldwide trade of \$577.03 billion (table 4). The share of Japan's trading companies in Japan's overall trade declined, on a fiscal year basis, from 72 percent in FY 1989 to 45 percent in FY 1993. The major trading companies' involvement in Japan's total imports declined from a high of almost 95 percent in JFY 1989 to 61 percent in JFY 1993. The trading companies share of Japan's total exports declined steadily from a high of 54 percent in JFY 1989 to 37 percent in JFY 1990 and 1991, to 36 percent in JFY 1992, and to 35 percent in JFY 1993.²⁶

Both advantages and disadvantages have been cited by foreign companies regarding the use of trading companies to access Japan's capital and consumer goods markets. The trading companies are able to save their foreign clients time, effort and costs. They internalize and minimize transactions costs through their long-term, close relationships with other companies within their own keiretsu and with other inter-market groups.²⁷

²⁴ See for example, M.Y. Yoshino and Thomas Lifson, *The Invisible Link: Japan's Sogo Shosha and the Organization of Trade* (Cambridge: Westview Press, 1986); Kunio Yoshihara, *Sogo Shosha: The Vanguard of the Japanese Economy* (Oxford: Oxford University Press, 1982); Alexander Young, *The Sogo Shosha: Japan's Multinational Trading Companies* (Cambridge: Westview Press, 1979); and Kiyoshi Kojima and Terutomo Ozawa, *Japan's General Trading Companies: Merchants of Economic Development* (Paris: OECD, 1984).

²⁵ Calculated from data of Japan Foreign Trade Council, Inc. in Keizai Koho Center, *Japan 1995, An International Comparison*.

²⁶ Calculated from data of Japan's Foreign Trade Council, Inc. as reported in Keizai Koho Center, *Japan An International Comparison*, various years.

²⁷ The trading companies also maintain ties to subsidiaries and affiliated firms, including small and medium-sized firms in Japan's distribution sector. According to one study, about two-thirds of subsidiaries of trading companies were located in Japan while the rest were located abroad. The JFTC has concluded that the trading companies exert significant influence over their affiliates' fiscal and managerial policies through financial and personnel ties. By providing financing to affiliates and non-affiliates, the trading companies are able to create a situation of mutual dependency by which the companies depend on the trading company for loans while the trading company must help the firms earn profits and avoid defaults. Japan Fair Trade Commission, "Survey on the Present State of Business Activities of the Sogo Shosha," Antimonopoly Law Colloquium 97-4 (April 1983):111; and Michael R. Czinkota and Jon Woronoff, *Japan's Market: The Distribution System* (Praeger Special Studies, 1986), 35-36.

Table 3. Sales and trade of Japan's nine major trading companies, JFY 1993.

(millions of dollars)

Trading Company	Total Sales	Sales in Japan	Exports From Japan	Imports to Japan	Offshore Trade
Itochu	145.1	77.4	15.9	13.4	38.4
Mitsui	142.6	70.9	18.0	19.1	34.7
Marubeni	136.3	70.0	19.8	15.6	31.0
Sumitomo	135.2	69.6	20.5	19.4	25.6
Mitsubishi	127.0	62.2	20.4	21.3	23.9
Nissho Iwai	86.2	39.3	10.0	15.8	21.1
Subtotal	772.4	389.4	104.6	104.6	174.7
Tomen	58.7	27.9	6.1	6.9	17.8
Nichimen	49.4	23.2	4.3	3.5	18.3
Kanematsu	47.4	12.7	8.8	19.2	6.7
Total	927.9	453.2	123.8	134.2	217.5
Share of Trading Companies Total Sales (percentage)	100.0	48.8	13.3	14.5	23.4

Source: Figures calculated from Japan Foreign Trade Council, Inc. as reported in Keizai Koho Center, *Japan 1995*:

An International Comparison.

Note: Yen/dollar exchange rate = Y111.2=\$1.00

Table 4. Involvement of Japan's nine major trading companies in Japan's trade, JFY 1989-1993

	(billions of yen)				
	FY 1989	FY 1990	FY 1991	FY 1992	FY 1993
Exports of Nine Major Trading Companies From Japan	20,836	15,412	15,639	15,384	13,768
Japan's Total Exports ¹	38,883	41,877	42,696	43,055	39,616
Trading Companies Share of Japan's Exports (percentage)	53.6	36.8	36.9	35.7	34.8
Imports of Nine Major Trading Companies to Japan	28,736	23,077	20,010	18,241	14,926
Japan's Total Imports	30,407	34,171	30,972	29,224	24,550
Trading Companies Share of Japan Imports (percentage)	94.5	67.5	64.6	62.4	60.8
Trading Companies Total Trade (Exports and Imports) ²	49,572	38,489	35,649	33,625	28,694
Japan's Total Trade	69,290	76,048	73,668	72,279	64,166
Trading Companies' Share of Japan's Total Trade (percentage)	71.5	50.6	48.4	46.5	44.7

Source: Figures were calculated from Ministry of Finance and Japan Foreign Trade Council, Inc. data, as reported in Keizai Koho Center, *Japan: An International Comparison* (various years).

¹Customs clearance basis, exports, f.o.b., imports, c.i.f.

²Total does not include trading companies involvement in third country trade.

However, these very relationships and affiliations may also affect the volumes, prices and types of imported foreign products which are handled by trading companies. Nonetheless, many foreign companies with inadequate knowledge of, or experience in, Japan's market employ the trading companies' services to gain at least limited entry to Japan's markets.

In addition to their predominant position within the domestic economy, Japanese trading companies play a leading role in supporting the overseas activities of Japanese firms, including those in Asia, and in facilitating trade between third countries. They serve as the linchpin linking supply and demand points worldwide. Through their efficient and extensive global communications and information-gathering networks, the trading companies provide key services (sourcing, financing and marketing) to companies

with fewer resources and capabilities. The net effect of trading companies' assistance is to minimize the risks associated with changing prices, exchange rates, and local regulations for Japanese firms. They also help to lower the transaction costs associated with the physical distribution of products in foreign markets.²⁸

In Asia, as in other overseas markets, the trading companies serve as project organizers on large-scale engineering and construction contracts.²⁹ They facilitate Japan's overseas development assistance, secure sales contracts and financing, act as the plant supplier, and provide technical advice and consulting services to all stages of the project.³⁰ There is a "tight corporate hierarchy" between the trading company and its banks, and the trading companies' branch networks. Typically, the parent companies in the networks retain research and development, marketing, and financial analysis functions. The subsidiary, while restricted in its ability to sign contracts or to initiate a new project, is responsible for local shipping and supervisory functions. By maintaining strong interfirm linkages, the trading companies serve as important intermediaries between local suppliers, parent companies and customers in Japan.³¹

Keiretsu Presence in Selected Asian Economies

Given the information about keiretsu activities in Japan, a key question is: how much of a presence do they have in Asia? In order to provide additional understanding of the extent of keiretsu involvement in selected Asian countries (Indonesia, Malaysia, and Thailand), a data base of Japanese affiliates and their respective keiretsu was developed, according to the following methodology. First, the Japanese firm and host country for investment were identified using Japan External Trade Organization's (JETRO) 1994-1995 *Directory of Japanese Affiliated Companies in Asia*. The survey, while not a complete listing, provides extensive coverage of Japanese affiliated firms operating in various business fields in Asia. The 1994-95 survey lists 3,574 companies operating in Hong Kong (299), Korea (218), Brunei (3), Indonesia (348), Malaysia (557), the Philippines (237), Singapore (1,244) and Thailand (668). The survey covers those Japanese affiliated companies in which "10 percent or more ownership is held by one or more Japan-based companies." Local subsidiaries and subsidiaries of subsidiaries are also included in the survey coverage. All 1,573 companies in Indonesia, Malaysia, and Thailand that are listed in the JETRO survey were included in the data base.

Secondly, the parent company for each Japanese affiliate and its related corporate grouping was identified by cross-referencing the JETRO directory with Dodwell's *Industrial Groupings in Japan 1994/1995*. Dodwell's categorization of keiretsu (horizontal, vertical, production and distribution) was used for purposes of identifying the affiliated grouping for each Japanese firm investing in the selected countries. However, the survey focuses mainly on the horizontal and vertical keiretsu. The six major horizontal keiretsu are: Mitsubishi, Mitsui, Sumitomo, Fuyo, DKB and Sanwa. IBJ and Tokai are considered to be medium-sized keiretsu. Thirty-eight vertical groups were profiled by Dodwell and used for purposes of this data base. A broad based set of criteria was used to match each overseas investor with its affiliated grouping in Japan. If the parent firm of the overseas affiliate was listed as a Presidential

²⁸ Katano, 59, 68, and 72.

²⁹ Mitsui & Co., Ltd., *Service Guide*, 1995, 7.

³⁰ Robert M. Orr, Jr., *Japan's Foreign Aid Power* (New York: Columbia University Press, 1994), 60-61.

³¹ Edgington, 98-108.

council member, as having equity ties,³² or as having personnel ties to one of the groups, it was considered to have an affiliation with that group.³³

According to table 5, the highest number of affiliates associated with one or more keiretsu (both horizontal and keiretsu) in Japan, as a proportion of the total sample size occurred in Indonesia (61 percent), followed by Thailand (48 percent) and Malaysia (45 percent).³⁴ In Thailand, 295 affiliates were associated with one of the horizontal keiretsu, compared with 212 in Malaysia and 211 in Indonesia. (The totals include firms that belong to more than one keiretsu, either vertical or horizontal). Those horizontal keiretsu with the highest number of affiliated firms in the three countries were: DKB (128), Mitsui (116), Sumitomo (109) and Mitsubishi (104). The six major keiretsu had the largest numbers of affiliates in all three countries compared to the two medium-sized keiretsu. By country, DKB, Mitsui and Mitsubishi exhibited the highest numbers of affiliates in Thailand, compared to keiretsu affiliates in the other two countries. Of note, Mitsubishi had relatively fewer numbers of affiliates in Malaysia (23) compared to its presence in Indonesia (31) or Thailand (50) and compared to the other keiretsu with affiliates in Malaysia.

There were 76 affiliates associated with vertical keiretsu in Thailand, 66 in Malaysia and 31 in Indonesia. The vertical keiretsu with the highest numbers of affiliated firms were: Hitachi (26), Toyota (24), Matsushita (19), Toshiba (16), Nippon Steel (14), and Nissan (12). By country, Hitachi and Matsushita's affiliates in Malaysia and Toyota's affiliates in Thailand and Indonesia were the most noteworthy in terms of numbers. Other keiretsu with a moderate presence were Toshiba and Nippon Steel in Malaysia and Thailand (table 6).

When examined by industry, keiretsu were found to have invested in 40 industries in Indonesia, 43 in Malaysia, and 49 in Thailand. Japanese affiliates with ties to keiretsu in Japan were involved in producing or distributing both capital and consumer goods (furniture, housewares, cosmetics, and

³² Previous research has indicated that equity ties of even less than 10 percent may be enough to affect the behavior of Japanese firms regarding their relationships with other Japanese firms or groups. As such, a minimum threshold for share-holding was not designated as a criteria for determining a firm's keiretsu affiliation.

³³ The term "affiliation" is defined here as meaning to have some type of equity or personnel ties or other business relationship to the group. Although Dodwell provides some indication of the "degree of inclination" of firms to their related keiretsu, no attempt to assess or to quantify the strength of the ties between the investing firm, the parent firm and the group was made. However, in general, it can be said that in many cases the inclination of the parent firm to the group is quite strong. The purpose of presenting information on the Japanese affiliates in East Asia and their related grouping is to indicate the scope and extent of keiretsu presence, regardless of the strength of the ties among members, in the selected countries. The degree of control and closeness of the linkages among firms differs among various keiretsu groups. In addition, individual firms may have relations with more than one keiretsu or have their own vertical group while belonging to a horizontal group, for example. In many cases, the parent firm of the Japanese affiliate could not be identified through available reference sources. Due to incomplete coverage of the actual number of investments in the JETRO survey and difficulties in tracing the identification of the parents or other firms affiliated with the Japanese investments in the selected countries, the totals for the number of firms affiliated with keiretsu is likely understated.

³⁴ For purposes of this data base, in cases where a parent firm was identified as having relations with more than one keiretsu, the multiple affiliations are included in table, but were only counted once in the summary statistics provided above.

Table 5. Japanese affiliates in Indonesia, Malaysia and Thailand associated with keiretsu

	Indonesia	Malaysia	Thailand
Number of affiliates associated with vertical keiretsu	31	76	67
Share of total number of affiliates (percentage)	9	14	10
Number of affiliates associated with horizontal keiretsu	188	212	295
Share of total number of affiliates (percentage)	54	38	44
Number of affiliates associated with keiretsu	212	251	320
Share of total (percentage)	61	45	48

Source: Data was compiled from JETRO's *Directory of Asian Affiliated Companies in Asia* and *Dodwell's Industrial Groupings in Japan 1994/1995*.

Table 6. Japanese affiliates in Asia associated with keiretsu, by name of group

Name of keiretsu	Indonesia	Malaysia	Thailand
Horizontal			
Mitsubishi	31	23	50
Mitsui	33	31	52
Sumitomo	32	36	41
Fuyo	23	35	39
Sanwa	25	38	37
DKB	37	36	55
Tokai	19	11	15
IBJ	11	2	6
Vertical			
Toyota	9	4	11
Hitachi	3	18	5
Bridgestone	1	1	1
Nippon Steel	2	7	5
Fujitsu	1	3	0
Tokyu	1	1	2
Honda	3	3	3
Kajima	2	1	0
Matsushita	2	10	7
Shimizu	1	1	0
Sony	1	2	3
Mazda	1	0	0
Nissan	1	5	6
Toshiba	1	8	7
Sharp	0	2	2
Sanyo	0	1	1
Taisei	1	1	0

Table 6—Continued. Japanese affiliates in Asia associated with keiretsu, by name of group.

Name of keiretsu	Indonesia	Malaysia	Thailand
Isuzu	2	2	5
Kobe Steel	0	1	0
Aeon	0	0	1
NEC	0	5	5
Ito-Yokaido	0	0	1
Kintetsu	0	0	1
Canon	0	0	1
Total	242	288	362

Source: Data was compiled from JETRO's *Directory of Asian Affiliated Companies in Asia* and *Dodwell's Industrial Groupings in Japan 1994/1995*.

jewelery, for example) and services (banking, insurance, trading, shipping and freight forwarding). In Indonesia, those sectors with the greatest number of keiretsu affiliates included automotive parts and accessories; banking; chemicals; construction; construction materials, textiles and trading. In Malaysia, those sectors with high keiretsu affiliation included: electrical and electronic appliances; audio and video products; metals; automotive parts and accessories; and trading. In Thailand, the sector with the highest keiretsu affiliation was electrical and electronic appliances while other sectors with large numbers of keiretsu affiliates included automotive parts and accessories; freight forwarding and warehousing; chemicals; construction; textiles; and trading (table 7). Based on this information, it appears that the keiretsu are involved in a wide variety of manufacturing, distribution and transportation activities in these economies.

Keiretsu Operations in Asia

Given this information about the extent of keiretsu presence in Asia, what are some of the other characteristics of Japanese investments in Asia, including affiliates associated with keiretsu? Surveys of

Table 7. Japanese affiliates in Indonesia, Malaysia and Thailand associated with keiretsu, by industry.

	Indonesia	Malaysia	Thailand
Advertising	0	0	1
Architects and engineers	0	0	4
Audio and Video products	1	15	8
Automobiles	1	2	11
Automotive parts and accessories	20	11	21
Banking	20	12	6
Bearings	0	0	3
Bicycles and Parts	1	2	0
Chemicals, paints, pigments and related	11	3	16
Clocks and watches	0	0	2
Communications and telecommunications	1	2	3
Computer parts and software	1	6	4
Construction	15	10	15
Construction equipment	3	0	3
Construction materials	9	1	1
Consultants	3	3	1
Cosmetics	1	0	2
Design	0	0	1
Department stores	2	1	5
Electric power and equipment	1	0	7
Electrical and electronics appliances and parts	10	46	40
Feedgrains	1	0	0
Food and beverages	0	2	8
Fishing	5	0	0
Freight forwarding and warehousing	2	2	17
Furniture	0	1	0

Table 7—Continued. Japanese affiliates in Indonesia, Malaysia, and Thailand associated with keiretsu, by industry.

	Indonesia	Malaysia	Thailand
Gas appliances	0	0	1
Garments and accessories	3	0	3
General merchandise	0	0	2
Glass and glass products	1	4	3
Golf courses	1	0	0
Hotels	3	1	0
Housewares	0	1	0
Industrial Ceramics	0	1	0
Insurance	3	9	5
Jewelry	0	0	1
Leasing	8	3	6
Machine parts and components	0	2	0
Machinery	6	4	4
Medical equipment	0	0	1
Metals	10	18	19
Mining, oil and gas extraction	1	0	1
Motorcycles and parts	1	5	3
Office Equipment	0	5	1
Optical and photographic equipment	0	2	3
Petroleum refining	0	1	2
Pharmaceuticals	4	0	
Plastics, resin and molds	2	6	8
Real estate	8	0	2
Restaurant	0	0	1
Securities	2	0	6
Semiconductors	0	1	3

Table 7—Continued. Japanese affiliates in Indonesia, Malaysia, and Thailand associated with keiretsu, by industry.

	Indonesia	Malaysia	Thailand
Shipbuilding	2	0	3
Shipping	3	2	3
Textiles	11	4	16
Tires and rubber materials	2	1	0
Tools	0	1	2
Trading firm	22	32	24
Transportation Services	0	2	0
Trucks and industrial vehicles	0	1	2
Wood products	1	3	0
Products, others	6	11	4
Services, others	2	1	4
Others	2	1	4

Source: Data was compiled from JETRO's *Directory of Asian Affiliated Companies in Asia* and *Dodwell's Industrial Groupings in Japan 1994/1995*.

Japanese companies conducted by the Ex-Im Bank and statistics published by the U.S. Department of Commerce and Japan's Ministry of Trade and Industry provide some insight into Japanese investments with regard to ownership, type of investment, reason for investment, and their sales and procurement behavior. The survey evidence suggests that Japanese firms are not just shifting their production bases to Asia to secure lower-cost wages and to export to third markets, but that they are also very interested in gaining local market shares, especially for transport machinery, iron and steel, other manufacturing and chemical products. "Preservation or expansion of market share" is the leading reason given by Japanese firms surveyed for investing in ASEAN or the NIEs while "development of new market" is the main reason for investing in China.³⁵ According to MITI data, 66 percent of total sales by Japanese affiliates in Asia are directed at the local market. As such keiretsu practices employed in downstream distribution channels could have an affect on market opportunities. At the same time, Japanese affiliates in Asia continue to import almost 38 percent of their inputs from Japan for manufactured goods.³⁶

There is increasing statistical and anecdotal evidence that at least some business practices associated with keiretsu in Japan, are also employed in Asia. For example, in some cases Japanese auto firms have demanded lower prices for parts and higher quality standards from their suppliers during economic downturns. The local suppliers, who are locked into producing products according to the Japanese manufacturers specifications, have no choice but to comply.³⁷ As in Japan, the parent or dominant firm supplies the capital, technology, managerial expertise and a market, through established distribution networks. The dominant firm is able to maximize the benefits resulting from quasi-integration and long-term relations and minimize its risks. In exchange, the supplier is expected to produce parts, investment in production equipment and provide training to employees in accordance with the parent's criteria.³⁸ As in Japan, the effect of such relations may be to limit outside suppliers' opportunities.

There are indications that "buy Japanese" preferences, prevalent in Japan, also appear to be favored by Japanese firms in Asia. Japanese auto producers in Asia, for example, continue to purchase high-end parts from Japan or from Japanese affiliates that have followed them offshore. In Singapore, Japanese electronics firms purchase almost 80 percent of their audio video components from other Japanese companies located there. In fact, Japanese affiliates in Asia continue to import almost 38 percent of their inputs from Japan for manufactured goods.³⁹ Anecdotal evidence suggests that the effects of these practices and close manufacturer-supplier relations in Asia may be exclusionary. For example, U.S. auto producers claim that they have already experienced difficulties in finding local firms willing to supply them in Asia because of ties to Japanese producers.

This information regarding the characteristics of Japanese investments in Asia, when viewed in the context of the keiretsu affiliate data suggests that for manufactured goods and other industries where there is a keiretsu presence, there may be a high degree of intra-keiretsu purchasing and distribution. A high proportion of overall transactions by Japan's Asian manufacturing affiliates takes the form of intra-firm trade. The most recent statistics available indicate that 59 percent of all sales and 63 percent of all

³⁵ *Ex-Im Review*, Vol. 14, No. 1, 1994.

³⁶ MITI, *Kaigai Toshi Tokei Soran*, No. 5, 1994.

³⁷ Hatch and Yamamura, p. 31.

³⁸ *Ibid*, p. 57.

³⁹ MITI, *Kaigai Toshi Tokei Soran*, No. 5, 1994.

purchases for manufacturing affiliates are intra-firm transactions (Tables 8 and 9).⁴⁰ Local and foreign firms, including U.S. companies, are likely to face keen competition in these product areas and face difficulties in accessing both upstream and downstream channels where there is a predominant keiretsu presence.

Implications for U.S.-Japan Relations

While more research is required to fully understand the practices of individual companies, some conclusions can be drawn based on the available evidence regarding the implications of the keiretsu in Asia for U.S.-Japan economic relations, including market access. Entire Japanese manufacturing and distribution channels have relocated to Asia -- including manufacturers, suppliers, retailers, banks and trading companies. Based on a limited sample, a majority of these companies, in at least the selected countries of Indonesia, Malaysia and Thailand, have ties to the keiretsu in Japan. The companies surveyed are involved in numerous industries, producing and distributing both capital and consumer goods. The "keiretsufication" of those industries where Japanese firms have made extensive investments such as electronics, autos and parts, chemicals, banking, construction and metals, may affect market opportunities for non-keiretsu suppliers and distributors, including both domestic and foreign firms. To the extent that Japanese firms in Asia are duplicating their home-market organizations and practices, there is reason to expect that foreign firms, including U.S. companies, may experience difficulties in entering markets in Asia. This includes purchasing components, becoming keiretsu suppliers or marketing products to local consumers.

Despite some of the potential problems for foreign firms, there may be several advantages for local economies associated with the replication of Japanese keiretsu in Asia. To the extent that some local firms are brought into the keiretsu and transfers of managerial and technological skills occur, there may be gains to the Asian economies in terms of raising productivity, quality control, and production management. Consumers could benefit from the introduction of new products and improved service. Localities adjacent to Japanese production facilities and industrial estates have already witnessed improvements to infrastructure, such as new highways that are built by the investing firms.

From a U.S. perspective, if American firms are found to be excluded from supplier/distributor or other contracting opportunities as a result of Japanese business relationships in Asia, the U.S. or other governments may be pressured to seek negotiations with host countries. However, it may not be that easy to determine the appropriate negotiating partner because the distinction between perceived local barriers to trade and investment and "transplanted trade barriers" is likely to become blurred. The interlinkages between Japanese keiretsu and local economies will make it more difficult to distinguish the actual origins of market access problems which could either be attributed to transplanted keiretsu practices, indigenous practices, or the practices of local firms that have been integrated into the keiretsu. It will therefore be very important that accurate and complete information about any problems that U.S. firms face in Asian markets be relayed to U.S. negotiators in order to minimize misunderstandings and to avoid unnecessary trade negotiations.

⁴⁰ MITI, *Basic Research on Business Activities Abroad*, reported in *Vision for the Economy of the Asia Pacific Region in the Year 2000 and Tasks Ahead* (August 1992).

Table 8. Ratio of transactions (procurements) in the same group (proportion of intra-firm transactions to total transactions), JFY 1989.

(percentage)				
Procurements	Local	Japan	Third Country	Total
All industries	10.3	63.2	3.7	18.0
All manufacturing	4.1	62.6	23.9	29.1
Chemicals	2.8	83.8	33.6	33.7
Industrial machinery	0.6	79.1	32.3	35.3
Electrical machinery	5.1	65.3	29.8	35.1
Transportation machinery	2.3	48.9	0.7	21.8

Source: MITI, *Basic Research on Business Activities Abroad* reported in *Vision for the Economy of the Asia-Pacific Region in the Year 2000 and Tasks Ahead Report* (August 1992).

Table 9. Ratio of transactions (sales) in the same group (proportion of intra-firm transactions to total transactions), JFY 1989.

(percentage)				
Sales	Local	Japan	Third Country	Total
All industries	4.4	34.3	14.8	16.1
All manufacturing	6.5	58.9	37.2	21.0
Chemicals	4.2	40.2	35.1	11.5
Industrial machinery	0.6	98.5	45.4	29.6
Electrical machinery	12.9	60.3	43.9	36.7
Transportation machinery	6.2	35.7	8.5	6.8

Source: MITI, *Basic Research on Business Activities Abroad*, reported in *Vision for the Economy of the Asia-Pacific Region in the Year 2000 and Tasks Ahead* (August 1992).

In general, researchers are divided in their views about whether the keiretsu and production networks are opening to outside firms in Japan and overseas. According to one view, keiretsu networks are indeed facing pressures to open up as the costs of maintaining less productive group members increases. In addition, as firms are inclined to enter into more cross-national alliances, keiretsu interfirm ties may weaken.⁴¹ However, in the short term, there is less of a chance that keiretsu member ties will ease. It appears that keiretsu firms are likely to switch to new suppliers only as a strategy of last resort. There are not yet enough internal and external pressures to reverse decades of closed purchasing behavior and preferential business relations. This is because the underpinnings of the close firm relations, such as the emphasis on loyalty, obligation, long-term stability and “buy national” preferences have not disappeared even as the economic pressures to do so have. Nor have many of the financial and non-financial incentives which help to cement in-group ties fallen into disuse. For example, a 1996 JFTC report indicates that such practices as rebates and restrictions on non-OE parts sales continue to be prevalent in the Japanese auto industry.

The first step toward addressing market access issues associated with keiretsu overseas is to identify specifically the extent and types of business practices underlying their production and distribution networks. Over the long-term, both regional (APEC) or multilateral fora (OECD, WTO) could address issues regarding differences in competition policy, business organization, and economic structures among countries, beginning with joint studies.

In the meantime, there is no reason to expect complete convergence between Japanese and U.S. economic systems. Significant differences are likely to remain. It is highly likely that Japan will not abandon the keiretsu in the short-term, despite current economic or political pressures. Their activities will continue to highlight the contraposition of industrial policy and competition law, both overseas and in Japan.

⁴¹ Ernst, pp. 33-34.

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Comments by Edward Lincoln on
Japanese Group Boycotts and Closed Government Procurement as Barriers to Trade
by Mark Tilton
and
Japanese Corporate Activities in Asia: Implications for U.S.-Japan Relations
by Diane Manifold

MR. LINCOLN:

I will make some broad comments about the papers, and a bit about how they relate to APEC. Let me start with the paper of Mark Tilton.

He describes market behavior in Japan that I think has very disturbing implications for the future of APEC as a regional mechanism for moving toward more open markets. Japan is a country where the reduction in border barriers, the easing of tariffs, and other measures, do not seem to have made the market more open, or more open at least in certain industries.

We must ask to what extent his case studies, cement and steel, are generalizable to the rest of the Japanese economy? That is not an easy question to answer. I am just going to answer with anecdotes. Generalizing from anecdotes is even more dangerous, but I thought I would give you the flavor of some of the things that go on in Japan.

We had an interesting episode in glass within the last 2 years in Japan. Glass is another market in Japan that has been closed, and there has been pressure from American glass companies to open it up. We have a bilateral agreement that is supposed to make the market more open.

Central Tokyo has a new performing arts center. It is a Tokyo municipal government project, and the Japanese construction company has close ties with a particular Japanese glass company. The Americans lobbied to put in a bid. The Americans had both the lower price and higher quality glass. The arts center required a great deal of specialty glass.

The construction company's initial attempt was to go with their traditional supplier. After pressure had mounted, the construction company's final solution was to cut and to paste. It divided the building into halves. The Japanese glass company got one-half of the building, the American company got the other one-half. The Japanese glass side of the building faces the bank that the Japanese construction company has a relationship with. I find that really wonderful.

I have a second anecdote. Tokyo Steel, as Mark mentioned, is the minimill in Japan that is not in the same cartel with the integrated steel producers. There is a rumor that I heard from a representative of one of the integrated mills in Japan, that the cartel members in Japan, over the last 6 months to a year, have been trying to buy up scrap steel in Japan to drive up the price. And this scrap is the raw material input for Tokyo Steel, and the cartel members do so to drive Tokyo Steel thereby out of business. At this point, the summer of 1997, this maverick steel company is apparently tottering on the verge of bankruptcy.

A third anecdote involves airline deregulation in Japan, one of the more successful things we have already done in the United States. Every Japanese Government official will tell you that Japan is now

carrying out domestic airline deregulation. The proof is that they will allow a newcomer to the market, probably next year.

It is true that prices have been at least partially deregulated in Japan, with the effect that prices have gone up at least on some routes. The fact that prices went up is presumably the reason why this new company is coming in. It wants to service the busiest route in Japan: Tokyo to Sapporo, which is one of the routes where prices did go up. And so the Japanese tell us that this is the symbol of deregulation.

However, in contrast to U.S. conditions, the Ministry of Transportation retains control over the allocation of routes, frequencies, and timing of landing slots at the airports. Such newcomers to the market as this one airline will be granted six landing slots at Honeida Airport. I cannot imagine trying to run an entire airline with six landing slots. In essence, this company will serve Sapporo only and with only six round trips a day. In essence, the Ministry has guaranteed that this company will have high operating costs, because it is going to have fixed investment in its gates and sales infrastructure. It will have high operating costs, and therefore be unable to cut prices in the market very much. In my opinion, the cartel in domestic airlines remains largely intact.

From an APEC standpoint, we should specifically worry about Japan. Here we have an organization trying to push forward a generally more liberal regime for all countries for market access. I think this the evidence we have on behavior in domestic Japanese markets raises serious doubts as to whether Japan will actually live up to whatever commitments it makes in APEC.

On any of the topics that we have talked about--steel, cement, airlines, or glass--the Japanese Government tells you the market is open, that there is no problem. It asks, What are we? What is there to negotiate about? What is your problem? Your problem must be inferior quality of your product. You do not try hard enough to get into the market.

We are likely for a long time to see token gestures towards complying with any APEC principles as they evolve over the years, but we will see far less real change on the ground. I hope that other panels this afternoon and tomorrow ask whether this example of Japan we have been looking at represents a kind of "Asian way," as Mahatier would like to put it. The Asian way is one of cartels, secret deals, price gouging, mutual back scratching, and other kinds of state-condoned private exclusionary practices. I think that these are probably the conditions. Japan may be a little more sophisticated, subtler than other countries. But I think that this kind of behavior is not exactly an "Asian way" alone. It is simply the way of most of the world.

Perhaps we do not observe it as much around the region because wages are very low. If they are conspiring to hold prices up, they are holding them up from a lower level. Mark's example of cement, for example, focuses on Korea as the potential supplier of cement to Japan. I do not think competition in the cement industry in Korea is probably any better than the competition in the cement industry in Japan, but at least the Koreans have a lower wage structure. So the Koreans are in a position to undercut prices in really high-price markets like Japan.

Certainly I think we should worry about the Japanese example. We should worry about whether we are going to see similar problems in other countries, where there is a visible process of moving forward with token gestures of market opening, where we see far less real reform when we really look carefully.

This is important because now Japanese firms are moving into the rest of Asia, taking their notions of market behavior along.

That note brings me to Diane Manifold's paper. I think Ms Manifold has done some very important work here in identifying trends: To what extent have Japanese companies moved into Asia, and to what extent does this represent an export of keiretsu structures around the region?

There are two questions here. One is whether some of the numbers we see are high or low? Diane mentioned the percentage of sales and purchases of Japanese manufacturing firms in Southeast Asia, and the extent to which those transactions are intrafirm transactions. It would help if we could frame those data and pin those data down in a more comparative context. Is this or figure really high, relative to what American and European firms do in Southeast Asia?

And in some sense, you could argue that virtually every firm in Japan that invests elsewhere in the world is in some form or shape a member of a keiretsu. Even a small Japanese textile firm that chooses to move into China is likely to take explicit advice and help of a Japanese trading company, and probably the bank that the trading company deals with.

And so in a sense, they are going with a set of real ties that lock them into working with whomever that trading company works with, even though they may not show up in the data as belonging to the big recognizable keiretsu. So the keiretsu question asks to what extent these long-term ties that push a company towards dealing with the same firms that it would have dealt with in Japan, even though they are thousands of miles away, may apply to nonkeiretsu firms to some extent as well.

The other question here is how much these relationships affect American and other foreign firms trying to do business in the region? As Diane put it, U.S. companies may experience difficulty in entering markets in Asia. In essence, this process is still an unknown for us. We do not have a lot of anecdotes yet. We have not looked very carefully at this issue yet. We assume that such problems do exist and are likely to become more serious, but we do not really know all that much.

I can give you a couple of small instances of the difficulty. For example, several years ago Indonesia was to undertake a major upgrade of its telephone system, and invited foreign bids to supply the equipment. AT&T lost the bid, even though it had superior equipment at presumably a competitive price. AT&T lost the bid because the money to finance the upgrade of the telephone system was from the Japanese Government. The Indonesian Government decided--either on its own or perhaps with a little subtle or not-so-subtle pressure--to buy the equipment from Japan. After the U.S. Government made a big protest about it (much like the example I gave you on glass), the Indonesian Government decided to play "cut and paste." It divided the contract into two halves, between AT&T and the Japanese.

For another example, Japan has a two domestic standards for cellular telephone service. It has its peculiar standard, and it has also adopted the Motorola-generated standard in wide use in the United States and Europe. AT&T developed the Japanese peculiar standard, and the standard has now been adopted for the first time by a foreign company. Cambodia has adopted it for cellular telephones in Cambodia. And the financing for the construction of the cellular telephone industry in Cambodia is coming from Japanese foreign aid money.

These minor anecdotes suggest that connections of one sort or another have disadvantaged American firms. So this kind of difficulty is certainly a topic we want to think about although we really do not know yet how much of a problem there is.

In a broader context, this difficulty of entry is a problem for APEC. As a process, APEC is supposed to be moving all of the countries in this region towards more openness. But maybe we have Japanese companies coming in with their greater openness, and closing some of these markets back off by importing their own exclusive practices.

How the rest of the region feels about this is something, again, that I do not think we know very much about. My perception is that Asian economies have welcomed the flood of Japanese firms over the past decade. The firms often brought with them large amounts of ODA money to provide the supporting infrastructure for industrial development. The firms brought jobs and higher wages with them. So why should they complain if the Japanese want to do business with themselves? Whether the countries will maintain that attitude in the future is something I do not think that we know very much about. So as we think more broadly about APEC, I think the issues raised in this panel were important ones.

For autos, the cost of the basic materials--the steel and the chemicals that are expensive--are 10 to 15 percent of total cost. And those costs are absorbed and made up for. When you talk to people in the auto industry, they say that the Japanese steel industry has invested money in producing very innovative, high-quality stainless steel. A kind of compact exists that the auto industry buys almost all of its steel from domestic steel companies--in exchange for the steel companies making this investment in new forms of steel.

The domestic steel companies certainly benefit from having a portion of the steel produced of very high quality. In a more fluid, competitive market, the auto companies could very easily buy a lot of their lower grades of steel from Korea, but there has been an industry decision not to do that.

Other industries in construction have very high prices. That makes it easy for construction firms to absorb expensive steel and cement. Construction costs in Japan are about twice what they are in the United States. It appears that construction then cross-subsidizes industries like shipbuilding that get small discounts. The steel industry also gives small discounts, for instance, to the shipbuilding industry, because it is under intense competition. It gives small discounts even to the electronics industry. These little deals are made to bring these prices down somewhat for exporting, so that exporting industries that are then cross-subsidized by nonexporting industries.

So there is really just a tendency here to deal with "who you know." We can get a cultural explanation of this tendency, but the people are the people you know you have dealt with in the past, and those people have adapted to your needs. You know that if future adaptations need to be made, they can make them. On the other hand, someone who offers you a 10-percent lower price may be a person whose product may not be exactly adapted to your needs, and you may not know furthermore whether he can make any future adaptations as technologies change, as the markets change, and as markets demand different products from you.

So I do not see this pattern as pernicious, and I will extend it to discussion of ethnic Chinese networks in trade later on. Dealing with whom you know, who has proven to fit your needs in the past, is a business practice worldwide, including this country's firms. It is not Japan-specific or pernicious.

I think I agree with that. Maybe we can draw a distinction between consumer products and industrial products, where the nature of competition tends to be somewhat different. It is a little harder to control consumers than it is to control a small number of buyers in an industry. But even with consumer products, there is positive change.

My favorite story is beer. The price of beer has come down from roughly 220 yen per can to about 190 yen per can. That works out at current exchange rates, to 7 or 8 dollars a six-pack. And people think that is cheap. And yet the price of beer came down and then seemed to level off at that point. A lot of excess profit was still sitting in the industry that I would have thought would need a much more competitive market, and which would wring out the system. But that is not happening yet. But still, progress is progress. You take it where you can get it.

Let me just add one [more] comment. One thing we have already seen in the APEC context is that we should not anticipate that Japan will play much of a real leadership role. There are few areas where the Japanese really want to be the force for making things more open; that is not in their interest at home.

But I would add that there are some areas where maybe the Japanese do have an emerging interest in having things more open. If not at home, the Japanese are interested in greater openness at least around the rest of the region, certainly so in an area like intellectual property right protection, where Japan's own record at home is not the greatest. But they are far beyond China at the present time. And one would like to believe that on some of these issues Japan would at least be an ally in helping others, like the United States, if we choose to push hard on some of these issues.

Comment by Steve Parker on

**Japanese Group Boycotts and Closed Government Procurement as Barriers to Trade
by Mark Tilton**

Professor Tilton presents a convincing story of how Japan has used private sector cartels supported by government administrative actions to keep domestic prices well above world prices while simultaneously limiting imports and propping up exports for two key industries -- cement and steel. These practices contribute to the widely held presumption that "Japan Inc" (a set of common national objectives implemented through cooperation (collusion?) among businesses and government) uses informal trade and investment barriers to restrict imports and to subsidize indirectly exports even while formal trade barriers decline to insignificant levels.

Furthermore, and quite importantly, he documents why there has been limited domestic pressure to break these cartels, either from local competitors and consumers or government regulators. His argument falls back on "Japan-Inc's" dedication by producers, consumers and government officials alike to support key elements of the manufacturing sector, even when high domestic prices result. Critically, however, he also shows how underlying the Japan Inc consensus is a web of personal interest stories ranging from financial support by cartelized sectors for government political activities, the practice of hiring retired bureaucrats in cushy jobs often through support from formerly regulated firms, and the use of business associations to enforce cartels, sometimes involving organized crime and other strong-armed methods.

Since cartels are by nature secretive and opaque, his research relies largely on newspaper articles and generally unattributed personal interview sources to tell a story of how firms and government officials enforce the cartels, splicing in real data on prices, output, and trade flows that exhibit cartel-like results -- significant differences between domestic and foreign prices, limitations on output levels, and constrained imports matched with higher than expected exports.

Although Tilton's story line is compelling, and certainly provides enough circumstantial evidence to rile a trade negotiator, I'm left with several questions. First, his argument on how downstream industries absorb the high prices of key inputs is weak. One can see how this works in the construction sector, given that foreign competition is limited and that government (and thus taxpayers) ultimately foot much of the bill. As an aside, this may also explain the ineffectiveness of Japan's fiscal policy expansion in 1994 through 1997, since higher but inefficiently employed government spending on public works yield limited long-term economic stimulus. Tilton's argument on how highly competitive auto and electronic sectors can absorb the high prices for inputs (up to 40 percent on steel) are less well developed. Secondly, he does not describe well how Japanese firms are able to presumably cross-subsidize high levels of exports from these cartelized sectors that exhibit domestic prices at much higher levels than foreign competition. Thirdly, little attention is paid to the swings in exchange rate levels over the last fifteen years that have significantly affected Japanese pricing and market share strategies. Fourth, there is an implicit presumption in the paper that cartels similar to those described for cement and steel permeate the Japanese economy. Is the entire Japanese economy a web of price-fixing cartels supporting mercantilistic tendencies?

Lastly, especially since Tilton's research and data are somewhat sketchy for the last several years, are things changing? What about the new Japan? Is the intensity of foreign competition throughout the Japanese economy and in international markets breaking down the economic and political basis for cartels?

My personal view is to accept Tilton's analysis of cartels in these two sectors (and probably more but not necessarily all sectors), but to raise a hypothesis that considers whether the dynamics of change in Japan are affecting these types of practices, especially as the Asian financial crisis exposes weaknesses in the Asian development model that hold in many cases as strongly for Japan as for Southeast Asia and Korea. This is important for U.S. trade negotiators, who obviously would welcome greater domestic pressure for change in Japan, but also who should be focusing on issues as they evolve in the future rather than as they existed in the past.

Over the last several years, even though Japan's overall economy has been stagnating, import levels have increased substantially. Although far from an ideal market environment, U.S. and other non-Japanese firms now complain less about informal restrictions to entry into the Japanese markets. Hard economic/market realities -- slow growth, high domestic costs, attractiveness of less developing economies catching up to Japan -- seem now to dominate trade and investment decisions with Japan.

Some of this market opening resulted from tough negotiating primarily by Americans (*gaiatsu*), but Japanese producers were severely stressed by the high Yen period in 1995 and 1996 (reaching around 80 Yen per dollar), which combined with weak domestic markets to dramatically lower profit levels and to push many of the smaller firms that support the Japanese keiretsu systems off shore for survival. The banks that generally form the core of the keiretsu systems are burdened by non-performing loans. Few Japanese firms have been able to maintain international market leadership, especially in the rapidly developing high-tech and information technology sectors.

Although it has frustrated U.S. negotiators, Japan seems to have been content with their system that produced remarkable economic and social advances since World War II, and countries rarely make fundamental changes when it is not perceived to be in their own self interest. But have things changed? Are domestic pressures building up for real economic change that will reduce systems frictions between Japan and other economies, especially the United States?

Although recent weakening of the Yen to the 110 to 130 range per dollar has ameliorated price pressure, the effects of the Asian financial crisis has countered with further pressure that limits export demand and dramatically increases price competition from Asian competitors. Many from the outside (and in Japan) are surprised by the slow and weak response by the Japanese government to the weak domestic economic conditions and by Japanese firms to strong competitive pressures. Professor Tilton notes in his conclusion that Japanese businesspersons acknowledged the continuation of cartel behavior during his trip to Japan early in 1997. As we are learning, this behavior is part of a wider system of interests that permeate Japanese government and business institutions, and to some degree Japanese values. The Asian financial crisis poses particular difficulties, and opportunities, because it in many ways deals with a set of systematic political and economic issues that are embedded in the Asian development model. Whether these types of cartels diminish in influence will depend significantly on how Japan responds to the pressures and lessons learned from the Asia crisis, which only adds to the domestic pressures for change arising from lackluster economic performance in the Japanese economy.

Comment by Nagesh Kumar on

**Japanese Corporate Activities in Asia: Implications for US - Japan Relations'
by Diane Manifold**

The paper by Manifold deals with an important topic. It examines if the Japanese production networks in Asia are characterised by traditional keiretsu practices as prevailing in Japan and whether transplantation of these corporate practices acts like a trade barrier for non-keiretsu enterprises. Manifold attempts to answer this question with a survey of Japanese companies in three Asian countries viz. Indonesia, Malaysia and Thailand. The Japanese industry is known to be dominated by keiretsus covering operations in wide range of manufacturing and services. The bulk of smaller companies are also linked with larger keiretsu enterprises as subcontractors. A large part of the dealings of keiretsu enterprises are conducted within the group. This means that outside firms are at a disadvantage in dealing with the keiretsu firms.

Manifold found that 61 per cent of Japanese affiliates in Indonesia, 48 per cent in Thailand and 45 per cent in Malaysia had keiretsu links. Japanese affiliates in Asian countries tend to buy a large part of their requirements of parts or components either from sources in Japan or from established network of Japanese affiliates within the host country. Manifold sees the close manufacturer-supplier relationship practised by Japanese affiliates in Asian countries as exclusionary or as a transplanted trade barrier in that it potentially affects the ability of US firms to sell to Japanese affiliates. This exclusionary behaviour explains 59 per cent of all sales and 63 per cent of all purchases of manufacturing Japanese affiliates represent intra-firm transactions. Manifold concludes the paper with implications for bilateral trade policy negotiations between the two countries.

The analysis presented in the paper is interesting and highlights the concerns of US firms which find it difficult to penetrate the Japanese production networks, in Asia or other host countries. The practice, however, raises concerns for the host country's developmental prospects too. These are related with the diffusion of technology and know-how brought in by foreign companies in the host economies. The recent developmental literature has highlighted the importance of vertical inter-firm linkages that foreign affiliates establish with national firms as an important source of spillovers of knowledge or diffusion of technology in the host country. If foreign firms transplant their entire networks of suppliers and do not develop local sources of supply in their host countries, the diffusion of knowledge would be minimal. Therefore, this issue is important for determining the developmental impact of the FDI on the host economies.

The other point I would like to make is that multinational enterprises are known to internalize transactions within the organization to save transaction costs all over the world. The bulk of international trade of US MNEs is also conducted on intra-firm basis. For instance, in manufacturing, nearly 50 per cent of US exports were made to overseas affiliates of US MNEs with 87 per cent of them being shipped by US parents on intra-firm basis in 1994. The proportion of US imports that are conducted on intra-firm basis is even higher at 66 per cent. That does not, however, necessarily indicate a high proportion of purchases of US affiliates being made on intra-firm basis from other US affiliates within the host country. The source wise break up of purchases of US affiliates abroad is not reported in the Department of Commerce's Benchmark Surveys. On the basis of what is reported, it is clear that 19.5 per cent of purchases of majority owned US affiliates in manufacturing are imported from the US, largely from their parents. In addition, they buy some proportion from other local affiliates and import from affiliated firms in third countries. Lipsey (1998) has worked out the proportion of purchases of US affiliates in developing countries from

other local affiliates and imports from other affiliates in third countries in affiliate sales. Using those proportions to work out the magnitude of affiliated purchases by majority owned affiliates in manufacturing in all countries and compute their proportion to their total purchases yielded 13.1 and 7.28 per cent respectively for affiliated third country imports and affiliated local purchases. Adding up all the affiliated purchases gives us a figure of 39.84 per cent. Therefore, US affiliates may also be buying nearly two-fifths of their purchases from affiliated sources. Although lower than the figure for Japanese affiliates, it still calls for an explanation. The major difference is that in the Japanese case, relocation of Japanese firm assembling the final product is followed by its supplier of components in the home country as well, while in the US case probably some components are purchased within the host countries but a considerable proportion is continued to be bought with affiliated sources of supply.

The modern industries are characterised by a high degree of product competition, which in turn involves a high extent of product specificity and a high element of proprietary knowledge in the component design. These factors tend to raise costs of dealing with unaffiliated suppliers. MNEs tend to lower these transaction costs by internalizing them. Japanese corporations reduce the transaction costs by building a long term relationships and bondage with their suppliers. Whatever be the explanations, these practices do tend to reduce the diffusion of knowledge in host countries and act as trade barriers for unaffiliated enterprises.

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SESSION IV

CASE STUDIES B

China's Nontariff Trade Barriers

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ABSTRACT

During the Pre-reform period in China, planned economy determined the policy and practice in foreign trade sector which is used as a means to balance shortage and surplus. Trading companies were not profit oriented. Examples of allocation distortion are given. The State-ownership exacerbate these distortions. After reform began, restructuring in trading sector gradually removed these distortions, but still a lot to be done. Major non-tariff barriers are discussed, especially regarding entry and foreign exchange. All forms of non-tariff barriers are counted according to the "General list of tariff and non-tariff measures for import/export." A section focusing on the efficiency loss due to these barriers are expounded. Finally, the prospect of future changes are expected, particularly on the problem on equity and efficiency in international trade.

D) Introduction

To understand China's current trade barriers, one must go back and review the trade principle found under the "Planned economy" or "Mandatory Economy" before China's reform began in 1979. The current practice in international trade sector is a modification of what occurred under the previous regime.

According to the Marxist economic theory, the value of products is solely determined by the labour consumed during the production process. As a result, the consumers' willingness to pay is ignored. Price is calculated by the "value" of input elements, not affected by demand. Such economics has led to a distorted price system, where resources are allocated not by price signal but by the planners' subjective verdict.

In an ideal market there is no shortage or surplus, since price can iron out all such disequilibrium, if the transaction cost is ignored. In the planned economy, however, price can not stimulate production to meet demand. Due to this, shortage and surplus were prevalent. Although planners made great efforts to ease disequilibrium the results were ineffective. Import and export was used as an additional means to achieve equilibrium. International trade, therefore, was not based upon comparative advantage, but rather upon so called shortage and surplus. China set a low tariff for goods which were in shortage and deemed should be imported, and set high tariff for goods in surplus and deemed should not be imported. Tariff was not used to protect infant industries.

For example, in 1988 the customs office announced that the import tariff of eye glass plate which can change its darkness following the changes of the ambient light would be increased. China by then had acquired German technology which could produce it and as a result the product was no longer in shortage. When the technology had not been imported, a lower tariff was set. The tariff was eventually raised after the technology had matured. So, the intention behind a tariff in a planned economy leads to protect a matured industry.

The price distortion in planned economy has caused huge losses in resource allocation through the international trade sector. High pressure polyethylene is a good example of what happens when the planned price was set too low which creates a serious shortage. In 1987 a certain domestic producer looking for a better price was determined to export polyethylene which he did to Hong Kong. As the demand, however, could not be met, domestic consumers tried to import from the world market. By chance, the same product, without moving an inch, was "exported" then "imported" to and from Hong Kong. The Hong Kong businessman perpetrated this earned hundreds of thousands of dollars. And the vice minister of Ministry of Chemical Industry was sacked. In fact, this is not his fault, but rather the blame should be placed on distorted price. This sort of problem still exists. China exports and imports tens millions tons of crude oil and oil product every year.¹ Probably China is the only country in the world which exports and imports billions dollars of same product.

Price control can only be achieved in an economy dominated by state-owned enterprises. Where private owned enterprises are the norm, firms will look for profit and price will automatically approach equilibrium. In such condition, if government controls price, black market will eventually emerge, and

¹ China exported 18.8 m tones of crude oil and 4.1 m tones of product oil in 1995, and imported 17.1 m tones of crude oil and 14.4 oil products in the same year. --- *"China Energy Annual Report 1996"*

price control would be hard to implement. Previously all firms in China belonged to the State. In this environment price control was easy to achieve.

Price distortion was not the only cause of economic loss in the trade sector. The ownership of trading companies was also a serious problem. Since many of the trading companies were once and still are state-owned, nobody is held responsible for profit generation. Some company staffs consider their personal benefit to be the number one priority. Reaching a business agreement often brings personal benefit in the form of commission, free visit to foreign country, etc. This encourages company staffs to give up lucrative terms during bargaining. As a result, many trading companies are suffering great loss, and some of them have gone bankrupt.

The incentive to make a profit is very weak in these state-owned companies. The principle behind management is not to make a profit but rather the idea of bureaucratic hierarchy, i.e. the high rank officials make the final decision regardless of whether it is rational or not. On many occasions a trading partner might provide a very favorable business condition which all staffs involved in bargaining reckon the deal should be agreed. If the deal does not have the consent of a high ranking official then ultimately it might fail. The opposite is also true; the condition of a deal might be unfavorable, but a high ranking official would see it in his judgment to make the deal go through. This is why some foreign businessmen see the behavior of their Chinese counterparts to be irrational and find them difficult to negotiate with.

In the context of public ownership, in theory every Chinese citizen has the right to say something in decision making process in business management. In reality the decision is made by the relevant governmental authority. Due to the vague ownership, however, no single body, individual or group, can say the final word and assume the full responsibility. Therefore, the decision process takes long time that is needed for negotiation among ministries and departments. In international trade sector, many groups may involve and their interest are concerned, to reach an agreement is usually difficult.

II) Nontariff barriers in China

A) Barriers on entry

In the international trade sector business was conducted by State-owned import/export firms. No private firm was involved in the trade business at that time. Trade was effectively controlled by the governments at central level and provincial level. Owing to the barriers in entry, little competition was encountered and many trade opportunities were lost.

There are two kinds of trading companies conducting export business: one purchase goods on domestic market then export, the other involve in trading business only as agent.. For small scale producers who make tools and small machinery, etc. they have little ability to communicate the consumers in foreign countries. So they sell their product to trading companies. These companies are State-owned and of small scale. Owing to limited scale, their management costs are usually high, and they can hardly follow the changes on the foreign market. Along with the introduction of market economy into China, competition has forced these small trading companies to restructure even to close down.

For industrial manufacturing factories, they are urged to conduct export through agent trading companies,² so as to establish a closer relationship with final consumers. Such a change requires less entry barriers in trading business. For large manufacturing factories in steel making, coal mining, petro-chemical sectors, they are trying to establish their own trading companies, because they want to follow the market promptly and to reduce transaction costs, especially for those who make products that need maintenance service. Along with the reform in trade sector in China, these large factories have been given the rights to involve in trading business.

According to the Law of International Trade, only approved trading companies have the right to engage in the business of trading.³ Since reform began in 1979 the number of trading company has risen sharply and correspondingly the trade volume has increased by more than six times. At the moment there are about 14,000 domestic trading firms engaged in the import and export business, 2,000 of which are at the county level (China's State-owned-firms are classified according to bureaucratic level, the ministerial, provincial, municipal, and county levels) exporting agricultural and local special products. Most of them have not acquired their own production base and conduct business only as a middle-man. Due to their small scale and limited capital, many are losing money. At a recent conference they were urged to merge with the big trading companies or to engage in domestic trade, which they were barred from till the early 1990's.⁴

In addition to the trading companies, there are about 150,000 foreign funded firms conducting processing export, i.e. import raw materials and export processed products. The share of processing trade, which is about 45-50% of the total trade, against general trade has been falling a little in the current year, showing a development of comparative advantage other than the low labor cost.

Foreign trading companies were not allowed to engage in the international trading business in China. This regulation, however, has gradually been removed. In October 1995, Mr. Jiang, the Chinese president, attended the third meeting of the Asian Economic Co-operation Organization, where he announced that joint-venture foreign trade companies would be set up. Recently three joint-venture trade companies have been allowed to be established.⁵ An official from the Ministry of Foreign Trade and Economic Cooperation (MOFTEC) announced that within three years of China's accession to WTO, foreign businesses in China would be allowed to deal in international trade through an automatic

² China should promote agent companies in trading business. *Economic Highlights*. August 15, 1997. (in Chinese).

³ The Law of International Trade requires five conditions to apply trade license, which are: 1) has set up organization with a trading name; 2) has its specific trading category; 3) has the capacity to trade in terms of space, capital, and professionals; 4) those who have been involved in trade business through agent company have reached a certain quantity of turnover; 5) other conditions according to related laws and rules. On *International Business Daily*, August 6 and 7, 1997, a detailed rules for the approval of trading companies are issued.

⁴ "Small trade firms need revival" *China Daily*, July 19, 1997.

⁵ "First foreign trade JVs set up" *China Daily*, July 12, 1997. In one of the JVs, the foreign capital comes from Mitsubishi Corp. of Japan and Continental Grain Co. of the U.S.A. The other comes from Daewoo Group of Republic of Korea. These JV's are located in Pudong, Shanghai. Another news appeared on *China Daily*, August 3, 1997, reports a third JV firm to open in Shenzhen dealing foreign trade business. The foreign side partner is Dow Trading PRC Inc.

registration system.⁶ For domestic trade companies a similar policy has also been promulgated. Some requirements will remain, however, such as a minimum trade volume which accomplished in previous years.

B) Barriers in Foreign Exchange

Control of foreign exchange is the most critical barrier to international trade business.

In China, before reform began in 1979, foreign exchange was provided only to assigned import/export corporations. All foreign exchange earned by exporters had to be sold to the People's Bank, and importers had to purchase foreign exchange from it as well. Domestic currency was always valued too high, might be 50% higher than equilibrium rate, so as a consequence, foreign exchanges became very scarce.

After reform had been enacted, the control on foreign exchange has been gradually relaxed. The first major step was to create a parallel market for foreign exchange where the exchange rate was closer to the equilibrium rate. Trading companies could retain certain proportion of foreign exchange they earned to be exchanged on the parallel market. This not only revealed the true value of foreign exchange, but also provided a relatively free market for those who buy and sell foreign exchanges. This additional option improved economic efficiency. The same foreign currency, however, has two exchange rates resulting in manipulation and corruption. Officials who control the allocation of foreign currencies can change the quota allocation and exchange for personal benefit. The second major step was the merging of the two markets in 1994. The market of official rate was done away with, but the floating market had been retained. The floating of the exchange rate is now due to supply and demand change, but with intervention from the central bank. The exchange rate is currently very stable; the day to day fluctuation has been less than 0.5%, but has steadily declined from 8.7 to 8.28 (RMB/USD) in the past two and half years. The US dollars has been strong in the past year relative to Japanese yen and German marks, however, Chinese yuan has still gained ground. Currently the persistent surplus found in foreign trade and in the huge foreign exchange reserves (\$120 billion), indicates a further possible appreciation of RMB.⁷

For current account governmental control has been greatly reduced. Chinese people may receive foreign currency, keep it in their own possession or in banks, and withdraw from banks still in foreign currency freely without showing any certificate. People can sell their foreign currency to bank and may also change foreign currency from one form to another. Some people speculate on foreign exchange market and earn a profit.⁸ To buy foreign currency, however, one has to show some sort of documentation, such as passport with visa signed.

⁶ "China to reform trade practice in WTO bid." *China Daily*, June 13, 1997.

⁷ "Yuan hits record high from dollar oversupply." *China Daily*, July 6-12, 1997.

⁸ "Ordinary people play forex game in Beijing." *China Daily*, July 6-12, 1997. The newspaper reports the story that growing number of Beijing residents trade foreign currencies through banks according rates on the international market. This has caused annual transaction values to rise sharply. The average value for each deal is USD3,000 to 5,000 and the maximum is \$200,000. In Beijing, 82.6% of its residents own foreign currency. Foreign exchange savings for individuals in Chinese banks has surpassed more than \$20 billion and continues to grow.

In terms of foreign exchange, Chinese companies do not enjoy as much freedom as individuals; they have to change all their foreign exchange earnings into RMB. Only foreign invested companies and trading companies can keep a foreign exchange account. Import trade companies can buy foreign exchange by showing approved customs declaration form. They can also buy foreign exchange in advance for import purposes, but have to show the approved customs declaration form later. Some importers buy and import foreign goods but pretend it as a gift so as to avoid import taxation. They have to swap foreign currency through various channels, for example: direct buying from companies who export without dealing with bank. But these deals incur a higher transaction cost of a few percent. In terms of capital accounts, strict control is still in effect; only small changes have been made, and up to the year 2000 no fundamental change is expected. To remit the profit of JVs abroad is under control; it is possible only if the profit is in foreign currency. This is why most of JV companies are involving export business.

It is prohibited for Chinese organizations to keep an account in foreign countries, unless special permission is issued.

To turn Chinese RMB into a fully convertible currency, it must be stable, and, especially, can resist the influence of drastic fluctuation of exchange rates. The financial crisis happened in Mexico and Thailand warned China to take a more cautious step.

The maximum amount of foreign currency that one can carry out of the country has increased to US\$2,000 freely, and without limit if he shows a certificate that the foreign currency was withdrawn from the bank.

C) Import and Export Quota, License, Registration, Commodity inspection, and Quarantine, etc.

Prior to economic reform, all goods that could be substituted by domestic products were not allowed to be imported. After economic reforms were implemented, this policy was replaced by licensing or quota control. Export goods were also under similar control. The rationale behind this is to satisfy domestic demand and to maintain the price on the world market. This was especially true for those products which were mainly produced in China, such as tungsten, magnesium and related products.

The year of 1994 saw a major reform in international trade which included tariff reduction. Non-tariff treatments were also reduced but still a lot remained. Currently the total number of eight digit tax code is 6554, among which the number of various kinds of controls are as follows:⁹

⁹ General Customs Administration: General Catalog of Import and Export Tax, and Non-tariff Measurements. This is an official document with 562 pages released on April 1994 and valid up to now. The number of each control in all categories was counted item by item. (in Chinese, also available in English).

Various Kinds of Trade Control

Import license (I)	308
Export license (E)	626
Quota subject to general control (G)	97
Quota subject to electric and machinery control (C)	145
Register at the State Council (S)	454
Quota auctioned at the Electric and Machinery Control Office (T)	116
Import commodity inspection (I)	831
Export commodity inspection (E)	1631
Quarantine inspection (R)	791
Import food hygiene inspection (F)	613
Medical inspection (M)	117

Source: Ministry of Foreign Trade and Economic Cooperation

Many goods are subject to several controls at the sometime, for example, grain subject to I, S, R, F, and commodity inspection; chemical fertilizer subject to G, license, and commodity inspection. Among 6554 eight digit items there are 3372 items, or 51.4%, free of any kind of restriction.

In addition to these, some other kinds of control also are in effective. The "Chamber of Commerce" of various sectors, a semi-governmental organizations, impose export discipline. For example, if metallurgical coke is exported at a too low price due to price competition in domestic market, then the exporter will be deprived of his coke exporting rights.¹⁰ The Chamber of Commerce is a very powerful authority which is in charge of auction, to set lower limit of export goods and impose sanction.

Some times quarantine controls set restriction on import and may cause significant economic impact.¹¹

¹⁰ Authorities won't tolerate undercutting. *China Daily*, July 20, 1997. The news report that coke export by China has increased from 400 tone in 1986 to 4 million tone in 1994, and 8.86 m tone in 1995 mainly bought by U.S.A., Brazil, India and Germany. The coke exports in the first five months of 1997 increased by 54.9% as compared with the same period last year, however, export earnings rose only 40.2%. Many coke producers (about 5,000 in Shanxi Province alone) are competing by undercutting price. Therefore, the China Chamber of Commerce of Metal, Minerals, and Chemicals Importers and Exporters made such a decision. But the real problem here is the social cost of severe pollution caused by coke processing is not included in the production cost. Most of the coke producers are using very primitive technology and emit tremendous black smoke covering the full sky. Such a scene can be seen in Shanxi Province frequently. In addition to coke, MOFTEC criticized two trading companies exported alumina at a price lower than normal price by 16% and 31%. The losses accounted for were \$12,000 and \$10,800 respectively, as reported by *International Business Daily*, August 2, 1997. (in Chinese)

¹¹ China bans imports of poultry from Britain. *China Daily*, July 30, 1997. For fear of New Town Disease might hit China's poultry industry, the country decided to suspend imports as of May 8, 1997. All approval lists issued by the bureau are invalid, and all poultry and related products should be sent back to Britain or destroyed.

In some countries, product standards are used as a means of protection, which may include environment standards, labor standards. But standards for manufactured goods are not used as a means of protection in China, who is generally moving towards adoption of international ISO standards.

The rejection rate of commodity inspection is lower in the first six months this year than that in the same period last year. For export commodity inspection of 870,000 batches valuing \$28.4 bn, the rejection rate is 0.72% in terms of number of batch, or 0.76% in terms of value, lowered by 0.47% and 0.38% than that in the last year respectively. For import commodity inspection, the rejection rate of 168,000 batches valuing \$22.1 bn in the first six months this year is 4.3% in terms of batch, or 3.3% in terms of value, lowered by 8.0% and 1.4% than that in the last year respectively.¹²

Currently, the commodity inspection has to be carried out by the National Commodity Inspection Bureau and the entrusted local bureaus. Only a few foreign invested companies under special permission by the National Bureau and MOFTEC can conduct the inspection on their own exports, but not allowed to do inspection committed by other firms.¹³ According to the Commodity Inspection Law, foreign inspection agencies will be accredited and entrusted by the National Bureau to undertake inspection in China and abroad.

Another non-tariff barrier is related with taxation. The Tax Rule Commission under the State Council recently issued a circulation that the import/export tax reduction plan is restricted to a specific category for a specific quantity and specific purpose. This is a combination of quota control and tax reduction. The quota should be allocated by the principle of Fairness, Publicity, and Transparency. Companies who hold the quota and have the import right can import by themselves; who do not have the import right can import through agent trading companies base upon competition. No extra fee is allowed to be charged. This policy is effective from January 1st to December 31, 1997.¹⁴

According to a specific study, the nominal average tax rate of 25 most heavily protected goods in China on 1994 was 21.7%, and the average equivalent tax rate of non-tariff barrier of these 25 goods was 21.6%. So the average total tax rate was 43.3%. The study shows that the tax was almost equally divided between tariff and non-tariff barriers¹⁵. As a comparison, the total tax for goods of five categories in Japan in 1989 was 178.2%, among which the equivalent tax of non-tariff barriers took 173.5%¹⁶. In the U.S.A. the average total tax rate of the selected 21 categories of goods in 1990 was 35.2%, among which 31.7% was due to non-tariff barriers¹⁷. Here we see a big difference in trade practice among countries.

¹² Result of commodity inspection shows that both quality and quantity have raised. *International Business Daily*, August 7, 1997. (in Chinese)

¹³ Sanction applied to foreign companies who set up commodity inspection business. *International Business Daily*, July 11, 1997.

¹⁴ Preferential tax rate is restricted to a specific purpose and quantity. *China Economic Daily*, August 12, 1997. (in Chinese)

¹⁵ Zhang Shuguang, Zhang Yansheng, Wan Zhongxin: *Cost of Protection in China*, a project sponsored by the Institute of International Economics. 1997. (both in Chinese and English).

¹⁶ Yoko Sazanami, Shujiro Urata, Hiroki Kawai: *Measuring the Costs of Protection in Japan*. 1995. Page 7.

¹⁷ Gary Clyde Hufbauer and Kimberly Ann Elliott: *Measuring the Costs of Protection in the United States*. 1994, published by the Institute for International Economics.

In China, however, the real tax collected is much less than the nominal tax rate. For the year 1994, the average nominal tax rate was 35.9%, while the real collected tax rate was about 5% (processing trade is excluded), which is much less than the nominal tax rate. This is because of broad tax exemptions and reductions, and weak tax administration, let alone large quantity of smuggling. At the same time, the non-tariff trade barriers was not reduced. Therefore, in general, the non-tariff barriers in China have played a main role in protection. In the coming years both tariff and non-tariff protection are scheduled to be reduced. However, non-tariff barriers seems to be more difficult to remove, since it is less apparent and not easy to be detected.

D) Quota and efficiency loss

The whole trade control system listed in **Table 2** is very complicated. The import quota system will be described as an example to illustrate its effect on efficiency.

The import quota is usually distributed through three channels: those through central ministries, those through provincial companies, and those for special users. The share of each of them depends on the specific commodity. The final users apply import quota through these three channels, and get approved quota not necessary equal the applied quantity. The allocation of import quota does not always in consistent with the final demand, some have surplus quota and some do not have enough quota. So trade of quota happened very often, though prohibited by government. Since there is no quota market and it can not be exchanged efficiently, it often happens that quota surplus and deficit exist simultaneously. Therefore, if the quota is distributed to a great number of consumers, to increase quota volume may be not as effective as to establish a quota market.

Quota establishes a price difference between foreign market and domestic market and thus a extra profit for quota holders. The price difference depends on the efficient use of quota and the size of the quota; the larger the quota, the lower the quota price.

Quota has no nominal price but often bears a value in reality. So, quota system may cause illegal profit and corruption, if the officials in charge of quota distribution exchange quota for personnel benefit. According to WTO requirements and the "Memorandum of Understanding" (MOU), a bilateral governmental agreement between US and China, most of quota restrictions will be removed¹⁸. Chinese central government tends to eliminate quota distribution by gradual increasing quota size. But negotiation with ministries representing the benefit of producers is hard to proceed, and some import quota are getting smaller to protect domestic producers' benefit.

According to Chinese practice, the final users may not have the import rights, so they have to consign importation to trading companies. On the other side, trading companies do not have quota allocation, they import or export according to the order placed by final consumers who know very little about the price changes on the world market. Thus some opportunities of profit creation have been lost; sometimes they purchase at high price and push the world market price even higher. Trading companies, therefore, are requesting quota allocation, but has not been approved by the State Council yet.

¹⁸ The U.S. Embassy, Beijing, China: *China Commercial Guide 1994-95*.

Based on the idea of planned economy, the quota control sometimes creates subsidy but not profit for the quota holders. For instance, the import of chemical fertilizer is subject to quota control, but most of the imported fertilizer should be sold to peasants at a subsidiary price. Since peasants sell their produce to the State at a low price, so they are entitled to enjoy a low price fertilizer. However, such low price fertilizer is supplied only at a limited amount, and a high price market operates in parallel to satisfy the remaining demand. This high price market supports the production of local small fertilizer factories which produce chemical fertilizer at a low efficiency and high cost. Currently the market price of urea is about RMB1,600/tonne, and the imported urea is only MB1,300/tonne.¹⁹ The difference of RMB300(\$38)/tonne becomes the price of quota and the source of illegal income. Moreover, very often peasants can not purchase fertilizer at the subsidiary price, since there is no mark on the fertilizer itself, and nobody can identify a specific bag of fertilizer should be sold on subsidiary price or on market price. It is easy to get illegal profit by adding RMB300/tonne to the imported fertilizer and sell it to peasants. It has been frequently urged on the newspaper to sell fertilizer to peasants at official price, however, whether it is implemented is difficult to be monitored.

The import subsidy described in the preceding paragraph only happened in planned economies. This incident illustrates the following facts:

- A) Price distortion may propagate. Low grain price entails low price of chemical fertilizer. And low price of fertilizer deserves its producers to enjoy low price of its input elements, such as electric power and oil or gas. Finally there would be an expanding distortion leading to a confusion in the price system.
- B) The peasants who get low price fertilizer would use more fertilizer than those who get it at high price, when other conditions are equal. Then the marginal output of fertilizer will be different, which means violation of optimal allocation of fertilizer.
- C) Quota creates the opportunity of corruption, and the benefit of peasants were infringed.

Quota system, particularly the import subsidy, damages both efficiency and equity, a result just in opposite to the original purpose.

Another kind of import subsidy is over-valued domestic currency, which distorts the measurement of comparative advantage and results confusion in international trade business. Before 1994, the year of merging two foreign exchange systems, China imported grains without reckoning the difference of prices between domestic market and international market. Superficially, world market price was always higher than domestic price, because domestic grain price was an officially depressed price. But at the same time the value of RMB was over-valued. Therefore, nobody knows should China import grain based on

¹⁹ Problems grow for fertilizer industry. *China Daily*, August 15, 1997. The article reports that the domestic demand is 32 m tonnes for 1997, and domestic production is 26.6 m tonnes, import is expected to reach 6.5 m tonnes, plus last year's surplus of 8 m tonnes. So supply surpasses demand by some 9 m tonnes, which caused several newly commissioned large fertilizer factories to stop production. The article does not specify these supply and demand are based on what price. The article also implies, because of the lower price of imported fertilizer, import of fertilizer can not be stopped even at a great surplus on domestic market.

comparative advantage, and if China should, then how much. In other words, if the domestic price of grain would be raised to the international market price, and domestic production response correspondingly, should there be any shortage of grain? At the moment, the exchange rate in China is close to equilibrium rate, but the grain price is still heavily intervened by the government. There are a lot of debate on how much grain should China import.²⁰

Because of the price distortion, the State trading companies did not take profit as their operation objective, but to earning foreign exchange as the objective, regardless how much is the cost. The State made foreign exchange earning plan every year and this plan was carried out through out the country. After reform went deeper and broader, most of price distortion was gradually eliminated and profit becomes the most important objective of these companies²¹. Since January 1994 the State Planning Commission stopped to make foreign exchange earning plan. Since then trading companies have found their import/export structure was seriously distorted and many of them were losing money. The restructuring of trade is a serious task to be carried out in the coming years, and market force will be the main driving force of such adjustment.

Export quotas began to be distributed by auction but only on a trial base. No import quota has been distributed this way.²²

III. The Prospect

China has gradually moved toward to eliminate non-tariff barriers. On 1992, the number of commodities under quota control was reduced from 212 to 183, and at the same time import licensee for 16 categories was removed. On December 31, 1993, import license for another 9 categories of 16 kinds of commodities including steel, medicine, civil aircraft, BW television set was removed. On May 1994, the import license and quota for 195 kinds of commodities was removed; beginning from April 1st, 1996 the number of quota control was cut by 30%.

In the recent negotiation with WTO's officials in August 1997, Chinese government promised to make drastic and across-the-board reduction of the phase-out schedule of nontariff measures. The phase-out period for 86 items of quota control will be shortened from twelve years to eight years, which include automobiles and auto parts. To ensure a smooth elimination of the non-tariff measures, China has proposed annual growth rates of the quota volume, ranging from eight percent to twelve percent, during the transition period.²³ The trade policy and practice in China has been undergoing some fundamental change in the past two decades, especially in the past three years. Along with China becoming a big player in international trade and acknowledging international norm, China will more and more follow the principle of

²⁰ Dr. Guoqing Song: *Grape, Walnut, and Money*. Manuscript of working papers, Center of Chinese Economic Studies, Peking University. June 1997. (in Chinese)

²¹ Distribution system responds to market, *China Daily*, August 19, 1997. The report said that a market pricing system has been formed, with 90-95 per cent of the prices under market regulation.

²² The auction of export quota can be seen frequently on the newspaper *International Business Daily*, an official newspaper published by the MOFTEC. Price limits are set for some products for auction such as honey, but others no price limit is set.

²³ WTO entry smoothed by lower tariffs. *China Daily*, August 4, 1997.

free trade. A big country that changes its trade practice in such a scope and speed successfully has rarely happened in world history.

In national context, equity and efficiency are two basic principles to formulate policy. In international context, these two principles also are guiding considerations. However, since there is no international government, the principle of equity has been followed with some difficulty, and efficiency has been preponderated. To be treated with same rules, is an example of efficiency first. In the international trade aspect, free trade is a commonly accepted principle, which will lead to a better allocation of resources utilization. But developing countries are situated on an inferior situation in terms of capital, professionals, and information, thus the equal rules of free trade lead to unequal results. Particularly, there are a set of rules to reach free trade, but no generally accepted rules to reach equity. Equity is achieved only based on concession. Therefore, efficiency is a hard constraint and equity becomes a soft constraint. If we are pursuing to narrow the difference of income distribution among countries, some hard rules have to be founded in international trade negotiation.²⁴

What people in developing countries are particularly distressed is the fact that some businessmen from developed countries take the advantage of corruption in developing countries to achieve their interest. Such kind of deed adds difficulty to combat corruption in developing countries and even fosters corruption. To establish a healthy international trade relationship, it is better to have all kinds of irregular behaviors be punished by international law.

²⁴ Yushi Mao: Efficiency and Equity in International Economic Relationship, *International Economic Review*, Nov.-Dec. 1996. (in Chinese).

Response by Yu-Shi Mao to Dr. Will Martin's comment on China's Nontariff Trade Barriers

I agree that problems in foreign trade sector arising under the pure planning system are different from those under the transition period. Under pure planning system, price did not function as an allocative signal, or price changes (if there were any) did not change resource allocation. But an accounting system based on planned price affects the macroeconomic equilibrium, i.e. the aggregate supply equals aggregate demand. This is why there was no inflation nor deflation under planned economy, although individual goods are not in equilibrium; some in great shortage and others in great surplus.

Another characteristics with pure planning economy is the "non-conflict of interest among participants in the economy". Producers are not maximizing their profit, and consumers are not maximizing their utility. Everyone in the economy is striving under one goal, that is maximizing "output". Such an economy seems to be in high harmony, but in fact, it creates great confusion, because no correct price signal could be established, which would be established by negotiation between producers and consumers based on self-interest. So the output is not measured by value but by material. All kinds of former socialist economies produced a great deal of steel, cement, coal, etc. but little value. The whole nation is running at a loss, although it produces a large output. The trade sector might be losing money, though it relieves "shortage", since it is conducted by certain "proportion among sectors" not by comparative advantage as indicated by price signal.

Then came the reform period in which price control was relaxed and decision making power was decentralized. Governmental officials began to respond according to distorted price signals, and some chaos did happen. Only after such chaos was the price adjusted towards equilibrium level. This is the lesson that we learned from the past. However, during the reform, the policy was "crossing the river by touching the stones", and few people, even economists, could analyze in a clear way.

Now China's reform has entered a new phase in which the ownership structure has to be changed. This is a more profound and comprehensive change involving political arguments, since the State ownership is a component of the communist orthodoxy. Before reform, all business belonged to the State with almost no exception, and the State was the only employer. The State assumed all the profits and losses. In such a condition, competition makes little sense, because managers are agent of the State property and do not assume the economic responsibility. Managers of trading companies conduct trade business not only according to price signal, but also to the order of their boss, the higher rank officials, or according to their own individual interests. This is why many of the trading companies are losing money and even going to bankruptcy.

I also agree that monopoly in trading of specific products deteriorated efficiency. This is a problem not only regarding the trading sector, but also regarding other sectors. Monopoly is one of the major sources of price distortion now.

I can not understand why low wages is a source of bias in tariff equivalents as mentioned in the comments. As long as wage level is at equilibrium, there is no bias to speak of. China is an under-developed country and can not offer high wage. If wage is deliberately set high, then there will be a real bias.

The grain price in China has been set free several times. But because of the State-ownership of storage and transportation, an integral part of grain transaction, free price gave opportunity of windfall profit for these monopolized storage and transportation businesses, but little profits were directed to individual farmers. So price was put under control once again. Unless private businessmen join storage and transportation, no real market for grain could be established.

Barriers to Trade in Selected Sectors by ASEAN Members: How Important are NTBs?¹

David Ingersoll and Kim Frankena²
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Introduction

Background

Recent liberalization in the Asia-Pacific region has reduced the level of market distortions attributable to tariffs and other border measures. Not only have tariffs been lowered unilaterally and multilaterally, but trade protection has become more transparent and predictable via extensive bindings in the World Trade Organization (WTO) and voluntary action plans for liberalization in APEC. In the case of ASEAN members--Brunei, Indonesia, Malaysia, the Philippines, Singapore, and Thailand--such liberalization has often been part of sweeping economic reform programs that include substantial privatization and deregulation of state-led economic activity. In 1996, for example, Indonesia issued two deregulation packages that have opened the country to greater trade and investment.

Even so, the degree of liberalization in East Asia is arguably lagging that of other developing regions,³ and recent Commission research suggests that important obstacles remain to commerce among Asia-Pacific economies. For example, a 1993 USITC study on East Asian economic integration found that numerous non-tariff barriers (NTBs) to trade and investment hamper the efficient flow of resources among APEC economies, particularly in such sectors as basic petrochemicals, automobile manufacture, and electronics.⁴ A 1996 public hearing conducted in conjunction with a study conducted for USTR revealed considerable interest by the U.S. business community in tapping the APEC region's potential and identified remaining barriers to U.S. exports and investment.⁵

¹ The authors are grateful for the research and expertise provided by the following USITC staff: Paul Gibson, Diane Manifold, and David Flynn.

² The authors are with the Office of Industries and the Office of Economics, respectively of the U.S. International Trade Commission. Office of Economics research papers presented at the Symposium are the result of the ongoing professional research of USITC Staff and are solely meant to represent the opinions and professional research of individual authors. These papers are circulated to promote the active exchange of ideas between USITC Staff and recognized experts outside the USITC, and to promote professional development of Office staff by encouraging outside professional critique of staff research. These papers are not meant to represent in any way the views of the U.S. International Trade Commission or any of its individual Commissioners or the U.S. government.

³ See, for example, Inter-American Development Bank, "Trade Liberalization," in *Economic and Social Progress in Latin America: 1996 Report*, (Washington, D.C.: Johns Hopkins University Press, November 1996) and Judith M. Dean, Seema Desai, and James Riedel, *Trade Policy Reform in Developing Countries since 1985: A Review of the Evidence*, World Bank Discussion Paper No. 267, 1994.

⁴ U.S. International Trade Commission, *East Asia: Regional Economic Integration and Implications for the United States*, USITC Publication 2621, May 1993.

⁵ U.S. International Trade Commission, *U.S. Interests in APEC Trade Liberalization*, (confidential report (continued...))

Many of the obstacles identified were NTBs. While most quantitative restrictions have been or are being converted to tariffs, procedural barriers persist--in the form of cumbersome and arbitrary customs procedures, non-transparent or restrictive import licensing requirements, discriminatory government procurement procedures, distorting conditions on foreign direct investment, and poor intellectual property rights protection. Commitments undertaken in the WTO should improve the situation somewhat, but key industries--such as agriculture, automobiles, and chemicals--often have not been included in recent liberalization plans (e.g., Indonesia).

APEC has indeed resulted in some important breakthroughs. Not only did members lay out plans for liberalization in the November 1996 Manila Action Plan for APEC (MAPA) that indicate recent market opening is on track or will be accelerated, APEC was instrumental in building the "critical mass" for the Information Technology Agreement announced at the WTO's December 1996 Singapore Ministerial. APEC may again jump start worldwide liberalization: in May 1997, APEC Trade Ministers announced that they were investigating additional sectoral liberalization initiatives. At the Vancouver Ministerial meeting in November 1997, APEC Ministers selected 9 sectors for immediate work on trade liberalization and six others for additional development of proposals. The nine sectors selected by APEC Ministers and endorsed by APEC Leaders were: chemicals, energy, environmental goods and services, fish and fish products, forest products, gems and jewelry, medical equipment and instruments, toys, and the telecommunications mutual recognition arrangement.

The work on trade liberalization is to include identification and reduction of non-tariff barriers as well as reduction or elimination of tariffs. For example, in the chemical sector, the tariff measures proposed are for APEC economies and others with significant chemical industries to bring tariffs into conformity with the rates established in the Chemical Tariff Harmonization Agreement which was completed during the Uruguay Round. Once this harmonization has been accomplished, additional tariff reductions are to be negotiated. The work program for non-tariff measures includes facilitation and liberalization of customs and regulatory procedures, harmonization of chemical standards and testing, and reduction of non-tariff barriers that have not yet been identified.

Purpose

This paper identifies some remaining barriers to trade and investment in particular sectors in the APEC region and then quantifies NTBs that occur across selected petrochemical products within the ASEAN region. First, the results of a comprehensive multi-industry survey of remaining barriers to U.S. trade and investment in individual ASEAN members are presented. Then, those industries that face NTBs in multiple ASEAN markets are identified and discussed. Finally, results to date of Commission efforts to estimate the tariff equivalents of the remaining barriers in several product categories in the petrochemical sector are presented. Ultimately, it is hoped these results may prove useful to modelers seeking to assess trade liberalization within APEC, particularly since existing models contain limited information on the NTBs most frequently cited as posing obstacles to U.S. exporters.

⁵ (...continued)

for USTR on Inv. No. 332-365), May 1996.

Approach and Methodology

Price Gap Method

A common practice for estimating the effects of non-tariff trade barriers involves calculating the gap between world prices and domestic prices in the country or countries having such restrictions. These price gaps (or the tariff equivalents of the non-tariff barrier share of the price gaps) can then be used in the framework of a partial or general equilibrium analysis to estimate the economic effects of the non-tariff barriers.⁶ The Commission has previously used the price-gap method to estimate tariff equivalents and economic effects of U.S. import restraints⁷ and the tariff equivalents for U.S. and foreign agricultural programs.⁸

The price gap method used in this paper utilizes the average import unit value of a product in the country as a proxy for the world price of that product. This approach eliminates the need to consider transportation costs and other fees necessary to move the product from the exporting country to the importing country. This approach minimizes complications where multiple products in multiple countries and imports from multiple sources are being considered. This import price is then compared with a domestic wholesale price for the same product in an attempt to observe any difference that might occur at approximately the same point in the distribution process. The difference between these two prices is then examined to deduct the amount of any tariffs and taxes. The remaining gap is expected to reflect the effects of any non-tariff barrier(s) affecting that product.

There may be factors other than NTBs, tariffs, and taxes that contribute to differences in prices between imported and domestic products. For example, product quality or other physical characteristics, product differentiation, and location in time and space have been identified as potentially distorting factors.⁹ These factors are in addition to any margins or inventory costs charged by handlers of the imported product. The existence of these, and other factors, influenced the choice of products for this study. Specifically, those commodities were selected where it is believed that differences in physical characteristics, quality, and product differentiation of the products should be minimal.

Review of Selected Studies

Three recent reports have been released by the Institute for International Economics which estimated the costs of protection in East Asian countries, although none of the studies involved the ASEAN

⁶ In percentage terms, the price gap = $100[(P_d - P_m)/P_m]$, where P_d and P_m stand for the price or unit value of the domestic good and the imported good, respectively.

⁷ USITC, *The Economic Effects of Significant U.S. Import Restraints*, USITC Publication 2699, 1993.

⁸ USITC, *Estimated Tariff Equivalents of U.S. Quotas on Agricultural Imports and Analysis of Competitive Conditions In U.S. and Foreign Markets for Sugar, Meat, Peanuts, Cotton, and Dairy Products*, USITC Publication 2276, 1990, and USITC, *Estimated Tariff Equivalents of Nontariff Barriers on Certain Agricultural Imports in the European Community, Japan, and Canada*, USITC Publication 2280, 1990.

⁹ Papillon, Benoit-M., "Measuring Non-Tariff Barriers to Differentiated Import Products," *Contemporary Economic Policy*, Vol. XII, July 1994, pp 67-78.

countries that are the subject of this paper. These studies all used variations of the price-gap method to estimate the economic costs of protection, and it is the price gap portion of their methodology used in those works that is reviewed here.

A study of protection levels in Japan compared the C.I.F. import unit values with the domestic producers' unit values for similar products.¹⁰ The import unit values also included the application of tariffs. Both the import unit values and the producers' unit values are intended to exclude any markup by wholesalers and thus be at the same level in the distribution process.

Since the objective of Japanese study was to measure the cost of protection across the entire economy, the study examined each of the 420 categories in the input-output table using a minimum level of imports of 1 billion yen and a minimum unit value differential of 5 percent with 1985 data. The sectors that met their criteria, plus some additional categories involved in trade controversies, were reevaluated using 1989 data, yielding 43 categories that accounted for about 19 percent of Japanese imports. The authors noted that since "the unit value differentials for Japanese imports far exceed Japanese tariff rates, it seems likely that nontariff measures are a more substantial cause of protection in Japan than tariffs."¹¹

The second study evaluated the protection levels in Korea and estimated the costs of the major trade measures.¹² This study did not cover all measures of protection or sectors but focused on tariffs and known quotas. What the author called opaque non-tariff barriers were not addressed, as the only non-tariff barriers effects estimated were those involving agricultural quotas covering 16 product categories (at the 4 digit HS level). These tariff equivalents were taken from a review of the Uruguay Round Text by Korea's Economic Planning Board and from Korea's Uruguay Round Schedule LX which covers agricultural products.¹³ The approach used for these agricultural products was to measure the total difference between domestic and foreign prices minus the tariff rate.

Similar to the case in Japan noted previously, the apparent tariff equivalents of the non-tariff barriers addressed were substantially higher than the collected tariff rates. For example, the tariff for pork was 20 percent while the tariff equivalent of the quota was 30 percent. In the case of rice, the tariff was 5 percent and the tariff equivalent of the quota was 590 percent.¹⁴

The third study examined the cost of protection in China for 25 products with either high tariff and/or non-tariff barriers.¹⁵ The products evaluated covered a wide spectrum and included such things as agricultural and forest products, fuels, metal products, automobiles, and computers. The tariff equivalents of the non-tariff barriers for each of the 25 categories were estimated by comparing the C.I.F. import price

¹⁰ Yoko Sazanami, Shujiro Urata, and Hiroki Kawai, *Measuring the Costs of Protection in Japan*, (Washington, D.C.: Institute for International Economics, 1995).

¹¹ Sazanami, p. 19.

¹² Namdoo Kim, *Measuring the Costs of Visible Protection in Korea*, Institute for International Economics, Korea Institute for International Economic Policy, November, 1996.

¹³ Kim, p. 63.

¹⁴ Kim, p. 30.

¹⁵ Zhang Shuguang, Zhang Yansheng, and Wan Zhongxin, *Measuring the Costs of Protection in China*, Unirule Institute of Economics and Institute of International Economics, 1996.

of the product and the wholesale price of the imported product. These wholesale prices were collected through a survey of companies and government departments.

In most cases, the resulting tariff equivalents of the non-tariff barriers were significantly lower relative to the tariff levels than in the two previous studies.¹⁶ However, direct comparisons are not truly appropriate given the differences in methodologies of the studies. In most cases the tariff equivalents of the non-tariff barriers were less than the tariffs for the same products. The highest NTB tariff equivalents of about 70 to 110 percent were associated with basic commodities such as wheat, ammonium phosphate, rapeseed oil, and sugar. The tariffs on those products ranged from 0 to 30 percent.

Identification of NTBs in Selected APEC Countries

After settling upon the ASEAN region as being both the fastest-growing market for U.S. exports and least studied in terms of quantifying remaining barriers, the research team conducted a scan to identify sectors that faced barriers across multiple ASEAN markets. The scan did not include Singapore, given its generally open market, nor Brunei, given its small size and dearth of available information. Thus the focus was on Indonesia, Malaysia, the Philippines, and Thailand. The material reviewed included information contained in the Commission's country/regional and industry files, as well as various authoritative public sources of information: USTR's *National Trade Estimate Report on Foreign Trade Barriers*, APEC Individual Action Plans, hearing transcripts and written submissions for the record in connection with the Commission's May 1996 report to USTR on *U.S. Interests in APEC Trade Liberalization*, Customs Guides contained on the APEC Tariff Database, the UNCTAD TRAINS database, WTO Trade Policy Review Mechanism reports, World Bank and IMF country studies, the 1995 Pacific Economic Cooperation Council (PECC) report, *A Survey of Impediments to Trade and Investment in the APEC Region*, and other specialized reports. A variety of information sources, with their differences in industry definitions and levels of detail, were used to identify areas for further investigation. We used the information as reported (e.g., if one source said there was an NTB in "processed foods" and another reported NTBs in "canned fruits and snack foods" all three entries were registered. However, in many cases we benefitted from direct industry input and a standard set of illustrative questions distilled from Commission trade agreement expertise to identify whether NTBs likely exist.

Although a large number of U.S. industries/sectors (some 60 overall) were found to face tariff or non-tariff barriers in the 4 ASEAN markets under study, only a fourth of them appeared to face barriers in multiple ASEAN markets. Specifically, 5 of the 61 sectors faced barriers in four ASEAN country markets, 12 faced barriers in three ASEAN markets, and 17 faced barriers in two ASEAN country markets (Table 1). For example, the sugar industry was among those facing barriers in 4 ASEAN countries, notably NTBs in all 4 countries and high tariffs in one country (Table 2). The petrochemical and wood pulp and paper industries appeared to face barriers in 3 ASEAN countries, including NTBs in all countries but Malaysia.

¹⁶ Ibid, p. 8.

Data for Price Gap Analysis

Next, we focused on obtaining the data needed to conduct a price gap analysis for products within the sectors identified as facing barriers in three or more ASEAN markets. For pricing information, sources of data consulted included national statistical authorities, international organizations, commodity organizations, U.S. government agencies, trade associations, and industry contacts. For import price data, that is, the unit value of imports, UNCTAD trade statistics and national statistics were consulted. As can be imagined, locating price data and ensuring its comparability with trade data and across ASEAN countries proved time-consuming and fraught with difficulties. Tariffs, import surcharges, taxes, and institutional features that could be factors in explaining the calculated gaps were then identified.

Results of Price Gap Analysis

The initial objective was to estimate and then compare price gaps for several factors across several countries. Initial data searches were focused on non-agricultural sectors for which at least three of the four countries are alleged to have trade barriers. We focused on sectors such as petrochemicals, chemicals, and pharmaceuticals. However, these searches revealed a paucity of domestic price information, particularly wholesale prices, for the primary products of these sectors in these ASEAN countries. As an alternative, we selected a set of secondary or intermediate products of the petrochemical sector: low density polyethylene (LDPE), linear low density polyethylene (LLDPE), high density polyethylene (HDPE), polypropylene (PP), general purpose polystyrene (PS-GP), and high impact polystyrene (PS-HI). Data for these products were also limited, and we were able to obtain the necessary data only for Thailand.

The petrochemical industry in Southeast Asia, particularly the ASEAN countries, has been expanding owing to an increasing demand for the industries output. Demand is currently stronger than supply in the ASEAN countries. Thailand was selected as the focus of this paper it because its industry is developing faster than the others in Southeast Asia and data are more available. Thailand gained both investment and capacity during the 1990s (figure 1). As detailed later in this paper, the government has encouraged the development of the petrochemical sector through a variety of means, including via direct ownership, restricted entry and expansion, and import protection. The major development in Thailand was the discovery and commercialization of natural gas and the subsequent increase in feedstock use of ethane

Table 1: Sectors facing barriers in multiple ASEAN markets

Barriers in 4 ASEAN countries	Barriers in 3 ASEAN countries	Barriers in 2 ASEAN countries
Animal feed	Fruits and nuts	Cement
Sugar	Processed foods	Explosives
Alcoholic beverages	Rice	Film
Motor vehicles and parts	Chemicals	Household appliances
Textiles and apparel	Coin-op games	Office furniture
	Computers and software	Precision instruments
	Iron and steel	Corn
	Leather	Meats -
	Petrochemicals	Milk/dairy products
	Pharmaceuticals	Poultry
	Pulp and paper	Canned fruits
	Toys and games	Snack foods
		Salt
		Soybeans
		Vegetables
		Wheat
		Agricultural machinery

Source: Compiled by USITC staff.

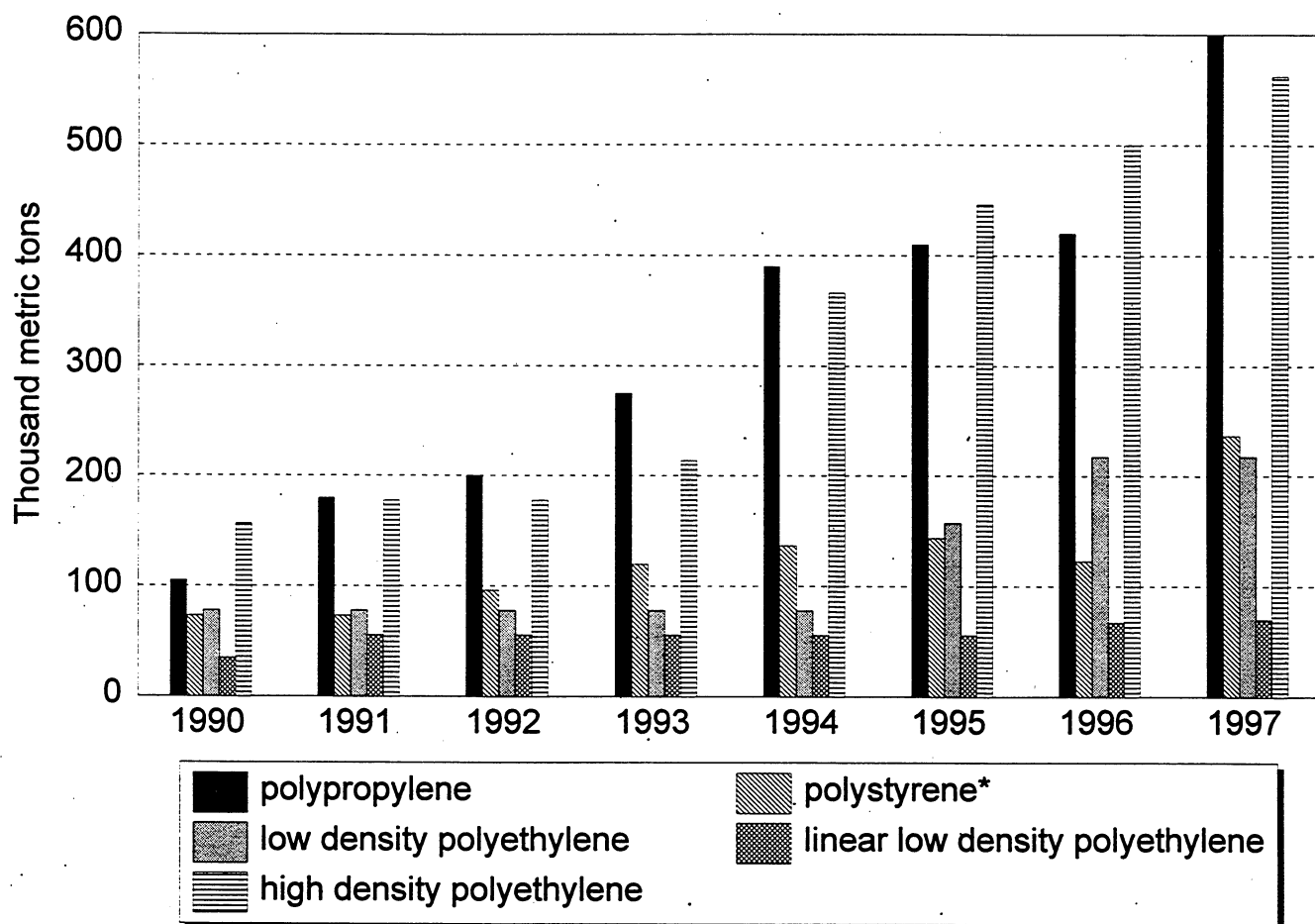
Table 2. Tariff and non-tariff barriers in selected ASEAN members, by industry

Industry	Malaysia		Indonesia		Philippines		Thailand	
	Tariffs	NTBs	Tariffs	NTBs	Tariffs	NTBs	Tariffs	NTBs
Agriculture								
Animal feed	x			x	x	x	x	x
Coconut								x
Coffee						x		
Corn					x	x	x	x
Flour		x				x		
Fruits and nuts	x				x	x		x
Meats		x			x	x		
Milk/dairy products				x			x	x
Oranges								
Potatos								x
Pork				x				
Poultry				x	x	x		
Processed Foods		x			x		x	x
Canned fruits	x				x			
Snack foods	x				x			
Rice				x	x	x	x	x
Salt				x				x
Soybean				x				x
Soy meal				x				
Sugar		x		x	x	x		x
Sweetners				x				
Vegetables	x				x	x		

Industry	Malaysia		Indonesia		Philippines		Thailand	
	Tariffs	NTBs	Tariffs	NTBs	Tariffs	NTBs	Tariffs	NTBs
Wheat				x		x		
Agricultural Machinery			x	x	x			
Alcoholic beverages	x		x	x	x	x	x	x
Aircraft				x				
Aluminum	x		x	x				x
Cement		x				x		
Cereals					x	x		
Chemicals			x	x		x		x
Coin-op games			x			x		x
Computers and software (keyboards)			x			x		x
Construction equipment	x							
Cosmetics								x
Electronics				x				
Engines				x				
Explosives	x					x		
Film	x							
Hand tools			x					
Household appliances						x	x	
Household furniture			x					
HVAC machinery				x				
Iron and steel	x	x	x	x	x	x		
Leather	x			x	x			
Medical Equipment				x				

Industry	Malaysia		Indonesia		Philippines		Thailand	
	Tariffs	NTBs	Tariffs	NTBs	Tariffs	NTBs	Tariffs	NTBs
Motor vehicles and parts	x	x	x	x	x	x	x	x
Office furniture	x				x	x		
Petrochemicals				x		x	x	x
Pharmaceuticals			x	x		x		x
Plastic resins		x						
Precision Instruments			x	x		x		
Printed matter						x		x
Pulp and paper	x		x	x		x		x
Shipbuilding				x				
Refined Copper			x	x				
Soda ash & rel. chemicals			x	x				
Straw and wicker	x							
Telecommunication Equipment								
Textiles and apparel	x	x	x	x		x	x	x
Tobacco	x	x					x	x
Toys and dolls			x			x		x
Video game software								x
Wood products			x	x				

Figure 1- Thai production capacity, 1990-97



* Production capacity is not separately reported for the various forms of polystyrene.

Source: Adapted from Parpinelli TECNON database.

and propane. Thailand's petrochemical industry is still dominated by former state-controlled firms, such as the National Petrochemical Public Co., Ltd. (NPC).

The refining of the natural gas increased the supply of chemicals, known as monomers, such as ethylene, propylene, and styrene. Meanwhile, use of petroleum as a feedstock for monomer production has grown. Some of the principal products derived from these basic building block chemicals are the polymers polyethylene, polypropylene, and polystyrene that are the subject of this paper. These polymers are used in a wide variety of applications by downstream industries.

Polyethylene

Polyethylene plastics resins are produced in variety of forms. Low-density PE (LDPE) has, by industry definition, a density of less than 0.940 grams per cubic centimeter. It is the softest and least crystalline of these resins. High-density PE (HDPE) is defined as products having a density equal to or greater than 0.940 grams per cubic centimeter. Within these ranges there is a broad spectrum of density combination. For example, linear low-density PE (LLDPE) has a more crystalline structure than LDPE but they compete in the same markets.

LDPE (and LLDPE) resins are used principally to manufacture blown and cast plastics films. Blown films are used for packaging, lamination, and shrink films. Cast films are used to manufacture containers for food such as bags for bread and frozen foods. LDPE resins are non-toxic and have low flammability characteristics, however, as with all disposable packaging the environmental impact of waste disposable is a concern; however, these products are fully recyclable because they are thermoplastics (i.e., the products can be heat softened and reformed.)

HDPE resins are utilized for their physical toughness, high melting temperatures, and chemical resistance. HDPE resins can be used in melt forming applications such as extrusions, injection molding, blow molding, and powder coating. The largest use for HDPE resins is for milk bottles and other food liquids. In addition, containers for household chemicals, motor oil, pharmaceuticals, cosmetics, fuel tanks, large trash containers, and pails are common uses. Injection molding applications include the manufacture of crates, pallets, and cases. Disposal of these durable plastic items is an environmental concern.

Polypropylene

Low melting grades of polypropylene are used for sheets, films, profile forms, and extrusions. However the largest use is in synthetic fibers for carpet yarn, upholstery, and undergarments. With additives, polypropylene fibers with good dimensional stability, strength, low-flammability, thermal, and ultraviolet light resistance can be obtained. The good working ability of PP fibers makes them suitable for use in active, athletic sports wear.

Other applications for polypropylene resins are as substitutes for cellophane in packaging. Molded applications include appliance housings, battery cases, medicine bottles, and syringes.

Polystyrene

The largest use polystyrene resins is for packaging. Polystyrene is available in three forms, general purpose crystal, high impact, and expandable. General purpose polystyrene resin is used for clear polystyrene film used or food packaging. High impact PS is used for such products as smoked detector cases, toys cathode ray tube housings, and electrical appliances. The expandable is used in home insulation, siding and exterior wall sheathing.

We obtained monthly wholesale price series for the six products in Thailand for the period January 1994 through December 1996. These series consisted of the high and low local prices for each of the six polymers. We compared the monthly averages of these local prices against the import prices for the same products for the same period (figures 2 and 3). We used the spot prices, delivered basis, for Southeast Asia as the estimates of the import prices in Thailand. The local prices reflect the grades of the products closest to those for which the spot prices were reported. By inspection, one can see that the local polymer prices in Thailand generally track the spot prices.

The local prices for the polyethylene products rose sharply in the second half of 1994 and then decreased irregularly during 1995, with the prices in 1996 generally around the level of prices in the first half of 1994 (figure 2). The spot prices peaked in the middle of 1995 before generally leveling off in 1997. The local prices and the spot prices for polyethylene converged over the period. The local and spot prices for polypropylene and polystyrene followed a similar pattern (figure 3). Prices rose over the first part of 1994, dropped off a bit in late 1994, peaked in mid-1995 and then settled in 1996. Two major factors were China, which purchases largely on the spot market, and the start-up of additional production. China's purchases fell off substantially after the first half of 1995, but resumed again in 1996,¹⁷ exerting a major influence on East Asian prices, given its role in polymer, monomer, and intermediates consumption.)¹⁸

To estimate the price gaps between the local and import prices, we first calculated the annual average local and import prices for each product using the data noted above (table 3). The differentials between the import unit values and the domestic wholesale prices were adjusted by the level of the tariffs (table 4).¹⁹ Note that the table indicates that the applied tariff rate was reduced at the start of 1997 but reports indicate that the planned tariff cuts have been delayed until at least 1998,²⁰ which in any case does not affect our price gap calculations for 1994-96.

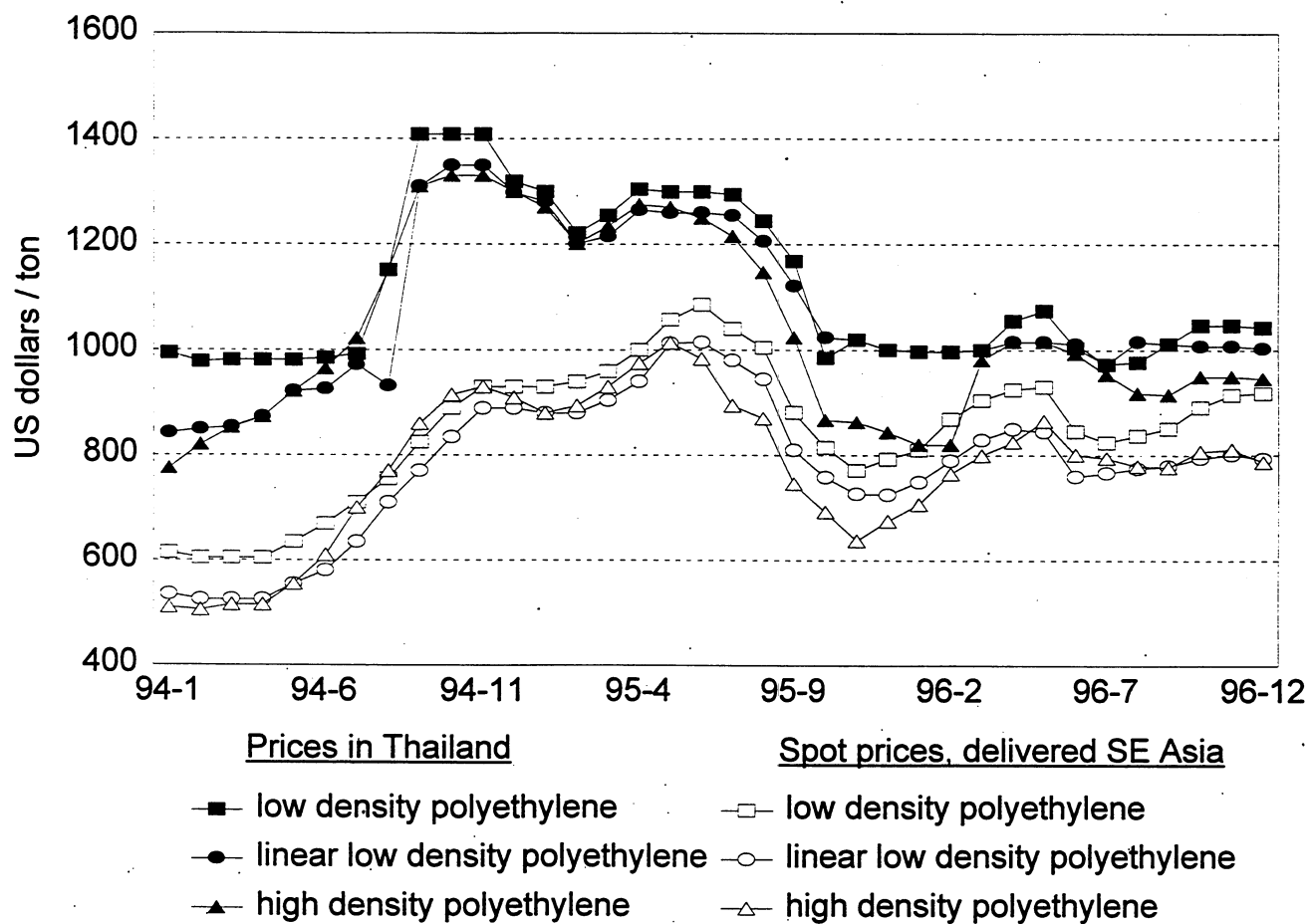
¹⁷ Jean Francois Tremblay, "Asia Pacific: Slowing Economies Mean Less Growth for Chemicals," World Chemical Outlook, *Chemical and Engineering News Record*, [date].

¹⁸ Ian Young, "Asian Agitation: Capacity Additions Shake Markets," *Chemical Week*, Mar. 20, 1996, p. 41.

¹⁹ USITC staff understand that the reported wholesale price series for these polymers in Thailand do not include the reported 10 percent consumption tax and thus the tax need not be added to the import price.

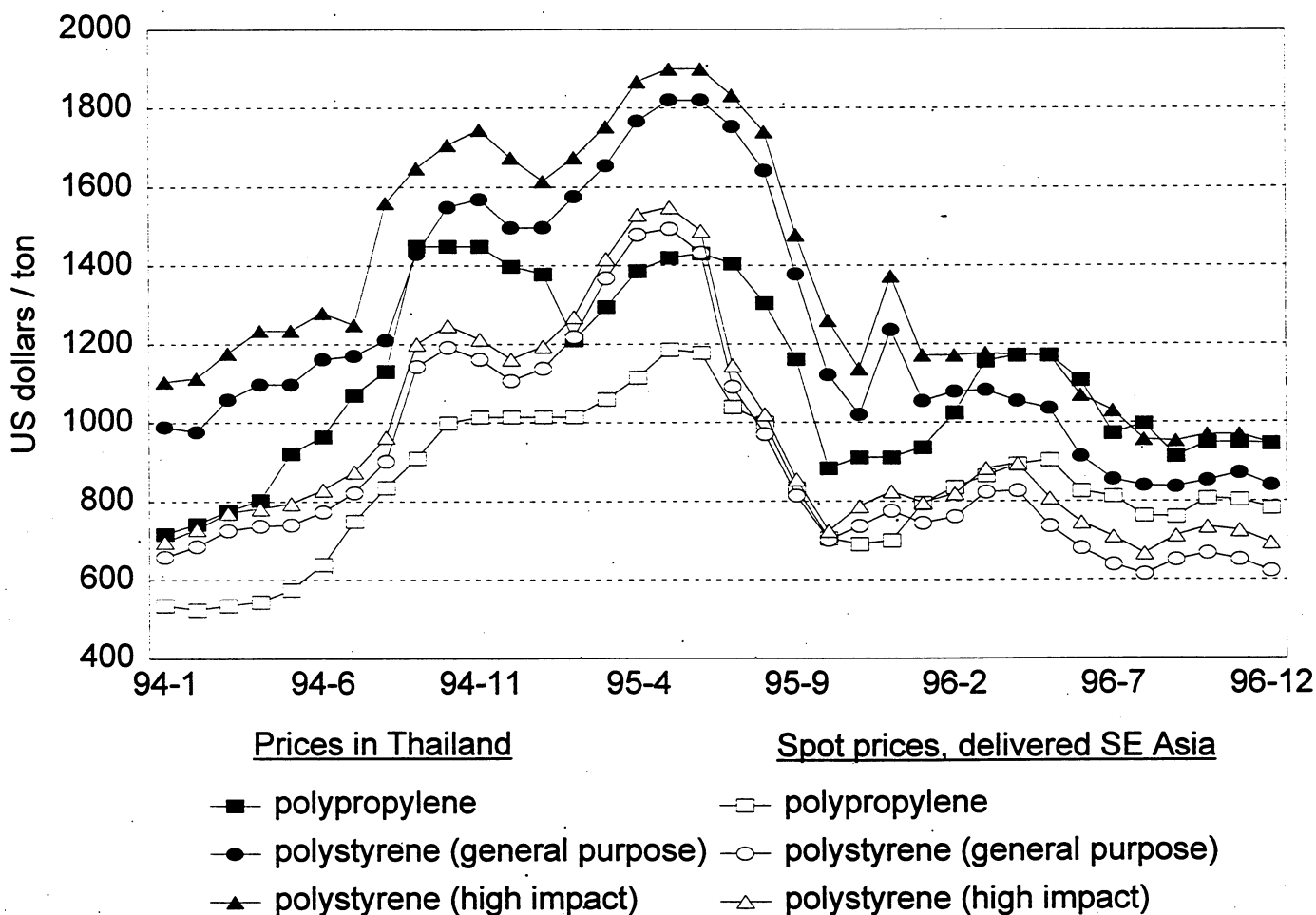
²⁰ Need to confirm that the tariff is still 30% for the polymers and was throughout 94-96.

Figure 2- Polymer prices, 1994-96: Polyethylene



Source: Adapted from Parpinelli TECNON database.

Figure 3- Polymer prices, 1994-96: Polypropylene and Polystyrene



Source: Adapted from Parpinelli TECNON database.

Table 3.

PRICE GAPS, USING SPOT PRICES						
Product	Year	Local	Import	IMP + TAR	LOC-IMP,\$	LOC-IMP,%
LDPE	1994	1132	731	950.3	181.7	24.856361
	1995	1200	940	1222	-22	-2.340426
	1996	1019	876	1138.8	-119.8	-13.6758
LLDPE	1994	1040	665	864.5	175.5	26.390977
	1995	1176	882	1146.6	29.4	3.3333333
	1996	1005	794	1032.2	-27.2	-3.425693
HDPE	1994	1054	691	898.3	155.7	22.532562
	1995	1122	849	1103.7	18.3	2.155477
	1996	940	793	1030.9	-90.9	-11.4628
PP	1994	1073	740	962	111	15
	1995	1225	962	1250.6	-25.6	-2.661123
	1996	1025	821	1067.3	-42.3	-5.152253
PS-GP	1994	1234	888	1154.4	79.6	8.963964
	1995	1524	1102	1432.6	91.4	8.2940109
	1996	944	702	912.6	31.4	4.4729345
PS-HI	1994	1426	939	1220.7	205.3	21.863685
	1995	1627	1151	1496.3	130.7	11.355343
	1996	1063	766	995.8	67.2	8.772846

Table 4.
Thailand's tariff on polyethylene, polypropylene, and polystyrene²¹

SITC	HS Sub- heading	Description	Rate of duty					
			Rate under decree			Applied rate		
			Ad	Valorem	Specific rate Unit	Ad	Valorem	Specific rate Unit
57111	3901.10	Polyethylene having a specific gravity of less than 0.94						
		- For polyethylene used in the manufacture of telephone or electric wire	40		Kg	8.00	10	Kg
		- Other						
		- Imported before January 1, 1997	40		Kg	8.00	30	Kg
		- Imported after December 31, 1996	40		Kg	8.00	20	Kg
²¹ Need to add polypropylene and polystyrene tariffs to this table - the applied rates are the same as above, and I believe the other rates for these polymers are the same as for polyethylene. SITC numbers are as follows:								
57111	polyethylene < .94	LDPE AND LLDPE						
57112	polyethylene > .94	HDPE						
57211	polystyrene (expandible)	PS						
57219	polystyrene, other	PS-GP						
57511	polypropylene	PP						
HS numbers:								
3901.10	polyethylene < .94	LDPE AND LLDPE						
3901.20	polyethylene > .94	HDPE						
3903.11	polystyrene (expandible)	PS						
3903.19	polystyrene, other	PS-GP and PS-HI						
3902.10	polypropylene	PP						

Table 4-Continued
Thailand's tariff on polyethylene, polypropylene, and polystyrene

SITC	HS Sub-heading	Description	Rate of duty					
			Rate under decree			Applied rate		
			Ad	Valorem	Unit	Ad	Valorem	Unit
57112	3901.20	Polyethylene having a specific gravity of 0.94 or more						
		- For polyethylene used in the manufacture of telephone or electric wire	40		Kg		10	Kg
		- Other						
		- Imported before January 1, 1997	40		Kg		30	Kg
		- Imported after December 31, 1996	40		Kg		20	Kg

Source: APEC CD ROM 1995 Database.

The resulting price gaps for each of the six products follow the same trend. The price gaps for each product are the highest in 1994 and decline in both 1995 and 1996. The steepest declines are for the polyethylene and polypropylene polymers. Note that many of the calculated price gaps for these two polymer forms are negative in 1995 and 1996. The price gaps declined less, both absolutely and relatively, for the two forms of polystyrene.

The calculated price gaps for 1994 and the subsequent declines appear to indicate both the existence of non-tariff barriers such as those noted below and evidence that such barriers are decreasing. A possible explanation for the negative values is that the spot prices are higher than prices for comparable products and grades would be under the normally longer term contracts between producers and buyers.

Thailand's tariffs, import surcharges, taxes, and NTBs

Tariff data was obtained from the APEC tariff data base (1997 Internet version and 1995 CD-ROM (pilot) version). Information on import surcharges, taxes, and NTBs was obtained from specialized publications. The information reviewed to identify barriers includes several useful but somewhat dated analyses as well submissions made by U.S. industry alleging the existence of policies or practices that restrict U.S. exports and investment. *Before the final paper is completed, we plan to verify and update this information, which reveal numerous NTBs in these sectors.*

Though some liberalization is underway, various policies by Thailand appear to have distorted the market for petrochemicals during the period under review. Among these policies were (1) extensive government involvement as both a producer and a consumer, (2) government support for local investment, and (3) tariff and non-tariff barrier (NTB) protection. Data prepared by the Pacific Economic Cooperation Council in 1995 is suggestive, showing that more than 15 percent of the tariff lines in the petroleum refining sector were subject to NTBs.²²

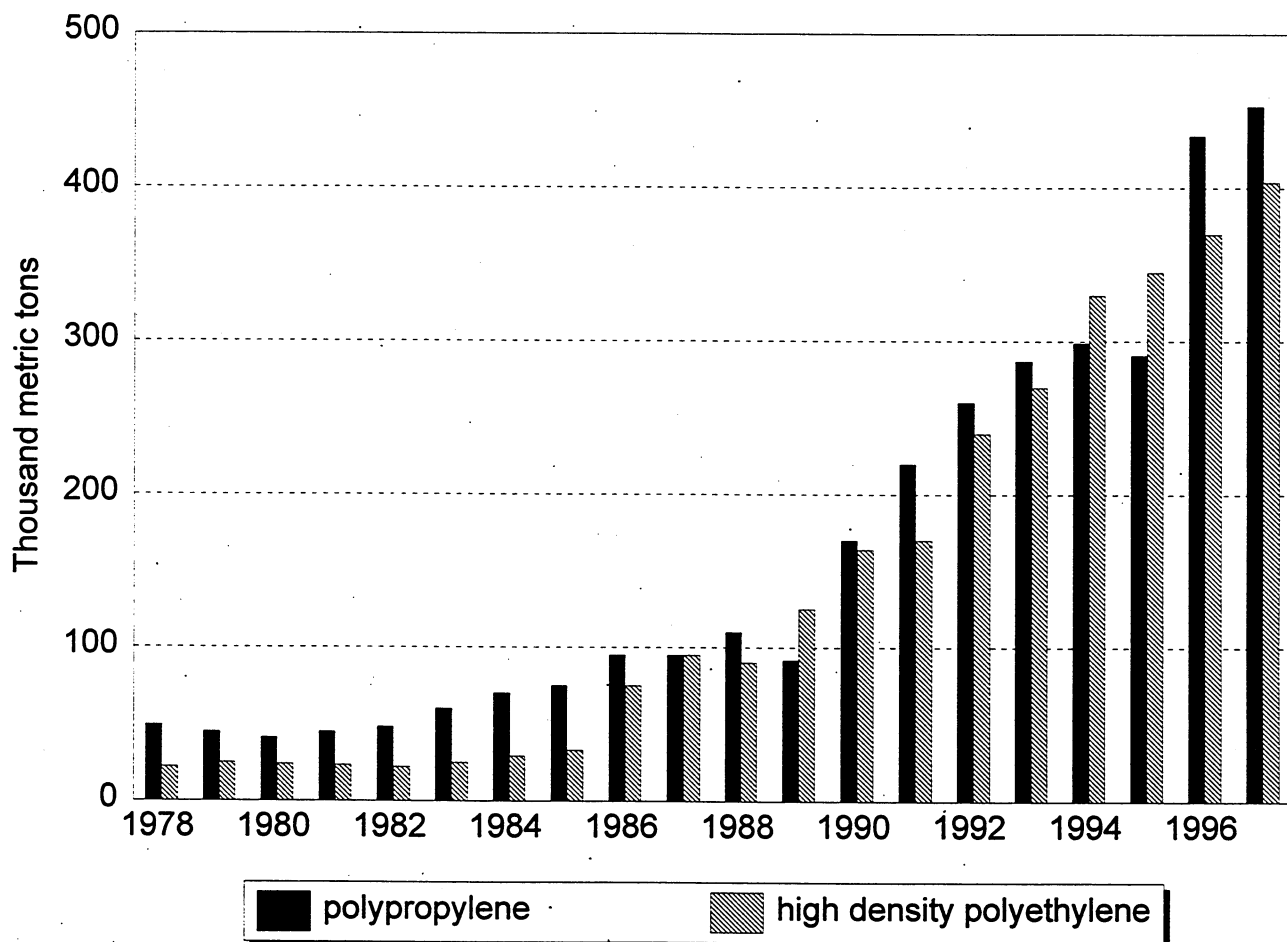
Thailand's remaining barriers have important implications for APEC liberalization, as realization of current expansion plans could make Thailand ASEAN's biggest petrochemical producer. The bulk of Thailand's petrochemical production is sold on the domestic market (figures 4 and 5). Expanded capacity has been built to meet growing domestic demand for plastics and by the agro-industrial, electronics, and textile industries. By 1995 Thailand had become self-sufficient in basic petrochemical products²³ and a net exporter of polyethylene, polypropylene, and polyvinyl chloride (figure 6).²⁴ U.S. imports from Thailand, meanwhile, rose from \$7,000 in 1994 to just under \$1 million in 1996.

²² Pacific Economic Cooperation Council (PECC), *Survey of Impediments to Trade and Investment in the APEC Region*, (Singapore: Pacific Economic Cooperation Council), 1995, p. 234.

²³ "Super Thailand: Industry Grows Rapidly to Meet Soaring Demand for Plastics," *Asian Business*, June 1996, p. xiv.

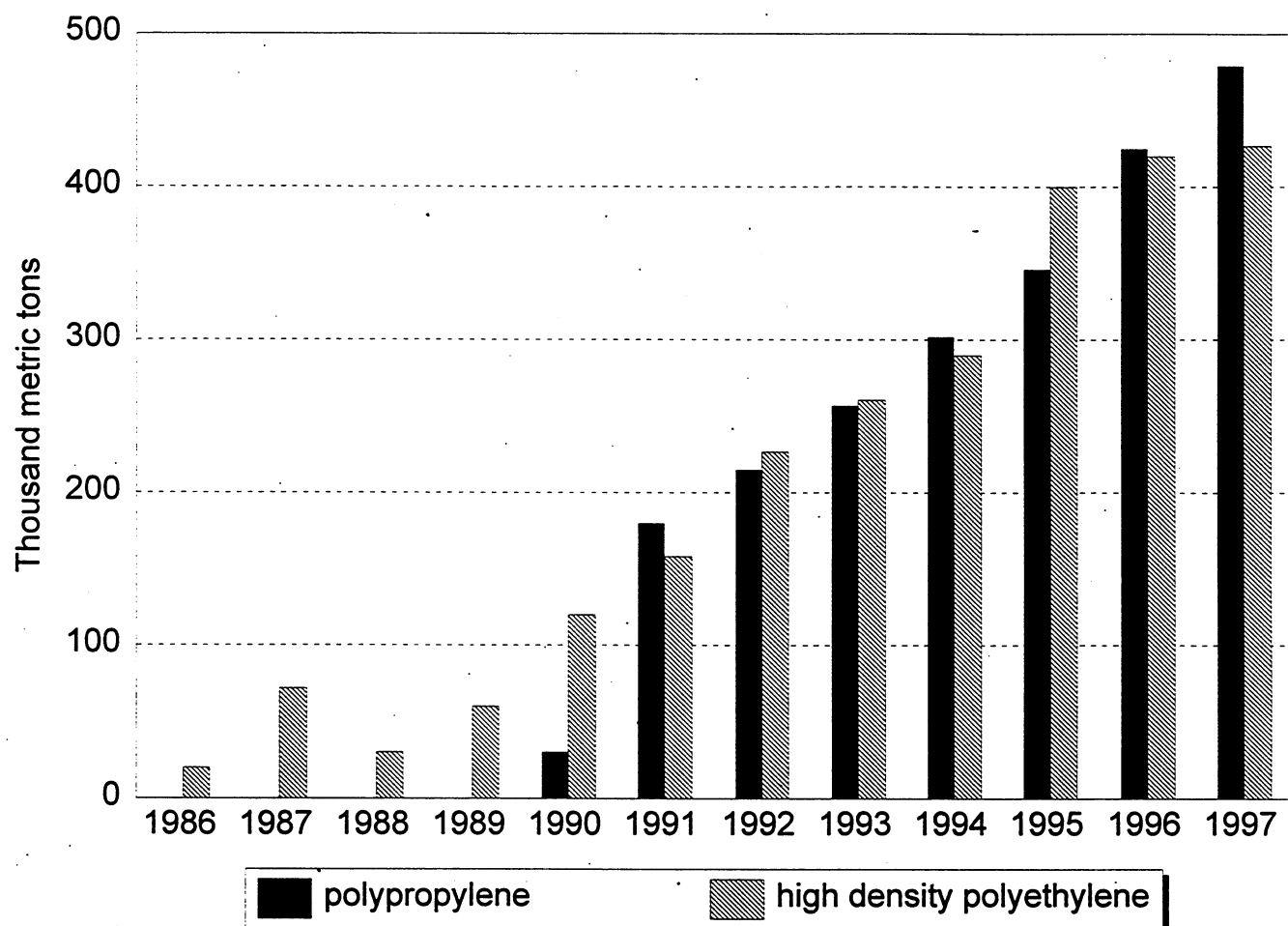
²⁴ "Country Report of Thailand: Petrochemical Industry in Thailand," Prepared by National Petrochemical Public Co., Ltd.

Figure 4- Thai consumption, 1978-97



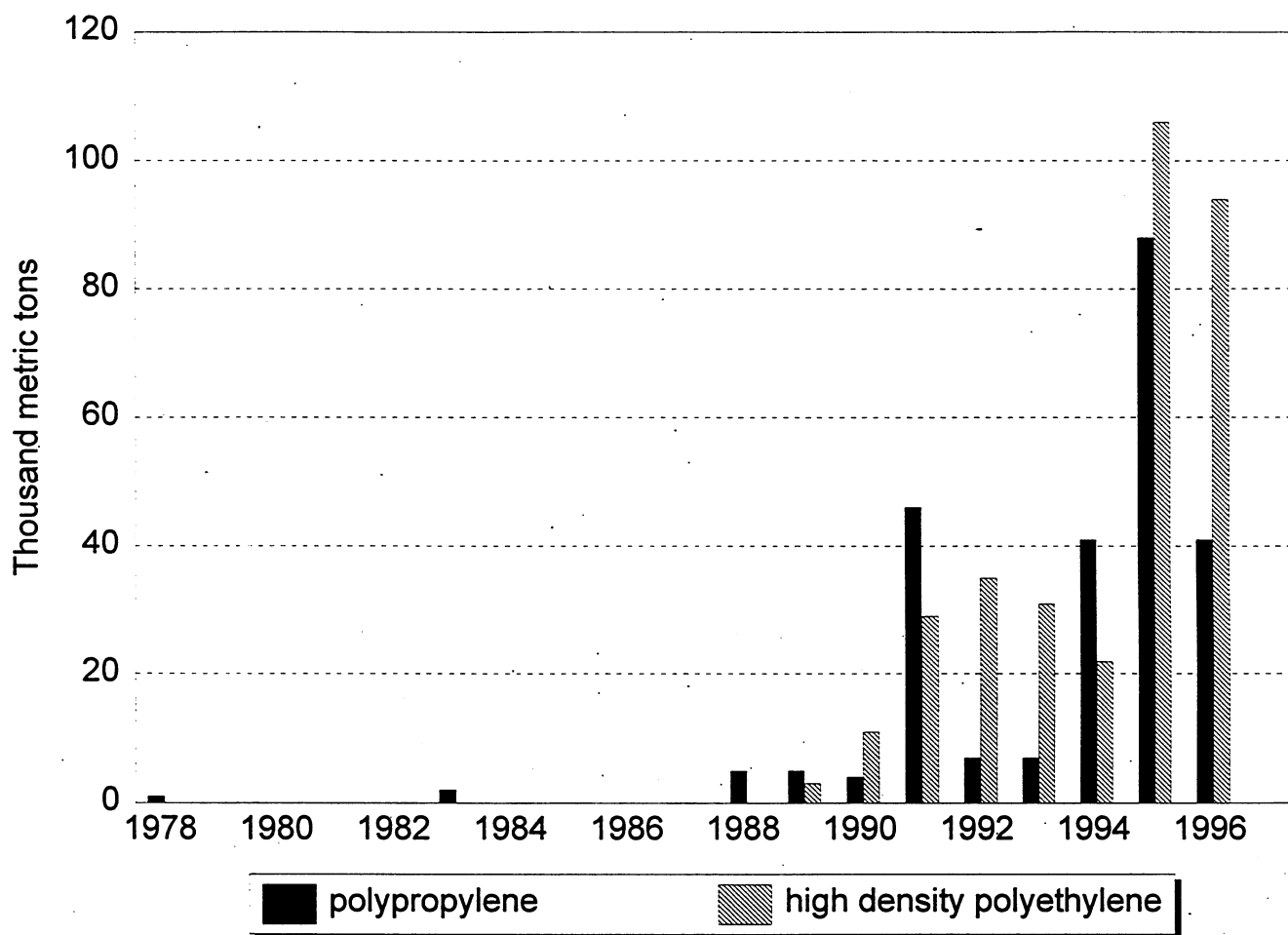
Source: Adapted from Parpinelli TECNON database.

Figure 5- Thai production, 1986-97



Source: Adapted from Parpinelli TECNON database.

Figure 6- Thai exports, 1978-97



Source: Adapted from Parpinelli TECNON database.

Government ownership

The state plays a major--though not exclusive--role in the production of petrochemicals in Thailand. One analyst reported, "Most investments have been under government sponsorship, but future activities are to include more private sector sponsorship and initiation."²⁵ Indeed, the largest players in the industry are essentially state-owned firms that either have moved upstream or downstream into petrochemical production.

- The state oil company, PTT, engages in petrochemicals via its National Petrochemical Corporation (NPC), Thai Olefins Co. (TOC), and Thai Aromatics (TAC) subsidiaries.²⁶ PTT's stake of NPC was initially 49 percent; today, PTT owns about 38 percent of NPC. Six firms that operate downstream facilities own the remainder,²⁷ including the State firm Siam Cement, which owns a 12 percent stake and is also a petrochemical producer via its Thai Polyethylene subsidiary. NPC's pricing for these downstream firms is cost-plus.²⁸
- TOC, which brought major new capacity online in 1995 and 1996, is 49 percent owned by PTT. TOC's pricing is reportedly based on U.S. Gulf Coast prices.²⁹
- TAC, which did not produce during the period, started out being 100 percent owned by PTT, but that share was to decline to 49 percent.

Thai Petrochemical Industry Co. (TPI), a producer of basic petrochemicals, is a privately owned, family-run, publicly-traded company that formerly served as Thailand's largest rice dealer.³⁰

²⁵ Ronald E. Hagen, *The ASEAN Petrochemical Industry: A Preliminary Survey*, East-West Center Working Paper, Energy and Minerals Series, No. 10, Dec. 1997, p. 22.

²⁶ Fereidun Fesharaki and Kang Wu, "Energy Policies in Asian-Pacific Developing Economies," *Asian-Pacific Economic Literature*, Vol. 6, No. 2, Nov. 1992, p. 33.

²⁷ Ronald E. Hagen, *The ASEAN Petrochemical Industry: A Preliminary Survey*, East-West Center Working Paper, Energy and Minerals Series, No. 10, Dec. 1997, p. 22.

²⁸ Ronald E. Hagen, *The ASEAN Petrochemical Industry: A Preliminary Survey*, East-West Center Working Paper, Energy and Minerals Series, No. 10, Dec. 1997, p. 23.

²⁹ Ronald E. Hagen, *The ASEAN Petrochemical Industry: A Preliminary Survey*, East-West Center Working Paper, Energy and Minerals Series, No. 10, Dec. 1997, p. 23.

³⁰ Jean-Francois Tremblay, "Thailand Aspires to be A Petrochemical Power," *Chemical Engineering News Record*, [date].

Government support

The government also provides less direct income support to the petrochemical industry.

- According to an official of Thailand's Ministry of Industry, policies "to protect and nurture the industry," such as restricting construction in order to assure the profitability of new entrants, were pursued at first.³¹
- More recently, entry into the industry had been promoted via the designation of the petrochemical industry as among six basic industries eligible for favored tax treatment by the Thai Board of Investment; investors in the sector are granted an 8-year corporate income tax exemption.³² Some joint ventures, particularly with Japanese firms, have been established.
- Yet, 100 percent foreign ownership is discouraged in favor of joint ventures with local partners, according to press reports.³³ Moreover, with the industry facing overcapacity and with very slim profit margins on polypropylene, only new entrants with ready markets and that are able to attain downstream output of 500,000 metric tons a year can hope to be viable, one analyst suggested.³⁴ In part due to concerns about overcapacity, in early 1997, the Thai government postponed NPC's plans to begin building a large new petrochemical complex,³⁵ the first of three new crackers expected to be built in Thailand within the next several years.³⁶ If realized, these projects are expected to quadruple Thailand's ethylene capacity.³⁷
- The government long controlled ex-refinery prices for domestic oil and oil products. These price controls were formally lifted for most products during 1991. Still, 1997 trade press reports indicated that the Thai government was considering lowering gas and electricity prices for petrochemical producers to help them control overhead costs.

Tariffs

- Thailand did not participate in the Chemical Tariff Harmonization Agreement, under which members agree to harmonize tariffs at relatively low levels and to reduce and eliminate certain NTBs affecting chemical trade.³⁸

³¹ Ibid.

³² WTO, *Trade Policy Review Mechanism: Thailand*, Report by the Secretariat, WT/TPR/S/9, p. 61.

³³ "ASEAN Interest High," *Chemical Week*, July 31, 1996, p. 38.

³⁴ Baldave Singh, "Petrochemical Overcapacity Looms," *Chemical Week*, Mar. 5, 1997, p. 37.

³⁵ "NPC3: Delayed but Not Canceled," *Chemical Week*, Mar. 5, 1997, p. 18.

³⁶ "Learning the Lessons of Overcapacity," *Chemical Week*, Mar. 19, 1997, p. 43.

³⁷ Anne K. Rhodes, "World Ethylene Capacity Jumped 5 million mt/y or 6.5 % in past year," *Oil and Gas Journal*, May 19, 1997, p. 50.

³⁸ Chemical Manufacturers Association, *Statement before the U.S. International Trade Commission*
(continued...)

- The latest WTO Trade Policy Review of Thailand points out that just 8 percent of Thailand's tariff lines in the petrochemical sector are bound, making petrochemicals the sector with the fewest bindings.³⁹ Nevertheless, the World Bank estimates that in terms of value, more than half of Thailand's total chemicals imports benefit from tariff bindings as a result of the Uruguay Round, versus less than 3 percent prior to the Uruguay Round.⁴⁰
- Specific (rather than ad valorem) tariff rates are applied to petroleum products and in 1995, 87 percent of Thailand's plastics imports are subject to the higher of a given ad valorem and a specific rate.⁴¹
- Thailand began reducing tariffs on products of the chemicals or allied industries in 1993 and on mineral fuel and petrochemicals in 1995.⁴² However, because it was "regarded by the Government as unable to compete with imports," petrochemicals was among the sectors that was to have tariff rates reduced in two phases, with half of the planned decrease going into effect Jan. 1, 1995 and the other half to go into effect on Jan. 1, 1997.⁴³
- Later, some petrochemicals were temporarily exempted from the tariff liberalization scheduled to take effect on Jan. 1, 1997; tariffs still range from 30 to 60 percent.⁴⁴ Specifically, the proposed cut in polymer duties, from 30 percent to 20 percent, was delayed by one year. Duties on ethylene and propylene were reduced, as planned, from 12 to 5 percent; those on aromatics were cut from 30 percent to 20 percent. The Thai Board of Investment, which retains broad authority to impose emergency prohibitions,⁴⁵ reportedly weighed in in support of the postponement out of fear that the lower tariffs could harm local producers.⁴⁶

³⁸ (...continued)

regarding *U.S. Interests in APEC Trade Liberalization*, Inv. 332-365, Apr. 10, 1996.

³⁹ WTO, *Trade Policy Review Mechanism: Thailand*, Report by the Secretariat, WT/TPR/S/9, p. 40.

⁴⁰ J. Michael Finger, Merlinda D. Ingco, and Ulrich Reincke, *The Uruguay Round: Statistics on Tariff Concessions Given and Received*, (Washington, DC: The World Bank, August 1996), p. 40.

⁴¹ WTO, *Trade Policy Review Mechanism: Thailand*, Report by the Secretariat, WT/TPR/S/9, p. 39.

⁴² IMF, *Thailand: Statistical Appendix*, IMF Staff Country Report 96/83, August 1996.

⁴³ WTO, *Trade Policy Review Mechanism: Thailand*, Report by the Secretariat, WT/TPR/S/9, p. 37.

⁴⁴ USTR, *1997 National Trade Estimate Report on Foreign Trade Barriers*, p. 361.

⁴⁵ "Thai Customs Guide," APEC CD-ROM 1995 Tariff Database. In addition, under certain circumstances, the Minister of Finance can issue notifications to raise or lower tariffs and the Ministry of Commerce may impose import surcharges.

⁴⁶ "Asian Locations Gain in Popularity," *Chemical Week*, Mar. 26, 1997, p. 46.

Other non-tariff barriers

- Conditional import prohibitions and import licensing requirements still apply to most of Thailand's imports,⁴⁷ including imports of petroleum and natural gas-related products, such as liquefied petroleum gas (LPG) and kerosene.⁴⁸

In addition to reviewing published sources of information on Thailand's barriers, we contacted a limited sample of a dozen U.S. chemical companies that export to Asia to discuss their experiences. Generally speaking, the two key issues identified were tariffs, which remain high but are applied equally to all suppliers,⁴⁹ and governmental sponsorship of local competitors, either through direct ownership or informal protection. This governmental support was seen as instrumental in underwriting and absorbing substantial additions to local capacity. Whether this came at the expense of imports is not clear. As table 5 indicates, the value of U.S. exports to Thailand have exhibited an erratic pattern over the period, but unit values tended to rise. However, when excess supply and unprofitably low prices prevailed in Asia generally, the result was a U.S. retreat from most basic petrochemical exports in favor of sales of specialty petrochemicals, U.S. firms reported.

Liberalization Steps

As the recent financial crisis in East Asia makes clear, such policies of government direction and protection may have had important costs for Thailand itself. Even before the crisis broke, the Thai authorities appeared to recognize the desirability of weaning the petrochemical industry from government protection. As noted above, the country's second major petrochemical facility was to price its output in line with U.S. Gulf Coast prices, indicating a *de facto* requirement to meet competitively set world prices. The government began to restructure the national petroleum authority to improve its competitiveness and increase its responsiveness to customers in such industries as plastics, which face growing competition from China and other suppliers. Liberalization plans were announced in mid-1995 that permit up and downstream integration by existing producers. Petrochemical companies are now permitted to produce or invest in any petrochemical product except aromatics, while upstream companies are permitted to invest in the production of feedstocks. Deregulation of the aromatics sector was also announced.⁵⁰ Investment restrictions were thus removed, as were investment incentives.⁵¹

These changes, as well as the more far-reaching ones associated with IMF-backed assistance, may go some way towards making the Thai market more open to foreign suppliers and more competitive generally. If so, the trends witnessed in this paper--of a close relationship between Thailand's internal prices and spot prices; lower, albeit still volatile prices; and a diminishing "price gap"--may well continue.

⁴⁷ WTO, *Trade Policy Review Mechanism: Thailand*, Report by the Secretariat, WT/TPR/S/9, p. 45.

⁴⁸ WTO, *Trade Policy Review Mechanism: Thailand*, Report by the Secretariat, WT/TPR/S/9, p. 32.

⁴⁹ Thailand did not provide preferential rates to ASEAN suppliers during the period under review as part of its commitments to attain an ASEAN Free Trade Area, according to data obtained from one of the companies.

⁵⁰ WTO, *Trade Policy Review Mechanism: Thailand*, Report by the Secretariat, WT/TPR/S/9, p. 37.

⁵¹ Jean-Francois Tremblay, "Thailand Aspires to be A Petrochemical Power," *Chemical Engineering News Record*, [date].

Table 5: U.S. Exports to Thailand of Selected Petrochemical Products, 1992-96

HTS No.	Description	1992	1993	1994	1995	1996
Value, in thousands of dollars						
3901.10	Polyethylene having a specific gravity of less than 0.94, in primary forms	2,171	1,755	3,008	3,878	5,525
3901.20	Polyethylene having a specific gravity of 0.94 or more, in primary forms	2,258	1,672	3,061	4,916	2,255
3902.10	Polypropylene, in primary forms	3,611	573	1,493	1,954	1,327
3903.11	Polystyrene, expandable, in primary forms	511	642	106	53	0
3903.19	Polystyrene, not elsewhere specified, in primary forms	368	1,179	306	2,934	263
Total, listed items		8,919	5,820	7,974	13,735	9,370
Unit value, in U.S. dollars per kilogram						
3901.10	Polyethylene having a specific gravity of less than 0.94, in primary forms	0.763	0.820	0.845	1.100	1.010
3901.20	Polyethylene having a specific gravity of 0.94 or more, in primary forms	0.545	0.609	0.736	1.012	0.914
3902.10	Polypropylene, in primary forms	0.578	0.600	0.775	1.169	1.085
3903.11	Polystyrene, expandable, in primary forms	0.838	0.836	0.798	0.923	n.a.
3903.19	Polystyrene, not elsewhere specified, in primary forms	0.864	0.742	1.444	2.487	4.095
Source: Compiled by the staff of the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce.						

Comments by José Tavares de Arujo on

**China's Nontariff Trade Barriers by
Yu-Shi Mao**

and

**Barriers to Trade in Selected Sectors by ASEAN members: How Important are NTBs? By
David Ingersoll and Kim Frankena**

The presentations made by Prof. Yu-shi Mao and Dr. Ingersoll have highlighted the importance of measuring non-tariff trade barriers. But they also have shown us how difficult is to accomplish this task.

My comment will be focused on these difficulties. Normally, the assessments of trade barriers, protection costs and related subjects are based on the concept of market distortion. However, in order to use this analytical instrument, we have to accept a series of conventional assumptions, such as that we are dealing with an open market economy, running in a more or less stable macroeconomic environment, wherein most sectors are exposed to international competition, while some others are temporarily protected. If there are subsidies in that economy, they are targeted to some industries or activities, but not spread throughout the economy

These assumptions – trade openness, macroeconomic stability and selective protection – are quite reasonable when we are dealing with the OECD countries, or some developing countries such as Chile, for instance. In these cases we can easily apply conventional instruments like the price gap method: the difference between domestic prices and the prices of imported goods give us a good estimate on the amount of existing market distortions. And then we may go ahead and calculate the rates of effective protection, welfare losses, and so on.

But most transition economies are marked by those peculiarities so well described by Prof. Yu-shi Mao: exchange rate appreciation; dual, triple or multiple exchange rates; state firms producing basic inputs with prices established through political criteria, etc. In this context, price gaps can be meaningless. Besides, those countries often provide very limited information on the existing protection mechanisms. This is not to deny the importance of price comparisons, but just to stress that some precautions are needed. In fact, the starting point of the discussion is always a price comparison. The only caveat is that in the case of transition economies – and, I must say, also in some developed economies like Japan – we need to add other variables, such as profit rates and productivity indexes.

To get reliable data on these variables can be even harder than estimating price gaps. But they provide some preliminary indication on how domestic prices are structured. In other words, with some general information on profit rates in the most important sectors of the economy, some aggregate data on productivity growth and a rough idea of the innovative efforts made by the leading firms in the country, we can get a broad view of the present conditions of competition in that economy. And then we will be better prepared to check the quality of our price gaps estimates.

Perhaps, instead of focusing our attention on prices gaps we should look at *profitability gaps* measured by international comparisons. Under this approach, we should try to explain the difference between domestic and international profits in some selected sectors, using the above mentioned indicators as explanatory variables.

Comments by Will Martin on

China's Nontariff Barriers by Professor Yu-shi Mao

This paper contains a great deal of valuable information on China's trade regime, and its implications for China's trade. I understand that the paper was prepared under very tight time constraints, and it is very impressive given the time that was available for it. At times, the current draft leaves the policy messages a little unclear and it would be very useful to revise it so that the main messages become easier to understand.

The discussion of the planning system in the Introduction is very useful. I think it would be useful, however, to distinguish the problems arising under the pure planning system with those arising under partial reform. Under the pure planning system, pre 1978, my reading is that the tariff, and all other price-based measures, had only an accounting function. Since the dozen or so foreign trade corporations (FTCs) had monopoly control over their product lines, and the planners told them how much to import and export, the key problem was not of excessive price response to domestic-world price differentials. The problem was that, absent any system to reflect scarcity, the traders had no real idea of what mix of products should be traded, or how much. Only after reform began, and the trading companies were urged to respond to price incentives, did the distorted prices create the incentives for distorted trade that Professor Mao describes on page 2.

The large gross imports of oil and oil products do not fit my hypothesis, however, because they are covered by a state trading monopoly. Are there different types of oil-- heavy and light crude, for example-- that might justify some two-way trade?

The problems of ownership and control that Professor Mao describes on pages 2 and 3 seem to be persistent. They may be alleviated by the delegation of foreign trading rights to lower levels of government, and the increased competition between firms that arises now that there are many thousands of trading firms. In this situation, firms that engage in uneconomic trades face the risk of going out of business. However, reforming corporate governance seems a high priority problem.

On page 3, section IIA, the first paragraph seems to refer to the pre-reform situation, where the dozen trading firms were huge, unresponsive entities. The next paragraph refers to the post-reform situation, where there are thousands of state-owned FTCs and even more joint ventures with trading rights. Some thousands of state-owned industrial firms have direct trading rights-- but this does not mean they have their own trading firms; these industrial firms have the right to trade only their own products. The commitment to free trading rights within three years of entry into the WTO is extremely important, although the environment is currently quite competitive in terms of the number of firms active.

The listing of kinds of trade control on page 7 is very useful. One other measure that I would suggest including is the continuing monopoly State Trading in products such as grains, chemical fertilizers, oil and oil products. This form of trading has the same dismal results as were observed under the pre-reform trade regime. The wrong quantities of goods are imported-- the recent World Bank study on agricultural trade found that grain imports actually destabilize domestic grain prices. Further, because of their isolation from the needs of buyers and sellers, these traders trade the wrong mix of products-- the same World Bank study found that imports of potash fertilizers have consistently been too low. It also seems worth mentioning Designated Trading, which covers some important products like steel, and restricts

trade to 50 odd firms, frequently with geographical limitations on trade that probably create some degree of market power. China has committed to abolishing Designated Trading after WTO entry, but plans to retain state trading, which is GATT legal, albeit very costly for China's economy.

The key results on nontariff barriers are discussed very briefly on page 8. Readers of this paper need much more of the information from the underlying paper on *Measuring the Costs of Protection* if they are to evaluate the results. Even there, the details are sometimes a little sketchy on exactly what prices are being compared and how reliable they are. Professor Mao points out that the tariff collection rates in China are greatly below the applied rates. Does this mean that the nontariff barriers are understated? It seems worth mentioning another possible source of bias in the tariff equivalents that arises from the much lower level of wages in China. Since goods prices typically include some local services, price comparisons between high and low income countries typically understate the level of protection in low-income countries and overstate it in high income countries. This may contribute to explaining the surprisingly high estimates for the USA and Japan reported from the related Institute for International Economics studies.

The selection of highly protected commodities tends to raise the estimated tariff equivalent of protection. In the recent World Bank study *China Engaged*, we drew on the price estimates from Professor Mao's study, and some from the ICP project, and concluded that the average tariff equivalent of Nontariff Barriers was about 9 percent. Even this was sufficient to greatly increase the benefits from liberalization.

p10-11. The problem of artificial prices for planned goods is important. It's important to mention that the size of these distortions seems to have decreased in recent years. I understand that official prices for grains were frequently above market prices during the past year. However, while fixed official prices are retained, there will be the problems of gaps between market and plan prices, and consequent scope for corruption.

Comments by Agapi Somwaru on

Barriers to Trade in Selected Sectors by ASEAN Members: How important are NTBs? by David Ingersoll and Kim Frankena

This study attempts to identify and empirically assess the impact of trade barriers in the APEC region other than tariff barriers and quantitative restrictions. As the authors clearly state in the paper, the objectives of the paper are:

- a) to identify any barriers to trade and investment in particular sectors in the ASEAN region, and
- b) to quantify No Tariff Barriers (NTBs).

Although the task seems rather simple and straight forward, only one who has dealt with a subject of this manner can understand the authors' brave decision to tackle such a complex topic. Given the vast number of sectors, the various commodity and trade classification systems, the vast number of industry definitions followed by the various countries, the variety of the measuring units used for the same commodity globally, any attempt to dwell upon the forms of NTBs on ASEAN countries it is truly a courageous effort. In general, the paper meets its primary objective, that is, identifies the various NTBs, it serves as a screening device and it sets the foundation for further investigation.

However, although the authors undertook this great effort, which is of particular importance for modeling activities, they failed to associate the NTBs in the selected ASEAN countries with the size of trade volume involved. The paper on Table 1 and 2 provides aggregated and detailed lists of NTBs in selected ASEAN countries by industry, respectively; however, trade volumes affected by these trade barriers are not reported. Consequently, the evaluation of the magnitude of these NTBs is not easily assessed or thoroughly addressed and furthermore their effects on trade, as trade distortion instruments, is difficult to be evaluated. The importance of the imposition of NTBs on trade depends upon the size of trade volume that affect. If the trade barriers reported affect large volumes of trade, then the NTBs have significant effects and, consequently, greatly distort trade. Thus, the NTBs are important to be further studied and analyzed. Otherwise, if imported commodities in these selected ASEAN countries are facing numerous NTBs but the size of trade volume involved is small, then the consequences of the imposition of NTBs is rather minimal. The list of the number of NTBs for all sectors, by country or by groups of countries that the authors provide in the paper, is rather misleading if the NTBs are not associated with the volume of the tradable goods that are affected by the NTBs.

After the Uruguay Round, many efforts were undertaken to quantitatively evaluate the NTBs. The authors selected the price gap method as an approach to quantify the NTBs. Although this method is not the most suitable, it has its merits due to lack of other more theoretically sound procedures. Furthermore, an incorporation of a review of the methods used in various literary works for quantifying NTBs by the authors, would have been very meaningful and helpful to the reader.

An essential literature review section is also missing from the paper. The section on *Review of Selected Studies* is not sufficient to serve as literature review section. The section is rather misleading and confusing section of the paper, since the focus of the paper is on ASEAN countries. The three Selected Studies are in close geographically proximity to the ASEAN countries but have vast differences in economic and trade activities.

Given that the authors labeled their paper as a draft, I am hoping that the final version will contain a strong summary and conclusion. The paper in its final form should also make distinctions between the domestic *producer* and *consumer* prices (on Table 3), and provide, if possible, insights on the trade that is involved with the NTBs.

SESSION V

BUSINESS NETWORKS

Ethnic Chinese Networks In International Trade

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Ethnic Chinese networks, as proxied by ethnic Chinese population shares, are found to have a positive effect on bilateral international trade, especially in differentiated products. Evidence is presented indicating that this effect is unlikely to be attributable to any cross-country taste similarity created by ethnic Chinese populations. Ethnic Chinese networks are estimated to increase differentiated product trade for the typical APEC country pair by 30.2 percent in 1990. Some tentative welfare conclusions and even more tentative policy recommendations are also presented.

*Rauch is also affiliated with the NBER. Financial support was provided by NSF grant #SBR-9709237.

I. Introduction

The economic boom in Southeast Asia has called attention to the role of ethnic Chinese networks in international trade and investment (see, e.g., Redding 1995). Studies show that not only the Overseas Chinese but also many other ethnic groups living outside their countries of origin create formal or informal "societies" to which coethnic businesspeople from both the host countries and the mother country have access. Kotkin (1992) states that "Chinese entrepreneurs remain, in essence, arbitrageurs, their widespread dispersion a critical means of identifying prime business opportunities" (p. 169) and "most of Hong Kong's Indian businesses--from the tiny two-man operation to the giant conglomerate--fit the classical mold, with extended families providing the linkages between various national markets" (p. 219).¹

The operation and economic importance of coethnic societies has been especially well documented for the special case of trade between countries hosting recent immigrants and these immigrants' countries of origin. Gould (1994) finds that immigration to the United States increases U. S. bilateral trade with the immigrants' countries of origin and that this "immigrant-link effect" is stronger for U. S. exports than for U.S. imports, indicating that the effect works primarily through the establishment of business contacts rather than through increased U. S. preferences for goods produced in the country of origin. Chin, Yoon, and Smith (1996, p. 498) give an example of how these business contacts worked to promote Korean wig exports to the United States:²

Korean wig importers' contribution to the Korean wig import business was far greater than their numbers. From these immigrant wig importers, South Korea wig manufacturers could obtain information on new styles and market trends. Since they were not able to develop new styles of their own (prominent U.S. hair designers continuously developed innovative styles), South Korean wig manufacturers had to depend entirely on Korean immigrant wig importers for information on trends in U.S. wig fashion.

The empirical success of Overseas Chinese networks highlights the shortcoming of the assumption of perfect information embedded in the standard approach to trade in differentiated products (e.g., Helpman and Krugman 1985). It is reasonable to imagine that within a country buyers are informed at nominal cost of all available varieties and their characteristics, and sellers are well aware of how to reach the buyers that form their particular market niches. We argue that these presumptions are much less plausible for the international market, where buying agents for consumer goods distributors and firms seeking inputs to production processes incur considerable costs in discovering the foreign varieties available and their characteristics, as well as the capabilities of the suppliers of these varieties, and sellers incur considerable costs in finding buying agents or intermediate goods demanders that are good matches for the variety they have to offer. As Swedish Trade Council export consultant Kent Goldmann (quoted in Nothdurft 1992, p. 32) stated of his clients that are marginal or failed exporters,

¹ Rauch (1996b) studies a formal society of English-speaking Caribbean-American businesspeople. Unfortunately, the reasons why some ethnic groups form successful societies and others do not are still a mystery.

² Wigs were one of the major items in Korea's initial drive to break into world markets for manufactures in the 1960s and early 1970s. They were her third largest export item in 1970, accounting for 11.2 percent of *total* exports.

“Sometimes their product isn't right for the market, or the country they chose was not a good fit, or their approach or agents are not right.” Preferential group ties operating across markets are effective exactly because they overcome these information problems.

In order to distinguish this hypothesis about why coethnic networks matter for trade from other hypotheses, we build on the empirical framework developed in Rauch (1996a). He looks for evidence that variables indicative of the presence of networks should have more impact on bilateral trade in differentiated products than in homogeneous products, since the information problems discussed above should be more important for the former group of commodities. In the next section, we repeat, for the convenience of the reader, the rationale given in Rauch (1996a) for dividing commodities into three (rather than two) groups. In section III we present evidence using a gravity model regarding the impact of overseas Chinese networks on international trade. Section IV presents a tentative welfare analysis of our findings, and section V presents even more tentative policy recommendations. Conclusions and suggestions for further research are presented in section VI.

II. Organized Exchanges, Reference Prices, or Neither

In the empirical work below we will divide internationally traded commodities into three groups: those traded on organized exchanges, those not traded on organized exchanges but nevertheless possessing what we shall call “reference prices”, and all other commodities. In this section we will give the theoretical motivation for this tripartite division.

Let us first consider why some commodities are traded on organized exchanges and others are not. The conventional wisdom is that there is a cost to setting up “markets” (organized exchanges) that is independent of the volume of transactions, and that this non-convexity will not allow a market to open if the expected volume of transactions at the price expected to prevail in equilibrium is too small.³ For the sake of concreteness, let us attempt to apply this conventional wisdom to two commodities at the three-digit level of the Standard International Trade Classification (SITC), which is the least disaggregated level for which we will attempt to categorize commodities in the empirical work below. The two commodities are Footwear (SITC 851) and Lead (SITC 685, not to be confused with Lead Ores and Concentrates, SITC 2874). Suppose we use the dollar values of international trade in 1990 between the 63 countries in the sample of Rauch (1996a) to indicate the “thickness” of the markets in these commodities, admitting that this is a bad proxy because it excludes domestic trade and does not account for the average size of transactions. The figures are \$27.3 billion for Footwear and \$1.3 billion for Lead, of which nearly 90 percent is Lead and Lead Alloys, Unwrought (SITC 6851) as opposed to Lead and Lead Alloys, Worked (SITC 6852). Unwrought lead is traded on the London Metal Exchange while footwear is not listed on any organized exchange. This information appears to contradict the conventional wisdom on formation of organized exchanges. However, one could argue that “footwear” is not a well-defined commodity and needs to be disaggregated into various types of shoes, each one of which may have a volume of transactions smaller than that of lead. As we know, in the limit this process

³ Much to our surprise, we could not find a formalization of this “conventional wisdom” in the literature. The closest we found is Heller (1993). Market formation involves set-up costs in his model, but his focus is on coordination failure where it is mutually profitable to open markets in complementary commodities but not to open one of them individually.

of disaggregation leads to shoes for which there is only one supplier: shoes are “branded” or differentiated products.

Without necessarily endorsing this argument, let us explore it further by contrasting Footwear with Polymerization and Copolymerization Products (SITC 583). 1990 international trade in these chemicals for the 63 countries in Rauch (1996a) amounted to \$47.6 billion. Like Footwear, they are not listed on any organized exchange, perhaps because they can be disaggregated into types for each of which the market is too “thin”. Does this mean that Polymerization and Copolymerization Products should be treated in the same way as Footwear in the empirical analysis below?

The answer is no. Polymerization and Copolymerization Products are not “branded”: prices can be quoted for these products without mentioning the name of the manufacturer, and these “reference prices” are found to be sufficiently useful by industry actors to be worth quoting in trade publications. For example, a price per pound of Polyoxyethylene Sorbitan Monostearate is quoted weekly in *Chemical Marketing Reporter* on the basis of surveys of suppliers. Abstracting from transportation costs, it is then possible for traders to assess the profitability of shipping polymerization and copolymerization products between any two countries solely on the basis of the prices prevailing at the ports of those two countries. One or more traders specialized in a given one of these chemicals can keep informed of its prices around the globe and perform international commodity arbitrage, matching distant buyers and sellers just as would traders on an organized exchange. As far as empirical analysis of matching international buyers and sellers is concerned, then, the reason to treat commodities traded on organized exchanges differently from commodities that only have reference prices is that we know the former have specialized traders that centralize price information while the same is only potentially true for the latter.

Shoes, on the other hand, do not have reference prices. Any observed price at another location must be adjusted for multidimensional differences in characteristics, and the adjustment depends on the varieties of shoes available at that location and the distribution of consumer preferences over varieties at that location. We claim that these informational demands are too great to permit international commodity arbitrage,⁴ and therefore traders will instead engage in a sequential search for buyers/sellers that terminates when some “reservation match” is achieved. This search is facilitated by contacts who “know the market”. In this paper we are particularly interested in the impact on trade of ethnic Chinese traders’ networks of coethnic contacts.

For the purposes of the empirical work below, we can summarize the discussion of this section as follows. Possession of a reference price distinguishes homogeneous from differentiated products. Homogeneous commodities can be further divided into those whose reference prices are quoted on organized exchanges and those whose reference prices are quoted only in trade publications. The network/search model should apply most strongly to differentiated products and most weakly to products traded on organized exchanges, with its applicability to other homogeneous products unclear. Thus

⁴ Here we find it helpful to have in mind Hahn’s (1971) definition of markets as activities that transform “named” goods into “anonymous” goods. One could argue that the “anonymity” provided by the price system is what makes international commodity arbitrage possible. It is not possible for “branded” (named) commodities because they have not been transformed into anonymous commodities by “markets” (organized exchanges) or by other means.

Overseas Chinese networks should have the greatest effects on matching international buyers and sellers of differentiated products. This hypothesis will be examined in the next section.

II. Evidence From a Gravity Model of Trade

A. The Gravity Model

The standard (indeed, the only) empirical framework used to predict how countries match up in international trade is the gravity model. This model takes its name from the prediction that the volume of trade between two countries will be directly proportional to the product of their economic masses (as measured by GDP or GNP) and inversely proportional to the distance between them. As Harrigan (1994) and others have pointed out, at least two different theoretical foundations can be given for gravity models of trade: the monopolistic competition model and what Harrigan calls the Armington-Heckscher-Ohlin-Vanek model. The careful empirical work of Hummels and Levinsohn (1995) led them to conclude (p. 828) “that something other than monopolistic competition may be responsible for the empirical success of the gravity model,” but the Armington-Heckscher-Ohlin-Vanek model is not strongly indicated as an alternative.

Rather than discuss its possible microeconomic foundations, we would instead like to note that the gravity equation can be derived from the assumption that every country consumes its own output and that of every other country in proportion to its share of world demand. This leads immediately to the equation

$$V_{ij} = s_i GDP_j + s_j GDP_i \quad (1)$$

where we have used the notation from Helpman (1987): V_{ij} $\equiv$ bilateral volume of trade between country i and country j and s_n $\equiv$ share of country n in world spending. Since under balanced trade $s_n = GDP_n / \overline{GDP}$, where $\overline{GDP}$ $\equiv$ world gross domestic product, then assuming balanced trade yields

$$V_{ij} = 2 GDP_i GDP_j / \overline{GDP}. \quad (2)$$

This is the basic gravity relationship, minus the inverse dependence of trade on distance. We would argue that it is most useful to view this relationship as a basic “null” or starting point for further analysis of trade rather than as something that itself needs to be explained.⁵ In other words, it will often be useful for “positive” theoretical and empirical work on trade to focus on explaining deviations from this relationship, just as normative work takes autarky as its starting point and measures gains from trade relative to autarky.

⁵ Deardorff (1995, p. 9) states, “any plausible model of trade would yield something very like the gravity equation, whose empirical success is therefore not evidence of anything, but just a fact of life.”

In the empirical work below we will estimate the gravity model separately for each of the three commodity groups distinguished in the previous section. Following the same reasoning that led to equation (1), we write

$$V_{ijk} = s_i w_{jk} GDP_j + s_j w_{ik} GDP_i, \quad (3)$$

where w_{nk} is the commodity k share of country n output. Substituting for s_n as before yields

$$V_{ijk} = (w_{ik} + w_{jk}) GDP_i GDP_j / \overline{GDP}. \quad (4)$$

If w_{nk} varies across n , due for example to comparative advantage, then $w_{ik} + w_{jk}$ is not constant for a given k . In the final gravity model specifications below we will assume that $w_{ik} + w_{jk}$ is absorbed into a multiplicative error term.

Following the usual gravity specification, we assume that factors that aid or resist trade cause deviations from (4) multiplicatively. In addition to distance, we shall include the other factors aiding or resisting trade that were used by Frankel and co-authors in a series of papers on trading blocs (e.g., Frankel, Stein, and Wei 1993). Per capita income has become a standard covariate in gravity models (for example, it is used in the paper by Eaton and Tamura (1994) cited below), and Frankel et al. included the product of per capita GNPs. (They also used GNPs rather than the GDPs that appear in equations (1) - (4)). They added a dummy variable indicating when two countries are adjacent, which is important since the distance between Chicago and Mexico City, say, is a much less complete measure of the physical separation between the United States and Mexico than is the distance between Chicago and London of the physical separation between the United States and the United Kingdom. They included a dummy variable indicating the presence of a colonial tie or common language between two countries. Finally, they added dummy variables indicating membership in two preferential trading blocs, the European Community (EEC) and the European Free Trade Association (EFTA).

To indicate the presence of ethnic Chinese networks, we add a variable equal to the product of the two countries' ethnic Chinese population shares. Note that this variable takes on the value zero if either country has a zero ethnic Chinese population share, and it is maximized for a given total ethnic Chinese population share when the two countries have equal shares. In future research we plan to experiment with other functional forms for this variable.

We were concerned that, if countries with similar tastes tend to trade more with each other (as has been argued by Linder (1961), for example), one could interpret a finding of a positive effect of the ethnic Chinese variable on bilateral trade as indicating that the variable was a proxy for taste similarity rather than networks. We attempt to partially address this concern by splitting the dummy variable for colonial ties/common language used by Frankel et. al into separate dummy variables for colonial ties and common language. The idea is that common Chinese ancestry should have effects on taste similarity roughly equal to those of common language (recall that most emigration from China occurred before World War I), so that if the ethnic Chinese variable has a clearly greater impact on bilateral trade than the common language variable we can discount the taste similarity explanation somewhat.

We can now write our gravity model as follows:

$$V_{ijk} = \alpha_k (GNP_i GNP_j)^{\beta_k} (PGNP_i PGNP_j)^{\gamma_k} DISTANCE^{\delta_k} \times \exp(\epsilon_k ADJACENT + \zeta_k LINKS + \eta_k EEC + \theta_k EFTA + \lambda_k CHINPOP + \phi_k LANGUAGE + u_{ijk}), \quad k=1,2,3, \quad (5)$$

where $k = 1$ denotes organized exchange commodities, $k = 2$ denotes reference priced commodities, and $k = 3$ denotes differentiated commodities, and $PGNP$ denotes per capita GNP, $DISTANCE$ equals the great circle distance between the principal cities of countries i and j , $ADJACENT$ takes the value of one if countries i and j share a land border and zero otherwise, $LINKS$ takes the value of one if countries i and j share a colonial tie and zero otherwise, EEC and $EFTA$ equal one if countries i and j are members of the European Community and European Free Trade Association, respectively, and zero otherwise, $CHINPOP$ equals the product of the ethnic Chinese population shares for countries i and j , $LANGUAGE$ takes the value of one if countries i and j share a language and zero otherwise, and u_{ijk} is a Gaussian white noise error term associated with the dependent variable V_{ijk} .⁶

The dependent variable V_{ijk} is bounded below by zero, and some observations achieve this bound. Following Eaton and Tamura (1994), we estimate a modified gravity model in which the right-hand side of equation (5) must achieve a minimum threshold value a_k before strictly positive values of V_{ijk} occur. In the iceberg transportation cost metaphor, we might think of $-a_k$ as an amount of “melting” that occurs as soon as the trip starts independent of the distance traveled. The gravity model to be estimated in subsection C below is then

$$V_{ijk} = \max[-a_k + \alpha_k (GNP_i GNP_j)^{\beta_k} (PGNP_i PGNP_j)^{\gamma_k} DISTANCE^{\delta_k} \times \exp(\epsilon_k ADJACENT + \zeta_k LINKS + \eta_k EEC + \theta_k EFTA + \lambda_k CHINPOP + \phi_k LANGUAGE + u_{ijk}), 0], \quad k=1,2,3. \quad (6)$$

Rearranging and taking natural logarithms of both sides yields

$$\ln(a_k + V_{ijk}) = \max[\ln \alpha_k + \beta_k \ln(GNP_i GNP_j) + \gamma_k \ln(PGNP_i PGNP_j) + \delta_k \ln DISTANCE + \epsilon_k ADJACENT + \zeta_k LINKS + \eta_k EEC + \theta_k EFTA + \lambda_k CHINPOP + \phi_k LANGUAGE + u_{ijk}, \ln a_k], \quad k=1,2,3. \quad (7)$$

Equations (7) will be estimated by maximum likelihood, where the likelihood function is constructed using what we call a threshold Tobit model. The details of the estimation procedure are given in Eaton and Tamura (1994, pp. 490-492).

⁶ The reader might note that it is possible to rewrite equation (5), replacing the product of per capita GNPs with the product of populations, in which case the coefficient on the product of GNPs would equal $\beta_k + \gamma_k$ and the coefficient on the product of populations would equal $-\gamma_k$.

Following Deardorff (1995) and Wei (1996), we also estimate a second gravity model in which a variable for the geographical remoteness of the trading partners from the rest of the world has been added. Their argument is that, all else equal, two countries that are very far away from most other large potential trading partners (such as Australia and New Zealand) will trade more with each other than two countries that are close to most other large potential trading partners (such as Denmark and Portugal). The variable *REMOTE* equals the product of the weighted sum of country *i*'s distances from all other countries in the sample and the same weighted sum for country *j*, where the weights are the GNPs of the other countries. Thus we also estimate:

$$\ln(a_k + V_{ijk}) = \max[\ln\alpha_k + \beta_k \ln(GNP_i GNP_j) + \gamma_k \ln(PGNP_i PGNP_j) + \delta_k \ln DISTANCE + \epsilon_k ADJACENT + \zeta_k LINKS + \eta_k EEC + \theta_k EFTA + \lambda_k CHINPOP + \phi_k LANGUAGE + \psi_k \ln REMOTE + u_{ijk} \ln a_k], \quad k=1,2,3. \quad (8)$$

In light of the theory presented so far, we expect the following relationships to hold among the coefficients of interest: λ_3 should be positive, significant, and greater than ϕ_3 , and $\lambda_3 > \lambda_2 > \lambda_1$. The effects of *CHINPOP* for reference priced commodities are expected to be intermediate because, with regard to matching international buyers and sellers, their homogeneity makes them like organized exchange commodities but their lack of organized exchanges makes them like differentiated commodities.

B. Data

The sample of countries used in the estimation below is listed in Table 1. They are the same 63 countries that were chosen by Frankel and his co-authors. This allows us to use their data for GNP and per capita GNP (in current dollars), great circle distance between principal cities, and dummies for adjacency, European Community membership (see Table 3), and European Free Trade Area membership. A colonial ties dummy variable was constructed on the basis of articles in the *Encyclopedia Britannica*. A common language dummy variable was constructed by assigning countries to language groups on the basis of *Ethnologue* (Grimes 1984).⁷ Data on ethnic Chinese population circa 1980 was collected from Poston and Yu (1990). The same data circa 1990 was collected from the *Overseas Chinese Economy Yearbook 1990* (1991). Table 1 lists the number of ethnic Chinese (column CHIN) and the overall population (column POP) for 1980 and 1990 for all countries in our sample for which this data is available.

Unlike Frankel et al., we use the World Trade Database of Statistics Canada as our source for bilateral trade. The World Trade Database is derived from United Nations COMTRADE data. Its advantages are (1) it is much cheaper, especially important given that data at the 4-digit SITC level are being used, and (2) special care was taken to insure that trading partners were correctly identified (as

⁷ Two countries were considered to belong to the same language group if at least ten percent of the population of each country speaks that language at home. While colonial ties and common language often went together, in many cases this was not true. For example, Belgium and France share a common language, but not a colonial tie; Kenya and the UK share a colonial tie, but not a common language. See Table 2.

opposed to listing an *entrepôt* as the trading partner), mainly by making careful efforts to insure that exports of country *i* to country *j* of commodity *k* equal imports of country *j* from country *i* of commodity *k*.

As discussed in the previous section, commodities are classified into three categories: organized exchange, reference priced, and differentiated, at the three- and four-digit SITC level. Trade reported at a less disaggregated level was omitted. Fortunately, this accounted for only 0.1 percent of the total value of trade in our sample in each of the two years. Commodities were classified in the following manner. All commodities at the five-digit SITC level were classified by looking them up in *International Commodity Markets Handbook* and *The Knight-Ridder CRB Commodity Yearbook* (to check for organized exchanges) and *Commodity Prices* (to check for reference prices, e.g., price quotations published in trade journals such as *Chemical Marketing Reporter*). Classification of the next higher level of aggregation was then done according to which of the three categories accounted for the largest share (almost always more than half) of the value of its world trade. Since the World Trade Database does not report world trade by five-digit SITC, the sum of 1980 U.S. General Imports and Exports from the U.S. Department of Commerce was used for this purpose. Because ambiguities arose that were sometimes sufficiently important to affect the classification at the three- or four-digit level, both “conservative” and “liberal” classifications were made, with the former minimizing the number of three- and four-digit commodities that are classified as either organized exchange or reference priced and the latter maximizing those numbers. An appendix listing all of the commodities used in the estimation below and their conservative and liberal classifications is available on request.

C. Results of Estimation

Tables 4 - 5 give estimates of equations (7), the first gravity model above, for 1980 and 1990, respectively. It should be noted that no attempt was made to adjust for changes in classification of commodities by the three categories that may have occurred during the period 1980 - 1990. Ethnic Chinese population data are not available for six countries in 1980 and five countries in 1990, reducing the maximum number of observations from $(63)(62)/2 = 1953$ to $(57)(56)/2 = 1596$ and $(58)(57)/2 = 1653$, respectively.

First, we note that the coefficient on *CHINPOP* is positive and highly significant for differentiated products for both years and for both the conservative and liberal aggregations. Second, we note that the coefficient on *LANGUAGE* is not statistically significant for differentiated products in any year and in any aggregation.⁸ It thus appears that ethnic Chinese networks cause an increase in bilateral trade in differentiated products, and that it is unlikely that this effect is simply due to any cross-country similarity in tastes that ethnic Chinese populations might create. Third, we note that the coefficient on *CHINPOP* is largest for differentiated products and smallest for organized exchange products except for the conservative aggregation in 1980, when the coefficient on *CHINPOP* is smallest for reference priced products. However, in a pooled estimation we would probably find that within any year and aggregation we could not reject the hypothesis that these three coefficients are equal.

⁸ This result is unchanged if we set *LANGUAGE* = 0 for country pairs involving Israel and Arabic-speaking countries.

It is interesting that, comparing any column in Table 4 (for 1980) to the corresponding column in Table 5 (for 1990), the coefficients on *DISTANCE*, *LINKS*, and *CHINPOP* are all smaller in the latter table. This indicates that with global transportation and communication improving, proximity, colonial ties, and coethnic information networks are all diminishing in importance.

Tables 6 - 7 give estimates of equations (8), the second gravity model above, for 1980 and 1990, respectively. In 1990, the addition of the variable *REMOTE* causes *CHINPOP* to become insignificant for products traded on organized exchanges. It retains significance (at the one percent level) for reference priced products and differentiated products. These results support even more strongly than do the results of Tables 4 - 5 our contention that the positive effect of ethnic Chinese networks on bilateral trade is due to their ability to overcome informational barriers to trade in differentiated products.

What is the quantitative importance of the ethnic Chinese network effect on bilateral trade? It seems appropriate to evaluate this for APEC. The mean value of *CHINPOP* for APEC country pairs is roughly 0.07, compared to 0.0001 for all other country pairs in the sample. Using this value in conjunction with the smallest estimate for differentiated products of the coefficient on *CHINPOP* (3.77, for the second gravity model in 1990) yields the estimate that ethnic Chinese networks increase differentiated product trade for the typical APEC country pair by 30.2 percent.

We were concerned that our results for *CHINPOP* might be driven by trade among China, Hong Kong, and Taiwan, the three country pairs in our sample with the highest values of *CHINPOP*. This concern was heightened by the possibility that in constructing our trade data Statistics Canada may not have completely allocated to its ultimate origins and destinations the entrepôt trade between Hong Kong and China. We therefore reestimated our gravity models omitting these three country pairs. Far from making the coefficients on *CHINPOP* insignificant, however, this omission actually caused them to grow larger.

IV. Tentative welfare analysis

To our knowledge Casella and Rauch (1997) have developed the only general equilibrium model of the effects of information networks on international trade in differentiated products. It is somewhat risky to apply their conclusions here, however, since there are only two countries in their model and hence they cannot allow for the possibility that, for example, strong network connections between two countries might not only create trade between them but also divert trade that might have occurred between them and other countries. (Indeed, our empirical model needs to be extended to allow for this possibility as well.) The reader should bear this caveat in mind for the remainder of this section.

The results of Casella and Rauch confirm that for both countries an international information-sharing network raises the ratio of trade to GDP, increases (expected) GDP, and makes traders who are part of the network better off on average. Surprisingly, they also find that traders who are not part of the network are not merely unaffected by its presence but are actually worse off on average. The intuition for this result is as follows. Consider two countries that are similar in the sense that a product that sells well domestically (has a large domestic market niche) also sells well internationally. A coethnic trader with a product that is well positioned in his domestic market prefers to trade internationally in an information-rich environment that ensures that he will meet with an appropriate, high-volume distributor. In other words, he will choose to rely on the coethnic network. On the other hand, a coethnic trader with

a product that is poorly positioned in his domestic market will avoid the network in the hope of luckily meeting with a distributor with better market access than he deserves whom he can convince to take his product on. Now consider two countries that are dissimilar in the sense that how well a product sells domestically has no predictive power for how well it sells internationally. In this case every trader has an identical international market niche in expectation. Nevertheless, a trader with a favorable domestic market niche has more negotiating strength in the sense that he has less to lose by simply walking away from an international deal and selling only in his domestic market. A coethnic trader with a product that is well positioned in his domestic market may choose to avoid his international network because it gives his trading partners too many other options and thereby dilutes his bargaining power.⁹ We can summarize with the statement that when countries are similar coethnic traders with the most favorable international market niches rely on their network, while when countries are dissimilar coethnic traders with low bargaining power rely on their network. This self-selection of the more desirable trading partners into the network causes traders without access to the network to lose.

In the present context the results of Casella and Rauch (1997) suggest the following tentative welfare conclusions. (1) Ethnic Chinese networks raise world GDP by overcoming informational barriers to trade. (2) The ethnic Chinese traders themselves capture (more than) all of the increase in world GDP. (3) Other traders are made slightly worse off on average by the existence of ethnic Chinese networks because the ethnic Chinese traders they may meet have been negatively selected.

V. Very tentative suggestions for policy

As long as you have the option whether or not to rely on your network, having access to it can only make you better off.¹⁰ It follows that if governments can improve the access of their citizens to existing international information-sharing networks they should do so if the costs are not too high. It would probably also be beneficial for governments to create parallel networks that can substitute for coethnic ones, though this is less obvious.

What follows is a very tentative list of policy suggestions. It should be emphasized that these suggestions are not mutually exclusive.

The book *Overseas Chinese Business Networks in Asia* (1995) concludes with a number of suggestions for how non-ethnic Chinese businesspeople can take greater advantage of ethnic Chinese networks. Basically these suggestions concern how to make domestic ethnic Chinese more accessible as business partners in international ventures. Lest there be any misunderstanding, we should note that most studies show that ethnic Chinese are quite willing to include non-ethnic Chinese business partners in their network once they get to know them.

⁹ It has been stated of the overseas Chinese in Asia (Ziesemer 1996, p. 29), "Every key individual among them knows every other key figure."

¹⁰ This is not true if other traders can recognize that you are part of a network and choose to discriminate against you on that basis. In this case traders who would prefer not to rely on their network for the reasons given in the previous section no longer have that option. See Casella and Rauch (1997), section VII.A.

Business networks need not have a coethnic basis, of course. Business associations such as Chambers of Commerce are a form of information-sharing network. Governments can help such associations establish or deepen their international presence. Lim (1996) notes that the government of Singapore has been especially aggressive in this regard. She also makes the point that national business associations suffer from a disadvantage (relative to regional associations, say), because by definition they exclude businesses of other nationalities, including those of the host location.

Finally, governments can establish or improve the functioning of their own international information-sharing networks, i.e., trade promotion organizations. The Hong Kong Trade Development Council is widely regarded as one of the most successful examples of such organizations. According to Keesing (1988, p. 20), "HKTDC sees its central task as 'matchmaking' between foreign buyers and Hong Kong firms wishing to export."

VI. Conclusions and suggestions for future research

We have found that ethnic Chinese networks, as proxied by ethnic Chinese population shares, have a positive effect on bilateral international trade, especially in differentiated products. We presented evidence indicating that this effect is unlikely to be attributable to any cross-country taste similarity created by ethnic Chinese populations. Ethnic Chinese networks are estimated to increase differentiated product trade for the typical APEC country pair by 30.2 percent in 1990. We also presented some tentative welfare conclusions and even more tentative policy recommendations.

In the short term we plan to improve our estimation of the effects of overseas Chinese networks on bilateral trade by allowing for the network effect to exhibit diminishing returns as the ethnic Chinese population shares increase. Note that the smallest estimate for differentiated products of the coefficient on *CHINPOP* implies that two countries with 100 percent ethnic Chinese population will trade 43.4 times as much ($e^{3.77} = 43.4$) with each other as two countries with zero percent ethnic Chinese population. Also, we pointed out above that omission from our sample of the three country pairs with the highest value of *CHINPOP* increased the estimated coefficients on *CHINPOP*. Both of these facts indicate the need to allow for the marginal effect of *CHINPOP* to diminish with its size.

In the longer term we need to improve the theoretical basis for both our empirical specification and our welfare conclusions. The most immediate step would be to extend the model of Casella and Rauch (1997) from two to many countries. Less immediately, we need to think about the issue of formation of business networks on a non-coethnic basis, in order to have a firmer foundation for policy recommendations.

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Table 1
Codes, Countries, Chinese Population (CHIN), Population (POP, millions)
(1980 and 1990)

CODE	Country	CHIN (1980)	POP (1980)	CHIN (1990)	POP (1990)
1	Canada	289245	23.9	550000	26.52
2	France	210000	53.5	150000	56.44
3	W.Germany	20000	60.9	40000	63.23
4	Italy	3500	56.9	6000	57.66
5	Japan	54607	116.8	137499	123.54
6	UK	230000	55.9	230000	57.41
7	US b	806040	227.7	1800000	249.97
8	Austria	4500	7.5	3800	7.71
9	Belgium	4000	9.8	11000	9.84
10	Denmark	2000	5.1	5000	5.14
11	Finland	9	4.9	9	4.99
12	Netherlands	60000	14.1	70000	14.94
13	Norway	600	4.1	950	4.24
14	Sweden	5000	8.3	9000	8.56
15	Switzerland	3200	6.5	7500	6.71
16	Australia	122700	14.5	330300	17.09
17	Greece	186	9.6	120	10.12
18	Iceland		0.23		
19	Ireland	1000	3.3	1000	3.5
20	New Zealand	19248	3.3	30000	3.35
21	Portugal	2500	9.8	4700	10.53
22	Spain	3500	37.4	15000	38.96
23	S. Africa	11000	29.3	20000	35.28
24	Turkey	36000	44.9	60000	58.69
25	Yugoslavia		22.3		
26	Israel		3.9		
28	Argentina	2000	27.7	12000	32.32
29	Brazil b	11213	118.7	100000	150.37
30	Chile	2000	11.1	13000	13.17
31	Colombia	5600	26.7	4000	32.99
32	Ecuador	12800	8	16000	10.78
- 33	Mexico	20000	69.8	20000	86.15

CODE	Country	CHIN (1980)	POP (1980)	CHIN (1990)	POP (1990)
34	Peru	52000	17.4	500000	22.33
35	Venezuela	14000	14.9	14000	19.73
36	Bolivia	2000	5.6	4000	7.4
37	Paraguay	4000	3.2	6000	4.28
38	Uruguay	250	2.9	350	3.09
39	Algeria		18.9		
40	Libya	300	3	356	4.54
41	Nigeria	1000	84.7	1500	117.5
42	Egypt	20	39.8	110	53.15
43	Morocco	10	20.2	20	25.06
44	Tunisia		6.4		
45	Sudan	45	18.7	45	25.2
46	Ghana	300	11.7	320	15.03
47	Kenya	100	15.9	150	24.03
48	Ethiopia	50	31.1	55	50.97
49	Iran	300	38.4	300	54.61
50	Kuwait		1.4	200	2.14
51	Saudi Arabia	45000	9	30000	14.87
52	Indonesia	6150000	146.6	7260000	179.3
53	Taiwan	17444000	17.8	19943000	20.35
54	HongKong	4947000	5.1	5626000	5.8
55	India	110000	673.2	21000	827.05
56	S.Korea	46192	38.2	23328	42.79
57	Malaysia	3630542	13.9	5202000	17.86
58	Pakistan b	3600	82.2	3600	112.05
59	Philippines	1036000	49	800000	61.48
60	Singapore	1856237	2.4	2038000	3
61	Thailand	4800000	47	4800000	57.2
62	Hungary	24	10.8	24	10.55
63	Poland	77	35.8	77	38.18
64	China b	898564000	976.7	1032608000	1122.4

Sources: 1) Poston and Yu, *The Distribution of the Overseas Chinese in the Contemporary World*, International Migration Review, Fall 1990, 480-508.

2) Overseas Chinese Economy Year Book (in Chinese), Taiwan, 1991

3) Overseas Chinese Business Networks in Asia, Australian Department of Foreign Affairs and Trade, 1995

Table 2
Common Language Groups

English: Canada, UK, US, Australia, Ireland, New Zealand
Spanish: Spain, Argentina, Chile, Colombia, Ecuador, Mexico, Peru, Venezuela, Bolivia, Paraguay, Uruguay
Arabic: Israel, Algeria, Libya, Egypt, Morocco, Tunisia, Sudan, Kuwait, Saudi Arabia
French: Canada, France, Belgium, Switzerland
Portuguese: Portugal, Brazil
German: West Germany, Austria, Switzerland
Italian: Italy, Switzerland
Dutch: Belgium, Netherlands
“Malay”: Indonesia, Malaysia, Singapore
Mandarin: Taiwan, Singapore, China

Note 1: All pairs of countries in the same group receive a 1 for the dummy variable LANGUAGE.

Note 2: A country is considered to belong to a group if at least 10% of its population speaks that language as a native language.

Note 3: “Malay” is actually two different languages, called Bahasa Indonesia in Indonesia and Bahasa Malaysia in Malaysia (and by extension in Singapore). However, the overlap between the two languages is considerable, and the two countries have agreed on a common spelling system to facilitate mutual understandability.

Note 4: The question whether to choose “Mandarin” as a definition of a language, or just “Chinese” (which would include Cantonese, and therefore Hong-Kong), is obviously a little arbitrary. We preferred to use Mandarin, emphasizing mutual understandability (Mandarin and Cantonese are *not* mutually understandable), leaving the link for the Chinese population for the CHIN variable in Table 1.

Table 3
Countries which belonged to EEC and EFTA, circa 1980

EEC: France, West Germany, Italy, UK, Belgium, Denmark, Netherlands, Greece, Ireland, Portugal, Spain.
EFTA: Austria, Finland, Norway, Sweden, Switzerland, Iceland, Portugal.

Note: Luxembourg belonged to the EEC, but is not in our sample.

Table 4
Results of the estimation (1980)

	Eq. WC	Eq. RC	Eq. NC	Eq. WL	Eq. RL	Eq. NL
Intercept	-11.35 (1.27417)	-10.0808 (0.860614)	-11.3803 (0.805646)	-10.0012 (1.11684)	-10.7468 (0.867548)	-11.7767 (0.822486)
GNP _i GNP _j	1.05756 (0.041682)	0.908354 (0.027596)	0.902631 (0.026957)	0.985552 (0.037141)	0.95307 (0.027249)	0.89838 (0.027158)
PGNP _i PGNP _j	0.270813 (0.051161)	0.45088 (0.035147)	0.511695 (0.034469)	0.301279 (0.045467)	0.453211 (0.034962)	0.525564 (0.034940)
DISTANCE	-0.864658 (0.094900)	-0.920732 (0.066362)	-0.7721 (0.062860)	-0.829173 (0.085517)	-0.979745 (0.065565)	-0.75046 (0.063852)
ADJACENT	0.92442 (0.363525)	0.804827 (0.269381)	0.79139 (0.270815)	0.796905 (0.331320)	0.748169 (0.283700)	0.826515 (0.274547)
LINKS	1.06448 (0.235888)	1.06624 (0.171396)	1.31616 (0.161771)	0.979525 (0.211365)	1.10765 (0.171827)	1.31452 (0.162852)
EEC	-0.484365 (0.224827)	-0.098754 (0.158145)	-0.041122 (0.148349)	-0.576963 (0.204180)	-0.15909 (0.158955)	.295400E-02 (0.150341)
EFTA	-1.05727 (0.393205)	0.103814 (0.212574)	0.373211 (0.214623)	-0.749214 (0.299831)	0.132293 (0.200164)	0.404378 (0.219748)
CHINPOP	5.80101 (1.23860)	5.52948 (0.905033)	6.08143 (0.977039)	5.35475 (1.16338)	5.66249 (0.908343)	6.1518 (0.972941)
LANGUAGE	0.25063 (0.324764)	0.149352 (0.236885)	-0.202553 (0.189677)	0.255658 (0.292580)	-0.0343 (0.235715)	-0.165897 (0.191538)
Threshold	138.41 (18.7966)	116.167 (14.8259)	93.9315 (15.5065)	145.464 (20.1321)	119.319 (15.3266)	85.6427 (14.1557)

Note 1: W- organized exchange traded goods R - world reference priced goods N - neither
C - conservative classification L - Liberal Classification

Note 2: "Threshold" Tobit model, with maximum likelihood estimation.

Table 5
Results of the estimation (1990)

	Eq. WC	Eq. RC	Eq. NC	Eq. WL	Eq. RL	Eq. NL
Intercept	-8.23688 (1.09450)	-8.80778 (0.742415)	-9.78335 (0.680247)	-7.57875 (0.982157)	-8.69223 (0.736357)	-10.1819 (0.692222)
GNP _i GNP _j	0.997811 (0.037011)	0.94432 (0.024104)	0.965631 (0.023755)	0.950487 (0.033295)	0.960915 (0.024139)	0.972819 (0.024065)
PGNP _i PGNP _j	0.047043 (0.040045)	0.165534 (0.025773)	0.239462 (0.024205)	0.080775 (0.035467)	0.154936 (0.025610)	0.252983 (0.024373)
DISTANCE	-0.749251 (0.087655)	-0.672455 (0.062855)	-0.65917 (0.060481)	-0.702165 (0.079296)	-0.717876 (0.063609)	-0.671416 (0.60924)
ADJACENT	1.48489 (0.351976)	1.23878 (0.275968)	1.1246 (0.277309)	1.3757 (0.320716)	1.16014 (0.280072)	1.14643 (0.280669)
LINKS	0.896844 (0.208701)	0.745921 (0.146541)	1.23655 (0.138804)	0.917802 (0.188621)	0.687204 (0.147157)	1.24872 (0.142875)
EEC	-0.125506 (0.218793)	0.215173 (0.167943)	0.185192 (0.162864)	-0.125256 (0.203615)	0.147982 (0.165966)	0.186945 (0.164992)
EFTA	-0.780636 (0.433818)	0.038215 (0.203356)	0.218073 (0.231585)	-0.336833 (0.315953)	0.032204 (0.191001)	0.226827 (0.239530)
CHINPOP	3.13078 (1.61683)	3.90733 (0.938079)	4.423 (1.08797)	3.02865 (1.46632)	3.91311 (0.943779)	4.50673 (1.09974)
LANGUAGE	0.697561 (0.309998)	0.732307 (0.227240)	0.035604 (0.205994)	0.545929 (0.283038)	0.807848 (0.234024)	0.033828 (0.205498)
Threshold	99.1358 (13.5065)	128.773 (18.9636)	113.633 (20.5816)	122.367 (16.4509)	113.067 (16.8914)	107.104 (18.7982)

Note: see notes to Table 4.

Table 6
Results of the estimation (1980, with REMOTE)

	Eq. WC	Eq. RC	Eq. NC	Eq. WL	Eq. RL	Eq. NL
Intercept	-43.1865 (3.82788)	-18.9466 (2.78206)	-13.2940 (2.56147)	-34.5982 (3.36358)	-21.3665 (2.68258)	-12.9982 (2.60003)
GNP _i GNP _j	1.09318 (0.040598)	0.917916 (0.027604)	0.904853 (0.026991)	1.01292 (0.036549)	0.964541 (0.027141)	0.899808 (0.027192)
PGNP _i PGNP _j	0.366345 (0.51282)	0.477503 (0.035480)	0.517491 (0.035278)	0.375089 (0.045613)	0.485508 (0.035394)	0.529269 (0.035743)
DISTANCE	-1.41111 (0.111678)	-1.07395 (0.086038)	-0.805357 (0.082206)	-1.25336 (0.102566)	-1.16278 (0.084141)	-0.771694 (0.083406)
ADJACENT	0.079555 (0.360260)	0.569796 (0.277279)	0.740520 (0.286109)	0.145473 (0.330679)	0.467233 (0.288827)	0.794046 (0.290943)
LINKS	0.684553 (0.232029)	0.959215 (0.171408)	1.29364 (0.162899)	0.686537 (0.208235)	0.980595 (0.171273)	1.30016 (0.164068)
EEC	-0.396897 (0.229974)	-0.075647 (0.159757)	-0.036573 (0.148055)	-0.512378 (0.207155)	-0.131343 (0.162184)	0.583489E-02 (0.149917)
EFTA	-0.627179 (0.410722)	0.221814 (0.216406)	0.398546 (0.216421)	-0.420185 (0.304809)	0.273347 (0.206611)	0.420542 (0.221218)
CHINPOP	4.19925 (1.04485)	5.08009 (0.841076)	5.98485 (0.973581)	4.11226 (1.01249)	5.12657 (0.831783)	6.09020 (0.975426)
LANGUAGE	-0.134037 (0.318592)	0.041634 (0.236159)	-0.225650 (0.192651)	-0.043254 (0.288126)	-0.164029 (0.233681)	-0.180639 (0.194865)
REMOTE	1.92464 (0.217866)	0.536931 (0.167352)	0.115730 (0.154558)	1.48816 (0.194236)	0.642500 (0.159996)	0.073858 (0.156822)
Threshold	140.318 (18.8771)	117.259 (14.9429)	94.0737 (15.5334)	147.695 (20.3078)	120.290 (15.4201)	85.7149 (14.1741)

Note: see notes to Table 4.

Table 7
Results of the estimation (1990, with REMOTE)

	Eq. WC	Eq. RC	Eq. NC	Eq. WL	Eq. RL	Eq. NL
Intercept	-46.7381 (3.53268)	-28.0916 (2.49311)	-21.4796 (2.39226)	-39.9171 (3.18487)	-28.8931 (2.44942)	-21.1817 (2.41967)
GNP _i GNP _j	1.03876 (0.035269)	0.965344 (0.023678)	0.978754 (0.023609)	0.985394 (0.031934)	0.982775 (0.023627)	0.985189 (0.023937)
PGNP _i PGNP _j	0.149543 (0.039638)	0.216108 (0.025668)	0.270212 (0.025407)	0.166385 (0.035332)	0.208114 (0.025647)	0.281936 (0.025604)
DISTANCE	-1.40861 (0.103968)	-1.00436 (0.079223)	-0.860826 (0.079418)	-1.25802 (0.096351)	-1.06514 (0.078975)	-0.861082 (0.080456)
ADJACENT	0.493383 (0.330055)	0.74123 (0.262493)	0.822671 (0.266922)	0.540778 (0.303899)	0.639604 (0.264772)	0.862538 (0.271053)
LINKS	0.451281 (0.205606)	0.522699 (0.144322)	1.10177 (0.140853)	0.54489 (0.185921)	0.453402 (0.144823)	1.12213 (0.145204)
EEC	-0.112579 (0.225168)	0.220579 (0.171431)	0.187294 (0.165276)	-0.116421 (0.210720)	0.153934 (0.169721)	0.188756 (0.167276)
EFTA	-0.380749 (0.439519)	0.239204 (0.199248)	0.339376 (0.232060)	-.119883E-02 (0.315782)	0.242476 (0.185606)	0.340762 (0.239803)
CHINPOP	0.97111 (1.44674)	2.82409 (0.833339)	3.76552 (1.03149)	1.21218 (1.31921)	2.779 (0.839466)	3.88846 (1.04741)
LANGUAGE	0.303682 (0.299224)	0.53137 (0.219396)	-0.084642 (0.200475)	0.212531 (0.276215)	0.597509 (0.222568)	-0.079335 (0.201357)
REMOTE	2.33567 (0.203275)	1.1707 (0.148908)	0.709641 (0.145953)	1.96255 (0.185354)	1.22619 (0.146003)	0.667322 (0.147791)
Threshold	102.153 (13.7415)	132.221 (19.3768)	116.138 (21.0453)	126.369 (16.8430)	116.395 (17.2823)	109.143 (19.1633)

Note: see notes to Table 4.

The Organization of the Taiwanese and South Korean Economies: A Comparative Analysis

by

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This is a first draft of a chapter to appear in a book, co-authored with Nicole Biggart, to be published by Cambridge University Press. Please note that Robert Feenstra is the principal author of this chapter. Comments are most welcome, though the material should not be quoted.

Summary

Most specialists recognize that business networks are widespread in Asia. The dominance of the *keiretsu* in Japan and of the *chaebol* in South Korea is common knowledge. In recent years, many scholars and journalists have also written about the importance of Chinese business networks in all the Chinese dominated economies (e.g., Mainland, Taiwan, Hong Kong, and several Southeast Asian countries, including Thailand and Malaysia). Despite the recognition that Asian business networks are commonplace, there has been surprisingly little effort to analyze the organization and performance of these networks. In fact, most writers dismiss the importance of business networks as a result of either market failures or state directives, and hence as having no independent effects on the economy in their own right. Such writers would conclude that differences in the organization of business networks are differences that do not make a difference.

In this paper, we argue that business networks are important, that they are not simple reflections of market or state forces, and that organizational differences among networks do make a difference. Our key questions address these differences. How and why does economic organization differ across countries, and does it matter? These questions are, of course, rather general and abstract. To tie down our research empirically, therefore, we are asking these questions of two East Asian countries, Taiwan and South Korea. Most specialists in Asian development (Amsden 1985, 1989; Gold 1986; Wade 1990; Evans 1995) view the economies of Taiwan and South Korea as being organized in **essentially** the same way. Our research (Orrù, Biggart, and Hamilton, 1997; Hamilton and Feenstra 1995) and that of others (Fields 1995; Hyuk-Rae Kim 1993, 1994; Eun Mee Kim 1997), however, have shown that the two economies are actually organized very differently. The rapid growth common to these two countries hides the very substantial, and we believe important, differences in how their firms interact.

This paper describes the organizational differences between the two economies. Simply put, the predominant organizational features of the Korean economy are the very large, vertically integrated business groups called *chaebol*. Of particular significance are the five largest of these groups, which together account for a substantial share of the export output of the Korean economy. In contrast, the most important features of Taiwan's economy are the small and medium-size firms, which dominate export production, and the large business groups, which are on average much smaller than the *chaebol* and are mainly suppliers of intermediate goods and services for the small and medium sized firm sector. We have attempted to describe these differences in industrial structure quantitatively by developing a measure of the vertical integration for the respective business groups and a measure of business group participation in the major sectors in the respective economies.

Having established the organizational differences, we then outline a first step in explaining the organizational configuration. Using a highly stylized model to represent pricing decisions of firms in general equilibrium, we ask whether the organizational differences between the two economies can be explained in terms of simple economic reasoning. The simulation shows that multiple equilibria of interfirm organization are possible, that, in other words, several configurations of inter-firm networks represent stable outcomes of cross-market pricing decisions, and that two of these outcomes approximate the organization of Korean and Taiwanese economies.

One stable configuration is for firms to create enterprise groups in which firms buy intermediate goods and services from other firms in their own group and refuse to sell the same goods and services to competing groups. The configuration, which we call "V-Group" for vertical integration, resembles the

organization of the Korean economy. The model even predicts a division between a stable set of mega-groups and an unstable set of smaller groups. The logic here is that, in a vertically integrated economy, there is only so much profit to be made in manufacturing similar products. The larger and more heavily internalized groups have a competitive advantage over smaller groups. This division resembles what has actually occurred in South Korea, where the large chaebol have been extremely successful, but a second tier of chaebol has struggled mightily.

A second stable configuration of firms predicted from the model consists of a relatively large number of enterprise groups producing intermediate goods to sell at a profit to others firms utilizing those goods in the manufacture of final products. This configuration, which we call "U-Group" for upstream, resembles the economic organization of the Taiwanese economy. In another location, Hamilton (1997) has used the metaphor of a gold rush to describe this kind of economic organization. In a gold rush, although a few miners strike it rich, the biggest and most successful firms are those selling goods and services to miners. By analogy, as long as the small and medium-size firms compete with each other to manufacture products for the global market, they create demand for the goods and services that the larger upstream business groups provide. It is important to note that the model predicts the U-Group enterprise networks are stable only at fairly low levels of vertical integration. In other words, it does not make good sense for a manufacturer of shovels to hire miners to use the shovels they produce for mining gold. This logic has counterparts in the Taiwanese economy. It does not make sense for producers of textiles to make garments or for producers of plastics to make toys. It does make sense for such groups to stimulate demand rather than utilize output.

Our equilibrium model shows that, in principle, both V-Groups and U-Groups represent stable solutions to mutually determined pricing decisions reached by firms in an environment of other firms. Our empirical research suggests that the model roughly approximates the organizational dynamics of the Korean and Taiwanese economies. However, even if we assume that the model tells us something about the current organization of the economies, it tells us nothing about how they got that way. The model does not predict which among the stable alternative trajectories a society will take. We conclude with a discussion of our explanation for the different trajectories taken by Taiwan and South Korea.

The Organization of Business Groups

To enable our analysis of economic organization, we have created a database of 43 business groups for South Korea in 1989, and 80 groups for Taiwan in 1994. For both countries we are able to construct a *transaction matrix* for the major business groups. This matrix specifies the sales to other member firms within the group, as well as total sales and other information for each firm. Thus, the transaction matrices can be used to construct measures of the vertical-integration for each business group. We shall first report detailed results for the Korean groups, and then describe the Taiwanese groups. The comparison of these vividly illustrates both the differences in their size and vertical-integration: the largest groups in Korea are huge by comparison with other groups found in Korea or Taiwan, and are integrated through the entire production chain.

Why don't comparable groups exist in Taiwan? This will be addressed in the second half of the chapter, where we outline a stylized model of business groups. We will argue that the economic logic does not restrict the group structure to follow any one, unique or efficient form. Rather, there are several types of groups that can arise in equilibrium, with strikingly different degrees of concentration and integration.

The industrial structure of both South Korea and Taiwan will be seen to arise as viable equilibria: fully consistent with rational calculus, but not uniquely determined by this logic. Therefore, we need to look beyond the economic system to explain the differing industrial structure of each country.

Korean Business Groups, 1989

The primary source for the 1989 Korean data is the volume 1990 Chaebol Analysis Report (Chaebol Boon Suk Bo Go Seo in Korean) published by Korea Investors Service, Inc.

This volume provides information on the 50 largest business groups (measured in terms of assets) in South Korea, but for seven of these groups the data on internal transactions within the groups are missing. Thus, the 1989 database for Korea includes only 43 groups, with 525 firms. In Table 1 we show summary information for these groups. The first column of Table 1 reports the group's number, as it is used in the database, followed by the group name and the 1989 sales (in \$million), and the number of firms in each group.

The largest groups have become well known names in the U.S., such as Samsung and Hyundai. These two groups each had total sales exceeding \$25 billion in 1989, while the 43 groups together had sales of \$151.8 billion.¹ This magnitude is sometimes compared to Korean GDP (\$219.5 billion in 1989) to conclude that the business groups control a very large portion of the domestic economy. Such a comparison is incorrect, of course, because GDP is a value-added concept, reflecting the contribution made by each firm over and above its cost of materials. The 1990 Chaebol Analysis Report included the value-added of each group, which are included in the database, and these total \$32.2 billion over the 43 groups. Thus, these groups account for about 15% of Korean GDP in 1989.

Of principal interest is the extent to which business groups' sales go to other firms in the group, or equivalently, the extent to which the group relies on its own firms for intermediate inputs. We will refer to this as the "internalization" of a group, and it can be measured by the ratio of the sales to other firms in each group relative to total group sales.² The internalization ratio for each group is shown in the fifth column of Table 1. It is apparent that larger groups have rather high internalization, exceeding 30% in several cases, and that internalization is correlated with the size of each group. This can be observed in the simple and weighted averages reported at the bottom of Table 1: the simple average of the internal sales ratio is 11.5%, but the sales weighted average is about twice as large, at 22.0%.

There is one feature of the internalization ratio that is somewhat misleading, and that is the fact that it includes the *trading companies* within any group. These are companies who act as intermediaries in transactions between firms in the group, and also sell to and buy from firms outside the group. Including

¹ The dollar values for Korea have been converted from the Korea won using the exchange rate of 679.6 won per dollar at the end of 1989.

² An alternative measure of "internalization" is the ratio of purchases from other firms in the group relative to total purchases of intermediate inputs by all group firms. The internal sales and purchases are equal, but these two ratios differ because of their denominators: the internal sales ratio will be lower than the internal purchases ratio, because the total purchases of intermediate inputs by group firms will be lower than their total sales (the difference between these is value-added of the group). It is possible to construct the internal purchases ratio from each group from the database, but it displays much the same patterns as the internal sales ratio, which we shall focus on.

these firms can artificially increase the internalization ratio when the trading companies are simply transferring products between firms in the group. Twenty-seven out of the 43 groups in Korea – or nearly two-thirds – have trading companies, and these are indicated by an asterisk in column four of Table 1.

In order to correct for the presence of the trading companies, two questions need to be addressed. The first is how to distinguish trading companies. In the Korean database, we relied on three criteria. First, telephone surveys to the 43 Korean business groups were made to find out if each group had a trading company. Second, company descriptions in the Yearbook on the Korean Economy and Business 1991/92 published by Business Korea were used. If a company was described as a trading arm of their business group, it was included as the trading company. Third, along with the company description, if a company was largely involved in the group's internal transactions, it was counted as a trading company. Most of the trading companies are classified in sector 132 (wholesale and retail trade), though only a subset of firms in that sector are designated as trading companies.

The second question is how to correct for the presence of these companies when measuring the degree of internalization. Consider a trading company that purchases from firm A and sells that product to firm B, both in the same business group. Since this firm is simply acting as an intermediary in the transactions, it would be double counting to include both the purchase and sale. But since the product was transferred from A to B, it would be incorrect to exclude both transactions as well. Instead, we should ignore either the purchase or the sale by the trading company. We decided to ignore the *purchases* of the trading companies from other firms within the group.³ This means that when a trading company buys from an outside firm and sells to another firm within the group, the sale will be counted as internal transactions. But when a group firm sells to a trading company that then sells outside the group, no internal transaction is counted at all.

We use the phrase "without trading companies" (or, "no TC") to mean that we are consistently ignoring the purchases of trading companies from within the group. In the second-last column of Table 1 we report the internal sales ratio, calculated without the trading companies.⁴ This reduces the internalization of the largest business groups by almost one-half. Table 2 provides brief descriptions of all groups with internalization ratios greater than 15%, and section A lists seven groups whose internalization is reduced significantly by the removal of trading company purchases. These include the four largest groups – Samsung, Hyundai, Lucky-Goldstar, and Daewoo – as well as several smaller groups. Overall, the weighted average of the internal sales ratio for all groups is reduced from 22.0% to 13.4%, while the simple average is reduced from 11.5% to 8.3%.

We have excluded internal purchases of the trading company purchases as a way to avoid double-counting the transfer of goods between firms within a group. But the trading companies are also engaged in wholesale and retail trade, so that by excluding their purchases, we are moving towards a measure of groups' vertical integration within just manufacturing activities. To properly measure manufacturing integration, we also need to exclude the purchases of firms within each group that are classified within wholesale and retailing (sector 132) but are not designated as trading companies. While most of the trading companies are classified within this sector, there are some differences between them and other firms that

³ All of the trading companies made purchases from other firms in their group, and most also made sales.

⁴ The purchases of the trading companies are excluded from both the numerator and denominator of the internal sales ratio.

are classified within wholesale and retailing. Most of the trading companies are actively involved in seeking overseas customers, and therefore play an informational role within the business group. In contrast, the other wholesale and retailing firms are engaged in marketing the products domestically, through establishments owned by the group. This distinction is not hard and fast, however, and there is considerable overlap in their activities. Thus, as a natural extension omitting the purchases of trading companies, in the last column of Table 1 we report the internal sales ratio while omitting both the purchases of trading companies and all other firms in the wholesale and retail sector within each group.

Omitting the wholesale and retailing firms has a rather modest impact on the average internalization ratios: the weighted average is reduced from 13.4% to 11.8%, while the simple average is reduced from 8.3% to 6.8%. Still, there are a few groups whose internalization begins high and is reduced quite substantially by the exclusion of the wholesale and retail firms, and these are listed in part B of Table 2. Included among these is Sunkyung, which is the fourth largest group with 1989 sales of \$8.9 billion, and produces fuel oils and petrochemicals. Its retail gas and oil sales are handled by two firms, one of which is classified as a trading company while the other is not. A second group is also in the petroleum sector, Kukdong Oil, but is considerably smaller. A third group, Kangwon Industries, is involved in coal mining, steel and cement products. A common feature of these three groups is that their retail sales are focused on the domestic market, which explains why their retailers are not classified as trading companies.

In part C of Table 2, we list three additional groups that have high internal sales, where these are not accounted for by either trading companies nor other retailing activity. The Ssangyong group is the sixth largest in Korea, with 1989 sales of \$5.8 billion, and produces a diverse range of products including cement, fuel oils, construction, and motor vehicles. Excluding either its trading company or other retailing firms reduces its internalization ratio of 14.8% only modestly. However, the internalization of this group is no larger than most of the biggest groups in Korea. The distinctive feature of the Ssangyong group is that its trading company, Ssangyong Corporation, does not engage in nearly the same extent of the internal transactions found for the top four groups in Korea. Also included in part C are two smaller groups, Sammi and Kyesung Paper, which are producers of iron and steel products and paper products, respectively. The high internalization ratios for these groups, even after the trading companies and retailers are excluded, simply reflects the vertical integration of their manufacturing processes.

Taiwanese Business Groups, 1994

The primary sources for the 1994 Taiwan data are twofold: Business Groups in Taiwan, 1996/1997, published by the China Credit Information Service (CCIS); and company annual reports to the Taiwan stock exchange, for 1994, collected by the CCIS, and supplemented by interviews of selected firms. Business Groups in Taiwan, 1996/1997, provides information on 115 business groups in Taiwan. For the largest 80 of these groups, data on sales to and purchases from other firms in the groups was collected from their annual reports. Thus, the 1994 database for Taiwan includes these 80 groups, with 797 firms, as listed in Table 3.

The largest groups in Taiwan are considerably smaller than their counterparts in Korea, and the total sales of the Taiwan groups is \$76.3 billion, or about half as much as the Korean groups.⁵ In order to do a comparison with Taiwanese GDP, which was \$241 billion in 1994, we need to have a value-added figure for the groups. This was not provided in any of the source materials, but a rough estimate can be obtained by noting that the ratio of value-added to total sales for all the Korean groups is 21.2%. If we apply this same ratio to the total sales of the Taiwanese group, we obtain an estimated value-added of \$16.2 billion, so that the 80 group account for 6.7% of Taiwan GDP. The average number of firms in each group, shown at the bottom of column four, is also smaller than for Korea.

In the fifth column of Table 3, we report the internal sales ratio for the Taiwanese groups. In contrast to the Korean groups, it does not appear that the internalization ratios for Taiwan are significantly correlated with the size of the groups. Thus, the largest group – Formosa Plastics – has an internalization ratio of 15.8%, no larger than that which occurs for a number of other groups of varying size. This can also be seen from the averages reported at the bottom of Table 2. The average for the internal sales ratio is 9.5% and 7.0%, computed as a weighted and simple average, respectively. The difference between these is not nearly as marked as it was for the Korean groups. These internalization ratios are also smaller than they were for Korea. Thus, the groups in Taiwan have less vertical integration on average, and this is also true for some of the largest groups. There are still various groups in Taiwan that have rather high internalization ratios, and these will be examined in greater detail below.

We have corrected for the presence of trading companies in the business groups of Taiwan. Two criterion were used to select trading companies: if the name of the firm from Business Groups in Taiwan, 1996/1997 included the words "trading company"; or if the description of products from that source indicated "buying and selling" as a primary activity. The trading companies in most cases belong to the input-output sectors 89 (domestic wholesale trade), 90 (domestic retail trade) and 91 (import and export trade), though only a subset of the firms with these sector classifications are designated as trading companies. Groups in which trading companies exist are denoted by an asterisk in column four of Table Three, along with the total number of firms in the group.

Of the 80 business groups, 39 or roughly one-half were found to have trading companies, whereas two-thirds of the groups had trading companies in Korea. The extent to which the Taiwan trading companies are involved in the internal transactions of their groups is also considerably less than in Korea. Of the 39 Taiwan groups with trading companies, only 23 of these have any recorded purchases between that company and other firms in the group.⁶ The modest degree to which these companies are integrated with the activities of the business groups can also be seen from the last two columns of Table 3, where we list the internal sales and purchase ratio without the trading companies. By excluding the companies the weighted average of the internal sales ratio declines from 9.5% to 8.4%, and the simple average declines from 7.0% to 6.0%, which is much smaller than the corresponding decrease for Korea.

To gain a more detailed understanding of the role of trading companies in Taiwanese groups, descriptions of all groups that have internalization ratios of 15% or higher are provided in Table 4. These descriptions give information on the major internal transactions, but do not list the complete set of firms

⁵ The U.S. dollar values for Taiwan have been converted from the New Taiwan dollar using the exchange rate of 26.24 NT\$ per US\$ at the end of 1994.

⁶ There might be some other cases of internal purchases that we are not aware of due to missing data.

within the group. In part A of Table 4, we first describe four groups that include trading companies, and whose internalization ratios are considerably reduced by excluding the purchases of these companies. For example, the internal sales ratio for the group Hualon, a producer of synthetic fiber and cotton with 1994 sales of \$2.5 billion, is reduced from 16.4% to 4.7% when the purchases of its trading company, The E-Hsin International Corp., are excluded. The same is true for: Yuen Foong Yu, a manufacturer of paper products with sales of \$1 billion; Aurora, a manufacturer of electronic equipment with sales of \$404 million; and Taiwan Everlight Chemical, a smaller manufacturer of dyeing and bleaching materials. In the latter two cases, the trading companies are active in overseas markets.

In part B of Table 4 we list three other groups that have high internalization ratios. The firms involved in these transactions are retailers that do not fit our criteria for trading companies (i.e. these words do not appear in their name and their primary activity is not "buying and selling"). Three of these groups are very large producers of motor vehicles: Wei Chuan Ho Tai, with sales of \$4.9 billion, Yulon with sales of \$4.3 billion, and Chinfon, with sales of \$3.0 billion. Both of these sell to a domestic market that is protected by tariffs and domestic content requirements, and where export sales are practically nonexistent.⁷ The fourth group, Bomy, is a smaller producer of fruit and vegetable juices, which also sells domestically.

To determine the impact of excluding these wholesale and retail sales from groups' internalization, in the last column of Table 4 we re-compute the internal sales ratio while omitting the purchases of trading companies and all other firms classified in sectors 89 (domestic wholesale trade), 90 (domestic retail trade) and 91 (import and export trade). The internalization of the three large groups in autos, and the Bomy group in beverages, falls dramatically. The weighted average internal sales ratio now becomes 4.5%, while the simple average is 4.7%. There is evidently no relation at all between sales and internalization once the retail sales of the three large, automotive groups are excluded. The corresponding internalization rates computed without retail sales for Korea are 11.8% (computed as a weighted average) and 6.8% (computed as a simple average). The weighted average in particular is considerably higher than that for Taiwan, indicating the tendency of the largest groups in Korea to have substantial vertical integration even after the sales of trading companies and other retail firms are excluded.

In part C of Table 4, we describe the six remaining groups with internalization ratios of 15% or higher, that cannot be explained by either sales to trading companies or sales to wholesale or retail firms. At the top of this list of groups is Formosa Plastics, with 1994 sales of \$6.6 billion and an internal sales ratio of 15.8%. This is the only group listed in part C that has sales exceeding \$1 billion, and is therefore the only example in Taiwan of a large group with high internalization, not explained by either trading companies or retail sales. Its internal sales ratio is similar to that of some large groups for Korea (once the trading and retail sales are excluded). In contrast to the large Korean groups, however, Formosa Plastics is not vertically-integrated forward into the retail and export sectors, but maintains its presence primarily in chemicals and plastics, while also diversifying into textiles. This tendency to locate primary in the upstream sectors is shared by all six groups listed in part C, three of which are in chemicals, and one each are in food products (for animals), paper products, and plumbing supplies. These groups are supplying intermediate inputs to other firms, rather than selling directly to consumers or to overseas markets.

⁷ Taiwan maintains has a 30% tariff on imported autos, and also a domestic content requirement that 50% of parts and components for sedans be made in Taiwan. Up until 1994 it also banned imports from Japan. Despite these restrictions, imports accounted for one-third of total sales in 1994, with the largest sales coming from Japanese automobiles produced in the U.S.

Cross-County Comparison

An initial comparison of the groups in South Korea and Taiwan can be obtained by looking at the sector sales of the firms involved. For each country, the sales of business group firms are classified according to the input-output sector of their primary product. These sales are then aggregated to twenty-two broad manufacturing sectors, as shown in Table 2. The group sales are expressed as a percentage of total sales of all manufacturing firms in these sectors. For Korea we show values constructed from the 1983 and 1989 databases, while for Taiwan we show values from the 1983 and 1994 databases. Overall, there is a substantial degree of conformity in the sales of the groups between the earlier and later years. The principal change is that groups in both countries have been moving out of several sectors, including garments and apparel, rubber, and non-metallic mineral products (i.e. stone, clay and glass items).

For Korea, about one-half of the sectors have business group sales that account for more than 25% of total sales, and in several cases the business group sales account for more than 50% of total sales, including petroleum and coal, electronic products, motor vehicles and shipbuilding. The groups have a strong presence in both upstream and downstream sectors. Overall, the 43 business groups account for 41% of manufacturing output, together with 13% in mining, 32% in utilities, and 24% in transportation, communication and storage.

In Taiwan, by contrast, the business groups dominate in only a selected number of upstream sectors. Thus, in textiles the business groups account for nearly one-half of total manufacturing sales. These groups are selling downstream to the garment and apparel sector, where business groups are almost nonexistent. This pattern can also be seen from the strong group presence in pulp and paper products, chemical materials, non-metallic minerals, and metal products. In comparison, business groups have a weak presence in downstream sectors such as wood products, chemical products, rubber and plastic products, as well as beverages and tobacco. Overall, the groups account for only 16% of total manufacturing output, along with small shares outside of manufacturing.

In nearly every sector where Taiwanese groups have a significant share of sectoral sales, the Korean groups account for even more. In addition, Korean groups are dominant in heavy industries such as petroleum and coal, basic and non-ferrous metals, and shipbuilding. With the exception of only a small number of sectors (notably, garments and apparel), business groups in Korea spread across nearly the entire manufacturing sector, but this is not true in Taiwan, where groups are principally found in upstream sectors. This difference in the sectoral allocation is consistent with the higher degree of internalization found in Korean business groups, as these groups integrate forward and backwards to span the production process.

The vertical integration of the largest groups in Korea and Taiwan can be compared from Tables 6 and 7. There we report data for the largest five groups in each country, and the number of firms they have supplying in each sector. It is visually apparent that the largest Korean groups maintain a strong presence across a wide range of manufacturing sectors. For example, Hyundai has multiple firms producing in: primary metals, metal products, machinery, electronic equipment, shipbuilding, and motor vehicles. These firms are supplying their products to the other firms located downstream, and ultimately marketing the finished goods to consumers using their trading companies. The Daewoo group has a similar range of activities. An even greater spread is shown by Samsung, which includes firms within: textiles, supplying to garments and apparel; pulp and paper, supplying to printing and publishing; chemical materials supplying to plastics; machinery and electronic equipment, supplying to motor vehicles. Lucky-Goldstar shows a

dominant concentration within electronic products, with nearly half of its firms in that sector, but still maintains a presence in chemical and plastics, metals, and other sectors.

In comparison, the Taiwanese groups tend to be focused on a narrower range of activities, diversifying across one or two areas in addition to their major sector. Thus, Formosa Plastics has its major presence within chemicals and plastics, with some diversification in textiles. Shin King and Far Eastern both have their major presence in textiles, with diversification to chemicals, plastics and non-metallic minerals. In these cases the dominant sector is located upstream, and there are quite limited linkages between that sector and others where the group has diversified. This pattern is typical of the Taiwanese business groups.

Further evidence on the vertical integration of the groups can be taken from the internalization ratios, reported in Tables 2 and 3. In Table 8, we show the summary information on the internalization ratios for all business groups in each country, the largest five groups, and the remaining groups. The largest groups for Korea have 1989 sales ranging from \$8.9 to \$26 billion. These gigantic groups are all larger than the top five for Taiwan, with average 1994 sales of \$5.2 billion. The average internal sales ratio for the top five in Korea is twice as much as that for Taiwan, and three times as much when purchases of the trading companies and retail firms are excluded (though the ordering is reversed when only the trading companies are excluded). Closer inspection reveals that it is the top five groups for Korea that are the outliers in this comparison, measured in terms of sales or internalization. Outside of the top five, Korea has average internalization ratios for the remaining groups that are about 50% higher than for Taiwan, whereas the top five for Taiwan are themselves not much more integrated than the remaining groups for Korea.

Thus, the largest groups for Korea are not only enormous in terms of their sales, but are also substantially more vertically integrated than is typical for other groups in Korea or Taiwan. A scatter plot of the internalization ratios against the sales of each group, for Korea in Figure 1 and Taiwan in Figure 2 dramatically illustrates this conclusion. In each Figure, the black points are the internal sales ratios, while the gray points are the internal sales ratios calculated without the purchases of trading companies or other retail firms from within the groups (the ratios calculated with just excluding the trading companies would lie between these two points). We have quite intentionally kept the scales identical on the plots for each country. The top five groups for Korea stand out on the right-side of the plot, being dramatically larger than the other groups, and also have higher internalization as compared to many (though not all) of the others. The remaining groups are fairly tightly clustered with sales of less than about \$5 billion and internalization ratios mostly less than 20% (computed without the retail firms). The groups for Taiwan display much the same pattern as the remaining Korean groups. The largest group for Taiwan – Formosa Plastics – stands out somewhat with sales exceeding \$5 billion and an internalization of 15.8% whether trading companies and other retail firms are excluded or not. But for nearly all other groups that have high internalization ratios (above 20%), they are reduced substantially when the purchases of retail firms are excluded. There are also more very small groups for Taiwan than Korea. But notwithstanding these differences, the striking difference between the two scatter plots is the presence of the very large and highly vertically integrated groups for Korea. While small in number, these top five or six groups account for nearly two-thirds of the sales of all forty-three groups, and are a dominant presence in the Korean economy and its exports. The complete absence of similarly large groups in Taiwan attests to the difference in the industrial structure of the two countries. Identifying the reasons for this difference is the subject of the rest of this chapter.

A Stylized Model of Business Groups

We will develop a stylized model that abstracts from many of the actual features of South Korea and Taiwan, but nevertheless, is sufficient generate outcomes similar those observed in each country. In this stylized setting, let us divide the economy into two sectors: an upstream sector producing intermediate inputs from some primary factors, and a downstream sector using these intermediate inputs (along with primary factors) to produce a final consumer good. Suppose that both the sectors are characterized by product differentiation, so that each firm retains some limited monopoly power by virtue of the uniqueness of its product, and therefore charges a price, which is above its marginal cost of production. As usual under monopolistic competition, we will allow for the free entry of firms in both the upstream and downstream sectors, to the point where economic profits are driven to zero. Thus, the profits earned by firms through charging prices above marginal cost go to cover their fixed costs of production, where these fixed costs can represent that research, development, marketing or any other lump-sum costs associated with having a differentiated product.

In contrast to conventional treatments of monopolistic competition, we will also allow firms to align themselves, authoritatively, with other firms when this is advantageous. In particular, there will be an incentive for upstream and downstream firms to align themselves, because in the absence of any such integration the market prices for intermediate inputs are above marginal cost, which is a sure sign that agents could do better by internalizing the sale and pricing the input at exactly its marginal cost of production. By internalizing the sale in this manner, the upstream and downstream firms will be obtaining higher joint profits than if the input was just traded at its market price, and we take this to be the definition of a business group: an authoritatively organized set of firms that maximize their joint profits. In the same way that we allow for the free entry of individual firms, we will also allow for the free entry of business groups. We are, of course, abstracting for the moment from the many political and social factors that will influence the configuration of business groups in any setting. Here we simply ask what outcomes we might expect from the pure economics, focusing on the pricing decisions of the firms in general equilibrium.

The economy we have in mind is pictured in Figure 3. The upstream sector produces a range of products indicated by the dots at the top of the diagram. These are used in the production of the downstream products, indicated by the dots in the bottom of the diagram. A group will produce a range of both upstream products and downstream products, where it chooses the number of each to produce so as to maximize group profits. Alternatively, unaffiliated firms can produce individual upstream and downstream products. The equilibrium conditions are that the groups maximize profits, as do unaffiliated firms, and in addition there is free entry of both groups and unaffiliated firms. Whenever economic profits are positive there will be additional entry. This means that in equilibrium the profits of both groups and unaffiliated firms must be forced down to zero through competition, or could even be negative for upstream or downstream unaffiliated firms if they do not exist at all.

Business groups sell the upstream, intermediate inputs to their own firms at marginal cost, while these products are sold to unaffiliated firms at their marginal cost plus a markup. These means that business groups are inherently more efficient in their production than a combination of upstream and downstream unaffiliated firms. What then prevents business groups from taking over the entire economy? We introduce into the model "governance costs", which represent the costs of monitoring and coordinating the activities of firms within the group. These costs are borne only by groups, and not by the unaffiliated firms. There is a special reason within the model for such agency costs to arise. Because the inputs produced within a group are sold internally at marginal cost, these firms would not be covering their fixed

costs of production, and would therefore need to receive a financial transfer from the rest of the group. The size of this transfer depends on the extent of fixed costs (such as research and development) that is devoted to the creation of new product varieties. Since this would normally be private information of the firm involved, it would be difficult to implement this financial transfer without leading to some inefficiency. For example, the guarantee of the group to cover the fixed costs of the upstream firms could lead to less effort expended by the managers of these firms. We do not model these agency costs in any detail, but simply assume that the groups have a fixed governance cost over and above the costs of unaffiliated firms.

While these governance costs prevent the business groups from taking over the economy, their presence still has an impact on the profitability of unaffiliated firms. Suppose that the governance costs are small. Since a business group is otherwise more efficient than a set of unaffiliated upstream and downstream firms, when free entry drives the profits of the groups down to zero, it must be that the profits of some unaffiliated firms are even lower. This means that a zero-profit equilibrium involving the business groups, and the upstream and downstream firms cannot occur: either the upstream or the downstream unaffiliated firms (or both) will be driven out of existence by the free entry of business groups.

Thus, for sufficiently small governance costs, the equilibrium organization of this stylized economy can only have three possible configurations: (1) business groups dominate in the upstream sector (called *U-groups*) and are vertically-integrated downstream, but also compete with some unaffiliated downstream firms; (2) business groups dominate in the downstream sector (called *D-groups*), while purchasing some inputs internally and others from unaffiliated upstream firms; (3) a situation in which the business groups drive out unaffiliated producers in both the upstream and downstream sectors, and are therefore strongly vertically-integrated (called *V-groups*). These three configurations are illustrated in Figure 4. The first panel shows a U-group selling to unaffiliated firms, and the second shows a D-group buying from unaffiliated firms.⁸ In the final panel, we display two V-groups, that can optimally choose whether to sell inputs to each other or not.

Multiple Equilibria

From this description of the economy, we see the price system itself imposes some structure on the organization of the economy, but equally important, does not necessarily determine which of these equilibria will arise: in principle, an economy with the same underlying conditions (such as factor endowments and consumer tastes) could give rise to more than one possible equilibrium organization. We would need to verify that these equilibria are stable, meaning that once they are established there is no reason for it to change, even as the economy experiences some degree of change in underlying conditions. We will refer to this situation where there is more than one type of equilibrium organization as *multiple equilibria*.

To explore the possibility of multiple equilibria more closely, we need to consider what the incentives are for firms to vertically integrate within a business group. As we have already argued, the gains from integration are that intermediate inputs can be sold at their most efficient price, equal to marginal cost. It follows, therefore, that the incentive to integrate will depend on how far the market price

⁸ Illustrating a *single* business group is just for convenience in the drawing, and in equilibrium there will generally be a number of groups, which we assume are all of the same type.

differs from marginal cost, or to put it simply, on the markup charged for intermediate inputs. This incentive will, in turn, depend on the degree of horizontal concentration in the upstream sector. But now there is a circularity in the argument: the incentives to vertically integrate are strongest when there is a high degree of concentration in the upstream sector, but this concentration can simply reflect that presence of a small number of business groups dominating that market. Conversely, if there were a large number of business groups and unaffiliated firms selling in the upstream market, then the markups would be correspondingly lower, as would be the incentive to vertically integrate. This kind of circular reasoning is precisely what gives rise to multiple equilibria in any economic model, and in our stylized economy we therefore expect to observe both equilibria with a small number of business groups that are highly concentrated/integrated, and those with a large number of groups (and independent firms) that are less concentrated/integrated. The economics of the situation does not select further between these possible organizational structures: both can arise, and would be locally stable.

To confirm this line of reasoning, we have computed equilibria for the economy illustrated in Figures 3 and 4, using specific functional forms for the production of intermediate and final goods, and their demand. By assumption, all firms have access to the same technology, and the demand is identical across all varieties of the intermediate inputs, and of the final products. Thus, the equilibria we consider are "symmetric" in that all business groups are of the same size, and same is true for unaffiliated firms in each sector. The structure of production and demand we shall use are common in models of monopolistic competition, and relies on a constant "elasticity of substitution" between different product varieties. As its name suggests, this parameter measures the degree to which different varieties can substitute for each other, or serve the same purpose. Higher values indicate a greater degree of substitution, while its minimum value is unity. In all of our calculations we use as elasticity of substitution for the final products equal to five. For the intermediate inputs, on the other hand, we consider a range of elasticities of substitution between unity and 3.5. For each value of the elasticity of substitution, we compute the number of groups in equilibrium, as well as the number of unaffiliated firms and the prices charged by each. Our results for the number of groups are shown in Figure 5. To interpret this diagram, for most values of the elasticity of substitution, several possible equilibria are plotted. For example, for an elasticity of three, there are three equilibria: the first is a stable equilibrium with about two V-groups; the second is an unstable equilibrium with about six V-groups; and the third is a stable equilibrium with about fourteen U-groups in addition to some unaffiliated downstream firms.⁹ As another example, for an elasticity of substitution of two there are two equilibria: one with a small number of V-groups, and another with a large number of D-groups along with some unaffiliated upstream firms. What this diagram shows is that for most values of the elasticity of substitution, there are two stable equilibria: one with a small number of strongly vertically-integrated groups, and another with a larger number of less-integrated groups, that either buy from or sell to unaffiliated firms.¹⁰

⁹ When we compute the equilibria we allow the number of business groups, and the number of unaffiliated firms, to take on non-integer values. Note that in the V-groups equilibria there are no unaffiliated firms, because they are unprofitable. In the U-group equilibria the only unaffiliated firms are downstream, and in the D-group equilibria the only unaffiliated firms are upstream.

¹⁰ For low values of the elasticity, the D-group equilibria still occur but have not been plotted. The equilibria labeled with a question mark in Figure 5 are computed as D-groups, but have the feature that downstream unaffiliated firms would also want to enter. Thus, these equilibria will involve business groups and unaffiliated firms in both sectors, which is a configuration we have not explored in any detail. The groups do not drive out the unaffiliated firms in this case because their efficiency gains from pricing at marginal cost are smaller

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Thus, these computations confirm our expectation that the stylized model gives rise to several different types of group structure. To further understand the nature of these equilibria, in Figure 6 we show the price charged by business groups for intermediate inputs sold to outside firms. Note that the marginal cost of intermediate inputs has been set at unity in the model, which equals the internal price within a group. What we see from Figure 6 is that the stable V-group equilibrium has a high price for the inputs, which ranges from about two up to ten in the diagram. For smaller values of the elasticity of substitution, the price charged in the V-group equilibria takes on even higher values, up to infinity, in which case the groups find it optimal to not sell at all to outside firms.¹¹ Conversely, in the stable U-group and D-group equilibria, the prices charged are relatively low. The unstable V-group equilibria lie in between these two cases. Thus, this diagram confirms our argument above that the structure of the model leads to two stable equilibria, with a high and low price of the intermediate input. The high-price equilibria supports the strongly integrated V-group equilibria, where unaffiliated firms cannot even enter the market, while the low-price equilibria supports the less integrated U-group and D-group equilibria.

Vertical Integration

Our purpose in developing the stylized model has been to see whether it can predict alternative structures of business groups in South Korea and Taiwan. We are especially interested in the vertical-integration of the groups, as was measured by the internal sales ratio using our group data for these two countries. To compare the group data with the theoretical predictions of our model, we compute the internal sales ratio for each of the equilibria plotted in Figures 5. We distinguish between those equilibria with a small number of groups – what we call the *high concentration equilibria* – from those with a large number of groups – the *low concentration equilibria*. In Figure 5 the high concentration equilibria form an "S" shaped path and include the stable V-group at the bottom of the figure, followed by the unstable V-group, followed by the stable U-group equilibria. The low concentration equilibria form a path at the top of the figure, and include the stable D-group, followed by three unstable D-group points, followed by two stable V-group points, followed again by the U-group equilibria. Thus, for each value of the elasticity of substitution, we are choosing the equilibrium with the smaller number of groups as belonging to the high concentration path, and the equilibrium with the larger number of groups as belonging to the low concentration path (when there is a unique equilibrium for that value of the elasticity, then it belongs to both paths).

In Figures 7 and 8 we plot the internal sales ratio against the sales of the business group, for the high concentration and low concentration equilibria, respectively.¹² Recall that for the actual group data,

¹⁰ (...continued)

than their governance costs.

¹¹ There is a dashed line shown in Figure 5, that runs from the north-west to the south-east corner of the diagram. For equilibria above this line, the price charged by a group for inputs sold to outside firms is finite, but for equilibria below that line the price is infinite, meaning that no sales take place. The reason the group can find it optimal to not sell their inputs is because each input variety sold enables the purchasing firm to produce the final good at a lower cost. So while the group earns profits from the sales of the input, it loses profits from the additional competition in the final goods market. For equilibria below the dashed line, the second effect dominates, and any sales of the intermediate inputs is unprofitable for the business groups.

¹² In Figure 7 we have only graphed V-group equilibria that occur for values of the elasticity of
(continued...)

we computed the internal sales ratios over all firms in the group, and then again while excluding the internal purchases of trading companies and of other wholesale and retail firms. Our model does not incorporate any of the informational considerations that would give rise to trading companies, but it does contain a rudimentary distinction between manufacturing and retailing activities. The upstream sector in the model produces and sells intermediate inputs, while the downstream sector assembles and sells the final products. We can conceptually split the downstream sector into its two parts – assembly and retail sales – and treat these as distinct activities. If we suppose that the sales are done by firms other than those engaged in assembly activity but belonging to the same group, then the purchases of the retail firms can be either included within the internal sales ratio, or excluded. These two calculations differ only in an accounting sense in the model, and correspond very closely to how the internal sales ratios were computed for the actual group data.

In Figures 7 and 8, the gray points indicate internal sales ratios that are computed inclusive of the retailing activity of each group, whereas the black points indicate the internal sales ratios computed while excluding the internal purchases of the retail firms. Naturally, the internal sales ratios are higher when the retail purchases are included. We also see in Figure 7 that the internalization ratios for the V-groups are higher than that for the U-groups. If we exclude the unstable equilibria, then there is a noticeable gap between that (stable) V-groups, and the U-groups: the V-groups are much larger, and more strongly vertically integrated. We invite the reader to compare Figure 7 with Figure 1, which displayed the actual group data for South Korea in 1989. The presence of the large and strongly integrated groups is strikingly similar in the two diagrams. Even without any formal statistical comparison, it is apparent that the model is capable of generating equilibria that match the actual structure of Korean groups.

If we take seriously the unstable groups that appear in Figure 7, it would suggest that groups of an intermediate size in South Korea may not last over the long-term. This theoretical prediction appears to be borne out by the financial difficulties that several groups are currently experiencing. The Kia group – which was the eighth largest in 1989 – recently announced a large sale of land to raise cash needed to cover debts.¹³ Its troubles are in part related to the decision of Ford Motor Co. to no longer sell cars through Kia Motors Corp., and instead use its own distribution network in Korea. But Kia is also rumored to be the target of a takeover bid by the larger Samsung group. The Ssangyong group – which was the sixth largest in 1989 – is also selling some assets to cover the losses of Ssangyong Motor Corp.¹⁴ Smaller groups that are in financial difficulty include Sammi and Hanbo, both of which have affiliates that filed for bankruptcy this year.¹⁵

In Figure 8 we turn to the low concentration path, which consist primarily of U-groups and D-groups. This equilibria set has business groups that are considerably smaller than in the high concentration path, and that have smaller degrees of vertical integration. Again, we invite the reader to compare Figure 8

¹² (...continued)

substitution greater than 2.5, meaning that the price charged for group sales of the input to outside firms is finite. In the V-group equilibria for lower values of the elasticity, the sales of each group is even higher than those shown in Figure 7, which their internal sales ratios are in the range of those already shown.

¹³ "Kia Motors Struggles as South Korea's Auto Underdog," *Wall Street Journal*, July 25, 1997.

¹⁴ "Troubles of Korean Conglomerates Intensify, Signaling End of Era," *Wall Street Journal*, April 25, 1997.

¹⁵ "Slowing Down in Seoul: Koreas Inc. Mobilizes to Revive Its Economy," *Wall Street Journal*, April 17, 1997.

with Figure 2, which displayed the actual group data for Taiwan in 1994. We feel that there is a striking similarity in the two diagrams, especially as compared to the Korean and the high concentration diagrams. Our model gives rise to U-groups and D-groups that are small in comparison with the V-groups, and have lower internalization, which is the same as what we have observed by comparing the Taiwan and Korean groups data. The sectoral information for Taiwan indicated that many of the groups in that country are concentrated in the upstream sector, such as chemicals, meaning that the U-groups may be a better stylized description of that country than the D-groups. But in either case, the low concentration path provides a much better characterization of the Taiwan data, while the high concentration path appears to fit the Korean data.

In summary, our stylized model shows that, even in the absence of other conditions, the price structure among competing, organizationally linked sets of firms is a sufficient condition to push the cross-market organization of an economy in one of several directions. This, of course, suggests that more than one kind of cross-market economic organization not only is possible but would be economic rational and internally coherent. Nothing in the theory itself would suggest that economic factors alone predispose an economy to any one type of economic organization or another. Taiwan has not taken the direction taken by South Korea, which includes organizing extremely large groups integrated backwards and forwards, and we can see the same distinct outcomes arising as equilibria in our stylized model.

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Table 1: Business Groups in Korea, 1989

Number	Group Name	1989 Sales (\$ mill.)	Number of Firms (* TC)	Internal Sales Ratio (%)	Internal Sales (no TC)	Internal Sales (no Retail)
302	Samsung	26175	32*	31.9	18.9	18.8
301	Hyundai	25500	30*	33.0	19.8	19.8
303	Lucky-Goldstar	18807	45*	26.0	16.1	12.5
305	Daewoo	13837	24*	23.5	9.7	9.7
304	Sunkyong	8910	16*	20.6	16.7	10.3
306	Ssangyong	5777	15*	14.8	13.4	11.6
310	Hyosung	4697	20*	7.4	3.3	3.3
319	Kia	4602	9*	25.6	16.0	6.6
313	Lotte	3900	23*	9.2	9.2	7.7
309	Han Jin	3895	11*	2.7	2.2	2.2
308	Korea Explosives	3172	19*	7.7	4.7	4.7
312	Doosan	2417	17*	13.3	11.5	11.5
314	Kolon	2218	14*	10.6	4.0	4.0
318	Dongbu	1978	7*	26.1	17.3	17.3
311	Daelim	1951	12*	4.4	3.5	0.6
324	Dongkuk Steel Mill	1886	10*	5.4	3.4	3.4
321	Dong Ah Construction	1866	12*	1.1	1.1	0.7
317	Sammi	1696	5*	36.6	27.0	27.0
316	Kumho	1430	8*	3.3	0.4	0.4
327	Hanil	1296	12*	7.1	7.1	7.1
325	Miwon	1295	13*	12.5	6.4	6.4
358	Halla	1262	7	10.2	10.2	10.2
335	Kangwon Industries	1256	12*	33.5	33.0	11.4
334	Samyang	1038	5	1.6	1.6	1.6
352	Kohap	1016	6*	18.2	12.5	12.5
351	Poongsan	941	6	3.3	3.3	3.3
359	Woosung Construction	834	6	2.0	2.0	2.0
357	Kukdong Oil	812	3	19.3	19.3	0.0
333	Dongkuk Corporation	689	7*	11.3	1.1	1.1
348	Tongil	685	10	4.4	4.4	4.4
331	Tong Yang	672	5*	9.3	9.3	9.3
340	Byucksan	661	17	0.6	0.6	0.6
344	Daesung Industries	589	8	2.0	2.0	2.0
360	Anam Industrial	537	5	8.7	8.7	8.7
350	Oriental Chemical	528	9	8.9	8.9	8.9
345	Jinro	490	40	2.6	2.6	2.6
332	Taihan Electric Wire	490	3	3.0	3.0	3.0
361	Kyesung Paper	437	5	17.3	17.3	17.3
315	Han Yang	436	4*	6.6	0.7	0.7
343	Hanbo	420	3	2.6	2.6	2.6
362	You One Construction	281	2*	0.3	0.0	0.0
356	Kuk Dong Construction	247	4	0.1	0.1	0.1
355	Life Construction	211	4	3.5	3.5	3.5
Weighted Average			24.1	22.0	13.4	11.8
Average		3,531	12.2	11.4	8.3	6.8

Table 2: Korean Groups with Internalization Above 15%

A. Groups that include trading companies, so that internalization ratio is high when they are included, but lower when their purchases are excluded:

SAMSUNG

SAMSUNG CO. acts as the group's trading company. The group includes producers of industrial machinery, consumer electronics and appliances, in addition to construction operations and retail sales.

HYUNDAI

HYUNDAI CO. acts as the group's trading company. The group produces and repairs ships and other motor vehicles. It also has large construction operations and retail sales.

LUCKY-GOLDSTAR

LUCKY-GOLDSTAR INTERNATIONAL, oversees the joint operations of the merged companies LUCKY, and GOLDSTAR. They are producers of consumer electronics and appliances, electrical industrial apparatus, and a variety of chemical products in addition to their retail sales. Lucky-Goldstar International acts as the group's trading company.

DAEWOO

DAEWOO CO., heads this diverse group involved in motor vehicles, electronic products, metal products, as well as shipbuilding and repair. Retail sales are handled by Daewoo Co., acting as the trading company for the group.

KIA (KOREA INTERNATIONAL AUTOMOTIVE)

KIA MOTORS, oversees this group and acts as it's trading firm. This group produces some iron and steel forgings but mainly builds automobiles. Retail sales are not only made by Kia Motors, but also by ASIA MOTORS and KEM CO.

DONGBU

DONGBU INDUSTRIAL, manages this group and acts as the trading firm. Group products include: cold rolled steel, iron and steel foundry items, and residential construction.

KOHAP

KOHAP, leads this group. Group products include: chemical fiber fabrics, chemical fiber yarns, synthetic resin products, as well as wholesale distributing. KOHAP INC., is the trading firm and retailer of the firms products.

B. Groups that have a high internalization ratio, but much of it is accounted for by sales to wholesaler/retailers that are not designated as trading companies:

Table 2: Korean Groups with Internalization Above 15% (cont'd.)

SUNKYUNG

YUKONG, is the central fuel oil producer of this group, and purchases a large amount from other firms. Sunkyong also produces petrochemicals. Retail gas and oil sales are handled by the groups trading company, SUNKYUNG. A substantial amount of retail sales are also made by HUNGKUK SANGSA LTD, which is not classified as a trading company.

KANGWON INDUSTRIES

KANGWON INDUSTRIAL, directs this group. Group products include: coal mining, hot rolled steel, cement, and cement products. The group trading company is SAMPYO INDUSTRIAL. Retail sales are made by SAMPYO CORPORATION, with minor sales by SAMPYO GAS.

KUKDONG OIL.

KUKDONG OIL, leads this group. They produce fuel oils, retailing these products through SEIL PETRO-OIL.

C. Groups that have a high internalization ratio, that is not accounted for by either trading companies or wholesalers/retailers:

SSANGYONG

SSANGYONG CO., governs this diverse group. Its primary industries are cement, fuel oils, construction, and motor vehicles. Ssangyong Co. acts as a retailer and trade company for the group, except in automobiles where SSANGYONG MOTOR is the retailer.

SAMMI

SAMMI CO., heads this group and acts as the retailer/trading firm. Group products include: cold rolled steel, iron and steel foundry items, and some metal products.

KYESUNG PAPER

KYESUNG PAPER, heads-up this group, and buys from the other three firms in the group, especially from POONGMAN PAPER. Group products include: paper, paper products, and road transport.

Table 3: Business Groups in Taiwan, 1994

Number	Group Name	1994 Sales (\$ mill.)	Number of Firms (* TC)	Internal Sales Ratio (%)	Internal Sales no TC)	Internal Sales (no Retail)
1028	Formosa Plastics	6654	16	15.8	15.8	15.8
1063	Shin Kong	5724	25*	0.4	0.4	0.4
1092	Wei Chuan Ho Tai	4889	23*	28.1	28.0	0.4
1026	Far Eastern	4291	26	0.7	0.7	0.5
1095	Yulon	4264	23*	26.6	22.9	5.2
1123	President	3932	31*	6.4	6.1	4.5
1081	Tatung	3634	36	8.3	8.3	6.3
1119	Acer	3243	9*	3.5	2.4	2.4
1062	Chinfon	2986	16*	24.1	24.1	1.1
1141	Hualon	2517	9*	16.4	4.7	4.7
1017	Ho Hsin	2104	15*	0.2	0.2	0.2
1087	Tuntex	1831	16*	8.1	8.1	7.9
1082	Teco Electric & Machinery	1474	17*	2.6	2.6	2.6
1010	Chi Mei	1268	6*	0.3	0.3	0.3
1128	Rebar	1221	9*	1.4	0.9	0.9
1056	Pacific Cable	1214	26	3.2	3.2	3.2
1059	Sampo	1096	11	12.5	12.5	12.5
1077	Tainan Spining	1075	17	2.1	2.1	2.1
1138	Pacific Construction	1032	15	2.8	2.8	2.7
1096	Yuen Foong Yu	1000	8*	18.5	4.5	4.5
1058	Ruentex	997	25*	0.7	0.0	0.0
1078	Taiwan Cement	997	16	3.6	3.6	3.6
1045	Lien Hwa Mitac	900	12*	2.8	2.8	2.7
1115	Walsin Lihwa	881	8	0.1	0.1	0.1
1143	Lite-On	875	10	0.5	0.5	0.5
1125	Kwang Yang	855	7*	6.3	6.3	6.3
1009	Cheng Loong	823	7*	16.3	16.2	16.2
1129	Shih Lin Paper	766	5	0.1	0.1	0.1
1117	United Microelectronics	673	4	8.5	8.5	8.5
1002	Chung Shing Textile	668	5	6.6	6.6	6.1
1131	Yeang Der	618	14	1.0	1.0	0.1
1130	China General Plastics	598	5	12.6	12.6	12.6
1021	Chun Yuan Steel	528	5	4.7	4.7	4.7
1135	Adi	484	9	0.7	0.7	0.3
1139	Shinlee	456	12*	0.4	0.4	0.4
1133	Umax Elitegroup	436	8*	7.2	7.2	7.2
1103	Pou Chen Industrial	434	3	4.5	4.5	4.5
1140	Aurora	406	7*	17.5	8.6	8.6

1124	Ase	404	5*	10.5	1.3	1.3
1097	Great Wall	375	12	21.1	21.1	20.7
1033	Ho Cheng	375	8*	14.5	14.5	14.5
1079	Taiwan Glass	350	9*	2.6	1.3	0.6
1086	Tung Ho Steel	350	4	0.6	0.6	0.6
1118	Lealea	335	7	9.4	9.4	9.4
1090	Vedan	327	8*	8.1	7.5	7.5
1012	Chia Hsin Cement	303	7*	7.0	7.0	7.0
1036	Hwa Eng Cable	303	3	8.9	8.9	8.9
1101	Lily Textile	301	7	0.7	0.7	0.7
1121	Chia Her	293	5	1.6	1.6	1.6
1107	Sun Moon Star	287	5*	7.1	3.8	3.8
1070	Ta Ya Cable	276	6	4.0	4.0	4.0
1065	Shing Nung	256	13*	6.2	5.9	5.9
1025	Tah Tong Textile	235	13*	4.5	3.4	0.7
1137	Dahin	231	5*	12.3	9.9	9.9
1113	Chicony Electronics	217	3	4.3	4.3	4.3
1127	Kenda Industrial	211	8	0.5	0.5	0.5
1075	Lee Tah Farm Industrial	204	5	11.6	11.6	11.6
1011	Fwu Sow Industrial	200	7*	7.1	7.0	7.0
1132	Asia Chemical	180	13*	4.6	2.7	2.7
1050	Men Yi	170	4	1.0	1.0	1.0
1046	China Unique	166	4	2.8	2.8	2.8
1111	Ve Wong	161	3	10.0	10.0	10.0
1122	Hong Ho Precision Textile	159	6*	3.4	3.4	3.4
1020	Chun Yu	158	7*	6.1	5.6	5.3
1114	Ability	157	11	2.2	2.2	2.2
1136	Far Eastern Machinery	156	7	0.3	0.3	0.3
1142	UB	139	8	7.4	7.4	7.4
1013	Chien Shing Stainless Steel	137	6	8.4	8.4	8.4
1068	South East Cement	134	5	8.0	8.0	8.0
1126	Bomy	116	9	29.5	29.5	0.0
1116	Taiwan Everlight Chemical	104	5*	14.2	3.5	3.5
1110	Ching Kuang Chemical	104	3	10.6	10.6	10.6
1134	Nan Pao Resins	104	3	8.4	8.4	8.4
1120	Victor Machinery	101	12*	1.2	1.2	1.2
1014	Ren Hou (Chih Lien)	83	10*	0.0	0.0	0.0
1112	Yung Shin Pharmaceutical	78	8*	2.7	1.8	1.8
1030	Fu I Industrial	77	5*	5.1	5.1	5.1
1061	San Wu Textile	53	3	2.7	2.7	2.7
1207	Fong Kuo	48	4	6.5	6.5	6.5
1084	Tong Hsing	35	4*	2.8	2.0	2.0
Weighted Average			16.9	9.5	8.5	4.5
Average			954	10.0	7.0	4.7

Table 4: Taiwanese Groups with Internalization Above 15%

A. Groups that include trading companies, so that internalization ratio is high when they are included, but lower when their purchases are excluded:

HUALON

HUALON CORP., is a producer of synthetic fiber and cotton. It sell a large amount to THE E-HSIN INTERNATIONAL CORP., which is designated as a trading company.

YUEN FOONG YU

YUEN FOONG YU PAPER MFG. CO. LTD., is a manufacturer of paper products. It sells a large amount to RAY FOONG ENTERPRISE CO. LTD., which is designated as a trading company.

AURORA

AURORA CORPORATION LTD., SANTA SYSTEMS CORP., and AURORA MECHATRONICS CORP., are all producers of electronic equipment. They have transactions between themselves, and also with EOS SYSTEMS CORP., which is a trading company.

TAIWAN EVERLIGHT CHEMICAL

EVERLIGHT CHEMICAL INDUSTRIAL CORP., is a manufacturer of dying and bleaching materials. It sells a large amount to the following group companies, all of which are designated as trading companies: EVERLIGHT (HONG KONG) LTD.; EVERLIGHT USA LTD.; ELITE DYESTUFFS & CHEMICALS FOREIGN TRADING CO.

B. Groups that have a high internalization ratio, but most of it is accounted for by sales to wholesaler/retailers that are not designated as trading companies:

WEI CHUAN HO TAI

KUOZUI MOTORS LTD., is a producer of motor vehicles. It sell a large amount to HO-TAI MOTOR CO. LTD., which is an automobile dealer and service center.

YULON

YULON MOTOR CO. LTD., is a manufacturer, buyer and seller of automobiles and auto parts. CHINA MOTOR CO. LTD. produces finished vehicles and auto parts. Both these companies buy from a number of other firms in the same group that are also classified in the motor vehicle sector. Retail sales are handled by NISSAN TAIWAN LTD. and TAIWAN ACCEPTANCE CORP.

CHINFON

SAN YANG INDUSTRY CO. LTD., is producer of motor vehicles. It sells a large amount to NANYANG INDUSTRIES CO., LTD., which is an automobile dealer.

Table 4: Taiwanese Groups with Internalization Above 15% (cont'd.)

BOMY

CHOU CHIN INDUSTRIAL CO. LTD., is a producer of fruit and vegetable juices, sells and rents vendor machines, and manages supermarkets. It sells a large amount to the following group firms, all of which are engaged in selling beverages: CHOU SHANG INDUSTRIAL CO. LTD.; SHIOH HORNG CO. LTD.; CHOU HIS CO. LTD.; CHIA PIN INDUSTRIAL CO. LTD.; CHOU HUEI CO. LTD.

C. Groups that have a high internalization ratio, that is not accounted for by either trading companies or wholesalers/retailers:

FORMOSA PLASTICS

This group is a leading producers of chemicals, plastics, textiles and garments. It includes the following four firms, which have a large amount of transactions with each other: FORMOSA PLASTICS CORP.; NAN YA PLASTICS CORP.; FORMOSA CHEMICAL & FIBER CORP.; FORMOSA HEAVY INDUSTRIAL CORP.

CHENG LOONG

TIEN LONG PAPER MFG. CO. LTD., is a manufacturer of paper products. It sells a large amount to CHENG LOONG CO., LTD., which a producer of paper products, such as boxes.

CHINA GENERAL PLASTICS

TAIWAN POLYVINYL CHLORIDE, is a refiner of petrochemicals. It sells a large amount to CHINA GENERAL PLASTICS CORP.

GREAT WALL

GREAT WALL ENTERPRISES CO. LTD., is a producer of bean oil and animal fodder. It both buys and sell a large amount to the following group companies, the last of which does not have a sector classification, but might be a trading company: PAO FU LIVESTOCK ENTERPRISE CO.; TOTAL NUTRITION TECHNOLOGIES CO. LTD.; COUNTRY FLAVOR FOODS CO. LTD.; CHANNELS POWER CO. LTD.

HO CHENG

HOCHENG POTTERY MFG. CO., LTD., is a manufacturer of porcelain items. It purchases a large amount from (and sells a smaller amount to) the following producers of plumbing fixtures: HCG-MOEN CORP.; YUHONG CO. LTD.

DAHIN

DAHIN CO. LTD., is in chemicals and plastics engineering. It both purchases and sells a large amount with the following firms, the second of which is a trading company: YANIN LEATHER CO. LTD.; ATMOSA INTERNATIONAL CO. LTD.; YISHIN ENGINEERING CO LTD.

Table 5: Group Sales in South Korea and Taiwan

Sector	Korea, 1983 Group Sales /Sector Sales	Korea, 1989 Group Sales /Sector Sales	Taiwan, 1983 Group Sales /Sector Sales	Taiwan, 1994 Group Sales /Sector Sales
<i>Primary Products:</i>				
Agriculture, Forestry, Fisheries	na	0.3	na	2.9
Mining	10.6	12.8	0.0	0.0
<i>Manufactured Products:</i>				
Food Products	33.7	23.8	26.3	13.9
Beverages and Tobacco	27.6	47.3	3.8	1.4
Textiles	38.4	32.5	50.7	45.3
Garments and Apparel	12.6	0.9	12.0	0.4
Leather Products	15.2	7.6	9.1	\1
Lumber and Wood Products	31.5	13.4	4.0	1.1
Pulp and Paper Products	6.7	15.4	20.1	20.8
Printing and Publishing	\2	9.2	\2	0.0
Chemical Materials	54.3	37.5	42.4	35.3
Chemical Products	24.0	26.9	8.4	2.2
Petroleum and Coal Products	91.9	100	0.0	4.25
Rubber Products	76.8	21.9	13.0	1.2
Plastic Products	\3	38.8	5.4	5.0
Non-Metallic Mineral Products	44.6	28.0	47.6	37.6
Primary Metals	28.0	34.3	7.8	2.8
Metal Products	26.7	25.8	6.0	22.5
Machinery	34.9	33.9	3.6	12.3
Electronic Products	50.9	64.3	22.7	24.4
Motor Vehicles and Shipbuilding	79.0	80.4	23.6	34.9
Precision Instruments	14.0	11.1	0.0	0.0
Misc. Industrial Products	5.2	2.88	10.7	0.12
Total Manufacturing	45.4	40.7	19.0	16.4
<i>Non-Manufactured Products:</i>				
Utilities	na	3.6	na	1.2
Construction	66.0	31.7	5.6	8.4
Transportation, Comm. & Storage	23.1	23.6	1.8	3.0

Notes:

1. Leather products for Taiwan are included with garments and apparel.
2. Printing and publishing is included with pulp and paper products.
3. Plastic products for Korea in 1983 are included with chemical materials.

Table 6: Largest Five Groups for Korea

	Samsung	Hyundai	Lucky- Goldstar	Daewoo	Sunkyong
Agriculture, Forestry, Fishery					*
Mining					
Food Products	**				
Beverages and Tobacco					
Textiles	**				*
Garments and Apparel	*		*		
Leather Products					
Lumber and Wood Products		*			
Pulp and Paper Products	*				
Printing and Publishing	*				
Chemical Materials	**	*	*		**
Chemical Products			*		
Plastics	*		**	*	
Petroleum and Coal Products			*	*	*
Rubber Products					
Non-Metallic Minerals	*	*			
Primary Metals		****	*		
Metal Products		**	*	*	
Machinery	**	***	*	***	
Electronic Equipment	*****	**	[19]	*****	**
Shipbuilding and Repair		***		**	
Autos and Other Transport.	**	**		****	
Precision Instruments	*		**		
Misc. Manufacturing				*	
Utilities					**
Construction	**	***	**	*	*
Wholesale and Retail	**	**	*****	*	***
Transportation, Communication		**	**		**
Finance and Insurance	*		*		
Real Estate	*		*		
Other Services	*****	****	****	****	*
Total Number of Firms	32	30	45	24	16

Table 7: Largest Five Groups for Taiwan

	Formosa Plastics	Shin Kong	Wei Chuan Ho Tai	Far Eastern	Yulon
Agriculture, Forestry, Fishery		*			
Mining					
Food Products			***		
Beverages and Tobacco			*		
Textiles	**	****		****	**
Garments and Apparel					
Leather Products					
Lumber and Wood Products					
Pulp and Paper Products					
Printing and Publishing					
Chemical Materials	***				
Chemical Products				*	
Plastics	**	*			
Petroleum and Coal Products	**			*	
Rubber Products					
Non-Metallic Minerals				**	
Primary Metals			*		
Metal Products			*		
Machinery	*				**
Electronic Equipment			**		**
Shipbuilding and Repair					
Autos and Other Transport.			*		[10]
Precision Instruments					
Misc. Manufacturing					
Utilities		**			
Construction		*	***	***	**
Wholesale and Retail		***	*****	**	**
Transportation, Communication and Storage	**		*	**	
Finance and Insurance		*****	*	*****	**
Real Estate		*			
Other Services	****	*****	**	*****	
Unknown			**		*
Total Number of Firms	16	25	23	26	23

Table 8: Group Internal Sales Ratios, Summary

Number of Groups	Group Name	Sales (\$ mill.)	Number of Firms	Internal Sales Ratio (percent) ¹	Internal Sales Ratio (no TC) ²	Internal Sales Ratio (no Retail) ³
(a)	South Korea, 1989					
All 43	Weighted Average		24.1	22.0	13.4	11.8
All 43	Average	3,531	12.2	11.4	8.3	6.8
Top 5	Weighted Average		31.4	28.8	17.0	15.6
Top 5	Average	18,646	29.4	27.0	16.3	14.3
Other 39	Weighted Average		12.5	11.4	8.4	6.6
Other 39	Average	1,593	10.9	9.4	7.3	5.8
(b)	Taiwan, 1994					
All 80	Weighted Average		16.9	9.5	8.5	4.5
All 80	Average	954	10.0	7.0	6.0	4.7
Top 5	Weighted Average		22.1	14.0	13.4	5.2
Top 5	Average	5,164	22.6	14.3	13.6	4.5
Other 75	Weighted Average		14.3	7.2	6.0	4.2
Other 75	Average	673	9.1	6.5	5.5	4.7

Notes

1. Computed as the ratio of sales between firms in each group to total sales of the group.
2. "No TC" means that the internal sales ratio is calculated without including the purchases of any trading companies from within the group.
3. "No retail" means that the internal sales ratio is calculated without including the purchases of any trading companies or other wholesale or retail firms from within the group.

Figure 1: Korean Business Groups, 1989

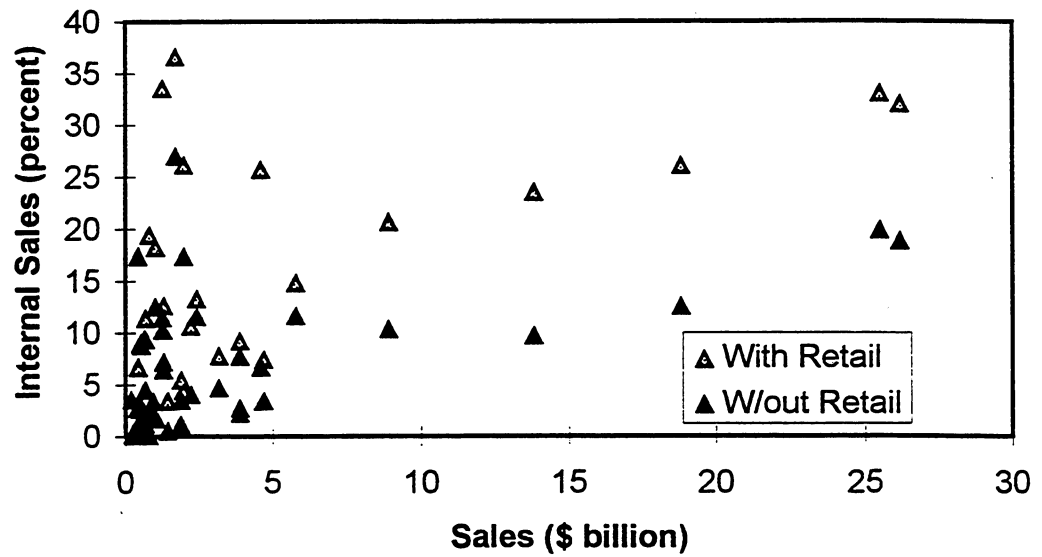
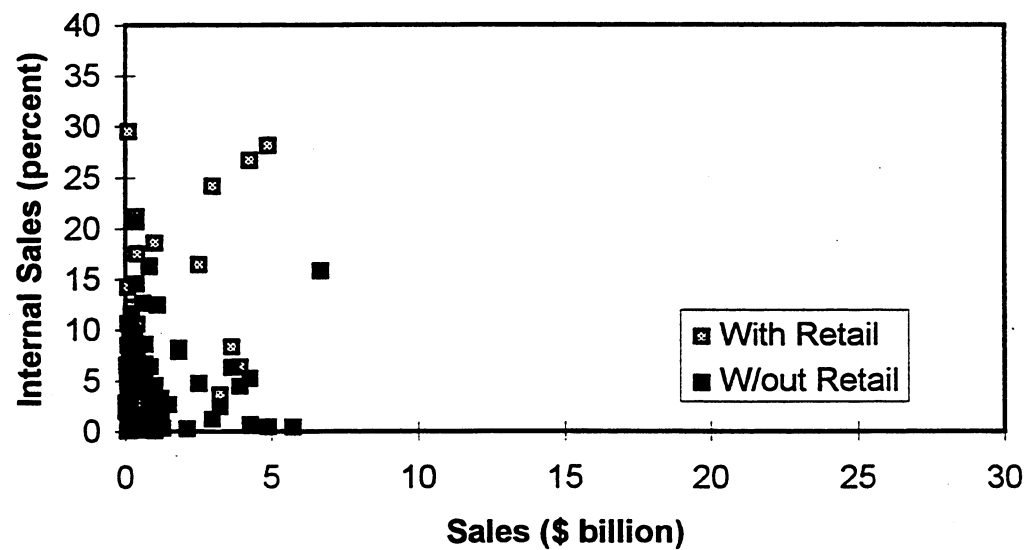


Figure 2: Taiwan Business Groups, 1994



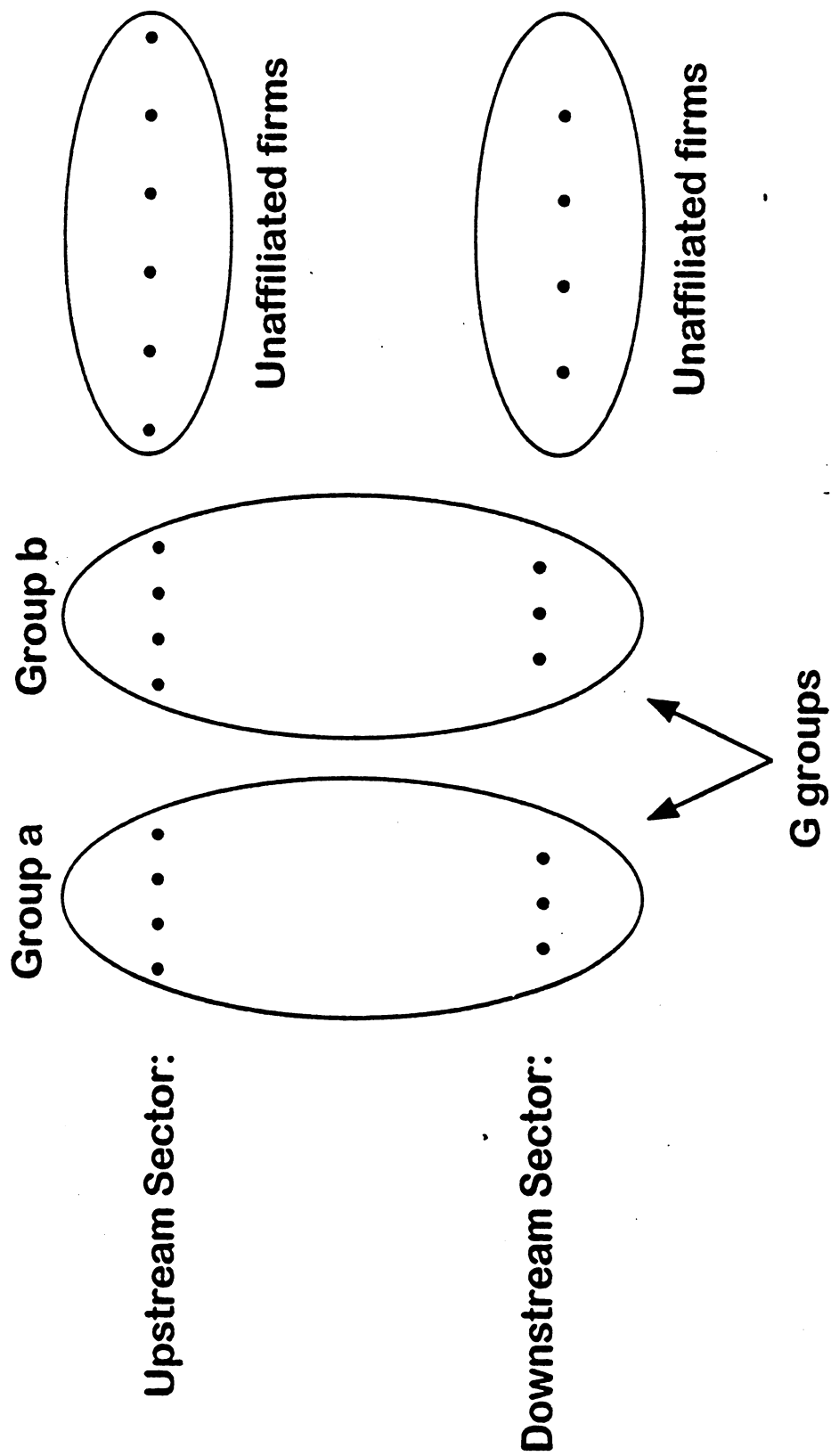


Figure 3: Model of Business Groups

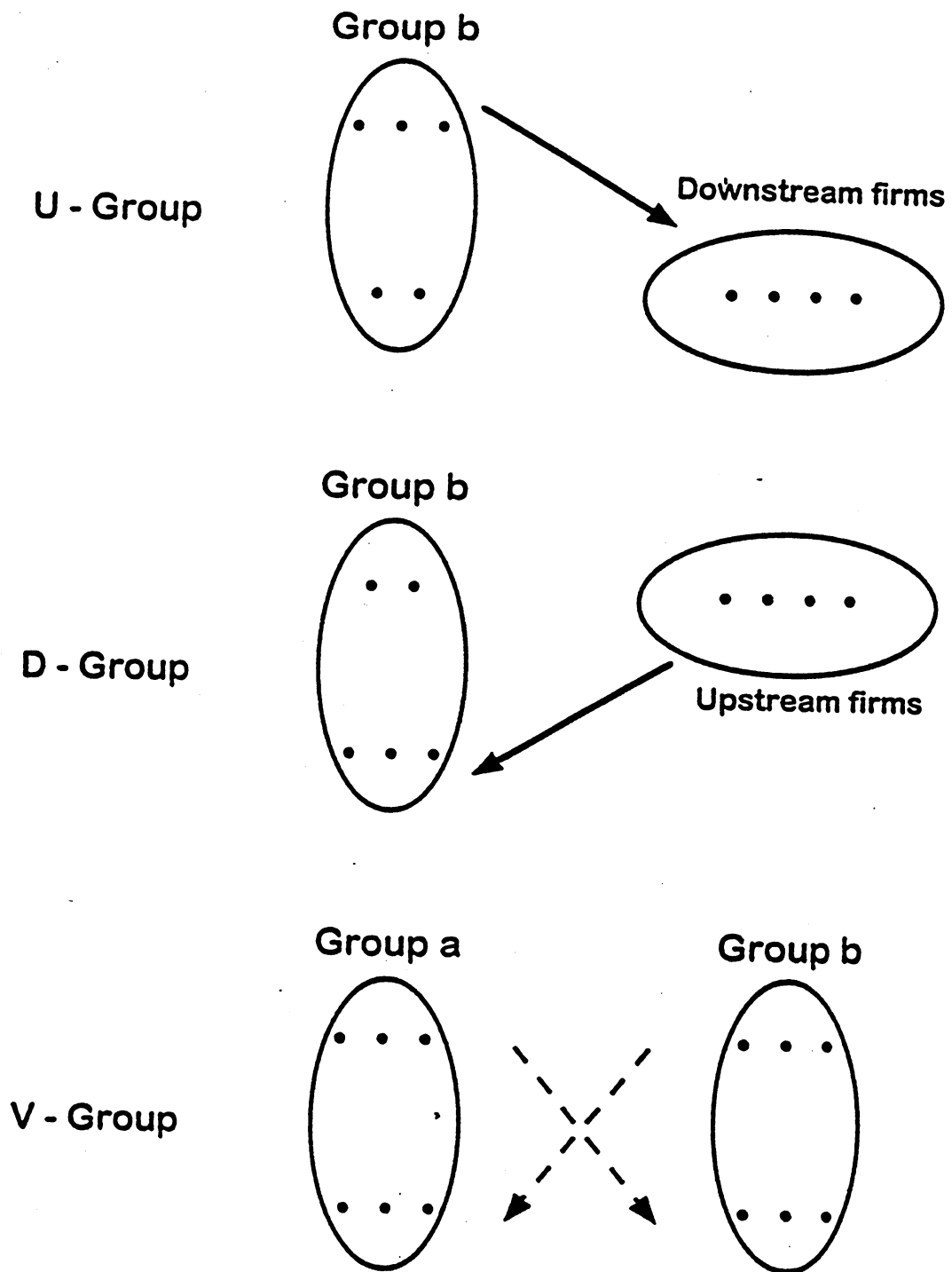


Figure 4. Types of Business Groups

Figure 5: Number of Business Groups

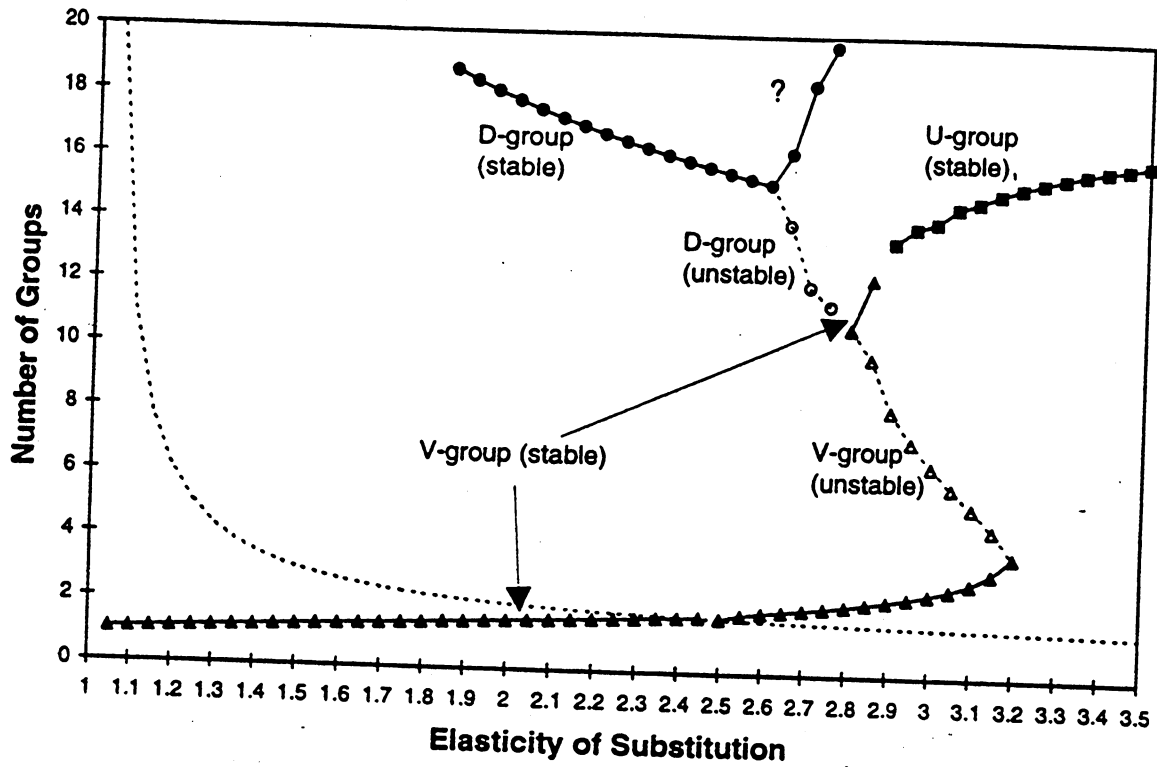


Figure 6: Price of Intermediate Input

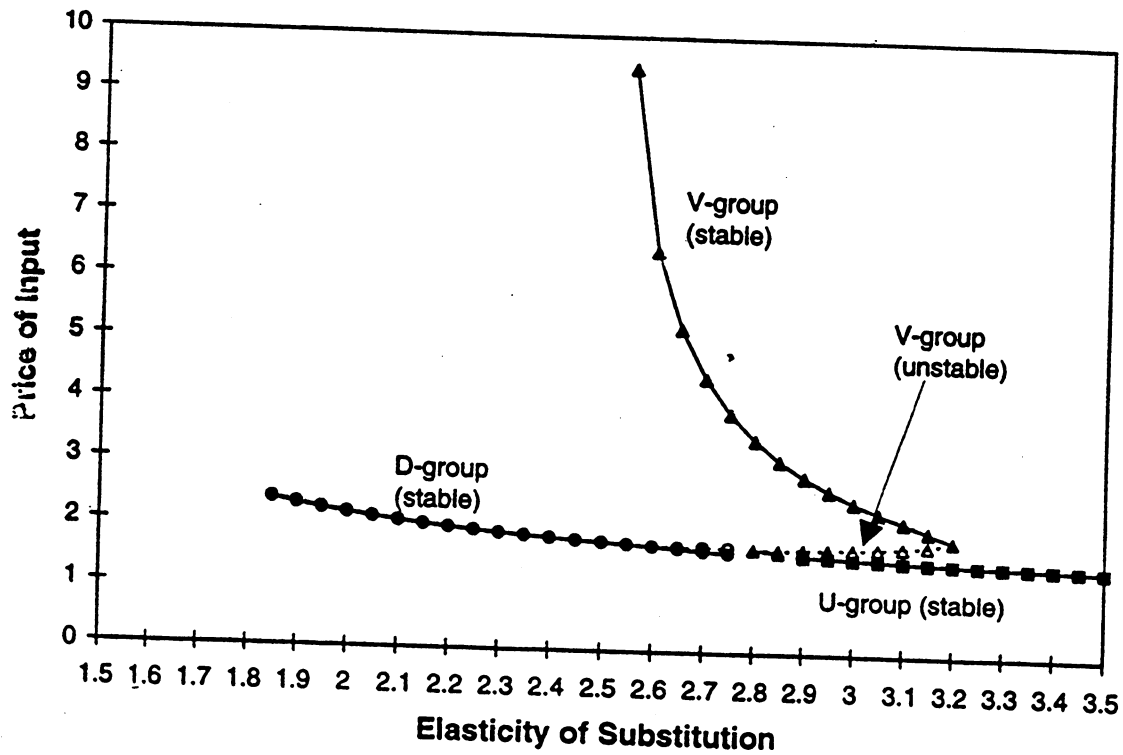


Figure 7: Internal Sales, High Concentration Equilibria

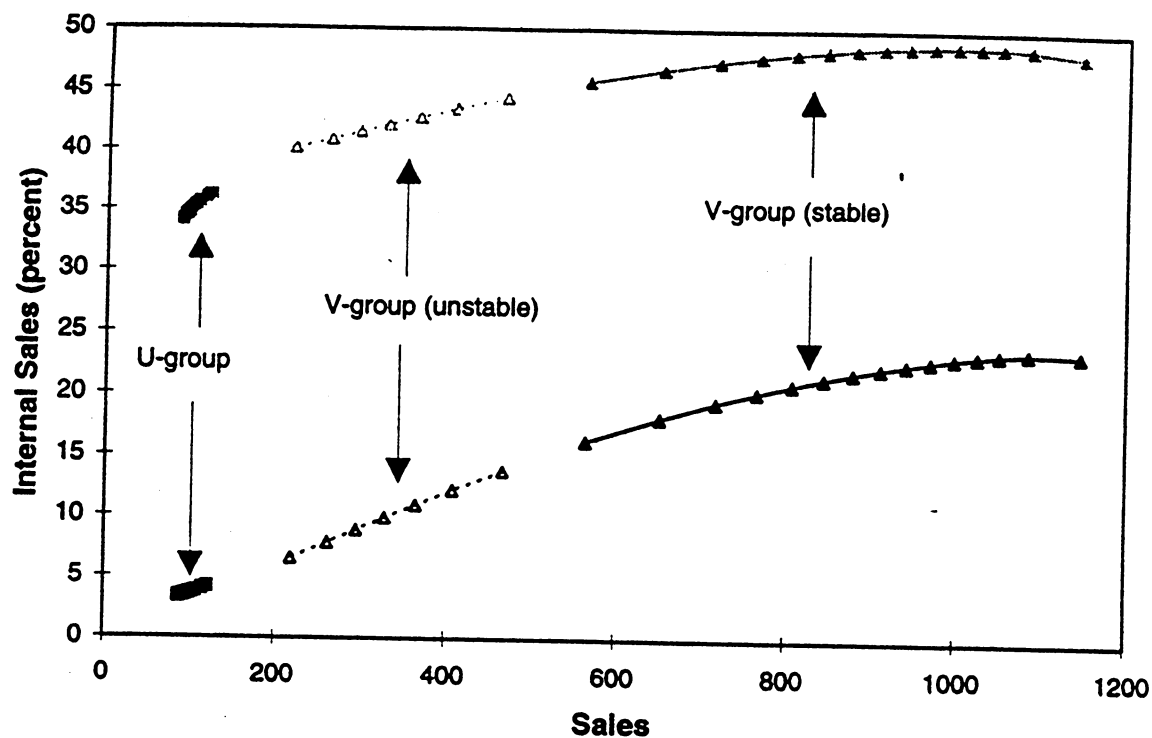
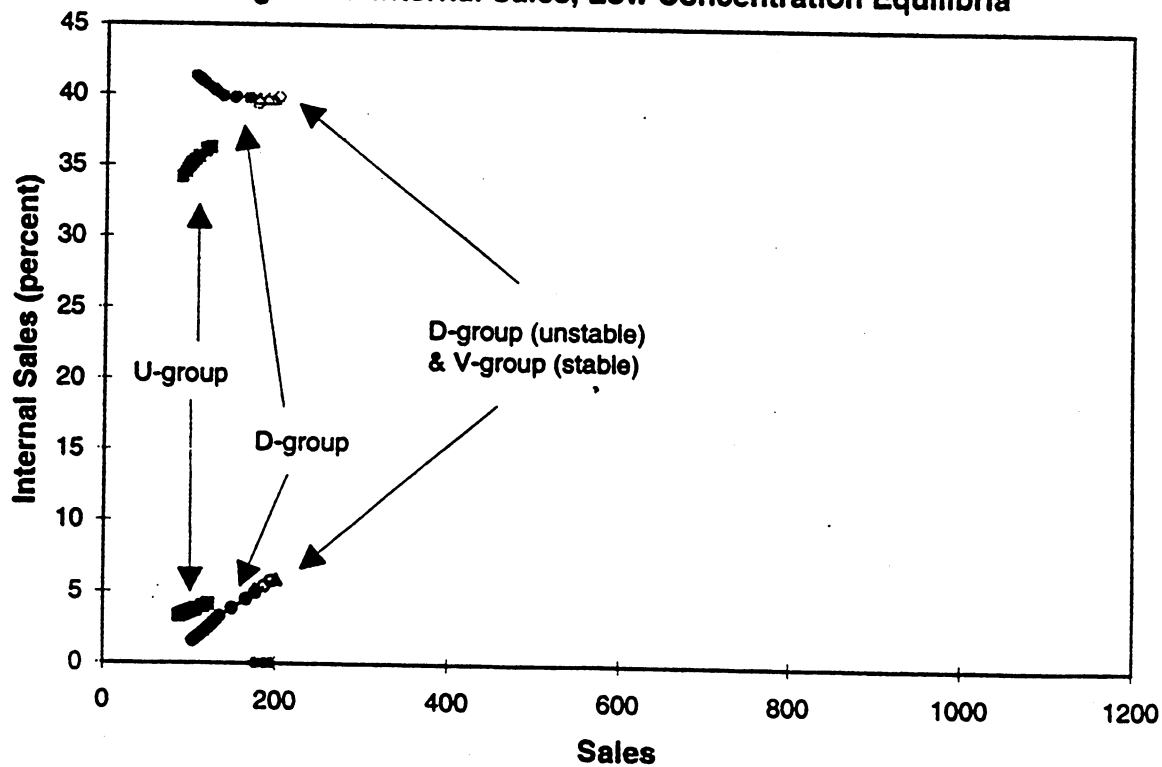


Figure 8: Internal Sales, Low Concentration Equilibria



Comments by Dennis Yao on

**Ethnic Chinese Networks in International Trade by
Victor Trindale and James Rauch**

and

**The Organization of the Taiwanese and South Korean Economies: A Comparative Analysis by
Robert Feenstra and Gary Hamilton**

The Trindale and Rauch paper suggests an information-based explanation for why ethnic groups generate trade between countries. The authors estimate a gravity model to explore these relationships--using a variable for the Chinese population shares. I think the results generally support the information explanation that is proposed in the paper and that the paper is a valuable contribution. However, there are aspects to the results raise questions.

Jim talked about one half of the two sets of models that are reported in the paper. One set includes a remote coefficient, which allows for special situations such as posed by Australia and New Zealand which are relatively isolated from their other trading partners. The other set leaves out the remote variable. The estimated coefficients differ across the various models.

In tables 4 and 5 (estimates without the remote variable) there is not much difference (statistically) in the coefficients for differentiated products versus market reference products versus the other category. In fact, the authors comment that the coefficients may not be statistically different from each other within any year and aggregation. Such a result is not fully supportive of the information argument that is being made.

I also wondered about the differences in the estimates between the 1980 estimations and the 1990 estimations. All things being equal, of course, 1980 and 1990 should have similar coefficients, but they don't. The 1990 data tells a much better story with respect to differentiation, and therefore better supports the proposed theory. The offered explanation is that communications had substantially improved worldwide by 1990 compared to 1980, but other explanation might also explain the differences. Given some of the alternative noninformation explanations for increased trade, it is quite important that differentiated products to produce different results than the other product categories.

One other explanation is that trade policies changed. If trade policies changed in this region between 1980 and 1990, that could alter the trade flows so as to produce differences between the 1980 and 1990 results. Another explanation is that these economist started trading different products during this period of time. Given the rapid growth and emergence of many of these countries during this period, one would expect that the profile of products that were traded on the world market would have changed.

Now consider two other theories of why ethnic networks might lead to increased trade. The first theory is a legal transactions cost argument. It runs like this: legal systems can impact trade especially where the contract enforcement systems are not good, where potential problems in business relationships can develop, and where legal system differ. Legal transactions are not a great problems in the United States. But in two countries with very different legal traditions and laws, trading across country boundaries can be a real problem. In such situation, traders might rely on ethnic background, personal relationships, shared cultural understandings, or other things that help support a relationships, shared cultural understandings, or other things that help support a relationship not fully supported by the legal systems. This theory also predicts that ethnic networks should lead to increase trade.

But does this alternative theory explain the difference in the impacts on differentiated products versus the other product categories? It could be argued that trade relationships involving differentiated products are generally more complex than those involving homogenous products and therefore that trade and distribution relationships involving such products depend even more on contract enforcement systems. In any event this explanation can well be complementary rather than a substitute for the informational theory proposed in the paper.

Another explanation involves government policy. As the ethnic share of the population in a country increases, it becomes easier to influence the government to produce trade policies favoring that ethnic group. This explanation also appears consistent with the results, although this theory also has some difficulty explaining the differentiated versus reference products results. Thus, it would appear that the differentiated product result is pivotal in at least partially ruling out these alternative explanations.

Finally, I will briefly note a policy implication of these results. Because ethnic networks appear to be efficiency enhancing, decision makers that would like governments to take action to offset the workings of such networks must be sure to take into account the positive efficiency-enhancing aspects of the networks.

I now turn to the Feenstra and Hamilton paper, a paper I also found to be stimulating and well done. First, I think the data tell a convincing story about the differences between the organization of the Korean economy and the Taiwan economy. The next question is whether the theory is compelling.

Because the model in the paper is not formally laid out--I understand that it is laid out in another paper--it is difficult for me to assess its strengths and weaknesses. The model produces multiple equilibria (that is, there is more than one stable configuration) Multiple equilibria can be produced, however, as an artifact of modeling assumptions any may not be a feature of a somewhat different, by equally compelling, model formulation. For example, the model appears to assume that each firm in an industry can only offer a single product. This is a simplification for tractability, but could have some impact on the equilibria that emerge. Therefore, a close examination of the actual model would have been useful in assessing the persuasiveness of the theory.

I can, however, examine the intuition that explains the reasons for the stability of the different economy configurations. With respect to the vertically integrated (chaebol) equilibrium more concentration implies higher markups, which imply more benefits to vertical integration, because of the efficiency gains, which imply more concentration, which implies higher markups. This set of self-reinforcing set of factors seems intuitively reasonable. I do not have as clear a sense of the intuition underlying the (Taiwan) equilibrium in which some groups are vertically integrated and others are not. It appears that the answer lies in the tradeoff between "governance costs" that encumber a vertically-integrated firm and the advantage that such a firm has in avoiding incorrect pricing, with the advantage increasing as concentration in the upstream industry increases. Without the actual formal model it is difficult to assess exactly how this works.

Now, I will make a few general comments. First, I do not know much about Korea, but as a business economist, I do wonder how the conglomerate aspect of the chaebols can survive. The vertical integration aspect of the chaebols at least has some identifiable benefits, and the tradeoffs identified in their paper along these lines make a lot of sense. But what advantages exist for the chaebols from their activity in unrelated industries (other than political advantages and advantages that might have emerged from a closed capital market)?

Second, the authors deliberately develop their model without government policy. They ask “with the market alone, what emerges?” The model produces two different kinds of equilibria. That approach is a strength since it indicates a central tendency that does not depend on government policy. Of course, since we are trying to understand Taiwan and Korea in practice and not just in (market) theory, at some point one needs to add back considerations about government policy, particularly in the case of Korea where government policy was arguably instrumental in creating an environment conducive to the creation and maintenance of the chaebol.

Another concern is that the authors’ model is of complete economy, but Taiwan and Korea are economies existing in a larger global trading system. The model ignores the impact of firms that are outside the modeled economy, but which compete with firms that exist within the modeled economy. (For example, Korea and Taiwan--representing different equilibria--compete with each other in many industries.) If there are factors that “isolate” the economies so that the model can be restricted to examining a country’s lone, then one should probably be sure that those factors (e.g., government factors!) Can justifiably be left out of the model.

My final comment is about the treatment of business organization in this paper. - The model allows for vertically-related firms and unrelated firms, but the real world allows for a continuum of relationships among firms in an economy. Some of the problems that could be partially or fully solved through vertical integration can also be solved through our organization relationships such as contracts. (e.g., contracts can often solve incorrect pricing problems.) These intermediate forms of relationships also change other incentives of firms and could affect the structure of the economy. I would counsel caution, then, on the interpretations based on the results of a model which limits itself to the polar extremes of organizational relationships.

The policy and trade implications are interesting. I believe the major point is that the organizational form that we observe in Taiwan and Korea are sustainable without government intervention. Elimination of the government role in promoting or assisting the organizational form will not, according to this theory, cause the economy to convert to a different organizational structure. Therefore, for example, if the Korean government were to end all policies that differentially help the chaebols, one should not expect that the chaebol form will be dismantled through market pressures alone.

Comments by David Gould on

Ethnic Chinese Networks in International Trade by Vitor Trindade and James Rauch

Overall, I found the paper to provide an informative exposition on the role that Chinese immigrant networks play in stimulating bilateral trade flows. Unlike Gould (1996) where immigrants are found to stimulate trade between their host and mother country, Vitor Trindade and James Rauch examine the hypothesis that Chinese immigrants have networks that enhance trade flows between any two countries which host these immigrant communities. Certainly, there is much causal evidence to suggest that these networks exist, but little or no solid empirical work to quantify how much these networks affect trade. I found most of the authors' arguments convincing, but I have a few comments that may strengthen the conclusions of the paper.

1) In testing the network hypothesis, Chinese immigrant populations in two trading countries are multiplied together to create the CHINPOP variable. For a given stock of Chinese immigrants in the two countries, this variable has the highest value when the populations are of equal size. This assumption implies that the largest network effects are between equal size communities and seems to be correct if the Chinese need a partner in the other country to trade with. But perhaps the Chinese are just good traders because of a culture that places a high value on entrepreneurship. In other words, Chinese immigrants might stimulate trade not just by trading with each other, but with everyone. A way of getting a better grip on this Chinese networks/good Chinese traders question is to examine trade between country i and j relative to their trade with the rest of the world ($V_{ij}/(V_{iw} + V_{jw})$). If this ratio is higher between countries with larger stocks of Chinese immigrants (controlling for everything else) it is more suggestive of the network hypothesis.

2) A more fundamental problem is that of distinguishing between the effects of Chinese immigrants and other immigrants. I suspect that countries that have a lot of Chinese immigrants also have a lot of immigrants from their direct trading partners. So, it may be that immigrants from their trading partners are important to bilateral trade and not Chinese immigrant networks. For example, Canada and the U.S. both have very liberal immigration policies, so they both have many immigrants in addition to Chinese immigrants. Moreover, Canada has a lot of U.S. immigrants and the U.S. has a lot of Canadian immigrants. U.S. immigrants in Canada and Canadian immigrants in the U.S. may be more important to stimulating U.S.-Canada bilateral trade than Chinese immigrants. This question may be tackled by looking at the share of Chinese immigrants in the total immigrant population, rather than just the absolute number of Chinese immigrants.

3) Does the threshold model provide better explanatory power over simple OLS? I can understand why a threshold in the immigrant community would be important, but is it also the case for total trade bilateral trade flows?

4) The REMOTE variable is not necessarily measuring what the authors want it to. In the text, they state that two nations that are close to each other, but are both far away from rest of the world (for example, Australia and New Zealand) might be expected to trade more with each other, *ceteris paribus*. This is reasonable. However, the way REMOTE is measured, it simply captures the point that both nations are far away from the world markets. It does not capture whether they are also close together. For example, you could have two nations like New Guinea and Greenland that may be equally far apart from world

markets but are still closer to world markets than they are to each other. In creating the REMOTE variable the authors should divide their measure by the distance between the two trading partners.

5) The intuition in part IV of the paper (tentative welfare analysis) was not clear to me. Perhaps the argument can be flushed out more.

Comments by Bee Yan Aw Roberts on

"The Organization of the Taiwanese and South Korean Economies: A Comparative Analysis" by Robert Feenstra and Gary Hamilton

While many researchers recognize the importance of the organization of firms and interfirm relationships in explaining performance, few have been able to give these issues the central place it deserves in any discussion of an economy's growth and development. This paper fills an important gap in the literature on the role of business networks in the economies of South Korea and Taiwan.

The first half of the paper provides careful documentation of the organizational differences between the South Korean and Taiwanese economies. A measure of the extent of vertical integration is developed and used to quantify the degree of "internalization" within the largest business groups in each economy.

On average the internalization ratio for South Korea is found to be 11.8 in contrast to the corresponding figure of 4.8 in Taiwan. While trading companies owned and operated within business groups are carefully accounted for in arriving at these figures, I wonder if the role of subcontracting firms should be addressed as well. The network of subcontractors has become increasingly important in Korea since 1982 with the passing of The Small and Medium Industry Systemization Law. These firms are more likely to be independent firms in Taiwan and should not affect the internalization ratio. If they can be owned by conglomerates in Korea, (I know that the Hyundai Motor Company group subcontracts out to suppliers within the group) then sales of subcontractors should be accounted for in measuring the extent of internalization. The problem is that, firms that are pure subcontractors often record zero sales (this is the case in Taiwan) implying that the actual magnitude of internalization for Korea may be higher than indicated by the measure used by the authors.

The authors provide an interesting insight into the nature of industrial structure in the two countries, namely that the general perception of Taiwan as an economy of very small firms producing for the world market and of South Korea as a country ruled essentially by very large, vertically integrated business groups called chaebols, the polar opposite industrial structure from that observed in Taiwan, is far too simplistic. The authors provide careful evidence to indicate that the industrial structure in both countries is far more heterogeneous. Taiwan's industrial structure is more accurately described as dualistic comprising of a large sector of small firms buying intermediate goods from an equally large sector of large business groups. Similarly, the conglomerates of South Korea comprise of the giant top five business groups with the remaining groups that are distinctly smaller and quite similar in characteristics to the biggest Taiwanese business groups.

The second half of the paper describes how the differences in how firms are organized in the South Korean and Taiwanese economies are consistent with a stylized model of business group formation. I found this section somewhat less compelling. In particular, the model appears to be more suitable in the context of explaining why firms have incentives to vertically integrate but less appropriate for the formation of business groups as we understand them. Public policy and financial reasons are often the main factors behind business groups. This is certainly true in the case of the two economies studied here.

One assumption that is worth considering in the paper is that with respect to entry and exit costs. Free entry and exit is assumed in the current model. Detailed studies on the industrial structure in South

Korea and Taiwan have pointed to distinguishing differences between the two economies with regards to the costs of entry and exit as an explanation for the different industrial structures that are observed. The costs of "governance" referred to in the paper is related closely with fixed production costs. Entry and exit costs are related to sunk costs and therefore likely also to affect decisions of incumbents as well as potential entrants in a way that ultimately influences the overall industrial structure in the economy.

As in any work on Asia, it is important to put the results generated by the model in the context of the current crises that has hit the economies in it. In particular, for South Korea, this crises has raised many questions about the economic wisdom of its business groups. The theoretical model in the paper predicts the stability of the large, highly vertically integrated business groups in Korea. However, it is not clear that even the top five business groups in South Korea (the stable V-group) will survive without major changes in the way they are organized. Moreover, since the early 1980s, it is a fact that the average size of firms have been increasing in Taiwan and decreasing in South Korea. Perhaps, in a relative sense, this pattern of convergence in the two economies is still consistent with the low and high concentration paths predicted for Taiwan and Korea, respectively. Nevertheless, a discussion of how some of the key changes that the economies have actually undergone ties in with the authors representation of their respective industrial structures will be useful and interesting.

SESSION VI

***SERVICES AND INTELLECTUAL PROPERTY
RIGHTS***

PATENT SYSTEMS IN APEC: ROLE IN NONTARIFF TRADE BARRIERS AND STRATEGIC TRADE POLICY

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(revised)

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Tariff and Nontariff Barriers"
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Abstract: Do differences in national patent systems constitute nontariff barriers to trade (NTBs)? Are national patent systems an instrument of strategic trade policy (STP)? Is the harmonization of patent systems necessary to reduce patent-related NTBs and STPs? This paper describes the state of patent laws across APEC nations, examines case studies of patent-related NTBs and STPs, and assesses whether patent harmonization in APEC will help reduce trade distortions. It is argued that some patent reforms are needed to reduce or avoid patent-related NTBs and STPs, but that the harmonization of patent laws itself is a limited solution. Patent *laws* per se are often not the source of trade distortions, but rather the *practises* of strategic private and public interests. More attention needs to be shifted to competition rules and to determining which features of patent systems are most conducive to social welfare.

Acknowledgements: I am very grateful to Carlos A. Primo Braga and Michael Ferrantino for comments and to the audience for their feedback. I also thank Jessica Duda and Jeff Majka for research assistance.

I. Introduction

"And?"

"The Japanese had already patented the products. In Japan."

"You mean they already had the algorithms?"

"No. They just had patents. In Japan, patenting is a form of war. The Japanese patent like crazy. And they have a strange system. It takes eight years to get a patent in Japan, but your application is made public after eighteen months, after which royalties are moot. And of course Japan doesn't have reciprocal licensing agreements with America. It's one of the ways they keep their edge.

"Anyway, when I got to Japan I found Sony and Hitachi had some related patents and they had done what is called 'patent flooding.' Meaning they covered possible related uses. They didn't have the rights to use my algorithms - but I discovered I didn't have the rights, either. Because they had already patented the *use* of my invention."

-- *Rising Sun*, Michael Crichton
(NY: Ballantine Books, 1992), p. 202.

The Asia-Pacific Economic Cooperation (APEC) has been formed to pursue, among other things, greater trade and technological cooperation. An important consideration in this pursuit is how well established intellectual property rights are, for such rights influence the market access and market share of domestic and foreign interests. In addition to the fictional novel *Rising Sun*, a number of surveys of U.S. corporate officials have expressed concern that countries (particularly Asian and especially Japan) are using patent policies as part of some strategic industrial plan, and that such behavior is a threat to free trade.¹ Thus a concern is that unless international patenting conflicts are addressed, some of the objectives of APEC might be undermined.

This paper reviews patent systems among APEC members and examines whether differences in patent laws and policies might constitute *nontariff barriers to trade (NTBs)* or enable nations to use patent policies as instruments of *strategic trade policy (STP)*. The paper then considers whether the *harmonization* of APEC patent systems could reduce the use of patent laws and policies as NTBs or STPs. Thus a contribution of this paper is in helping to assess the level of priority that patenting matters should receive in APEC negotiations.

The main findings of the paper are as follows: there are ways in which patent systems can be used as NTBs or STPs, and there have been instances where they were used as such. However, it is argued that harmonizing international patent laws is a limited solution. In many instances, it is not the laws per se that are the sources of trade conflicts, but the ways the laws are practised. Secondly, not all patent-related barriers to trade are the result of *public* strategies but of *private* (corporate) strategies, which fall outside the scope of public laws.

First, a few remarks on a working definition of NTBs or STPs. As Olechowshi (1987, p. 120) points out, they are easier to define by what they are not than by what they are, and offers as a working

¹ See, for example, GAO (1993) and Oppenheimer and Tuths (1987).

definition: "all public regulations and government practises that introduce unequal treatment for domestic and foreign goods of the same or similar products." The UNCTAD classification of NTBs rests on this sort of working definition. In addition, Laird and Yeats (1990, p. 16) point out that "intent [should be] a factor used for the identification of nontariff barriers," but that "intent cannot be determined without ... [an] investigation of their nature and actual operation." In other words, the discrimination may not exist in any of the properties of a policy measure but in the way the measure is applied.

The relevance of the above remarks for the study of trade and patent systems is that, first, both *public* and *private* measures may restrict trade or lead to discriminatory domestic and foreign treatment. Often, reports of international patent conflicts have failed to distinguish between actions caused by governments and those by private agents (e.g. corporate strategies). This has implications for global patent harmonization in that legal reforms which set standards for government actions only will have limited effects on reducing trade impediments.

Secondly, on the issue of *intent* to intervene or discriminate in trade, patent laws can be either inherently discriminatory (for example, when foreign evidence is outlawed in national court) or discriminatory in operation (for example, when certain types of inventions - e.g. pharmaceuticals - are declared unpatentable, thus hurting foreigners who tend to invent them and benefiting domestic inventors who tend to imitate them). More difficult to establish are cases where the laws or execution of the laws are applied to both domestic and foreign patentees (i.e. national treatment) in a non-discriminatory and transparent way, but nonetheless the system favours domestic inventors. For example, to the extent that the domestic system has features which foreign systems do not have (such as opposition to a competitor's patent grant, or native language requirements), domestic agents may be better able to utilize their system (that is, to win patent grants). In these cases, governments might be fully aware that their systems give domestic inventors an advantage but do not change their laws. Other patenting difficulties that foreigners face might better be categorized as *unintended* structural impediments to global patenting (for example, registration procedures, trial procedures, fees, and staffing problems).

Despite the potential for patent laws or practises to act as trade barriers, the UNCTAD classification of nontariff trade barriers does not include patent policies.² There might be several justifications for this. First, overall cases of patent policies used as an NTB/STP might be relatively very small compared to other policies like government procurement or standards. Secondly, patent policies are not, for the most part, "border" measures. Patent policies determine internal (national) and global market shares and access. Thirdly, patents affect trade flows rather indirectly. Patents are more concerned with trade in "ideas." *New* patents issued, for example, do not translate into commodities or services until reduced to practise, if at all and usually with some time lag. Trade flows are affected when counterfeit or infringed products violate *existing* patent rights.

A few related literature should be mentioned. A number of studies have raised the issue that disharmony in international patent laws may constitute NTBs.³ These studies do not, however, go into the details of patent systems in order to examine the sources of international conflict, as in this paper.

² See Table 2.1 in Laird and Yeats (1990).

³ See, for example, Stern (1987), Oppenheimer and Tuths (1987), Tussie (1993), Tyson (1993), and Primo Braga (1996).

Secondly, there are some empirical work on whether stronger patent rights encourage or impede trade.⁴ These studies, however, cannot indicate whether differences in patent regimes have acted as NTBs, for the following reasons: the empirical studies focus on an aggregate index of patent rights. As discussed in this paper, it is not the overall level of rights that discriminate in trade but the composition of rights (that is, the individual features of patent systems). Furthermore, their unit of analysis is the firm (exporter), and the focus is on how patent rights affect the profit-maximizing export behavior of firms. In the case of NTBs and STPs, the unit of analysis is the government, and the focus should be on how governments choose patent system features or policies to block imports or shift rents to domestic industry.⁵

The next section reviews some trends in intra-APEC patenting. It also reviews some basic features of patent systems and describes how these features differ across APEC. Section III examines cases of international patenting conflicts and examines which features of national patent laws, if any, played a role in the conflicts. These cases help to shed light on the extent to which patent systems have been used to restrict imports or foster domestic firms - that is, used as NTBs or STPs. Section IV, in light of the cases discussed in section III, evaluates whether patent harmonization is likely to be effective at minimizing international patenting conflicts.

II. Trends in Intra-APEC Patenting and APEC Patent Systems

At present, intra-APEC patenting activity is rather modest. Table 1 shows patent applications received by APEC members from domestic inventors, other APEC members, and total foreign inventors, in 1980 and 1990.⁶ Patent application data are useful in showing where inventions come from and where they go. Furthermore, by disclosing technical knowledge, patent applications are a useful source of knowledge spillovers; otherwise, should inventors not apply for patents, new pieces of knowledge would remain trade secrets, unless they are leaked or discovered through reverse engineering. Of course, there are some limitations with patent application data. They, for instance, do not capture all the flow of new inventions. Some new inventions are not patented, either because the subject matter is unpatentable (for example, biogenetic discoveries; weapons; toys) or because the inventor chooses to keep them secret. The quality of inventions is also not accounted for. A modest invention and a major invention each get counted as one new patent application. Thus a rise in patenting could be due to a mixture of increases in quantity and quality. Finally, not all inventions are marketed or manufactured (i.e. they may be "sitting on the shelf"). An increase in patenting activity need not suggest that society is utilizing newer technologies.

Subject to these provisos, the data in Table 1 provide some indication of the extent of intra-APEC trade in "ideas." The U.S. and Japan are the largest sources of new ideas, as well as being the prime destinations. While there has been a significantly greater rise in total foreign and intra-APEC patenting than in domestic patenting (with the exception of Japan), most of the new ideas tend to flow among the richer members of APEC (Australia, Canada, Japan, Korea, and the U.S.). There are several possible

⁴ See Maskus and Penubarti (1995) and Smith (1996).

⁵ One could argue that this empirical literature captures the *effects* of government patent-related NTBs on trade *indirectly*. To the extent that patent-related NTBs restrict trade, they should be reflected in the data.

⁶ Absent from the table are Brunei, China, Papua New Guinea, and Taiwan, for which data are not available.

Table 1. Intra-APEC Patenting

1990 Patent Applications from:

	Domestic Residents	APEC Members:						Total Foreign
		Aus	Can	Jpn	Mex	New Z	USA	
Aus	6948	—	520	1895	6	148	8681	19559
Can	2782	612	—	4444	8	29	16832	35135
Chile	191	8	14	11	2	4	285	642
H. Kong	21	6	2	273	n/a	1	404	1060
Indon*	49	20	4	144	n/a	2	259	731
Jpn	333373	637	663	—	7	33	19578	43419
Korea	9083	365	332	7346	5	1	7360	22304
Malay	92	57	32	357	1	5	912	2213
Mex	750	24	71	124	—	6	2893	4539
New Z	802	361	77	141	1	n/a	1699	3869
Philip	147	44	3	173	1	1	960	1822
Singa*	4	13	7	233	n/a	5	371	1003
Thai	73	47	12	360	1	—	813	1867
USA	91410	1398	3683	35771	76	105	—	84690

1980 Patent Applications from:

	Domestic Residents	APEC Members:						Total Foreign
		Aus	Can	Jpn	Mex	New Z	USA	
Aus	6582	—	183	1015	7	181	3883	9354
Can	1785	233	—	2018	18	37	13125	23189
Chile	140	n/a	n/a	n/a	n/a	n/a	n/a	685
H. Kong	10	7	6	142	0	0	240	723
Indon	5	17	4	60	0	3	174	475
Jpn	165730	154	271	—	20	27	10391	25290
Korea	1241	21	9	1622	1	2	1151	3829
Malay	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Mex	665	0	2	56	—	5	340	4132
New Z	1148	235	28	69	0	—	857	2290
Philip	119	48	15	192	1	5	654	1454
Singa	2	13	2	98	0	1	233	631
Thai	18	8	1	35	1	1	69	184
USA	62098	517	1969	12951	77	119	—	42231

Notes:

* indicates data from 1985

n/a indicates not available

Total Foreign indicates total non-resident applications (including from APEC members)

Source:

WIPO (1980, 1990)

reasons why new ideas tend to flow less to the rest of APEC. First, the markets may be small; for example, while Hong Kong and Singapore are fast growing economies, their markets (other than their financial markets) may be considered relatively small. Secondly, the patent rights may be weak (or application procedures unwieldy) to attract patent applications. Thirdly, the risk of imitation might be low enough that inventors believe they can introduce their inventions without the need for a (costly) patent. It remains to be seen whether improved economic relations within APEC will enhance intra-APEC patenting, due say to an increase in market size, patent rights, and scientific capability.

Currently, patent laws vary across APEC members, although there has been a greater convergence of standards recently owing to the Trade-Related Intellectual Property Rights (TRIPs) agreement. This can be seen from some measures of overall patent protection levels shown in Table 2. The patent rights indexes range from 0 (no protection) to 5 (strongest protection).⁷ Between 1980 and 1990, patent protection levels diverge somewhat due to a strengthening of rights in countries that already provide strong protection, but by 1995, the overall levels converge, as measured by the standard deviation. Generally, patent protection levels are highest in those APEC nations that, as shown in Table 1, are the major recipients of international patent applications.

There are, of course, some major limitations with the patent rights indexes shown in Table 2. First, the levels refer to "laws on the books," that is, to statutory provisions. They need not reflect the "actual" level of protection since there is no indication of how laws are actually carried out or have been carried out. Secondly, the indexes aggregate patent features. Often it is the individual features that are the subject of trade controversy. For example, both the U.S. and Japan rate very highly in terms of providing overall patent protection, but their differences in patent system details give rise to suggestions that their patent laws act as barriers to trade. Thus, to analyze issues pertaining to NTBs and STP, it is important to disaggregate patent systems by their features.

The differences in overall *levels* of protection are important nonetheless, particularly between the strong patent rights countries (usually the developed) and the weak (usually less developed). Weak patent rights nations can, for example, by imposing compulsory licensing, providing lax enforcement, or citing public interest claims, divert the market away from foreign nationals who own patent rights to local domestic producers, and thus distort international trade. Weak patent rights nations can discriminate against foreigners even when adhering to the national treatment principle, provided the same low levels of protection are provided to both domestic and foreign innovators. This favours domestic producers (at the expense of foreign) if domestic producers are imitators.

Thus differences in *overall* levels of patent protection are still relevant in so far as there still are some APEC members with very weak or no patent laws. For example, Papua New Guinea does not yet have a patent system; Indonesia joined the Paris Convention in 1970, but did not have patent laws until

⁷ The measures are based on Ginarte and Park (1997) and Rapp and Rozek (1990). Both indexes are similar in rating national patent laws on the basis of whether certain patent rights and enforcement provisions exist. The indexes differ in their method of scoring. The Ginarte-Park measure allows for more variability. They also differ in the coverage of countries and time periods. The Rapp-Rozek covers more countries but only a single time period.

Table 2. Index of Patent Rights among APEC members

	1980	1990	1995	1984*
Austral	3.23	3.32	3.63	4
Brunei	n/a	n/a	n/a	4
Canada	2.76	2.76	3.05	4
Chile	2.41	2.41	2.61	2
China	n/a	n/a	n/a	1
H. Kong	2.24	2.57	2.71	3
Indon	0.33	0.33	n/a	0
Japan	3.94	3.94	4.33	4
Korea	3.28	3.94	4.05	3
Malay	2.57	2.37	n/a	3
Mexico	1.40	1.63	1.95	2
New Zeal	3.32	3.32	3.32	4
Papua NG	0	0	n/a	0
Philip	2.67	2.67	n/a	4
Singap	2.57	2.57	2.57	4
Taiwan	n/a	n/a	n/a	3
Thail	1.85	1.85	1.85	1
USA	4.19	4.52	4.52	5
<i>Std Dev</i>	1.14	1.21	0.87	1.46

Sources:

Ginarte and Park (1997), Park (1997)

* from Rapp and Rozek (1990)

(n/a indicates not available)

1989; Brunei's patent system is not independent as it is based on the patent systems of the U.K., Singapore, and Malaysia (meaning that any patent granted in any of those countries can receive protection in Brunei provided it is registered within three years of grant date).⁸ Hong Kong is also dependent on the U.K. patent system. Singapore has only recently (in 1994) ended its dependence on the U.K. patent system and enacted its own laws.

Turning now to differences in patent systems, the following features will be highlighted for consideration: priority; novelty; interpretation of claims; publication; examination; opposition; duration; working requirements; and compulsory licensing. Table 3 provides a summary of these patent features across APEC.

Priority. In all APEC nations (except the U.S.), the *first-to-file* rule prevails, under which the first applicant to file for a particular invention has priority (in the awarding of any patent) over subsequent applicants. In the U.S., the *first-to-invent* rule prevails, under which the original inventor has priority. In the event of a conflict (where two or more inventors seek protection for substantially the same invention), *interference* proceedings are held in the U.S. to determine the first inventor. Such proceedings are costly and time-consuming (which is one reason given for advocating a switch to a first-to-file system). However, they are not as numerous; about one percent of total applications result in such proceedings, and less than one-tenth of one percent of them result in a patent being granted to someone other than the first to file.⁹

The question is whether the coexistence of these two different priority rules constitutes a structural impediment to trade. Before the TRIPs agreement, the U.S. rule was discriminatory because foreigners were unable to use evidence from outside the U.S. to establish that they were the first to invent.¹⁰ The U.S. laws (sections 102 a, b of Title 35) have since been modified to permit evidence from WTO member nations. This removes one advantage that U.S. inventors had over foreign; however, U.S. inventors who desire more time to developing their inventions before applying for patents abroad might be disadvantaged if some other party files abroad first for a similar invention. As Wiggs (1993) points out, however, the disadvantage to

⁸ A dependent patent system is likely to be convenient for a small economy like Brunei, with a population under 300,000 and with limited qualified manpower and technical expertise. Brunei is currently considering developing an independent system in the near future (see the APEC *Industrial Property Rights 1996 Symposium* Web Site - www.jpo-miti.go.jp/pate/repo/apec).

⁹ See GAO (1993).

¹⁰ See Moy (1992).

Table 3. Patent System Features among APEC members

	1 Exam for Novelty	2 Opposition After Grant	3 Working Required Within	4 Compul- sory License	5 Member- ship in	6 Duration (yrs)	7 Public- ation in or upon	8 Grace Period	9 Doctrine of Equiv.
Australia	yes	3 months	3 yrs	X	a,b	20	18 months	6 months	yes
Brunei	no	none		-	b		grant	none	
Canada	yes			X	a,b	20	18 months	1 year	yes
Chile	yes			-	b	15	60 days	none	
China	yes	3 months		X	a	20	18 months	none	yes
H. Kong				-	a,b	20	grant	none	
Indon		6 months	3 yrs	X	a,b	14	6 months	none	
Japan	yes	pre-grant	3 yrs	XX	a,b	20	18 months	6 months	no
Korea	yes	2 months	3 yrs	XX	a,b	20	18 months	none	
Malay			3 yrs	X	b	15	grant	none	
Mexico	yes		3 yrs	-	a,b	20	18 months	none	
New Zeal	yes	3 months	3 yrs	X	a,b	20	grant	none	
Papua NG									
Philip	yes		2 yrs	X	a,b	17	grant	none	
Singap	yes		3 yrs	X	a,b	20	grant	none	no
Taiwan	maybe	3 months	3 yrs	X		20	grant	none	no
Thailand	yes	180 days	3 yrs	X	b	15	grant	none	
USA*	yes	none		-	a,b	20	grant	1 year	yes

Notes:

For column 4:

X denotes yes

XX denotes yes after non-working for 4 years from filing date or 3 years from date of grant

- denotes no explicit provisions in laws

For column 5:

a. Paris Convention

b. WTO

For Column 9:

This doctrine permits judges to declare an invention to be infringing upon another if it operates in "substantially" the same way, and is therefore "essentially" an equivalent invention.

* U.S. Patent Award is based on "first-to-invent." All others on "first-to-file."

Blank indicates information not available

Sources:

Jacobs (1996), Park (1997)

U.S. inventors stems not from the first-to-file rule but from the absolute novelty requirements abroad, a feature which is next considered.^{11,12}

Novelty. A patent is awarded to an invention that is novel, non-obvious, and industrially applicable.¹³ An invention loses its novelty if it were publicly known, sold, or used before application. Some countries allow exceptions if the disclosure occurs during experimental testing or at an officially recognized international exhibition. The U.S. and Canada provide a *grace period* of one year, during which time inventors may use an invention commercially or publish information about it before deciding whether to apply for a patent. An advantage of a grace period is that inventors can begin marketing to determine whether the pursuit of a patent is worthwhile. The disadvantage is that, by using this option, inventors lose their patent rights in countries that do not have grace periods. Thus differences in grace periods across countries tend to distort marketing and patenting decisions.

One way in which novelty is not destroyed by disclosure is when a patent applicant first files in a country that is a member of the *Paris Convention* (of course, before disclosing anything). The applicant then has one year to apply for patents in any other member countries. During that time, the applicant can publicly disclose her invention, and the other member countries will not void her application, as they will treat the filing date in the first country of application as the effective filing date.

It is still the case, however, that an applicant cannot take advantage of grace periods in the U.S. or Canada because grace periods apply to actions taken *before* a patent is filed. In Paris Convention countries without grace periods, the inventor must still file first (somewhere in a Paris Convention country) before disclosing or marketing her invention.

The grace period complements the first-to-invent rule. By first inventing and then commercially practising her invention (for up to twelve months), the inventor in effect prevents other applicants from applying for a patent on a similar invention. Not only is she the first to invent, but her disclosure destroys novelty for other inventors (including those who might file first in other jurisdictions with the first-to-file rule). Only she can exercise the option to apply for a patent within one year of disclosure. A grace period with a first-to-file rule would effectively operate like a first-to-invent system since the grace period extends

¹¹ Wiggs's (1993) point is that even if the U.S. also had a first-to-file rule, U.S. inventors could still see their foreign patent rights in jeopardy unless similar novelty concepts are adopted abroad. If an inventor is from a country with a one year grace period (see below) and publishes her result before applying for a patent, she qualifies for a patent in her home country but forfeits her rights in countries with absolute novelty. Thus where grace periods are not provided, it is likely to be the novelty condition which spurs inventors to file first rather than the fear that a rival will file a similar invention first.

¹² Another argument against the first-to-file rule is that it disadvantages the small inventor. However, this assumes that large inventors cannot often be the first to invent. Larger inventors with more resources (for instance, laboratories and personnel), connections to the research world, and a large stock of accumulated knowledge (and variations of inventions), might possibly produce stronger evidence of being first. Small inventors are also likely to find the cost of interference proceedings especially prohibitive.

¹³ Note that a patent is not granted on the basis of its value in terms of its the net present discounted benefits. The economic value of a patent is useful to economic (welfare) analysis but is not a patent examiner's criteria, at least officially.

only to the inventor who first publicly discloses the invention.¹⁴ Only she can file within twelve months of disclosure and not have the disclosure used against her. Others who try to file before her *will* have the disclosure used against them. Thus systems with grace periods and the first-to-file rule will in effect give priority to those who are *first to disclose*. This would defeat the purpose of having a grace period in order to allow inventors to test-market their inventions or improve their ideas further before applying for a patent. Under this hybrid system, inventors may race to disclose incomplete ideas.

Interpretation of Claims. Once an invention is determined to be novel, the next question is "how novel?" This is where the scope of protection is relevant. Patent claims are outlined in the patent's *specifications*. If the patent applicant drafts claims too broadly, she is likely to be rejected for a patent since broad claims are likely to step on some prior knowledge, in which case the invention is not novel. If she drafts claims too narrowly, her competitors are likely to invent around her invention. The claims define the scope of protection and determine whether other inventions will infringe on hers; other inventions must, in other words, lie outside the scope of her invention. Some examiners (particularly in Japan and Korea) favour a relatively narrow scope while others (in the U.S.) permit a relatively broad scope, thus resulting in different kinds of infringement suits and judgements across countries. Some countries (the U.S., Australia, Canada, and China) allow, in infringement suits, claims of an existing invention to cover not only those that are *explicitly* expressed in the patent but also those that are implicit. This is the exercise of the *doctrine of equivalents*, which holds that inventions that substantially perform the same function, in substantially the same way, and produce substantially the same result, are the same inventions. Hence, by exercising the doctrine of equivalents, patent holders can make certain technologically neighbouring inventions around theirs liable for infringement.

Publication. Another key difference between patent systems concerns the publication of patent applications. In some APEC nations, the application is kept confidential until the patent is granted, and is kept confidential if the patent is not granted. In other APEC countries, the contents of the application are published after 18 months of application. While early publication contributes to quicker knowledge diffusion, it has some ambiguous effects on the patent applicant's incentives for patenting. On the one hand, it enables competitors to build on the knowledge and possibly make improvements which lead to patented inventions that compete with the applicant's or force parties into cross-licensing. On the other hand, the information in the application can be used by potential competitors to distance themselves from the applicant - that is, to develop inventions that avoid infringement and costly litigation, or avoid unwanted cross-licensing arrangements.¹⁵

Examination. A notable factor here is that in Japan patent examinations can be deferred (for up to seven years). Like grace periods, this feature permits applicants to modify their inventions during the deferral

¹⁴ The case where it will not be like a first-to-invent system is if the first inventor keeps the knowledge secret till applying, while a second (but later) inventor discloses the invention before the first inventor applies. The disclosure makes the invention no longer novel but the inventor who first brought the disclosure (i.e. the second, later inventor) has a grace period to decide whether to apply for a patent.

¹⁵ Unless of course the objective is specifically to get involved in litigation and cross-licensing. The next section discusses patents as instruments of rent-seeking.

period, while obtaining first-to-file status early on. A criticism with this feature is that it leads to strategic patenting behavior. Applicants who do not have a complete invention to file may nonetheless, by filing first and requesting a deferral of examination, prevent others from applying for a patent on a similar invention.

Opposition. Some systems allow the public to oppose the granting of a patent. Others (like the U.S.) do not provide for opposition. Where opposition is permitted, it takes place after a patent is granted. Only in Japan does it take place before the granting of a patent. Pre-grant opposition is preferable if only to prevent the granting and later revoking of an invalid patent. Post-grant opposition is preferable if rivals tend solely to use the process strategically to delay or prevent the granting of a patent to the applicant. The advantage of having oppositions in the first place is that they spread the burden of establishing novelty (and other proof of qualification for a patent) among the public and examiners. It is possible for examiners to overlook factors that are pertinent to the establishment of novelty, non-obviousness, and industrial applicability. The disadvantage is that rivals may offer self-interested (possibly frivolous) arguments against granting.

Duration. Most APEC nations provide 20 years of protection from the date of application. While adequate for some firms, it may not be adequate for others. Pharmaceutical firms, for example, use up much time to obtain marketing approval (through clinical tests). If, for instance, it takes 12 years to obtain approval, firms have 8 years of effective protection left, which may not be enough to recoup their fixed innovation costs.

Working Requirements. Some countries require that an invention be worked - i.e. utilized (manufactured or marketed) - or else the patentee forfeits her rights. Other countries (like the U.S. and Canada) do not require working. One advantage of requiring working is that it prevents patentees from hoarding knowledge. In the absence of such requirements, an inventor may patent strategically to prevent others from acquiring her technology (and putting it to use) or to wait patiently for the arrival of future innovations that might infringe on her technology, thus leading to profitable legal settlements or collection of royalties. A disadvantage of working requirements is that it does not give inventors the option to choose the most opportune moment to market or manufacture.

Compulsory Licensing. Some countries may require patent holders to license their inventions to others. This helps to diffuse the invention more widely (and possibly lower prices). Such mandated licensing can also be used by the government to break deadlocks (for example, when patents *block* each other - i.e. contain overlapping subject material that causes the manufacturing of one invention to infringe upon the other), or be used by the government in the event of national interest (health or safety). On the other hand, compulsory licensing reduces the patent holder's exclusive rights, and has been a major source of complaint against patent systems that feature this.

In short, patent features vary across countries. No one particular feature is ideal for all countries. Each has advantages and disadvantages, making any attempt at global patent harmonization difficult since it is unclear which feature (or combination of features) is best for national or global welfare. The next section explores how these patent features have been utilized in public policy and in private practise. The objective is to examine the extent to which differences in national patent features have resulted in NTBs and STPs.

III. Strategic Patenting Cases

This section examines some case studies of patent-related trade barriers. It is useful to divide the cases into two groups (though in some cases it is not very easy to make this distinction): namely those due to public sector strategies and those due to private sector strategies. The former includes examples of NTBs and STPs resulting largely from government actions; the latter are examples of patent-related barriers to trade resulting largely from corporate strategies. The distinction is relevant for public policy initiatives like patent harmonization since it helps to identify the source of conflict and the likely nature of policy response required - whether it be in the area of patent law, competition law, or other. Table 4 contains a brief summary of the case studies.

The distinction is also important because it is often easy to mistakenly conclude that the discriminatory treatment of foreign firms is the outcome of public policy (i.e. as an NTB or STP). Yet a simple fact must not be overlooked: that private firms will choose their patenting strategies to maximize their well-being, not society's. Their chosen strategies may very well deviate from *socially optimal* strategies. Among their strategies, it must be allowed that private firms will try to pre-empt or frustrate the patenting efforts of rivals (both domestic and foreign). It is somewhat surprising that surveys of patent-related NTBs or STPs sometimes ignore the basic point that private firms act to promote their own welfare, not society's. Consequently many surveys tend to view international patenting conflicts as the result of national or government policy.

While most of the case studies describe conflict between the U.S. and Japan, certain similarities in the patent systems of Japan, Taiwan, Korea, and Singapore, and in those of the U.S., Canada, New Zealand, and Australia, make the lessons from the case studies applicable to a wider APEC context.

On the surface most laws themselves do not appear inherently discriminatory. According to Wineberg (1988, P. 12):

"... an examination of the principal provisions of the Japanese patent laws does not reveal anything particularly different or discriminatory. Japan has patterned its patent laws on that of the Federal Republic of Germany."

Kotabe (1992, p. 157) supports this view noting that:

"Pre-grant opposition and deferred examination are the only procedural mechanisms unique to the Japanese patent system"

Thus, as Thorson and Fortkort (1993, p. 212) put it, "one must look beyond the mere form of the laws." A key theme in the case studies that follow is that it is not necessarily the laws per se that give rise to discriminatory treatment of foreigners but the way the laws are carried out or practised.¹⁶

¹⁶ Wineberg (1988) also stresses the cultural factors behind the differential effects of patent laws on foreigners.

Table 4. Strategic Patent Cases

<u>Parties (Nationality):</u>			<u>Patent Issue:</u>
Allied Signal (USA)	vs.	MITI Consortia, (Japan)	Pre-Grant Opposition
Texas Instruments (USA)	vs.	MITI (Japan)	Compulsory Licensing
Dow Corning (USA)	vs.	Sumitomo Electric (Japan)	Compulsory Licensing
Ampex (USA)	vs.	Sony, JVC, Matsushita (Japan)	Narrow Scope
Lemelson (USA, 1992)	vs.	Toyota, Nissan Mazda, Honda (Japan) Ford, GM, Chrysler (USA)	Submarine Patenting
Honeywell (USA)	vs.	Minolta Camera (Japan)	Non-Manufacturing of Auto-Focus Technology
Fusion System (USA)	vs.	Mitsubishi Electric (Japan)	Patent Flooding
SanDisk (USA)	vs.	Samsung (S. Korea)	Narrow Scope
Citibank (USA)	vs.	Sakura Bank, Mitsubishi Bank (Japan)	Pre-Grant Opposition
Intel (USA)	vs.	Twinhead (Taiwan)	Purchase of Non-Intel Microprocessing Chips

Sources:

Bremmer et. al. (1996), GAO (1993), McDonell (1995), Purchasing (1996), Shota (1992), Wysocki Jr. (1997)

A. Public Patenting Strategies

The following describe situations where foreign patentees believed that there were *public* motives impeding their access to national markets.

Examination Difficulties. A generic problem faced by patent applicants in Japan is the lengthy examination period. Some view this as a strategic trade barrier. However, the examination period is long for Japanese applicants as well. It can be somewhat longer for foreign nationals partly because they need more time to comply with Japanese legal requirements (for example, to translate technical information into Japanese *kanji* characters)¹⁷ and partly because they must deal with Japanese patent agents (*benrishi*) and not with attorneys from their home country. Some foreign patents applicants have complained of communication problems with their *benrishi*.¹⁸ Japanese law does not admit foreign attorneys to practise before the Japanese Patent Office (JPO); likewise the U.S. does not admit Japanese attorneys but only those attorneys from countries which reciprocally admit U.S. attorneys.

It is difficult to determine whether the lengthy examinations are used (intentionally) to discriminate against foreigners. To the extent that foreign patent applications are discouraged, there would be less new knowledge to be disclosed to the Japanese public (from the publication of foreign patent applications); this would be counterproductive to any public strategy to try to exploit and imitate foreign technologies. The lengthier examinations may have some other purpose, say to induce cross-licensing.¹⁹

Examinations are generally longer in Japan because the JPO is relatively understaffed. The average workload per examiner is three times that in the U.S.²⁰ The workload can be reduced by either increasing the number of qualified examiners or decreasing the number of applications. Due to a practise called *patent flooding* and the patentability of minor inventions (*utility models*) - both of which are discussed more fully below - the JPO receives the greatest number of patent applications (see Table 1).

Pre-grant Opposition. Because firms can oppose a grant before the patent is even granted, opposing firms can create a long delay in the patent application process. During this time, the patent application is made public (i.e. 18 months after filing), and Japanese competitors can invent around the applicant's patent, taking advantage of the narrow scope examiners accept to make minimal changes without infringing on the applicant's patent.

The following example shows how this patent system feature can be used to promote domestic industry. In the early 1970s, *Allied Signal*, a U.S. firm, developed an amorphous metal technology useful as a transformer in power utilities. This was targetted by MITI as a critical technology. A consortia of Japanese firms opposed Allied Signal's patent application. Eventually, Allied Signal did get protection, but

¹⁷ Patent applications in Japan must be filed in Japanese, whereas they may be filed in any language in the U.S. and translated later.

¹⁸ See GAO (1993) and Thorson-Fortkort (1993).

¹⁹ See Wineberg (1988) for a discussion of this point.

²⁰ See Kotabe (1992).

the pre-grant opposition consumed much time (10 years). Consequently, since protection issues from the date of application, Allied Signal received only 10 years of effective protection.

Compulsory Licensing. Using this patent system feature, the Japanese government was able to help promote its domestic semiconductor industry. As a condition for entering the Japanese market, *Texas Instruments (TI)* was required to take on *Sony* as a joint venture partner and to license its patents to the Japanese semiconductor industry. In Japan, TI faced tremendous difficulty obtaining a patent for its *Kilby* patent. It first filed in 1960 and faced numerous oppositions. The JPO rejected TI's application on the grounds that TI's patent claims were too "broad." By 1989, the JPO eventually granted a patent to TI, but the protection lasts until 2001.

As another example, in the early 1980s, *Dow Corning* sought a patent for optical fiber cables in Japan, but MITI deemed that telecommunications was a vital national interest. Dow Corning was compelled to license the technology to Japanese firms. Subsequently the technology leaked and *Sumitomo* developed a very similar technology which it then tried to export to the U.S. Dow Corning requested the U.S. Trade Representative to ban the imports of Sumitomo's cables; Sumitomo sued to have the patent invalidated, but the U.S. courts rejected it on the grounds that its technology was developed in substantially the same way (this is an example of the use of the doctrine of equivalents).

Joint Research Ventures. Strategic government preferences to domestic interests can be pursued through this forum. In MITI's *Very Large Scale Integration (VLSI)* project, while Japanese firms obtained free access to the patented technologies developed under this project, foreign participants were required, in quid pro quo fashion, to cross-license their technologies to obtain access.²¹

Patent Examination. The judgement of novelty, non-obviousness, industrial applicability, and scope is often subjective. In other words, patent examiners within or across countries can vary in their interpretation of the inventive step and claims of a patent. With this degree of discretion that patent examiners have, some U.S. firms have felt that examiners in Japan tend to reject foreign patent applications for technologies that MITI might target as critical to Japanese industry.

For example, a case study in Oppenheimer and Tuths (1987) describes the patenting difficulties faced by a small U.S. software developer. It developed a pattern-recognizing invention. But around the same time, Japan's *Nippon Telephone & Telegraph (NTT)* was sponsoring a *Pattern Information Processing System (PIPS)* project of its own. While the software company obtained patents in the U.S., Canada, Europe, and South America, it could not as easily in Japan. The Japanese examiner claimed that the utility or application of the technology was not clear. Eventually the company pared down its claims, as narrowly as possible, and was awarded a patent. The narrow scope of the patent granted to the company enabled Japanese competitors to pursue the PIPS project without infringing upon the software company's rights.

²¹ See Oppenheimer and Tuths (1987).

As another example, *Ampex*, a U.S. VCR producer, was also required to narrow its claims for its prototype VCR invention. This enabled several Japanese companies (*Sony*, *JVC*, and *Matsushita*) to develop close variations of Ampex's invention - in particular, compact home versions.

B. Private Patenting Strategies

Patents can be an important tool in strategic competition. The possession of patents can be a trump card for firms that seek favourable licensing terms, joint ventures and other strategic alliances. The following are examples and methods of patenting to capture market share. In the process, private strategic patenting may cause market share away to be taken away from domestic *as well as* foreign rivals.

Submarine Patents. Also known as *stealth* patents, these patents surface rather unexpectedly (sometimes decades after being filed) to challenge the rights of new technologies. That is, they surface with claims that their technological territory covers the claims of new technologies. The idea is to enable the holder of such patents to collect royalties or damages from infringement suits against the users of new technologies. While sometimes it is legitimate to claim that a new invention is a variant of an older one, other times submarine patenting is a lucrative form of activity. Both domestic and foreign firms may fall prey to submarine patenting. Thus, this activity can also be an obstacle to international trade.

An example of the effects of submarine patenting on trade relations is the case of *Lemelson vs.* twelve Japanese automotive companies.²² Jerome H. Lemelson, the namesake of the annual MIT-Lemelson prize, is a major patent applicant (owning nearly 500 patents). He neither manufactures nor makes prototypes of his inventions. In 1992, he successfully collected \$100 million from twelve Japanese automotive companies (including Toyota, Nissan, Mazda, and Honda) which all settled with him rather than go to court. His claim was that all of these companies were using image processing and other devices which he already had rights to from earlier patents. Lemelson has also pursued U.S. automotive companies, but *Ford Motors* is going to court. In this instance, Ford Motor would likely prefer to see the doctrine of equivalents applied less broadly. At issue is that the scanning device in Ford factories is mobile (i.e. can be hand-held) whereas the drawings in Lemelson's patents show the scanner in a fixed position.

From a social welfare point of view, submarine patenting is an unproductive, rent-seeking activity. Submarine patents make "no real technological contribution."²³ Resources are diverted to an activity that transfers rents from the "intended" practitioner of new knowledge to the non-practitioner (rent-seeker). As Bruce Lehman, the U.S. Commissioner of Patents and Trademarks, remarks:

"I thought what the patent system was all about was coming here and getting a patent and going to some banker or venture capitalist ... and get money, and then you go out and start a company and put products out on the marketplace. And you go sue the people that infringe on you." -- Wysocki (1997), p. A8.

To the rent-seekers, patenting itself is a business.

²² For fuller details, see Wysocki (1997).

²³ See Stern (1993).

This is an example where the obstacle to trade (domestic and international) has its origins in private strategic behavior, not public. Moreover, this activity adds to the transactions costs of doing business for both domestic and foreign firms *non-discriminantly* - although a case could be made that foreign firms less familiar with the practise or less innovative (say from smaller APEC nations) may be more adversely affected.

While the patent laws here are not explicitly discriminatory to foreign interests, it would be useful to consider what patent reforms might reduce submarine patenting and its barriers to trade.²⁴ In the U.S., patent laws do not allow for the publication of a patent application until (and unless) it is granted. If instead they allowed for the publication after 18 months of the date of application, as in other parts of the world, there would be less of a chance that firms would be surprised by submarine patents. Secondly, it might be useful to include manufacturing as a requirement of patents that are granted. Some countries of course have working requirements (after 3 years). The U.S. does not, and it could consider having one within a longer period (say 5-7 years). This would cut down on the hoarding of patents. Alternatively, working could be required only as a condition for being able to sue for infringement.²⁵ Finally, another proposal for reducing submarine patenting is to limit *continuation-in-part* patent applications. These allow applicants continually to file slightly revised versions of their patent applications. Thus, strategically motivated firms could adjust their applications to incorporate claims that cover the technologies of their rivals. As long as the applicants were first to file or invent, any commercialized technology which "steps" on the revised claims can be found to infringe. The laws could therefore put an upper limit on the number of revisions allowed and some time limitations on which to make them. Another proposal is to begin patent protection from the date of filing rather than the date of grant. Applicants would therefore use up their own (duration) time in making those revisions.

Blocking Patents. Firms can also strategically patent to prevent others from entering their technology territory. This practise is known as *strategic* blocking. Firms invent around their own core patents, and as a "fence," the new patents prevent others from developing and patenting inventions near their core technology neighborhood. The incumbents are likely, but not always, to have the advantage in doing so since they have easier access to the original research records of their core technologies. These blocking patents may act as entry barriers if competitors know that those patents are pending or are granted. Competitors risk getting embroiled in litigation if they enter a market and infringe upon existing technologies. Research by Cohen et. al. (1996) report that 82% of respondents indicated that blocking was a motive for patenting. Seeking protection for their intellectual property rights was secondary.

Portfolio Patenting. In Schumpetarian competition, firms would study the patenting and R&D strategies of rivals. The rivals in turn would do the same. But patents, however, disclose new knowledge (in exchange for the protection) and possibly some key information about firm strategies. One way to make it difficult for rivals to keep track of one's R&D results, strategies, and priorities is to file multiple patents (i.e. a portfolio

²⁴ The following policy suggestions are from Stern (1993).

²⁵ In a 1992 case, Minolta (Japan) paid Honeywell (USA) royalties of \$127 million for using in Minolta Alpha 7000 cameras the SLR (single lens reflex) technology which Honeywell developed in the mid-1970s but never manufactured. Honeywell has also sought to enforce its rights against video camera producers which, Honeywell argues, use the SLR technology (see Shota (1992)).

of them), each carrying a piece of the puzzle. This makes it costly and time-consuming for rivals (or future innovators) to trace all the information. An external effect of this is that it taxes the patent system (in terms of examination time and the search for prior art). Such a practise works against the social objectives of technology creation and diffusion, but works to allow certain firms to maintain market share.

Patent Flooding. A popular Japanese corporate strategy is to surround a foreign company's (or in some cases domestic company's) core patent with numerous patent applications representing minor improvements. This time (in contrast to a previous example) the *rivals* invent around a company's core patent. It is as if the rivals take the core technology "hostage." These flooded patents come so close to "blocking" the core patent (that is, they are all so close to infringing upon each other in use) that all the firms are forced into cross-licensing (thus exchanging each other's technology).

Patent flooding has in the past enabled some Japanese firms to appropriate the technologies of foreign firms. For example, *Mitsubishi Electric Co.* filed several hundreds of utility models around the U.S.'s *Fusion System Corp.* Indeed, relative to foreign applicants, Japanese companies like Mitsubishi, Ricoh, Matsushita, and Sharp have numerous utility filings (i.e. for every three patent applications, they have at least one utility model application).²⁶

A factor that contributes to patent flooding is the patentability of utility models; that is, for inventions that represent less of an inventive step required to qualify for an ordinary patent. Often, fringe technological ideas are the subject of utility models. With the publication of a rival's patent, competing firms can file applications for small changes in the design, shape, or structure of the rival's technology.²⁷ Again, the laws permitting patent flooding are not inherently discriminatory to foreigners. Patent flooding is something that foreigners can also practise on the Japanese firms. Indeed, Korean firms have started to flood applications around core Japanese technologies.

By clogging up the patent examination office, patent flooding also contributes to lengthy delays in patent granting. It also explains why Japan leads in domestic patenting (see Table 1). Patent flooding may also be seen as an unproductive use of time and resources. From a social welfare point of view, firms could better devote their time, energy, and resources to investing in more inventive projects rather than, essentially, to setting strategic traps for their competitors. One way to prevent patent flooding is to limit the number of utility filings, or make utility models require a larger inventive step. Another is to adopt the doctrine of equivalents so that patent claims can be more broadly interpreted, and thereby include or anticipate some of the patent and utility model applications that might be filed around the core patent.

Narrow Scope. When the scope of a patent granted is too narrow, it is easier for firms to "bump" into each other in technological space since firms can invent more closely to the central "core" of existing technologies. It also allows more inventors to participate in patenting: from producers of high quality inventions to low, from large inventive steps to small, or from great novelty to little. Hence it should not be surprising to see more infringement suits and invalidation challenges in regimes that reward narrower scope. (Offsetting this might be whatever technological benefits a narrower scope provides).

²⁶ See Thorson and Fortkort (1993), p. 300.

²⁷ For example, if someone has a patent for a plane, one could file utility models on the cockpit design, fuel injection process, or the landing gear.

For example, *SanDisk* (USA) has sued *Samsung* (Korea) for what the former sees as a slight modification of its flash technology; *Grid Systems Corp.* (USA), the developer of the basic structure of laptops, has sued *Toshiba* (Japan) for the latter's slight modification of the structure and display of the laptop; and *Micron Technology* (USA) has challenged *Goldstar* and *Hyundai* (Korea) for their modification of Micron's process for holding the structures of memory chips together. However, *if* patent harmonization should require that nations standardize "scope" and to do so at a fairly broad range, this might bias against the awarding of patents to the smaller APEC members. Their innovations - compared to those of the advanced industrial members of APEC - are likely to be of a relatively lower inventive step, quality, and novelty. At their stage of development, their innovations may largely consist of improvements which build upon existing knowledge bases.

Pre-grant Opposition. Pre-grant oppositions can be used by firms to frustrate rival patent seekers. Applicants facing such opposition must respond to each one individually and sequentially.

Recently, *Citibank* faced numerous oppositions against the patenting of its cyberbank technology.²⁸ Led by *Sakura* and *Mitsubishi Banks*, the oppositions argued that Citibank's claims were too broad and that a patent granted to Citibank would give the latter too much "territory" over cyberbank technologies. Another motive for the opposition was that the Japanese banks invested heavily in the British version of the technology (i.e. Mondex) developed by *National Westminster*. They would therefore have preferred the patent go to the British bank.

In some cases, the Japanese oppositions do not succeed. Recently, *Genentech* fairly easily withstood 38 oppositions (led by *Toyobo*) against the patenting of its TPA (a drug for treating heart attacks). Its patent in Japan was granted within 4 years of application, while it was turned down in Europe. One strategic reason Genentech received favourable treatment by the authorities might be that the market for TPA in Japan is small.

A key question whether it is possible to eliminate unproductive oppositions (aimed solely at thwarting competitors' patenting applications) without eliminating the pre-grant opposition feature. As a model, Article 25 of Decision 313, Cartegena Agreement (1992), provides legislation to be used to penalize excessively tactical oppositions. Overall, however, only ten percent of applications are opposed in Japan.²⁹ Of these, the average application faces about two oppositions. Generally, the broader and more valuable inventions are opposed.

Restrictions on Licensees. Just as governments can impose licensing restrictions, private agents can also. In the case of *Intel* (USA) vs. *Twinhead* (Taiwan), the latter, a producer of notebook personal computers, had been obtaining supplies of microprocessor chips from both Intel and Intel's licensees. Intel requested *Section 337* proceedings against Twinhead, arguing that Twinhead's sale of notebook PCs containing chips of Intel's licensees (who incidentally were also Intel's competitors) was tantamount to infringing upon Intel's patents. Intel sought to collect royalties from Twinhead for using chips supplied by Intel's licensees. Eventually Intel

²⁸ See Bremmer et. al. (1996).

²⁹ See Thorson and Fortkort, p. 297.

lost, and was found to "misuse" its patent rights.³⁰ Intel's underlying objective appeared to be to discourage Twinhead and other PC firms from using non-Intel chips, and thus allow Intel to retain its dominant market share. It appeared not to be the case that Intel was harmed by a foreign infringer, but that Intel faced growing competition from other chip makers and was choosing a 'response' strategy.

IV. Conclusions: Should APEC Harmonize its Patent Systems?

This section provides a general assessment of whether patent harmonization in APEC will help constrain the use of patent-related trade barriers or strategic industrial policies. Stern (1987, p. 204), argues that:

"National intellectual property laws act like NTBs only where there is disharmony in the law of nations. If every nation had identical intellectual property laws, to pick an extreme case, intellectual property laws would not operate as NTBs."

The conclusion in this paper, in light of the examples and case studies considered in the previous section, is that the harmonization of patent laws would not alone eliminate or reduce patent-related barriers to trade. First, it is not the laws (or differences in laws) per se which give rise to NTBs or STPs, but the *practises* of governments and firms. Secondly, it is not only -or even mainly - the legal or public authorities that can create NTBs or engage in STPs to promote some national interest, but private agents as well. The latter, in pursuing their own private interests, may pursue practises which restrict domestic and/or foreign competition. To the extent that patent harmonization focuses only on binding government actions or on setting rules for government behavior, the effort will fail to reduce patent-related barriers to trade. Other laws, rules, or penalties governing private practises are needed; for example, unfair competition rules or other laws that reach areas outside the scope of patent laws.

Laws themselves are unlikely to eliminate strategic *motives* on the part of firms or governments. In the case of firms, one could argue that it is in the nature of most firms to be strategic in competition, and that this should be taken as a given in policy formation. In the case of governments, however, a case could be made that, as public institutions, they *should* be able to act in the social interest and commit, through international rules, not to use strategic patent policies which, if applied worldwide, reduce world trade and welfare.³¹ This case, of course, is subject to opposing political economy pressures for governments to choose policies that benefit particular groups or sectors.

Nonetheless, to the extent that private strategic patenting and rent-seeking behavior continue to occur, tying public sector hands alone would not eliminate patent-related barriers to trade. International agreements, such as TRIPS, appear to concentrate predominantly on rules governing public sector behavior (with regard to the provision, administration, and enforcement of patent rights). More attention is needed to address barriers to trade resulting from private patenting behavior. While certain changes in patent laws may help to reduce abusive private strategic behavior, it is also important to address those abusive practises more directly.

³⁰ See McDonell (1995) for details.

³¹ A major cost to the world would be the misallocation of patent protection to less efficient inventors.

In thinking about international patent harmonization, it is important to acknowledge what the *objectives* of harmonization are. For instance, it is possible to misinterpret the idea of a level playing field to mean the equal presence of domestic and foreign agents in the market. This is not the case. The idea behind a level playing field is to remove distortions - or to create equal "opportunities," not equal outcomes. The relevance of this is that harmonization or patent policy reform should seek not to ensure that foreign firms will play the same strategies that domestic firms have the advantage in playing, but should seek to remove the strategic practises which create the distortion or barriers to trade in the first place. This is subtle point that is often overlooked.³²

It is also important to acknowledge the *costs* of patent harmonization as well as the *benefits* (say from reduced trade distortions). The harmonization of APEC patent laws (let alone those of the entire world) will be an ambitious and costly undertaking: the meetings and negotiations; the lobbying to get approval of the harmonized treaty from national legislative and executive bodies; the changing of individual country laws; and the transition process.

Another kind of harmonization cost is the cost of choosing the "wrong" standards - wrong, say, from an economic, ethical, or other view. In discussions of harmonization, it should not be assumed that choosing uniform standards will be distortion free. Unfortunately there is much disagreement about which particular patent system feature is best; for example, is post-grant opposition better, pre-grant, or none at all? Is a first-to-file or first-to-invent system fairer? Is a narrow scope or broad scope optimal? Should patent laws all apply the doctrine of equivalents? Not only is it not clear which of these various features is best for stimulating innovation and productivity, it is also unclear which reduces or increases barriers to trade and competition. The odds are that a given choice of uniform standards will be inefficient. Thus, the argument in favour of imposing APEC (or worldwide) uniform standards must rest on the idea that the elimination of transactions costs has such large global gains that they outweigh all the inefficiencies arising from standardizing along imperfectly chosen patent system features.³³

One advantage of taking more seriously the *practises* of laws across patent systems is that if much of the NTBs or STPs can be reduced or eliminated by *penalizing* abusive patenting practises without having to change much, if any, of the laws, there would be less pressure to have to harmonize patent laws fully or even partially, and incur these costs of global harmonization.

Finally, the remainder of this section considers some issues that patent harmonization does not address, and that ought to be addressed in future debate. First, APEC consists of a diverse group of countries, at different stages of development. In some countries, patent systems are quite complex and evolved. In others, patent systems have just been created or are in the process of being created. In these countries, their high-tech or innovation sectors are also not as fully developed as those of the advanced members of APEC. It is unlikely to expect strategic private patenting behavior to be a major issue here.

³² For example, policy recommendations in Thorson and Fortkort (1993) include the suggestion that U.S. firms be able to acquire the "skills" and opportunity to use pre-grant opposition, patent flooding, and utility models to compete on an equal footing with the Japanese firms in the Japanese market. From an economic point of view, this is much less efficient than setting policies to eliminate abusive practises on the part of *both* domestic and foreign firms. In principle, the focus of harmonization (or of the idea of a level playing field) should be not so much on the relative well-being of domestic and foreign firms but rather on the broader issue of whether the environment in which they operate is free of distortions.

³³ A future work could test this proposition in a multi-country general, equilibrium simulation model.

Their firms are unlikely to compete successfully against their counterparts from Japan or the U.S. at the game of strategic patenting. Thus rules governing strategic patenting are not likely to receive as high a priority as say getting technical cooperation from advanced APEC members, training examiners, and acquiring resources to develop their judicial infrastructure further. In other words, there are different priorities across APEC nations. This is not to say, however, that the experiences in Japan and the U.S. cannot be important lessons for the smaller APEC members to draw upon as their patent systems mature. Yet APEC may be too diverse a group to reach mutually interested agreements on patent harmonization.

Harmonization will also be inadequate in guaranteeing that patent rights are equally protected around the world. Clearly the enforcement infrastructure varies across countries, depending partly on the resources countries have. Poorer economies that say have the same laws as the rest of the world would likely have fewer resources to put into protecting and enforcing patent rights.

Likewise, another factor that varies internationally is the cost of patenting. Even if the laws are the same, as long as the cost of patenting remains uneven, there are still likely to remain significant transactions costs and impediments to international trade and patenting (see Meller (1997)).

In conclusion, there is scope for patent reform to improve APEC trade relations provided both public and private patent-related barriers to trade are addressed. However, patent law harmonization alone is not a sufficient response to international patenting conflicts and patent-related trade barriers. It is also necessary to (i) focus on the practises of the laws, (ii) complement patenting rules with other rules (concerning unfair competition), and (iii) address the costs of patenting, the limited resources for enforcement, the different priorities of different APEC members, and the desirability of different patenting features.

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Measuring Trade Impediments to Services within APEC

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Abstract

The measurement of impediments to trade in services within the APEC region is addressed in this paper. This work builds upon major methodological and practical issues encountered in measuring such impediments in the 1995 PECC Survey of Impediments to Trade and Investment in the APEC Region. Conceptual and measurement issues in deriving partial equilibrium estimates of the effects of service trade impediments are discussed. The feasibility and use of partial estimates, especially price-impact measures, as a means of benchmarking competitive outcomes is examined. A current joint research project involving the Australian National University, the Australian Industry Commission and the University of Adelaide will be drawn upon in which a seven step approach is being developed to identify, evaluate and measure the impact of Australian impediments to services trade. Australia's telecommunications sector is used as a case study of how to measure the domestic economic efficiency gains of regulatory reforms. Some important areas for future work, including the important link to services trade of foreign direct investment controls, are highlighted. Such work should be of interest to economic modellers as it will provide some insights into how partial measures of impediments can be constructively used to model the economic gains from trade liberalisation of services within APEC.

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Introduction

The research reported in this paper had its genesis during a Survey of Impediments to Trade and Investment in the APEC Region undertaken in 1995 (PECC 1995). It was shown in this Survey that although the service sector was growing rapidly in APEC, there was a high level of trade and investment impediments affecting service industries within the APEC region. This was the situation despite significant moves in some economies to deregulate and liberalise certain service industries in a bid to improve levels of efficiency and quality.

The importance of these impediments to services trade and investment within APEC led to the development and funding of an Australian Research Council proposal to investigate the issue for major Australian service industries in a collaborative study between the Australian National University, the Australian Industry Commission, and the University of Adelaide. Although it has an Australian focus, the study involves international comparisons and thus has international relevance. The three year study began earlier this year and, in conjunction with developing a general approach to measuring the impact of impediments to trade in services, it is planned to examine in detail three service industries per year. Currently the important input service industries of telecommunications, aviation and finance are being examined. The first of these industries is used in this paper as a case study of the general approach to measuring these impediments.

Before discussing the telecommunications case study, the preferred approach to measuring services impediments is developed. Early sections discuss in turn the chosen broad definition of a service impediment, the identification of a comprehensive listing of such impediments, and approaches to measuring and analysing the impact of impediments to services trade. There will be a focus on the preferred approach of a price-impact measure developed from the 'bottoms up', that is impacts allocated to specific impediments. This approach is distinct from a 'tops down' approach where unidentifiable price differences between the services examined and a 'benchmark' service are not attributed to specific impediments. The important impact of Foreign Direct Investment (FDI) restrictions on services trade is discussed in a separate section.

Defining Impediments to Services Trade

A number of preliminary concepts need to be defined before considering measurement of trade impediments to services. For example, what is actually meant by services? Services tend to be defined broadly, for example as the residual economic activity that is neither manufacturing nor agricultural production, and more concretely as 'invisibles'. A more precise definition is 'an activity that adds value either directly to another person or to a good belonging to another person' (Warren 1996). Key service industries include transport, telecommunications, banking, insurance, media, utilities, retail, education, consulting and the professions.

Taking this broad definition, services are an important and fast growing component of the Australian and other APEC economies. This growth has many facets — as a share of GDP, employment, and of trade and investment (see Figures 1-3 taken from PECC 1995). Services comprise over 70 per cent of GDP, and generally a greater proportion of employment, of some advanced APEC economies, such as the United States, and over 25 per cent of key developing APEC economies, such as China. Non-factor services trade makes up between 15 to 25 per cent of

all trade in APEC economies, and a greater proportion of FDI, being between 10 and 55 per cent of all inward investment. The growth has been driven both by demand, in line with the rapid development of many APEC economies, and by supply with technological advances increasing the range of available services, especially in relation to information technology. Their importance is magnified by the fact that they are an essential input to many other important activities, including goods trade.

What are the impediments to trade in services? The definition chosen of an impediment to trade in services concerns a 'comprehensive set of service related measures that distort an economy's efficient allocation of resources, including those that may cause an increase in the volume of trade and investment'. It was pointed out in PECC (1995) that all such definitions will have limitations. Explicit definitions may be avoided by using a list of impediments developed by international institutions such as UNCTAD but this may miss some newly developed impediments and would not provide the conceptual basis for measuring their impact. The key point is that whatever approach is used, the coverage of impediments must be comprehensive, covering not just border measures. Thus they should cover all modes of supply and incorporate, for example, those to investment measures that may impinge on the efficiency of service delivery. Moreover, discrimination in the treatment of foreign and domestic firms need not be an aspect of a service impediment — concepts concerned with market power and competitiveness have strong relevance.

The multilateral General Agreement on Trade in Services (GATS) applied a four part typology based on how international transactions in services can be accessed, namely:

- cross-border flows;
- movement of a consumer to a supplier's economy;
- movement of a commercial organisation to the consumer's economy; and
- movement of an individual supplier to the consumer's economy.

Free trade and investment in services is where service providers and consumers are able to interact through whichever mode they decide, free of any regulatory distortions. Any policy that impedes service producers and consumers interacting through any of these modes of supply is an impediment to international service transactions. Following Part III of the GATS, impediments may either violate national treatment or limit market access.

The GATS does not define market access. Article XVI (1) obliges members to grant market access to scheduled industry sub-sectors, while Article XVI (2):(a)-(f) contains a list of quantitative measures considered to be limitations on market access. Article XVII (1) defines national treatment as treatment no less favourable than that accorded to like domestic services and service providers subject to the limitations and conditions set out in the country's schedule of commitments. An uncomfortable overlap exists between the two commitments, with national treatment being interwoven with market access. Despite this confusion, it appears that the GATS application of market access was applied to broadly cover barriers to both foreign and domestic suppliers, that is competition policy (Snape and Bosworth 1996, Mattoo 1996).

As can be appreciated from the above, the chosen definition of an impediment to trade in services is broader than such international approaches, covering more than border measures and perhaps more than discrimination through market access and national treatment.

What are some measures of impediments to services? There are three basic approaches to measuring service impediments as just defined, namely quantity-impact type measures which compare trade volumes with and without the impediments; frequency type measures such as coverage indices (PECC 1995); and price-impact type measures which examine the impact on domestic prices of the impediments. These latter measures would include cost comparisons when aspects such as rents make price comparisons difficult.

There are difficulties with all these approaches, for example quality differentials between services adversely affect all the measures. The quantity-impact measures face substantial data limitations, in particular the lack of bilateral services trade data and the highly aggregated nature of current account data.

Data difficulties on the extent of impediments that limited the derivation of frequency type measures have been overcome to some limited extent by the availability of the GATS. This was achieved by classifying the commitments into three categories corresponding to:

- (1) the absence of restrictions either on national treatment or market access for a nominated sector for each mode of supply;
- (2) no commitment for a given sector/mode of supply; and
- (3) remaining restrictions for a sector/mode of supply that otherwise is bound by the GATS.

For quantification purposes these categories could be allocated values such as 1, 0 and 0.5 respectively then aggregated across economies and sectors to determine frequency measures (see Hoekman 1995). Examples of such measures are given in Figure 4 taken from PECC (1995). Here the indicators of the absence of service sector commitments are plotted under two assumptions, namely that industries not listed by economies are either impeded or open. Under either assumption the APEC impediments to services trade appear to have the potential to be substantial — even the most open of services (computer and tourism) having over 50 per cent of their markets suffering some form of impediment under the assumption that those not listed are impeded. The situation is much worse for the traditionally highly regulated and hence highly restricted services of postal, basic telecommunications, transport, health and social services. The situation improves generally across the board under the assumption that those not listed are open, apart from industries such as insurances where all economies listed their policies explicitly and the situation did not change much under both assumptions. The results under the two assumptions give an indication of the potential gains from making the GATS more definite. Generally the richer APEC economies tend to have more open services although there are some sectors that are closed in all economies.

However, frequency measures are inherently limiting, measuring the extent of impediments rather than their impact. One service industry may have the same frequency of impediments but the type of impediments and the industry to which they are being applied can have a substantial effect on the impact they have on trade. Moreover, frequency measures cannot be easily compared with traditional tariff measures in cross sector comparisons.

The focus of the remainder of this paper will be on the preferred price-impact measures, although, as already mentioned, this may entail comparison of the associated costs underlying the

prices. It may also entail the use of some quantity-impact measures such as quotas when these are more readily available and can be incorporated more easily into models that can provide the required impact measures in terms of resource allocation and associated measures of social welfare.

Identifying and Measuring Impediments to Services Trade

The approach to measuring impediments to trade and investment in services involves seven steps, each of which is detailed below:

1. Definition of service industries to be analysed

In order to maintain some degree of comparability across economies the UN Central Product Classification (CPC) has been used as the starting point for industry definition, as this was used in the GATS. However, there are various problems associated with using product rather than industry classifications. For example, many government policies apply to industries (e.g. banks) rather than services (e.g. deposit taking). Hence, the CPC categories in each of the target industries need to be concorded with industrial classifications such as the International Standard Industrial Classification (ISIC) to give a more complete picture of the industry parameters (see Table 1).

Table 1 Industry classifications and concordances

Industry	CPC	ISIC
Air Transport	73, 74, 88	621, 622, 63, 35
Finance and Insurance	81	651
Telecommunications	752	642

There is a question concerning the level of industry aggregation. Should a broad level be taken, such as insurance in general, or more specific components, such as selected insurances (e.g. car insurances), which could then be aggregated? A more disaggregated approach would be more appropriate in terms of better matching in international comparisons but could lead to difficulties in terms of allocating more general industry level common costs.

2. Identification of the specific impediments to trade

An essential preliminary step to measuring the impact of impediments to trade in services is to identify and establish an inventory of such impediments. This is not easy given the broad definition of impediments to trade in services chosen, for example encompassing internal regulations under competition policy and their effect on new entrants. Moreover, a key feature of impediments to trade and investment in services is that they tend to be in the form of non-tariff barriers (NTBs) such as licensing requirements, standards, outright prohibitions and so on which are less transparent and more difficult to measure. There are a large number of such NTBs as can be appreciated from the UNCTAD listing given in their database on Measures Affecting Services

Trade (MAST) based on the GATS list (see Table 2). Even taking the GATS modes of supply approach results in many modes, including commercial presence.

However, the GATS does provide a starting inventory as a result of the requirement that members schedule chosen industries, and the modes of supply within those industries, in which they agree to adhere to the principles of free market access and equivalent treatment of foreign service providers. The GATS is basically a standstill agreement, rather than a schedule of commitments to future liberalisation. As such, it reflects the extent of market access and national treatment commitment of most members as of 15 April 1994. It provides a registry of service industries that have been liberalised and by default those that remained closed or where no commitments had been made. Some industries such as maritime shipping were not included in the GATS. Moreover, it is a 'positive' lists approach in contrast to the 'negative' lists approach in the EU, NAFTA and CER which requires all impediments in the covered sectors to be revealed, and do not automatically exclude new sectors from such commitments.

Again in the interest of future comparability, it has been decided that the GATS framework should provide the starting point for defining what is 'trade' in services and what are impediments to services. As such, all four modes of supply are to be included in the analysis ensuring that all impediments affecting trade and investment in services are incorporated. Furthermore, impediments to all potential entrants in the market, including both domestic and foreign suppliers (market access) and, in particular, (national treatment) are examined.

The identification of impediments is aided by the GATS schedules of specific commitments made by various economies. In these schedules, economies list many of their remaining breaches of market access and national treatment greatly facilitating identification of relevant impediments. However, there is some evidence that not all impediments are included. Detailed examination of the relevant legislation and regulation covering air transport, financial services and telecommunications is a necessary first step for this project. Reports by foreign governments and industry associations (e.g. EC 1996, MITI 1996, USTR 1995) have proven helpful in identifying these impediments plus business practices and other less formal impediments. Determining what impediments actually exist within a GATS framework is a useful exercise in itself.

One outstanding issue that needs to be taken into account with a sectoral approach is the various cross-sectoral impediments that exist. These include impediments such as general foreign investment constraints and policies on work visas. The effect of these horizontal impediments on each target industry needs to be factored into the sectoral analysis.

3. Making explicit the theoretical link between the impediment and 'prices'

A more useful inventory than that just discussed would list for each service industry the type of impediment restricting trade, classified in terms of their impact on the economics of the market. Once the impediments have been identified, the effect of the policy on actual service outcomes needs to be conceptualised. In some cases this is a relatively simple task. For example, if the impediment is a quantitative restriction or a restriction on the number of firms in a market, then

Table 2 Categories of Measures

Measures affecting market access

- a Limitations on the number of providers
- b Limitations on the total value of service transactions or assets
- c Limitations on the total number of service operations
- d Limitations on the total number of persons that may be employed in a sector
- e Measures which restrict or require specific types of legal entity or joint venture
- f Limitations on the participation of foreign capital
- g Other measures affecting market access

Measures affecting national treatment

- a Discriminatory taxes
- b Discriminatory incentives/subsidies
- c Government procurement policies
- d Local content requirements
- e Nationality, citizenship or residence requirements
- f Other measures affecting national treatment

Measures affecting MFN treatment

- a Integration agreements, as stated in Article V of GATS
- b Reciprocity requirements
- c Bilateral agreements
- d Other measures affecting MFN treatment

Non-discriminatory measures, as stated in Article VI of GATS

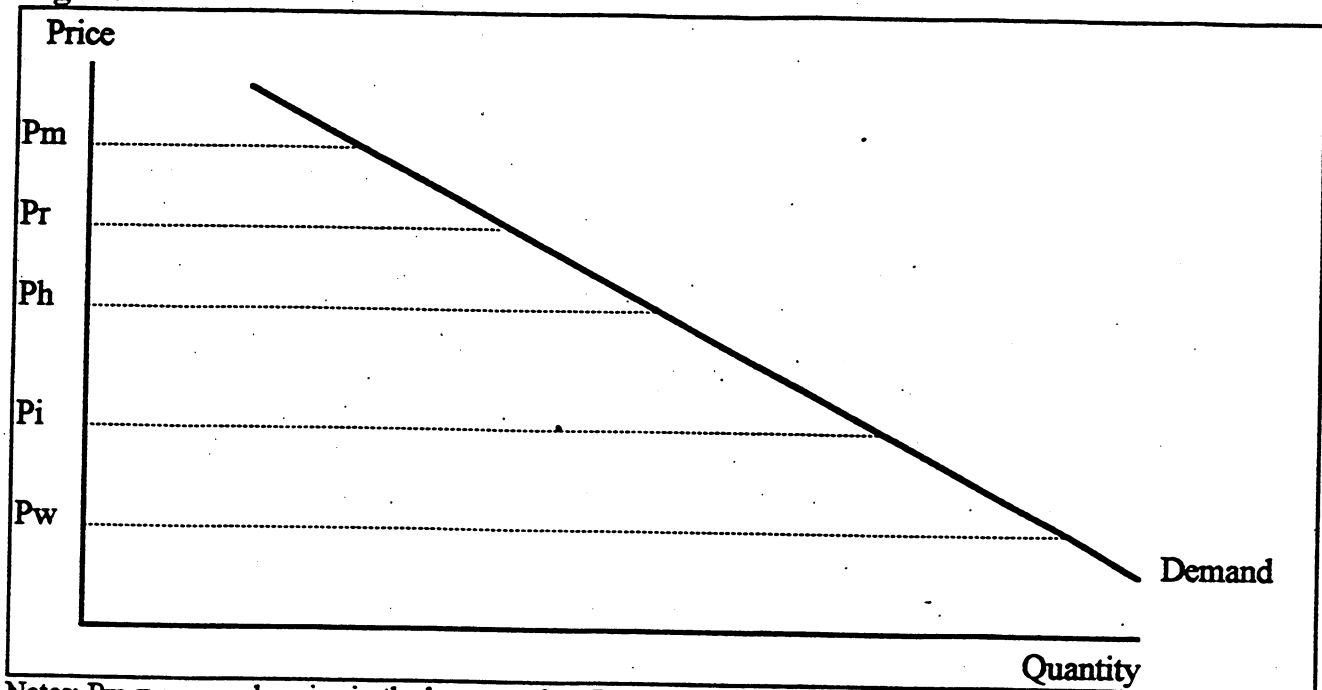
- a Licensing procedures
- b Technical standards
- c Recognition of qualifications
- d Other measures related to Article VI of GATS

it is known how this leads to higher prices. The same can be said for poor or no regulation of access to essential facilities. However, there are policies where this linkage is not so clear. One example is the effect on prices of limits on foreign investment in particular firms, as opposed to limits on all new foreign investment. This may impact upon the economics of the market, for example by constraining the introduction of new technologies, but the linkage is less clear.

4. Determine the relevant price wedge

Figure 5 depicts the various prices (which can also be thought of in terms of associated costs) that are relevant in determining the effect of an impediment to trade in services. In the figure, the quantity axis shows the volumes of some services such as international telecommunications. The price of the service is shown on the vertical axis. The diagram illustrates the market for this service in one economy. For simplicity, supply curves are horizontal (where marginal cost = average cost).

Figure 5



Notes: P_m = monopoly price in the home market; P_r = regulated price in the home market; P_h = competitive price in the home market; P_i = the price the best practice foreign investor can offer in the home market; P_w = the world price.

The lowest price shown (P_w) is the price at which the service can be delivered by the cheapest supplier(s) on the world market. It is assumed this service is delivered from the home base of that supplier, employing local inputs at home base prices alongside some internationally trade inputs which it can buy at world prices. It is also assumed the economy of focus is small in world market terms so the supply curve at this price is perfectly elastic. If the service is tradeable and no impediments to cross-border trade exist, the price expected to be observed in the domestic economy under examination is equal to the world price (P_w).

However, not all services are tradeable (in a cross-border sense). Therefore, to deliver its service to local consumers the world's best practice firm must invest in the local market. This may involve higher costs (e.g. labour, capital, telecommunications, transport etc) than the firm faces in its home market. These can be factored into the firm's cost function using econometric techniques. Hence the price it offers is higher than P_w , say at P_i . Therefore, if the service is non-tradeable and no impediments to foreign investment exist, the price expected to be observed in a competitive domestic economy is equal to the price the best practice foreign investor can offer in that market (P_i).

To summarise to this point, the benchmark price expected to be seen in an economy characterised by no impediments to trade and investment is either P_w or P_i , depending upon whether or not the service is tradeable.

If, however, there are impediments to trade and investment, costs and therefore prices are generally expected to be higher. But if the domestic market is relatively competitive, despite being protected from international trade and investment, the price should settle at P_h . P_h is higher than P_i or P_w , because international firms operating at world's best practice are excluded from the market. This assumes that domestic firms cannot obtain world's best practice technology.

However, suppose now that there is only one domestic supplier (e.g. due to scale economies). If that firm is not regulated and if there is also an impediment to trade in the service, the local supplier can act as a monopolist. It will set its price at P_m (determined as the price at which the profit maximising quantity of the service — set by the intersection of the marginal revenue curve and its marginal cost line — is demanded).

It may instead be the case that the domestic market is regulated and that the local firm is subject to a price cap. In this case some forms of cost padding can be expected. The reported average cost line is expected to increase to a level of say P_r . The regulated price may be at or above this level. For simplicity the former is assumed.

This model can be used to illustrate the effects of reform:

- (1) If for example, an economy decides to deregulate its market, but not to liberalise, then prices will fall from either P_m or P_r down to P_h .
- (2) If an economy then decides to allow in foreign investors, prices will fall from P_h to P_i
- (3) Finally, if an economy permits trade from the home base of foreign suppliers, then the price will fall to P_w , assuming it is tradeable.

It is the wedge between the various possible prices (or associated costs) in an economy without impediments (P_w or P_i) and the actual price (P_h , P_r or P_m) that is of greatest interest for this project. This wedge will provide the *prima facie* price-impact of the trade impediments.

5. Identify the appropriate benchmark market to measure the impact of the impediments

Once the linkage between the impediments and prices has been identified, it is necessary to find a market where such impediments do not exist to provide a benchmark against which to measure their impact. The market may either be a 'real market', such as the best practice market overseas, or it may be a 'theoretical market', such as a perfectly competitive market. Various benefits and problems are associated with whatever benchmark is chosen. In Australian telecommunications, two real and one theoretical market are available to determine the effect on prices of the duopoly on the provision of line links.

The first market that may be used as a benchmark consists of international prices for the provision of a range of telecommunications services. The advantage with this method is the availability of data. The OECD and the International Telecommunications Union (ITU) both produce extensive databases comparing tariffs or charges for various services around the world. The disadvantage with this method is that international prices may not reflect traded services, similar input costs and quality, nor liberalised prices. For example, maintenance costs for Singapore Telecom are likely to be significantly less than those faced by Australia's Telstra given the differing geography over which their respective networks operate.

The second market that may be used as a benchmark involves unimpeded domestic prices. The advantage of this method is that cost and quality differentials are no longer an issue (with some minor caveats). The problem is that aside from a few industries dependent upon essential facilities, access prices are not always available.

The third possible benchmark market — and the market that will be predominantly used in the Australian research — is the theoretical perfectly competitive market. Equal domestic and international prices do not imply there are no impediments, for example similar impediments could (1) apply worldwide. The real interest is in efficient pricing and thus prices compared with some measure of long run marginal cost (LRMC) — a cost-price wedge. International prices or unimpeded domestic prices when they reflect a relevant LRMC could act as a proxy for these costs. The theory underlying the approach is that if the market had no impediments to entry (market access problems) then it would be competitive and prices would be expected to approach LRMC. If there are impediments, however, a cost-price wedge will exist.

The definition of LRMC used is 'the cost of keeping a particular facility alive and well in the long run (IC 1997)'. LRMC includes operating costs, normal returns on capital and some payment, say in the form of depreciation on sunk capital, to ensure continued innovation and new investment. While LRMC recovers all costs directly attributable to a particular service, it will not generate revenues necessary to meet unallocatable (common) costs such as administrative costs. The most efficient way to recover these costs is from the service with the most inelastic demand which is unlikely to be international services.

The major problems with this method are data concerns and cost padding which are currently being worked upon. The problem of cost padding is difficult to overcome because of data issues. However, in some industries the international data is available to produce a world's best practice (technically and allocatively efficient) cost function using frontier or related techniques such as Data Envelopment Analysis. These functions require a standardised output, for example costs per mainlines in telecommunications, so that analysis can be undertaken across economies. Frontier estimation usually includes estimating bundles of output characteristics. This is like a hedonic price model — an implicit price model which assumes services are composed of a series of (perfectly divisible) attributes (e.g. quality differences) and enables isolation of values which contribute to observed price differences. Generally, frontier models have not fitted the data well but procedures such as robust estimation techniques can help in this regard (see for example Trewin et al 1995). In other cases data sets are more limited. Fortunately, the data that is available tends to come from the world's more liberal markets due to the competition policy regimes that affect service industries in these countries.

6. Decomposing the wedge

Even restricting the focus to price-impact or cost-price wedges, some fundamental issues remain such as whether these are best decomposed by 'building up' the impact of individual impediments or by 'breaking down' the wedge into components due to impediments and those due to other factors. The preferred approach is to 'build up' the impact of individual impediments (see IC 1995). This approach provides conservative estimates by avoiding the unintentioned capture of other factors causing the price differences. It also builds on the earlier stage of listing an inventory of impediments. By enabling the explicit identification of impediments and their price impact, it minimises the danger that international price comparisons may not be between the same quality service or markets (in equilibrium). The cost function discussed in the previous part not only provides a basis for a measure of the extent of the wedge but it also provides the base for determining the extent of the costs of individual impediment components, for example by substituting factor costs that have been increased by certain impediments.

A survey of industry will be undertaken, designed to elucidate possible reasons for price differentials that are not policy induced, but instead reflect differences in the costs of inputs, the quality of outputs or business practices and other informal impediments. Benchmarking is as much a 'process' as a technique, establishing a framework in which bureaucracy and industry can communicate on the factors that cause differences between domestic and international prices. In an international study of this type, the 'black books' process developed by government and industry of one economy on the impediments they face in other economies could be used (see for example EC 1996, MITI 1996, USITC 1995, USTR 1995).

This industry input will then be objectively corroborated using some of the new approaches to valuation adopted in environmental economics. These new approaches include hedonic pricing methods where an estimate of an implicit price is obtained by reference to real markets where desired features are traded. There can be problems with hedonic pricing such as with the functional specification, multicollinearity and identification, with the function capturing the interaction of supply and demand factors. The hedonic approach is like that of statistical agencies in relation to adjusting price indices for quality changes (e.g. a constant utility index).

Doing this for services is difficult but a watch on advertisements, etc and asking the service provider for detailed information often enables an assessment of changes. Contingent valuation may also be possible, where a direct attempt is made to elicit values via questionnaires (e.g. what would prices be on removal of a particular impediment). Essentially both these methods involve separating out and valuing of costs that may cause price differentials. Other methods that may prove useful in determining whether the Law of One Price should hold include those related to competitiveness and market power measures (e.g. Herfindal index).

7. Incorporation of the price-impact data into a General Equilibrium Model

Finally, in order that the impact on the wider economy (e.g. social welfare) of a particular set of impediments to trade in services can be measured, the relatively uninformative price-impact figures and other directly relevant information such as on quotas will be analysed in a modified GTAP model (Hertel 1997) capturing the structure of service industries. This will allow policy makers to quantify the costs of maintaining policies designed to exclude rival domestic and foreign firms from their service markets. Such an approach has been applied with frequency measures (see Brown et al 1995) and, although a useful first approximation, can be misleading and consequently distort policy advice.

Measuring the Impact of FDI Restrictions on Services Trade

FDI is the principal means used by foreign firms to establish a commercial presence. It is therefore impossible to talk about international trade in services without recognising the crucial role of foreign direct investment (FDI). Even in today's world of rapidly improving transportation and communication technologies, commercial presence continues to expand as the dominant mode of delivering many services overseas. Cross-border trade for many services is either infeasible, since direct interaction is required between providers and consumers or, even where technically possible, is less preferred to commercial presence. Thus, for many services, effective trade liberalisation entails FDI liberalisation.

Any examination of impediments to international trade in services must therefore encompass FDI restrictions. Although often justified on other grounds, such restrictions can be the main impediment to trading many services internationally. Data on the relative importance of commercial presence as an international mode of delivering services is limited. However, US data on domestic sales of foreign affiliates suggest that it is the predominate mode — the value of services imported via FDI was around 30 per cent higher than the value of services imported cross-border in 1992 (USITC 1995). The share of total world FDI flows going to manufacturing has declined in recent years, while for services it has increased. Some one-half of the global FDI stock is now in services, and they represent some 60 per cent of annual world FDI flows (UNCTAD 1996).

GATS and FDI

The GATS explicitly covers commercial presence as one of the four modes of delivery.² It is the first multilateral agreement to recognise the central role of FDI in trading services. FDI restrictions in services (but not in other sectors) are now covered by a binding multilateral agreement, with countries making broad commitments to reduce these and other barriers to services trade. However, the GATS has had only a limited impact on liberalising services trade, including little relaxation of FDI controls.

Many countries, such as Australia, also listed blanket horizontal restrictions making all investment proposals subject to their foreign investment legislation. Moreover, horizontal restrictions on the temporary movement of people by most countries are also likely to affect the viability of establishing a foreign presence where experienced overseas personnel are needed.

The GATS schedules, as for other modes of supply, are a useful starting point to identify FDI restrictions across members. However, they provide a very incomplete picture of the extent and nature of such restrictions. Taken at face value, they suggest that less than one-quarter of all APEC service markets are open to commercial presence (PECC 1995). Moreover, this is likely to underestimate the restrictiveness of investment regimes. Many FDI barriers are simply not covered, nor identified.

A useful summary of the extent to which different types of barriers are used in APEC economies is provided in Figure 6 (PECC 1995). This was extended for foreign ownership limits by the Australian Industry Commission (IC 1996) and is captured in Figure 7. These figures highlight not only the diversity in measures across APEC, but also the degree to which some economies restrict FDI. As well as frequency measures of FDI barriers and sectors affected, investment coverage ratios help illustrate the wide occurrence of the restrictions. What emerges from the limited empirical work is that FDI barriers are widespread, take many diverse forms, and are likely to significantly affect services trade and economic efficiency of host countries.

Such inventories of FDI restrictions, although useful, are generally inadequate, and are especially deficient in their analytical basis.³ This is not overly surprising given the diverse types of FDI restrictions that exist across countries. For example, over 57 varieties of FDI barriers have been identified (UNCTAD 1996). Any useful classification will also need to be constructed with its intended purpose in mind. Ideally, an inventory of FDI restrictions should be comprehensive and be capable of classifying such measures according to their likely economic effects.

While such studies confirm that FDI restrictions mainly apply in services, they fail to provide a framework for measuring the impact of such restrictions on the efficient provision of

² Commercial presence is covered by Article I in the GATS. Measures limiting the level of foreign ownership are expressly prohibited under market access commitments, unless specified in a country's schedule (Article XVI).

³ These inventories tend to rely heavily on self reporting by countries of their investment regimes. Consequently, much of the material available is 'patchy' across countries, and tends to focus more on the positive aspects of the regime, rather than the restrictive measures.

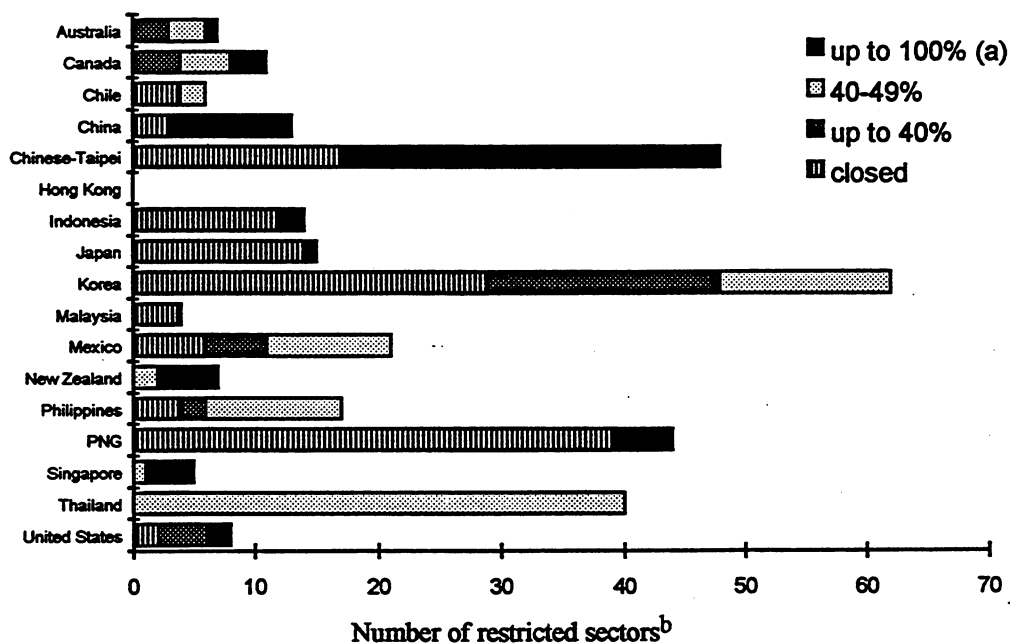
Figure 6: Schematic representation of major FDI impediments across APEC

	AUS	BD	CDA	CHL	PRC	HK	INA	JPN	ROK	MAS	MEX	NZ	RP	PNG	SIN	CT	THA	US
Screening/ notification	p	p	p	p	p	□	p	p	p	p	p	p	p	p	□	p	p	□
Restricted/ closed sectors	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p	p
Performance requirements	□	□	□	p	p	□	p	□	p	p	□	□	p	p	□	p	p	□
Fiscal incentives	□	□	□	□	p	□	p	p	p	p	p	□	□	p	p	p	p	□
Taxation	□	□	□	p	p	□	p	p	p	p	□	□	p	p	p	p	p	□
Priority sectors	p	p	□	□	p	□	p	□	□	p	p	□	p	p	□	p	p	□
Exchange controls	□	p	□	□	p	□	□	□	p	□	□	□	□	p	□	p	□	□

Note: Shaded areas represent impediments to foreign direct investment. In order, the country abbreviations refer to Australia, Brunei, Canada, Chile, China, Hong Kong, Indonesia, Japan, Korea, Malaysia, Mexico, New Zealand, Philippines, Papua New Guinea, Singapore, Chinese Taipei, Thailand and the United States.

Source: PECC 1995.

Figure 7: Sectors subject to FDI restrictions, by APEC economy



a Foreign ownership levels vary in this category subject to the investment fulfilling certain operational requirements or conditions. These include: export requirements; local content provisions; geographical limitations; and conditions such as reciprocity.

b Sectors correspond to the 4-digit International Standard Industrial Classification.

Source: IC (1996).

services, and of their impact on the economy generally. To do so requires techniques aimed at measuring the degree of restrictiveness of such measures.

Establishing a framework for quantifying FDI restrictions

As useful and fundamental as these inventory studies are, they do not enable the effects of FDI restrictions on economic efficiency to be assessed. Access to such measures, even if applied in a limited partial framework, would provide important insights into the protective effects of FDI restrictions on services provision, and generate essential inputs into modelling the general equilibrium effects of FDI restrictions as trade barriers to services. However, such measures do not currently exist. Some important lessons can be drawn, however, from the extensive work done on quantifying the domestic price and efficiency effects of tariffs and NTBs on trade in goods.

Although the difficulty of measuring the restrictiveness of FDI barriers is compounded by the vast array of impediments in existence, some measures, like for NTBs, may be more amenable to measurement and analysis than others. Indeed, as with trade barriers, first instincts would suggest that economic inefficiencies increase with less transparent measures. Strong economic arguments exist in favour of countries adopting more transparent measures to restrict FDI, such as clearly defined and administered limits on foreign ownership.⁴ Less transparent and indirect FDI barriers, such as screening requirements and operational restrictions, may well impose higher economic costs on host economies (and often foreign investors themselves) than more transparent measures, such as foreign ownership limits, provided such arrangements are administered openly and with a high degree of certainty. The difficulty is that governments, for various reasons, often prefer less transparent investment restrictions.

One way of measuring their impact would be to estimate price or rate of return impact of FDI barriers for services in the host country. As for trade barriers on goods, this could be a very useful way of comparing various FDI measures and modelling their impacts. However, such measures are likely to confront a range of conceptual and practical problems. Nevertheless, while measurement is difficult, the experience from measuring trade barriers for goods demonstrates that such estimates can be useful in analysing the economic costs of protecting services.

Conceptually, estimating the restrictiveness of the more transparent FDI measures could be done by identifying price or rate of return wedges. The relevant measures, or wedges, will however depend on the type of restrictions — for example, whether it is a direct limit on foreign ownership, or whether it involves some cost on the foreign investor. In some cases it will be appropriate to analyse the impact of the restriction in terms of its impact on asset prices or rates of return, while in others it would be best to identify impacts on the prices of the good or service that the foreign investor delivers. However, such measurements are fraught with difficulties, such as identifying the appropriate benchmark, especially the rate of return or asset prices that would apply without the FDI barrier. These conceptual and practical problems are compounded for less transparent FDI measures.

⁴ Such objective limits would also offer the advantage of being more amenable to reductions/removal within multilateral negotiations.

A major problem is that the direct link between the FDI restriction and its effects on prices will be unclear for many measures. Thus, even where a price/rate of return wedge is identified, it will be uncertain whether the gap incorporates the effects of the FDI restriction. Often, several FDI restrictions apply to a given sector and sometimes different foreign ownership limits apply to different firms in a sector, and to investment in new and existing firms. It is therefore difficult to identify which constraint is relevant and binding. Without some clear understanding as to how various FDI barriers impact on prices and rates of return, the extent to which the measure has been captured by the comparison will be unclear.

An alternate approach currently being applied at the Australian Industry Commission is to construct indices of the relative degree of FDI restriction for different sectors within countries, taking account of different types of restrictions and their likely economic significance. It may then be possible to arbitrarily translate these indices into tariff or tax equivalents. Although still only a proxy for measuring the restrictiveness of FDI impediments, the approach has the advantage of not considering all types of FDI impediments as being equally restrictive. A complete ban on foreign ownership would be assigned a much higher weight (for example, one) than would notification requirements. Developing sensible indices of FDI restrictions would require decisions on:

- which impediments to include in the index;
- the weights to assign to each type of barrier; and
- the weights to use when aggregating across sectors.

Gaining general agreement on these fundamental questions will not be easy. However, as a general rule, the index would need to cover at least the major types of barriers; the weights across these would need to reflect the relative economic costs of different types of restrictions; and country indices of FDI openness would need to reflect the services share of domestic output.

The Industry Commission is currently investigating options for quantifying the degree of openness to FDI in APEC economies (including indices of openness), and alternatives for modelling the general equilibrium effects of restrictions on FDI in services across APEC economies. Results are expected to be available later in 1997.

Case Study - Measuring the Impact of Telecommunications Reform in Australia on International Calls

In this section, the seven steps in the approach to measuring the impediments to trade and investment in services just outlined will be applied in turn to the telecommunications sector, drawing on work by the Industry Commission (IC 1997).

1. Definition of service industries to be analysed

As can be seen from Table 1 there is a one-to-one concordance between telecommunications product and industry classifications at the broad 3 digit level. However, this level is too broad for meaningful price and costs comparisons, so the case study will concentrate on

the main sub-sector that is of interest to APEC and was the focus of a recent Industry Commission paper, namely that of international calls. International telecommunication services are not distinguished in the ISIC classification and could be covered by a number of four or five digit level product classifications in the CPC (e.g. mobile telephone services, interconnection services). International calls are defined in the Industry Commission report as calls involving the international network in conjunction with local domestic networks; that is a system of country-to-country telecommunications links which are jointly operated by the international carriers of each country, and two domestic components connecting the call to an international gateway.

2. Identification of the specific impediments to trade and investment

Telecommunications was treated separately in the GATS with an Annex in the Final Act, but negotiations on basic telecommunications continued after the round with agreement being reached on 15 February 1997. Impediments that Australia would have listed in its GATS negotiations on telecommunications include in relation to national treatment and the commercial presence mode of supply, limits on foreign investment in the incumbent carriers. In relation to market access, the commercial presence mode of supply had limited ability for entrants to access international line links and domestic transmission capacity at the lowest price. In relation to the presence of natural persons mode of supply under both national treatment and market access there are some general impediments that apply across all sectors. Since the GATS, Australia has introduced new telecommunications legislation effective from 1 July 1997 that is expected to have a marked impact on specific telecommunication impediments to the competitive provision of international calls. However, as the GATS listing is likely to be the basis of any international negotiations, this will be used as the list of impediments for the telecommunications case study illustrating the seven step approach.

The Industry Commission (IC 1997) identified as impediments to service providers supplying international calls prior to 1 July 1997 the following:

- Strategic Partnership Agreements that enabled Telstra to offer large volume business users discriminatory discounts that were not based on costs and locked out potential competitors;
- legislative limitations on access to, and hence the costs of, international half-links between Australia and foreign markets such as submarine cables and international satellites that are jointly owned, operated and maintained through consortia and cooperatives respectively;
- higher costs of national connections; and
- a lower quality in terms of the type of services offered as a result of national connections.

The limits on foreign investment in incumbent carriers mentioned above still applies after July 1 1997.

On top of these domestic impediments, there are some international impediments such as the international accounting rate system, that have contributed to high international call prices.

3. *Making explicit the theoretical link between the impediment and 'prices'*

Under the terms of the *Telecommunications Act, 1991*, Australia opened up its telecommunications services market to competition from foreign service providers with one important caveat on market access. Until 1 July 1997, only Telstra and Optus were allowed to install and maintain telecommunications line links for the provision of public telecommunications services.⁵ The implications of this legislated duopoly on line links was that potential entrants were forced to purchase transmission capacity exclusively from one of the two carriers.

In the absence of essential facility legislation for potential entrants, both Telstra and Optus were able to sell access to transmission capacity — including international undersea cable and satellite capacity — at prices substantially above actual cost. This gave the carriers a significant cost advantage over service providers in each of the markets they compete; for example long-distance and international calls, internet access and data services. For consumers, this meant that prices were unable to fall to the same extent as possible if service providers had access to transmission capacity at competitive rates.

The other major impediment to services trade and investment in Australia is the limitations on foreign investment in the incumbent carriers. Under the 1991 arrangements, foreign investment in Optus was limited to 49 per cent. Changes announced in August 1997 removed these requirements allowing for full foreign ownership. All new carriers entering the Australian market now face no industry-specific foreign ownership controls. Importantly, however, the Telstra remains primarily in public hands. The legislation for the sale of one third of the dominant carrier limits foreign ownership to one third of that tranche, with individual foreign holdings also strictly curtailed.

As mentioned earlier, the implications for consumers of these foreign ownership limitations are less clear. However, foreign investment is thought to bring benefits in the form of new technologies and approaches that lead to lower cost and higher quality services. The detailed quantification of such benefits in the case of telecommunications is yet to be undertaken.

Under the international accounting rate system carriers charge each other for terminating international calls — services needed to complete an incoming call in the destination country. Settlement rates are paid to (received from) foreign carriers for terminating outgoing (incoming) services, and are negotiated bilaterally. High settlement rates are therefore both a cost (payment) and a benefit (receipt) to carriers, and the effect on individual carriers depends upon their balance of total outgoing and incoming calls. Reforming the international accounting rate system is a multilateral problem requiring a multilateral solution. Although such reform was not included in the recent WTO Agreement on Basic Telecommunications, despite Australia's attempts, the system's impact on prices would be expected to diminish as members increasingly open their telecommunications market to foreign competition, allowing foreign carriers the option of terminating their own calls.

⁵ Another company, Vodafone, was also allowed to build and maintain a third mobile telecommunications system.

Settlement rates, although declining in recent years, have not kept pace with rapidly falling costs. In 1995-6, Australian carriers' (tariff weighted) average settlement rate exceeded by sixfold the Industry Commission's estimated cost of terminating an international call. Whilst this system does contribute to higher outgoing call prices in Australia, the Industry Commission concluded that these prices are determined mainly by the competitiveness of the domestic segment of the international call market. A highly competitive Australian market would ensure receipts from termination services were used to reduce outgoing call prices.

4. Determine the relevant price wedge

In the previous subsections, three main impediments affecting Australian trade in international calls at the time of the GATS — a duopoly on link lines, FDI restrictions, settlement rates — were described along with their impact on prices and costs. In some cases, such as with FDI restrictions, the impact was not clear. Returning to Figure 5, more general restrictions such as on movement of natural persons ensure not all aspects of international calls are tradeable thus Pw is unlikely to be observed unless Australia is the world's best practice economy in this respect. The international settlement rate and impediments to FDI also ensure that Pw will not be observed. Finally, the duopoly on telecommunication line links meant the Australian market prior to the removal of these was either in a situation where Pm or Pr were relevant.

5. Identify the appropriate benchmark market to measure the impact of the impediments

There are a number of sources of international comparative data on telecommunications. For example, the ITU publishes on a country basis annual average prices per minute for various services plus annual average price for business and residential rentals. Although this data includes peak and off-peak prices, it does not include the many discounts known to exist in telecommunications. However, estimates of international revenue for 1994 and international minutes enables some average revenues per minute to be derived. The OECD provides estimates of revenue shares for each type of service but not minutes nor number of subscribers. Furthermore, the ITU provides total revenue figures for all countries for a number of years and the OECD for selected carriers for a couple of years, and these figures could be divided by mainlines to give a per unit revenue figure which is comparable with cost figures. The comparative cost data is more limited than the price data just described. The OECD has published cost data taken from annual reports, broken down into depreciation, capital expenditure, R&D, personnel costs and other expenses (including marketing and billing) but not by service, for 58 large OECD carriers for 1995 and for a smaller subset in 1992. Some of this data has been put onto a spreadsheet and some preliminary analysis of it is presented later in this paper. Annual reports on other carriers in the APEC region are available but have not been entered into the data base.

As mentioned earlier, another option of using unimpeded domestic prices as a benchmark has a number of advantages and disadvantages. One advantage is that many differentials such as those related to quality are minimised as basically the same service is being compared. The main disadvantage is the lack of availability of unimpeded price information for all required services. For example, a number but not all unimpeded prices, will be available as a result of the 1 July 1997 reforms in Australian telecommunications that have been introduced.

In the perfectly competitive approach, world's best practice for each of the components in a telecommunications service are calculated and summed to create an adjusted cost figure to compare with prices. This was the approach undertaken in Industry Commission report (IC 1997). World's best practice cost figures are required for customer access network, local loop, long-distance, international gateway, international half-circuits, settlement rates, and marketing and billing costs. The necessary data is available for most of these components but not for a multiple of years. In terms of Figure 5, this research determined that Pm referred to a pre-1989 situation; Pr equalled \$1.11; Ph equalled \$0.47; Pi would be a post-1997 rate with world's best practices introduced; and Pw equalled \$0.22 without a settlement rate and with two-way bypass. It should be appreciated that these figures are not set in concrete. Competitive markets are dynamic, introducing new, lower cost services that soon make such figures dated.

6. Decomposing the wedge

Decomposing the wedge starts with a 'tops down' approach even though this is not the preferred approach. However, it is a useful initial approach, giving an upper bound on the extent of the wedge to be 'broken down' into components due to impediments and those due to other factors. It also provides information that can be used in the derivation of a world's best practice cost function, or a lower bound on the wedge, that then can become the basis for 'building up' the contributions of specific classes of impediments. The international comparative data mentioned in the last part can provide international revenue, cost or profit wedges that could then be adjusted for quality differences and regressed on standardised costs (including institutional costs) using a frontier function approach to determine world's best practice. These wedges are presented in Figure 8 for 1995 data ranked by company on the basis of revenue per mainline.

A perspective on how much cost and quality differences explain these wedges can be obtained from ranking the wedges on the basis of wages and salaries, and on the basis of mainlines and mobile subscribers on a country basis respectively (see Figures 9 and 10). It is noticeable that there are discernible trends in these Figures but also a number of outliers that may be explained by information on efficiency or better information on revenues (e.g. monopoly arrangements), costs (e.g. institutional costs such as taxes) and quality (e.g. connection failures).

Quality differences need to be taken into account in any price comparisons. Hausman (1997) points out that the U.S. Bureau of Labour Statistics omits cellular telephones from its telephone services CPI. He estimates an augmented CPI that includes the decline in prices and the gain in consumer welfare from the introduction of these new services using yearly expenditure weights. These estimates show that such omissions bias the telecommunication services CPI, causing an estimated 8.5 per cent increase since 1988 to become a 20 per cent decrease.

As well as addressing these quality differences through hedonic price and other econometric models such as those discussed above, it is intended to try to elicit some information in the industry interview stage that will enable some contingent valuation of the price difference due to quality differences, impediments and so on.

Finally, valid international price comparisons will be dependent on the industries facing similar environments in terms of market structures, institutional arrangements and so on. These

market pricing assumptions, often reflected in the Law of One Price, will also need to be tested. A flavour of the type of approaches that could be used in this area is given in the USITC publication on global competitiveness of cellular communications (USITC 1993) in which competitiveness measures such as market shares are regressed against various explanators such as the competitiveness of the home market, R&D, and so on.

7. Incorporation of the price-impact data into a General Equilibrium Model

As mentioned earlier, an important component of the overall approach is to convert the relatively uninformative price-impact measures and equivalent information such as on quotas into measures of impacts on the wider economy such changes in social welfare. The approach intended for doing this is to insert the price-impact and other measures into a modified CGE model, GTAP, that captures the structure of the service industries. As it is early days in the project, this stage has not progressed all that far although there are some other papers in this symposium that may cover this issue in more detail.

However, the approach has been applied to some degree previously. For example, Brown et al (1995) applied the approach using the earlier mentioned frequency measures augmented by judgmental estimates of sector tariff equivalents (set at 200 per cent for prohibited sectors and between 20 and 40 per cent for others), and at a very aggregative 5 service sector level. The tentative results of this analysis showed that service trade liberalisation appears to be as important as that for goods, endorsing the decision to include services in the Uruguay Round. It was noted the method could be improved by using the type of price comparisons discussed earlier.

Conclusion

In the paper is developed a seven step practical approach for measuring impediments to trade in services within the APEC region, building upon research undertaken in a Survey of Impediments to Trade and Investment in the APEC region (PECC 1995). The measurement was undertaken in seven steps, namely:

- (1) defining the service industry to be analysed;
- (2) identifying the specific impediments to trade;
- (3) making explicit the theoretical link between the impediment and 'prices';
- (4) determining the relevant price wedge;
- (5) identifying the appropriate benchmark market to measure the impact of the impediments;
- (6) decomposing the wedge; and
- (7) incorporating the price-impact data into a general equilibrium model.

Measuring the impact of FDI restrictions on services trade was dealt with separately because of the central role it plays in trading services, as recognised in the GATS. A case study based on the Australian telecommunications sector is used to illustrate the seven steps identified in measuring trade impediments to services. This case study shows that there are many difficulties in the approach, but that it leads to some progress in measuring trade impediments to services.

One issue that arises in the approach is that of aggregation. The approach being undertaken at the sub-sector level. This should not be so much of an analytical problem. However, it could be a negotiations problem, encouraging sector negotiations such as that on telecommunications, rather than a service wide negotiations, which are likely to offer larger gains, especially for a diverse collection of economies such as in APEC.

The difficulties in working through the seven steps highlighted a number of areas requiring future research. These included the need for better (e.g. more consistent) price and cost information; a better understanding of the impact of some policies (e.g. in respect of FDI) and other aspects on the market; the econometric estimation of world's best practice cost functions; and the incorporation of the various forms of information from the earlier steps into economy-wide models measuring the broader impact impediments to trade in services. An interesting thought on the value of trying to measure the impacts of impediments to trade in services is that if the impact cannot be measured then what are existing policies in this area to be based on, and how are proposed changes to be assessed?

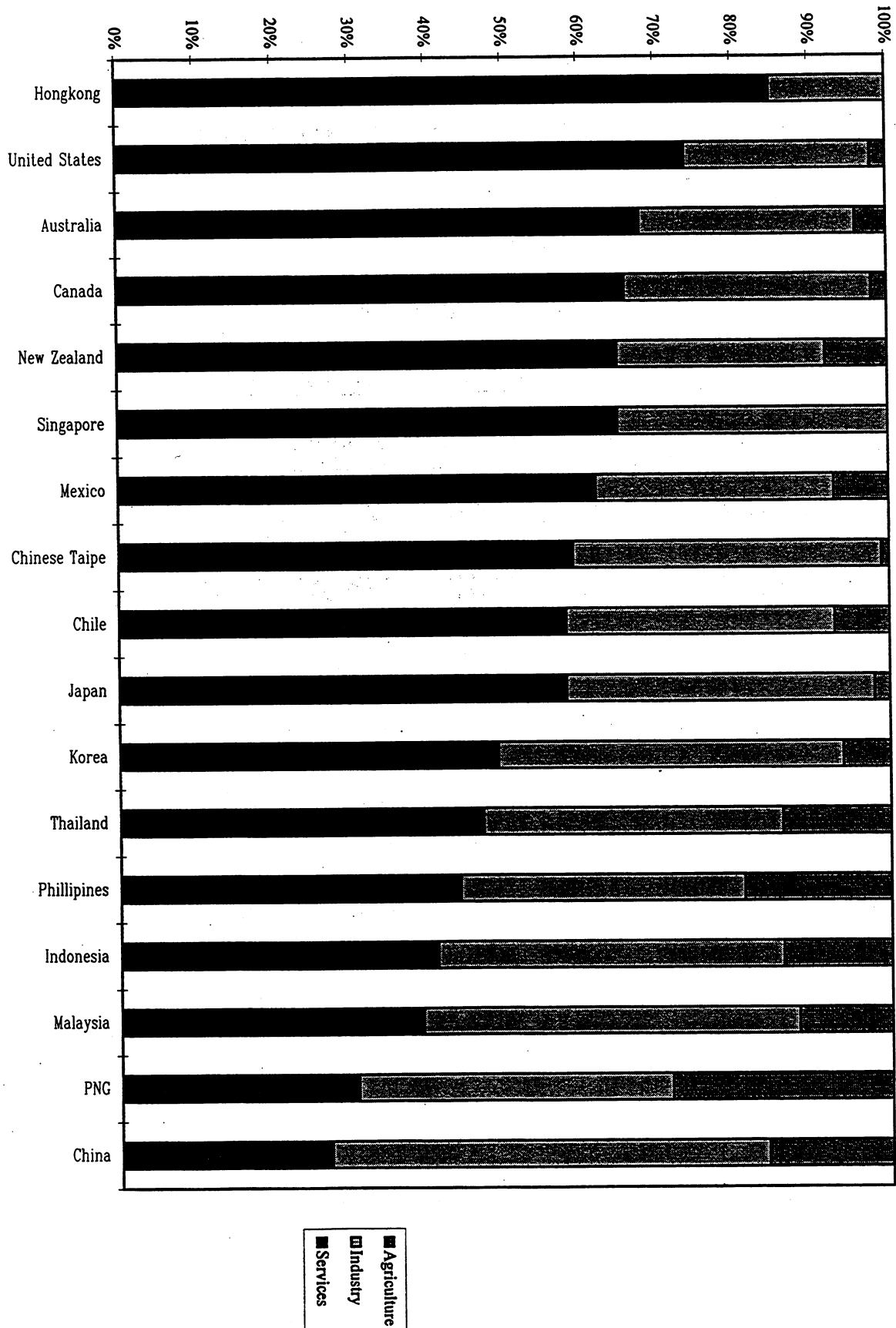
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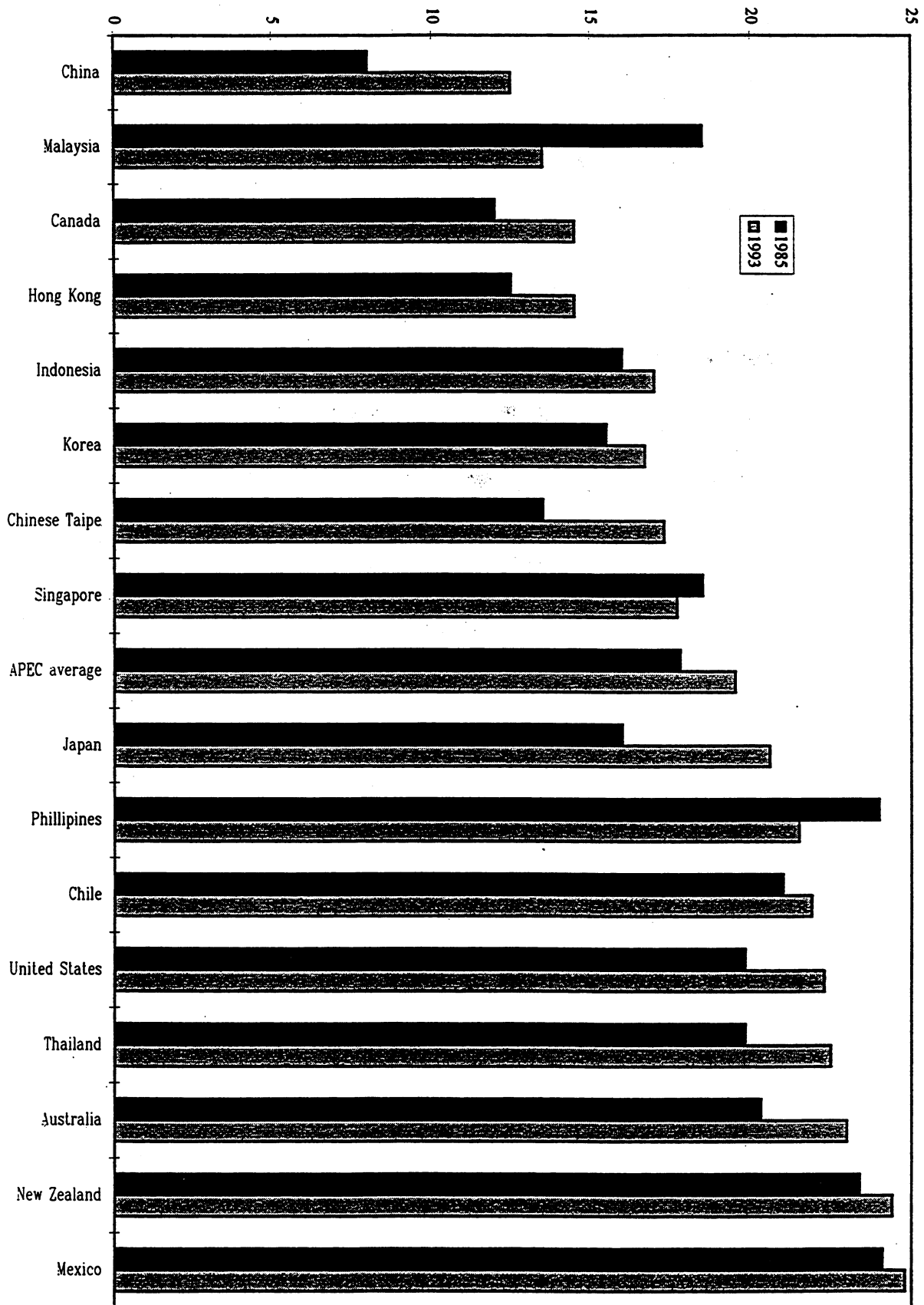
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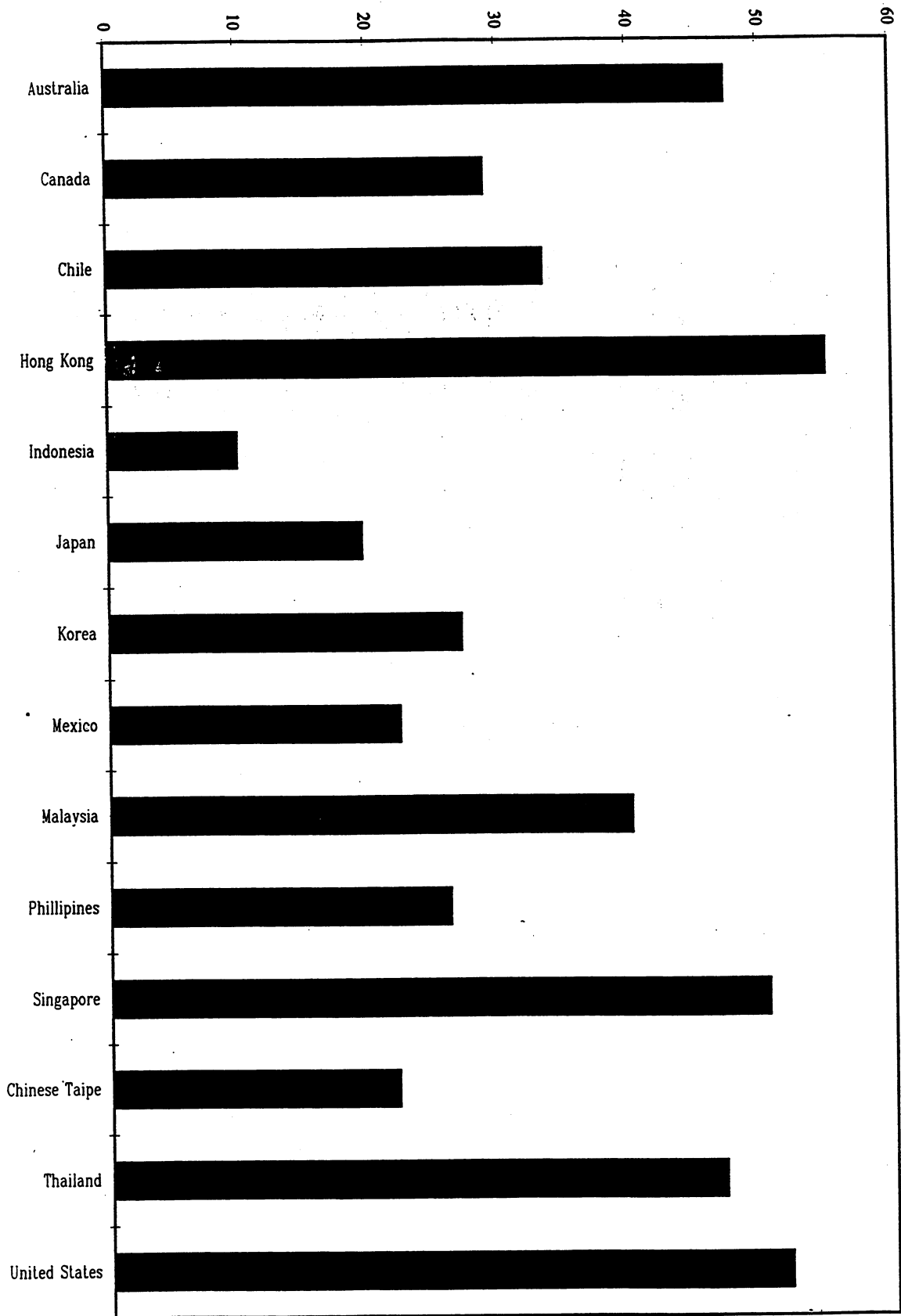
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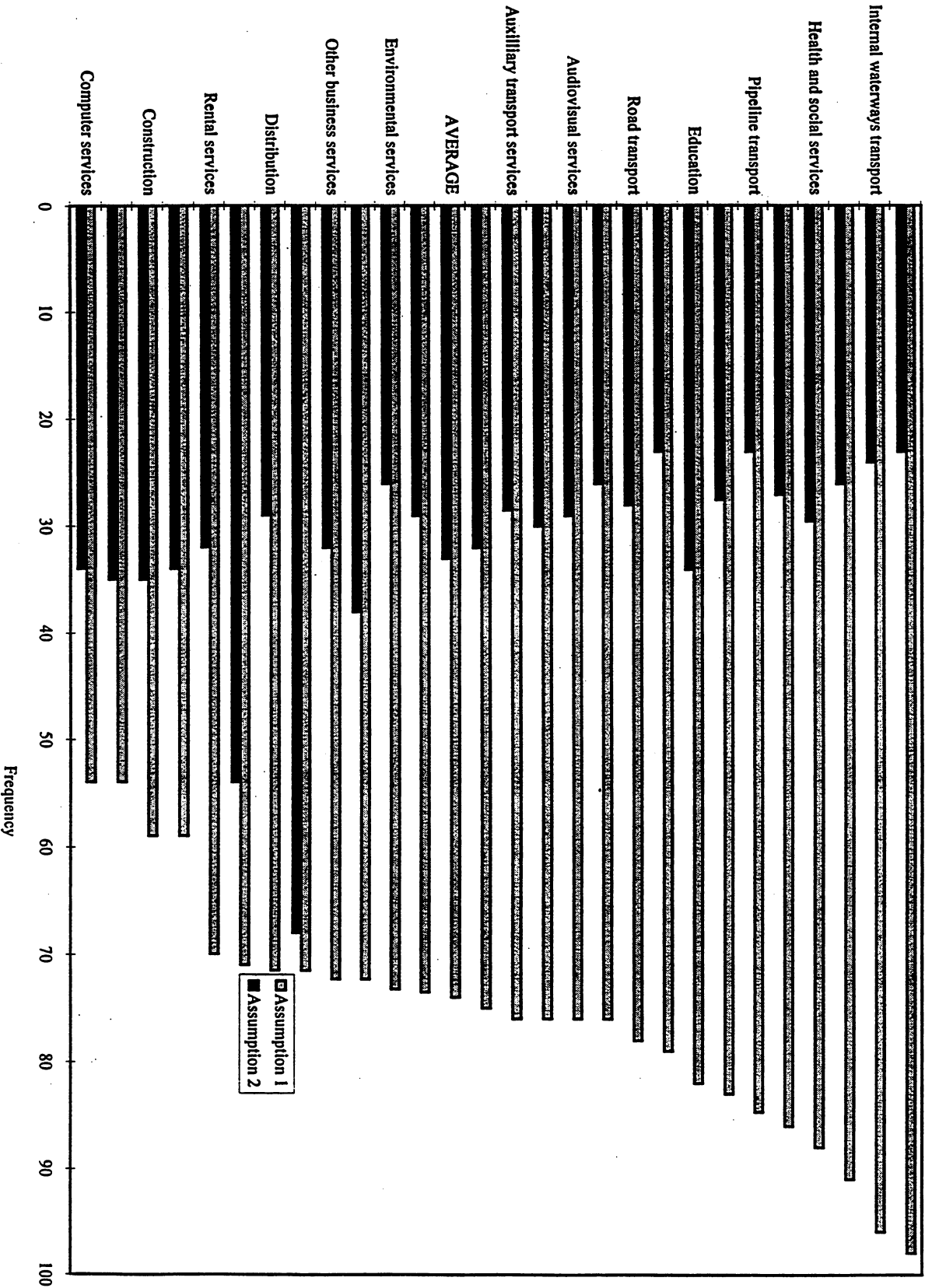


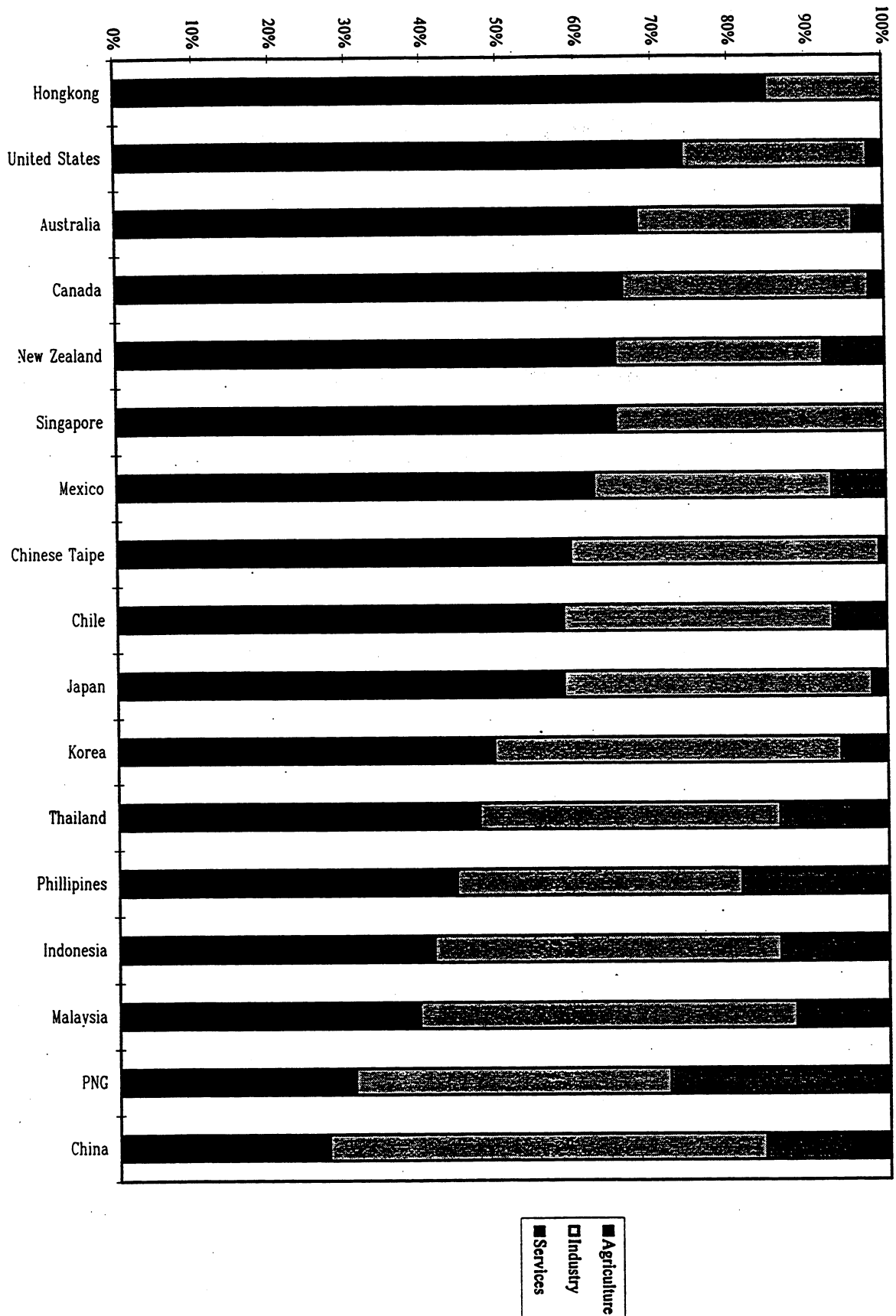
Sheet1 Chart 2



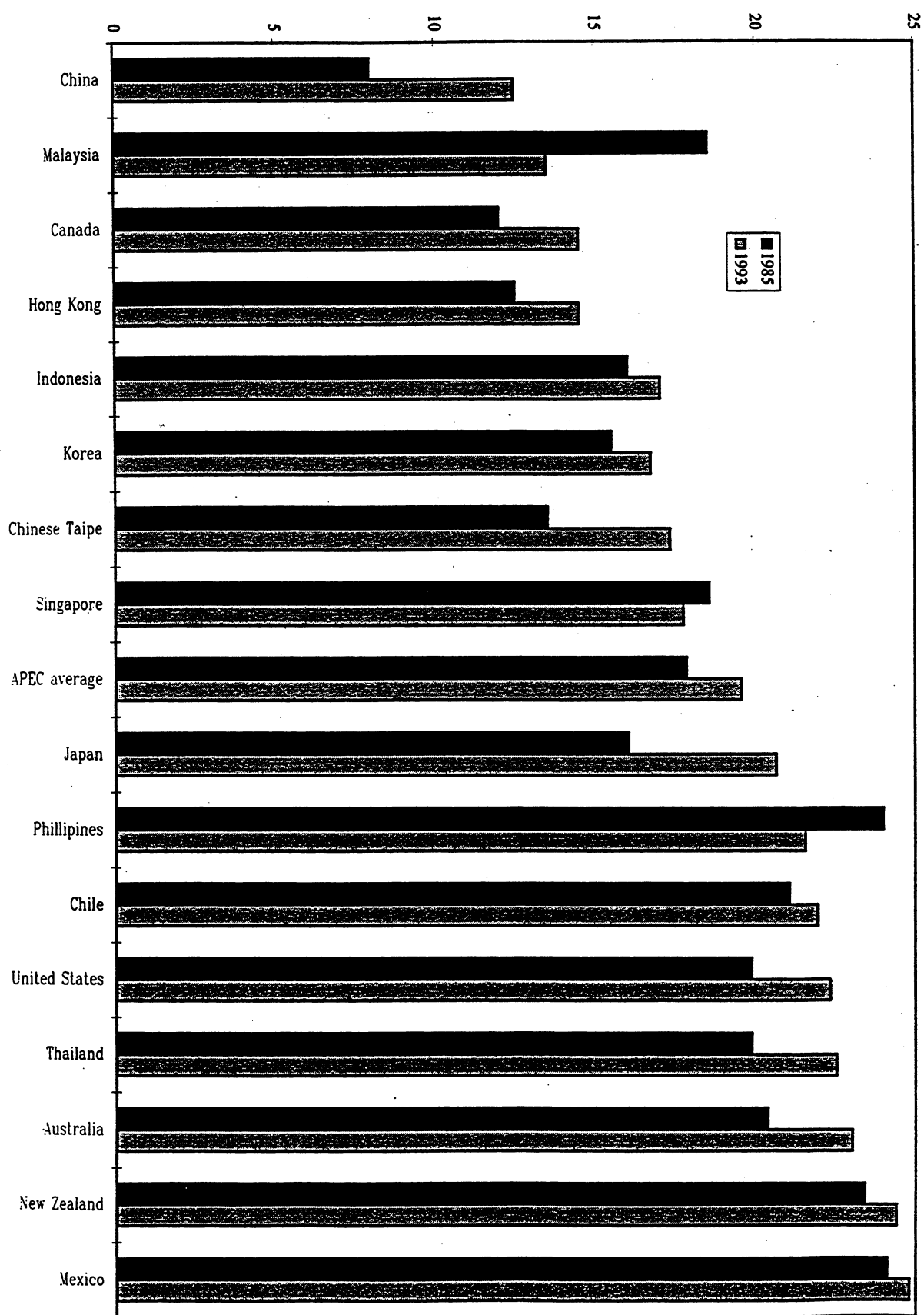


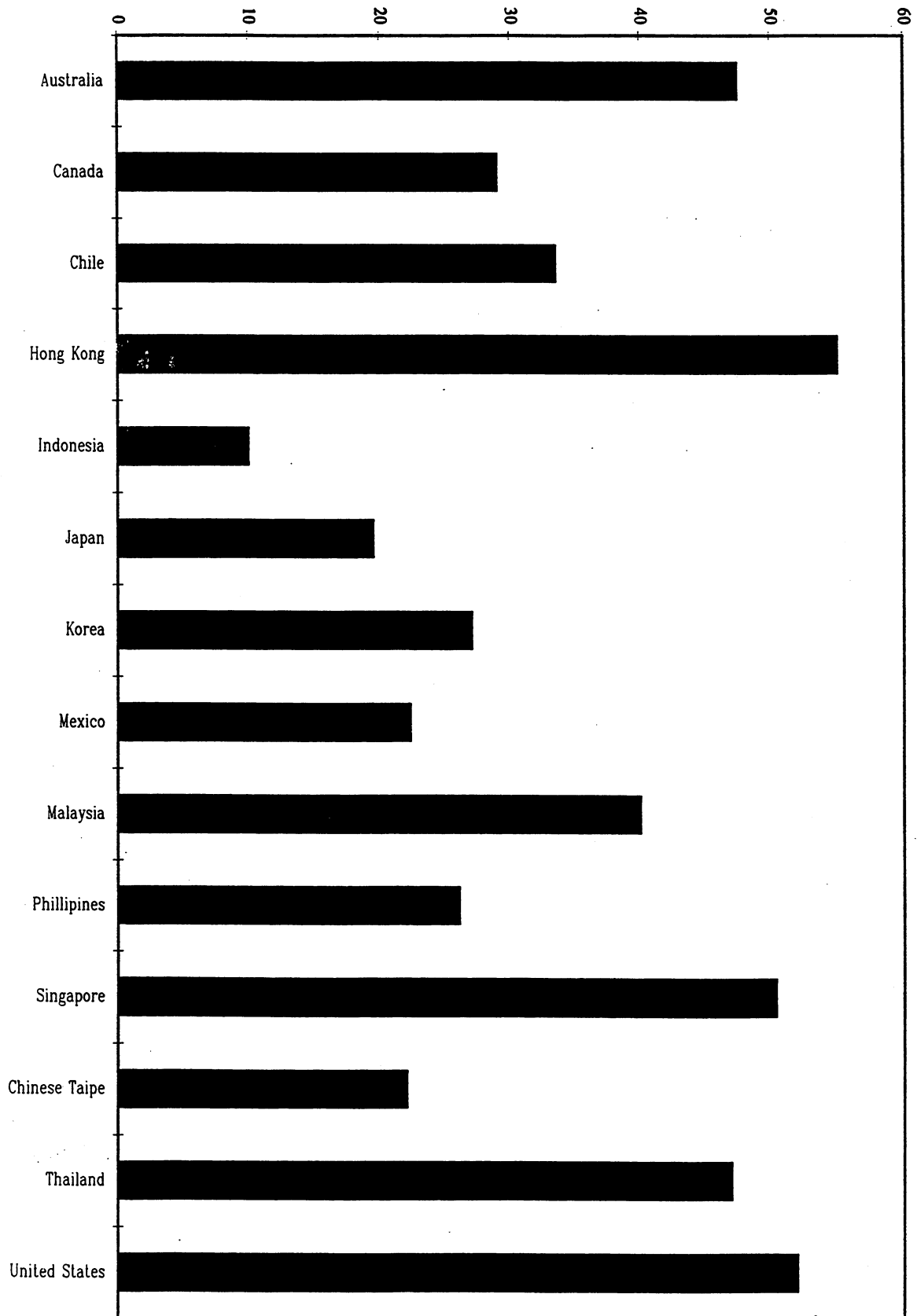
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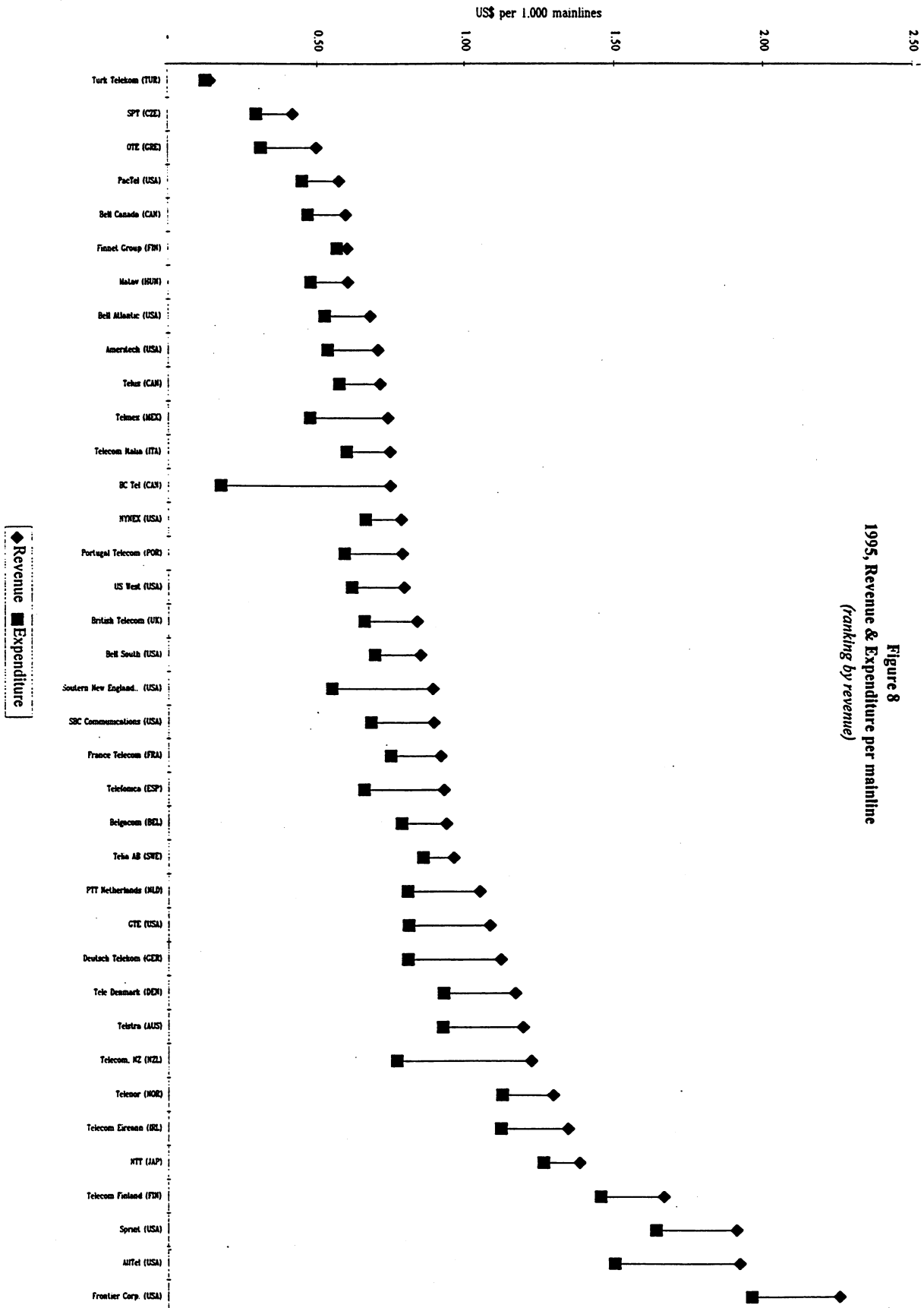
Sheet2 Chart 2





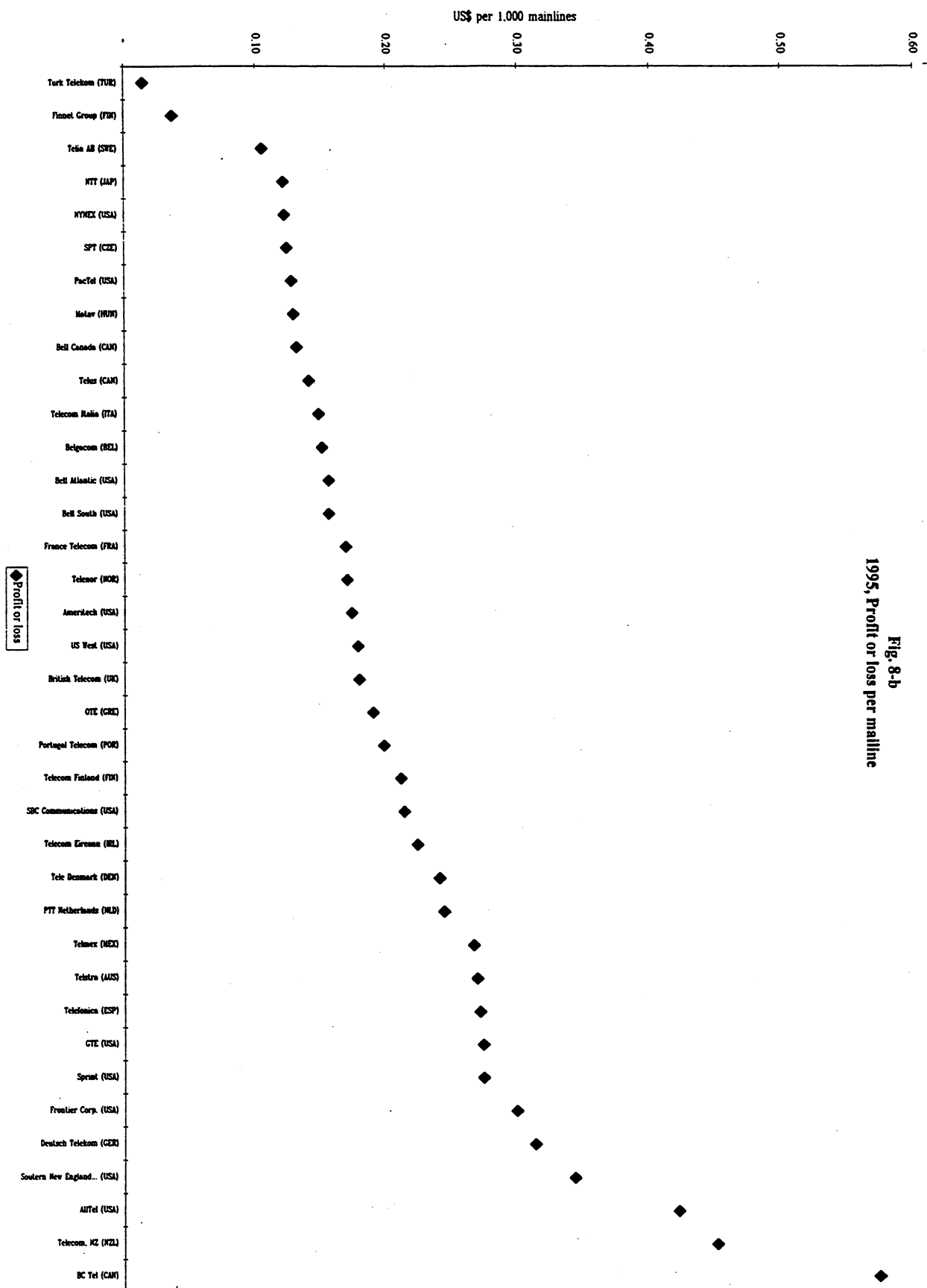
charts - R & X Chart 5

Figure 8
1995, Revenue & Expenditure per mainline
(ranking by revenue)



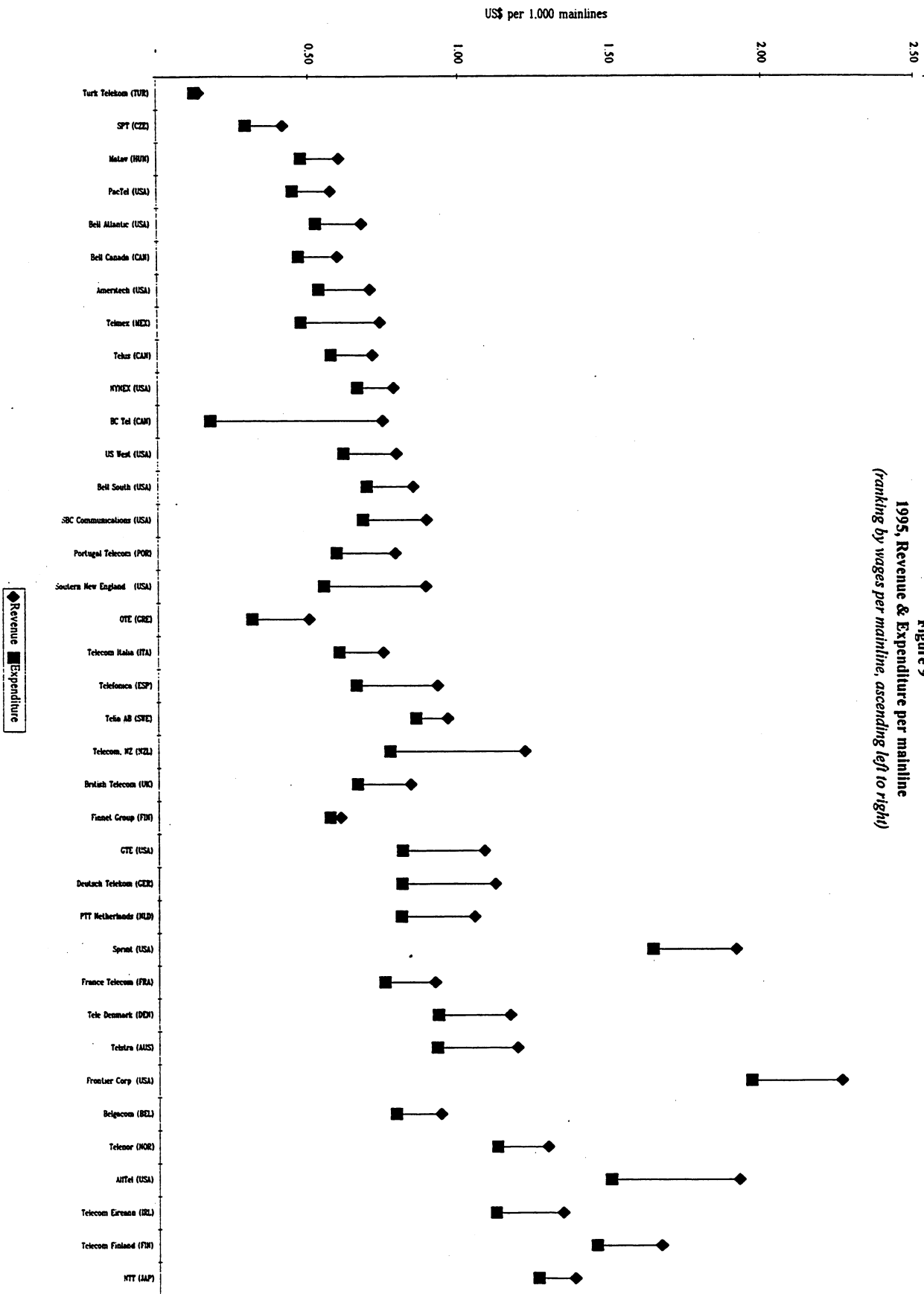
charts - profit Chart 1

Fig. 8-b
1995, Profit or loss per mainline

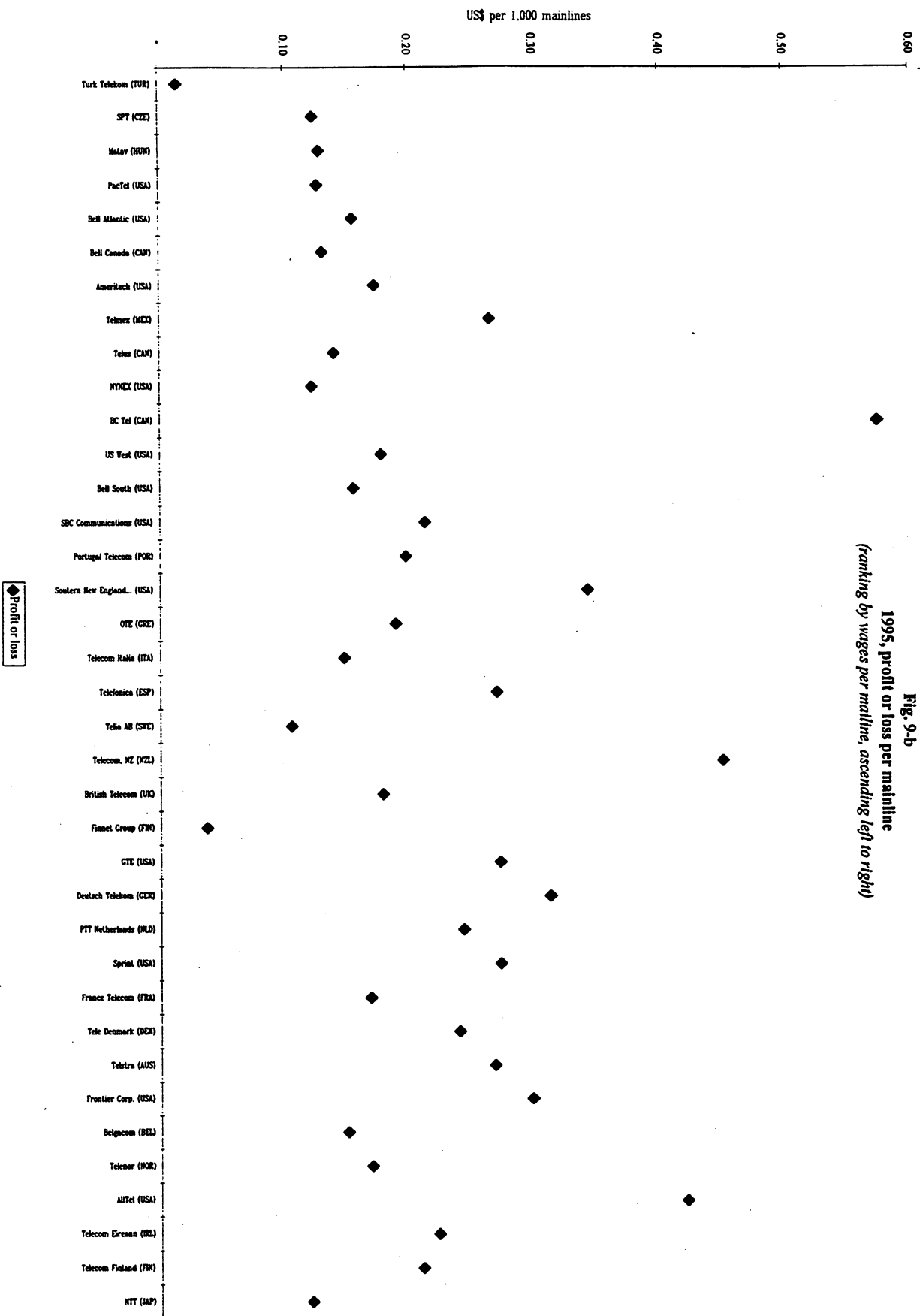


charts - R & X Chart 2

Figure 9
1995, Revenue & Expenditure per mainline
(ranking by wages per mainline, ascending left to right)

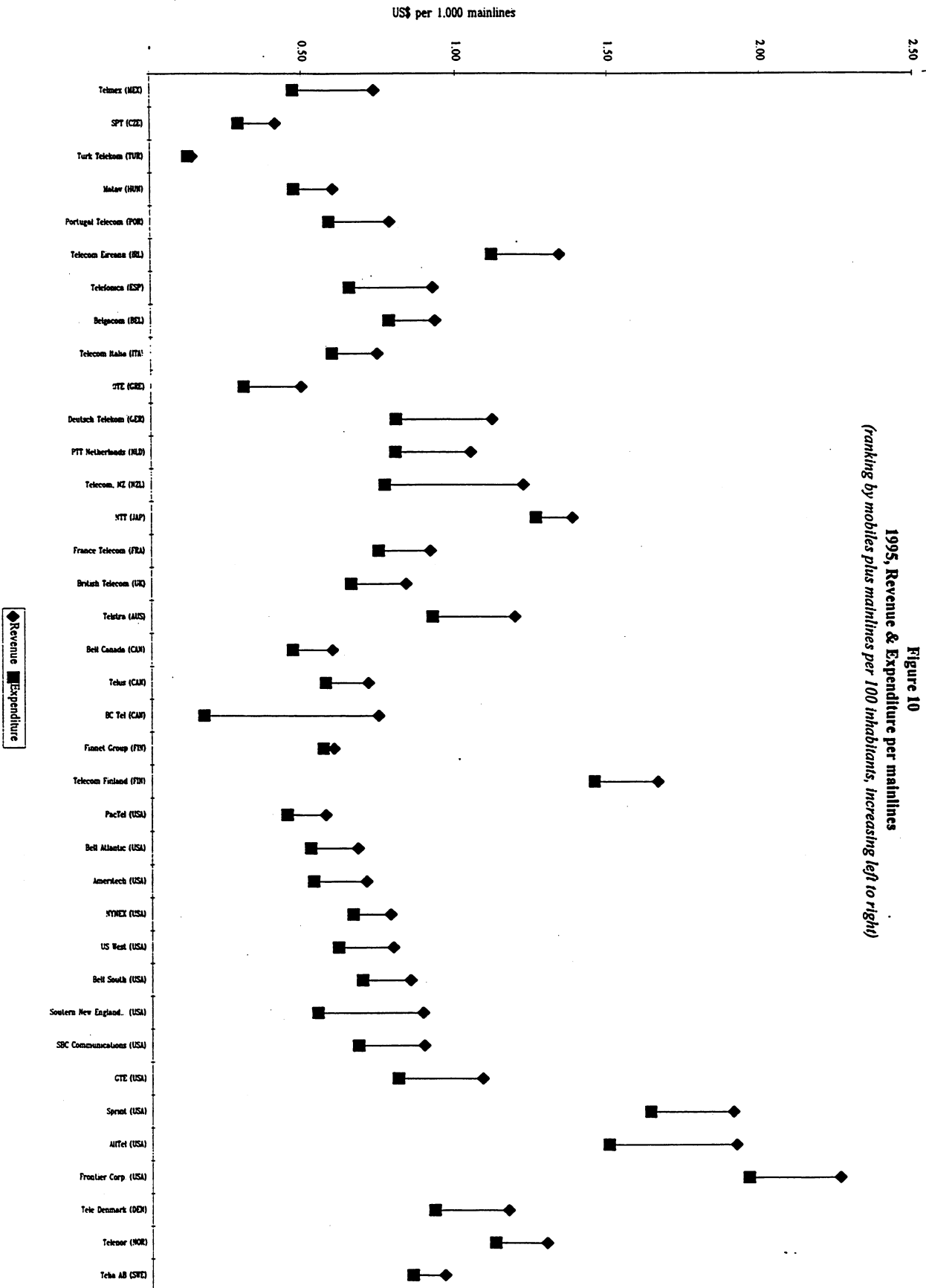


charts - profit Chart 2



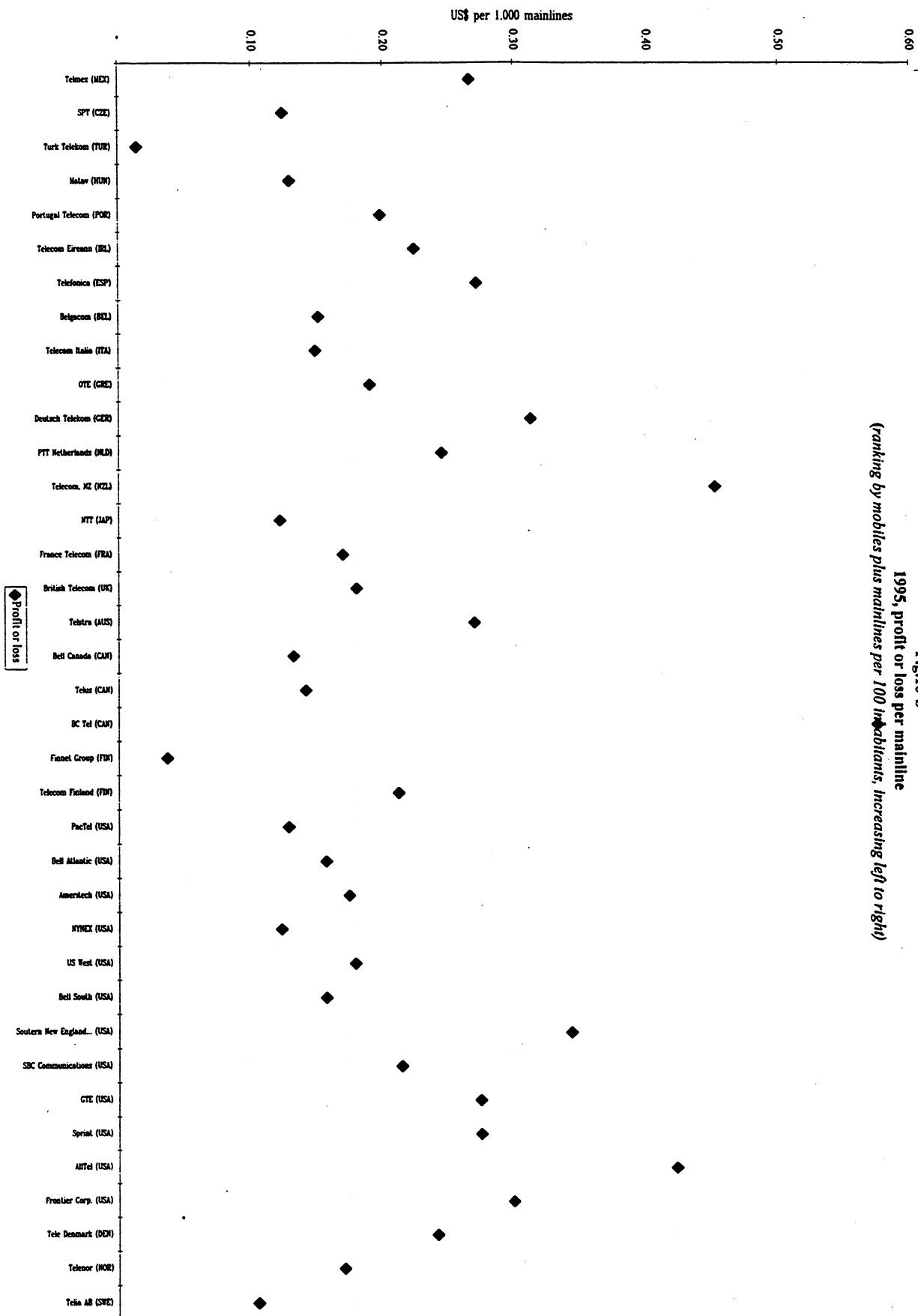
charts - R & X Chart 3

Figure 10
1995, Revenue & Expenditure per mainlines
(ranking by mobiles plus mainlines per 100 inhabitants, increasing left to right)



charts - profit Chart 3

Fig. 10-b
1995, profit or loss per mainline
(ranking by mobiles plus mainlines per 100 inhabitants, increasing left to right)



Comments by Carlos Alberto Braga on

**Patent Systems in APEC: Role in Nontariff Trade Barriers and Strategic Trade Policies by
Walter Park**

and

**Measuring Trade Impediments to Services within APEC by
Malcom Bosworth, Christopher Findlay, Ray Trewin, and Tony Warren**

Let me start by saying that I enjoyed the papers, and I tried to measure the contribution based on one letter that I received that said that the USITC, when requesting these papers, was striving to get a critical assessment of the state of the literature. While reading the papers on the metro on my way here, my first role in the critical assessment of the literature was to see if I were quoted. I was quoted in your paper. I was not quoted in yours. So that was the first problem. We are still in a very initial stage in some of these issues, particularly when we try to talk about relevance, particularly from the perspective of developing countries. The paper on intellectual property rights is good not only on the strength of the intellectual property rights regimes, but also on how these regimes are implemented. I do not have any disagreement in terms of the issues that were raised. Those issues are particularly relevant for the industrialized countries that are the OECD level countries in the context of APEC negotiations. Most of the papers give relevant examples about the U.S.-Japanese relations.

For developing countries, some other issues require attention even at the level of negotiations related not only to the issue of how the law is applied but also to how to put in place the commitments at different levels. For instance, some of these countries, as Professor Park mentioned, do not yet even have a full system of patent protection. Those that have made commitments that are WTO members probably will have something in place shortly. The question of enforcement is another dimension of negotiations. We already see enforcement in bilateral relations mentioned in passing, relative to a major economy like China, and relative to relations with the United States. The enforcement issue is going to be contentious in industrializing countries because enforcement is very resource-intensive. Many countries do not have experience in how to do it and will need technical assistance, especially where different practices can cause friction for the sake of friction.

The intellectual property rights paper is useful for defining two issues: implementation and enforcement. The other issues of private action and strategic behavior are interesting. In the end, however, the chief issue is what a nontariff barrier to trade is? Since the 1980s, we can say that intellectual property rights do affect trade. The literature has come to a consensus. Many models try to show this consensus. The dimensions of this impact of intellectual property rights, however, are open as in the question of private action, and in the effect of competition laws. We need to consider all this at the level of negotiations.

The paper on services poses the different alternatives to identify the implications of protection in the area of services for trade. The OECD has done a comprehensive study of the literature, and 3 years ago we did a study identifying the nontariff barriers to trade (still the most comprehensive review, with focus on developing countries). In terms of how to measure these, the seven steps from an economic perspective are right. I would add that one more way to put some benchmarks in the area of telecommunications that the FCC has just released for international phone calls.

To bring all this to a computer general equilibrium models, you mention some initial experiments of Drucilla Brown and others, published already in a book about the Uruguay Round. An issue of *Asia-*

Pacific Economic Review, with several pieces on this topic in a conference in Canberra, has among others, Joseph Francois advancing this discussion about how to model at the level of a general equilibrium model. This material needs attention for all the APEC countries in the content of the GATS.

We need to be careful not to give the wrong impression. The GATS is not a stand-still agreement. The offers made in Marrakesh in 1994 were tantamount to stand-still in the sense that the countries did not use the GATS to liberalize the regimes significantly. Their offers were status quo, but GATS is not stand-still. Major commitments in terms of liberalization of basic telecommunications agreement have been achieved. These commitments were the first big success of the GATS agreement.

Comments by Michael Ferrantino¹ on

**"Patent Systems in APEC: Role in Nontariff Barriers
and Strategic Trade Policy" by Walter Park**

Firms which seek to patent abroad can be subjected to a variety of irritations and frustrations, of types not experienced under their home-country intellectual property laws. Walter Park has provided us with a very useful overview of these irritations, and asks whether they constitute nontariff barriers to trade (NTBs) or instruments of strategic trade policy. As David Richardson points out elsewhere in this symposium, the economic issues involved in constructing a socially optimal international regime for intellectual property rights (IPRs) are indeed murky. From the standpoint of economic theory, the question of whether any particular country's IPR practices are relatively close to the optimum, either from the standpoint of national or global welfare, is yet more difficult. Among policymakers, at least in "Washington consensus" circles, there is a good deal more confidence in the right direction to head. Strong IPRs are better than weak, including strong recognition of foreigners' rights, and it is sometimes implied that the difference between a "strong" and "weak" system can be determined by casual inspection. *A priori*, the likelihood of economic theorists neglecting practical considerations and of policymakers ignoring basic economics cannot easily be ranked. Thus, the present effort at detailing the practical effects of different national patent systems in their actual operation is particularly salutary.

It should be emphasized at the outset that Park's concern is primarily with international trade in intellectual property, rather than merchandise trade. The present paper does not take up the question of whether strong recognition of foreign intellectual property tends to promote merchandise trade (e.g. by preventing reverse engineering of goods post-shipment) or to substitute for merchandise trade (e.g. by facilitating tariff-hopping direct investment, which is more profitable if employees in the foreign subsidiary cannot leave and set up shop using technologies learned in their first employment).

The evidence on the international effects of strong IPRs is beginning to accumulate. Strong IPRs generally encourage more trade in technological information itself, whether measured by values of royalties and license fees or by cross-licensing of patents (Ferrantino (1993), Ginarte and Park (1996)). Exports from developed countries to developing countries increase with stronger IPRs (Maskus and Penabarti (1995)), particularly when the developing country involved has sufficient technological capacity to make imitation viable (Smith (1997)). Countries with weak IPRs receive less foreign direct investment, and what they do receive is heavily weighted toward sales, distribution, and rudimentary production with widely diffused technologies (Lee and Mansfield (1996)). But strong IPRs do not necessarily stimulate all cross-border transactions. Cross-licensing of patents is reduced among countries with the highest level of IPR protection, since firms prefer not to share a truly effective patent monopoly (Ginarte and Park (1996)), and intrafirm exports of multinational firms may be stimulated by weaker IPRs, possibly to conceal steps of the production process (Ferrantino (1993)).

¹The author is with the Office of Economics of the U.S. International Trade Commission. These comments are solely meant to represent the opinions of individual authors. They are not meant to represent in any way the views of the U.S. International Trade Commission or any of its individual Commissioners or the U.S. government.

On the basis of the available evidence, it is reasonable to infer that strengthening of IPRs is complementary with trade and investment liberalization. This inference comes with a caveat; the complex effects of simultaneous liberalizations on the behavior of multinational firms are still not completely understood. By restricting his scope in the present paper to international patenting, Park is dealing in an area where the lines of argument are considerably clearer.

What people generally mean by a "strong" IPR regime is one in which inventors easily obtain recognition of their inventions, have reasonable prospects of discouraging imitators through the legal process, and thereby have greater incentives to invent. A strong global regime, by extension, is one in which inventors easily obtain worldwide recognition and can discourage imitators anywhere on the globe. APEC's Osaka Action Agenda of 1995 adheres fairly closely to this approach.

The TRIPS agreement, proof text for the APEC IPR goals, recognizes that countries might design their IPR systems for both "developmental and technological objectives" and that the least-developed countries need "flexibility ... in domestic implementation ... in order to enable them to create a sound and viable technological base." This implies that poorer countries, with weaker research capabilities, might find it in their interest to permit a good deal of domestic imitation of foreign intellectual property.

Park's analysis does not focus directly on differences between developed and developing countries, but rather on differences between the patent systems of the United States and Japan, which he sees as paradigmatic of a greater divide within APEC. He gives Taiwan, Korea, and Singapore as examples of economies with relatively Japanese-style systems, and Canada, New Zealand, and Australia as examples of economies with systems similar to the United States.

Japan has a deep technological base and engages in a good deal of innovation, as reflected in the large number of Japanese patent applications outside of Japan. Some of the underlying tensions behind the institutional differences discussed in the paper can be highlighted by an analysis of Park's Table 1, which assigns equal weights to each patent authority's data to adjust for the problem of varying patent scope in different countries. In considering ten countries other than the "big four" patenters, one finds patent applications in the "typical" APEC country look as follows:

APEC Patents by Country of Filer in 10 Technology-Importing Economies, 1990
(percent of total)

United States	38.6
Japan	14.0
Domestic	10.7
Australia	2.2
Canada	0.9
Other foreign	33.6

Allowing for the fact that countries with relatively low levels of patenting probably do not seek many applications outside the domestic market, this probably gives a fairly good picture of the relative contribution of various countries to overall technological effort in the APEC region. If one considers that pirated technology from overseas is not always matched by a corresponding patent application from the inventor, then the share of foreign technological effort in general, and U.S. technological

effort in particular, in APEC's overall development is necessarily greater than that indicated. By the above indicator, total exportable U.S. technological output in 1990 was 2.76 times the size of exportable Japanese technological output. For comparison, U.S. population, GDP, and manufacturing GDP (the latter two valued on a World Bank Atlas basis) were 2.02, 1.73, and 1.07 times the Japanese level respectively. This reflects the higher level of research productivity in the U.S. economy, also manifested in the chronic surplus in the U.S.-Japan bilateral technology trade balance. In 1995, for example, U.S. receipts of royalties and license fees from Japan were about \$5.34 billion, versus U.S. payments to Japan of \$1.47 billion.

This surplus would be even greater if it were easier for U.S. firms to make direct investments in Japan - the share of U.S. technology receipts from Japan not accounted for by U.S. affiliates is a relatively high 28 percent, as compared to 16 percent for receipts from other countries.

By contrast, Park's data on the 1990 distribution of patent applications filed in each of the four major APEC technology sources reduces to the following:

Patents filed in	Patents originating from (percent of total)					Other foreign
	Domestic	USA	Japan	Australia	Canada	
USA		52.1	---	21.9	0.8	2.2 24.8
Japan		89.5	5.2	---	1.2	1.2 6.0
Australia		26.2	32.7	7.2	---	2.0 31.9
Canada		8.3	44.4	11.7	1.6	--- 34.5

In the United States, the share of patents filed by U.S. inventors is only modestly higher than the total share of U.S. patents in the technology-importing markets, reflecting a reasonable preference of U.S. inventors for patenting at home. In Japan, by contrast, it is particularly difficult for any foreigner to get a patent. Given the U.S. lead in the overall volume of patentable inventions, it is striking that the share of patent applications filed in Japan and of U.S. origin, is less than one-quarter the share of patent applications filed in the United States and of Japanese origin. One expects the reverse situation - the Japanese net importation of technology in value terms, as reflected in licenses and royalties, should be reflected in a large share of patents filed in Japan being of U.S. origin.

The data thus suggest that either Japanese patent laws, or the patenting behavior of Japanese firms, creates a non-tariff barrier to trade in disembodied technology. This reduces U.S. firms' technology rents in the Japanese market, and perhaps in similar markets with Japanese-style rules and behavior. Park's account of the Japanese patent system and practices outlines how this takes place in practice. One reasonable interpretation of this state of affairs is that while Japan has now graduated to the stage of being a net technology exporter relative to most of APEC, its institutions still reflect its historical position as a net technology importer relative to the United States, with a system designed to facilitate imitation of U.S. (and to a lesser extent, European) technology even at some potential cost to the ability of emerging Japanese inventors to secure enforceable rights on their own innovations.

In contrast with this institutional analysis, both the Ginarte/Park index of patent rights for 1995 and the older Rapp and Rozek index (which covers more countries) reflect a fairly clear demarcation between developed and developing countries in terms of overall strength of patent rights, with Japan looking like the former group. As Park notes, the tension between his numerical scoring of Japan as

having strong IPRs and his institutional analysis of the Japanese system as potentially engendering NTBs is based on the reliance of the numerical scores on *de jure* features of the patent system, while the institutional analysis uncovers issues of *de facto* implementation.

The dichotomy between developed- and developing-economy APEC members is easily explained in economic terms. As Park recognizes, any patent regime must balance the gains of increased patent protection in terms of accelerated technical progress against the losses associated with the monopoly position of the patentee and the relative lack of competition. An MFN strengthening of IPRs in APEC's weak IPR countries will boost the incentives to research worldwide. By cutting off technological imitation, this will raise the price of some goods, with costs for consumers. Poorer countries are further down the product cycle, and can more readily produce imitative goods with mature technologies than engage in competitive innovation with the developed countries. Indeed, these countries already pay a substantial amount for international licenses and royalties (Evenson (1990)). Moreover, developing countries tend to be net importers of high-tech goods and in the short run may benefit from the option of buying cheaper imitation varieties of these goods. Thus, there tends to be a dichotomy between the interests of developed countries and developing countries, with the former desiring strong IPRs in order to earn greater rents from innovation with the latter disproportionately enjoying the benefits of imitation and competition (Chin and Grossman (1990), Deardorff (1992)).

In current APEC discussions, the developing members have elevated the issue of TRIPS implementation and technical assistance. They have argued, so far effectively, that the task of TRIPS implementation is so great as to preclude the taking up of new issues raised by the United States. These issues include the granting of rights for new technologies, particularly those based on information or biotechnology, which are still unpatentable in many countries.

The Japanese system is not "weak" in the same sense that the systems in developing APEC countries are said to be weak. The Japanese system maintains a substantial legal and administrative apparatus for processing both patents and patent disputes, and handles twice as many applications every year as the U.S. system. One main reason for this is the narrowness of scope of Japanese (and Korean) patents, which makes it easier for inventors to file claims for non-infringing close substitutes than in the U.S. system. Narrowness is partly induced by law and partly by the behavior of patent examiners, but it is essentially set by government. Under a narrow-scope system, the rents earned by any individual patentee are smaller than under a broad-scope system. Setting narrow scope leads to two of the private practices which Park discusses, patent flooding (in which competitors file numerous patents for minor modifications of the original invention to limit its scope) and patent blocking (the original inventor's defense against flooding, in which the inventor files the minor modifications simultaneously with the original).

Interestingly, when patent systems are operated on an MFN basis foreign firms may adopt the strategic practices in the local market. Park documents that Korean firms "flood" the Japanese patent authority with applications which surround valuable Japanese patents. U.S. firms seem not to do this very often. This may be attributable to the relative positions of the United States and Korea in the product cycle; it pays U.S. firms more to seek protection for their already existing inventions than to drain rents from Japanese inventions. Moreover, the barrier to entry imposed by the requirement that applications be filed in Japanese (the U.S. accepts foreign-language applications contingent on their eventual translation, which aids in establishing priority) and the non-recognition of foreign lawyers in

Japanese patent court are probably easier barriers for Korean than U.S. patenters to surmount, given historical circumstances.

Park's characterization of patent systems APEC-wide identifies several other features which, when contrasted with the U.S. system, either facilitate imitation or tend to reduce the rents obtainable from any patent eventually granted. About half of APEC, including the United States, publish patents upon grant, maintaining secrecy in the interim. The other half, including Japan, publish the application 18 months (or less) after application, making the information public. The United States, Australia, Canada, and China maintain the doctrine of equivalence, which effectively increases the scope of existing patents by permitting infringement suits against inventions which are substantially equivalent to the patented invention even if the equivalent inventions are not explicitly referenced in the patent. Many APEC countries, including Canada, Australia and Japan, provide for compulsory licensing, which forces patenters to share rents with local rivals. Compulsory licensing tends to transfer rents from technology-exporting to technology-importing countries, while in countries with a strong innovative base it may aid in facilitating collusion. Some non-U.S. APEC economies permit firms to legally oppose patent applications, in effect suing for infringement before the patent is even granted. This tends to favor incumbent firms over innovative entrants in general and domestic incumbents over foreign innovators in particular. While several countries permit opposition 2-6 months after the grant, Japan's system of pre-grant opposition provides the strongest protection for incumbent firms against innovators.

Measures which create barriers to entry for foreign innovators, or which transfer rents from innovators to imitators, tend to operate against the interest of U.S. producers, but may be understandable from the particularistic interest of developing countries wishing to benefit from low-cost imitation or to protect incumbent firms. Such measures make increasingly less sense as economies deepen their national technological capacities, and graduate from imitator to innovator status. It is striking how many provisions of the patent systems in Japan, Australia, and Canada tend to facilitate imitation at the expense of innovation, imposing costs not only on U.S. inventors but on the more innovative firms in those economies as well. Given the rapid expansion of technological capacity and education throughout the APEC region, the pool of potential innovators within each economy will grow ever larger, with those innovators probably benefiting under regimes converging toward the U.S. model with less dynamic incumbent firms preferring the status quo.

Given this set of facts, it makes sense for the United States to broaden the discussion of intellectual property in APEC, arguing that in the long run the development interests of the region are served by a mix of national systems which place progressively more weight on innovation while continuing to recognize some legitimate differences of national interest within the region. Patenting institutions which generate large numbers of applications relative to the economic value of those applications are inherently inefficient, generating rent-seeking behavior of primary benefit to lawyers and bureaucrats. The current bilateral barrier to services trade in patent law between the United States and Japan (the U.S. permits foreign patent lawyers only on a reciprocal basis) is an issue which links the APEC goal of reducing service-oriented barriers with IPRs; it would be interesting to know how many other APEC economies besides Japan maintain a similar barrier. Indeed, permitting APEC-wide free trade in patent lawyer services would represent a concession by the United States in terms of the services themselves, since Japan currently must hire U.S. lawyers to file tens of thousands of applications at the U.S. Patent and Trademark Office annually, and those lawyers' income would decline under free trade in their services. But the increase in U.S. technology income which could

result from permitting U.S. innovators to use their accustomed counsel in the Japanese system could well offset these losses.

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Comments by Richard Brown¹ on

**“Measuring Trade in Impediments to Services within APEC,” by
Malcolm Bosworth, Christopher Findlay, Ray Trewin, and Tony Warren**

The authors discuss methods of deriving partial equilibrium estimates of the effects of impediments to trade in services, examine the use of partial equilibrium estimates as means of benchmarking, and outline a seven-step approach to measuring the impact of impediments to services trade. The authors identify and discuss Australian impediments to trade in telecommunication services, and outline how the seven-step approach could be used to derive a price-impact measure of the effect of these impediments. Further, the authors highlight areas for future work, most importantly work that would assess the trade-impeding impact of foreign direct investment measures. In developing this paper, the authors drew on previous work performed for the Pacific Economic Cooperation Council and ongoing work by the Australian Industry Commission, the Australian National University, and the University of Adelaide.

The authors begin by defining impediments to services trade as a “comprehensive set of service related regulations or practices that distort an economy’s efficient allocation of resources, including those that may cause an increase in the volume of trade and investment.” This broad definition is appropriate as it comprehensively captures the nature of impediments to trade in services, including market access and national treatment restrictions, and applies to all modes of delivering services (i.e., cross-border flows, consumption abroad, commercial presence, and movement of individual service providers). The authors proceed by discussing alternative means of measuring impediments to trade in services and, in the process, indicate a preference for price-impact measures. Price impact measures examine an impediment’s effect on domestic prices.

The authors then proceed to outline and briefly discuss the seven-step approach method. These steps include:

- 1) rigorously defining the service industry/service activity using Central Product Classification (CPC) codes and International Standard Industrial Classification (ISIC) codes;
- 2) comprehensively identifying specific impediments to trade;
- 3) identifying the impact of each impediment on prices;
- 4) determining the relevant “price wedge,” which the authors identify as the difference between the actual price in the domestic market, shaped by industry structure and regulation, and the price in a market without trade or investment impediments (a benchmark market);
- 5) identifying the appropriate benchmark market, with the preferred benchmark market being the theoretical perfectly competitive market (i.e., one in which prices would track long run marginal cost);
- 6) decomposing the wedge to identify the price impact of specific impediments and other factors; and
- 7) incorporating price-impact figures into a general equilibrium model to assess the effect of impediments on the overall economy.

¹The author is with the Office of Industries of the U.S. International Trade Commission. These comments are solely meant to represent the opinions of individual authors. They are not meant to represent in any way the views of the U.S. International Trade Commission or any of its individual Commissioners or the U.S. government.

Before commencing the discussion of Australian impediments to telecommunications trade, the authors acknowledge the importance and the difficulty of measuring restrictions on foreign direct investment, as this is an important means of delivering services. The authors note problems regarding the identification, transparency, and quantification of impediments to foreign direct investment, and thus the difficulty of assessing their impact on prices and national economies.

The authors then proceed to demonstrate how the approach outlined above could be used to measure the impact of Australian impediments on international calling. In defining the industry, the authors note the deficiencies of both the CPC and ISIC codes, and instead rely on the Industry Commission's definition of international calls. The Industry Commission defines international calls as those involving a system of country-to-country telecommunications links which are jointly operated by the international carriers of each country, and two domestic components connecting the call to an international gateway. This seems an adequate definition for the immediate purpose of assessing the impact of telecommunications reform in Australia.

However, the authors' approach could be applicable to more APEC countries if they narrowed the scope of their examination to international voice services (CPC 7521). This may benefit examinations of certain countries by allowing the authors to identify and consider only those trade impediments and investment restrictions that pertain to international voice services, rather than other basic and value-added services provided over international circuits. In addition, restrictions on the provision of international voice services on a facilities or resale basis, or through various network technologies (e.g., wireline, cellular, microwave, satellite, etc.), are now specified in the WTO's supplementary basic telecommunication schedules, which would further ease the task of identifying impediments. The disadvantage of narrowing the scope in the proposed manner is that data on telecommunication services is not available on a subsector-by-subsector basis. The authors may also wish to consider how the increasing use of refiling, call-back, and country-direct services affects the pricing and volume of international calling in Australia and other APEC countries.

With respect to identifying specific Australian impediments to trade in telecommunication services, the authors identify:

- 1) past discriminatory practices that stemmed largely from Australian operators' control of the installation and maintenance of line links for the provision of all public telecommunication services;
- 2) past and current foreign investment caps on Telstra, Optus, and Vodafone; and
- 3) past and current adherence to the international accounting rate system.

The authors then reasonably argue that two companies' exclusive control over line links through July 1, 1997, and adherence to the international accounting rate system increased the price of international calling in Australia. They note that the price impact of foreign investment restrictions is not clear.

The authors identify a price wedge stemming from duopolistic control of line links, restrictions on foreign investment, restrictions on the entry of foreign technical "specialists," and continued adherence to the international accounting system. The authors' contention that these first three factors result in a price wedge appears reasonable. However, Australia's adherence to the international accounting system would seem to have little bearing on the existence of a price wedge as all countries adhere to this system. Observance of the system would not keep Australia from representing the "best practice" market.

The authors proceed to generate certain benchmark costs on the basis of OECD and ITU data. The work to date appears to end with the calculation of revenue-expenditure wedges, ranked by revenues in one instance (figure 8), and by wages in another instance (figure 9).

The authors have developed an ambitious, but reasonable, approach to measuring the impact of impediments to trade in services. This is a noteworthy achievement as it focuses on a sector of the economy that accounts for 60-70 percent of GDP and 70-80 percent of private sector employment, at least in most developed economies. The authors have also clearly identified the need for more service industry and trade data, and for more work to be conducted in the area of foreign direct investment.

SESSION VII

PUBLIC PRACTICES

Liberalizing Government Procurement in the APEC Nations¹

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Abstract:

In recent years East Asian nations have increased their expenditures on infrastructure projects, raising the concern that biased government procurement policies are retarding the growth of imports. The effect of central government procurement policies on bilateral imports was estimated using 1990 data from fourteen APEC nations. These estimates were used to forecast the percentage increase in the imports of a nation whose government unilaterally decides to cease discriminating against the foreign suppliers of tradeable goods. The forecasted increases were larger in nations where the ratio of government spending on tradeable goods to that nation's private sector spending on tradeable goods was larger. Given that this ratio differs significantly across the fourteen APEC nations studied, the percentage increase in imports due to liberalizing government procurement policies varies from approximately one per cent for Australia, Canada and the United States to approximately twelve per cent for Indonesia, Malaysia and Singapore.

¹ I would like to thank Jeff Bergstrand, Warwick McKibbin, Tom Prusa and Maurice Schiff for their helpful comments and criticism. All remaining errors are my own.

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1. Introduction

Two tendencies highlight the importance of quantifying the effects of government procurement policies on trade flows. First, the desire by several APEC nations to integrate their economies into the world trading system through a combination of unilateral and plurilateral liberalization initiatives. Secondly, in attempt to sustain their nation's high rates of economic growth, many East Asian governments are expanding their spending on infrastructure projects. These two tendencies begs the question: to what extent has the failure to liberalize government procurement policies offset the progress made in opening these economies to increased trade flows?

In this paper two mechanisms by which government procurement policies depress trade flows are considered. In the absence of these policies increased government spending (on tradeable goods) would have increased the demand for imports as some contracts are likely to have been awarded to foreign suppliers. This direct effect on the demand for foreign goods is augmented by the following indirect resource effect. In the absence of these policies, had some contracts been awarded to foreign firms then the amount of societal resources forgone to meet the nation's additional government expenditures would have been smaller. Since some of those forgone resources could have been used by domestic firms to produce exports, these policies reduce the nation's exports too.

This study examines the effects of government procurement policies on the bilateral imports of fourteen APEC nations in 1990. A well-known theory of bilateral import flows is modified to take into account the effects of government procurement policies, which restrict the purchase of tradeable⁴ goods to domestic suppliers. This conceptual framework is confronted with data, and the resulting statistical estimates are used to forecast the percentage increase in a given nation's imports resulting from a unilateral decision by that nation's government to buy tradeable goods from foreign and domestic suppliers in a non-discriminatory manner.

The central finding is that the forecasted increases in imports are higher in those nations where eliminating government procurement policies results in a higher percentage increase in the overall demand for tradeable goods. Alternatively put, eliminating a biased government procurement policy will result in a higher percentage increase in imports in nations where the ratio of the government's spending on tradeable goods to the private sector's spending on tradeable goods is higher. This ratio differs substantially across the fourteen APEC nations studied here. Unilateral liberalization of government procurement policies are forecasted to raise Australia's, Canada's and the United States' imports by approximately one per cent; whereas it would raise Indonesia's, Malaysia's and Singapore's imports by approximately twelve per cent in 1990. These forecasts for 1990 will understate the restrictive effect of these policies in 1998 in those nations where the recent growth of their government's spending on tradeable goods has exceeded the growth of their private sector's spending on tradeable goods.

⁴ A "non tradeable" good or service is a good that due to their characteristics of the good is only traded in the nation in which it was produced. Haircuts are an example of a non-tradeable good. A "tradeable" good is one that can be sold in market outside the nation in which it is produced. Whether a "tradeable" good is indeed "traded" (sold to a purchaser outside the nation in which it was produced) depends on a host of factors, such as transportation costs, tariffs and non-tariff barriers (like government procurement policies.)

Turning to the political economy of trade policy liberalization, if policymakers are keen to adopt liberalization packages that minimize the “disruption” (or percentage increase) of imports, then this study’s findings imply that the APEC nations are unlikely to reach a plurilateral agreement that results in each nation’s government spending similar proportions of their expenditures on tradeable goods supplied by foreign firms. Those national governments whose expenditures on tradeable goods are higher (relative to their respective private sector’s spending on tradeable goods) will want to liberalize their procurement policies at a slower rate, so as to minimize the “surges” in imports.

This paper is organized as follows. The related institutional and theoretical literature are discussed in the next section. The conceptual framework is described in the Section Three. The estimation strategy, data employed, estimating equation and results are described in Section Four, as are the forecasted increased in imports that would result from a nation’s unilateral liberalization of its government procurement policies. The implications of the empirical findings for the likelihood, and pace, of such liberalization are discussed in Section Five.

2. Institutional and Theoretical Considerations

Hoekman (1995) has noted that several objectives lead governments not to buy goods and services from the lowest cost supplier, irrespective of the location of the supplier. Specifically, “these [objectives] may include a desire to promote the development of domestic industry or technology; support particular types of enterprises (e.g. small- and medium-sized firms); or safeguard national security.”⁵ In an attempt to meet these objectives governments employ an arsenal of policy instruments to reduce the procurement of foreign-supplied goods by state, and private sector, entities. These policy instruments include offering price preferences to domestic suppliers; demanding that foreign suppliers meet higher cost and safety standards than domestic suppliers; direct bans on bidding or purchases from foreign suppliers; and imposing domestic-content requirements on domestic bidders for government contracts.

As Hoekman (1995) and Mattoo (1996, 1997) have argued, there is a presumption that the effect of these policies is to increase government expenditure, and reduce imports, national and world welfare. Interestingly, theoretical analysis of the effects of these policies effects have identified some circumstances where such policies have no effect on imports and national welfare (Baldwin and Richardson (1972), Richardson (1972) and Miyagiwa (1991)); and other circumstances where such policies might actually raise the welfare of the nation with the discriminatory procurement policies (McAfee and McMillan (1989)). Whether these logical possibilities are relevant to studying actual procurement policies; and whether the potential welfare gains from implementing these policies are large, are empirical matters. Indeed, in his assessment of the literature, Mattoo (1996) concludes that “the design of optimal⁶ discriminatory policy is difficult, and, in any case, the gains are unlikely to be large. Most seriously, the legitimisation of discrimination may lead to adverse political consequences, both at the national and international level, which outweigh the potential gains.” A detailed survey of the empirical estimates of the effect of these policies on imports and national welfare in a partial-equilibrium setting is found in Francois et. al. (1997).

⁵ Hoekman (1995), page 1.

⁶ That is, welfare-enhancing.

Conceptual Framework

Motivation and Assumptions

When studying the economic effects of a particular policy instrument it is customary to develop a theoretical framework that generates a relationship between the existence, or magnitude, of the given policy instrument and an economic variable of interest. Naturally, quantifying the effect of this policy instrument requires empirical counterparts to each of the variables in the predicted relationship. Two major problems emerge when this methodology is applied to quantifying the effects of government procurement policies. First, such policies involve a large number of policy instruments (or actions) that could plausibly affect the amount of goods supplied to governments by foreign firms, and empirical counterparts for them all may not exist.⁷

Secondly, governments have different methods for buying goods, such as purchases from markets and tendering. Previous theoretical research has demonstrated that the magnitude and direction of the effects of procurement policies on trade flows depends crucially on whether the market is perfectly competitive; the nature of any strategic interaction between firms; the share of total expenditure on the good accounted for by government expenditures; and on the characteristics of the tendering process⁸. Even if unambiguous predictions had emerged from theoretical analysis, an enormous amount of data would be required to implement this methodology at the disaggregated level.

In order to develop a tractable conceptual framework that yields predictions of the overall effect of these policies on a nation's imports, a modified version of this methodology is employed. Rather than examine the effect of each policy instrument separately, the maintained assumption is that together these policy instruments ensure that the government in question does not buy any tradeable goods from foreign suppliers. Consequently, the empirical analysis does not turn on the number, or nature, of these policy instruments but on the share of the nation's Gross Domestic Product (GDP) that its government spends on tradeable goods.

Formally, Anderson's (1979) model of bilateral trade flow determination in the presence of non-tradeable goods is modified to incorporate a government that buys both tradeable and non-tradeable goods. Denote:

⁷ For example, foreign firms may be at a disadvantage when bidding if they expect that the probability that the government will pay for any ex post cost-overruns is lower for them than for domestic firms. What observable could proxy for this unobservable policy instrument? Mattoo (1997) examines the effects of "bail out" policies that discriminate between domestic and foreign firms.

⁸ Baldwin and Richardson (1972), Richardson (1972), Miyagiwa (1991).

M_{ij}	Volume of nation i 's imports purchased from nation j
Y_k	GDP of nation k , $k \in \{i, j\}$
Y_w	World GDP
ϕ_k	Share of nation k 's private sector spending on tradeable goods, $k \in \{i, j\}$
θ_k	Share of nation k 's GDP that is spent on tradeable goods, $k \in \{i, j\}$
τ_k	Share of nation k 's GDP that is paid in lump sum taxes by the residents of nation k , $k \in \{i, j\}$
g_{kn}	Share of nation k 's GDP that is spent by nation k 's government on non-tradeable goods, $k \in \{i, j\}$
g_{kt}	Share of nation k 's GDP that is spent by nation k 's government on tradeable goods, $k \in \{i, j\}$

The following assumptions are made:

- A1 Other than government procurement policies, trade is free of all other impediments.
- A2 Each nation's trade is in balance.
- A3 Each nation's government budget is in balance.
- A4 Each nation's private sector has identical homothetic preferences.
- A5 Each good is produced in only one nation. (The Perfect Specialization Assumption.)

Helpman (1987) has demonstrated how to relax the assumption that each nation's trade is balanced. Although this relaxation alters the theoretical determinants of import flows, Helpman (1987) and Hummels and Levinsohn (1995) report that incorporating trade imbalances into the empirical approach did not alter their qualitative conclusions. Given that a trade imbalance implies that a nation's total expenditure differs from its total income, and that a government budget deficit or surplus implies that the government's total expenditure differs from its total income, Helpman's derivation of trade flows in the presence of trade imbalances could be reformulated to examine the case of government budget deficits also.

Deardorff (1997) has demonstrated, under certain conditions, that the assumption of Perfect Specialization is not needed to generate the class of so-called frictionless gravity equations, of which the theoretical relationship derived below is a member. Before concluding that assumption A5 is too strict, it is worth noting that Deardorff's formulation assumes that consumers randomly choose over suppliers of the same good, which may seem to some as stretching credulity too far. In the same framework, Deardorff relaxed the assumption of identical homothetic preferences⁹.

Whereas Anderson (1979), Bergstrand (1985, 1989) and Deardorff (1997) include international transportation costs in their derivation of the determinants of trade flows, only the first two authors give an explicit role to tariffs in their theoretical derivation.

⁹ Hunter and Markusen (1988), Hunter (1991) and Markusen (1986) also analyze the effects of non-homothetic preferences on trade flows. Bergstrand (1985)'s formulation assumed that domestic varieties of a good were closer substitutes for one another, than any imported variety was with any one domestic variety.

Derivation

Anderson (1979, section II) considered the case where the share of GDP accounted for by tradeable goods differed across nations and where there was no government spending or taxes, ie. $\forall k \quad \tau_k = g_{kt} = g_{kt} = 0$ and $\phi_k = \theta_k$. He demonstrated that:

$$(1) \quad M_{ij} = \frac{\theta_i \theta_j}{\sum_i \theta_i \left(\frac{Y_i}{Y_w} \right)} \cdot \frac{Y_i Y_j}{Y_w}$$

Now suppose that each nation's government raises lump sum taxes and spends this amount entirely on tradeable and non-tradeable goods, $\forall k \quad \tau_k = g_{kt} + g_{kn}$. Furthermore, assume that in each nation the government has the same preferences over tradeable goods as the private sector, and thus does not discriminate between foreign and domestic suppliers. In this case, the share of nation k 's GDP spent on tradeable goods is the weighted average of the share spent by the private sector (ϕ_k) and the share spent by the government (g_{kt}/τ_k). Specifically,

$$(2) \quad \theta_i = \phi_i(1 - \tau_i) + g_{it}$$

Unlike the Anderson (1979, section II) model, the allocation of a nation i 's GDP between the private sector and the government, as well as the expenditure shares ϕ_i and (g_{it}/τ_i) , determine nation i 's overall expenditure share on tradeable goods, θ_i . Like Anderson's (1979, section II) model nation i spends in total $\theta_i Y_i$ on tradeable goods in a non-discriminatory manner. Furthermore, since the government of nation j (one of nation i 's trading partners) buys goods in a non-discriminatory manner, all of nation j 's tradeable good output $\theta_j Y_j$ can be sold on domestic and international markets. Taken together, with the assumptions above, this implies that the total value of nation i 's imports from nation j is given by (1). In sum, the introduction of a non-discriminatory procurement policy will raise (lower) imports when a government spends a larger (smaller) share of its income on tradeable goods¹⁰.

In contrast, now assume that each government only buys tradeable goods from its own nation's producers, ie. $\forall k \quad g_{kn}=1$ and $g_{kt}=0$. This has two implications. First, although the share of domestically-produced tradeable goods output in GDP is given by (2), the share of GDP that is spent on tradeable goods in a non-discriminatory manner equals $\phi_k(1 - \tau_k) = \theta_k - g_{kt}$. From the assumption of identical homothetic preferences, the share of every foreign-produced tradeable good consumed by nation i in equilibrium will equal the nation i 's share of world expenditure on tradeable goods, or

¹⁰ In his comments on this paper, Bergstrand provides an extensive derivation of these arguments. Bergstrand's derivation, which is based on the assumption that each government's expenditure share on foreign produced tradeables is non-negative, is not to be confused from the derivation which is derived on the assumption that the government's expenditure share on foreign produced tradeables is zero.

$$(3) \quad \frac{\phi_i(1-\tau_i)Y_i}{\sum_i (\phi_i(1-\tau_i)Y_i)} = \frac{(\theta_i - g_{it})Y_i}{\sum_i (\theta_i - g_{it})Y_i}$$

Secondly, after satisfying its own government's purchases of tradeable goods, the producers of tradeable goods in nation j have only $(\theta_j - g_{jt})Y_j$ of output to be distributed across all of the private sector purchasers of tradeable goods. Thus, the total value of nation i 's imports from nation j is given by:

$$(4) \quad M_{ij} = \frac{(\theta_i - g_{it})(\theta_j - g_{jt})}{\sum_i (\theta_i - g_{it})} \cdot \frac{Y_i Y_j}{Y_w}$$

Equation (4) implies that government procurement policies reduce the total value of imports in equilibrium by reducing both the demand for imports, and the value of the goods that exporting nations have available to export. Furthermore, by dividing the expression for bilateral imports in (1) by the expression in (4), the theory predicts that (holding everything else constant) a complete liberalization of

$$100 \left(\frac{\theta_i}{\theta_i - g_{it}} \right) \%$$

nation i 's government procurement policies will raise nation i 's imports by

or $100 \left(\frac{1}{1 - \left(\frac{g_{it}}{\theta_i} \right)} \right) \%$. Thus, the larger is the ratio of government spending on tradeable goods to total national spending on tradeable goods, the larger is the percentage increase in nation i 's imports that results from unilaterally liberalizing its government procurement practices.

4. Estimation Strategy

To assess the accuracy of the theoretical relationship between government procurement policies and imports outlined above, by employing a tight link between this prediction (4) and the reduced form that is taken to with data, the estimation strategy enables the parameter estimates to be interpreted in light of the theory. Thus, unlike many studies of the "gravity equation"¹¹, no attempt is made to include

¹¹ The "gravity equation" postulates that the volume of imports by one nation from another nation is positively related to those nation's GDPs and negatively related to the geographical distance between those two nations. Initially, this postulated relationship had no theoretical foundation, even though it appeared to be an empirical regularity in the data. As noted in the last section, several scholars went on to provide such a theoretical foundation.

other variables which “ought to matter” but which are outside the realm of the theory under consideration.¹²

4.1 Data Employed

Empirical counterparts for all of the variables in equation (4) were found for fourteen APEC nations¹³ in 1990. The value of bilateral imports between each of the fourteen nations for 1990 were collected from the IMF’s *Direction of Trade Statistics*. Eliminating pairs of nations where import data were unreported or missing left 174 pairs. Data on each nation’s GDP in 1990 was collected from the IMF’s *International Financial Statistics Yearbook* (1995). Both the GDP and import data were converted to United States dollars at 1990 purchasing power parities.

The share of GDP spent on tradeable goods in each nation was proxied by one minus the share of service sector output in the nation’s GDP. This proxy was taken from the World Bank’s *World Development Report* in 1996 and the *World Tables* CD-ROM. This proxy will tend to understate the actual share of tradeable goods in nationS where some of its service sector output (for example, financial services) are tradeable. As Table One makes clear the size of the tradeable goods sector substantially differs across the fourteen nations in the sample.

Finding a proxy for government purchases of tradeable goods was more difficult. The IMF’s *A Manual on Government Finance Statistics* (1986) was employed to locate those reported expenditures in the IMF’s *Government Finance Statistics Yearbook* (GFS) that do not include transfer payments, payments for wages, salaries and non-tradeable services. Unfortunately, central government expenditures on different types of goods and services for current consumption were reported together. Fortunately, central government expenditures used to acquire fixed capital assets¹⁴ (other than land) were reported separately. This expenditure is likely to be on goods that are tradeable, such as construction materials, power generators and alike. The ratio of the government’s spending on acquiring fixed capital assets to the nation’s GDP was taken as a proxy for that nation’s spending on all tradeable goods (as a share of national GDP)¹⁵. This proxy for ξ_{it} is reported for each nation in Table One, and again there is substantial variation across the nations in the sample. Furthermore, as reported in the last column of Table One, the ratio of the government spending proxy on tradeable goods to the nation’s overall spending on tradeable goods varies substantially across the nations in the sample. Thus, if the theoretical predictions are borne out in the data, the restrictive effect of the government procurement policies also substantially varies across nations.

¹² For a devastating methodological critique of the empirical studies of the “gravity equation” which include variables that “ought to matter” see Leamer and Levinsohn (1996).

¹³ The fourteen nations were Australia, Canada, Chile, Indonesia, Japan, Korea, Malaysia, Mexico, New Zealand, Papua New Guinea, the Philippines, Singapore, Thailand and the United States of America.

¹⁴ For each nation this spending is reported in line 4 of Table C (“Expenditure and Lending minus Repayments by Economic Type” of the Consolidated Central Government) in the GFS.

¹⁵ To the extent that governments buy some tradeable goods for current consumption, this proxy will understate the actual total government spending on tradeable goods. This implies that the point estimates (presented in the next subsection) of the increase in bilateral imports due to liberalizing government procurement practices are underestimates.

TABLE ONE: GOVERNMENT AND OVERALL SPENDING ON TRADEABLE GOODS

Nation	Government Spending on Fixed Capital Assets as a Percentage of GDP (Proxy for g_k)	Share of Non-Service Sector Output as a Percentage of GDP (Proxy for θ_k)	Ratio of Government to Overall Spending on Tradeable Goods
Australia	0.00421	0.34136	0.01234
Canada	0.00329	0.34349	0.00958
Chile	0.01872	0.45000	0.04162
Indonesia	0.06675	0.60935	0.10955
Japan	0.00771	0.44493	0.01733
Korea	0.00899	0.52130	0.01724
Malaysia	0.06172	0.58000	0.10641
Mexico	0.01119	0.38664	0.02894
New Zealand	0.00859	0.33353	0.02576
Papua New Guinea	0.03518	0.59383	0.05925
The Philippines	0.01286	0.56376	0.02281
Singapore	0.03239	0.37314	0.08680
Thailand	0.02293	0.49770	0.04608
United States	0.00242	0.30089	0.00806

Sources: see text

4.2 Estimating Equation

To estimate the contribution of government procurement policies to the value of bilateral imports, logarithms of equation (4) were taken so that the government expenditure terms were separated from the GDP terms:

$$(5) \quad \ln(M_{ij}) = \ln(Y_i Y_j) - \ln \left(\left(\sum_i (\theta_i - g_{it}) \left(\frac{Y_i}{Y_w} \right) \right) Y_w \right) + \ln(\theta_i - g_{it}) + \ln(\theta_j - g_{jt})$$

As the second term does not vary across nations it was subsumed into a constant. Furthermore, assuming that the observed bilateral imports are mismeasured rationalizes the inclusion of an error term, yielding an unscaled estimating equation:

$$(6) \quad \ln(M_{ij}) = \beta_0 + \beta_1 \ln(Y_i Y_j) + \beta_2 \ln(\theta_i - g_{it}) + \beta_3 \ln(\theta_j - g_{jt}) + \epsilon_{ij}$$

To prevent the estimates from being driven by the scale of $\ln(M_{ij})$ and $\ln(Y_i Y_j)$, both the dependent variable and the first regressor are scaled by the GDP of the importing nation, Y_i . This yields the base specification:

$$(7) \quad \ln \left(\frac{M_{ij}}{Y_i} \right) = \beta_0 + \beta_1 \ln(Y_j) + \beta_2 \ln(\theta_i - g_{it}) + \beta_3 \ln(\theta_j - g_{jt}) + \epsilon_{ij}$$

where the predicted parameter values are $\beta_0 < 0$, $\beta_1 = \beta_2 = \beta_3 = 1$.

Table Two reports the estimated parameters, where a White Correction to the standard errors was performed to take account of heteroskedacity. Although far from perfect, the parameter estimates provide some support for the theoretical prediction under consideration. First, the

estimated parameters β_0, β_1 and β_2 have the correct sign and are statistically significant. Secondly, the parameter estimate for the effect of government procurement policies on bilateral imports (β_2) is very close to its predicted value of one.

In contrast, since the parameter estimate β_3 is statistically insignificant there is no evidence that the effect of a nation's government procurement policies reduces the amount of goods exported. In sum, the parameter estimates provides support for the proposition that biased government procurement policies reduce the demand for imports. There is little evidence that such policies reduce the supply of exports. Given the simplicity of, and restrictive assumptions underlying, the theoretical model it is not surprising that this estimating equation does not account for all of the variation in bilateral imports between these APEC nations.

TABLE TWO: PARAMETER ESTIMATES FOR BASE SPECIFICATION

Parameter	Estimated Parameter Value (White Corrected Standard Error)
β_0	-23.817 (1.662)
β_1	0.722 (0.066)
β_2	0.991 (0.452)
β_3	-0.501 (0.567)
Number of Observations	174
R^2	0.466

4.3 Forecasted Effects of Government Procurement Liberalization

Holding the other determinants of bilateral imports constant, the parameter estimate (β_2) is used to forecast the percentage increase in a given nation's imports resulting from the complete liberalization of its government's procurement policies. Those forecasts, with their ninety-five per cent confidence intervals, are presented in Table Three. For Australia, Canada and the United States, whose government

spending on fixed assets is small compared to the size of their nation's overall spending on tradeable goods sector, the forecasted increases are positive but small (of the order of approximately one percent.) In contrast, the point estimates for the forecasted increases in imports were approximately ten times larger (between eleven to twelve per cent) for Indonesia, Malaysia and Singapore. The forecasted increases for Papua New Guinea and Singapore highlight the importance of comparing the share of government spending on tradeable goods with the total national share of spending on tradeable goods. Both nation's governments spend approximately three and a half per cent of their GDP buying fixed capital assets, yet in terms of percentage changes procurement liberalization in Singapore would raise imports by almost twice as much as in Papua New Guinea. This arises because Singapore's smaller total tradeable goods sector implies that the additional demand for imports created by such liberalization is proportionally larger.

Given the concerns about the quality of the proxy variables noted above, these forecasts should not be taken as extremely precise estimates. Rather they highlight the order of magnitude of, and the relevant factors underlying, the import expanding effects of procurement liberalization¹⁶.

¹⁶ Other important caveats to these empirical results should be mentioned. First, the proxy for government spending on tradeable goods probably only accounts for government spending on capital goods, and not current goods. As noted above, a proxy that includes both types of spending would probably generate higher forecasts. Secondly, the analysis considers only spending by central governments, and not by state and local governments. To the extent that local governments have biased procurement policies too then the forecasts presented here are likely to be underestimates. Analysts who have detailed state and public enterprise spending data could repeat the above empirical strategy and probably obtain more accurate results. Thirdly, to the extent that some nation's procurement practices are less biased towards domestic producers as a result of their membership of the General Agreement on Tariffs and Trade's/World Trade Organization's Government Procurement Agreement, then the forecasts presented here are more likely to be overestimates. See Hoekman (1997) for an account of the operation of this agreement, and its possible effects on the spending behavior of member governments. Fourthly, the conceptual framework adopted here abstracts from the macroeconomic effects of liberalizing procurement practices on the trade balance, current account and exchange rates. As such, the forecasts present above should be thought of as estimates of the long run, rather than the short run, impact on imports.

TABLE THREE:**PREDICTED INCREASES IN BILATERAL IMPORTS DUE TO LIBERALIZING GOVERNMENT PROCUREMENT PRACTICES**

Nation	Point Estimate for Percentage Increase in	95% Confidence Interval	95% Confidence Interval
	Bilateral Imports	Lower Bound	Upper Bound
Australia	1.369	0.144	2.594
Canada	1.055	0.250	1.999
Chile	4.509	1.070	8.545
Indonesia	11.675	2.770	22.125
Japan	1.784	0.432	3.381
Korea	1.811	0.430	3.432
Malaysia	11.953	2.836	22.652
Mexico	3.150	0.747	5.970
New Zealand	3.111	0.738	5.895
Papua New Guinea	6.578	1.561	12.466
The Philippines	2.427	0.576	4.600
Singapore	11.093	2.632	21.023
Thailand	5.079	1.205	9.625
United States	0.944	0.224	1.789

Unless there is a substantial amount of spending on tradeable goods by non-central government bodies, or by government-owned enterprises (that follow the central government's procurement policies), Australia, Canada, Japan, Korea and the United States are unlikely to experience large import surges due to liberalizing procurement practices. However, such liberalization by those South East Asian nations whose government spending on tradeable goods is larger share of overall demand for tradeable goods, will result in larger percentage increases in imports.

5. Policy Implications

Given that complete liberalization of government procurement practices will lead to asymmetric increases in imports across APEC nations, what does this imply about both the likelihood that such liberalization occurs in the first place, and for the unilateral or collective nature of such liberalization? If policymakers prefer liberalization initiatives that do not lead to significant surges in imports¹⁷ (or large redistributions of income) then two implications follow from the empirical findings presented above. First, if liberalization proceeds in a unilateral fashion, (say) as part of a nation's Individual Action Plan, then those nations that are currently spending (or plan to spend) larger proportions of their GDPs on infrastructure projects (and other tradeable goods) are likely to want to liberalize more slowly. Secondly

¹⁷ Presumably the existence of the "escape clause" in United States (and international) trade law is an indication that policymakers are concerned about (at least temporarily) remedying the effects of import surges.

a plan to liberalize procurement practices collectively, whose objective is to ensure that each nation purchases approximately the same proportion of tradeable goods from foreign suppliers, is unlikely to obtain the unanimous consent of APEC members.

Disagreement over the appropriate pace of unilateral liberalization, and over the extent of any collective agreement to liberalize, is likely to ensure this remains a controversial policy issue. Furthermore, should spending on infrastructure spending (and other tradeable goods) rise as East Asian nations enter their next stage of economic development, this issue is likely to become even more contentious as reform-minded nations perceive greater forgone export opportunities, and nations opposed to reform expect such liberalization to generate large import surges.

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State Trading in Agriculture: An Analytical Framework

By

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Abstract

This paper highlights some of the recent concerns regarding agricultural state trading enterprises (STEs) and proposes an analytical framework to examine the trade impacts of such entities. Issues associated with discriminatory pricing, exclusive rights to sell and purchase commodities, and unfair competitive advantage vis-a-vis private traders are expected to be major concerns on the export side, while on the import side, the relevance of tariffification in the presence of STEs is being questioned. Our paper proposes that, in most instances, tariff equivalents are the most relevant methodology to quantify the trade impacts of agricultural STEs. But, obtaining empirical information that would enable the calculation of such measures is not an easy task. To that end, a classification scheme which highlights the different types of STEs in terms of their ability to distort trade is proposed. Quantification can then focus on those most likely to impact trade.

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STATE TRADING IN AGRICULTURE: AN ANALYTICAL FRAMEWORK¹

The Uruguay Round of GATT (General Agreement on Tariffs and Trade) negotiations made substantial progress in reducing barriers to agricultural trade in the areas of market access, export subsidies, domestic support, and phytosanitary measures. Even as the implementation of the Uruguay Round agreement advances, several issues have come to the forefront as “unfinished business.” One of the key focal points likely to emerge for future negotiations is that of state trading enterprises (STE).

The issue of state trading is as old as the GATT. The topic was intensively debated at the time of the Preparatory Committee meetings for the Havana Conference. Some countries at that time wanted to clip the wings of state trading enterprises, but the opportunity was lost. Too many countries relied on parastatals for their control on trade. The GATT rules that emerged merely tried to impose criteria for the performance of state trading enterprises.

This document represents our effort to stimulate discussions on the economics of state trading. The paper defines and raises concerns about terminology, discusses the importance of the topic, identifies major areas of policy concern, and discusses the suitability of existing analytical tools to study the issue. A number of country examples are used to advance the arguments. These examples highlight the practical difficulties that policymakers and negotiators are likely to face in designing policies and developing disciplines that are acceptable from a multilateral perspective.

II. What is state trading?

The literature includes several definitions of state trading (Lloyd, 1982). Much of the early focus was on state conduct of foreign trade (Hazard, 1959), on the practice of governments monopolizing foreign trade (Baldwin, 1970), and on the role of institutions wholly or partly owned by the Government (Ghai, 1973). These concepts gradually gave way to a functional definition, with Kostecki (1982) arguing that state trading occurs when a government or a government-backed agency determines the essential terms (including prices or quantities) on which exports and imports have to take place. Kostecki's characterization emphasized the role of government control rather than the creation of specialized institutions, since it is primarily the direct control that makes state traders behave differently from private entrepreneurs. Sorenson (1991), picking up on this theme, asserted that both market control and the impact that governments exercise over individual transactions are relevant. He argued that state trading exists when a government, an agency of the government, or an institution granted exclusive rights by the government, controls trade or materially affects the conditions of trade on a *transaction by transaction basis*. Sorenson's definition suggests that use of tariffs, quotas, and other traditional trade instruments does not constitute state trading, though trade by government-chartered marketing boards with monopolies would.

¹This publication is an out-growth of a brainstorming session on state trading that was held at the Economic Research Service, USDA on November 4, 1996. The authors would like to thank those individuals who participated in the workshop and reviewed the papers, especially Karen Ackerman who assisted in various phases of the project.

Departing from the functionalist approach, the recently concluded Uruguay Round of GATT negotiations adopted largely an institutional approach to state trading, defining STEs as *“governmental and nongovernmental enterprises, including marketing boards, which have been granted exclusive or special rights or privileges, including statutory or constitutional powers, in the exercise of which they influence through purchases or sales the level or direction of imports or exports.”* (WTO, 1994). Under this revised definition, WTO country notifications² on STEs include government agencies, statutory marketing boards, export marketing boards, regulatory marketing boards, fiscal monopolies, canalizing agencies, foreign trade enterprises, and boards or corporations resulting from nationalized industries.³ The U.S. initially acknowledged that the Commodity Credit Corporation was a state-trading organization, and other traders, including Canada, Australia, New Zealand, and Japan have recognized the existence of STEs in their countries.⁴ But, controversy surrounds the characterization of the European Union intervention agencies which manipulate markets but do not directly engage in trade, as well as U.S. marketing orders which may not be STEs in the traditional (institutional) sense but may impact international trade. To date, neither the European Union nor the U.S. have included such agencies/arrangements in their notifications.

Uruguay Round and State Trading

The activities of State Trading Enterprises (STEs) are governed by Article XVII of GATT 1947 which recognizes these entities as legitimate participants in international trade but establishes guidelines with respect to their behavior. The Uruguay Round Agreement did not directly change any of the provisions in Article XVII; instead it includes a Memorandum (Understanding on Interpretation of Article XVII) to clarify the definition and scope of trading activities, improve notification requirements, and facilitate formation of a Working Party on State Trading.

A Working Party was established in early 1995 under the Committee on Trade in Goods to provide a practical understanding of state trading as defined in the Memorandum, and to explore means of ensuring transparency in activities of STEs. The Working Party has met several times, reviewing current notification requirements and considering proposals to improve the existing questionnaire.

There are three key questions raised by the Uruguay Round definition of STEs. First, what is meant by a governmental institution or an enterprise? Is this an industrial organization usage of the term or is there a legal interpretation to it? Large differences exist in the organizational structures and managerial characteristics of trading units established or maintained by the state. At one end of the spectrum might be units fully integrated into government administration (departments, ministries, etc.) and whose day-to-day management is guided by the Government; at the other end might be units that are managerially autonomous even though the Government may subscribe to their capital stock wholly or partially. In between lie many combinations, including STEs that are subsidiaries of parastatal organizations or institutions, where the Government may hold minority shares but exert influence through other means. Second, how does one define exclusive or special rights or privileges? The vagueness of the expression leaves the door open for members to interpret according to their own canons when an enterprise has exclusive or special privileges. Third, must an entity make purchases or sales itself to qualify as an STE?

²Information about STEs and their activities are provided to the WTO on the basis of a questionnaire adopted in 1960. Responses to the questions are called “notifications.”

³Descriptions of activities that portray these parastatal characteristics can be found in WTO (1995).

⁴The U.S. first included the CCC as a state trader in its notification under Article XVII in 1979. The second notification was made in 1995 following the Uruguay Round Agreement. A revised notification in 1997 omitted mention of the CCC.

How does one classify institutions that are not physically involved with sales but contract with exporters/importers or require applicants for permits or licenses to demonstrate that exports meet standards set by them. Several organizations, including the New Zealand Apple and Pear Board, fall into this latter grouping.

Several provisions in Article XVII of GATT 1947 regulate the behavior of these organizations. These criteria were (and are still):

- o. that STEs should be subject to the GATT principle of non-discrimination, and therefore not discriminate among sources of imports or exports (Article XVII (1a));
- o. that they should act on the basis of “commercial consideration” (Article XVII (1b)), with respect to “price, quantity, availability, marketability, transportation, and other conditions of purchase and sale”, and should “afford the enterprises of other contracting parties adequate opportunity in accordance with customary business practice, to compete in such purchases or sales”;
- o. that importing state traders should not grant protection above that given by the bound tariff schedules (Article II (4)), a provision which is strengthened by the general admonition to countries to uphold the provisions of the Havana Charter (Article XXIX). The Article mandated full disclosure of import costs and profit margins of state import firms (Article 31:4), and stated that the agencies themselves must import supplies adequate to meet “full domestic demand” for the product (Article 31:5). The applicability of the Havana Charter in this case has been confirmed by panel findings.

All these requirements can be subject to several interpretations. For instance, does nondiscriminatory treatment entail most-favored nation obligation or national treatment obligation or both (Bernier, 1982)? Similarly, what constitutes commercial considerations, and is the ultimate objective to ensure that STEs act in ways similar to private traders? And, what does prejudice “legitimate” commercial interests imply? Can quantitative benchmarks be established to define these guidelines? Is there a time limit on how long any information can be held as proprietary? The definition of STEs and the interpretation of associated provisions are still matters of discussion among member countries.

III. Why is there so much interest in state trading enterprises?

There are three fundamental reasons why there is so much interest in the activities of state trading enterprises. The first relates to their influence on competition in agricultural markets; the second to the possibility that countries might use STEs as a vehicle to circumvent the disciplines achieved in the Uruguay Round; and, third, the impending accession to the WTO of China and Russia, two countries that use state trading enterprises extensively to regulate international trade. Let us now elaborate on each.

Role of STEs in agricultural trade

That state trading plays a significant role in international agricultural trade is well accepted. Take the world wheat market as an example. More than a decade ago, McCalla and Schmitz (1982) pointed out

that the proportion of wheat trade involving only private traders was small and declining. They argued that 95 percent of world trade in wheat in 1973-77 involved a state trader on at least one side of the transaction and that state trader to state trader transactions accounted for one-third of the trade. Since then, while there have been changes in the world wheat market brought on by the wave of privatization and structural reform programs that would suggest a diminished role for state traders, other developments indicate that the activities of state traders may not have abated all that much.⁵ For instance, though it is true that state trading as existed in the Former Soviet Union (foreign trade enterprises) no longer endures, *prima facie* evidence suggests that most of the republics of the FSU still use organizations that are directly or indirectly controlled by the Government and are akin to state traders. Similarly, with the CCC now considered a state trader, U.S. exports that were supported by EEP (Export Enhancement Program) bonuses during the last decade could be classified as state trading.

Moving beyond the wheat market to agriculture in general, consider the following statistics: in 1995 and 1996, 30 countries notified the WTO that a total of more than 100 STEs in their countries were involved in trade in agricultural products. Sixteen of these countries listed STEs for grains, and 10 reported STEs in dairy product trade. STEs were also reported for cotton, fish, forest products, horticultural products, livestock, meats, oilseeds, distilled liquor, and some tropical products. These statistics are most likely underestimated because the new WTO definition is still subject to interpretation and many member countries have yet to meet their reporting requirements.

Potential for STEs to circumvent WTO disciplines

One of the major breakthroughs in the Uruguay Round negotiations was that, for the first time in almost 50 years, member countries were successful in bringing agricultural trade under the general discipline of the GATT. This meant that many of the provisions and loopholes that had previously made agricultural support possible are now more constrained. Little was done to bring more discipline to state trading organizations through which many Governments provide support to the agricultural sector. The combination of these two developments has generated growing concern that some countries may use STEs--also referred to as single-desk buying or selling agents--to circumvent Uruguay Round commitments.⁶

⁵The diminished role of state traders is most apparent in Latin American countries like Argentina and Brazil, which have dismantled many parastatal institutions during the last decade.

⁶Although STEs may have the ability to circumvent the Uruguay Round Agreement commitments, there is little evidence to suggest that they are in fact doing so.

Among the principal concerns is the behavior of STE exporters who may use their exclusive monopoly and/or monopsony power to engage in unfair trading competition. U.S. producers, for instance, have complained that the Canadian Wheat Board (CWB) subsidizes grain through its pricing policies to their competitive disadvantage. Similarly, the use of subsidiaries by the New Zealand Dairy Board to acquire U.S. dairy quotas and pocket rents has come to the attention of dairy interests in the United States. Thus, political pressures to bring state trading to the forefront of policy debates have been growing in the U.S., and both the Administration and the Congress have initiated actions to address these concerns.⁷

The Agreement on Agriculture and STEs

There are several references to state trading in the Agreement on Agriculture: the definition of nontariff barriers subject to conversion to tariff equivalents includes nontariff measures maintained through STEs; export subsidy disciplines are applicable to governments and their "agencies"; and, when providing information to the Committee on Agriculture regarding implementation, WTO members are asked to explain the administration of market access and export subsidy commitments, including details about STEs and their relevant activities. In addition, Japan agreed to sets limits on the price mark-up that the Japanese Food Agency could establish for stipulated commodities. The Agreement, however, is much less explicit with regards to disciplines on export credits and other subsidies administered through state trading organizations.

Accession of China and Russia

The impending accession to the WTO of China, Russia, and Taiwan has generated considerable nervousness in the international trading community. All three countries use parastatal organizations to conduct the basic tenets of domestic policy. The lack of transparency in their behavior makes other countries suspicious about the fairness of their trading practices. While it seems unrealistic to assume that these countries would completely subjugate themselves to international norms, it is more likely that they would accede to norms of international discipline as a condition of accession rather than agree to do so afterwards. The global community, it seems, is pushing for more transparency in the practices of existing organizations as well as assurance that new state trading parastatals are not brought to the forefront of the international trade arena.⁸ Both China (vegetable oil) and Taiwan (rice), for instance, are attempting to create new state trading institutions to administer the trade regime (quota) that will emerge from accession to the WTO.

IV. Why do countries pursue state trading activities?

The notifications made to the WTO indicate several reasons why countries pursue state trading (GATT, 1995).⁹ Among most developed countries, the primary motivation for pursuing state trading appears to be to attain domestic policy objectives of income support and price stabilization for producers.

⁷On September 12, 1996, the House Committee on Agriculture held a public hearing on the effects of state trading on world agricultural trade. The Deputy Secretary of Agriculture and two panels of industry witnesses participated. Much of the focus was on the lack of transparency in the operations of STEs.

⁸The fact that some of these countries still engage in barter trade heightens even more the concerns about transparency.

⁹Implicit in all these justifications is the assumption that markets, when left to themselves, will not reach a solution that meets society's goal.

Fulfillment of these objectives, in turn, requires regulations on quantities and prices of traded goods. Hence, prices of commodities in question, are most often “fixed” directly by the STE or by the Government through parastatal organizations. Typically, monopoly/monopsony rights are considered essential if the aim is to insulate the domestic market from foreign markets. In the case of exporting agencies, the focus has been on granting parastatal organizations monopsony power in the domestic market and “single selling desk” authority in international markets. For importers, the policy is reversed, with parastatals having sole purchasing authority in the international market and monopoly selling rights in the domestic market. Because price stability is an integral part of the domestic policy agenda of most developed nations, many parastatal organizations also participate in intervention activities. Hence, management and disposal of stocks is a common feature of these enterprises and government-set targets for reserve stocks are maintained and managed by state trading enterprises. Activities of the Canadian Wheat Board (CWB) among exporters, and the Japan Food Agency (JFA), among importers, would be illustrations of developed country state trading enterprises being used as instruments to attain domestic policy objectives.

Among developing countries, state trading is frequently rationalized as a means to operationalize the cheap food policy (food security obligations) under which retail prices are lower than producer and/or world levels. This policy generally involves taxing producers (agricultural sector) to subsidize consumers (industrial sector) and, as earlier, requires regulations on quantities and prices of traded goods. State trading enterprises are viewed as effective administrative vehicles to execute this domestic policy objective, especially if the goal includes transportation and distribution of subsidized food or agricultural inputs. The practices of the Food Corporation of India and BULOG in Indonesia, both of which have sole authority for domestic purchases of grains and exclusive rights on imports, illustrate these types of functions.

The notifications submitted to the WTO cite several other reasons why countries pursue state trading. Some of these, such as achievement of economies of scale in trading operations (foreign market development and quality control), improvements in terms of trade, fulfillment of international commitments on quantity/price, and credit requirements, can be considered as subsets of the overall objective of income support and/or cheap food policy. Others, such as maintaining public health, providing capital funds to initiate entrepreneurship, rationing of foreign currency reserves, and generating revenue for the treasury may be not be directly related to agriculture but are nonetheless given as reasons for which STEs are initiated.

The notifications do not include information from countries that are not members of the WTO. But, the form of economic organization in some of these excluded countries--China and, until recently, Russia--may be such that state trading is the only compatible form of international interface (McCalla and Schmitz, 1982). Hence, a centrally planned economy with public ownership and/or distribution systems, may find private international trade incompatible with those domestic organization. These countries, therefore, may have little choice but to pursue state trading.

Though not stated explicitly in any of the country notifications, many governments prefer parastatal organizations because these allow them flexibility to carry out political mandates expeditiously. Hence, it is not uncommon to see governments use STEs to implement policies that would otherwise receive parliamentary scrutiny (treasury-financed subsidies). Similarly, state trading is often preferred to taxes/subsidies for redistributing incomes among different groups because it is more convenient and less likely to give rise to political protests. Indeed, it is the covert nature of STE activities that makes them

attractive relative to other policy instruments. For these reasons, any attempt to eliminate STEs in future negotiations is likely to meet with resistance from many member countries.

Policies implemented through STEs involve a wide spectrum of activities. It is possible that policies are in conflict with one another. For instance, if the objective of the STE is domestic price stabilization, then its international bargaining power may be weak because its excess demand and excess supply curves will be perfectly inelastic and it will buy the necessary imports, or sell any surplus, at any world price (WTO, 1995). While state trading is one means of attaining various domestic and trade policy objectives, it is not the only instrument. Income support for producers, for instance, could be done through decoupled payments without ever resorting to parastatal organizations. This suggests that it is important to rank policies and practices in terms of their capacity to distort trade. Moreover, much of the rationale that has been offered as justifications for parastatal organizations, including risk management, economies of scale associated with marketing, development of niche markets, and new customers through market development, could be executed just as efficiently by private traders (Carter, 1996).

V. What are special concerns about STE exporters?

The fundamental concern with activities of exporting state trading enterprises is that such entities might be the vehicle through which member countries attempt to circumvent the Uruguay Round commitments made in the Agreement on Agriculture. Why might state trading enterprises be in a position to circumvent Uruguay Round disciplines and engage in unfair trading practice? Because, it is argued, statutory regulations provide STEs with opportunities unavailable to commercial firms that compete against them.

To begin with, many STEs have exclusive rights to purchase and sell particular commodities destined for the domestic and/or export markets. Depending on the objectives of the STE, they might use this statutory power to act as a monopsonist/monopolist, offering producers prices lower than those available in the world market and/or charging consumers prices higher than those prevailing in the international market. The added returns/profits that would be available from the domestic market could be used by the STE to subsidize foreign sales of one or more commodities in which it has monopoly and/or monopsony rights.¹⁰ This economic rent stemming from statutory powers is typically not available to commercial firms that have to compete against STEs in the international market.

Besides, some STE's engage in the practice of price pooling where the final price paid to producers is a blended price based on net revenue of all sales in foreign and domestic markets. Price pooling, designed essentially to stabilize price and income risks to producers, allows STEs to pay producers the same return regardless of the time of delivery during the marketing year. Consequently, STEs have greater flexibility in discretionary pricing in the international market (through delayed payments to domestic

¹⁰Subsidization of export sales of agricultural products is permissible as long as countries remain within their WTO commitments.

producers), an arrangement not available to private exporters who have to compete with other domestic sellers in acquiring exportable products.¹¹

It is also suggested that STEs that control domestic supplies or exports have less uncertainty in sourcing supplies. This allows them greater freedom than private firms in making export sales commitments and permits STEs to make long-term agreements with importing country governments. However, commercial exporters like Cargill can source from various countries to fulfill their sales commitments, a benefit that is normally unavailable to STEs.¹²

In addition, most STEs have exclusive rights to export sales of particular products. Exclusive export rights can enhance the monopoly powers and rents available to STEs and encourage the practice of price discrimination across export markets.¹³ One extreme type of price discrimination is predatory pricing in which STEs--armed with Government underwriting of losses--may attempt to drive commercial competitors out of the market. But, the ability of STEs to discriminate across export markets depends as much on the responses of competitors in the international market place as on exclusive domestic rights to exports.

Governments can provide facilities to STEs that are not available to private firms. The most obvious of these are subsidies paid out to cover deficits on payment guarantees to producers. The Canadian Government, for example, provided financial assistance to barley producers in 3 of the last 10 crop years when average market returns were lower than initial payments. While underwriting of producer payments by the Government is permissible under WTO rules, such guarantees may provide two additional indirect benefits: they allow state traders to undertake pricing risks beyond what a commercial enterprise might do, especially if STEs have goals other than profit maximization; and, an interest rate advantage may accrue to STEs because of their association with the Government. Typically, the perceived risk of lending to the Government is lower than to private entities, and STEs--working with Government secured loans--may face lower borrowing costs than commercial exporters. The CWB estimates that these benefits are worth around \$60 million annually, though Carter and Loynes (1996) hypothesize that the subsidy is greatly underestimated. With cost advantages such as these, STEs may be in a better position than commercial exporters to undercut competitors' prices.

Quantifying Benefits of State Trading Enterprises

One study (Kraft, Furtran, and Tyrchniewicz, 1996) estimates that the single-desk status (ability to discriminate) of the Canadian Wheat Board yields \$557-\$690 million annually to Canadian producers in the wheat pool. Others argue that price pooling in itself does not necessarily lead to higher producer prices. Carter and Loynes (1996), for instance, question the ability of the CWB to extract significantly higher prices "because Canadian grain must be priced competitively in world markets, and the majority of Canadian wheat sales are into markets where price is more important than quality."

¹¹Private exporters are also more restricted in their pricing operations relative to STE exporters because the cost of storage limits their ability to hold commodities for a long duration.

¹²Examples of exceptions include the New Zealand Dairy Board and Australian Wheat Board, both of which can source from other countries.

¹³Price discrimination *per se* is not prohibited by the GATT; rather, it is permitted for commercial reasons to meet conditions of supply and demand in export markets.

Finally, STEs are also known to enjoy facilities unavailable to commercial exporters. These include tax benefits, transport subsidies, preferential foreign exchange rates and public utilities, and occasional capital expansion funds. These benefits may, over the long run, provide STEs with a competitive edge vis-a-vis commercial exporters.

VI. What are special concerns about state trading importers?

The existence of state trading importing agencies raises a question of the relevance of some of the disciplines agreed to in the Uruguay Round. The conversion of non-tariff barriers and the binding of those tariffs was clearly the most significant outcome of the Agreement on Agriculture. But, tariffs can be of very little meaning when a parastatal organization regulates total demand. Because most state trading importers have exclusive rights to purchase and sell particular commodities, it is difficult to determine whether purchases--both domestic and imports--are being restricted because of lack of demand or because of specific governmental policy such as domestic protection, control of foreign exchange regime, or revenue generation. Under these circumstances, if the parastatal agency decides to keep strict control on sales and purchases, then the existence of tariffs in place of quotas may not enhance demand and improve market access. Product availability and consumer choice will remain distorted.

In cases where new tariffs were erected, the Uruguay Round also introduced the concept of tariff rate quotas (TRQs) as a means to expand imports for those products subject to tariffication.¹⁴ These provisions in themselves do not guarantee improved market access. If the over-quota tariffs are prohibitively high--as is the case for many countries--then, in practice, the only imports entering the country might be the minimum access commitments. Or, if countries included existing preferential arrangements in current access commitments, then the possibilities for expansion in imports remain limited. Compounding this problem is the suggestion by some that countries should be permitted to include future preferential arrangements to fulfill minimum access commitments.

WTO rules allow monopoly importers to administer imports into a country provided decisions are based on "commercial considerations." But, what is meant by "commercial considerations"? The lack of transparency in the decision-making procedures makes it difficult to determine whether purchases are in the spirit of the WTO. These decisions, in turn, could determine who gets the monopoly rent associated with quotas or licenses. Could it be that STEs discriminate among exporters for non-commercial reasons? The "legalization" of tariff rate quotas following the Uruguay Round Agreement makes import administration by STEs a pressing concern, especially in view of the vagueness that exists in the Agreement on Import Licensing Procedures with regard to the allocation of import quotas.

The tendency of several countries--following the Uruguay Round--to establish new state trading import agencies to administer minimum purchase requirements is another major concern. The Philippines, for example, announced a new state trading agency to implement its meat tariff rate quotas. Similarly, Taiwan is planning to set up new STEs to import rice and sugar as per WTO minimum access requirements. And, China recently re-introduced state trading in vegetable oil as a prelude to WTO

¹⁴ A tariff rate quota refers to a trade regime with three characteristics: a quota that is set at current and/or minimum access, low tariffs on imports within the quota, and high tariffs on above-quota imports.

accession. The objective, in all three cases, appears to be to grant exclusive purchase rights to parastatal organizations so that the Government can continue to control trade. These practices impede entry of private entrepreneurs, stifle competition, and distort consumer preferences.

Several other issues regarding importing agencies can also cause trade frictions. Many STEs control the grades and standards of imported products. Such control can lead to discriminatory treatment against goods of certain national origin, impeding the free flow of goods. Similarly, some countries maintain multi-tiered exchange rate systems, where STEs are given preferential rates for purchases. This discourages competition and puts private importers at a distinct disadvantage. And, STEs are occasionally allowed to keep over-quota tariff revenues or resale price differentials. STEs can use revenue from such sources to subsidize other aspects of their operations to the disadvantage of private entrepreneurs. Special privileges accorded to STEs and their impact on competition policy are at the heart of all these issues.

VII. How does one measure the trade impacts of STEs?

The principle analytical task in monitoring the impact of STEs is to measure the effects on quantities traded, consumed, and produced of activities of state trading enterprises. Distortions that arise from STE activities are quantifiable in principle. The international trade literature has dealt with this issue in terms of "equivalence" of state trading and tariffs. Lloyd (1982) shows that a state trader that restricts imports will have an equivalent effect on domestic price to a tariff of a certain amount. Similarly, it could be argued that an STE which restricts/expands exports can be shown to have an effect on domestic price equivalent to an export tax/subsidy. The implications of this are that one can build state trading into an analytical framework as a set of equivalent tariffs or subsidies. Such an approach views state trading as one of several instruments that might be used to pursue objectives of governmental policy and dispenses with a need for a special theory of state trading. It treats the theory of state trading activity as an application of existing theory of (private) trading.

How valid is this equivalence approach in analyzing the trade impacts of agricultural STEs? In asking the question, two separate issues should be kept in mind. One is its relevance in the context of **current international trade rules** and the other is its ability to capture **distortions in trade flows** relative to a free-trade (or a welfare-maximizing) norm. These issues are clearly separable both in practical and theoretical terms. One deals with rules that exist, the other suggests possible changes in the rules. One is easily definable and subject to straightforward quantitative estimation, the other is dependent upon a range of assumptions about the behavioral functions of imperfectly competitive enterprises. The analytical issue with respect to current rules is dealt with first, and that of imperfect competition is treated subsequently.

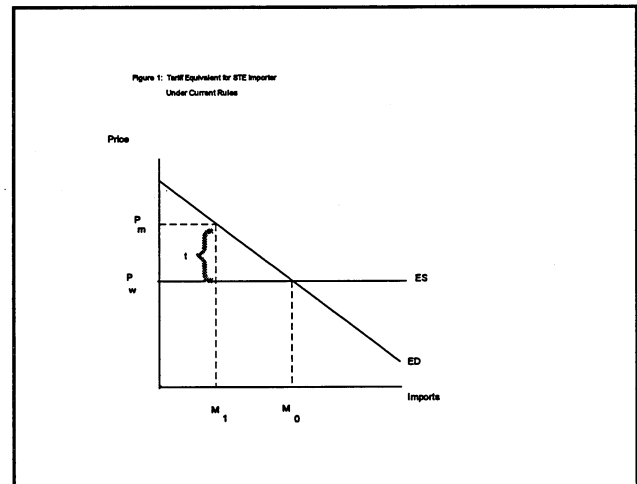
Framework for Analysis of Distortion under Current Rules

The provisions of the GATT have generally proved inadequate to curb the activities of state trading enterprises and have been weakly enforced. The contracting parties of the GATT were expected to inform the Secretariat of the existence of state trading enterprises, but relatively few countries made the effort, and the questionnaire developed in 1960 to be used for notification was somewhat undemanding. This led to several attempts over the years to strengthen and make more specific the constraints, but the efforts have so far proved fruitless.

Most STEs trade in agricultural goods. This undoubtedly contributed to the lax enforcement of existing regulations. Because agricultural policies were generally not controlled by trade rules, it would have been futile to have tight restrictions on the agencies which carried out policies. This gave room for the possible defense of STEs as administrators of non-tariff barriers allowed under Article XI (2) and, perhaps more than any other factor, prevented the strict application of Article II (4) to agricultural trade. When dispute settlement panels considered the activities of state importers, such as the case of the Australian complaint against the Korean Livestock Product Marketing Organization (LPMO) in 1989, they found Article II (4) did not apply to quantitative restrictions legally applied under Article XI. The comparison of the mark-up and the bound tariff was not deemed appropriate when quantitative restrictions were present. Now that quantitative restrictions have been largely removed as a result of the Uruguay Round Agreement on Agriculture, the rules are easier to enforce.

State trading importers, as discussed above (page 3), have one overriding obligation, to satisfy local demand for the imported product, and one rigid constraint, to avoid giving more protection than the bound tariff. In addition there is the more general injunction that they should behave like commercial concerns, and they are supposed to respect *mfn* principles¹⁵. Thus the analytical issue is whether local demand is satisfied and whether the operation of the STE grants more protection than the bound tariff. The question as to whether they act commercially is best thought of as a combination of the two more precise conditions: if they import to satisfy the level of domestic demand which would face a private importer paying the bound tariff they could be deemed to be behaving “commercially”.¹⁶

The analytical framework for measuring protection is quite well developed in the literature. If we can conceptualize an import demand function for a product then the gap between the world price level and the wholesale price of the same (or equivalent) good is the tariff equivalent of the set of policies (including market structure conditions) which operate to determine the import quantity. This is illustrated in Figure 1 where the STE is a trading agency operating under competitive norms. ED is the excess demand curve faced by the STE and ES is the excess supply schedule which is perfectly elastic at the world price P_w . The appropriate analytical device in this case is the **tariff equivalent** which



combines both the demand satisfying and tariff binding constraints. If the STE imports and sells at the same price (account being taken of handling costs) then there will be a zero tariff equivalent. If the STE merely sells in competition with private importers then the tariff equivalent will be the actual tariff applied

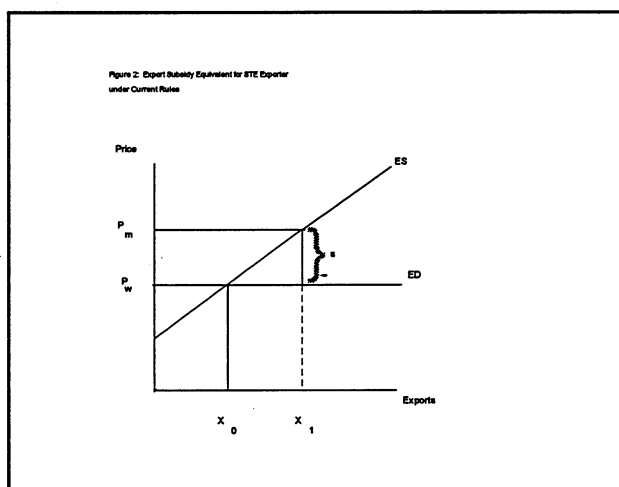
¹⁵ *MFN*, or the most favored nation clause, requires members to grant to the products of other members treatment no less favorable than accorded to the products of any other country. Thus, no country is to give special trading advantages to another country or to discriminate against it.

¹⁶ To place further restrictions on importing STEs as to their behavior in dimensions other than import quantities and prices would seem to be outside the spirit of the WTO.

to private transactions.¹⁷ The trade impact of the STE is the reduction in import volume (M_1M_0) that would be caused by a tariff (t) of this amount.

State trading exporters are subject to only one firm constraint, that they should not grant export subsidies that would exceed the allowable subsidies in the Schedules. The same general injunction to behave commercially applies to STEs, but this again can be taken to be a shorthand for a prohibition on the granting of subsidies. The analytical issue is, therefore, whether the STE in question grants an export subsidy and if so whether that subsidy is within the Schedule.¹⁸

The traditional analysis of export subsidies is also adequate for dealing with the problem of state traders (figure 2). A STE will exhibit to the world an export supply schedule (ES) which will be observable at the price (P_w) and quantity of sale (X_0). In addition, there will be a domestic price paid to the producer (P_m) by the STE. The degree of subsidy can, therefore, be measured as an **export subsidy equivalent (s)**, analogous to the tariff equivalent of the importing STE. The trade effect is the amount by which an export subsidy of that amount would expand trade (X_0X_1). The level of export subsidy equivalent multiplied by the quantity of exports will give the equivalent expenditure on export subsidies.



Framework for Analysis of Distortion under Imperfect Competition

The second issue, the analysis of distortions arising from imperfectly competitive behavior of STEs, is somewhat more complex. Monopoly power can be exercised by both private and public enterprises in several ways which will effect trade flows. Analysis of the trade impacts of state trading from a welfare perspective thus takes one immediately into a deeper area of enquiry than that of whether state trading violates current trade rules. This requires a more complex framework

If one takes the view that the WTO should move the world toward a situation of perfect competition in all domestic and international markets, then all public and private abuses of power are potential targets for regulation. The activities of state traders would just be one aspect of this approach.

¹⁷We would not wish to belittle the practical problems of collecting data on import demand when no imported goods have been allowed onto the domestic market, or when there are other constraints such as foreign exchange restrictions or health and safety standards which make the comparison tricky.

¹⁸Under current WTO rules, there is really a double test in that the STE would have to comply with both the quantity and expenditure provisions of the Schedules. But, it is quite possible that a STE could grant a subsidy which in value terms did not violate the Schedule limits, but the quantity that benefitted from that subsidy could be above the quantity allowed to be subsidized.

The analytic framework which one would use would be conceptually simple if operationally complex. One would have to measure market power in all markets and devise rules which would address this range of issues. The rules would presumably apply to both private and public actors and to factor markets as well as goods and services. It is unlikely that the world is willing to go this far in the foreseeable future.

In that case the question becomes which set of non-competitive activities should be targeted? The playing field may be level but the players can be of very different sizes. Presumably the issue comes down to one of the external impacts of market distortions: which departures from the competitive norm are likely to be causing the greatest problems for other countries? This helps to narrow down the range of topics to be explored in that it suggests that purely domestic monopolies that do not trade may be of little interest.

If we omit domestic monopoly in non-tradables as a trade issue we can focus on two aspects: (a) the impact of domestic market power on the trade outcome and (b) the exploitation of international market power through the manipulation of trade quantities (or prices). The first can be thought of as the "small country" case and the second as a "large country" problem, though even the smallest of countries can be important in the sale of any particular product.¹⁹

Small Country Case

The analytical issue in the small country case is how to derive the trade impacts of the exercise of monopoly power in domestic markets. Monopoly power can come in three guises: the control over domestic production, the control over domestic use or consumption, and the control over trade quantities (imports or exports). Assume to start with that these functions are separate (i.e., the same agency does not control production and trade). Also assume initially that the country in question is indeed complying with all the WTO regulations discussed above. Thus the trading enterprise is not granting protection above the bound level, and not imposing quantitative restrictions on trade flows.²⁰ If the country is active in export markets there are no illegal export subsidies being paid, directly or indirectly to producers. The focus is therefore on the nature of the trade distortion other than those related to hidden protection through non-tariff means and camouflaged export subsidies.

Assume a domestic monopolist (public or private) trying to use market power to maximize profits. Consider first the import case. The monopolist would like to restrict production below the competitive level in order to drive up the price. However the consumers can buy from abroad at the world price. The monopolist acts so as to bring marginal cost of domestic production into line with marginal revenue as given by the price of imports (i.e., world price plus tariff if any). If a domestic monopolist has no help from

¹⁹An example is the tiny island of Grenada which markets about one third of the world's nutmeg.

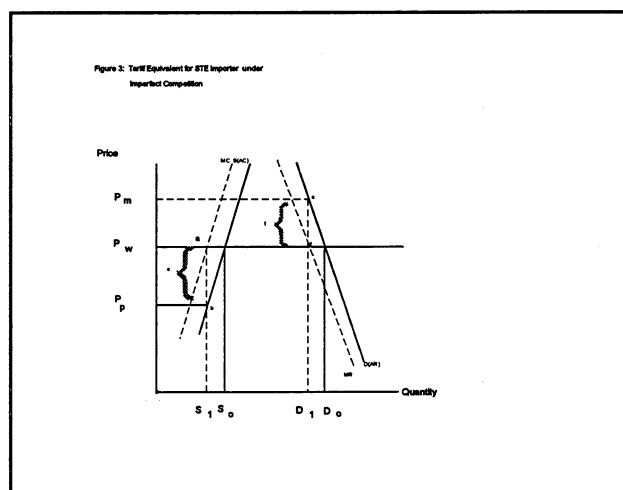
²⁰The question of what constitutes a quantitative restriction is important here. If an STE "decides" to import only a specific quantity of a product in a year, is that a quantitative restriction on trade? Yes, if it is not possible for another entity to purchase more on world markets and import that additional quantity. No, if the STE does not have such monopsony rights but merely chooses that as an appropriate import level given market needs and local market conditions. The key question is thus whether the state trading enterprise imposes quantitative restrictions on other actors in the market. In what follows, we assume that the STE does not have the right to prevent other firms from importing over the bound tariff.

any quantitative controls over imports then buyers can always satisfy their needs from imports. The quantity of imports would not be markedly different from that of a competitive industry. The trade effect of a domestic monopolist is therefore very limited in the absence of (quantitative) trade restrictions. The exporter case is similar. The producer will try to gain some monopoly rents by restricting production until marginal cost is equal to world price plus tariff. But again, if the monopolist is also selling abroad and has no control over imports, then the impact is minimal. In neither case is there major distortions in trade flows relative to a competitive system.

Consider now the possibility of a monopsonist (public or private) who acts as the sole purchaser of domestic output and tries to minimize cost. The monopsonist might wish to purchase less from the domestic supplier than would a competitive purchase sector. The rent would come from purchasing less of the domestic product (at a lower price than the cost of imports) in order to equate the marginal cost of buying from the domestic market with the world price (plus tariff). But this would require export controls (or the compulsory purchase of all domestic product, which implies a ban on exports). However, if domestic firms can export, the monopsonist loses its market power. Export restrictions are, therefore, the key issue with respect to the use of monopsony power on the domestic market.²¹ Such restrictions are the vital link between the use of monopsony power and impact on trade flows.

In short, the only non-competitive action that remains unconstrained by existing trade rules is the decision as to **how much to produce**. The trade impact of monopoly (or monopsony) power at the national level arises not from the production decision *per se* but from the support of domestic monopolies (and monopsonies) **with non-tariff trade restrictions**. Tariffication and the removal of quantitative import and export restraints should render largely irrelevant the domestic market structure.

Monopoly control over trade, however, cannot be dismissed lightly as with control over production or use. Consider three cases. In the first, a trade monopoly is a “pure” profit-maximizer, or rent-seeker using control over trade to exploit either domestic buyers or domestic sellers or both. If the objective of the STE is to maximize profits by exploiting consumers, then even in the small country case with no power to change world prices, the trader would impose trade restrictions equivalent to a tariff or an export subsidy. Figure 3 provides an illustration of this for the **importer case**. The rent-maximizing tariff for the STE importer would be the gap (t) between marginal and average revenue on the domestic market, while the volume of imports associated with this trade restriction would be S_0D_1 , a quantity that is D_1D_0 lower than the free trade solution (S_0D_0). Conversely, if the objective of the STE was to exploit producers, the equivalent policy would be a subsidy on imports to lower domestic price until the marginal cost of buying from the domestic producer equaled the world price. The level of rent-maximizing subsidy



Conversely, if the objective of the STE was to exploit producers, the equivalent policy would be a subsidy on imports to lower domestic price until the marginal cost of buying from the domestic producer equaled the world price. The level of rent-maximizing subsidy

²¹It is arguable that the use of export restrictions itself is not allowed under the current trading rules. It is also rare for such restrictions to be challenged by trading partners (or at least the exporters).

would be the difference (e) between the supply price and the marginal cost of purchasing from domestic sources. However, if the STE importer controlled domestic marketing as well and decided to exploit both consumers and producers to maximize its profits, imports could be sold domestically at the high price and domestic product could be purchased at the low price. This type of market differentiation has existed in several countries of the Former Soviet Union.

The framework for measuring the impact for such a consumer-exploiting STE importer is similar to that discussed above. The measurement of the trade effect is simply the **tariff equivalent** of the policy set. In the case of a producer-exploiting STE, the measurement of trade effect is the **import subsidy equivalent**. With market differentiation, the trade impacts would no longer simply be represented by the tariff equivalent: it would have to be calculated from the **producer and consumer subsidy equivalent** (OECD, 1987; USDA, 1987).²²

The second case is where the trade monopoly is in place to support the producer monopoly, so that together they exploit domestic consumers. If the entire rent is handed over to producers as decoupled payments, this scenario differs from the consumer-exploiting trade monopoly only in the distribution of rents. But, if the rent is distributed to producers in the form of higher prices (P_m in figure 3), the trade impacts would be as if the STE were exploiting consumers. In either case, the tariff equivalent would still represent the trade effects of STE activities.²³

The third case is that of a producer-exploiting monopsony linked to a trade monopoly which would keep domestic prices low with import subsidies or export taxes. This would be tantamount to the cheap food policy pursued by several developing countries. The trade impact (S_1S_0) would be measured, as before, by the subsidy/tax equivalent (e).

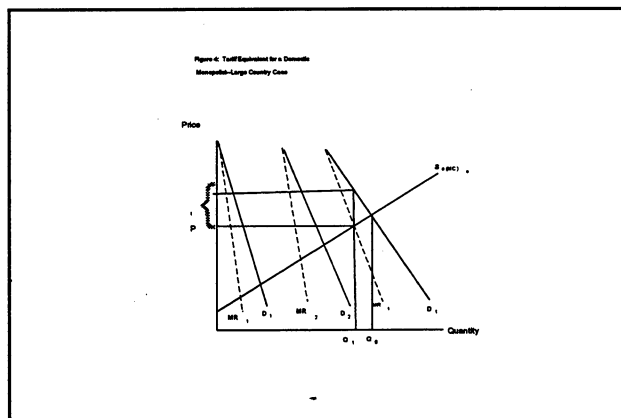
In summary, in the small country case, the operation of domestic monopolies and monopsonies unsupported by trade monopolies (or quantitative restrictions) pose no problem for trade. If they are linked to a body that controls trade flows, they can exploit either domestic consumers with tariff-like policies or domestic producers with tax-like policies. The only case where measurement of the trade effect is likely to be problematic is where the state trader runs a complex policy of splitting the domestic market and thus using a combination of producer and consumer taxes in conjunction with trade measures.

²²The situation would be similar for an STE exporter, with the difference that the policy instruments would be an export subsidy if consumers were to be exploited, and an export tax if producers were to be exploited. In cases where both are exploited, the PSE/CSE concept again becomes relevant.

²³If only part of the rent is passed on to producer in the form of higher prices, this would be equivalent to market segmentation, and the PSE/CSE would be the relevant measure.

Large Country Case

If we drop the assumption that the country cannot alter its terms of trade, the trade impact is marginally more difficult to compute. However, the analysis does not change markedly. Take figure 4 as an illustration. The demand faced by the monopolist is the sum of domestic and foreign demand curves, and is less than infinitely elastic. The monopolist equates total marginal costs (MC_0) to total marginal revenue (MR_t), and not just to domestic marginal revenue (MR_1). There will, therefore, be some profits to be had by reducing production and pushing up world price. The impact on trade flows can be depicted by a **producer tax equivalent** (t) on domestic production, where the height represents the degree of market power in the total market. But, in practice, restraining domestic production in the absence of trade controls is unlikely to cause trade problems. The domestic monopolist, likewise, has some market power if world prices are impacted by the restriction of purchases on the domestic market. With less purchased from the domestic market, imports would increase and world prices would rise. But the trade impact is due to the reduction in production and can be calculated from the producer tax equivalent as before.



The situation becomes a little more interesting when one considers a profit-maximizing “pure” trade monopolist/monopsonist, who could discriminate among markets and impose optimal trade taxes. Essentially, a monopolist trader would equate its excess supply schedule with the marginal export revenue function and impose an optimal export tax. This is in addition to the trade taxes that might be used to exploit the domestic market. A monopsonist trader, on the other hand, would equate its excess demand schedule with the marginal import cost function and impose an optimal import tariff. The trade effects, in both cases, can be represented with a tariff equivalent.

Traders that function in support of producers and/or consumers would face similar situations. The coalition between the domestic monopolist and the state trader would set a somewhat higher tariff against imports so as to exploit the world market as well as the domestic one. The monopolist with supporting trade controls would impose a lower domestic producer price so as to gain a little from weaker world market prices. In general, the terms of trade impact is a refinement on the calculation of the measure of the trade effect. It will not often shift either the direction nor dominate the magnitude of the impact on trade.

Analytical Approach and Complexity of State Trading Practices

The tariff/subsidy equivalent approach that has been proposed to analyze the distortionary impacts of STEs is relatively simple. It transforms the entire set of policies and activities associated with state trading into one summary measure that can be compared over time; across commodities, policies, and countries; and, is easily understood. But is the analytical framework completely adequate for addressing some of the thorny issues associated with state trading?

One of the primary concerns raised about state trading enterprises is their ability to cross-subsidize across markets as a result of the economic rent stemming from statutory powers given to them. Analytically, this concern is not a real problem: it would just mean that the tariff/subsidy equivalents would have to be measured in two or more markets rather than in a single market. Hence, cross-subsidization between the internal and external markets would be measured as higher protection (tariff equivalents) in the domestic market and greater subsidization (export subsidy equivalents) in foreign markets. The same would be true for cross-subsidization across commodities. Tariff/subsidy equivalents could be measured in the different markets and compared to their WTO obligations.

Price pooling schemes are often cited as another source of concern. But, to a large extent, the analytical issue is no different than cross-subsidization across markets or products. The tariff equivalents would still represent the trade impacts of policy. Where the analysis becomes more complex is in cases of price-pooling across time (between years). In this situation, the tariff equivalent should be calculated over the length of time in which the policy is applicable. Pooling across time may have an impact on stocks and hence trade. But even here, it is difficult to argue that pooling has an unequivocal effect on the volume of trade.

Does the price gap capture the “unfair competitive advantage” that STEs are able to secure from Governmental association? Tax benefits, transport subsidies, and preferential exchange rates were cited as some of these provisions. If we assume that the objective of the STE is to maximize profits with price as the decision rule, then conceptually, these do not pose any problems. Clearly, if the STE sets prices to maximize its profits taking into account the effects of these provisions, then the price gap would capture the bevy of provisions that facilitate STE activities. However, if there are cases where the tariff equivalent did not capture this effect, then it will be necessary to calculate the tariff or subsidy equivalents of the policy and come up with alternative measures such as PSEs/CSEs. Input subsidies, or policies that are defined as part of WTO internal support disciplines, may fall in this category.

The issue is often raised of so-called “hidden” or implicit subsidies associated with certain STE activities. To the extent that these are not reflected in either domestic or trade prices, it could suggest that the tariff equivalent does not adequately represent the trade impacts of STEs. Availability of preferred interest rates which allows STEs to undertake pricing risks beyond what a commercial enterprise might do could be one such example. But, such cases are likely to be few and far between, and the concern relates not necessarily to the appropriateness of the analytical framework but rather to the availability of data to capture these activities.

The proposed analytical framework captures most but not all the trade effects associated with STEs. For instance, it is difficult to quantify the benefits for STEs of making long-term agreements with other public enterprises or the advantages that STEs derive from governmental market promotion programs channeled exclusively through them. Clearly, if such instances are important, then the analysis of the trade impacts of STEs will have to go well beyond the simple concepts of tariff and subsidy equivalents presented in this paper.

VIII. Developing a Classification Scheme for State Trading Enterprises

Our discussions so far have focused on issues and concerns about state trading enterprises (STEs) and the measurement of the extent of market distortions such entities generate. We have suggested that the link between domestic market structure and trade controls is a key issue that can be expected to impact a STEs **capacity to distort international trade**. For instance, a statutory marketing board that has exclusive authority to purchase and sell domestic output may influence international trade very differently than a STE which merely administers automatic licenses. Similarly, a STE importer that is a player in the domestic market can be expected to influence trade much more than a trading agency that is a issuer of licences. Clearly, our understanding of the economics of STEs can be greatly enhanced by developing a framework which would facilitate classification of such entities in terms of their ability to impact trade.

A classification scheme--or taxonomy--which provides the conceptual foundation for understanding and analyzing the market effects of STEs can be useful in several respects. First, it can provide a snapshot of the similarities and differences among STEs in terms of several broad economic traits. Policymakers might find it be useful to know, for instance, whether the Canadian Wheat Board and the Australian Wheat Board are comparable with respect to ownership structure, trade structure, or other relevant characteristics. Second, a classification scheme provides a starting point for building an inventory of STEs. An inventory listing, especially if it includes information on market shares, can provide policymakers with a perspective on the changing importance of STEs in agricultural trade. Third, even though the trade impacts of STEs can be measured through tariff equivalents, there have been very few attempts to empirically assess the quantitative impacts of such entities on international agriculture trade. This paucity of empirical analyses is likely to continue because of the difficulties of obtaining information considered proprietary. To the extent that one of the goals of the WTO is to move towards freer trade taking into account the existence of STEs, a classification scheme that provides qualitative indications (or ordinal ranking) of the trade impacts of such enterprises could facilitate policymakers and negotiators make informed decisions. Lastly, a classification scheme might be the basis for organizing thoughts around the issue and focusing on a sub-set of policy concerns, especially as they relate to the need for detailed case studies.

For any classification scheme to be useful, it must have several characteristics. At a minimum, it has to be geared towards achieving some specific goal. In the case of STEs, the goal should be the grouping of entities based on the firm's capacity to distort international trade. Moreover, a classification scheme should be easily understood and interpretable. Thus, the practice of classifying STEs as statutory marketing board or export marketing board or regulatory marketing board may not be very useful if it does not provide insights into the economics of market distortion. A classification scheme should also be comparable over time, across sectors, policies and countries, and be robust. Where possible, it should be non-controversial and acceptable to all. Finally, a classification scheme should be precisely defined, though precision itself should not lead to excessive disaggregation such that the economic categorization becomes meaningless.

What might be an appropriate classification scheme to understand the economics of state trading enterprises? Our discussions on the conceptual framework presented earlier suggests that there are several elements associated with the market regime under which an STE operates as well as its institutional structure which determine the parastatal's capacity to distort international trade. We will now describe these in greater detail, focusing on how each of these might help us understand the capacity of a STE to distort international trade.

Trade Balance

Trade balance for a commodity at a point in time establishes whether an STE is an exporter or an importer. Why is it important to classify STEs as exporters or importers? Because, as indicated earlier, the behavior of exporting STEs can be expected to be very different from STE importers. Whereas a STE exporter attempts to enhance trade and competition in the international market, a STE importer is more interested in restricting trade and augmenting protection in the domestic market. The concern with exporting STEs is relatively simple: do they violate the Agreement on Agriculture export subsidy disciplines? The issue with importing STEs is more complex: do they use tariffs and other nontariff barriers to trade (NTBs) to protect domestic industries? *Ceteris paribus*, if the objective of multilateral negotiations is to move towards freer trade taking into account the possibilities of rules violation, an exporter that directly enhances international competition might be considered "less objectionable" to one that restricts competition. Indeed, identifying the trade balance associated with a STE is the first step towards understanding the economics of such enterprises.

Market Control

Market control refers to four specific activities that a STE might be engaged in: imports, exports, domestic procurement (purchases), and domestic marketing (sales). The ability of a STE to distort international trade depends, among other things, on the control it exercises over these activities. If a STE regulates all of these activities, then its capacity to distort markets is likely to be much greater than if it controlled none of the activities.

What are the various possibilities that exist with respect to control of imports, exports, domestic procurement, and domestic marketing, and can we establish a qualitative index of trade distortion based on the type of regime in operation? At one end of the spectrum would be a market regime where the STE maintains complete control over each of these activities. In practical terms, this would most likely represent a situation where the STE has single desk authority on imports, is the sole seller of exports, has monopoly power on domestic marketing (sales), and is a monopsonist buyer with respect to domestic procurement. All transactions, whether in the domestic or international markets, would have to be channeled through the STE. The other extreme would be a market regime where the STE has no control over imports, exports, domestic marketing, or domestic procurement. Presumably, the STE--in this situation--would behave no differently than a competitive private firm, and the possibilities for a STE to distort internal and international markets are, thus, very limited.

Straddling these two extremes are several possibilities. A STE might still be the single desk authority for imports but face competition in domestic marketing. Domestic consumers, therefore, would have the choice of purchasing either from the parastatal organization or from other domestic suppliers. Similarly, the STE might be the sole seller in the export market but face competition in domestic procurement. Domestic producers can sell either to the parastatal or to other domestic consumers. From a free trade perspective where more competition is preferred to less, a STE that has exclusive authority for **both** domestic procurement/marketing and international sales/purchases would be considered less desirable than one which controls only **one** of the markets.

Policy Regime

Two separate issues emerge regarding the policy regime: the first concerns the type of policy instruments in use, while the second relates to the competitive edge that a STE might be able to gain because of exclusive access to certain policy instruments. A STE that relies on quantitative restrictions on imports (or exports) is likely to distort international trade much more than a STE that obtains its protection from tariffs. From a free trade perspective, therefore, a STE that is supported by tariffs is preferred to one that resorts to non-tariff trade barriers. Comparable arguments can also be made (and conclusions drawn) with respect to various domestic policy instruments. As has been established in the literature elsewhere, income payments which only directly affect producers are preferred to market price support payments which distort both consumer and producer preferences. The second issue on policy regimes relates to the use of instruments that allow STEs to obtain a competitive edge over other firms operating in the same market. For instance, does preferential allocation of quotas (monopoly rents) or exclusive access to tariff revenues benefit parastatal organizations to the detriment of commercial firms. If so, a STE which does not have access to preferential governmental assistance can be considered more desirable to one that receives such benefits.

Product Range

Product range might be another indicator of the capacity of a firm to distort trade. Presumably, if a STE trades in several products, it has more leverage in manipulating markets and more discretionary authority in moving away from free trade for any specific commodity. The ability of any firm to move away from a competitive solution depends on the market power that it exercises within a country or internationally. Market power depends, among other things, on a firm's capacity to differentiate its product and regulate use of substitutes. If a firm has complete control over the commodity and its substitutes, then it has a greater capacity to distort trade. This capacity is likely to be even greater if the STE has control over upstream and downstream activities and can engage in transfer pricing as a consequence of vertical/horizontal integration. From the perspective of moving towards free trade, a STE that trades only in one commodity may be preferable to one that controls several products.

Ownership and Management Structure

The ownership and management structure of an STE can impact international trade in several ways. An STE which is owned by the Government and has been established to provide income and price stability may behave differently than an STE owned by producers which has as its objectives profit maximization. Or, an STE that is owned by the Government and is guaranteed against bankruptcy is likely to impact trade differently than a commercial firm operating without government assistance. Clearly, if a continuum on trade distortion were to be established, an STE financed entirely by producers without the deep pockets of the Government is more likely to move towards free trade than an STE owned by the Government. Ownership, in this case, is being used as a proxy to represent the move towards a welfare maximizing norm.

Creating STE Archetypes

Classification of STEs requires attention to market control mechanisms, policy regimes, as well as institutional characteristics such as ownership structure and product range. Table 1 provides a classification scheme for STEs based on the market control mechanism and the policy regime faced by parastatals. A **Type I** STE is defined as a parastatal which operates under a competitive market regime without any controls on either domestic or international trade. The institutional characteristics of the enterprise is not important under these conditions because the STE is competing with private firms on a level field. One possible exception to this might be a situation where an STE gains a competitive edge over commercial firms as a result of exclusive government programs, such as tax benefits and/or subsidies on utilities.

Table 1: Typology of State Trading Enterprises

Type	Quantitative Trade Controls?	Domestic Market controls on procurement and/or marketing?	Examples	Classification Scheme
Type I	None	None	Australian Meat and Livestock Corporation	Green
Type II	None	Yes	Some U.S. Marketing Orders (i.e. California Raisins)	Green
Type III	Yes	No	Australian Wheat Board, New Zealand Dairy Board	Amber
Type IV	Yes	Yes	Canadian Wheat Board, BULOG	Red

But this is likely to be an exception rather than the rule. An example of a Type I STE is the Australian Meat and Livestock Corporation which essentially engages in market promotion activities only. A **Type II** STE would be a parastatal organization which operates without any restrictions on external trade but maintains controls over the domestic market. Depending on whether the parastatal organization deals with multiple or single commodities and based on whether it was owned by the Government or producers, Type II could be further disaggregated as necessary. Some U.S. marketing orders, such as the California Raisin Board, is an example of a Type II STE. A **Type III** STE would be a parastatal which operates in a competitive domestic environment but benefits from **quantitative controls on external trade**. As before, variants of type III would depend on ownership and product structures. The Australian Wheat Board or the New Zealand Dairy Board are examples of Type III STEs. A **Type IV** STE would be a parastatal which imposes quantitative restrictions on imports and maintains control over the domestic market as well.

Variants would depend on product and ownership structure. BULOG among importers and the Canadian Wheat Board among exporters are examples of Type IV STEs. But, it is worth pointing out that the same STE might be classified differently, depending on the commodity under consideration. For instance, the China Cereal Oil and Food Corporation (COFCO) would be designated as Type IV for cereals (exclusive control over external trade and domestic marketing) but Type III for vegetable oils (monopoly in external trade only). A similar argument could be made for the Canadian Wheat Board with respect to feed barley where it is not a monopsonist in the domestic market. Is it feasible, based on the typology described above, to group STE archetypes in terms of their ability to distort agricultural trade? One possible grouping, paralleling that in the Uruguay Round Agreement on Agriculture, is to color code them in terms of **green**, **amber**, and **red**. **Green** STEs would be those which are least likely to distort trade and may not need scrutiny vis-a-vis current rules violation. Clearly, Type I STEs, which have little, if any, capacity to influence external trade, would fall in this category. But, it also seems logical to group Type II STEs in the green category largely because of the absence of trade controls. Domestic consumers (producers) can resort to international markets for purchases or sales, suggesting that domestic controls without trade restrictions does not significantly violate competitive norms. **Amber** STEs are defined as those which allow competition in the domestic market but not in external trade. These would be Type III STEs which have the ability to distort trade but are not as distortionary as Type IV STEs. The policy goals for amber STEs should be to address the extent of market control they exercise as well as to examine their institutional characteristics. **Red** STEs would be those which maintain control over both the domestic and external markets (Type IV). These STEs have the capacity to distort trade the most because of exclusive marketing authority in both markets. The policy goal vis-a-vis red STEs should be to address entry restrictions into these markets. Institutional characteristics, while important, do not necessarily constitute the overriding impediment to a move towards free trade.

The classification scheme we propose is one means of deriving a qualitative measure of the distortionary impact of STEs. But, it is not an end in itself. This qualitative information should be used in conjunction with two others measures: empirical estimates of the tariff equivalents, and means testing which would indicate how large a player in the global market the STE might be. Then, and only then, will we have a realistic picture of the capacity of a STE to distort international trade.

X. Conclusion

State trading in agriculture is not a new phenomenon. It has, though, been getting additional attention recently because of the Uruguay Round Agreement on Agriculture which disciplines many of the traditional methods of providing support.

The basic objective of this paper was to examine trade policy issues concerning agricultural state trading enterprises. On the export side, practices such as selective price cutting and price pooling schemes are often cited as major irritants. Issues on the import side include the relevance of tariffication in the presence of state trading, the adequacy of price mark-ups in disciplining STEs, and procedures for administration of tariff-rate quotas. The primary concern with agricultural STEs is the prospect of circumvention of Uruguay Round commitments. The ambiguities associated with the Uruguay Round definition of STEs do not make matters any easier.

The focus of the analysis was on the trade distortions arising from activities of STEs. The analytical framework that is proposed to examine distortions under current WTO rules is rather straight

forward: traditional tariff equivalents and corresponding export subsidy equivalents could be used to represent the trade effects.

More complex is the question as to whether non-competitive conditions in domestic markets distort trade and how one measures the impacts. We concluded that, for a small country, the disruption in trade is minimal when the production and purchasing monopolies are not supported by trade controls. But, even in cases where trade controls are used, the impact of trade policies themselves can be expressed in terms of tariff equivalents, and come under the purview of current rules. Links between domestic and trade monopolies are common ways of providing producer protection, but again, this can be measured using tariff equivalent methods.

Though the calculation of tariff equivalents gives a quantitative indication of the trade impacts of STEs, for many purposes a qualitative categorization of the types of STEs is useful. We suggest such a taxonomy based on the variables of market structure, policy instruments, and ownership.

Our paper suggests that the concepts and analytical framework to look at the trade impacts of STEs are relatively well-developed. The real challenge is to devise a system that would make available the necessary empirical information to calculate the tariff and subsidy equivalents.

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Comments by Maurice Schiff on

**The Effect of Liberalizing Government Procurement Practices on APEC Nations' Imports
by Simon Evenett**

and

**State Trading in Agriculture: An Analytical Framework by
Praveen Dixit and Tim Josling**

I read the papers in reverse order, so I am going to make my comments in reverse order to the presentation. The paper by Praveen Dixit and Tim Josling on State Trading in Agriculture in an Analytical Framework tries to tackle the issues of defining state trading, the interest in state trading enterprises, and measurement of their impact, with some classification schemes. I will comment next on Simon Evenett's paper. He follows a different approach because all the state trading or the government procurement is put together, and the overall impact is measured together rather than distinguishing between different categories. So the two papers are quite complementary.

So I touch on a number of points. First, in the matter of state trading enterprise, one issue is China and Russia, trying to get accession to the World Trade Organization. And can they use that to get around all sorts of things. A paper by Bach and Will Martin, State Trading in China, says there is a lot of competition among state trading agencies in enterprising China because some of them are at commune level, or at provincial level, and so on. There is contestability and competition. Probably Russia is different, so one might differentiate between China and Russia.

Page 7 states that trading enterprises and LDCs are to implement chief food policies, with taxation on producers and certainly on consumers. Implementation, of course, requires regulation of quantities and prices of traded goods. One might want to distinguish whether the country imports or exports. After all, if you tax production--consumption--of an importing country, you are going to increase imports and the problems of balance of payments or of the budget. You want to minimize or control the amount of imports. But for a net exporter like Argentina, when it taxes producers, it exports a bit less. So it is not clear that it needs to start controlling. If the model in mind were of an importing country (you must recall that there are some countries that export). The issue of measuring tariff equivalent and so makes me hesitate on whether we can turn all this into tariff equivalents or not? I guess the "whether" depends on the approach.

It is probably a good just to be a good economist and see what is happening. And if there are monopolies or cross-subsidizations and so on, see what is happening. Measure the impact on incentives, and then on trade, or on production or on consumption, or something like that. For instance, I remember an agriculture project years ago. Some people claimed, for example, that in one country they received 20 percent less for their output than on imports. They overlooked how the marketing board tended to buy their output at the beginning of the season, and how the imports came at the end of the season. After a good economist corrected for the cost of storing over the year, then the 20 percent fell down to maybe 6 percent. So you want to be careful about the structure of the industry, studying on a case by case basis.

On the issue on page 7 again--whether state trading enterprises are viewed as an effective administrative vehicle to execute domestic policy objectives, I was thinking that is nice to say about state trading enterprises. Deepak Aluwalia has a paper about leakages of about 45 percent for edible oil, 30 percent for wheat, and so on. So I am not sure how effective state enterprises are in achieving goals. Finally, on the classification, type 2, type 3 and so on; as long as there are no quantitative restrictions or monopolies on trade, those are type 2 that control domestic trade and that would have little effect on trade.

For example, the paper by Simon Evenett shows that those who procure locally, domestically on (tradables) are not involved with the trade sector, but in some countries they have a tremendous impact on trade. You could also subsidize production, and if you do that, you tax consumption. And to subsidize production is like putting a tariff at the same rate. So domestically you can have the same impact as you do with trade policy. So distinguish between type 2 and type 3; be a bit careful. One can find some other policy that gives exactly the same result.

The second paper on the effects on APEC nation imports, of liberalizing government procurement practices, raises the concern that liberalizing government procurement will raise imports, much more in some countries than in others. Those that are much more exposed depend more on trade and will have larger effects than those less dependent. The larger countries will see less impact relative to GDP. And therefore, liberalization may be difficult, in sort of a cooperative or joint agreement, as a regional agreement.

One issue or basic assumption of the model is balanced trade. If trade is balanced, I should be happy to have a huge increase in imports, because then I also have a huge increase in exports. This balance means that everything was inefficient before, when buying only domestically, procuring domestically. Now that I can procure abroad, I get great efficiency gains of specialization, great increases in imports and trade, since trade is by definition balanced. Somehow these policy conclusions are not consistent with the methodology of the paper. In fact, both papers should clarify what happens to trade and welfare. If exports are equal to imports, I should not worry about trade balance but about welfare. The two intuitions here are that (1) if the government liberalizes trade, in terms of procurements, then imports will rise. And (2) the increased efficiency will cause some sort of gain. And a gain in welfare or a gain in income means that these resources may be spent on exporting, and there may be more exports. I think differently. The first intuition is fine. If you liberalize imports of procurements, they rise. But when income goes up, imports, not exports, may go up. Typically exports are driven not by domestic demand, but by foreign demand. In fact, when you liberalize these imports and imports go up, you see an impact on the real exchange rates. But in the model I do not see any prices.

My thinking is that liberalized imports create a demand for imports that goes up. That liberalization creates disequilibrium in your balance of payments. Or, if you want the excess demands for tradables and nontradables, you have an adjustment in the relative price of tradables and nontradables. So you get a depreciation of the real exchange rate that will lead to an increase in exports. And that would be a secondary mechanism by which exports would rise.

Now, let me add that equation 6, which comes out of the model of Anderson, transformed to take into account government procurement, allows the author to go from equation 6 to 7 by dividing by YI . To eliminate some problems of scale, he divides by Y . This works only if β_1 is equal to 1, which is what the paper tests for. But the test comes out to 0.722, which is significantly different from one. In fact, if you were to add here minus 1, minus β_1 , Line Y , et cetera, which would make it identical, and then run it with the YI on the other side, then maybe we would have values for our co-efficient somewhat biased because that variable is missing in the test.

The last thing to say concerns (1) whether exports are equal to imports or not, or (2) whether we should build in some disequilibrium so as to allow some disequilibrium in the short and medium runs. Then, when one liberalizes, we have a disequilibrium between exports and imports. And again, page 14, states that β_3 , being close to zero, means that there is no evidence that the effects of a nation's

procurement policies reduce the amount of goods exported. But we started from the model basis that exports equals imports. So either we have an disequilibrium or an equilibrium.

Comments by Jeffrey Bergstrand on

“The Effect of Liberalizing Government Procurement Practices on APEC Nations’ Imports” by Simon J. Evenett

This paper uses a standard international trade methodology to determine reasonable parameter estimates of the effects of liberalizing government procurement policies. While the overall methodology is certainly suitable, there appear to be some minor inconsistencies in the modification of the underlying theoretical framework that suggest the empirical model estimated may be misrepresenting the claimed effects, and some other minor aspects that might be addressed to avoid potential misspecification errors. This paper modifies a well-known theoretical foundation for the gravity equation in international trade [Anderson (1979)] to introduce a potential role for government spending on tradeables to estimate ultimately if there are potential trade-creating aspects from “liberalizing government procurement policies” in the APEC region. However, I found the derivations of theoretical reduced-form equation (4) incomplete and consequently misleading. However, I think the paper can be corrected to more clearly reveal what is likely transpiring.

First, the author unfortunately chooses some confusing redefinitions of Anderson’s original notation such that it is difficult to see how this paper’s reduced-form compares cleanly with Anderson’s. Here M_{ij} corresponds with M_{ji} in Anderson. Henceforth, to follow the derivations I will use M_{ij} to denote the trade flow from j to i (as in the paper) and $M_{ij} = M'_{ji}$, the latter denoting in Anderson’s model the trade flow from j to i . In this model, modifying Anderson:

$$(1) \quad M^P_{ij} = M^{P'}_{ji} = \gamma_j \phi_i Y_i$$

where P denotes a private sector import by i from j , ϕ_i (as in this paper) denotes the share of private sector spending on tradeable goods in nation i , Y^D_i denotes disposable income in nation i [$= (1-\tau_i)Y_i$], and γ_j denotes the share of tradeable expenditures of nation i spent on country j . As in Anderson, assume identical homothetic utility such that γ_j is identical across importing countries and equals nation j ’s share of world output of tradeables; this is consistent with the model here.

In this model,

$$(2) \quad M^G_{ij} = M^{G'}_{ji} = \gamma_j g_{it} Y_i$$

where M^G_{ij} denotes the import by nation i ’s government from j of goods, g_{it} denotes (as in this paper) the share of country i ’s GDP spent on tradeables by the government (hence, government procurement policies (favoring domestic suppliers) tend to lower g_{it}). Consequently, the overall bilateral trade flow is:

$$(3) \quad M_{ij} = M'_{ji} = \gamma_j [\phi_i (1-\tau_i) + g_{it}] Y_i$$

Solving this model as in Anderson (1979) yields:

$$(4) \quad \sum_i M_{ij} = \sum_i M'_{ji} = \gamma_j \{ \sum_i [\phi_i (1-\tau_i) + g_{it}] Y_i \}$$

or

$$(5) \quad [\phi_j (1-\tau_j) + g_{jt}] Y_j = \gamma_j \{ \sum_i [\phi_i (1-\tau_i) + g_{it}] Y_i \}$$

or

$$(6) \quad \gamma_j = [\phi_j (1-\tau_j) + g_{jt}] Y_j / \{ \sum_i [\phi_i (1-\tau_i) + g_{it}] Y_i \}$$

Substituting equation (6) into equation (3) yields:

$$(7) \quad M_{ij} = M'_{ji} = [\phi_i (1-\tau_i) + g_{it}] [\phi_j (1-\tau_j) + g_{jt}] Y_i Y_j / (\{ \sum_i [\phi_i (1-\tau_i) + g_{it}] Y_i / Y_w \} Y_w)$$

similar to, but not identical to, equation (4) in this paper.

There seems a fundamental, yet correctable, error in the construction of the first two terms in the numerator of the paper's equation (4). In fact, since the terms θ - g_t in the paper's eq. (4) can be replaced by $\phi (1-\tau)$ for each country, then in the paper's present construction any reduction in g_t (that is, switching government expenditures from tradeables to nontradeables) for a given tax rate, τ , must be accompanied by a rise in g_n , leaving *no net effect on trade*. (Recall, $\tau = g_t + g_n$ for budget balance.)

By contrast, eq. (7) above makes more sense intuitively, since -- with $\tau = g_t + g_n$ -- a fall in g_t can be accompanied by an equal percentage rise in g_n but there will be a net decrease *or* increase in the trade flow depending upon whether ϕ is less than or greater than $1/2$, since for instance $\phi_i (1-\tau_i) + g_{it} = \phi_i - \phi_i g_{in} + (1-\phi_i) g_{it}$.

A second important, and unrelated to the first, point is that the author uses the model of Anderson that *suppresses* distance, a factor influencing transport costs. Anderson's paper provides a nice way of thinking about the role of transport costs, as do other papers in the gravity-equation literature cited recently in Jeffrey Frankel's *Regional Trading Blocs in the World Economic System* (Washington, D.C.: Institute for International Economics, 1997). I reserve some concern that the estimated equations did not include a role for distance as a proxy for transportation costs. The author's footnote 5 does not provide a sufficiently convincing rationale for excluding distance in this study.

Third, these considerations may shed some light upon the empirical estimates of the coefficients of empirical equation (7) in the paper. According to the model, β_1 should equal one and β_2 should equal β_3 when the underlying variables are properly measured. Thus, I would imagine some of the final inferences in the paper would be amended were some of these modifications introduced.

Comments by John Reeder¹ on
State Trading Enterprises (STEs) by
Praveen Dixit and Tim Josling

Overall: This is an excellent article that discusses current thinking on STEs. Their classification system for STEs is an interesting new framework, and adds to understanding that STEs vary in their effects on trade and production.

Economic assumptions about STEs and economic efficiency

It may be helpful to readers if the authors would have briefly described the STE issue in a larger economic framework. STE are but one small part of the larger debate of public choice: what do government and private industry do in a private economy? STEs represent government activity as applied to a specific industry or business sector. A priori, STEs are not bad or good, more or less efficient than private enterprises in the real world of second best. In many factor markets, it is wrong to characterize a specific STE as economically inefficient without an analysis of the supply and demand conditions affecting the product, the market structure, and other related government goals or policies.

For example, it may appear prima facie to be inefficient for a coffee marketing board in a small producing developing country to impose export taxes to raise government revenues. Yet without other tax revenues, what are the government's choices? STEs can also be analyzed through other criteria used to measure good governance: is the enterprise run efficiently? Does it operate transparently through public accountability and published results? In developing countries, one may find STEs that operate clandestinely and inefficiently, not dissimilar to other portions of their governments.

Historical background of the issue

Another aspect of the issue the authors could have more fully explained is the historical framework of STEs. On page 6, the authors do discuss why countries pursue state trading in agriculture. Many STEs were created in the midst of the Depression of the 1930s or in some cases in the agricultural bust right after WWI (the Canadian Wheat Board). Agricultural surpluses in tropical products such as coffee or sugar or cocoa also motivated creation of STEs.

Another motive behind the creation of STEs was industrial structure, particularly with decentralized farmers facing monopsony processors, traders (including railroads), and large purchasers with market power. An STE is an alternative regulatory structure for dealing with market power. In theory, it is possible to regulate monopoly or monopsony power through public bodies such as utility rate commissions or railroad rate commissions (such as the former ICC), but economic research has shown that such regulation is often ineffective. Developing countries created parastatals in the 1940s, and 1950s

¹ The author is with the Office of Industries of the U.S. International Trade Commission. These comments are solely meant to represent the opinions individual authors. They are not meant to represent in any way the views of the U.S. International Trade Commission or any of its individual Commissioners or the U.S. government.

because of a belief that a market failure required the presence of the state to begin industries dominated theretofore by the developed countries (steel and petroleum for example).

Specific commodities and STEs.

It may also be helpful to consider the type of commodity affected and its specific supply and demand history. Dairy seems to be a sector that is strongly affected worldwide by government policies; is the New Zealand Dairy Board's existence related to this?

Specific page comments:

Page 4, third paragraph: I agree that STE trading may not have changed all that much. In wheat trade, the four big exporters, the U.S., Canada, Australia, and the EU all have had some form of state trading over the past decade, depending on the definition of STEs.

Page 4, second paragraph: As to reasons behind the current policy interest in STEs, the GATT obviously covered STEs since the immediate post-WWII period, however none of the leading powers, particularly the United States, had any interest in curtailing or curbing STEs. So when did the U.S. change its views on this topic, and begin its current opposition to STEs? This policy change can be seen as a logical continuation of the U.S. initiative, begun in the Reagan Administration, to eliminate government influence and regulation on trade and domestic production. The drive for "free trade" (by which is meant "unregulated" trade) obviously benefits certain groups more than others.

As a corollary to this, the U.S. Government and the multilateral financial institutions have been pushing developing countries since the debt crisis of the early 1980s to carry out so-called "neo-liberal reforms" that entail the elimination of parastatals and privatization of government owned industries (steel, utilities, petroleum for example), and this certainly included elimination of STEs.

Private multinational and financial interests have also been behind the neo-liberal reforms to further their own pecuniary interests. This group also includes politically connected elites in certain developing countries (as well as the Former Soviet Union (FSU)) who have made scandalously high profits (rent seeking) from their purchase of previous public enterprises and STEs. This also involves the issue of good governance.

Page 10, first paragraph.--I agree with the ambiguity as to whether an STE can raise capital at a lower cost than private enterprises. There is probably some lower interest rate charged for a government backed loan, but that depends on the government entity and on the private enterprise to which a comparison is made. D.C. Government bonds are currently rated as junk bonds "BBB" by Standard and Poors; Sally Mae or Ginnie Mae bonds are rated much closer to U.S. bond rates. What rate does an ADM or a Cargill pay for short term loans or credit to finance its grain trading, and what rate does the CWB pay? A well-run STE is probably viewed by lenders as credit worthy, and would receive a low rate of interest. But a well run merchant trading company like Cargill with annual sales of over \$40 billion is also going to receive a prime rate from its bankers.

Pages 15-18: The analytical presentation on pages 15-18 is a little obtuse (at least for this non PhD-economist), partly because their figures are not easily readable nor explained well. I would shorten this explanation, and make the figures more readable.

Page 28 (reference GAO study): GAO has published a more recent study, **Canada, Australia, and New Zealand: Potential Ability of Agricultural STEs to Distort Trade**, June 1996, you may want to cite.

SESSION VIII

***GENERAL EQUILIBRIUM MODELING OF TRADE
LIBERALIZATION A***

STRATEGIC INTERESTS OF ASEAN IN REGIONAL TRADING ARRANGEMENTS IN THE ASIA-PACIFIC REGION

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STRATEGIC INTERESTS OF ASEAN IN REGIONAL TRADING ARRANGEMENTS IN THE ASIA-PACIFIC REGION

I. INTRODUCTION

The past decade has witnessed deepening economic integration among neighbouring nations through formal regional trading arrangements. Spearheaded by the United States and the European Union, regionalism spread rapidly in the Americas and Europe but was slower to take hold in the Asia Pacific region. Since the early 1990's, however, there has been added momentum in this region to fully embrace the idea of regionalism in order to leverage on the growing interdependence among member economies.

Currently, regional institutions within Asia Pacific can be conceived as concentric rings of regional groupings. The oldest of these is the grouping of ASEAN countries, originally comprising Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand with later inclusion of Vietnam, Laos and Myanmar. At the next level within East Asia is the proposed East Asian Economic Caucus including largely ASEAN and North East Asian countries like Japan, Korea and China but excluding the western industrialised economies in North America and Australasia. At the widest level is the established institution of APEC, encompassing the 18 countries in North America, East Asia, Australasia as well as Chile and Mexico.

This paper examines the strategic interests of ASEAN countries within APEC when forming regional alliances in the pursuit of trade liberalisation. Employing a Computable General Equilibrium (CGE) model, the effects of the various Free Trade Area arrangements on ASEAN as a whole as well as on each individual ASEAN country are analysed. A strong case is made for ASEAN to extend the boundaries of its trade liberalisation strategy to a larger regional framework.

Overview of Regional Institutions in the Asia Pacific Region

(a) ASEAN

Formed in 1967, the Association of South-East Asian Nations (ASEAN) is the oldest of the established regional grouping in the Pacific Basin. Originally conceived as a political grouping, early efforts in economic cooperation were inward-looking and were largely unsuccessful in fostering growth and intra-regional trade expansion.

The revival of regionalism in the mid and late 80's, especially the then impending formation of NAFTA led to the idea of an ASEAN FTA (AFTA) being tabled in early 1991. The proposal gained official endorsement in January 1992 in the Singapore Summit which set a timetable of 15 years or attainment by 2008.

Spurred on by external forces, ASEAN has made substantial progress in accelerating its liberalisation process. Subsequent ASEAN ministerial meetings have deepened and broadened the scope of the AFTA agreement in addition to accelerating the timetable for attainment to 2003. However, unlike the

European Union, ASEAN countries are more competitive than complementary in their economic structure. ASEAN countries are heavily dependent on foreign direct investments (FDI) from outside the region to drive the industrialisation process. Similarly, the level of intra-regional trade dependence is fairly low. Trade links are limited in most cases with the exception of Singapore which has extensive trading relationships with all ASEAN nations, reflecting the island state's role as an entrepot port. All ASEAN countries trade heavily with USA, Japan, EU and other NIEs, with intra-ASEAN trade accounting for only 10-25% of total global trade. Consequently extra-ASEAN investment inflows and trade are far more important in integrating ASEAN economies than intra-ASEAN linkages.

(b) East Asian Economic Caucus

The idea of the East Asian Economic Grouping (EAEG) came from the Malaysian Prime Minister, Dr. Mahathir Mohammad when he suggests in late 1990 that Malaysia would take the lead to set up an East Asian trade group to counter the single market concept of the European Community and NAFTA. The EAEG concept was to embrace countries in South East and North East Asia although no firm list of countries was made out. The United States, Canada, Australia and New Zealand were to be excluded. The rationale was that cooperation and speaking in one voice was necessary among the Asia-Pacific countries in the face of the then failure of the GATT talks. Malaysia may particularly wish to anchor Japan to East Asia rather than have Japan uproot its industries away to Europe or North America.

In October 1991, ASEAN trade ministers met and supported the EAEG concept as an ASEAN initiative after the name was changed to East Asian Economic Caucus (EAEC). North America and Australia have voiced opposition to the concept which has resulted in the cautious attitude and Japan and some ASEAN countries to the idea. Moreover, the significant dependence of East Asian countries on the US market makes it costly for an East Asian grouping to exclude the US.

(c) APEC

The Asia Pacific Economic Cooperation (APEC) was formed in 1989 at a meeting of foreign and trade ministers in Canberra, Australia. The original members of the APEC forum included Australia, Brunei, Canada, Indonesia Japan, South Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand and the United States. Membership of this broadest of Asia Pacific regional groupings has since expanded to 18 member economies.

The APEC forum set out to coordinate economics and trade among member economies, partly in response to growing concern over the lack of progress in the GATT Uruguay Round negotiations. Subsequent APEC ministerial meetings have resulted in greater commitment from member nations to further the cause of trade liberalisation in the region, culminated in the Bogor Declaration of free and open trade and investment by 2010/2020. A number of trade liberalisation objectives and agendas have been arrived at, the latest being the Manila Action Plan, under which each member country spells out its individual liberalisation programme above and beyond Uruguay Round commitments.

II. REGIONAL ECONOMIC INTEGRATION AMONG THE ASEAN NATIONS

ASEAN Free Trade Area (AFTA)

The Association of Southeast Asian Nations (ASEAN) is a regional bloc representing the Southeast Asian countries, recognized as a separate geographical area in the modern world since World War II. In order to strengthen political cohesiveness, enhance the cooperation among member nations and to increase the volume of intra-regional trade as well as accelerate the economic growth of each member nation, ASEAN was established in 1967 by the five founding member nations—Indonesia, Malaysia, the Philippines, Singapore, and Thailand. The ASEAN membership has been extended to Brunei Darussalam in 1984, Vietnam in 1995, and Lao PDR and Myanmar in 1997. If Cambodia succeeds to join ASEAN, ASEAN will cover all the ten Southeast Asian countries.

Since the 1980s, the economic performance of most of the ASEAN member nations has been impressively successful. However, its regional economic cooperation has not been very successful in helping each member nation to advance up the ladder of economic development. To continue to grow faster and to respond to the recent trend of regionalism around the world, such as, the European Union (EU) and the North American Free Trade Area (NAFTA), each ASEAN member nation has been forced to enhance economic cooperation to strengthen collective market size and attractiveness to direct foreign investment. That is, in order to move up the ladder of economic development in this highly competitive world economy, each ASEAN member nation has to attempt to enhance the regional economic cooperation. Another important challenge on ASEAN was the return of Hong Kong to China in 1997. China's rapidly expanding economy itself has already been recognized in ASEAN as a challenging factor in attracting direct foreign investment as well as exporting to third market. In addition to the challenge by China itself, Hong Kong as a state of China in 1997 and China's possible reunification with Taiwan in the future will be a big challenge to ASEAN at the world market.

The ASEAN Free Trade Area (AFTA) can be interpreted as ASEAN's collective strategic response to China's competitive pressure as well as to the worldwide movement towards regional trading arrangements, particularly in the Americas. On January 1, 1993, ASEAN launched the free trade area with an agreement of reducing or eliminating tariffs on nonagricultural products within 15 years under a Common Effective Preferential Tariff (CEPT) scheme. Each ASEAN member nation would cut import tariffs for all goods traded within the region to below 5%. Two different tracks—a "fast track" and a "normal track" will accomplish the import tariffs cut under the CEPT scheme. Under the "fast track," the import tariffs for products with tariffs below 20% will be reduced to below 5% by January 1, 2000, and for other products by January 1, 2003. Under the "normal track," the import tariffs for products with tariffs above 20% will be reduced to 20% within five to eight years in the first stage and reduced to below 5% in the following seven years.

Since ASEAN declared its strategic response to the worldwide trend of economic integration to sustain its rapid economic growth by stimulating intra-regional trade and by attracting more foreign direct investment, quite a number of researchers have attempted to evaluate the possible gains or losses from AFTA.¹ Some of them strongly support AFTA, insisting that the trade creation effect of free trade area

¹ See Imada, Montes, and Naya (1991), Imada and Naya (1992), Moellers and Mahmood (1993), Nadal De Simone (1995), Park (1995), Ramasamy (1995), and Ariff et. al. (1996).

will overwhelm the trade diversion effect. Besides the net positive trade creation effect, the free trade agreement will be beneficial to each ASEAN member nation because it will improve the economic efficiency resulting from the stronger competition and provide a large prospective market, which has over 400 million consumers. In addition to the static gains, they expect big dynamic gains from the strengthened international competitiveness, enhanced inflow of foreign direct investment from other regions, and learning-by-doing effects via trade and foreign direct investment.

On the other hand, some have raised skepticism about the success of AFTA based on the slow progress of past ASEAN economic cooperation. They note the small volume of intra-ASEAN trade, relatively similar production and trade structures in each ASEAN country, and competition among the members for the same export markets.² They conclude that ASEAN member nation's economic structure are more competitive than complementary. Therefore AFTA, by reducing tariff barriers among the nations will be "trade-diverting" rather than "trade-creating." Researchers pessimistic about AFTA also insist that cooperation within a free trade area among the members of ASEAN, which have very different tariff structures and are located at different stages of economic development, will not be feasible. These differences will yield extremely different gains or losses from regional integration to each participating country and will hinder the movement toward a common market.

ASEAN's Regional Grouping in a Global Context

This paper attempts to evaluate the possible gains or losses from AFTA as well as other AFTA plus free trade arrangements on ASEAN as a whole and on each ASEAN member nation. We attempt to analyze whether it is better for ASEAN to maintain the pure regionalisation within a bloc or to widen the option toward other blocs in a wider regional context. For example, ASEAN may push APEC to go toward a free trade area, it may try to integrate with greater China—China, Hong Kong, and Taiwan, initiate discussion on AFTA-US free trade area, or it may start dialogue with Japan and Korea to strengthen the East Asian Economic Caucus (EAEC).

III. CGE MODEL STRUCTURE

In this paper, we focus on finding ASEAN's strategies in regional trading arrangements in the Asia-Pacific. To find ASEAN's strategic policy alternatives through extending the AFTA agreement, we use computable general equilibrium (CGE) analysis as the modeling framework. CGE modeling has been well recognized as a useful methodology to measure the impact of regional economic integration. As the impact of regional economic integration depends on complex microeconomic relations, intersectoral and intercountry linkages, CGE analysis is preferable to traditional econometric models and partial equilibrium analysis, which have difficulty capturing the variety of microeconomic relations and complicated feedback effects. However, contrary to the large volume of literature on computable general equilibrium analysis

² Intra-ASEAN trade has expanded from 16.3% in 1990 to 17.9% in 1993 and 19.6% in 1996. Every ASEAN member's export-led growth has been in several limited items of exportables, such as, light manufactured products, natural resources, and agricultural products. About 30% to 40% of each ASEAN member's exportables are sold to the United States and Japan.

dealing with the effects of NAFTA or APEC free trade area,³ the gains or losses of AFTA have rarely been studied in a general equilibrium framework.⁴

The CGE model used in this paper is a modification of multi-regional CGE models in Lewis, Robinson and Wang (1995) and Global Trade Analysis Project (GTAP) at Purdue University.⁵ The CGE model for this research is highly disaggregated in region and commodity. The highly disaggregated CGE model allows us to analyse both overall macroeconomic impacts of the possible regional groupings on each ASEAN economy as well as the impacts on each industry level in each country. In this preliminary effort to compare the possible strategic regional groupings in the Asia-Pacific region, we have aggregated the number of independent countries/region into nine, and the number of sectors into ten (see Tables 1 and 2). In particular, each of the ASEAN five countries is treated as an independent country in the region to facilitate the analysis of the effect of different scenario on each ASEAN member's economy.

TABLE 1. Regional Aggregation

Aggregation	Economies/Regions
Indonesia	Indonesia
Malaysia	Malaysia
Philippines	The Philippines
Singapore	Singapore
Thailand	Thailand
Greater China	China, Hong Kong, and Taiwan
North East Asia	Japan and Korea
United States of America	USA
Rest of the World	Other countries

TABLE 2. Commodity Aggregation

Aggregation	Industries
Agriculture, Forestry and Fishery	Paddy rice, wheat, grains, non grain crops, wool, other livestock, forestry, fishery
Mining	Coal, oil gas, other minerals
Food and Beverages	Processed rice, meat products, milk products, other food products, beverages and tobacco
Textiles	Textiles and wearing apparels
Chemicals	Petroleum & coal products, chemical rubbers & plastics, nonmetallic mineral products
Metals	Primary ferrous metals, non ferrous metals, fabricated metal products
Transport Equipment	Transport equipment
Machinery Equipment	Machinery and other equipment
Other Manufacturing	Leather, lumber & wood, pulp paper, other manufacturing
Services	Electricity, gas and water, construction services, trade and transport services, other private services, other government services, ownership of dwellings

³ See Tan and Toh (1997).

⁴ See Park (1995) and Park and Lee (1997).

⁵ See Hertel et. al. (1996).

The general features of the static multi-region CGE model can be summarized by the following assumptions.

- A. Similar to traditional multi-regional CGE model of trade liberalization, the CGE model assumes perfect competition markets and that all the markets are cleared.
- B. Production process is represented by a Constant Elasticity of Substitution (CES) production function of primary sectors—labour, land, and capital with fixed proportions of intermediate input demands. Producers maximize profits at perfectly competitive goods and services market. Therefore zero profit condition at each market holds.
- C. The primary input factors are fully utilized and capital is freely mobile across sectors within a region but labour and land are sector-specific within a region. Sectoral employment is allowed to vary but aggregate employment is fixed.
- D. Export supplies and domestic supplies of domestically produced goods and services are allocated by Constant Elasticity of Transformation (CET) aggregation function.
- E. A representative household has a Cobb-Douglas expenditure function equivalent to the Cobb-Douglas utility function optimization process.
- F. Real investment and government spendings are fixed as policy variables.
- G. Regional CGE models in the model are linked through regional trade flows.
- H. Armington assumption is applied to trade between regions.
- I. For model closure, exchange rates are endogenously determined to maintain the given value of trade balance in each economy.

The import demand function specification and the inclusion of positive externality are special features of the CGE model adopted in this paper. Following Deaton (1980) and Lewis, Robinson, and Wang (1995), we have adopted the Almost Ideal Demand System (AIDS) specification for imports. This specification allows import expenditure elasticities to be different from unity as well as the more realistic situation of allowing cross-country substitution elasticities to vary for different pairs of countries.⁶ In general, this specification generates more realistic trade-volume and terms-of-trade effects when analyzing the economic impact of regional trade liberalization.

There is a substantial theoretical and empirical literature indicating that potential dynamic effects of trade liberalization are significantly larger than the traditional static gains. There are, however, fewer consensus on the different channels as well as the quantitative magnitude of the positive externalities of such trade-productivity links.⁷ Instead of tackling the substantial theoretical and empirical problems of

⁶See for example, Hanson, Robinson and Tokarick (1990) for AIDS function in CGE model of the US economy. See Brown (1987), Alston (1989) and Devarajan, Lewis and Robinson (1990).

⁷See for example Barro (1991), Levine and Renelt (1992), Baldwin and Seghezza (1996), Baldwin (1992).

introducing economies of scale and imperfect competition in CGE models, we have adopted the introduction of potential dynamic effects of trade liberalization by incorporating equations for generating positive externalities through both export expansion and the importation of new capital goods.

Following Lewis, Robinson, and Wang (1995), we have adapted the three different channels of trade-productivity links. The first channel links sectoral productivity to sectoral imports of intermediate and capital goods so that the extent of productivity increase depends on the share of intermediates in production. The second channel for trade-productivity links is the externality associated with sectoral export performance i.e. higher export growth translates into increased domestic productivity. Thirdly, the externality associated with aggregate exports whereby increased exports make physical capital more productive, an effect embodied in the capital stock input in the production process.

The first two channels of imported intermediate input (ρ^k) and sectoral export performance (ρ^e) impact productivity through the sectoral production functions.

The externality associated with aggregate exports (ρ^k) is directly embodied as an increase in the initial capital stock ($FS_{k,0}$) and hence enters the production function indirectly as an increase in the capital input.

$$FS_{k,t} = FS_{k,0} \rho^k$$

Each of the three externality relationships (ρ^m , ρ^e , ρ^k) operates through simple elasticity equation. For example, an export productivity elasticity of 0.15 for industrial sector export means that a 10 percent rise in real exports would result in a 1.5 percent increase in total factor productivity in that sector. Empirically, with little good estimates to draw on, the choice of externality parameters to use in the model is largely based on guesstimates. For these preliminary simulations, we have used the Lewis, Robinson and Wang (1995) guesstimates, which are partly based on De Melo and Robinson (1992) in their analysis of the Korean growth performance.

Finally, the model has been calibrated based on the Global Trade Analysis Project (GTAP) data set version 3.0.⁸

IV. LIBERALIZATION OF TRADE BEYOND AFTA

The economic benefits/costs of AFTA to ASEAN members have been studied by several researchers⁹. In general, the effects are favourable though not exceptionally large. This could be due to the high degree of complementarity in economic structure and low volume of intra-regional trade among ASEAN members. However, it is noted that there will be substantial scope for expanding intra-regional trade when AFTA is fully implemented to complement the economic reform and deregulation undertaken in each member economy to pursue export-oriented development strategy and attract foreign capital and technology inflow.

⁸See Hertel et. al. (1996).

⁹ See for instance, Imada, Montes and Naya (1991), Park (1995), Toh and Low (1993).

In the discussion that follows, we consider a few options which can possibly be pursued by ASEAN as whole in enlarging its trade linkages with other trading region/countries in the Asia Pacific. With the help of the CGE model, we attempt to evaluate the benefits and costs from the perspective of the five major ASEAN countries in each of the options. We treat the benefits of implementing AFTA as the basis to compare the gain obtainable in the other options. For each case, a 50% reduction of existing (i.e. base year 1992) protection rate (tariff and non-tariff barriers) within the regional grouping is used as the basis of the shock. A total of five options are considered. They are:

- A. AFTA and FTA with US
- B. AFTA and FTA with Japan and Korea
- C. AFTA and FTA with China, Hong Kong and Taiwan (Greater China)
- D. AFTA and FTA with Japan, Korea, China, Hong Kong and Taiwan (EAEC)
- E. AFTA and FTA in APEC

A schematic representation of the possible sub-regional groupings that ASEAN may seek to enlarge its AFTA is shown in Figure 1.

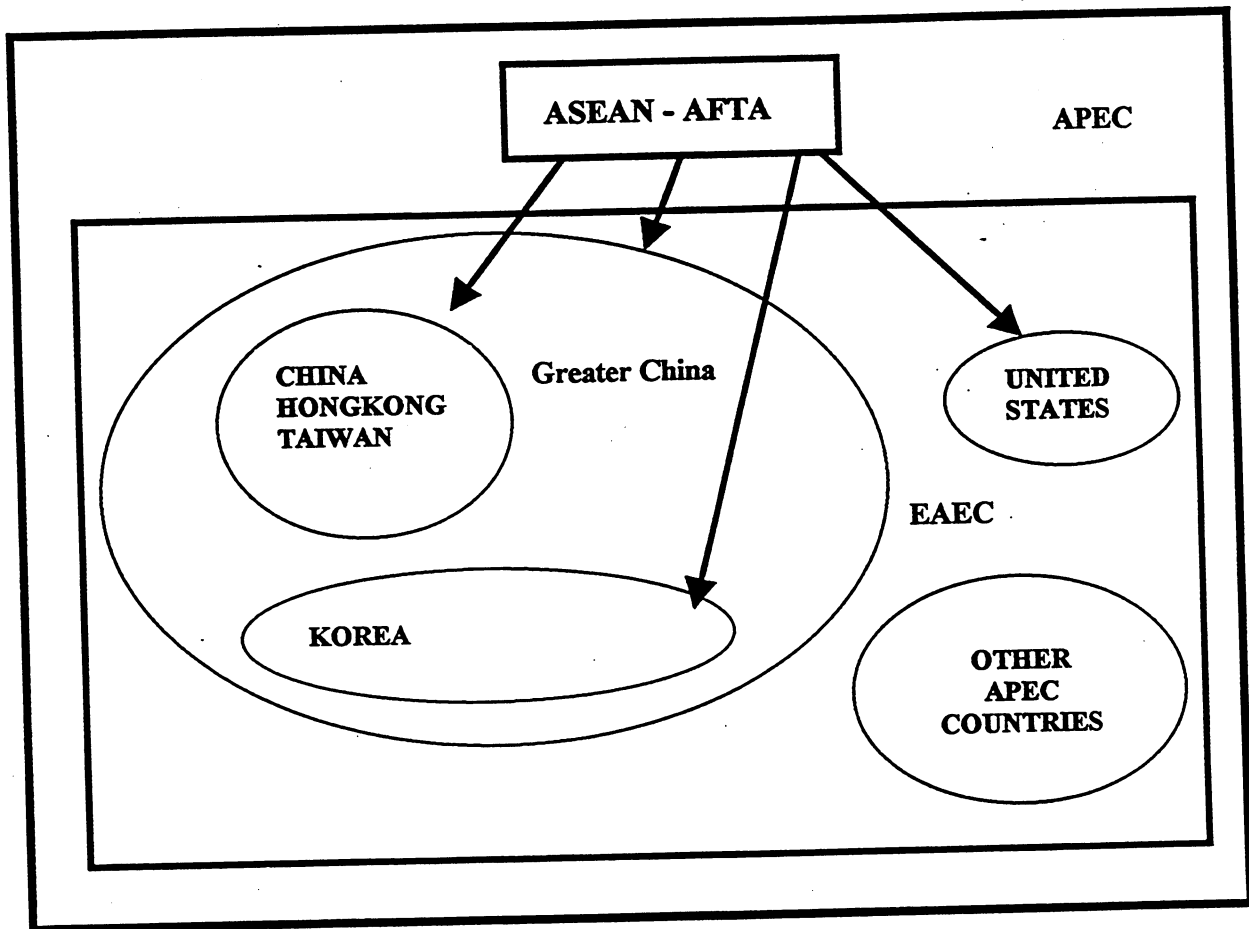
The impact of a 50% reduction of protection rates in the AFTA on the real GDP of the five ASEAN members is shown in Table 3¹⁰. Measured by the percentage deviation from the base year (1992), Thailand, Malaysia and the Philippines are expected to record the highest increase while Singapore appears to benefit least from the ASEAN free trade area. However, this is not surprising as Singapore already has very low tariff barriers, while the other ASEAN members still have considerable room for reduction in tariff and non-tariff barriers to enjoy the gain in international trade. Nevertheless, ASEAN members are aware of the non-zero sum gain in trade liberalisation as often the positive externalities from international competition and exchange will more than compensate for the necessary costs of adjustment.

Table 3 : Macroeconomic Effects of AFTA
(percentage deviation from base)

	Real GDP	Export	Import	Rental	Wage
ASEAN 5	0.34	1.05	0.89	1.01	0.66
Indonesia	0.10	0.39	0.37	0.20	0.19
Malaysia	0.58	1.89	1.75	1.81	2.05
Philippines	0.43	1.94	1.41	0.79	0.77
Thailand	0.60	1.93	1.44	1.34	1.36
Singapore	0.02	0.22	0.24	1.20	1.28

¹⁰ The insignificant impacts of the AFTA on other countries in the model are summarized in Appendix Table 1.

Figure 1: Possible Configuration for Expanding AFTA within APEC



The exports and imports for ASEAN5 as a whole will increase by about one per cent. This small effect is reflective of the current low level of trade interdependence as well as the heavy reliance on markets beyond the ASEAN region. In a way, it also provides a rationale for ASEAN to seek greater trade cooperation with countries and trading groups beyond Southeast Asia to enhance economic gains.

Trade Liberalization Between ASEAN (AFTA) and Other Regions

The idea of a free trade area between ASEAN and the United States is not new. As early as 1988, a joint effort by U.S. and ASEAN researchers submitted a report to the Joint Steering Committee of the ASEAN and US Government proposing the two parties enter into an economic cooperation agreement¹¹. Within the scope of such an agreement, the United States and ASEAN would be able to negotiate a wide range of formal agreements, ranging from formal comprehensive treaties to sector- and issue-specific arrangements. The researchers of the report believe that "an ASEAN-U.S. FTA should be the ultimate goal of the Framework Agreement".

The delayed completion of the Uruguay Rounds has stimulated and spawned several imaginative proposals for bilateral and sub-regional economic cooperation, especially in the Asia Pacific region. The remarkable economic success of the Asian NIEs and the rapid expansion of the Chinese economy quite naturally point researchers and analysts to consider the continuance of trade-led development in the formation of free trade area. One natural grouping, already driven substantially by market forces despite political reservations, is the economic grouping comprising Taiwan, Hong Kong and China to form Greater China. A *Greater China FTA* is reckoned to be a formidable trading bloc equipped with up-to-date technologies, capital, marketing network, adaptable labour force and very large domestic market. This Greater China grouping poses a strong competitive challenge to ASEAN. One strategy is for ASEAN to seek a regional grouping with Greater China. Another possible development is the FTA with Japan and Korea to counter the influence of the Greater China FTA.

While intra-regional economic cooperation is the main focus of ASEAN, it has increasingly recognized the leverage it possessed as an economic bloc in regional and multilateral negotiations. As an economic entity, ASEAN through its own FTA can increase its linkage with other FTAs to bring about greater welfare for its members. Thus the impacts of trade liberalization beyond AFTA in five possible directions are of interest to policy makers in ASEAN countries.

¹¹Naya S. et. al.(1989) *ASEAN-US Initiative*, East West Centre, Honolulu and Institute of Southeast Asian Studies, Singapore.

Table 4 : Effect on Real GDP

(Impact of AFTA plus relative to AFTA)					
	<i>AFTA</i>	<i>AFTA+</i>	<i>AFTA+</i>	<i>EAEC</i>	<i>APEC</i>
ASEAN 5	2.1	2.0	3.3	4.3	5.4
Indonesia	2.8	2.8	6.1	8.0	10.0
Malaysia	1.3	1.6	2.2	2.9	3.3
Philippines	3.7	2.2	4.1	5.3	8.1
Thailand	1.7	1.9	2.9	3.8	4.5
Singapore	1.2	1.3	1.7	2.1	2.5

Table 4 compares the real GDP gains for the various AFTA plus regional trading arrangements relative to the present AFTA arrangement. Starting with the ASEAN-US FTA, the improvement in real GDP for ASEAN is about twice that of AFTA. The improvement is not significantly different if ASEAN will to form a FTA with China, Taiwan and Hong Kong. However, when the latter is expanded to include Japan and Korea to form the EAEC, the improvement in real GDP increases to 4.3 times that of AFTA. Enlarging the FTA membership to cover the whole of APEC will increase the improvement to 5.4 times that of AFTA alone. Interestingly, a FTA involving ASEAN, Korea and Japan produces real GDP improvement larger than that of the ASEAN - US FTA or the ASEAN-Greater China FTA, indicating the substantial complementarities between the economic structure of Japan and Korea with that of ASEAN. Appendix Table 2 shows the real GDP gains or losses for the various policy alternatives to all the regions/countries in the model. From the Appendix Table 2, we find that the regional trading arrangements are mutually beneficial to the participating economies in terms of the real GDP.

At the individual country level, the macroeconomic impact on real GDP is not uniform among the five ASEAN members. While the other four ASEAN members may be relatively indifference between ASEAN - US FTA or the ASEAN-Greater China FTA, Philippines would prefer an ASEAN-US FTA by virtue of the greater gain in real GDP. In fact, Philippines' benefits will be more pronounced whenever a FTA does include the US as a member. On the other hand, an ASEAN-US FTA is of lesser significance to Malaysia and Singapore. It is noteworthy that Indonesia's gain in real GDP will be substantially improved whenever Japan is included as a member of the FTA. These are not peculiar phenomena but are reflective of the heavy reliance of the Philippines and Indonesia on the United States and Japan in trade and investment respectively. Nonetheless, it will be an important factor in the crafting and implementing of policies relating to unified ASEAN initiatives in trade and investment liberalization vis-a-vis other trading blocs.

Trade volumes will expand in tandem with the expansion of real GDP in the economies of ASEAN. Mirroring the impact on real GDP, Table 5 presents the impact on the exports of the ASEAN 5 in the different FTA schemes. FTA with East Asian economies will generate greater export volumes under a ASEAN-US FTA. In fact, it is expected in the coming years, intra Asian trade will continue to expand faster than ASEAN-US trade when the economies in Asia are further integrated by the rapidly expanding intra-regional expansion in trade and investment among regional economies.

Table 5 : Effect on Exports

(Impact of AFTA Plus Relative to AFTA)

	<i>AFTA</i>	<i>AFTA</i>	<i>AFTA</i>	<i>EAEC</i>	<i>APEC</i>
ASEAN5	1.8	2.0	2.9	3.9	4.8
Indonesia	2.7	3.0	6.0	8.1	10.0
Malaysia	1.3	1.7	2.1	2.8	3.2
Philippines	3.5	2.5	4.0	5.7	8.5
Thailand	1.7	2.0	2.9	4.0	4.6
Singapore	1.2	1.2	1.7	2.0	2.4

Note: Appendix Table 3 shows the effects on all the regions/countries in the model.

At a more disaggregated level, Table 6 presents the sectoral impact in the ASEAN5 economies under different FTA schemes. By virtue of the fact that the ASEAN economies have quite different industrial structures, natural resources endowment, it is not surprising that sectoral trade dependency is not uniform throughout ASEAN. While Singapore is very much dependent on the export of manufactured goods, the other members still have substantial portion of their trade in natural resources like oil, gas, rubber, tin and timber. However, the accelerated pace of industrialisation with the help of foreign investments have led all ASEAN economies onto a convergent path of increased dependency on trade in manufactured goods, extending from labour intensive textile and apparel production to more sophisticated products in the microelectronic and information technology areas.

For AFTA, the primary sector for ASEAN as a whole is estimated to contract marginally, particularly for Malaysia, Thailand and Singapore. When linked to US or Northeast Asia, ASEAN collectively will expand the primary sector, especially for Malaysia and the Philippines.

All the ASEAN 5 member will increase their industrial output in the secondary sector as a result of various FTA schemes. For ASEAN5 as a whole the impact were about doubled in the case of an ASEAN-US FTA or ASEAN-Greater China FTA, to more than five times in the case of a FTA in APEC. Again, the importance of US to the Philippines and Indonesia, as well as the importance of Japan to Indonesia and the Philippines stand out, for both the secondary and tertiary sector. Concurrent growth in the ASEAN tertiary sector is also expected, though Singapore stands out as an exception where tertiary output is projected to decline in all the FTA schemes.

The impact of the FTA on three different industries are shown in Tables 7, 8 and 9. Table 7 presents the impact on the output in the textile industry. As in most developing economies, textile production and exports are important economic activities in ASEAN. Tariff reduction and the dismantling of international quantitative restraints such as the Multi Fibre Arrangement, will undoubtedly boost the export performance of many developing countries including ASEAN members.

Table 6 : Impact of AFTA and other FTA Scheme on Sectoral Output

	<i>AFTA</i>	<i>AFTA + USA</i>	<i>AFTA + Greater</i>	<i>AFTA + JAPAN +</i>	<i>EAEC</i>	<i>APEC</i>
Primary Sector						
	<i>-0.04</i>	<i>0.09</i>	<i>0.04</i>	<i>0.10</i>	<i>0.09</i>	<i>0.12</i>
	<i>0.04</i>	<i>-0.49</i>	<i>-0.99</i>	<i>-0.78</i>	<i>-1.40</i>	<i>-1.55</i>
Malaysia	<i>-0.38</i>	<i>0.23</i>	<i>0.20</i>	<i>0.80</i>	<i>0.77</i>	<i>0.75</i>
Philippines	<i>0.19</i>	<i>-0.03</i>	<i>0.03</i>	<i>0.19</i>	<i>0.25</i>	<i>0.21</i>
Thailand	<i>-0.06</i>	<i>-0.15</i>	<i>-0.19</i>	<i>-0.31</i>	<i>-0.42</i>	<i>-0.50</i>
Singapore	<i>-0.08</i>	<i>-0.03</i>	<i>-0.12</i>	<i>0.07</i>	<i>-0.04</i>	<i>-0.07</i>
Secondary						
	<i>0.85</i>	<i>2.07</i>	<i>2.16</i>	<i>2.95</i>	<i>4.16</i>	<i>5.31</i>
	<i>0.24</i>	<i>3.10</i>	<i>3.38</i>	<i>6.76</i>	<i>9.25</i>	<i>11.60</i>
Malaysia	<i>1.92</i>	<i>1.35</i>	<i>2.05</i>	<i>2.09</i>	<i>3.16</i>	<i>3.55</i>
Philippines	<i>1.22</i>	<i>4.25</i>	<i>2.67</i>	<i>4.15</i>	<i>5.95</i>	<i>9.56</i>
Thailand	<i>1.17</i>	<i>1.77</i>	<i>1.94</i>	<i>2.66</i>	<i>3.60</i>	<i>4.32</i>
Singapore	<i>0.21</i>	<i>1.32</i>	<i>1.23</i>	<i>2.13</i>	<i>2.52</i>	<i>3.10</i>
Tertiary Sector						
	<i>0.27</i>	<i>1.82</i>	<i>1.87</i>	<i>3.28</i>	<i>4.17</i>	<i>5.03</i>
	<i>0.08</i>	<i>2.43</i>	<i>2.61</i>	<i>6.51</i>	<i>8.32</i>	<i>10.07</i>
Malaysia	<i>0.45</i>	<i>1.33</i>	<i>1.86</i>	<i>2.26</i>	<i>3.14</i>	<i>3.54</i>
Philippines	<i>0.30</i>	<i>3.23</i>	<i>1.69</i>	<i>4.18</i>	<i>4.86</i>	<i>7.12</i>
Thailand	<i>0.52</i>	<i>1.54</i>	<i>1.78</i>	<i>2.87</i>	<i>3.65</i>	<i>4.17</i>
Singapore	<i>-0.06</i>	<i>1.29</i>	<i>1.32</i>	<i>1.67</i>	<i>2.10</i>	<i>2.48</i>

Note:*Figures in italics represent the percentage deviation from 1992 base case***Other bold figures represent the multiples using the AFTA percentage deviations as base****Appendix Table 4 shows the effects on all the regions/countries in the model****Table 7: FTA Schemes and Textile Output**

	<i>AFTA</i>	<i>AFTA + USA</i>	<i>AFTA + Greater</i>	<i>AFTA + JAPAN +</i>	<i>EAEC</i>	<i>APEC</i>
ASEAN	1.8	1.9	3.1	3.5	5.8	6.9
Indonesia	<i>1.0</i>	<i>2.1</i>	<i>3.7</i>	<i>7.9</i>	<i>10.8</i>	<i>12.3</i>
Malaysia	<i>6.3</i>	<i>1.1</i>	<i>2.8</i>	<i>1.6</i>	<i>3.6</i>	<i>3.7</i>
Philippines	<i>4.2</i>	<i>2.7</i>	<i>5.8</i>	<i>3.7</i>	<i>9.0</i>	<i>11.4</i>
Thailand	<i>1.4</i>	<i>1.8</i>	<i>1.5</i>	<i>2.5</i>	<i>2.9</i>	<i>3.6</i>
Singapore	<i>0.5</i>	<i>1.1</i>	<i>4.4</i>	<i>3.1</i>	<i>7.3</i>	<i>8.0</i>

Note:*Figures in italics represent the percentage deviation from 1992 base case***Other figures represent the multiples using the AFTA percentage deviations as base****Appendix Table 5 shows the effects on all the regions/countries in the model**

The figures in Table 7 indicate that for AFTA, textile output will increase the most in Malaysia and the Philippines. Linkage with the other regional economies, particularly Japan, Korea and the US, will boost the production of textile output in Indonesia and the Philippines substantially.

As the ASEAN economies industrialised, the trade pattern will likely to alter in tandem with the changing industrial structure. Hence, exports of manufactured products and more capital intensive commodities like machineries and equipment will increase. In Tables 8 and 9, the impact of different FTAs on the output of machineries and equipment, other manufactured goods are compared.

Table 8 : FTA Schemes and Machineries & Equipments

	<i>AFTA</i>	<i>AFTA + USA</i>	<i>AFTA + Greater</i>	<i>AFTA + JAPAN +</i>	<i>EAEC</i>	<i>APEC</i>
ASEAN	1.6	1.9	1.3	3.7	4.1	5.1
Indonesia	1.2	3.7	2.1	7.8	9.2	12.5
Malaysia	3.3	1.4	0.9	2.6	2.6	3.0
Philippines	4.4	3.3	1.4	5.0	5.4	8.0
Thailand	3.8	1.7	1.7	3.7	4.4	5.2
Singapore	-0.1	0.1	-0.1	0.5	0.5	0.7

Note:

Figures in italics represent the percentage deviation from 1992 base case

Other figures represent the multiples using the AFTA percentage deviations as base

Appendix Table 6 shows the effects on all the regions/countries in the model

Table 9 : FTA Schemes and Other Manufactured Goods

	<i>AFTA</i>	<i>AFTA + USA</i>	<i>AFTA + Greater</i>	<i>AFTA + JAPAN +</i>	<i>EAEC</i>	<i>APEC</i>
ASEAN	0.6	2.2	2.3	1.4	2.6	3.6
Indonesia	0.3	3.6	1.6	1.3	1.6	3.8
Malaysia	1.5	1.3	2.4	1.4	2.8	3.2
Philippines	0.7	5.6	0.4	1.1	0.1	4.2
Thailand	1.0	1.5	2.3	1.6	2.8	3.1
Singapore	-0.7	1.0	0.9	1.4	1.3	1.3

Note:

Figures in italics represent the percentage deviation from 1992 base case

Other figures represent the multiples using the AFTA percentage deviations as base

Appendix Table 7 shows the effects on all the regions/countries in the model

As in the case of textile output, output for machineries and equipment will expand under AFTA, particularly for Malaysia, Philippines and Thailand. The importance of the US and Japan for Philippines and Indonesia stand out again. For output of other manufactured products, Table 9 indicates that the US

market is extremely important for output expansion, compared to the Northeast Asian market. This is the sector where Northeast and Southeast Asia are competitive and highly dependent on the vast US market.

V. CONCLUSIONS

The regional grouping of ASEAN has increasingly emerged as a significant player in regional and global political and economic discussions in the post cold war era. As a grouping of small to medium sized powers located in the dynamic Asia Pacific region where the interests of major powers like the US, Japan, China intersect, ASEAN has been able to play a disproportionately important role. ASEAN's support was instrumental in the formation of APEC in 1989. ASEAN also played a major role in the establishment of the multilateral security grouping, the ASEAN Regional Forum (ARF). The Asia-Europe Summit (ASEM) was also a major initiative undertaken by ASEAN in enhancing the economic linkages between Asia and Europe to dilute the dominance of the US in global affairs.

While the ASEAN Free Trade Area has been somewhat successful in enhancing greater economic cooperation in ASEAN, there has been increasing concern on how ASEAN as a grouping should progress to enhance its international competitiveness in an increasingly globalized economy. Existing expansion in AFTA included the discussion on the elimination of non-tariff barriers, trade facilitation measures like the harmonization of tariff nomenclature, mutual recognition of product standards and the revision of these standards to enhance transparency. In addition, the establishment of an ASEAN Investment Area was designed to maintain ASEAN's competitive position in attracting direct foreign investment.

For Liberalization in services, ASEAN adopted the Framework Agreement on Trade in Services at the ASEAN Summit in December 1995. The agreement committed ASEAN to eliminate substantially all existing discriminatory measures and market access limitations amongst member states and prohibited new or more discriminatory measures and market access limitations. The priority services sector for negotiations were financial services, telecommunications and tourism. ASEAN countries have committed to reaching an agreement for these sectors beyond their WTO obligations within 18 months from the start of the negotiations in January 1996.

However, recent difficulties in the Southeast Asian economies indicate that ASEAN would face enormous challenges in the next decade. Compared to the past decade of rapid growth, the next decade is likely to pose major fundamental challenges, even after the present turmoil in the equity and foreign exchange markets stabilized.

Firstly, particularly since 1992, China has emerged as a major competitor in attracting foreign direct investment as well as selling to third market, especially the US market. The bulk of foreign direct investment from Taiwan, Hong Kong that flowed to Southeast Asia between 1987-91 has been diverted to China. Increasing amount of investment from Korea, Japan, US and Europe have also been attracted by the expanding China market. ASEAN has responded by broadening, deepening and further liberalizing the ASEAN Free Trade Area (AFTA) to create a potential market of 500 million consumer as a collective strategic response to the external competition.

Secondly, there are indications that NAFTA and the regional trading arrangements in the Americas could increasingly pose a competitive challenge to Southeast Asia. This is particularly so for sectors like textile, garment and automobile where the rules of origin have been rather restrictive. For example, Asia's

market share in US apparel imports had declined from 68% in 1990 to 40% in 1996, while that of Mexico, Canada and the Caribbean have increased from 16% to 37% in the corresponding period. In the first six months of 1997, growth of apparel exports from Mexico and the Caribbean to US have risen by 30-50%, that of China by 50% while that of Southeast Asian countries by only -3 to 16%.

Thirdly, the Southeast Asian countries are increasingly being squeezed in the middle of the industrial ladder. They do not yet have the skill and technological base to compete with the NIEs. On the other hand, the other cheap labour countries like China, South Asia and some Latin American countries are rapidly catching up from behind. Judging from the present poor educational and skill profile as well as weak technological base of countries like Thailand and Indonesia, the continuous upward climbing is likely to be an arduous one. Hence, the present difficulty might not be purely cyclical but could rather be more structural and longer term.

With growth in the next decade to be much more arduous, ASEAN's 2020 vision of a peaceful and prosperous grouping might not be achievable based largely on the effort in AFTA alone. ASEAN might need to actively explore closer economic relationship with other complementary regions to ensure sustained momentum in growth. While political and security considerations would be significant in such exploration, the economic benefits and gains as examined in this paper would also be of substantial consequence.

At the present stage of development, dependence pattern in trade and investment, it is most advantageous for ASEAN to focus extra-ASEAN regional grouping at the APEC level rather than truncate it at the EAEC level. This is because two key countries in ASEAN, namely the Philippines and Indonesia will suffer substantially from any exclusionary trading groups that exclude the US.

While the trade and investment pattern could change substantially over the next two decades, particularly with China emerging as an increasingly important trading partner, the importance of Japan and the US to ASEAN is likely to remain. While the rapid industrialization of the coastal region of China could increasingly create a big market for ASEAN products, the gradual migration of labour intensive and medium technology products from coastal to inland China would likely to prolong China as a serious competitor to ASEAN in attracting direct foreign investment and exporting to third market for quite a sustained period.

From the US perspective, any scheme that is likely to exclude itself in East Asia will probably continue to come from Malaysia, while the Philippines and Indonesia can be counted on to oppose such exclusionary scheme. On the other hand, China which has the ambition to play a more significant economic and political role in East Asia, can be counted on to strongly cultivate Malaysia and Thailand to reduce the dominant role of the US in the region. From this perspective, US might need to increasingly depend on Japan, the Philippines and Indonesia to ensure continued dominant economic and political presence in East Asia in the next century.

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APPENDICES

**Appendix Table 1. Macroeconomic Effects of
(% Deviation from Base)**

	Real GDP	Exports	Imports	Rental Rate	Wage Rate
Hong Kong	0.000	0.002	0.005	0.005	0.005
China	-0.001	0.004	-0.005	0.000	0.001
Taiwan	0.000	0.012	0.003	-0.003	-0.003
Korea	0.001	0.011	-0.005	-0.002	-0.003
Japan	-0.001	-0.013	-0.017	0.000	0.000
USA	0.000	0.005	0.103	0.003	0.007
EU	-0.001	-0.010	-0.004	0.000	0.001

Appendix Table 2. Effect on Real GDP (% Deviation from Base)

	AFTA	AFTA + USA	AFTA + Greater China	AFTA + JAPAN + KOREA	EAEC	APEC
Hong Kong	0.000	0.000	0.000	-0.001	-0.002	-0.004
China	-0.001	-0.001	0.852	0.002	1.640	1.871
Taiwan	0.000	0.000	0.038	0.000	0.080	0.259
Korea	0.001	0.001	0.001	0.112	0.246	0.442
Japan	-0.001	-0.001	-0.001	0.023	0.056	0.155
USA	0.000	0.006	-0.001	-0.001	-0.001	0.038
EU	-0.001	-0.001	-0.001	-0.001	-0.001	0.000
Indonesia	0.102	0.281	0.284	0.612	0.802	0.995
Malaysia	0.579	0.779	0.950	1.296	1.677	1.898
Philippines	0.431	1.578	0.934	1.763	2.287	3.504
Thailand	0.604	1.024	1.177	1.746	2.314	2.697
Singapore	0.017	0.021	0.023	0.029	0.036	0.042

Appendix Table 3. Effect on exports (% Deviation from Base)

	AFTA	AFTA + USA	AFTA + Greater China	AFTA + JAPAN + KOREA	EAEC	APEC
Hong Kong	0.002	-0.001	-0.024	-0.009	-0.066	-0.090
China	0.004	0.004	4.313	0.005	7.970	8.856
Taiwan	0.012	0.011	0.539	0.008	1.331	2.489
Korea	0.011	0.010	0.023	1.657	2.642	4.472
Japan	-0.013	-0.013	-0.017	0.350	0.848	2.023
USA	0.005	0.119	-0.001	-0.004	-0.010	0.700
EU	-0.010	-0.010	-0.013	-0.013	-0.014	0.001
Indonesia	0.392	1.069	1.184	2.367	3.190	3.919
Malaysia	1.888	2.497	3.212	3.959	5.315	5.978
Philippines	1.942	6.761	4.929	7.813	11.045	16.484
Thailand	1.927	3.261	3.895	5.634	7.622	8.888
Singapore	0.215	0.262	0.264	0.367	0.435	0.511

Appendix Table 4. Effect on Sectoral

	AFTA	AFTA + USA	AFTA + Greater China	AFTA + JAPAN + KOREA	EAEC	APEC
PRIMARY SECTOR						
Hong Kong	-0.031	-0.031	-0.094	-0.031	-0.219	-0.250
China	-0.002	-0.001	0.348	0.002	0.690	0.820
Taiwan	0.003	0.000	-0.128	0.000	-0.231	-0.790
Korea	0.000	0.000	0.002	-0.129	-0.499	-0.972
Japan	-0.001	-0.003	0.000	-0.084	-0.253	-1.207
USA	-0.077	-0.110	-0.080	-0.077	-0.078	0.081
EU	-0.004	-0.004	-0.004	-0.003	-0.002	0.003
Indonesia	0.040	0.088	0.038	0.105	0.092	0.115
Malaysia	-0.379	-0.495	-0.990	-0.778	-1.399	-1.551
Philippines	0.192	0.227	0.198	0.797	0.774	0.750
Thailand	-0.060	-0.034	0.026	0.194	0.250	0.205
Singapore	-0.077	-0.153	-0.192	-0.307	-0.422	-0.499
SECONDARY SECTOR						
Hong Kong	0.002	0.002	0.041	0.003	0.068	0.070
China	0.000	0.000	1.802	-0.001	3.440	3.854
Taiwan	0.004	0.003	0.267	-0.004	0.551	1.695
Korea	0.005	0.004	-0.001	0.358	0.982	1.934
Japan	-0.001	-0.001	-0.003	0.066	0.161	0.561
USA	0.000	0.034	-0.003	-0.008	-0.017	0.072
EU	0.006	0.005	0.005	0.003	-0.002	-0.009
Indonesia	0.245	0.758	0.826	1.654	2.264	2.839
Malaysia	1.922	2.588	3.947	4.021	6.084	6.823
Philippines	1.216	5.166	3.247	5.049	7.240	11.630
Thailand	1.170	2.065	2.273	3.109	4.213	5.051
Singapore	0.211	0.280	0.261	0.450	0.534	0.655
TERTIARY SECTOR						
Hong Kong	-0.002	-0.002	-0.008	-0.002	-0.013	-0.011
China	-0.002	0.000	0.635	0.004	1.236	1.429
Taiwan	-0.001	0.000	-0.061	0.004	-0.116	-0.333
Korea	-0.002	-0.002	0.000	0.023	0.014	-0.034
Japan	-0.001	-0.001	-0.001	0.007	0.018	0.043
USA	-0.002	-0.003	-0.001	0.000	0.003	0.023
EU	-0.003	-0.002	-0.003	-0.002	-0.001	0.003
Indonesia	0.080	0.195	0.209	0.523	0.668	0.808
Malaysia	0.453	0.603	0.842	1.025	1.423	1.604
Philippines	0.298	0.963	0.504	1.247	1.448	2.122
Thailand	0.523	0.803	0.929	1.498	1.908	2.180
Singapore	-0.063	-0.081	-0.083	-0.105	-0.132	-0.156

Appendix Table 5. FTA and Textile output (% Deviation from Base)

	AFTA	AFTA + USA	AFTA + Greater China	AFTA + JAPAN + KOREA	EAEC	APEC
Hong Kong	-0.004	-0.010	0.264	-0.004	0.482	0.559
China	0.001	0.000	5.782	-0.008	11.775	12.888
Taiwan	-0.065	-0.076	0.490	-0.128	0.610	3.536
Korea	-0.036	-0.038	-0.085	1.875	3.598	7.033
Japan	-0.003	-0.001	0.011	0.078	0.232	0.538
USA	-0.067	0.030	-0.039	-0.052	-0.007	0.416
EU	-0.014	-0.012	0.004	-0.005	0.027	0.045
Indonesia	1.009	2.149	3.774	7.926	10.882	12.392
Malaysia	6.338	6.788	17.796	10.433	22.589	23.639
Philippines	4.156	11.195	24.103	15.286	37.332	47.530
Thailand	1.387	2.497	2.051	3.489	4.032	4.952
Singapore	0.534	0.608	2.328	1.644	3.881	4.263

Appendix Table 6. FTA and Machineries and Equipment Output (% Deviation from Base)

	AFTA	AFTA + USA	AFTA + Greater China	AFTA + JAPAN + KOREA	EAEC	APEC
Hong Kong	0.036	0.049	-0.144	0.074	-0.235	-0.290
China	0.001	0.002	1.326	0.005	2.556	3.080
Taiwan	0.047	0.051	0.447	0.074	1.708	1.421
Korea	0.044	0.042	0.047	0.657	0.622	0.845
Japan	0.010	0.007	0.007	0.125	0.287	0.639
USA	0.217	0.261	0.210	0.189	0.165	0.243
EU	0.057	0.053	0.054	0.044	0.030	-0.002
Indonesia	1.193	4.433	2.547	9.311	10.992	14.927
Malaysia	3.276	4.502	3.046	8.539	8.361	9.730
Philippines	4.397	14.557	6.072	21.946	23.719	35.328
Thailand	3.797	6.391	6.380	13.905	16.880	19.743
Singapore	-0.059	0.061	-0.122	0.451	0.464	0.712

Appendix Table 7. FTA and Other Manufactured Goods Output (% Deviation from Base)

	AFTA	AFTA + USA	AFTA + Greater China	AFTA + JAPAN + KOREA	EAEC	APEC
Hong Kong	-0.006	-0.007	-0.078	-0.012	-0.143	-0.163
China	0.002	0.000	3.096	-0.004	5.381	6.114
Taiwan	-0.025	-0.032	0.336	-0.058	0.286	1.745
Korea	-0.011	-0.014	-0.008	0.497	1.655	3.276
Japan	-0.006	-0.008	-0.015	-0.022	0.017	0.361
USA	-0.080	-0.099	-0.101	-0.084	-0.118	-0.184
EU	-0.014	-0.015	-0.022	-0.015	-0.028	-0.031
Indonesia	0.267	0.961	0.426	0.337	0.425	1.014
Malaysia	1.472	1.969	3.590	2.093	4.193	4.643
Philippines	0.728	4.077	0.283	0.817	0.060	3.035
Thailand	0.985	1.518	2.274	1.581	2.731	3.010
Singapore	-0.667	-0.690	-0.578	-0.954	-0.865	-0.867

The COMPREHENSIVENESS OF APEC's FREE TRADE COMMITMENT

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ABSTRACT

Comprehensiveness is an important feature of APEC's goal of free and open trade and investment. Both services trade liberalisation and trade facilitation measures add significantly to the benefits from liberalisation of merchandise trade. But were agriculture to be excluded, the APEC region would forgo benefits amounting to fully 60 per cent of the gains from liberalisation of merchandise trade. Not only would the efficient agricultural exporters in the region stand to lose in an economy-wide sense, but so too would the economies that currently maintain relatively high protection of agriculture and rob themselves of gains from improved efficiency and greater specialisation.

Comprehensiveness is also important as a principle guiding progress. The efficiency costs of trade restrictions are a function of disparities in assistance, as much as of levels. Liberalisation efforts that focus on lowly or moderately assisted sectors, leaving untouched the high levels of assistance in sensitive sectors, risk increasing the disparities in assistance. The potential costs of this approach are illustrated by examining the impact of some of the likely nominations for 'early voluntary liberalisation' initiatives.

THE COMPREHENSIVENESS OF APEC'S FREE TRADE COMMITMENT

1 Introduction

In the Bogor Declaration of November 1994, APEC members committed themselves to the long-term goal of free and open trade and investment in the Asia Pacific, at the latest by 2010 for industrialised countries and 2020 for developing countries.

This goal will be pursued promptly by further reducing barriers to trade and investment and by promoting the free flow of goods, services and capital among our economies. We will achieve this goal in a GATT-consistent manner and believe our actions will be a powerful impetus for further liberalisation at the multilateral level to which we remain fully committed. (APEC Economic Leaders 1994)

The goal was clearly ambitious, with the commitment covering not just goods trade but also services trade and capital flows. The Bogor Declaration also gave considerable weight to APEC's trade and investment facilitation programs, which were to complement and support the process of liberalisation.

Twelve months later the key issue leading up to the Osaka meeting of APEC leaders was whether the APEC commitment could be comprehensive in its sectoral coverage. Four major APEC economies — Japan, Korea, China and Taiwan — indicated concerns about including their agricultural sectors in the commitment to free trade. The issue of comprehensiveness was one of the most difficult faced during the year. But at the Osaka meeting, the principle of comprehensiveness was firmly endorsed. Agriculture remains on the APEC agenda.

In addition to comprehensiveness, the Osaka Action Agenda laid down other principles to govern progress towards free and open trade and investment. Implementation was taken further with the Manila Action Plan for APEC in November 1996. This incorporated Individual Action Plans, Collective Action Plans and other joint activities in various APEC forums. On one assessment, the Individual Action Plans of some economies fall short of Bogor targets, while for other economies the plans appear sufficient to

reach the target (Yamazawa 1997). The 1996 Leaders' meeting also called for nominations for 'early voluntary liberalisation' initiatives, which are in the process of being prepared. It remains to be seen how comprehensive is the final package of these initiatives.

The first purpose of this paper is to establish the importance of having a comprehensive end-point or goal, by examining the possible long-term impact of the various components of the free trade commitment made at Bogor. The paper is one of a growing body of literature that examines empirically the impact of liberalisation in APEC (eg. World Bank 1994, Murtough et al. 1995, McKibbin 1996, Young and Huff 1997, and work currently being undertaken by the Trade Liberalisation Task Force of the APEC Economic Committee). In addition to looking at the liberalisation of merchandise trade in agricultural and non-agricultural products, the paper also includes the possible impact of services trade liberalisation, as well as of trade and investment facilitation measures.¹

The analysis suggests that both services trade liberalisation and trade facilitation measures can add significantly to the benefits from liberalisation of merchandise trade. It also suggests that were agriculture to be excluded, the APEC region would forgo benefits amounting to fully 60 per cent of the gains from liberalisation of merchandise trade. Not only would the efficient agricultural exporters in the region stand to lose in an economy-wide sense, but so too would the economies that currently maintain relatively high protection of agriculture and rob themselves of gains from improved efficiency and greater specialisation.

The second purpose of the paper is to highlight the importance of comprehensiveness as a principle guiding progress. The efficiency costs of trade restrictions are a function of disparities in assistance, as much as of levels. Liberalisation efforts that focus on lowly or moderately assisted sectors, leaving untouched the high levels of assistance in sensitive sectors, risk increasing the disparities in assistance. The potential costs of this approach can be illustrated by examining the impact of some of the likely nominations for early voluntary liberalisation initiatives. In a few instances, economies are projected to lose from individual initiatives, for classic second-best reasons.

The paper is structured as follows. Section 2 briefly discusses the economic tools with which APEC liberalisation is examined, while some of the key assumptions underlying the analysis are outlined further in Appendix A. The analysis makes use of IC95, a model of international trade featuring economies of scale in production and gains from intra-industry specialisation.

Readers wanting to avoid technical detail can skip this material, but should be aware that the results of an exercise such as this can sometimes be very sensitive to some of the assumptions used. A systematic sensitivity analysis is provided in Appendix B. The discussion of results in the main body of the paper endeavours to draw on conclusions that are robust to the sensitivity tests chosen.

Section 3 then discusses the scope of the APEC commitment to free trade. It covers the likely scope of facilitation initiatives as well as trade liberalisation. One important consideration is to net out of the analysis the impact of trade liberalisation initiatives already agreed to in other fora. The key agreements netted out of the current consideration are the NAFTA and Uruguay Round agreements. The results show that despite the Uruguay Round's achievements in liberalising world trade in agricultural and processed food products, the agricultural and food sectors in some APEC economies would remain relatively highly protected, and therefore subject to significant structural adjustment as a result of APEC's commitment to free trade.

¹ The paper draws heavily on an earlier paper by Dee, Geisler and Watts (1996).

Section 4 then examines the projected impacts of APEC liberalisation for each of the key economic groupings in the region, focusing on the contributions from liberalisation of merchandise trade, services trade, and from trade facilitation measures. It also discusses the economy-wide implications had agriculture been excluded from the liberalisation package.

Section 5 examines more closely the importance of comprehensiveness during the implementation of APEC's commitment.

Section 6 gives suggestions for further research.

2 The framework for analysis

The analysis makes use of a multiregion, multisector model called IC95, a hybrid model incorporating features from Jomini et al. (1994), Hertel (1997), Francois, McDonald and Nordstrom (1995) and Brown et al. (1995). Its key features are:

- a database with a 1992 reference year from the GTAP model (Hertel 1997), but updated to incorporate more recent information on various forms of protection from GATT/WTO sources, and then adjusted to exclude the trade liberalisation already scheduled under the Uruguay Round and NAFTA agreements;
- an imperfectly competitive, monopolistic competition treatment of resources, food processing and other manufacturing industries along the lines of Francois, McDonald and Nordstrom (1995) and Brown et al. (1995); and
- a treatment of capital accumulation and international capital mobility midway between those of the Salter (Jomini et al. 1994) and GTAP models.

Each of these features is discussed in more detail in Appendix A of this paper.

The analysis uses the model to provide a long-run snapshot view of the full impact of APEC's free trade commitment. Information on post-Uruguay, post-NAFTA levels of assistance gives an indication of how much further each APEC economy would need to go to achieve free trade. Several past studies are available that can give a likely indication of the scope for resources savings from trade and investment facilitation measures. These assistance changes and direct resource savings are fed into the model framework, to give an indication of the flow-on effects on wages, prices, and levels of economic activity.

The liberalisation and facilitation measures will be phased in over time, and it will also take time for each APEC economy to adjust to the changes. During this phasing and adjustment period, a myriad of other changes will also affect each APEC economy. These other changes are not taken into account in the current analysis. For this reason, the results from the model should not be interpreted as indicating the likely changes over time that will occur in each APEC economy — such results would require *all* changes, not just changes in assistance, to be taken into account. The model results should instead be seen as providing an indication, at some future point in time after all the phasing and adjustment has taken place, of how different each economy would be, compared with the alternative situation at the same point in time, had the liberalisation not taken place.

The distinction is important to keep in mind. Sometimes to aid fluency, the results are couched as if key economy indicators 'rise' or 'fall'. This should not be interpreted to mean that the indicators would be higher or lower than they are now. It means that they would, at some future time, be higher or lower than they otherwise would have been had the liberalisation not occurred. In both cases, in a growing economy, these indicators could be higher than they are now.

3 The scope of APEC's free trade commitment

Liberalisation

Any assessment of APEC's free trade commitment needs to net out the impact of other trade liberalisation initiatives agreed to in other fora. As noted above, the current assessment nets out the impact of the NAFTA and Uruguay Round agreements. It does not net out the impact of the AFTA agreement, since both the degree of liberalisation under AFTA, and its relation to APEC liberalisation, are unclear for at least some countries.

The levels of protection remaining in APEC economies, once the NAFTA and Uruguay Round agreements are netted out, are shown in Table 1. For comparison purposes, it also shows the equivalent protection levels in non-APEC regions. For each region, the table shows average protection levels for three broad sectors, being weighted averages of protection levels for the 37 industry groups included in the IC95 model for which post-Uruguay data were obtained from the World Bank. The sectoral breakdown of the IC95 model is shown in appendix Table A1.

For most industries, including those in the services sector, post-NAFTA, post-Uruguay protection is measured by a single tariff rate or tariff equivalent of non-tariff protection against imports. For agriculture and food processing, protection is currently granted by a range of non-tariff barriers and domestic support measures, as well as by explicit tariffs and export subsidies. Under the Uruguay Round agreement, non-tariff barriers on agriculture are to be converted to explicit tariffs. The average tariff rate for agriculture and food in Table 1 therefore shows the average tariff protection level that will apply once tariffication and associated tariff bindings are in place. Similarly, the average export subsidy and production subsidy rates show post-Uruguay levels of export subsidy and domestic support.²

² The summary information in Table 1 first aggregates distinct bilateral tariff rates for each region across the range of other regions supplying the imports. This averaging across source regions has been done at the 37 industry level using import weights. Thus for example, the average tariff levels for the NAFTA region take into account that for a range of goods, tariffs will be zero for NAFTA's trade with itself. It then aggregates protection levels across industries. For each broad sector and for each type of protection, the sector average protection level has been obtained as a production weighted average of rates across the relevant industries. The sectoral averages for services differ slightly from those reported in Brown et al. (1995) because of a slightly different method of aggregation.

Table 1: Estimated post-NAFTA, post-Uruguay levels of protection
(per cent)

	<i>Aus</i>	<i>NZ</i>	<i>NAFTA</i>	<i>Jpn</i>	<i>Kor</i>	<i>Ind</i>	<i>Mal</i>	<i>Phl</i>	<i>Sng</i>	<i>Tha</i>	<i>Chn</i>	<i>Twn</i>	<i>EU</i>	<i>ROW</i>
Import tariffs														
Agric & food ^a	1.4	1.9	7.6	61.8	36.2	15.4	32.8	37.0	7.8	39.2	6.1	37.9	33.1	9.8
Res & manuf ^a	6.2	5.8	1.5	1.2	9.0	18.3	9.9	22.0	2.3	27.4	11.3	6.5	3.2	11.7
Services ^b	109.0	107.6	63.1	68.2	54.5	49.1	52.2	51.3	50.8	47.7	47.2	52.6	98.9	110.5
Export subsidies														
Agric & food ^a	0.9	..	1.6	..	..	..	..	..	..	..	..	..	8.1	0.1
Production subsidies														
Agric & food ^a	0.8	0.6	3.2	3.4	7.2	1.4	..	..	..	0.4	..	..	..	..

^a Estimates from World Bank (as also reported in Hertel et al. 1995), Incgo (1995) and Francois, McDonald and Nordstrom (1995). See Appendix A for further details.

^b Estimates from Hoekman (1995), reported in Brown et al. (1995). The cross-regional pattern of these estimates relative to Australia and New Zealand lacks plausibility, but the estimates provide the only comprehensive attempt to date to quantify barriers to services trade. See Appendix A for further comments and qualifications.

The average levels of protection in Table 1 give a broad indication of the scope of APEC's free trade commitment. In what follows, it is assumed that a move to free trade involves the complete elimination of the protection summarised in Table 1. There has been debate by some APEC members on whether free trade would mean absolutely zero tariffs on merchandise trade. If not, the current treatment might be slightly overstated. In the services area, where some barriers tend to be of an all-or-nothing nature, the current treatment is more likely to be appropriate.

The Bogor declaration also committed APEC members to achieving their free trade goal in a GATT-consistent manner. In itself, this did not necessarily commit members to liberalise on a non-discriminatory or most-favoured-nation basis. For example, Article XXIV of the GATT allows discriminatory action so long as it liberalises 'substantially all trade' and so long as barriers to non-members are not raised. The enabling clause of the Tokyo Round Agreement effectively removes this constraint with respect to the imports and exports of developing countries. Snape (1995) nevertheless argued that it would be extremely difficult for a preferential APEC agreement to meet all the requirements of GATT consistency. The current assessment of APEC liberalisation assumes that the liberalisation occurs in a non-discriminatory manner, consistent with the notions of open regionalism and concerted unilateralism. Indeed, the principle of non-discrimination was endorsed at the Osaka summit in November 1995.

According to Table 1, the areas of highest average assistance are in the service sectors of most APEC economies. As noted above, the assistance 'guesstimates' are obtained indirectly. Where a region failed to make an offer during the GATS negotiations, this was interpreted as indicating the existence of a range of barriers prohibiting market access. Since no economy scheduled more than about 65 per cent of the total number of possible sectors (Hoekman 1995), and since the tariff equivalent of a prohibitive trade

restriction was assumed to be 200 per cent, it is not surprising that the guesstimated tariff equivalents of all services trade restrictions averaged between 50 and 100 per cent. It is nevertheless difficult to fully understand the cross-regional pattern of estimates. In any event, were an alternative interpretation put on the failure to make an offer, the tariff equivalents would be smaller (Warren 1996, PECC 1995).

Since very little services trade liberalisation has been achieved so far under the GATS agreement, there is considerable scope for liberalisation under APEC's free trade commitment. Any assessment of the impact of such liberalisation needs to be qualified, however, not just by cautions about the quality or interpretation of the trade restriction guesstimates, but also by qualifications on the quality and extent of data on initial levels of services trade, and on the way that services are modelled.³

The database for a model such as IC95 can, at best, draw on data for the total levels of services trade by service category obtained originally for balance of payments purposes and subsequently incorporated into regional input-output frameworks. The data therefore tend to be better for the service categories such as 'trade and transport' that are relatively well-measured for balance of payments purposes, but less reliable for some of the other service categories, particularly private services (including business services such as technical consultancy, software development) that are often measured as a pure residual. Even where trade totals are measured with reasonable reliability, it needs to be remembered that the bilateral patterns of such trade are obtained by pure estimation (typically from bilateral patterns of goods trade or by using some form of gravity model), since no bilateral services trade data are collected directly in any systematic fashion.

Services trade can perform a number of functions. Services can be required in their own right, such as when an engineering firm wins a contract to provide consultancy services on a foreign construction project. Alternatively, services can be traded internationally to facilitate trade in merchandise. Trade and transport services (wholesaling, retailing, air, sea, road and rail transport services) are the most obvious example, but it appears that many financial services are also 'traded', via the permanent presence of a banking or insurance facility in another country, to facilitate goods trade between the two countries. The benefits of trade liberalisation are likely to be greater, and more evenly spread, when services play a dual role, because the linkages to other parts of the economy are more pervasive.

Like Salter and GTAP, IC95 captures the dual role of trade and transport services as being traded in their own right as well as facilitating goods trade. It does not capture a dual role for any other service category, despite this probably being an important feature of why they are traded. To the extent that the data are reliable, the dual role has been captured for the most important category, since trade and transport services are more heavily traded than other service categories in most economies. To the extent that a dual role for other services has not been recognised, the benefits from services trade liberalisation may be understated.

³ It is nevertheless easy to overestimate the extent to which services require a modelling treatment different from that for goods. Brown, Deardorff and Stern (1995) have considered this in some detail, and conclude that the key difference requiring a different treatment is the characteristic identified by Ethier and Horn (1991), that producers of services typically specialise their products to the particular needs of customers. This is a level of product differentiation below the firm-level differentiation captured in IC95 (see Appendix A), and is also an argument for possible diseconomies of scope.

Table 1 shows that next to service sectors, the agricultural and food sectors in Japan, Korea and Taiwan have among the highest levels of protection within the APEC region, even taking into account the liberalisation already agreed to under the Uruguay Round agreement. However, the agriculture and food sectors in Thailand, the Philippines and Malaysia are also relatively highly protected. China does not appear to be heavily protected, although this may be an artifice of the way that the agricultural estimates in China have been constructed.

The estimates of agricultural protection in Table 1 do not include the impact of quarantine restrictions. If APEC's free trade commitment removes other restrictions on agricultural trade but if quarantine restrictions remain, even for the best of reasons, then the effective liberalisation of agricultural trade could be considerably less than the estimates in Table 1 would suggest. This is an important qualification to the impacts of agricultural liberalisation estimated in the next section.

Outside of agriculture and services, post-NAFTA, post-Uruguay assistance levels are generally more moderate, although low sectoral averages for resources and non-food manufacturing in some economies disguise a relatively wide dispersion of assistance at the industry level around the sectoral average. In particular, tariffs on textiles and clothing are still relatively high in Australia and New Zealand, importing economies not otherwise affected by the Uruguay Round commitment to dismantle the Multifibre Arrangement. Assistance to motor vehicles is also high in these economies. Assistance to textiles, clothing and lumber products tends to be high in Indonesia and Malaysia. Within non-food manufacturing, assistance tends to be high across the board in the Philippines and Thailand.

Facilitation

According to UNCTAD, a comprehensive US assessment of the costs involved in document preparation and handling in connection with the movement of goods in international trade concluded that the total cost of paperwork and procedures could amount to 10 to 15 per cent of the value of goods traded. This was recognised as a conservative estimate by UN experts.

The estimate was made in 1971, and did not take account of indirect costs

which can be quite substantial, although they are not easy to quantify, like those caused by delays in transport resulting from cumbersome procedures, delays in payment caused by errors in documentary credits, losses due to deterioration or pilferage while cargo is waiting for clearance or onward transportation, etc. Neither did it refer to lost opportunities, nor the strong disincentive for potential exporters caused by the complication of international trade procedures. (UNCTAD 1992, p. 99)

UNCTAD noted that while there have been substantial cost improvements since 1971, the range of 10 to 15 per cent of the value of goods traded is 'still generally accepted in trade facilitation circles as an order of magnitude for the direct and indirect costs of procedures'. For economies such as South Korea where trade is 40 per cent of GDP, the estimated costs of doing trade could therefore account for as much as 4 to 6 per cent of GDP.

A more recent study of the potential cost savings from market integration in Europe estimated the direct and indirect costs of border controls and customs red tape to be smaller than the UNCTAD study, although other types of savings from market integration were also considered.

The Cecchini studies, (Cecchini 1988) looked at a range of barriers that could be targeted in a single European market:

- border controls and customs red tape;
- divergent standards and technical regulations;
- conflicting business laws and tax regulations; and
- protectionist procurement practices.

The study used survey techniques to examine the direct and indirect costs of border controls and customs red tape, including administration costs, consignment delays and turnover foregone. It also gave estimates of the government spending on the resources required to operate the customs controls. Direct administration costs were estimated at around 1.5 per cent of the value of trans-border trade, while delays added a further 0.5 per cent. The cost of business foregone was between 1 and 3 per cent of the value of trade, while the cost of government expenditure added only 0.1 to 0.2 per cent. In total, therefore, the direct and indirect costs of border controls and customs red tape were up to 5 per cent of the value of trade.

In the European context, the border controls were needed for a variety of reasons: because of differences in VAT and excise rates, because of the need to adjust farm product prices in accordance with Europe's Common Agricultural Policy, for veterinary checks, transport controls, statistical formalities or to enforce bilateral trade quotas and other quantity restrictions with non-EC countries to certain goods. The costs of border controls and customs red tape were highest for small businesses.

As noted above, the Cecchini studies also looked at a range of other measures affecting either goods trade or cross-border investment. These measures could, on a broad interpretation, be taken as potential areas of action for the facilitation of trade or investment flows.

Divergent technical regulations and standards, along with duplication of testing and certification procedures, were found to affect a range of manufacturing goods (particularly food, pharmaceuticals, motor vehicles, telecommunications equipment and building materials).

The cost of regulatory diversity hit hardest in sectors combining high levels of both technology and regulation (pharmaceuticals and telecommunications equipment), while mature industries like motor vehicles and consumer electronics were also severely penalised. Regulations were also identified as imposing barriers to market entry in the service sector, particularly in finance, insurance and securities, telecommunications services, and other business services, eg. advertising, engineering, computing and legal services.

Energy, transport, telecommunications and water supply were characterised as having nationalistic procurement practices for strategic reasons. Specific cost savings from open competition were identified in

pharmaceuticals, office machinery and instrumentation, telephone switching, telephones. electrical equipment, motor vehicles and coal.

The Cecchini studies measured the total gains from market integration in several different ways. One method added together the gains from the following sources:

- the gains from removing barriers that directly affect intra-EC trade, essentially customs formalities and related delays;
- the gains from removing barriers to production, ie. barriers which hinder foreign market entrants and thus the free play of competition;
- the cost reductions achieved by business through exploiting more fully potential economies of scale; and
- other gains in efficiency due to intensified pressures of competition.

The total gains from all these sources were in the range from 4.3 to 6.4 per cent of the EC's GDP. Estimates derived by alternative means were in the same ballpark.

Thus the Cecchini studies identified potential gains from narrowly-defined trade facilitation measures that were smaller than those in the UNCTAD study, but gave estimates of a similar order to the UNCTAD study when potential savings on a broader front from economic integration were included.

One purpose of this study is to examine the flow-on impact of savings from facilitation measures. The indirect savings incorporated in the above estimates give one indication. Another approach is to take the direct cost savings from the above analysis, and to use the IC95 model framework to estimate the associated indirect flow-on effects. This has the advantage of providing an estimated impact on a basis consistent with the method used to examine the impact of liberalisation.

The approach has been to adopt two alternative estimates of the potential direct cost savings from facilitation measures — 5 per cent and 10 per cent of the value of goods traded. The lower figure is larger than the upper bound of 2 per cent direct cost savings from administration and delays associated with customs controls and red tape, but allows for some limited action on facilitation of investment flows.

The upper figure is a possible estimate of the direct cost savings from a more extensive set of facilitation measures. The Osaka Agenda lists a range of objectives that hold out the prospect of more significant gains. The APEC economies have pledged not only to simplify and harmonise customs procedures and to enhance the mobility of business people, but also to:

- ensure the transparency of standards and conformity assessment, align both mandatory and voluntary standards with international ones, achieve mutual recognition of conformity assessment, and promote cooperation for technical infrastructure development to facilitate broad participation in mutual recognition arrangements;
- introduce or maintain effective and adequate competition policy and/or laws associated with enforcement policies, ensure the transparency of the above, and promote cooperation among APEC economies;

- develop a common understanding on government procurement policies and systems, and achieve liberalisation of government procurement markets throughout the Asia-Pacific region in accordance with the principles and objectives of the Bogor Declaration; and
- promote the transparency of their respective regulatory regimes, and eliminate trade and investment distortions arising from domestic regulations which not only impede free and open trade and investment but are also more trade and/or investment restricting than necessary to fulfil a legitimate objective.

These objectives hold out the prospect of more significant gains from facilitation measures.

To model the flow-on effects and indirect cost savings associated with facilitation measures, an indication is needed of where the direct resource savings will occur. Trade and investment facilitation measures presumably lower the resource cost of moving goods and capital between regions. As noted above, the IC95 model recognises the role that trade and transport services play moving goods and other services internationally. This broad sector includes the activities of freight forwarders and others directly involved in trade facilitation. The approach has therefore been to calculate the dollar savings equivalent to 5 or 10 per cent of the value of total trade (as measured by imports), and to assume that trade facilitation measures will produce direct resource savings in the trade and transport service sector (technically, via a productivity improvement) equivalent to this dollar amount.

Thus the benefits of facilitation are assumed to accrue by being able to economise directly on existing resources in a given use, which is analogous to having more resources. This is in contrast to the benefits of trade liberalisation, which are expected to accrue primarily through efficiency gains associated with reallocating existing resources to better uses. The returns from trade facilitation measures are therefore likely to be substantial by comparison with the returns from liberalisation. However, it needs to be remembered that trade liberalisation, particularly if it is non-discriminatory, could well be a necessary precondition for significant direct resource savings on the facilitation front.

4 The economy-wide impacts of APEC's free trade commitment

Liberalisation

The economy-wide and broad sectoral impacts of APEC trade liberalisation, covering all sectors including services and implemented on a non-discriminatory basis, are shown in Table 2.

As noted above, a key benefit of non-discriminatory trade liberalisation is the opportunity to make use of the cheapest imports from the best sources, allowing some existing resources in import-competing industries to be reallocated to better uses domestically. In addition to these traditional static allocative efficiency gains, the current model allows for additional gains from increased international specialisation. As explained in Appendix A, the gains from specialisation tend to magnify the overall effects of trade liberalisation.

Table 2: Welfare and sectoral implications of APEC liberalisation^a

	<i>Aus</i>	<i>NZ</i>	<i>NAFTA</i>	<i>Jpn</i>	<i>Kor</i>	<i>Ind</i>	<i>Mal</i>	<i>Phl</i>	<i>Sng</i>	<i>Tha</i>	<i>Chn^b</i>	<i>Twn</i>	<i>EU</i>	<i>ROW</i>
Welfare effects														
Real income	4.4	9.6	0.7	1.5	2.1	2.9	3.8	2.4	17.2	4.1	1.8	1.7	0.3	0.3
Real GDP	3.4	5.6	0.7	1.5	3.9	5.1	4.9	4.2	6.9	4.5	3.1	1.4	..	..
Terms of trade	1.3	4.8	0.2	-1.9	-3.7	-5.2	-2.4	-4.2	2.9	-0.3	-2.5	-0.4	1.7	0.9
Trade effects														
Exports	48.5	36.6	18.4	29.1	40.8	66.0	25.0	56.8	8.5	45.1	54.1	28.2	5.3	2.4
Imports	52.4	51.1	18.1	35.2	36.0	63.8	27.0	49.8	10.1	34.8	45.5	40.1	6.8	3.1
Balance of trade	0.2	-0.2	..	-0.2	-0.2	1.0	0.4	0.3	4.2	3.0	0.7	-0.3	..	..
Output volume														
Agriculture	12.3	13.2	-6.4	-42.3	-37.3	0.2	-0.2	-5.5	-6.1	8.1	-0.3	19.6	2.5	4.1
Resources	36.0	36.9	6.8	6.5	-12.3	-13.3	-18.3	-10.7	70.2	-33.6	-15.0	-10.1	-4.2	-4.4
Manufacturing	-2.8	-2.6	-0.9	1.6	7.8	27.0	9.3	11.0	-6.7	2.9	2.4	1.9	-1.6	-2.3
Services	-2.2	-1.1	..	-0.7	1.2	0.4	4.1	1.4	11.8	2.0	2.5	0.2	0.6	0.7

^a IC95 model projections. All results represent deviations from control. Most variables are measured in percentage changes, except for the balance of trade as a proportion of GDP, which is an absolute change measured in percentage points.

^b Includes Hong Kong.

The combined effect of gains in static efficiency and from specialisation could be measured by the change in an index of real final output (say, real GDP), minus a change in the index of real primary factor usage. Such a measure is not reported directly in Table 2, however, because it gives only half the story.

An important additional, dynamic benefit of trade liberalisation is when gains in allocative efficiency and from increasing international specialisation provide incentives for an economy to increase its underlying resource base. This source of dynamic gain has been highlighted recently in the United States, particularly by Baldwin (1992), and is captured in models such as IC95 or Salter that allow for more capital to be accumulated than otherwise on the face of beneficial policy initiatives. As noted in Appendix A, IC95 also makes provision for induced employment gains in economies with a high proportion of the workforce in non-wage agriculture initially. These induced increases in resource base also tend to magnify the overall effects of trade policy initiatives.

By definition, the combined gains from allocative efficiency, increased specialisation, and the dynamic gains from induced increases in resource base can be measured by the change in an index of real final output, ie. real GDP. Table 2 confirms that APEC liberalisation on a non-discriminatory basis would lead to real GDP being higher than otherwise in all APEC economies.

The real GDP gains tend to be bigger in the smaller and more open economies. They are greatest in Singapore, largely because of Singapore's entrepôt role as a conduit for cheaper imports from outside the APEC region (recall that liberalisation is on a non-discriminatory basis). Indeed, if APEC liberalisation were instead on a preferential basis (assuming the same rules of origin as for AFTA, namely 40 per cent of content), Singapore's gain in real GDP would fall to be about the same order as Indonesia's, and less than

New Zealand's (with these real GDP gains in turn being smaller than in Table 2 because of the preferential nature of the liberalisation).

Nevertheless, welfare in each region is affected not just by increases in economic activity, but also by changes in the prices of the goods and services a region produces to derive income, relative to the prices of the goods and services that consumers (public and private) purchase to yield utility. One important element of this is changes in a region's terms of trade.

Trade liberalisation would tend to raise the average world prices of agricultural and food products, since liberalisation will have the effect of reducing the export and production subsidies afforded these products in many countries. Conversely, liberalisation would have the effect of lowering the average world prices of resources, non-food manufacturing and services, areas currently protected primarily via tariffs or tariff equivalents (in the case of services, essentially by assumption).

Table 2 confirms that terms of trade would tend to improve for agricultural exporting regions such as New Zealand, Australia, and to a lesser extent the NAFTA region, while falling either in agricultural importing regions such as Japan and Korea, or in regions with significant levels of tariff protection in resources and/or non-food manufacturing such as Indonesia, Malaysia, the Philippines, Thailand and China. Singapore's terms of trade improve as some of its traditional entrepôt trade (eg. machinery and equipment) contracts to make way for entrepôt trade in areas where its neighbours are newly competitive, such as agricultural and food products, textiles and clothing.

In some regions, therefore, terms of trade improvements magnify the real GDP gains from trade liberalisation, while in other regions, terms of trade declines moderate the real GDP gains. Nevertheless, all regions are projected to gain in terms of real income, a measure that takes both factors into account and is therefore a better measure of the impact on overall welfare of each region.⁴

Table 2 also confirms that trade liberalisation is projected to be accompanied by a major expansion in regional trade levels, above what they would otherwise have been. The projected changes in sectoral output also suggest the need for significant structural adjustment in some economies, although it needs to be recognised that in some cases, the measured percentage changes in sectoral output disguise the real scope of the adjustment. For example, the very high percentage expansion in Singapore's resource sector (which includes forestry and fishing) is from a very low base. At the other extreme, the relatively modest percentage changes in service sector output may represent significant adjustments, given the large sizes of the service sectors in some economies.

⁴ In IC95, real income is measured as net national product, deflated by a price index for net national expenditure (private and public consumption and net investment). This is essentially the same as the equivalent variation measure of welfare in the GTAP model, but differs from the measure of real income in the Salter model by including the price of investment goods in the overall price deflator. IC95's measure therefore recognises that if trade liberalisation allows cheaper net additions to capital stocks, this will improve future productive capacity and hence future consumption prospects. Irrespective of which measure is used, one potential influence on welfare is minimised in the current analysis. In the absence of additional foreign borrowing or lending, real income is not affected by major changes in debt service obligations to foreigners, other than those arising from induced changes in interest rates.

Economy-wide effects of excluding agriculture

Table 3 is designed to give an indication of the economy-wide implications of excluding agriculture from the liberalisation package. A comparison with Table 2 shows a number of interesting features.

Table 3: Welfare and sectoral implications of APEC liberalisation that excludes agriculture^a

	<i>Aus</i>	<i>NZ</i>	<i>NAFTA</i>	<i>Jpn</i>	<i>Kor</i>	<i>Ind</i>	<i>Mal</i>	<i>Phl</i>	<i>Sng</i>	<i>Tha</i>	<i>Chn^b</i>	<i>Twn</i>	<i>EU</i>	<i>ROW</i>
Welfare effects														
Real income	3.2	5.4	0.5	0.7	1.5	2.4	2.4	2.0	16.4	1.0	1.8	1.0	0.4	0.1
Real GDP	3.1	5.1	0.5	0.7	1.6	4.4	3.0	3.6	6.6	4.0	3.2	0.5	0.1	0.1
Terms of trade	-1.8	-2.1	-0.2	-0.7	-0.4	-4.8	-1.6	-3.7	2.8	4.1	-2.5	-0.1	1.7	0.7
Trade effects														
Exports	48.0	36.9	16.5	24.0	25.6	56.1	19.1	51.4	8.0	44.6	52.3	24.9	4.8	1.5
Imports	47.6	41.8	16.1	29.1	24.4	55.2	21.2	45.0	9.6	30.8	43.9	35.5	6.3	2.3
Balance of trade	0.2	-0.3	-0.1	-0.1	0.3	0.6	0.3	0.4	4.1	2.2	0.7	-0.1	..	..
Output volume														
Agriculture	1.7	-0.7	1.3	1.1	-1.5	-0.8	0.1	-4.4	-6.6	-1.1	-0.4	0.7	-0.3	-0.2
Resources	44.5	58.9	4.7	3.1	-9.8	-8.2	-13.1	-10.8	69.2	-25.7	-16.9	-9.3	-4.0	-2.9
Manufacturing	-3.0	-4.9	-0.4	2.4	1.1	20.5	4.3	12.8	-7.1	4.9	3.8	0.4	-1.4	-1.6
Services	-2.4	-0.4	-0.1	-1.2	0.6	0.4	3.5	1.0	12.0	2.3	2.4	..	0.7	1.0

^a IC95 model projections. All results represent deviations from control. Most variables are measured in percentage changes, except for the balance of trade as a proportion of GDP, which is an absolute change measured in percentage points.

^b Includes Hong Kong.

In all but one case (the exception being China), the real income gains to APEC members are lower when agriculture is excluded from the liberalisation package. This drop off in projected gains is most noticeable for two quite different categories of region — the relatively efficient agricultural exporters, and the regions with very highly assisted agricultural sectors. The best examples in the former category are Thailand, an efficient exporter of processed rice, and New Zealand, and efficient exporter of dairy products. When agriculture is excluded from the liberalisation package, the real income gains to these regions fall by three-quarters and one-half, respectively. The best example in the latter category is Japan, with only one half the real income gain when agriculture is excluded.

For both Japan and Korea, the exclusion of agriculture essentially eliminates the significant pressure for structural adjustment in both the agricultural sector and in processed food. However, it also leads to significantly smaller gains arising from better allocative efficiency and international specialisation (with their reinforcing dynamic effects), as indicated by the significantly smaller projected gains in real GDP. This effect more than outweighs the easing in terms of trade that comes about from less upward pressure on the average world prices of agricultural products. For Japan and Korea, therefore, excluding agriculture

may allow these economies to avoid significant sectoral adjustment, but at a significant economy-wide cost.⁵

The picture in Taiwan is more mixed. The real income gains in Taiwan are smaller when agriculture is excluded, but somewhat surprisingly, the projected change in agricultural output is not nearly as favourable as when agricultural liberalisation is included. The reason is that Taiwan's agricultural sector is projected to gain more from agricultural liberalisation elsewhere in the region than it is projected to lose from agricultural liberalisation at home. The assistance estimates built into the IC95 database (sourced originally from the GTAP model) suggest that while Taiwan heavily assists grain and dairy production, its production of meat products and other food products is relatively lightly assisted. These latter sectors have significant export sales to Japan, and are projected to expand strongly when Japan liberalises its agriculture as part of the full APEC liberalisation scenario. The inability to pursue this source of comparative advantage explains the lower overall real income gains for Taiwan when agriculture is excluded from the liberalisation package.

Finally, China is projected to be just as well off whether agriculture is excluded as when it is included, although in terms of real GDP, China is projected to do slightly better when agriculture is excluded. This may well be an artifice of the way assistance in China has been measured. As noted in the previous section, Chinese agriculture appears to be relatively lightly assisted in the IC95 model, possibly the net result of having combined relatively high explicit tariffs with a range of domestic pricing arrangements that implicitly tax agriculture. It is a moot point whether both will be up for negotiation or action in an APEC context. The down payment that China offered at Osaka seemed to be limited to explicit tariffs and import control measures. Were that trend to continue, the pattern of adjustment could well be more like that of an economy with relatively high formal border measures, but some existing agricultural trade with other economies in the region. In that case, the projected results for Taiwan may offer a rough indication of the likely implications for China.

Contribution of services trade liberalisation

One of the motivations of the current study is to examine the implications of services trade liberalisation in an APEC context. The contribution of services trade liberalisation can be measured in one of several ways — either by looking at the implications of services trade liberalisation alone, or by comparing the effects of a full liberalisation package with a package that excludes services. In principle, if there are significant non-linear interaction effects between merchandise trade and services trade liberalisation, the two approaches need not give the same answer. As it happens, both approaches have been tried, and they give very much the same answer, at least for a key aggregate like real income.⁶ Table 4 shows the broad welfare and sectoral implications of service trade liberalisation on its own.

⁵ This conclusion does not depend on the assumption, implicit in Table 3, that agriculture is excluded from the liberalisation package in every APEC region. In a scenario in which only Japan, Korea, Taiwan and China excluded agriculture, the projected real income gains in Japan and Korea were even smaller. Their real GDP gains were smaller as resources were actually attracted into agriculture, while the terms of trade movements were more adverse because of agricultural liberalisation elsewhere.

⁶ For all regions except Singapore, they give the same answer for real income to within a decimal point. For Singapore, they give the same answer to within half a percent.

Table 4: Welfare and sectoral implications of APEC liberalisation for services only^a

	<i>Aus</i>	<i>NZ</i>	<i>NAFTA</i>	<i>Jpn</i>	<i>Kor</i>	<i>Ind</i>	<i>Mal</i>	<i>Phl</i>	<i>Sng</i>	<i>Tha</i>	<i>Chn^b</i>	<i>Twn</i>	<i>EU</i>	<i>ROW</i>
Welfare effects														
Real income	2.8	5.0	0.5	0.6	0.5	0.4	0.8	1.0	7.3	0.8	0.5	1.3	0.1	0.2
Real GDP	2.6	4.5	0.4	0.7	0.4	0.3	0.6	0.5	3.6	0.3	0.4	0.9	..	0.1
Terms of trade	-1.6	-1.7	..	-1.7	0.1	0.1	..	1.0	1.1	1.0	0.1	0.3	0.4	0.5
Trade effects														
Exports	30.0	29.4	11.2	15.6	4.4	3.9	4.0	4.3	0.7	0.6	4.2	8.6	1.4	1.2
Imports	29.4	33.5	10.6	17.3	4.7	5.4	4.8	5.4	1.4	1.2	3.9	12.6	1.7	1.6
Balance of trade	0.1	-0.3	..	..	-0.1	-0.2	0.1	..	1.8	0.2	0.1	..	..	..
Output volume														
Agriculture	1.2	-1.4	0.2	1.4	-0.3	0.3	0.2	-0.6	-2.1	-1.2	-0.2	-0.2	..	-0.2
Resources	18.2	45.2	1.5	5.2	-2.1	2.5	-5.7	-4.1	76.8	-7.3	-1.3	-3.0	-1.5	-2.5
Manufacturing	6.1	-0.5	0.7	2.6	-1.6	0.6	-0.8	-2.7	-15.3	-3.5	-1.3	-0.6	-0.9	-1.3
Services	-2.6	-1.4	-0.3	-1.3	0.6	-1.2	2.7	1.8	16.0	3.0	1.6	0.3	0.4	0.9

^a IC95 model projections. All results represent deviations from control. Most variables are measured in percentage changes, except for the balance of trade as a proportion of GDP, which is an absolute change measured in percentage points.

^b Includes Hong Kong.

Comparing Tables 2 and 4 suggests that services trade liberalisation can provide a significant proportion of the total gains from trade liberalisation, although this conclusion is subject to a number of provisos discussed in the previous section. Services trade liberalisation is projected to provide between 13 and 30 per cent of the total gains for Korea, Indonesia, Malaysia, Thailand and China, 40 per cent of the total gains for Japan and between 50 and 75 per cent of the total gains for Australia, New Zealand, the NAFTA region and Taiwan. Services trade liberalisation contributes a greater share of the total gains in economies where the services sector accounts for a relatively large share of GDP initially, and/or where services trade barriers have been assessed as relatively high.

Whether services trade liberalisation leads to a contraction or expansion of services sector output in an economy also depends primarily on whether barriers to services trade have been assessed as being high by international standards. The projected flow-on effects to other sectors in each region reflect the combination of several factors. The first is a reaction to the resource flows into or out of the services sector — resource movements into services, for example, that cannot be met by additional resource accumulation will need to be transferred from other sectors.

However, some other sectors will themselves gain significantly from more competitive service provision. In particular, recall that the IC95 model recognises explicitly that the trade and transport service industry plays a direct role in transporting other traded goods and services internationally. Other sectors that will tend to benefit significantly from services trade liberalisation are those, such as the resource

sectors in Australia and New Zealand, for which transport costs to foreign markets are an important determinant of international competitiveness.⁷

Facilitation

The Bogor declaration identifies trade and investment facilitation measures as being just as important a component of the free trade commitment as liberalisation initiatives. And liberalisation on a non-discriminatory basis is likely to be an important precondition for the harmonisation and/or streamlining of trade procedures.

As discussed in the previous section, a direct cost saving equivalent to 5 per cent of the value of trade seems an upper limit to the potential gains from a relatively narrow set of trade and investment facilitation measures. With the broader objectives regarding standards, competition policy, procurement and regulation endorsed at Osaka, then the direct cost savings could rise to as much as 10 per cent of the value of trade.

The flow-on effects of facilitation measures by APEC members with direct resource savings equivalent to 5 per cent of the value of imports are shown in Table 5. Although the IC95 model is not linear by design, its projected impacts of facilitation measures that save 10 per cent of the value of imports is very close to twice the impact shown in Table 5.

The direct resource savings have been assumed to accrue in the trade and transport service industry. This industry has a particularly critical role to play in facilitating the international movement of goods and other services, although it has other functions as well. Table 5 suggests that some of the resources freed by streamlining of trade procedures could stay on in the sector to facilitate a greater flow of traded goods and services. But some of the resources could also be redeployed, particularly elsewhere in the service sector, to perform other functions.

Almost by definition, the size of the overall real income gains is greater for regions with a high trade share in GDP. Since a resource saving of this sort is akin to having more resources in total in a region, overall income gains can be achieved without the need for significant structural adjustment. Thus trade facilitation measures equivalent to 5 per cent of the value of imports are projected to yield real income gains that can be as great or greater than those achieved through trade liberalisation, but with significantly less relative movement in the sectoral composition of output.

⁷ The theoretical structure of IC95 does not allow for tariffs on those trade and transport services imported indirectly as the transport 'margin' on imports of other goods and services. But to the extent that lowering tariffs on direct 'non-margin' imports of trade and transport services reduces the domestic costs of producing those services, this flows on to the cost of international transport margins supplied by the domestic industry. Thus the model captures, albeit in an indirect way, the way in which lowering barriers to service trade can lower the cost of international service margins.

Table 5: Welfare and sectoral implications of APEC facilitation measures equivalent to 5 per cent of the value of imports^a

	<i>Aus</i>	<i>NZ</i>	<i>NAFTA</i>	<i>Jpn</i>	<i>Kor</i>	<i>Ind</i>	<i>Mal</i>	<i>Phl</i>	<i>Sng</i>	<i>Tha</i>	<i>Chn^b</i>	<i>Twn</i>	<i>EU</i>	<i>ROW</i>
Welfare effects														
Real income	1.2	2.2	0.8	0.7	2.3	1.9	3.7	2.1	5.3	2.9	2.8	1.7	0.1	0.2
Real GDP	1.1	2.0	0.7	0.6	2.3	1.8	4.2	2.1	4.9	3.0	2.8	1.7	..	0.1
Terms of trade	..	..	..	0.4	-0.3	..	-1.1	-0.7	-0.2	-0.5	-0.7	-0.2	0.1	0.3
Trade effects														
Exports	1.0	1.4	0.7	0.6	1.5	1.2	3.9	1.7	0.8	2.5	3.4	1.4	..	0.2
Imports	0.8	1.4	1.0	0.7	0.4	1.0	2.3	0.9	0.4	0.9	1.8	1.0	0.4	0.7
Balance of trade	..	..	..	..	0.3	0.1	0.3	0.1	1.4	0.5	0.4	..	..	-0.1
Output volume														
Agriculture	..	-0.4	0.2	0.2	0.4	0.4	-0.1	0.1	-0.3	0.2	0.4	0.4	0.1	0.1
Resources	0.7	2.1	-0.1	0.1	0.2	-0.5	-4.6	1.0	3.1	1.0	-2.8	-1.6	0.4	0.8
Manufacturing	0.3	-0.4	0.3	0.4	-0.3	1.5	1.8	0.3	-2.1	1.3	1.2	..	0.2	..
Services	0.9	1.5	0.5	0.3	2.5	1.9	6.6	2.4	6.1	2.9	3.7	2.2	-0.1	-0.2

^a IC95 model projections. All results represent deviations from control. Most variables are measured in percentage changes, except for the balance of trade as a proportion of GDP, which is an absolute change measured in percentage points.

^b Includes Hong Kong.

Summing up

The overall dollar impact of liberalisation and facilitation initiatives on the real income of each region is shown in Table 6. It also shows the total impact for the APEC region as a whole.

The key findings are as follows:

- elimination of all trade barriers, including in services, could eventually involve real income gains of US\$303 billion per annum for APEC members, over and above what real incomes otherwise would have been;
- relatively narrow trade facilitation measures could add up to US\$216 billion, while more extensive measures covering standards, competition policy, procurement and regulation could add up to US\$442 billion, giving a maximum total of US\$745 billion;
- but excluding sensitive sectors, especially in agriculture, would dramatically reduce the economic benefits. Failure to advance agricultural liberalisation beyond the Uruguay Round commitments would mean forgoing US\$106 billion of real income gains — that is 61 per cent of the total benefits of US\$175 billion from liberalisation in traded goods, or 35 per cent of total trade liberalisation benefits of US\$303 billion after inclusion of services. Moreover, if agriculture is excluded, US\$10 billion of annual free rider gains would flow to the EU.

Table 6: Real income gains from APEC trade liberalisation and facilitation

Change in Region	Facilitation				Non-agriculture				Agriculture				Services				Liberalisation				Total gains from liberalisation and facilitation (at 5%)			
	At 5% of imports		At 10% of imports		Real Y%		Real Y\$		Real Y%		Real Y\$		Real Y%		Real Y\$		Real Y%		Real Y\$		Real Y%		Real Y\$	
	Real Y%	Real Y\$	Real Y%	Real Y\$	Real Y%	Real Y\$	Real Y%	Real Y\$	Real Y%	Real Y\$	Real Y%	Real Y\$	Real Y%	Real Y\$	Real Y%	Real Y\$	Real Y%	Real Y\$	Real Y%	Real Y\$	Real Y%	Real Y\$	Real Y%	Real Y\$
Australia	1.2	5	2.5	11	0.4	2	1.2	5	1.2	5	2.8	12	4.4	18	5.6	23	4.4	18	5.6	23	5.6	23	5.6	23
New Zealand	2.2	1	4.5	3	0.5	..	4.1	3	4.1	3	5.0	3	9.6	6	11.8	8	9.6	6	11.8	8	11.8	8	11.8	8
NAFTA	0.8	70	1.5	140	..	4	0.3	23	0.3	23	0.5	43	0.7	70	1.5	140	0.7	70	1.5	140	1.5	140	1.5	140
Japan	0.7	39	1.4	80	0.2	8	0.8	44	0.8	44	0.6	34	1.5	86	2.2	125	1.5	86	2.2	125	2.2	125	2.2	125
Republic of Korea	2.3	17	4.8	35	1.0	7	0.7	5	0.7	5	0.5	4	2.1	16	4.4	33	2.1	16	4.4	33	4.4	33	4.4	33
Indonesia	1.9	7	4.0	15	2.0	8	0.5	2	0.5	2	0.4	2	2.9	11	4.8	18	2.9	11	4.8	18	4.8	18	4.8	18
Malaysia	3.7	7	7.7	14	1.6	3	1.4	2	1.4	2	0.8	1	3.8	7	7.5	13	3.8	7	7.5	13	7.5	13	7.5	13
Philippines	2.1	3	4.3	6	1.1	1	0.4	..	0.4	..	1.0	1	2.4	3	4.5	6	2.4	3	4.5	6	4.5	6	4.5	6
Singapore	5.3	9	11.2	19	9.1	16	0.8	1	0.8	1	7.3	12	17.2	30	22.4	39	17.2	30	22.4	39	22.4	39	22.4	39
Thailand	2.9	9	6.0	18	0.2	1	3.1	9	3.1	9	0.8	2	4.1	12	7.0	20	4.1	12	7.0	20	7.0	20	7.0	20
China	2.8	41	5.7	85	1.4	20	0.6	9	0.6	9	0.5	7	2.4	36	5.2	78	2.4	36	5.2	78	5.2	78	5.2	78
Taiwan	1.7	8	3.5	17	-0.3	-2	0.7	3	0.7	3	1.3	6	1.7	8	3.4	16	1.7	8	3.4	16	3.4	16	3.4	16
EU	0.1	4	0.1	9	0.3	27	-0.1	-10	-0.1	-10	0.1	8	0.3	25	0.3	29	0.3	25	0.3	29	0.3	29	0.3	29
Rest of the world	0.2	5	0.3	12	-0.2	-7	0.2	7	0.2	7	0.2	8	0.3	9	0.4	14	0.3	9	0.4	14	0.4	14	0.4	14
Total APEC		216		442		69		106		106		128		303		519		303		519		519		519

Assumptions: Trade facilitation induces a productivity improvement in the trade and transport services sector equal to 5 or 10 percent of imports.

Measured benefits do not include liberalisation under the Uruguay Round or NAFTA.

IC95 model projections. As noted in the text, IC95 probably underestimates pure border protection in China post-Uruguay Round. For this table, the projected benefits from agricultural reform in China have been modified. These results are based on the assumption that agricultural liberalisation would have a similar impact on the economies of Taiwan and China (in percentage term). So freeing agricultural trade was assumed to increase real income in China by 0.6 percent compared with 0.7 percent for Taiwan.

Real income (Real Y) gains expressed in \$US are based on the estimated size of the world economy in 2010.

5 Implementation

The Bogor Declaration in November 1994 defined the end point of the APEC process — free and open trade and investment in the Asia-Pacific region. The Osaka Action Agenda in November 1995 confirmed that commitments would be comprehensive. It also began the specification of tasks by which the end point would be reached. The implementation process was taken further with the Manila Action Plan for APEC in November 1996. This incorporated Individual Action Plans, Collective Action Plans and other joint activities in various APEC forums.

The Osaka Action Agenda specified principles defining how progress should be made towards the end point. In addition to comprehensiveness, WTO-consistency, transparency and non-discrimination, the following additional principles were to be applied to ‘the entire APEC liberalisation and facilitation process’:

- comparability — economies should undertake comparable liberalisation and facilitation, taking into account liberalisation and facilitation already achieved;
- standstill — impediments should not rise above initial levels;
- simultaneous start — impediments should begin to fall in all economies at the start of the APEC implementation process;
- continuous process — impediments should decline each year;
- significant contributions — impediments should decline substantially each year;
- differentiated timetables — economies can reduce different types of impediments in the order and at the rate they find desirable, provided that the path conforms to other guidelines; and
- flexibility — available in dealing with issues arising from the different levels of development and diverse circumstances in each economy during the liberalisation and facilitation process.

Many of these principles can be seen as defining a requirement for ‘steady’ or ‘linear’ progress. The Individual Action Plans have already been evaluated in those terms (eg. Yamazawa 1997).

Yet despite the endorsement of comprehensiveness, other of the principles appear to leave the way open for economies to ‘back-load’ their liberalisation efforts in sensitive areas. Petri (1997a) goes so far as to say the criteria fall short of defining a minimum acceptable *breadth* of progress.

The potential implications of this can be seen by examining the impacts of possible ‘early voluntary liberalisation’ initiatives currently being developed in response to APEC leaders’ 1996 request. In discussing how to implement the Leaders’ decision, the Senior Officials Meeting early in 1997 noted that ‘any sectoral liberalisation process would need to seek a balance in the broad interests of members, be subject to wide business/private sector support, and support the principle of comprehensiveness and mutual benefit’. It remains to be seen the extent to which the combined package of agreed sectors and measures from all members meets the principle of comprehensiveness. Nevertheless, the measures expected to be put

up by individual member countries tend to involve sectors in which the level of assistance in the sponsor country is relatively low.

The IC95 model has been used to examine the likely impact of liberalising some of these sectors in isolation. Examples include non-ferrous metals (which Australia is expected to nominate), chemicals (which has been nominated by the United States and Singapore), fish (which New Zealand, Thailand and several other countries have nominated) and wood and wood products (which Canada and others have nominated).

Without presenting the results in any detail, one broad lesson from the exercise was that the larger the number of sectors to be liberalised, the larger and more uniform would be the real income gain across APEC. In total, there were projected to be widespread, but modest, gains among APEC economies.

When some sectors were considered in isolation, a few economies were projected to lose, for classic second-best reasons. The losers retained much higher tariffs elsewhere. Liberalisation of lowly or moderately protected sectors caused resources to flow into other less efficient sectors, thus causing allocative efficiency losses.

These latter results highlight that the welfare losses of tariff protection are related to the dispersion in tariff levels, as much as to their levels. Taking a 'tops down' approach to liberalisation can reduce the dispersion of assistance, and likely avoid second-best welfare losses. Taking a 'bottoms down' approach can increase dispersion, and create such losses.

This is not to deny that a 'bottoms down' approach may not be an important confidence building measure in the early stages of the liberalisation process. As the Australian Industry Assistance Commission noted in its report on methods of achieving general reductions in protection:

The choice of a particular option depends on the relative weight placed on different government objectives. Options which emphasise the objective of encouraging the development of competitive industries tend to involve larger reductions in high rates of protection and have wider coverage whereas options which focus on the community's capacity to absorb changes have smaller reductions over a longer time period. (Industries Assistance Commission 1982, p. 1)

Nevertheless, the end point of the APEC liberalisation agenda is fixed in time. In a few economies, it may be politically feasible slowly to build a consensus for a 'big bang' liberalisation of sensitive sectors late in the day. In many economies, the community impact is more likely to be minimised by taking advantage of the full time frame, starting now, and making gradual 'linear' reductions in assistance, even in sensitive sectors. Not only would this likely minimise the burden of adjustment, it could also be preferable from an efficiency perspective.

6 Areas for further research

One of the conclusions of this paper is that the impacts of trade liberalisation and facilitation initiatives are shown to be positive throughout the APEC region. This conclusion is shown (in Appendix B) to be relatively robust, at least in direction if not in magnitude, to variations in key parameters. Significantly, it is also shown to be robust to certain changes in model specification. Nevertheless, there is scope for further research into the reasons for the changes that are observed. There is also scope for relaxing the model's relatively constrained treatment of capital mobility. A more realistic treatment, in line with recent theories of direct foreign investment, would allow for less mobility than in the case of perfect arbitrage, but would require empirical research into how capital flows would change in response to changes in rate of return differentials. With a less severely constrained treatment of capital flows than currently, the projections shown here would tend to be amplified.

Another conclusion of this paper is that both services trade liberalisation and trade facilitation measures could add significantly to the benefits from liberalisation of merchandise trade. However, the analysis of the benefits of services trade is based on a set of stylised guesstimates of the current impacts of services trade restrictions. A key area for further research would be to get a more direct understanding of the nature and size of the barriers to services trade, as well as a more up-to-date estimates of the direct benefits of trade facilitation measures. The recent PECC (1995) publication is an important step in improving the information base on trade barriers within the APEC region.

APPENDIX A: KEY FEATURES OF THE IC95 MODEL

Database

The starting point for the database is the GTAP multiregion database from 1992. The World Bank subsequently released data on pre- and post-Uruguay Round tariff rates for the sectors incorporated in the GTAP and Salter models, (see, for example, Hertel et al. 1995), obtained in turn from the WTO. There has also been a first attempt at estimating the tariff equivalents of restrictions applying to services trade (reported in Brown et al. 1995, and based in turn on pioneering work by Hoekman 1995).

The World Bank pre-Uruguay tariff rates differ from those built into the original GTAP database. This raises the question of which set of starting estimates to adopt. In many cases the World Bank estimates are more dated, being centred around 1988 with some from as early as 1986. However, the World Bank estimates appear to provide more comprehensive country coverage, particularly for some of the economies in the ASEAN region. The World Bank's post-Uruguay data are obviously valuable for summarising the offers made during the Uruguay negotiating process.

The approach here has been to replace the GTAP tariff estimates with the World Bank's pre-Uruguay estimates, except in the following cases. In agriculture, fishing, and food processing, the GTAP estimate was retained when it was higher than the World Bank's estimate. This is the approach of Hertel et al. (1995), who argue that the World Bank rates for agriculture and food may not adequately capture the tariffication of some agricultural assistance. The GTAP tariff rates were also retained in toto for the three Chinas, (the People's Republic, Hong Kong and Taiwan), regions for which the World Bank provided no data.

The tariff equivalents of restrictions to services trade reported in Brown et al. (1995) were also built into the database. As noted, these were taken in turn from work by Hoekman, who used the presence or absence of offers made during the GATS agreement as an kind of 'revealed preference' indicator of the assistance likely to be afforded currently by particular measures in each region. The procedure was then to assign tariff equivalents to individual measures (200 per cent for measures judged to be prohibitive, and rates of between 20 and 50 per cent for other measures), so as to provide a weighted average assistance estimate for each sector. The resulting estimates are high, and their cross-regional variation lacks plausibility in many instances.

These measures of assistance to services sectors suffer from at least two additional weaknesses. The scope of services trade as defined in the GATS agreement extended well beyond trade as conventionally defined. It also covered services delivered by way of permanent presence in the host country, ie. via direct foreign investment rather than via trade more narrowly defined. Particularly in a model that makes explicit provision for capital accumulation and its possible mobility, it may be preferable to model those interventions affecting capital mobility directly, rather than converting them to tariff equivalents on services trade.⁸ Hardin and Holmes (forthcoming) have made progress on quantifying separately the impediments to direct foreign investment.

In addition, the estimates assume that an absence of offers implies a prohibitive trade restriction. This is clearly arguable — a country may equally fail to make offers for a lowly assisted service sector with a strong competitive advantage. Alternative tariff equivalents are becoming available based on alternative assumptions (Warren 1996, PECC 1995).

For other forms of assistance, specifically the export subsidies and production subsidies applying to agriculture and food and the export tax equivalents of the Multifibre Arrangement, the GTAP estimates have been retained.

The resulting database incorporates the measures of assistance that predate the reductions agreed to under the Uruguay Round and NAFTA agreements. In order to exclude the influence of these agreements on the current assessment of the APEC free trade commitment, NAFTA and Uruguay Round liberalisation experiments were conducted on the database to produce a database incorporating post-Uruguay and post-NAFTA levels of assistance, while taking account of the structural adjustments that these agreements will cause.

Specifically, NAFTA liberalisation was modelled as the elimination of tariffs and export subsidies on trade in agriculture and food, resources and manufacturing within the NAFTA region (United States, Canada and Mexico).⁹ Starting with a post-NAFTA database, Uruguay Round liberalisation was then modelled as follows. Tariffs for all sectors except services were reduced to their post-Uruguay Round

⁸ Petri (1997b) notes that about half of services trade is carried out via direct foreign investment, and uses this as a basis for applying the Hoekman estimates entirely to capital flows rather than to trade flows.

⁹ This approach does not adequately recognise the special arrangements that have been made for some sensitive products: automobiles, clothing and textiles, electronics, sugar, meat, eggs, poultry and dairy products. It is unclear the extent to which NAFTA will result in liberalisation of services trade. The agreement takes a negative list approach so that all services trade is liberalised unless explicitly excluded, but then allows a grandfathering of all existing restrictions. Snape (1995) discusses the possible interactions between APEC and other regional agreements, covering NAFTA, the Americas, AFTA and CER.

levels, using the World Bank's data on post-Uruguay tariff rates. In agriculture and food processing, export subsidies were reduced by 34 per cent in industrial countries and 24 per cent in developing countries (Inego 1995) while production subsidies were reduced by 20 per cent in industrial countries and 13 per cent in developing countries (Francois, McDonald and Nordstrom 1995). Finally, the export taxes used to model the impact of the Multifibre Arrangement were eliminated. No liberalisation of barriers to services trade was included. This is based on the assessments of Hoekman (1995) and others that little or no liberalisation in services was achieved in the Uruguay Round. However, the GATS agreement has served the very useful purpose of establishing a framework for future negotiation and of binding the status quo.¹⁰

These procedures produce a database with post-NAFTA, post-Uruguay levels of assistance, with which to assess the impact of the APEC commitment to free trade within the APEC region. Young and Huff (1997) have noted the importance of assessing APEC in a post-NAFTA environment. The procedures do not net out the impact of other existing trade agreements of importance in the APEC region, in particular, the ASEAN Free Trade Agreement (AFTA). However, Snape (1995, p. 9) notes that (unlike NAFTA), AFTA may be providing an alternative to APEC for some APEC members, 'and in this regard may be regarded as a "fallback" or a competitor, depending on one's perspective'.

Imperfect Competition

Many conventional models of trade incorporating the assumption of perfectly competitive industries are not perfectly competitive models at all. In particular, those that incorporate the Armington assumption allow a commodity or service from one region to be an imperfect substitute for the same commodity or service from other regions. This assumption of imperfect substitution is usually invoked in order to explain the observed phenomenon of two-way trade in a given commodity or service. However, it gives a particular region, even if it is small, a degree of market power. This manifests itself in a terms of trade decline when the region expands exports of a commodity or service, even if the region is sufficiently small that the average world price remains essentially unchanged. Examples of models incorporating the Armington assumption are Salter and GTAP.

By contrast, models that incorporate global monopolistic competition recognise that product differentiation is likely to occur at the firm, rather than the regional level. It is not so much that cars from Japan are imperfect substitutes for cars from the United States or Europe, but that Hondas are imperfect substitutes for Fords or BMWs. A model of firms producing differentiated products and competing globally therefore has some intuitive appeal.

Francois and Shiells (1994) have shown that analytically, the two approaches are very similar. They differ in only two respects. Firstly, the elasticities of substitution appropriate to firm level product differentiation tend to be larger than those used in models of regional product differentiation. This can be justified in several ways. One is simply the intuitive appeal of product differentiation at the firm level, together with the observation that firms are typically smaller than regions. Another is the observation that

¹⁰ Francois and Martin (1995) have argued that the binding process per se has a liberalising effect, by reducing both the mean and the variance of future protection measures.

large elasticities of substitution are required before multi-country trade models can successfully reproduce historical changes in trade patterns.¹¹

Secondly, models of firm level product differentiation typically incorporate a love of variety for its own sake, so that consumers and users are better off when there are more varieties (or firms) globally than when there are fewer. Since most trade is in intermediate goods, an appealing interpretation of this love of variety in a trade context is that with more variety, a firm can buy an intermediate input that is better tailored to its own particular use. This love of variety can be modelled as a productivity improvement that occurs when the number of varieties expands, or a productivity decline that occurs when the number of varieties contracts. This can affect the productivity of the commodity in both intermediate and final use. With this love of variety, models of monopolistic competition can capture gains from trade arising from specialisation in production, as well as those arising from comparative advantage. The productivity improvements associated with a love of variety tend to amplify the sectoral output adjustments that occur in conventional Armington models of trade.

Francois, McDonald and Nordstrom (1995) and IC (1995) provide examples of both these key differences. Francois, McDonald and Nordstrom also show how global imperfect competition can be built into a multiregion trade model in a particularly parsimonious fashion. With monopolistic competition, firms face increasing returns to scale but entry ensures no super-normal profits for any firm. With monopolistic competition, therefore, market power can be exploited to recover fixed costs, but no further. Under these conditions, there is a direct relationship between the extent of product differentiation and market power (as measured by elasticities of substitution between varieties) and the markup of price over marginal cost (which with free entry will be just sufficient to cover fixed costs). Francois, McDonald and Nordstrom therefore use estimates of scale elasticities obtained from engineering studies to measure markups of price over marginal cost, and hence the elasticities of substitution between varieties. These elasticity taste parameters also parameterise the extent of the productivity improvement when the number of varieties expands.¹²

Their approach, and their parameterisation, is adopted for the resources, food processing and other manufacturing sectors in the current model. In the absence of scale elasticity estimates for the remaining sectors, the 'perfect' competition, Armington treatment of Salter and GTAP is used, also as in Francois, McDonald and Nordstrom. The key parameters for the current exercise are shown in Table A1.¹³

¹¹ See Gehlhar (1997). Also required is an explicit treatment of human capital as a factor of production. There is no skill differentiation of labour in the current version of IC95.

¹² Under the assumptions they adopt, output per firm is fixed, so that industry output can be used as an indicator of the number of firms, and hence the number of varieties. Richer treatments of monopolistic competition (eg. Brown et al. 1995) allow output per firm and hence average production costs to adjust, leading to the possibility of additional procompetitive effects associated with trade liberalisation.

¹³ In common with Brown et al. (1995), however, it was found that the productivity improvements associated with love of variety introduced model instability when parameterised strictly according to a Dixit-Stiglitz (1977) aggregator function. In this exercise, productivity is assumed to increase when industry output (the indicator of number of varieties) increases, but only at a tenth the rate suggested by a Dixit-Stiglitz aggregator. Brown et al. (1995) used a dampening factor of one half. Note that Brown et al. also extend their treatment of imperfect competition to the services sector (see Brown, Deardorff and Stern 1995).

Table A1: Key elasticities in the IC92 model

	<i>Inverse Scale^a</i>	<i>Domestic/Import^b Armington</i>	<i>Import/Import^b Armington</i>	<i>Primary Factor Substitution^c</i>
Paddy rice		2.2	4.4	0.56
Wheat		2.2	4.4	0.56
Other grains		2.2	4.4	0.56
Non-grain crops		2.2	4.4	0.56
Wool		2.2	4.4	0.56
Livestock products		2.8	5.6	0.56
Forestry		2.8	5.6	0.56
Fishing		2.8	5.6	0.56
Coal	0.95	20.0	20.0	1.12
Oil	0.95	20.0	20.0	1.12
Gas	0.95	20.0	20.0	1.12
Other minerals	0.95	20.0	20.0	1.12
Processed rice	0.85	6.7	6.7	1.12
Meat products	0.85	6.7	6.7	1.12
Milk products	0.85	6.7	6.7	1.12
Other food products	0.85	6.7	6.7	1.12
Beverages & Tobacco	0.85	6.7	6.7	1.12
Textiles	0.86	7.1	7.1	1.26
Wearing apparel	0.87	7.7	7.7	1.26
Leather & fur	0.88	8.3	8.3	1.26
Lumber & wood products	0.86	7.1	7.1	1.26
Pulp, paper & printing	0.86	7.1	7.1	1.12
Petroleum & coal products	0.92	12.5	12.5	1.26
Chemicals, rubber & plastics	0.85	6.7	6.7	1.26
Non-metallic minerals	0.88	8.3	8.3	1.26
Iron & steel	0.87	7.7	7.7	1.26
Non-ferrous metals	0.86	7.1	7.1	1.12
Fabricated metal products	0.88	8.3	8.3	1.12
Transport equip	0.85	6.7	6.7	1.26
Other machinery & equipment	0.85	6.7	6.7	1.26
Other manufacturing	0.88	8.3	8.3	1.26
Electricity, gas & water		2.8	5.6	1.26
Construction		1.9	3.8	1.40
Trade & transport		1.9	3.8	1.68
Private services		1.9	3.8	1.26
Govt services		1.9	3.8	1.26
Ownership of dwellings		1.9	3.8	1.26

^a Under the assumptions in the model, inverse scale elasticities measure the ratio of marginal cost to average cost. For data sources on scale elasticities, see Francois, McDonald and Nordstrom (1995).

^b For industries where inverse scale elasticities (s) are available, the Armington elasticities are given by $1/(1-s)$. For other industries, the Armington elasticities take the values normally used in the Salter and GTAP models.

^c Taken from the GTAP model.

Capital accumulation

The model used for the current exercise makes provision both for capital to accumulate in a given region, and for foreign borrowing to further facilitate the mobility of capital between regions, using the approach in the Salter model (McDougall 1993). In the current exercise, regions are permitted to accumulate capital, but only in a way that keeps their debt to income ratios fixed. Essentially, this means they must fund domestically any additional capital accumulation that would not have taken place otherwise.¹⁴

There are two possible justifications for this. One is the empirical observation, originating with Feldstein and Horioka (1980), that capital appears to be far from perfectly mobile internationally. The other is that imposing a fixed debt-to-income ratio is akin to imposing a terminal condition, given the long-term snapshot view of the current exercise, that regions cannot accumulate debt 'forever'.

A preferable approach, and an area for further research, would be to implement a treatment of partial capital mobility that is consistent with more recent theories of foreign direct investment (see Markusen 1995 for a useful summary). Petri (1997b) has made a very promising start in that direction.

Other key assumptions

In most regions, both labour supplies and employment rates are held fixed (more precisely, are held at the values they otherwise would have had without the trade liberalisation in question). This means that the beneficial labour market impact of trade liberalisation is absorbed in the form of higher wages rather than higher employment levels.

There has been some debate in the literature as to whether this is the appropriate treatment for economies with a significant share of the labour force in subsistence agriculture. Dee, Jomini and McDougall (1996) have shown that one alternative treatment, in which employment varies enough to hold real wages fixed, can have a strong impact on the projected results from trade liberalisation scenarios. However, there is ample evidence of strong real wages growth historically in economies with large agricultural sectors (World Bank 1995), so that the assumption of fixed real wages in a trade policy context is probably too extreme. On the other hand, evidence on unemployment and underemployment is still too patchy or untrustworthy to provide a reliable alternative means of gauging the potential employment gains from trade liberalisation.

The current treatment is based on studies that have shown a reasonable degree of wage responsiveness of labour supply among households in subsistence agriculture. The distinguishing feature of these households is that consumption and production decisions are consolidated into a single decision-making unit. One study has shown wage elasticities of labour supply in the range 0.1 to 0.3 (Singh, Squire and Strauss 1986). For economies where more than 20 per cent of the workforce is in non-wage employment in agriculture (World Bank 1995, the economies being Malaysia, Indonesia, Philippines, Thailand and China), the elasticity of labour supply with respect to (post-tax) wages has been set at 0.2.

¹⁴This treatment is very much like the 'endogenous capital, fixed savings rate' treatment in Francois, McDonald and Nordstrom (1995).

This treatment raises a second, related issue. The current model contains a treatment of government finances along the lines of the Salter model. This allows IC95 to quantify the lost tariff revenue associated with trade liberalisation. In most regions, income tax rates on labour and non-labour income are assumed to increase equiproportionately so as to maintain government savings rates constant in the face of reduced tariff revenues, and the other changes precipitated by trade reform. In a few economies, tariff revenue constitutes a significant share of government revenue initially, so that the required changes in income tax rates can be substantial. In one case, Thailand, the induced increase in income tax rates on labour income was enough to ensure a reduction in post-tax wages, despite upward movement in pre-tax wages. This in turn induced a negative labour supply response, a result judged to be implausible. For Thailand and the Philippines, economies where income tax revenue is a relatively small share of total revenue *and* where implied labour income tax rates are very much higher than non-labour income tax rates initially, the burden of adjusting to lower tariff revenue was assumed to fall on non-labour income taxes alone.

APPENDIX B: SENSITIVITY ANALYSIS

The projected results from economic models can be sensitive to the values chosen for their demand and supply parameters, all of which are subject to some uncertainty. But economic models can also be sensitive to changes in their theoretical structure (see also Francois, McDonald and Nordstrom 1995).

This appendix tests the sensitivity of the key results of this paper to variations in both parameter values and theoretical structure. The sensitivity analysis is conducted on the projected implications of APEC trade liberalisation (the base case reported in Table 2), with the results reported for the model's welfare measure, real income, and its key components, real GDP and the terms of trade.

The base values for the key parameters of IC95 that determine the responsiveness of supply and demand were shown in Table A1 of Appendix A.

Because of the restrictions on international capital mobility assumed in IC95, the model does not project major changes in capital/labour ratios in any region. The model results therefore prove to be relatively insensitive to variations in the primary factor substitution elasticities, since these supply side parameters are not required to play a major role. Thus this appendix only reports sensitivity to the key demand parameters, these being the elasticities of substitution between imports from different sources and the elasticities of substitution between imported and domestic goods.

The first set of results, reported in Tables B1 to B3, show the effect on the welfare variables of varying these Armington elasticities uniformly by plus and minus 25 per cent, and by plus and minus 50 per cent. Real GDP and real income both prove to be approximately linear in the parameters, with both increasing for higher values of the trade parameters. The only sign reversals occur for real income in China when the elasticities are reduced by 50 per cent, and in real GDP in the Rest of the World when they are increased by 50 per cent.

While the terms of trade also appear to be approximately linear in the parameters, the direction of the response depends on each region's trade balance (the value of exports at fob prices less the value of imports at cif prices). The terms of trade effects are positively related to movements in the trade elasticities for net importing regions (eg. NAFTA, Singapore) and negatively related for net exporting regions (eg. Australia, New Zealand). The increased competition created by greater substitutability between imports from different sources and between imports and domestic goods forces domestic firms to improve their efficiency more in the face of a given tariff cut. The larger cost reductions from import-competing firms mean that the average world prices of all commodities are reduced below what they were with lower trade elasticities. For net exporting regions this reduction in world prices has an unfavourable terms of trade effect, while the opposite is true for net importing regions. Again the only case of a sign reversal in the terms of trade effect occurs with a 50 per cent reduction in parameters, this time for Taiwan.

The results of this paper may also be sensitive to the model's theoretical structure, and so sensitivity analysis is conducted on the implementation of imperfect monopolistic competition.

The second set of results in Tables B4 to B6 show the effects of implementing an imperfect monopolistic competition treatment for the resources, food processing and other manufacturing industries, industries for which estimates of the necessary scale elasticities were available. As described in Appendix A, this treatment involved two key changes to the Armington-style perfectly competitive model. Firstly, the

import substitution elasticities of the relevant industries were increased, and secondly, variety scaling of output was introduced. The tables show results for an Armington-style competitive model (using the standard Armington elasticity values from the Salter or GTAP models), the individual effects of the two additions, and then their combined effects.

The results in Table B4 show that for most regions, increasing the trade elasticities for the relevant subset of industries increases real GDP, while adding variety scaling causes only marginal changes compared with the standard Armington-style perfect competition model. Appendix A notes, however, that variety scaling has been introduced at only a tenth the rate suggested by the theory. Overall, the combined effects produce larger real GDP gains for most APEC regions, reinforcing the view that the modelled gains from specialisation tend to reinforce the gains from allocative efficiency.

The results for the terms of trade in Table B5 prove to be much more sensitive to variations in model specification. Part of the reason appears to be that the changes have been instituted primarily in manufacturing industries, and models such as this appear to be very sensitive to what happens in the manufacturing sector. The variations in model specification are significant enough to cause sign reversals in projected terms of trade changes in four of the regions — Australia, NAFTA, Thailand and Taiwan. The combined effects on terms of trade are dominated by the trade elasticity increase.

Despite this, the results for real income are less sensitive to variations in model specification. In most regions, the modelled gains from greater specialisation are projected to reinforce those from allocative efficiency, and in no case is there a sign reversal.

As stated in the paper, the results of this sensitivity analysis offer comfort in the robustness of the qualitative results presented.

Table B1: Implications of APEC trade liberalisation for real GDP — sensitivity to variations in Armington elasticities

	<i>minus 50%</i>	<i>minus 25%</i>	<i>base case</i>	<i>plus 25%</i>	<i>plus 50%</i>
Australia	1.47	2.36	3.41	4.68	6.20
New Zealand	2.50	3.91	5.63	7.66	10.00
NAFTA	0.28	0.44	0.65	0.89	1.16
Japan	0.78	1.18	1.53	1.88	2.23
Korea	2.26	3.05	3.86	4.68	5.51
Indonesia	2.29	3.60	5.12	6.83	8.72
Malaysia	1.98	3.33	4.89	6.68	8.75
Philippines	2.57	3.34	4.17	5.06	6.00
Singapore	3.81	5.33	6.86	8.41	10.02
Thailand	2.42	3.42	4.47	5.65	7.05
China	1.32	2.17	3.12	4.16	5.30
Taiwan	0.56	0.96	1.40	1.90	2.45
EU	0.02	0.03	0.03	0.03	0.03
ROW	-0.08	-0.06	-0.04	-0.02	0.01

Table B2: Implications of APEC trade liberalisation for terms of trade — sensitivity to variations in Armington elasticities

	<i>minus 50%</i>	<i>minus 25%</i>	<i>base case</i>	<i>plus 25%</i>	<i>plus 50%</i>
Australia	2.37	1.91	1.35	0.90	0.54
New Zealand	6.76	5.54	4.80	4.36	3.92
NAFTA	0.13	0.17	0.24	0.32	0.43
Japan	-2.35	-2.14	-1.95	-1.81	-1.69
Korea	-4.15	-3.82	-3.67	-3.57	-3.50
Indonesia	-4.98	-5.03	-5.24	-5.48	-5.72
Malaysia	-2.30	-2.36	-2.39	-2.40	-2.41
Philippines	-5.16	-4.48	-4.19	-4.01	-3.87
Singapore	2.85	2.87	2.92	2.94	2.93
Thailand	-1.24	-0.53	-0.28	-0.17	-0.07
China	-2.70	-2.59	-2.54	-2.54	-2.56
Taiwan	0.21	-0.16	-0.41	-0.59	-0.73
EU	1.67	1.67	1.72	1.80	1.87
ROW	0.77	0.81	0.91	1.01	1.10

Table B3: Implications of APEC trade liberalisation for real income — sensitivity to variations in Armington elasticities

	<i>minus</i> 50%	<i>minus</i> 25%	<i>base</i> <i>case</i>	<i>plus</i> 25%	<i>plus</i> 50%
Australia	2.33	3.29	4.38	5.72	7.36
New Zealand	6.39	7.75	9.57	11.86	14.42
NAFTA	0.36	0.53	0.74	1.00	1.29
Japan	0.62	1.09	1.51	1.92	2.33
Korea	0.29	1.23	2.11	2.97	3.84
Indonesia	0.35	1.56	2.88	4.34	5.95
Malaysia	0.85	2.23	3.84	5.71	7.87
Philippines	0.37	1.44	2.40	3.37	4.38
Singapore	13.05	15.06	17.16	19.21	21.23
Thailand	1.28	2.79	4.08	5.43	7.03
China	-0.15	0.77	1.75	2.80	3.95
Taiwan	1.01	1.29	1.65	2.10	2.62
EU	0.26	0.27	0.29	0.30	0.31
ROW	0.16	0.20	0.25	0.31	0.38

Table B4: Implications of APEC trade liberalisation for real GDP — sensitivity to variations in model specification

	<i>Armington-style</i>	<i>Higher trade elasticities</i>	<i>Variety scaling</i>	<i>Base case (both)</i>
Australia	2.75	3.38	2.78	3.41
New Zealand	5.51	5.66	5.52	5.63
NAFTA	0.53	0.64	0.53	0.65
Japan	1.05	1.48	1.09	1.53
Korea	2.43	3.63	2.55	3.86
Indonesia	3.63	4.50	4.19	5.12
Malaysia	3.01	4.57	3.13	4.89
Philippines	3.10	3.96	3.30	4.17
Singapore	5.37	7.02	5.12	6.86
Thailand	3.53	4.35	3.66	4.47
China	2.00	3.08	2.04	3.12
Taiwan	1.43	1.38	1.43	1.40
EU	0.04	0.04	0.03	0.03
ROW	-0.02	-0.01	-0.05	-0.04

Table B5: Implications of APEC trade liberalisation for terms of trade — sensitivity to variations in model specification

	<i>Armington-style perfect</i>	<i>Higher trade elasticities</i>	<i>Variety scaling</i>	<i>Base case (both)</i>
Australia	-0.65	1.30	-0.64	1.35
New Zealand	2.98	4.80	2.97	4.80
NAFTA	-0.13	0.19	-0.10	0.24
Japan	-2.82	-1.97	-2.81	-1.95
Korea	-2.87	-3.55	-2.96	-3.67
Indonesia	-1.37	-4.69	-1.61	-5.24
Malaysia	-1.38	-2.25	-1.44	-2.39
Philippines	-1.58	-3.89	-1.68	-4.19
Singapore	3.19	2.89	3.24	2.92
Thailand	0.08	-0.23	0.03	-0.28
China	-1.17	-2.45	-1.21	-2.54
Taiwan	0.22	-0.38	0.19	-0.41
EU	1.37	1.67	1.40	1.72
ROW	1.14	0.91	1.12	0.91

Table B6: Implications of APEC trade liberalisation for real income — sensitivity to variations in model specification

	<i>Armington-style perfect</i>	<i>Higher trade elasticities</i>	<i>Variety scaling</i>	<i>Base case (both)</i>
Australia	3.16	4.33	3.20	4.38
New Zealand	8.40	9.59	8.41	9.57
NAFTA	0.55	0.73	0.56	0.74
Japan	0.86	1.46	0.90	1.51
Korea	1.10	1.94	1.19	2.11
Indonesia	3.14	2.55	3.58	2.88
Malaysia	2.72	3.66	2.79	3.84
Philippines	2.73	2.34	2.90	2.40
Singapore	15.85	17.23	15.69	17.16
Thailand	3.18	3.97	3.29	4.08
China	1.42	1.76	1.44	1.75
Taiwan	1.98	1.66	1.97	1.65
EU	0.24	0.29	0.23	0.29
ROW	0.31	0.29	0.27	0.25

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Comments by Jeffrey Lewis on
Strategic Interests of ASEAN in Regional Trading Arrangement in the Asia-Pacific Region
by Innwon Park, Kong-Yam Tan, and Mun Heng Toh
and
The Comprehensiveness of APEC's Free Trade Commitment
by Philippa Dee

I am going to exercise the power of the Chair to add a few remarks of my own, some of which have been anticipated. First of all, I felt more comfortable because of the long footnote at the bottom of Philipps Dee's paper with the organizational changes. I work for the World Bank, where we have been having changing acronyms and changing organizations forever. Second, is this the same Department of Foreign Affairs that worried so much about numbers they left the documents outside the Pacific Forum Conference on the table? Okay. I feel comforted too.

I have decided to start by trying to list the stylized facts of these kinds of multicountry models. We now have hundreds of examples and variants. One no longer needs to explain every tiny component, but can instead start from a common view of the broad, stylized facts and conclusions.

The first fact or conclusion is that all participants in a regional liberalization exercise or free trade agreement benefit, particularly, as Philippa just pointed out, when the liberalization is comprehensive and includes all sectors. Most cases that reach alternative results involve only selected and pathological sectors that usually have very specific explanations.

The second conclusion or stylized fact addresses the early concern about spreading free-trade regional agreements, that they could have a detrimental effect on those left out, as if trade created within a free-trade agreement would come at the expense of trade outside the region, or that trade diversion would exceed trade creation. This has not been the case, not even in apparel 5 years or so after NAFTA, nor anywhere in this broad class of models. Trade creation almost always exceeds trade diversion, usually by a factor of 4 or 5 or 8.

The third stylized fact, which Philippa highlighted, is that the size of the country gain is more or less proportional to the size of the liberalization that the country is undertaking. This is her Epsilon T squared: the more you offer, the more you gain. Some exceptions occur, as Innwon Park's paper suggested. In some cases, the regional pattern and choice of partners matters: who is included and who is not. But, the more you offer, the more you gain. Now, what does all this mean? If we think of the plain vanilla kind of multicountry CGE model, we get positive gains that are proportional to the size of what is offered up. But the numbers are not big: really just small percentages of GDP. They are quarter-percentages or less for the large countries, for example, the United States or NAFTA agglomerations, and a little bit bigger perhaps for Japan. Numbers get bigger for smaller economies.

This leads to the next line of inquiry; "the search for large numbers." When we look for numbers larger than one-quarter percent of GDP, we implicitly believe other things are going on. These models tend to get extended to create larger gains, or to capture some of the effects that we

This is the approach taken in Park's paper that began from our model, where direct links occur between trade expansion as a result of liberalization and the productivity with which existing resources are used. As another example, Philippa's model took in gains from trade facilitation. Another approach is to build in bigger distortions. We benchmark models with bigger distortions because when we eliminate these distortions, we get bigger gains. This time-honored approach goes back to the early single-country work. In such work, the gains that would accrue from trade liberalization were much bigger when one built in big rents to begin with, not just official tariffs. In fact, Shujiro Urata, who is here today, and I tried to produce large estimated numbers for Turkey. If you build in big distortions and remove them, you then get bigger gains. A third approach is imperfect competition which, as Philippa argued, is no longer really a bell and whistle but a prominent feature in a whole series of models, linked to the underlying Armington story and not all that different. My point here is that countries gain: the more you offer the more you gain. After recognizing that, we should confirm validity and model parameterization as the next set of issues, which is how big the numbers are and how well designed and developed the stories are that motivate them. For example, the big gains from service sector liberalization in the story very much derive from the tariff equivalent of 100 percent, which was built in from the start, whereas the tariff equivalents for the manufacturing sector in many of these economies, including the developing economies is 10-20 percent. Thus, one gets large gains from service sector liberalization.

I think another area of importance is trade facilitation and "reality checking" the numbers. I found the estimates of the size of these effects to be low, particularly for many of the developing countries. If one were to look at the potential impact of import-clearing procedures and harmonization and elimination of such procedures in an economy such as Indonesia (where I worked for many years), you can get far larger estimates of the gains that might occur based on micro surveys of importers. For example, the famous experiment in Indonesia occurred when management of the customs clearance process was taken away from the customs authorities and replaced it with the international surveyor SGS. Clearing times for imported shipments of goods dropped by 85 percent, from somewhere like 23 days down to 2 or 3 days average. And the importers swore that it was saving them on the order of 10 to 20 percent of the cost of the shipment to clear their goods that fast. So these potential gains could be enormous, particularly for economies where institutional structures do not necessarily work well.

We have not talked much about service sector liberalization in the past, largely for two reasons: first, none of the earlier global liberalizations had service sector liberalization on the table, so that was a good reason not to consider it. And second, even when we considered it, we did not treat it because it poses difficulties to the way we think about liberalization, particularly to our whole approach towards tradability and choices of import versus domestic. And so I think one question that has to be asked is whether our paradigm--whether an Armington paradigm or an imperfect monopolistic competition paradigm of substitutability based on price--is the right way to approach service sector liberalization.

If you walk into a bank in Jakarta--whether a domestically owned bank or a domestic branch of a foreign bank--you know that nearly all of the inputs and nearly all of the labor and nearly all of the capital are Indonesian, and not Australian or American or anything else. So it is not clear that your choice is between a "domestically produced" Indonesian good with domestic inputs or a "foreign produced" good made with U.S. or Australian inputs. Nor is it clear that price sensitivity matters. Those who pursue liberalization must think more about the way that these choices can be modeled.

Comments by Mary E. Burfisher on

“Strategic Interests of ASEAN in Regional Trading Arrangements in the Asia-Pacific Region,” by Park, Innwon; Tan, Kohn-Yam; and Toh, Mun-Heng,

REVIEW

Park, Tan and Toh provide a very capable analysis of the impacts of alternative regional trading arrangements in the Asia-Pacific region on the five members of ASEAN. Their analysis draws mainly from the results of a global computable equilibrium model, and is enriched with a broader discussion of the political and economic motivations for ASEAN members' trade policies. Their main conclusion is that the larger the free trade area, the greater the gains for each of the ASEAN countries in terms of GDP growth, exports, and output. The largest free trade area that they consider is among the 18 members of APEC. The smallest is among the five ASEAN countries.

This is an outcome that we might expect based on economic theory. The more member countries, the more likely it is that a free trade area includes complementary economies with potential for trade creation, and the smaller the scope for trade diversion. The authors provide a good background discussion of the underlying trade and production data in their model. They note that ASEAN countries have competitive production structures, and relatively larger trade flows with non-ASEAN APEC members compared to intra-ASEAN trade. This discussion provides some intuition into their model results and policy conclusions.

An important feature of their analysis is their incorporation of trade and productivity links. In this way, they attempt to capture the mechanisms behind the tremendous, apparently trade-related, economic growth that has been observed in these countries over the past two decades. They model a relationship between export growth and increased productivity of labor, capital, and land. They also incorporate the relationship between increased imports of intermediates and capital goods, and factor productivity. Even so, the projected impacts of free trade agreements on ASEAN countries are found to be extremely small. ASEAN GDP increases only 0.34% under an ASEAN free trade area, and only 2% under an APEC free trade area.

While their model results are certainly credible, it would be useful if the authors had provided more insight into what drives them. For example, what share of the expected GDP growth under the alternative free trade scenarios is accounted for by productivity growth, and does this vary by country? Likewise, base data on the sectoral trade barriers would help to give a sense of the significance of trade liberalization for these economies. Assumptions about countries' export supply and import demand elasticities would help to explain both the magnitude of the impacts of alternative free trade arrangements, and the differences in effects among ASEAN members. The text is not clear about the authors' factor mobility assumptions. If, in fact, both land and labor are sector specific within each region, as they state, this would help account for small impacts. Although why this very restrictive assumption, or any factor mobility assumption, is made ought to be explained. The authors might consider including their welfare results. While they provide real GDP impacts, these are not necessarily of the same sign as welfare changes. These are simply suggestions for elaborating on what is already a strong paper.

One of the main contributions of this paper is its insight into strategic issues. In particular, the authors develop some important conclusions regarding the divergent interests of the ASEAN members

regarding expansion options. All ASEAN members gain from each successive expansion of ASEAN (in terms of GDP growth) and have the largest GDP gains under the largest free trade arrangement, APEC. However, some members gain more from expansion toward China than from expansion toward the U.S. This is the type of outcome that has raised concerns about the relationship between regionalism and multilateralism, and in particular, whether regional trade agreements are likely to lead, through membership expansion, to global free trade. On one hand, the authors' results suggest the possibility that some countries, if able to dominate the ASEAN trade policy agenda, would derive much of their gains from expanding ASEAN only within Asia, and may not derive sufficient additional gains to make pursuit of a full APEC worthwhile. On the other hand, the authors find positive, if unequal, incentives for all ASEAN members to expand to the largest possible union.

While the authors already provide a thorough analysis of ASEAN's free trade options, their discussion has also stimulated some ideas about some additional areas to consider. One is the possible disparities in trade-productivity links among APEC countries, particularly the possibility of relatively rapid productivity growth in China. A second is the expansion of ASEAN under open regionalism, the MFN-based approach to regional trade liberalization that has been proposed for APEC. These model extensions might generate some very different and useful insights into ASEAN members' incentives to expand their regional trade agreement beyond AFTA and beyond Asia.

Comments by Wang Zhi¹ on

“The Comprehensiveness of APEC’s Free Trade Commitment” by Philippa Dee

In this paper, Philippa Dee presents a comprehensive assessment of the impact of APEC trade liberalization, including liberalization in both merchandise and services trade, as well as savings from trade and investment facilitation measures. Starting from the GTAP database, the author has amassed and synthesized an enormous amount of additional data and evidence from other sources in the process of constructing and calibrating the IC95 multi-regional CGE model. Having struggled myself with these same data, and been frustrated by the inconsistencies that exist, her capable efforts in reconciling the base year data with post-NAFTA, post-Uruguay protection levels alone should be highly praised.

Turning to the policy implications, her results highlight the importance of all sectors being included in APEC’s goal of free and open trade. She found that both services trade liberalization and trade facilitation measures can add significantly to the benefits from liberalization of merchandise trade. However, if sensitive sectors such as agriculture were excluded, the economic benefits would be dramatically reduced for most APEC countries. This result is not surprising given the structure of the IC95 model and its base year data which net out the impact of the Uruguay Round and NAFTA agreements. Agriculture is a major sector of unfinished business from the Uruguay Round. There are high protection rates for food and agriculture products, for example, remaining in East and South East Asia. With the freer play of comparative advantage after APEC trade liberalization which includes agriculture, more efficient resource allocation across the region will lead to significant efficiency gains across APEC economies and increases in import demand for food and agriculture products, particularly in East Asia. Therefore, the welfare gain both for major exporting and importing economies would be substantial.

However, because of the static nature of the IC95 model and the comparative statics counterfactual experiments design used by the author, it is not possible to show that the contribution from agriculture to total welfare gains will decrease during the course of APEC trade liberalization as agreed to in the Bogor Declaration. There are two major reasons. First, the time table for liberalization is 2010 for industrial countries and 2020 for developing countries. East Asia’s newly industrialized economies such as Singapore and Taiwan have declared their intention to participate in the same time table as industrial countries. Since agriculture resources in APEC’s developing economies such as ASEAN are more abundant than economies like Japan, Korea and Taiwan, which are planning to fully liberalize in 2010, the contribution from agricultural reform will be relatively less after 2010. Second, demand for agricultural products is less elastic than other commodities. As the share in total demand for agriculture and food products decreases along with economic growth, its contribution to total welfare gains from APEC trade liberalization will also decline over time.

Another valuable contribution from Dee’s study is the attempt to examine the cost savings from trade facilitation measures in addition to trade liberalization. This effort broadens the policy coverage normally covered in exercises conducted by CGE models. However, it is not very clear from her paper

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how this is implemented in the IC95 model. It may be more convincing if she were to interpret these facilitation measures as a means to reduce transaction costs for all commodity trade. Because there are delivery costs associated with each bilateral trade flow in the GTAP data base, it will be very easy to assume a uniform reduction across all sectors and regions in the model as a proxy for immediate results from trade facilitation offers. The indirect impact of these reductions on other parts of the global economy then can be evaluated similar to other trade impediment reductions. Since these transaction demands are supplied by the trade and transportation service sector in each region, a reduction in trade delivery costs would also induce direct resource savings to the sector (use less resources but deliver more goods to consumers), a consequence that Dee was trying to analysis.

Most trade liberalization exercises based on CGE models are concentrated on merchandise trade, with the notable exception of Brown et al (1995), due to the lack of systematic information on services trade barriers. The only available source of service trade barriers is the work by Hoekman(1995). In order to cover the impact of trade liberalization in the services sector, the tariff equivalents of restrictions to services trade that “guesstimated” by Hoekman were built into the base year data of Dee’s study. It is the first attempt that I am aware of to cover services in an assessment of APEC trade liberalization. Although the results provide some sense of the relative importance of barriers to services trade and the interactions between the goods and services sectors when those barriers are removed, they should, at best, be considered only as indicative, given the weakness and arbitrariness of Hoekman’s guesstimates.

Besides the problems underlying the protection data used in this study, simulation results from CGE models are also conditional on estimates of various elasticities and other parameters used in the model, and are often criticized by econometricians because the uncertainty surrounding those estimates may dwarf the quantitative results predicted by the model. In addition to parameter sensitivity, the results are also sensitive to changes in model specifications (Francois, et al., 1995).

In response to these concerns, Philippa Dee reported the results from conditional sensitivity analyses of import substitution elasticities by varying those parameters uniformly in her study and found that key simulation results such as the real GDP and the real income are approximately linear with respect to those parameters. However, as Harrison, et al. (1993) have pointed out, such procedures often overstate the robustness of model results in a multi-variate context. Unconditional Systematic Sensitivity Analysis (USSA) is recommended as an alternative. In such a procedure, a distribution is assumed for each uncertain parameter (assuming the parameters are independently distributed), and a certain number of parameter values are randomly selected based on discrete approximations of their distribution. The model is then solved for all possible combinations of the selected point values of the parameters, and estimates of the mean and standard deviation for the model's major endogenous variables are generated. Such an approach is obviously superior than what used in this study. In order to overcome the tremendous computational requirements caused by dimension explosion in USSA procedure,² Orthogonal Design, an experiment design method widely used in natural sciences, may be introduced to reduce the computation difficulties may involved in the analysis(Wang, 1997).

² As noted by Harrison, et al. (1993), in a model with M uncertain parameters and a sample size of N for each parameter, the required model solution under USSA would be N^M times.

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SESSION IX

***GENERAL EQUILIBRIUM MODELING OF TRADE
LIBERALIZATION B***

The Cost of Regulation in the Japanese Service Industry

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March 1998

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This is a substantial revision of Kawai and Urata (1997).

The Cost of Regulation in the Japanese Service Industry

Hiroki Kawai and Shujiro Urata

The Japanese service industry has expanded rapidly, accounting for more than three-quarters of its GDP or employment in the 1990s. However, the Japanese service industry suffers from inefficiency and the prices of services are high. These unfavorable characteristics of the Japanese service industry, which are largely due to extensive regulations, result in substantial costs to the Japanese economy. The simulation results, using a CGE model, indicate that the cost of regulations in the service industry is as large as nine percent of GDP. The cost to an average Japanese consumer would be approximately 270,000 yen or US\$2,300.

I. Introduction

As is the case in other developed countries, the service sector has become increasingly important in the Japanese economy. Its share in total value added and employment rose respectively from 67 and 62 percent in 1980 to 76 and 73 percent in 1993. Despite a rapid expansion of the service sector, a number of service markets are regulated through a variety of forms. For example, entry into most service markets such as transportation and communications needs an approval of the government, and most service prices have to be approved by the government or reported to it. This is a quite a contrast to the manufacturing sector, where regulations have been largely liberalized.

A regulated service market limits competition and results in high prices and low productivity. Consumers lose on both counts, while producers lose when they are forced to pay high prices for intermediate services such as transportation or communications. Since the service sector accounts for a large part of the Japanese economy, inefficiency of the service sector influences Japan's economic activities at sectoral as well as overall levels.

This paper examines quantitatively the cost of Japan's regulated service market by undertaking counterfactual simulations with the use of a computable general equilibrium (CGE) model.¹ Through provision of a virtually realistic "economy", CGE models enable one to examine effectively the impact of policies such as regulations on the economy.

The paper begins with a brief description of the service sector in Japan, setting the stage for the following analyses, then turns to an analysis of the cost of regulation in the service sector. The final section offers concluding comments.

II. The Service Sector in the Japanese Economy

While the service sector in Japan expanded rapidly over time, there are wide variations between sub-sectors of services (Table 1). In terms of output (value added), construction, distribution, and real estate account respectively for 10.3 (9.4), 9.9 (13.8), and 6.5 (11.1) percent of all industries.² As for employment, the distribution sector has by far the largest share, accounting for 20 percent of total employment, followed by construction at 10 percent. Being labor intensive, distribution's share in total employment is significantly greater than its corresponding share in output or value added.

To investigate further the importance of the service sector, we computed the impact of the price change of a particular service on the overall prices by taking inter-industry linkages into consideration.³ The computed values are shown in the last column of Table 1. For example, a 1 percent decline in the price of construction leads to 0.05 percent decline in overall price level. Among the service sub-sectors, the

¹ A number of studies have been undertaken by using CGE models. Most of them examined issues related to foreign trade and fiscal measures. See Robinson (1988) for a survey of CGE models. For a more recent survey, see Garbaccio and Plummer (1997).

² "Other services", including government services, restaurants, and medical services, account for a large part of the service sector, as shown in Table 1.

³ We used a 162x162 input-output table for 1993, and produced a 162x162 matrix consisting of the magnitude of the impact of price changes in sector i on sector j , where i and j range from 1 to 162.

Table 1: The Service Sector in the Japanese Economy: 1993

Sector	Output		Value Added		Employment		Labor Productivity Total=1.0	Impact of price changes on overall price
	Trillion yen	share (%)	Trillion yen	share (%)	1,000	share (%)		
I Agriculture, Forestry and Fishery	17441	2.0	9198	2.2	4455	6.9	0.318	0.0307
II Mining	2027	0.2	978	0.2	94	0.1	1.609	0.0033
III Manufacturing	317183	36.7	105256	24.9	12912	19.9	1.255	0.2981
IV Services	521648	60.4	322411	76.4	47526	73.1	1.044	0.7427
Construction	88779	10.3	39706	9.4	6511	10.0	0.939	0.0522
Public Utilities	21873	2.5	12155	2.9	505	0.8	3.707	0.0373
Distribution	85357	9.9	58240	13.8	13609	20.9	0.659	0.1351
Financial/Insurance Services	28888	3.3	19405	4.6	2056	3.2	1.453	0.0579
Real Estate	56199	6.5	46675	11.1	762	1.2	9.430	0.0778
Transportation	34783	4.0	19720	4.7	2891	4.4	1.050	0.0522
Communications	13317	1.5	9605	2.3	752	1.2	1.967	0.0295
Other Services	192450	22.3	116905	27.7	20440	31.4	0.880	0.3007
Total	864122	100	422221	100	64994	100	1.000	1.0747

Source: Computed from the Input-Output Table 1993, Management and Coordination Agency.

impact of price changes in the distribution sector is particularly large: a 1 percent decline in the price of distribution would result in 0.13 percent decline in the overall price level. Because distribution services are used extensively as inputs in the production of other sectors, a decline in their price would benefit other Japanese producers greatly.

Because regulations are likely to affect prices and technical efficiency, we compare the Japanese service sector to that of the U.S. with respect to their prices and TFP (total factor productivity) levels. Table 2 shows these differences for 162 sectors in 1990. The figures are constructed in such a way that the U.S. value is unity. They reveal that the prices of services in Japan are significantly higher and TFPs are lower than those in the U.S.

The prices of construction, financial, transportation, and other services in Japan are more than double their U.S. counterparts.⁴ In particular, the prices of road freight transport and storage, building maintenance, legal and accounting services, and other business services are very high. There are only four service sub-sectors where the prices in Japan are lower than those in the U.S.: air transport and related services, education and research, non-profit organization, and medical and health services. For twelve service sub-sectors out of forty-eight sub-sectors, the TFP level in Japan is higher than that in the U.S. Some of these sub-sectors include medical and health services, education and research, and air transport and related services.

In general, those sectors where prices are high exhibit low TFP levels, reflecting a relationship that inefficient use of resources leads to high production cost, which in turn results in high prices. However, there are sub-sectors where both high prices and high TFP exist in Japan. These are water supply, real estate, communications, railroads, other transport services, motor vehicle repair, amusement and recreation services, and information and computer services. This "anomaly" may be explained by the absence of competition in these sectors caused by government regulations. Without competition, efficient producers capable of producing at low cost can charge high prices, enabling the producers to earn excess profits.

III. The Impact of Deregulation in Services: A Simulation Using a CGE Model

What is the impact of high prices and low productivity on the Japanese economy? In this section we use a CGE model to simulate a counterfactual case under which the level of TFP of the Japanese service sectors were to increase to the U.S. level as a result of deregulation.⁵ We then compare the counterfactual with the actual case to estimate the impact of low productivity and high prices on the Japanese economy.

⁴ It should be noted that one of the reasons behind high price differentials in services between Japan and the U.S. is that services are nontradable.

⁵ Our CGE model deals with 162 sectors. We adopted a savings-driven closure rule and the fixed exchange rate regime. For more detailed information on our model, see Kawai and Urata (1997).

Table 2. Price and TFP Differences Between Japan and the U.S. (U.S.=1)

Sector	Price	TFP	Sector	Price	TFP	Sector	Price	TFP
Agriculture	2.261	0.880	Metal products for construction	2.091	0.672	Paper containers	1.381	1.262
Cereals	6.000	0.207	Other metal products	1.742	0.740	Other wooden products	1.016	1.497
Forestry	3.120	0.385	Electric wires	1.230	1.084	Pulp	0.940	1.613
Tobacco	2.250	0.538	Steel and steel products	1.271	1.243	Newspapers	1.042	1.861
Vegetables	1.784	0.649	Aluminum products	1.140	1.354	Construction	2.505	0.562
Poultry	1.855	0.686	Other non-ferrous metals	1.180	1.403	Railroad construction	2.672	0.500
Dairy farming	2.173	0.698	Copper products	1.109	1.497	Electric utility facilities	2.672	0.507
Fruits	1.524	0.806	Machinery	1.288	1.253	Public utility	2.648	0.520
Other non-edible foods	1.420	0.905	Other general machinery	2.374	0.627	New residential construction	2.711	0.530
Agri services	1.358	0.968	Office machinery	2.252	0.644	New non-residential construction	2.354	0.588
Other edible foods	1.249	1.005	Machine tools	2.056	0.707	Telecommunication facilities	1.913	0.625
Other livestock	1.412	1.165	Medical instruments	1.891	0.710	Other construction	2.183	0.639
Crops for sugar	1.000	1.217	Other electric machinery	1.843	0.799	Building repairs	2.183	0.644
Fishery	0.986	1.326	Optical instruments	1.479	0.852	Electricity, gas, water	1.753	0.922
Logging	1.089	2.031	Engines and boilers	1.573	0.880	Gas	2.524	0.521
Mining	1.039	1.613	Rotating electric machinery	1.500	1.015	Thermal energy supply	1.425	0.852
Metal ore	3.000	0.391	Watches and clocks	1.445	1.023	Electricity	1.814	0.922
Other non-metal ores	3.322	0.406	Conveyors	1.392	1.104	Water	1.302	1.149
Coal mining	0.844	1.354	Batteries	1.337	1.123	Distribution	1.578	0.830
Gravel, quarry and crushed stones	0.709	1.806	Electronic computing equipments	1.245	1.125	Wholesale	1.572	0.830
Crude petroleum and natural gas	0.843	1.956	Elec equip for internal comb engines	1.257	1.152	Retail trade	1.586	0.830
Food	2.069	0.944	Electric bulbs	1.342	1.163	Financial services	2.404	0.803
Sugar	1.770	0.431	Aircraft	1.045	1.164	Banking	2.532	0.803
Animal oil and fat	2.657	0.545	Two wheel vehicles	1.079	1.209	Insurance	2.107	0.803
Vegetable oil	2.230	0.652	Ratio and TV	1.085	1.222	Real estate	1.290	1.349
Soft drinks	2.147	0.666	Electron tubes	1.057	1.253	Real estate	1.290	1.349
Meat and meat products	2.308	0.666	Textile machinery	1.263	1.256	Transportations/communications	2.943	0.817
Other food stuffs	2.186	0.712	Semi-conductors	1.057	1.268	Road freight transport and storage	6.908	0.159
Bread	1.847	0.747	Analytical instruments	1.056	1.277	Postal services	1.390	0.788
Sea foods	1.571	0.757	Electric and electronic parts	1.166	1.297	Water transport services	1.662	0.792
Liquor	2.722	0.757	Railroad cars	1.037	1.304	Broadcasting	1.365	0.971

Noodles	1.938	0.780	Other household electric appliances	1.248	1.330	Road passenger transport	1.123	0.976
Confectionery	1.847	0.809	Ship building	1.045	1.405	Communications	1.232	1.136
Other processed agricultural foods	1.712	0.884	Cars	0.755	1.712	Railroads	1.142	1.209
Dairy products	1.930	0.927	Other telecommunication machinery	0.743	1.878	Other transport services	1.102	1.464
Grain mill and flour	2.286	1.357	Wired communication machinery	0.743	1.880	Air transport and related services	0.854	1.606
Tobacco	1.847	1.682	Other manufacturing	1.766	0.933	Other Services	2.008	0.943
Feeds for animals	0.896	2.227	Plywood	6.900	0.197	Legal and accounting services	4.804	0.272
Textiles	1.224	1.153	Foreign and Japanese paper	2.297	0.583	Other business services	4.804	0.305
Wearing apparel	1.546	0.722	Stationary	2.390	0.607	Building maintenance services	4.804	0.379
Reeling and spinning	1.495	0.843	Other manufacturing	2.148	0.668	Waste and scraps	2.577	0.388
Carpets	1.261	1.000	Coated and converted paper	2.159	0.749	Public services	2.088	0.508
Fabrics, yarn	0.885	1.551	Other paper products	1.972	0.785	Motor vehicles leasing	2.495	0.512
Other textiles	0.547	2.152	Miscellaneous ceramic products	1.726	0.800	Hotel and lodging	2.077	0.646
Chemical products	1.517	1.196	Wood chips	1.436	0.817	Extra household expenditure	2.077	0.659
Basic chemicals	2.341	0.705	Toys and sporting goods	1.681	0.818	Advertisement	1.960	0.707
Petroleum and coal products	1.987	0.712	Publishing and printing	1.646	0.867	Restaurants	2.077	0.755
Tires	1.657	0.871	Concrete	1.573	0.868	Unclassified	2.077	0.772
Paints and ink	1.920	0.904	Other leather products	1.588	0.907	Other repair	1.719	0.796
Agricultural chemicals	1.607	1.036	Furniture	1.664	0.908	Other personal services	2.071	0.859
Other chemicals	1.379	1.245	Records	1.478	0.928	Barber and beauty shops	1.938	0.895
Plastics and rubber products	1.171	1.248	Cement	1.482	0.931	Motion pictures	1.384	0.991
Footwear	1.146	1.323	Cement products	1.460	0.989	Motor vehicle repair	1.220	1.019
Synthetic resin	1.382	1.330	Musical instruments	1.478	1.026	Amusement and recreation services	1.391	1.020
Synthetic fibers	1.091	1.584	Small personal adornments	1.404	1.026	Information and computer services	1.190	1.054
Fertilizers	1.072	1.714	Ceramic wares	1.415	1.027	Non-profit organization	0.920	1.299
Medicaments	0.736	2.152	Ordnance	1.000	1.135	Education and research	0.785	1.998
Cosmetics, toiletries	0.705	2.352	Glass and glass products	1.229	1.139	Medical and health services	0.588	2.278
Soap and detergents	0.609	2.504	Leather and fur products	1.497	1.167	Government	2.088	0.477
Metals	1.476	1.062	Carbon and graphite products	1.234	1.203	Government	2.088	0.477

Source: Kawai(1996)

In the simulations, the level of TFP is increased exogenously. Since the prices are determined endogenously in the CGE models, they cannot be so changed.⁶ But the prices would change as a result of the changes made in TFP.

Before conducting counterfactual simulations, we first examine the impact of a 10 percent increase in the level of TFP for the service sectors, one sector at a time, to discern the magnitude of the impact of deregulation by individual sectors. We call this exercise a "sensitivity" analysis.

III.1 Sensitivity Analysis

The results of increasing the TFP level of eight service sectors by 10 percent are shown in Table 3. As expected, this leads to lower prices and higher levels of real wages, income, consumption, and GDP. Specifically, a 10 percent increase in TFP in all the service sectors would reduce consumer and investment prices by 4.72 and 4.67 percent, while increasing real wages, disposable income, consumption, and GDP by 5.23, 5.04, 4.54, and 5.46 percent, respectively.

There are wide variations in the magnitude of the impact of these changes, depending on the service sectors where the increase in TFP occurs. The largest increase in GDP (0.93%) occurs when an increase in TFP takes place in construction services, because this encourages fixed investment by lowering the price of construction.⁷ The increase in fixed investment in turn results in higher GDP. Indeed, a 10 percent increase in the level of TFP in construction services leads to a decline in the price of investment goods by 2.3 percent, which in turn results in the increase in private fixed investment by 2.4 percent.

An increase in the level of TFP in the distribution sector also leads to a significant increase in GDP. Specifically, a 10 percent hike in TFP would cause a 0.83 percent expansion in GDP. In this case, private consumption as well as fixed investment are promoted by lower prices of consumption and investment goods, which are caused by the increase in productivity in the distribution sector. Consumers benefit from the improved productivity in the distribution sector, as a 10 percent increase in the level of TFP in this sector increases the real wages and real disposable income by 0.85 and 0.91 percent, respectively.

Improved productivity in other service sectors has a smaller effect. A 10 percent increase in the level of TFP in real estate, transportation, finance and insurance, public utilities, and communications results in the increase of GDP by 0.51, 0.41, 0.31, 0.20, and 0.11 percent, respectively.

⁶ To be more exact, in our CGE model, foreign prices are exogenously given, and domestic prices are endogenously determined. Furthermore, we treat services as non-tradables, that is, there are no trade or no foreign prices in our model. As such, we adjust TFP in the deregulation simulation. In contrast, primary and manufactured products are traded, and therefore, in our "free trade" simulation, both foreign prices and TFP are adjusted.

⁷ The increase in TFP level in "other services" contributes most to GDP. However, as "other services" is a heterogeneous group, we do not discuss them explicitly.

Table 3: Sensitivity Analysis: 10 percent increase in TFP in Different Sectors

Table 3: Sensitivity Analysis: 10 percent increase in ITP in Different Sectors											
Base	Total	Service Sectors							Non- services		
		construc- tion	public utilities	distribu- tion	finance & insurance	real estate	transpor- tation	communi- cation		others	
Macroeconomic Indicators											
(index, billion yen)				percent change from the base							
Real wage	1,000	5.23	0.08	0.28	0.85	0.43	0.92	0.37	0.14	1.93	2.63
Consumers price	1,000	-4.72	-0.06	-0.17	-0.99	-0.31	-0.69	-0.44	-0.12	-1.91	-2.43
Investment price	1,000	-4.67	-2.29	-0.05	-0.81	-0.12	0.04	-0.34	-0.05	-1.02	-4.07
Real investment	115,184	8.23	2.44	0.31	1.24	0.55	0.47	0.51	0.17	2.19	6.64
Real disposable income	291,834	5.04	0.07	0.24	0.91	0.39	0.83	0.39	0.13	1.92	2.56
Real consumption	243,628	4.54	0.04	0.21	0.83	0.35	0.75	0.36	0.12	1.75	2.29
GDP	424,537	5.46	0.93	0.20	0.83	0.31	0.51	0.41	0.11	2.07	3.56
Increase in Consumers' Surplus											
per family	815,995	7,489	38,575	144,995	51,590	263,039	74,728	23,512	377,790	465,094	
per capita	263,224	2,416	12,443	46,772	16,642	84,851	24,106	7,585	121,868	150,030	
Source: Authors' calculation											

Source: Authors' calculation

When productivity improves in construction services, the producers' prices decline only in construction services, public utilities, and real estate.⁸ In contrast, for the case where productivity improves in other service sectors, the producers' prices in all the sectors decline, albeit by small magnitude. These contrasting impacts can be explained by differential inter-industry relationships. Construction services are mainly used in construction, while other services are used in many sectors. In particular, an improvement in the level of TFP in distribution and in transportation leads to a significant reduction in the prices of other products.

III.2 The Impact of Deregulation in Services

Next we perform the following simulations:

Simulation 1 Deregulation Scenario: Since services are not considered tradable, free trade in services cannot be applied.⁹ But deregulation of the services sectors is expected to reduce prices and improve productivity. We undertake the deregulation exercise by increasing the level of TFP of the Japanese service sectors to a point where the TFP gap between Japan and the U.S. is reduced by 50 percent. Prices of non-tradable services are determined endogenously in the model.

Simulation 2 Free Trade Scenario: Price differentials between the prices of Japanese imports and U.S. prices of tradable products are eliminated, and the TFP gaps between U.S. and Japanese tradable primary and manufacturing sectors are halved.

Simulation 3 (combination of simulations 1 and 2): price differentials between Japanese imports and U.S. tradable products are eliminated, and TFP gaps in the tradable and service sectors between Japan and the U.S. are reduced by 50 percent. Simulation 3 may be considered as a regulation-free and free trade regime.

The reason that the TFP gaps in the tradable and service sectors between Japan and the U.S. are reduced by 50 percent rather than completely eliminated in the free trade and deregulation simulations is that only a part of these gaps may be attributable to trade restrictions and regulations. Other factors such as industrial organization also play an important role in determining TFP and price levels.

Results of the simulations are shown in Table 4. Under the deregulation case, where the TFP gap between the Japanese service sectors and the U.S. counterparts were halved, Japan's GDP would rise by 9.3 percent. A major factor behind the substantial increase in GDP is an expansion of fixed investment, which increases by 13.3 percent. Consumption increases by 4.2 percent. The average consumer would gain 269,864 yen from deregulation of the service sectors. The expansion of investment and consumption occurs because of the decline in the prices of investment and consumption goods. Among the service sub-sectors, deregulation of construction services contributes notably to the increase in GDP, as it reduces the price of construction services greatly by improving productivity of that sector. Recall that the impact of the increase in productivity in construction services was found large in the sensitivity analysis.

⁸ Because of the limitation of space, the effects on producers prices discussed in the main text are not reported in Table 3. For those interested, please contact the authors for detailed results.

⁹ Some services are traded, but they are treated as non-tradable in this paper, because of a lack of sufficient information on the mechanism and statistics of service trade.

Table 4 Deregulation in Services and Free Trade in Tradable Sectors

Table 4 Deregulation in Services and Free Trade in Tradable Sectors				
Economic Indicators	Base	Deregulation in services	Free trade in tradable sectors	Deregulation and free trade
percent change from the base				
Macroeconomic Indicators (index, billion yen)				
Real wages	1.0	4.1	2.7	7.5
Consumers price	1.0	-5.5	-3.7	-9.3
Investment price	1.0	-11.5	-4.6	-16.6
Real investment	115,184	13.3	3.2	18.2
Real disposable income	291,834	4.6	3.0	8.2
Real consumption	243,628	4.2	2.8	7.5
Real GDP	424,537	9.3	2.2	12.2
Cosumers' surplus (equivalent variations, yen)				
Per family		863,564	628,507	1,798,979
Per capita		269,864	196,408	562,181
Prices of consumption goods (index)				
Food and beverage	1.0	-5.6	-8.2	-14.1
Clothing	1.0	-5.4	-6.2	-11.5
Rent and e.g.w	1.0	-2.8	-1.0	-3.9
Furniture, etc	1.0	-6.0	-3.4	-9.5
Medical, insurance	1.0	-6.0	-2.0	-8.1
Tranportation	1.0	-4.5	-2.4	-7.0
Education, amusement	1.0	-3.9	-2.3	-6.3
Others	1.0	-9.7	-2.9	-12.9
Prices of production goods (index)				
Agriculture	1.0	-3.3	-10.9	-14.8
Mining	1.0	-12.8	-3.8	-18.0
Food	1.0	-4.0	-12.6	-17.5
Textiles	1.0	-3.8	-7.1	-11.2
Chemicals	1.0	-3.1	-7.1	-10.6
Metals	1.0	-3.6	-5.4	-9.4
Machinery	1.0	-3.8	-4.8	-9.0
Other manufacturing	1.0	-4.2	-8.5	-13.2
Construction	1.0	-17.4	-3.2	-21.2
Utilities	1.0	-5.8	-1.5	-7.6
Distribution	1.0	-7.4	-1.3	-8.4
Finance & insurance	1.0	-9.1	-1.2	-10.3
Real estate	1.0	-2.1	-0.5	-2.7
Transport, communication	1.0	-13.3	-1.9	-15.1
Services	1.0	-11.2	-2.3	-13.9
Government	1.0	-19.9	-1.5	-21.4
Domestic production (billion yen)				
Agriculture	19,522	5.0	6.1	12.8
Mining	2,156	11.8	1.3	15.4
Food	36,953	3.9	9.6	15.0
Textiles	14,334	4.9	6.2	12.2
Chemicals	49,707	6.6	2.2	10.3
Metals	52,246	8.8	2.9	13.5
Machinery	132,234	4.8	3.2	9.3
Other manufacturing	50,583	7.7	3.6	12.9
Construction	89,199	18.4	2.4	22.1
Utilities	20,454	7.9	2.8	12.0
Distribution	82,414	6.8	1.9	9.4
Finance & insurance	31,252	8.4	2.9	12.5
Real estate	50,116	2.4	0.6	3.7
Transport, communication	53,382	9.7	3.0	13.7
Other services	184,798	8.5	3.0	12.6
Government	20,409	19.6	1.6	21.2

Employment (1,000)				
Agriculture	5,343	2.8	-8.4	-4.7
Mining	100	-69.7	-8.0	-92.0
Food	1,745	2.0	-0.7	1.3
Textiles	1,474	2.6	0.2	3.3
Chemicals	1,252	6.2	0.6	8.0
Metals	1,838	6.8	-3.2	4.7
Machinery	4,741	0.2	-3.0	-3.3
Other manufacturing	2,876	5.4	-2.8	3.4
Construction	6,502	0.6	-1.1	-0.8
Elec, gas, water	477	-3.7	0.1	-4.8
Distribution	13,508	2.9	1.8	5.2
Financing	2,216	-0.3	2.3	2.3
Real estate	679	2.8	1.0	4.2
Transport, communication	3,547	-7.7	1.6	-5.9
Other services	17,464	-4.0	0.5	-4.1
Government	1,955	-0.3	0.6	-0.5

Source: Authors' calculation

Deregulation in the service sector leads to an increase in production in all the sectors in the economy. In particular, the increase in production is very large in government services (19.6%), construction services (18.4%), mining (11.8%), and transportation and communications (9.7%). Deregulation affects employment. Mining sector employment is particularly hard hit, as it would be reduced by 70%. This is attributable to the small size of the mining sector in the pre-deregulation period. Because of the small base, the changes expressed in percentage would show up large.

Under the second scenario of trade liberalization, free trade would raise GDP by 2.2 percent.¹⁰ Unlike the case of deregulation, both investment and consumption contribute equally to GDP growth, as they rise by around 3 percent. The increase in consumption follows from the increase in real wages and real disposable income. In turn these increases are attributable to the reduction in product prices, resulting from free trade.

Various sectors would be affected differently by free trade. As the domestic to foreign price ratios of primary products is significantly higher than that of manufactured products in the pre-free trade situation, the prices of primary products decline compared to those of manufactured products when free trade is introduced. Despite the decline in producers prices, production of all the products increases. Three reasons may be given for this seemingly anomalous result. One is the real income effect, which results in the increase of the consumption of all the products, thereby inducing demand for domestically- produced products. The second reason may be an improvement in productivity (assumed to follow from trade liberalization), which increases the competitiveness of domestic producers, enabling them to expand production. The third factor is the assumption of low substitutability between imported and domestically produced products. This assumption derives from the estimates which were made by using the data observed under the trade-restricted regime. Because of low substitutability, reduction in import prices would have a limited effect in expanding imports at the cost of domestic production.

Despite the increase in production, free trade would reduce employment in the primary sector because of the increase in TFP. Employment in agriculture declines by 8.4 percent and in mining by 8.0 percent. Since the primary sector in Japan is characterized by high prices and low productivity, free trade would greatly affect the primary sector.

The results of simulation 3, which considers both deregulation in the non-tradable service sector and free trade in the tradable sector are more or less the summation of those obtained from simulations 1 and 2. GDP would increase by 12.2 percent; consumption and investment would increase by 7.5 and 18.2 percent respectively, as the prices of consumption and investment goods decline by 9.3 and 16.6 percent. The benefits from increased consumption can be translated into a rise in the consumer surplus of 562,181 yen per person. Prices of all the products and services decline with the rate of the decline being particularly large for primary products, construction services, transportation, and government services (around 15-20% each). Production in all sectors increases, although there are wide variations in the rate of increase, with production of services expanding the most. The rate of increase in the production of construction services, and government services exceeds 20 percent. In contrast, the rate of increase in the production in real estate is only around 3 percent.

¹⁰ Using a partial equilibrium approach, Sazanami, Urata, and Kawai (1995) estimates the cost of high prices in Japan to be 0.5 percent of GDP in 1989. Besides the differences in the models, it should be noted that an improvement in productivity, which was assumed in our study, was not assumed in their study.

Although production would increase in all the sectors, employment in eight sectors (agriculture, mining, machinery, construction services, utilities, transportation and communications, other services, and government services) declines and that in the remaining eight sectors increases. Employment in mining declines sharply, while that in chemicals expands significantly. These observations indicate that deregulation and trade liberalization would necessitate substantial structural changes, incurring a large cost of adjustment.

IV. Conclusions

The service sector has increased its importance in the Japanese economy, currently accounting for more than 70 percent of total value added and employment. Despite its importance, it is plagued by high prices and low productivity, the cost of which is estimated by a CGE model at 9 percent of GDP, and 270,000 yen in terms of per capita consumption. The cost is greater, amounting to 12 percent of GDP and 560,000 yen worth of per capita consumption, when high prices of tradable goods are also taken into account.

Our estimates indicate that policies such as deregulation in the service industry and trade liberalization in the tradable sector are warranted. But such policies result in the redistribution of workers among different sectors. Indeed, as much as 70 percent of workers in the mining sector are likely to lose employment. It is therefore important to introduce assistance programs such as income transfer and retraining, in order to reduce the cost of adjustment.

There are some areas that were not adequately dealt with in this CGE model, and are left as agenda for future research. First, some services such as transportation and communications, are traded internationally, but because of lack of information on service trade our CGE model treated all services as non-tradable. Second, foreign direct investment (FDI) is not incorporated in our model. FDI is increasing rapidly, and it has an important impact not only on commodity trade but also on service trade. Its exclusion from our model is likely to lead to some biases in the results.

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Liberalizing Services Trade in APEC: A General Equilibrium Analysis with Imperfect Competition*

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Abstract

This paper presents a general equilibrium investigation of services trade liberalization in APEC using a global multi-country, multi-sector applied general equilibrium model with an imperfectly competitive service sector. Reducing the service sector's nontariff barriers is modeled by eliminating the possibility for oligopolistic firms to price-discriminate between client countries within APEC and lowering the fixed costs of the firms doing service exporting business. The results suggest that services trade liberalization almost systematically reinforces existing trade balances. The increase in demand for intermediate services tends to reinforce rather than counteract the role of primary factors in determining sectoral comparative advantage. Tariff liberalization in the region has a contrasting effect on trade and welfare compared to services liberalization. The Western APEC members received the greatest welfare gains from services trade liberalization, while the developing economies which start out with the highest levels of tariff protection gained more if only tariffs were eliminated.

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I. Introduction

I-1. Services trade

Services are an important sector in every economy, comprising 50 to 80 percent of GDP in most of them. Since they are collectively the largest segment of almost all economies, it is not surprising that they also constitute a major intermediate input to production in other sectors. Services are also playing an increasingly important role in international trade. While services were once considered nontradable, international trade in services is one of the fastest growing components of world trade and now comprises some 25 percent of the total. With its dominant and integral role in national economies and rapidly growing role in the world economy, we can expect that reducing the barriers to trade in services will have a notable impact on other sectors, and that the protection environment in other sectors will affect trade in services.

This study explores some potential effects of liberalizing trade in services among APEC members by using Computable General Equilibrium (CGE) simulations of liberalization in an imperfectly competitive services sector. Imperfect competition is a useful framework for considering barriers to trade in services. These barriers include the costs of documentation for meeting foreign regulations, certification, and government procurement requirements, obtaining foreign market information, and maintaining distribution networks. Such barriers reduce the options for consumers to seek different sources of supply and increase opportunities for monopolistic pricing. In this study, services barriers are portrayed as fixed costs of exporting. When the need for spending on these fixed costs is reduced by trade liberalization, economic welfare is bound to improve. However, the results also reveal an important structural story about the impact on other sectors. The rest of this section gives a general description of the basic framework, the next section describes the CGE model in more detail, and the final two sections present a description of simulations and results.

I-2. Approach

It should be noted at the outset that data on trade in services suffers from many weaknesses. The compilation of national balance of payments accounts reveals that a fair amount of services trade may go unrecorded, and that countries categorize the components of services trade in different ways. Indeed, some of the apparent acceleration in services trade may derive from recently improved statistical coverage. Similarly, barriers to trade in services are also difficult to measure. While affected by local taxes and subsidies applied to goods, market access for services is especially influenced by regulations, quotas, technical standards, certification requirements, distribution networks, and government procurement rules. In the wake of the Uruguay Round, Hoekman (1996) made an initial attempt to benchmark the relative degrees of protection of services markets in a number of countries, using the extent of commitments under the General Agreement on Trade in Services (GATS) agreement. Using these measures to develop tariff equivalents, Brown, Deardorff, Fox, and Stern (1996) implemented a pioneering exercise in the global simulation of services trade liberalization. Their model also includes imperfect competition in all sectors except agriculture.

One important feature of international trade in many services is the difficulty in selling in foreign markets without a local presence in those markets, such as with banking and insurance. This gives rise to the strong association between services trade and foreign direct investment (FDI). Investment in services

is now estimated to constitute one half to two thirds of the inward FDI for many countries (Hoekman, 1996; OAS, 1997). Therefore, services trade is quite sensitive to barriers to FDI. Petri (1997) explores the impact of this type of trade barrier in APEC using a global model with foreign ownership of subsidiaries in the home economy. The foreign subsidiaries have production technologies distinct from their domestic competitors, but they also face a specific tax that reduces the profitability of FDI.

In the current study, the various nontariff barriers (NTBs) affecting services are assumed to give the service suppliers from a given country a different degree of monopoly power in each national market, including their own. Thus NTBs allow the imperfectly competitive service sector to price discriminate across country markets. As is traditional in CGE models with imperfect competition, this sector is modeled with fixed costs which cause average costs to be above marginal costs and allow for increasing returns to scale. Barriers to trade in services are also modeled as fixed costs. Thus to be able to export, firms must make fixed expenditures on capital and labor in order to gather market information and meet regulations and other requirements.

There is some evidence, though mostly indirect, to support the view that there are fixed costs involved in exporting services. Campa (1993) examines the case of wholesale trade industries in the U.S. between 1981 and 1987 and tries to explain the pattern of entry by foreign firms. He assumes that foreign firms must meet (though not exceed) the proportions of U.S. sectors' holding of fixed assets and expenditures on media promotion. He finds a significant negative relationship between these sunk costs and foreign entry as well as a significant negative impact from exchange rate volatility. He further infers an influence from sunk costs given that this would explain the negative impact on entry from exchange rate uncertainty, and he finds a significant negative effect from a term interacting sunk costs and exchange rate volatility. Notably, he does not find any significant effect of variable costs in the firm's home country on entry in the U.S. market.

A study by Glejser, Jacquemin, and Petit (1980) uses Belgian data, mostly of manufactures, but they did include the industrial design sector. They report on a survey of 1446 exporters where one question asked firms whether they were handicapped by a lack of information about foreign outlets. Analysis of the data vindicates the survey opinions, showing that an affirmative answer is indeed negatively correlated with export rates. The data further show that exporters concentrate their exports on a small number of countries, supporting the view that sunk exporting costs are specific by country of destination.

Roberts and Tybout (1995), in their study of Colombian plant-level decisions to export, consider only manufacturing firms. Nevertheless, their econometric results reject the hypothesis that sunk costs for entry into the export market are zero. They infer from their results that reductions in fixed costs could make exporting profitable for more firms and that export promotion efforts should distinguish measures aimed at existing exporters from those aimed at easing the entry of new exporters. Gallaway (1994) cites the widespread existence of national export promotion agencies designed to reduce the information gap on foreign markets as evidence that such fixed costs of exporting are important.

Of course we do not know what the level of fixed costs are in services. But in the spirit of counterfactual simulation, we make various assumptions and test the impact of trade liberalization under different possible scenarios.

II. The model

II-1. Overview of the model

The world economy consists of 10 regions, each with 11 production sectors. All the APEC members in the model are either an individual country or an aggregated region. The 10 regions are: (1) United States, (2) Canada, (3) Japan, (4) China, (5) Mexico/Chile, (6) Australia/New Zealand, (7) Korean, Singapore, Hong Kong and Taiwan as a region, (8) Southeast Asia, (9) European Union, and (10) the Rest of World which includes all countries not elsewhere classified. The 11 production sectors are: (1) agriculture, (2) energy, (3) textile and paper, (4) petroleum chemical products, (5) metals, (6) transport industries, (7) other manufacturing, (8) non traded services, including construction and utility, (9) trade and transportation, (10) other government service and (11) other private service, including financial and insurance services and commerce¹. Except for the other private service sector, all other sectors of production are perfectly competitive. In these sectors, countries are linked by the Armington system so that commodities are differentiated in demand by their geographical origin.

The focus of this study is non tariff barriers (NTBs) and its effects on trade among the APEC members. In most cases, NTBs raise the cost of doing export business for foreign firms and prevent domestic consumers from cross-border arbitraging. To capture these, the service sector is modeled as a noncompetitive sector in which firms have price-discrimination opportunities across national markets. This model structure was first developed by Mercenier (1995) in a study of European Union's move to a single market. Based on Mercenier (1995), major features of the model are presented as follows.

II-2. The households and final demand

Final demand decisions in each country are assumed to be made by a single representative household². Besides the consumption decision, the representative household also makes a saving/investment decision. However, the static property of the model prevents savings to be endogenously determined and hence the saving rate is fixed in the model.

The households value products of competitive industries from different countries as imperfect substitutes (Armington, 1969), while they treat as specific each good produced by individual firms operating in the private service sector -- the non competitive sector, i.e., the preferences exhibit love for variety in the private service sector (the Dixit-Stiglitz specification, 1977). Thus, preferences can be represented by a two-level utility function:

$$U_r = U[u_1(\cdot), u_2(\cdot), u_3(\cdot), \dots, u_j(\cdot)] \quad (1)$$

¹ The data used are from GTAP version 3, 1992. See McDougall (1997).

² The government exists as a final demander. The government's function is simplified to collect tax revenues and consume final goods. The government revenue is assumed to be fixed and the difference between the government revenues and government consumption is transferred to the households.

where $u_j(\cdot)$ is the subutility derived from the consumption of product j and $U_j(\cdot)$ is the upper tier utility function that translates all sectoral subutility levels into an overall welfare level. For the consumption of a product produced from the competitive sector, the lower level utility function can be replaced by an Armington composite good which is the composition of consumption aggregates in terms of geographical origin. For the consumption of the noncompetitive sector's products, the lower level utility function is a combination of products of individual firms located in the ten regions. Limited by the data, as well as to simplify the model setup, we assume that each region acts as an aggregate demander and faces an aggregate subutility/Armingtonian function, i.e., classification of final demand as the households, the government, intermediate or investment demand only happens at the upper level, while at the lower level each economy acts as a single agent. Formally, the lower level problem in Eq. (1) can be represented by the following CES functions:

$$\begin{aligned} \text{Max } CD_{jr} + GD_{jr} + IVD_{jr} + ID_{jr} &= [\sum_{s \in W} \alpha_{jsr} M_{jsr}^{-\rho_j} + (1 - \sum_{s \in W} \alpha_{jsr}) D_{jr}^{-\rho_j}]^{-1/\rho_j} \\ \text{s.t. } PC_{jr} (CD_{jr} + GD_{jr} + IVD_{jr} + ID_{jr}) &\geq \sum_{s \in W} P_{jsr} M_{jsr} + P_{jrr} D_{jr}, \quad j \in CS \end{aligned} \quad (2)$$

$$\begin{aligned} \text{Max } CD_{jr} + GD_{jr} + IVD_{jr} + ID_{jr} \\ &= [\sum_{s \in W} \alpha_{jsr} \sum_{f \in F_{js}} M_{fjsr}^{-\rho_j} + (1 - \sum_{s \in W} \alpha_{jsr}) \sum_{f \in F_{jr}} D_{fjr}^{-\rho_j}]^{-1/\rho_j} \\ \text{s.t. } PC_{jr} (CD_{jr} + GD_{jr} + IVD_{jr} + ID_{jr}) \\ &\geq \sum_{s \in W} \sum_{f \in F_{js}} P_{fjsr} M_{fjsr} + \sum_{f \in F_{jr}} P_{fjrr} D_{fjr}, \quad j \in NC \end{aligned} \quad (3)$$

where j is sector/good index with J representing the set for sectors, CS representing the subset for the ten competitive sectors and NC the noncompetitive service sector; and s, r are region indices with W representing the set for the ten regions; f is the firm index with F_{jr} representing the set for firm in sector j and located in region r ; M_{jsr} is imports by region r from region s for competitive sector's product j and M_{fjsr} is region r 's demand for firm f 's product and firm f is located in region s 's noncompetitive sector; D_{jr} is the demand for the product j produced at home region r and D_{fjr} is the demand for firm f 's product and firm f is located in the home country; P_{jsr} is the price of good j faced by region r and imported from region s and P_{fjsr} is the price charged by firm f in region r 's market and firm f is located in region s ; CD_{jr} , GD_{jr} , IVD_{jr} , and ID_{jr} are, respectively, the household, the government, investment, and intermediate demand for the composite good j ; PC_{jr} is the unit price for the composite good j . The consumer final demand for the composite, CD_{jr} , is derived from the upper level utility function of the households, the value of the government final demand for the composite; $PC_{jr} \cdot GD_{jr}$ is a fixed share of the government total revenues; the value of the investment demand, $PC_{jr} \cdot IVD_{jr}$ is a fixed share of total investment; while the intermediate demand, ID_{jr} , is determined by the production technologies of all sectors and will be defined later.

The total consumption of households and government, plus investment demand, spending at current prices are equal to national income, which is the sum of labor earnings and capital revenues

owned by the households and the net tax revenues owned by the government. The capital revenue of each region includes domestic capital rentals and pure profits generated from the non competitive service sector. Labor and capital, which are in fixed supply, are perfectly mobile across sectors in each region but not internationally. Thus, factor rental prices are endogenously determined by factor market clearing. Also, the data reflect an initial imbalance of trade in each region. Given the static property of the model, the aggregate values of the trade balances for each region are fixed at their initial levels (but not the bilateral trade balances). There is no monetary term in the model and hence the real exchange rates are endogenously determined by the Walrasian equilibrium condition in the world market.

II-3. Firms in the noncompetitive sector

The model setup for firms in the competitive sectors is quite standard and hence the discussion focuses on firms in the non competitive service sector. The private service sector is assumed to have increasing returns to scale in production. The existence of economies of scale internal to firms operating in the private service sector makes perfect competition impossible in this sector. Following Mercenier (1995), we assume that firms in the noncompetitive service sector behavior as an oligopolist. There is of course no general model of oligopoly. "The outcome of oligopoly competition depends on numerous details, especially the choice variables of firms (e.g., prices or outputs) and the nature of conjectures about other firms' responses" (Helpman and Krugman, pp85, 1993). Following a number of researchers, the traditional Cournot's assumption is adopted, i.e., assuming that oligopolistic firms choose outputs as their strategic variables taking other firms' outputs as given (the noncooperative behavior).

The existence of NTBs to trade allows firms to charge different f.o.b. prices to different customers in different national markets, i.e., markets are segmented and consumers are prevented from cross-border price arbitraging. In particular, firms have an incentive to offer low prices in markets in which their market shares, and therefore their incentive to restrict sales to support the price, are low (e.g., a foreign market), but to offer a high price in the market in which their market shares are high (e.g., the home market).

Formally, the increasing returns to scale production is modeled by assuming that, in addition to variable costs, individual firms face fixed primary factor costs. The variable costs are associated with the technology which is the same as that for the competitive sectors, i.e.,

$$x_{jr} = l_{jr}^{\beta_{lr}} k_{jr}^{\beta_{kr}} (\prod_{i \in J} ifd_{ijr}^{\beta_{ir}}), \quad \in NC \quad (4)$$

where x_{jr} is the individual firm's output in sector j of region r , l_{jr} and k_{jr} are demand for labor and capital, respectively, ifd_{ijr} is intermediate demand for good i used in sector j , and $\beta_l + \beta_k + \sum_i \beta_i = 1$.

Assuming symmetry between the oligopoly firms operating within each region's noncompetitive sector (but different cross regions), the total output of the noncompetitive sector in region r is $X_{jr} = n_{jr} x_{jr}$ where n_{jr} is the number of firm in the noncompetitive sector j . The constant return to scale technology in variable inputs defined in Eq. (3) implies that the unit variable cost, v_{jr} (and hence the marginal cost) of the production is a function the factor rental prices plus intermediate input prices only, i.e., $v_{jr} = v_{jr}(w_r, r_r, PC_{1r}, \dots, PC_{Jr})$, w_r , r_r are wage and capital rental rate, respectively.

The fixed costs are independent of the quantity of the output, so that the average cost is declining in output. The average costs of the production for an individual oligopoly firm can be defined as:

$$V_{js} = v_{js} + \frac{(w_s \bar{L}_{js} + r_s \bar{K}_{js})}{x_{js}}, \quad j \in NC,$$

where L and K are fixed inputs of labor and capital, respectively.

With Cournot's assumption, an oligopoly firm's price-discriminating strategy is to choose sales to each individual markets as its strategic variables to maximize profits, taking other firms' sales and prices to the same markets as given, i.e.:

$$\text{Max}_{\langle z_{jsr} \rangle} \pi_{js} = \sum_{r \in W} P_{jsr} z_{jsr} - v_{js} x_{js} - w_s \bar{L}_{js} - r_s \bar{K}_{js}, \quad j \in NC,$$

where z_{jsr} is the quantity of the output sought to region r 's consumer by region s ' an individual firm, and $\sum_{r \in W} z_{jsr} = x_{js}$ (while region r 's demand for the products produced by region s is $n_{js} z_{js} = n_{js} M_{jsr}$ and demand for the home products is $n_{jr} z_{jr} = n_{jr} D_{jr}$). The country-specific profit maximizing price has the Lerner formula:

$$\frac{P_{jsr} - v_{js}}{P_{jsr}} = - \frac{\partial P_{jsr}}{\partial z_{jsr}} \frac{z_{jsr}}{P_{jsr}}. \quad (5)$$

where the right hand side of Eq. (5) is the inverse firm's perceived elasticity of demand for market r . The computation of these elasticities can be found in Mercenier (1995). These elasticities crucially depend on the market shares of each individual firm (including its domestic market share and market share in each foreign country). When the number of firms in the service sector is fixed, the oligopoly firms may experience nonzero profits. Alternatively, the number of firms is endogenously determined by entry and exit up to the point at which profits are driven down to zero (Chamberlain's large group case, 1933).

As a firm's perceived elasticities of demand depend on its market share, Eq. (5) implies that if a firm's market share is low in a specific national market (and hence its perceived elasticity of demand in that market is low), it has to charge a lower price in that market. In contrast, if the firm's market share is high in a market, the firms' perceived elasticity of demand in that market is high and hence the price the firm charges in that market is higher. It is clear that, at least, for the service sector, firms have a higher market shares in their home market. Thus, Eq. (5) implies that oligopoly firms would charge a higher price in their domestic market and lower prices in the foreign markets. Consequently, for an import country, the domestic price would be higher than the import prices for the private service sector. Different from tariff barriers which usually raise prices for both domestic and imported goods, the non tariff barriers sometimes only raise the prices for domestic goods. However, as the barriers in the domestic market prevent more cheaper foreign goods from coming in, domestic consumers have to consume more expensive domestic good, instead of cheaper foreign goods. If APEC can reduce non tariff barriers among the members, the opportunities for firms to price discriminate among different national markets would become smaller. This is the major task of the next section.

III. Description of the Policy Simulations

Three experiments are conducted by our study. In the first experiment, we remove all tariffs of APEC members imposed on their imports from other countries, including non-APEC countries. In addition, the self-restricted export taxes on textile are removed. The major consideration to conduct this experiment is that the smaller economies of the Asia-Pacific region benefit from a global based system which does not condone selective discrimination. Also, members such as Japan and other emerging economic giants of East Asia benefit from a global economic order, for different reasons. East Asia is not a natural economic unit. Although the share of trade within East Asia has been expanding rapidly, East Asia's exports to and imports from the rest of the world will continue to increase. The economic impact of maintaining open trading links with the rest of world, especially Europe and North America is a source of resistance to any formal trading bloc in this area. For these reasons, the long-term pressures within APEC, especially from its East Asian members, are to work cooperatively for free trade in the global economy. Hence, in the first experiment, we conduct a non-discriminated simulation by eliminating all tariffs APEC members imposed on their imports from the world.

In the second experiment, in addition to tariff elimination of the first experiment, we integrate APEC's service market by assuming that oligopoly firms in the service sector switch from their initial price-discriminating strategy to a single pricing behavior within the APEC. Formally, the firm's perceived elasticity of demand in the integrated market becomes a weighted average of the price elasticities on each individual economy within the APEC:

$$E_{jsAPEC} = \sum_{r \in APEC} [E_{jsr} \frac{n_{js} z_{jsr}}{\sum_{r \in APEC} n_{js} z_{jsr}}], \quad s \in APEC,$$

where E_{jsAPEC} is the firm's perceived elasticity of demand in the integrated APEC market, E_{jsr} is elasticity of demand in each individual member's market and $n_{js} z_{jsr} / \sum_{r \in APEC} n_{js} z_{jsr}$ is the share of each economy's demand in the total demand of APEC members.

This experiment can be rationalized as follows: Although tariffs within the service sector of the APEC economies are negligible, various non-tariff barriers exist such as government policies and security regulations. These barriers confer to firms the power to price discriminate between national markets. The integration program is expected to restore cross-border arbitraging by suppressing all forms of NTBs. Firms would then be forced to charge a unique price within APEC. Modeling this is difficult because NTBs are essentially unobservable. The modeling strategy adopted, therefore, consists of treating these NTBs as latent variables, which underlie the existence of price discrimination opportunities for firms in the pre-integration equilibrium. Once this is recognized, it suffices to infer from the data set the price system consistent with the optimal price discrimination strategies of oligopolistic firms and to interpret these as resulting from the implicit structure of NTBs. The experiment then consists of forcing the individual firms to adopt single pricing within APEC market, price being determined from their average regional wide monopoly power and interpreting this behavioral change as the optimal strategic reaction to the disappearance of the never-explicitly modeled NTBs.

Together with integrating service market, in the experiment 2 we also reduce fixed costs by 10 percent for all firms operating in the service sector of the APEC members. Non-tariff barriers increase firm's difficulty to enter other members' market. Such difficulty is usually linked with high fixed costs for firms in the export business. Once market entry barriers are reduced, we should expect that firms operating in the service sector become more efficient and hence can reduce their fixed costs.

In the last experiment, we only simulate service sector market integration plus 10 percent fixed cost reduction. By doing so, we can isolate the effects of market integration in service sector from other sectoral policies. Service sector produces most intermediate inputs for other final production and is the largest sector in the model. This experiment can help us to evaluate the importance of liberalization of service sector on the economy as a whole.

IV. Results

IV-1. Welfare

Reducing tariffs and barriers to trade in services are under discussion by APEC members as integral parts of meeting their overall goals on liberalizing trade and investment among them. In this study, liberalization of services trade is discussed in the context of tariff reduction, while they are simulated separately and jointly. Since a major objective of trade liberalization is improvement in economic efficiency, we begin with discussion of welfare effects. Then, to illuminate issues of structural change, we follow with sectoral results as represented by either changes in trade flows or changes in output. In all experiments, country or regional trade balances remain fixed, but the partner and sectoral composition may change.

It should be noted at the outset that the tariff removal experiment was not intended as a portrait of APEC tariff liberalization since it starts from pre-Uruguay Round tariffs and since APEC members have not committed to eliminating tariffs. Rather, the experiment was intended to provide a comparator and to allow the simulation of services liberalization both with and without the presence of other tariff distortions. So in table 1 we see the regional welfare gains associated with the removal of tariffs in APEC economies, tariff removal combined with services liberalization, and services liberalization alone, with all original tariffs in place. As can be expected, the greatest welfare gains from tariff removal take place in economies starting out with the highest levels of tariff protection, namely the developing and newly industrialized economies of east and southeast Asia.

In contrast, the regional structure of welfare gains practically reverses when services alone are liberalized. As will be seen below, the large western economies have an apparent comparative advantage in services. Therefore, they gain relatively more from reduction in services barriers, and in fact they gain more from services liberalization alone than they do from tariff removal alone. Of course this depends on the size of the experiment, so as a benchmark we note that the sources of gain between tariffs and services are about equal for the U.S. when services fixed costs are reduced by five percent.

While in the case of tariffs, most gains arise from economies reducing their own protection, with services, APEC economies gain extra dividends from liberalization abroad. Services trade barriers are modeled as forcing suppliers to spend more on their own capital and labor in order to obtain essential foreign market information and to comply with foreign restrictions, thus increasing total fixed costs

Table 1. Changes in welfare index in the simulations
 (% deviation from the base year)

	EXP1¹	EXP2²	EXP3³
USA	0.908	2.658	1.731
Canada	1.344	2.726	1.364
Mexico/Chile	1.408	1.917	0.555
Australia/New Zealand	2.983	4.111	1.111
Japan	2.845	4.511	1.627
NIC of East Asia⁴	7.866	8.926	0.971
China	7.392	7.241	-0.077
Southeast Asia	6.789	7.656	0.908
EU	0.186	1.311	1.118
ROW	0.495	1.367	0.864

1. Eliminating all tariffs of APEC countries imposed on their imports from the world;
2. EXP1 plus integrating service market in APEC and reducing fixed costs by 10 percent for firms operating in the service sector of the APEC countries;
3. Only integrating service market in APEC and reducing fixed costs by 10 percent;
4. Including Korea, Taiwan, Hong Kong and Singapore.

regardless of the (positive) amount exported. The reduction of services barriers is simulated by reducing fixed cost and forcing firms within APEC to move to a single-price strategy in the APEC market. In these experiments, firms' profits are fixed at the base level, and the number of firms vary, i.e., firms are allowed free entry.³ Then, once price discrimination across foreign partners is eliminated, the reduction in costs from lowered trade barriers leads to a reduction in the price of services for domestic consumers.

IV-2.Sensitivity

The choice of reducing services fixed costs by the same percentage amount across all regions in APEC derives from the base structure of services trade. Using the degree of services protection estimated by Hoekman (1996), the APEC model regions can be classified as relatively more or less open regarding services trade. The base data on the direction of services trade indicate a similar structure across partners for all regions. In the data, firms in each region export services to all other regions, and they export most to the more open economies and less to the economies more closed regarding services. Alternative structures of the services liberalization experiment were tried, such as using substantially smaller fixed cost reductions for the economies with the largest services sectors, but the results were not inconsistent with those presented here.⁴

Another important variation on these experiments involves testing different levels of substitution elasticities. When the substitution elasticity on the imperfectly competitive services sector is reduced, welfare gains from services liberalization are increased, as theory would predict. Lower degrees of substitutability across different suppliers of the noncompetitive good increase the opportunities for monopolistic price discrimination and thus increase the gains from reducing barriers that generate price discrimination.⁵ Also, sectoral trade results are attenuated but structurally similar, and there is little impact on the tariff removal scenario compared to the high elasticity case. The three original experiments were also repeated with double the values on Armington elasticities for the competitive sectors. Again, this increases welfare gains, accentuates structural trade results and does not reverse them. The results shown here represent the conservative cases for the competitive sectors.

IV-3. Structural effects

Considering sectoral adjustments as seen through changes in net exports, the first thing to note in experiment 1 is the strong impact on tradable services of removing tariffs on all other sectors.⁶ In the tariff removal experiment, the U.S. surplus in services expands notably while the deficits in the other western APEC economies are reduced. The biggest decline in net exports is in the EU, which does not participate in the tariff removal. China expands its surplus and southeast Asia reduces its deficits.

³ Firms within each region in the model are assumed to be identical. Hence, the firms' market shares within sectors, including export shares, are the same, regardless of whether they are new entrants.

⁴ Another alternative included basing fixed cost reductions on a region's export as compared to total sales of services.

⁵ In the model calibration, reducing the Armington elasticity for services also increases fixed costs in the sector.

⁶ The service sector bears negligible tariffs in most regions.

Table 2. Levels of sectoral net exports by countries, \$1000 million

	BASE	EXP1	EXP2	EXP3
2.1 USA				
Private services	3.7473	18.0814	20.9632	6.4149
Agriculture	22.9362	51.0476	51.4247	23.0591
Energy	-42.3982	-39.2488	-39.5348	-42.7272
Textile and paper	-41.5251	-55.4163	-56.3681	-42.2793
Petrochemicals	12.3747	10.1849	9.8917	12.1278
Metals	-12.3527	-13.8129	-14.0751	-12.5908
Transport industries	-11.8235	-9.4033	-9.8830	-12.3126
Other manufacturing	-15.6546	-47.8873	-49.1360	-16.6287
2.2 Canada				
Private services	-10.3344	-9.1673	-9.2611	-10.4485
Agriculture	5.2372	7.7857	7.8210	5.2529
Energy	8.6312	8.9130	9.0480	8.7636
Textile and paper	10.6252	8.6332	8.7042	10.7258
Petrochemicals	-1.9828	-2.1375	-2.1346	-1.9778
Metals	2.5780	2.4181	2.4263	2.5882
Transport industries	6.3401	5.7526	5.8045	6.3993
Other manufacturing	-19.7889	-21.0098	-21.2330	-20.0071
2.3 Mexico/Chile				
Private services	-2.4678	-1.3283	-1.9997	-2.9368
Agriculture	0.2242	1.9806	2.0777	0.2807
Energy	7.8486	7.9337	8.0571	7.9426
Textile and paper	-1.8570	-1.9814	-1.9099	-1.8116
Petrochemicals	-5.8546	-5.7903	-5.7597	-5.8458
Metals	0.3381	0.0410	0.0965	0.3765
Transport industries	-4.3094	-5.4695	-5.4184	-4.2722
Other manufacturing	-8.0427	-10.2148	-10.1027	-7.9594

Table 2. Levels of sectoral net exports by countries -- continue, \$1000 million

	BASE	EXP1	EXP2	EXP3
2.4 Australia/New Zealand				
Private services	-1.4349	-1.9617	-1.9548	-1.3753
Agriculture	15.8639	26.3621	26.6056	16.0099
Energy	11.1117	10.6739	10.7149	11.1487
Textile and paper	-3.4234	-6.2217	-6.2918	-3.4684
Petrochemicals	-3.2671	-4.4245	-4.4745	-3.3104
Metals	2.4498	1.9506	1.9416	2.4450
Transport industries	-6.3939	-8.4980	-8.5514	-6.4377
Other manufacturing	-13.0008	-15.3985	-15.4987	-13.0944
2.5 Japan				
Private services	-6.6360	-7.4482	-8.3538	-7.7293
Agriculture	-41.6624	-94.0601	-94.9412	-42.0585
Energy	-50.7555	-52.7186	-52.7973	-50.8284
Textile and paper	-14.7299	-14.9176	-15.0735	-14.8578
Petrochemicals	1.7243	5.4755	5.6134	1.8232
Metals	11.6275	14.2971	14.4174	11.7405
Transport industries	75.9006	84.2608	84.8935	76.5056
Other manufacturing	147.7895	187.0193	188.3319	148.8706
2.6 NIC of East Asia				
Private services	-6.2986	-6.8271	-6.7341	-6.3157
Agriculture	-13.9189	-25.1649	-25.4636	-14.0864
Energy	-23.4715	-25.0507	-25.2048	-23.6240
Textile and paper	30.8137	46.0744	46.4059	31.0731
Petrochemicals	-2.9875	-4.1544	-4.2533	-3.0551
Metals	-5.9598	-6.9587	-6.9854	-5.9792
Transport industries	-5.1732	-6.3115	-6.3056	-5.1660
Other manufacturing	13.9959	16.3803	16.4661	14.0883

Table 2. Levels of sectoral net exports by countries -- continue, \$1000 million

	BASE	EXP1	EXP2	EXP3
2.7 China				
Private services	7.2710	13.3554	11.6165	5.9278
Agriculture	5.1735	12.4408	12.7113	5.3502
Energy	1.5083	2.7072	2.7906	1.5786
Textile and paper	20.2462	18.5446	19.1983	20.7268
Petrochemicals	-8.2310	-10.2157	-10.0791	-8.1218
Metals	-3.1386	-4.2358	-4.1584	-3.0771
Transport industries	-5.2875	-9.7644	-9.7399	-5.2695
Other manufacturing	-9.0121	-15.7981	-15.5106	-8.7864
2.8 Southeast Asia				
Private services	-4.8003	-0.4885	-0.7893	-4.8384
Agriculture	15.5061	14.2209	14.3488	15.6270
Energy	12.2100	14.0306	14.0184	12.1506
Textile and paper	19.4452	22.8130	23.0306	19.5996
Petrochemicals	-9.7275	-10.9194	-11.0024	-9.8378
Metals	-8.5116	-10.1272	-10.1552	-8.5509
Transport industries	-8.7996	-12.2005	-12.2348	-8.8411
Other manufacturing	-8.8061	-13.3560	-13.3479	-8.8401
2.9 EU				
Private services	35.0393	13.7423	15.8564	36.8427
Agriculture	-16.5356	-8.2178	-8.5131	-16.8753
Energy	-63.5860	-63.9632	-64.6501	-64.2244
Textile and paper	-25.4473	-25.6343	-26.1110	-25.8498
Petrochemicals	31.5481	35.3690	35.5532	31.7504
Metals	11.7439	14.0552	14.0079	11.7089
Transport industries	16.6733	19.0514	19.0343	16.6952
Other manufacturing	21.0021	29.4311	29.4633	21.0963

However, the industrialized east Asian economies increase their deficits. These changes are best understood in the context of trade shifts in other sectors.

The elimination of all tariffs in the model leads to trade patterns that capitalize more on comparative advantage, absent the consideration of nontariff barriers. In the U.S., a higher surplus in services and agriculture is accompanied by a notable drop in its deficit in transport equipment. These shifts are balanced (under the constraint of fixed trade deficits) by higher trade deficits in the textile and the other manufacturing sectors.⁷ The Asian economies expand net exports in sectors such as textiles, energy (southeast Asia), or other manufactures (newly industrialized economies), while expanding deficits in transport equipment and chemicals. What may be more noteworthy and in greater contrast to services liberalization are the cases where sectoral trade balances move in a countervailing direction, or opposite of that indicated by the base data.

In addition to the large drop in the U.S. transport equipment deficit mentioned above, there are notable declines in trade surpluses for energy and metals in Australia/New Zealand, textile/paper and transport equipment in Canada, and chemicals in the U.S. as well as many other smaller reductions in net balances. Almost none of these countervailing trade shifts is replicated in the case of services liberalization. In experiment 3, trade balance changes are smaller than in the case of tariffs. The surpluses and deficits of the base data are almost always reinforced or left virtually unchanged.

When services alone are liberalized, the main impact on other sectors is through their use of services as an intermediate input. As mentioned earlier, services are the single most important intermediate input in the base input-output data. Also, as table 3 shows, the demand for intermediate services expands dramatically when their trade barriers are reduced. The critical feature here, as pointed out by Burgess (1990), is whether intermediate services counteract or reinforce other sources of comparative advantage. Figure 1 examines this issue from the point of view of primary factor intensities. Drawn from the base data, they indicate that across the APEC economies (except for Canada and Australia/New Zealand), services is a capital intensive sector and is generally used most intensively in other capital intensive industries. This indicates that intermediate services largely reinforce primary factor intensity as a source of comparative advantage. Thus the liberalization of services trade largely reinforces existing sectoral trade balances. Of course there may be many measurement issues regarding the base data, but these results indicate the role that factor intensities may have in services liberalization.

Under tariff removal, all relative prices are directly affected and there is more scope for productive resources to shift across sectors. In experiment 2, services liberalization is combined with tariff removal. However, the role of services liberalization in reinforcing existing trade balances is sustained, with previously noted reductions in trade balances due to tariff removal counteracted partly by services liberalization.

Of course sectoral net trade balances are not independent policy objectives, and structural issues are deeply connected to changes in domestic demand as well. For those interested in sectoral issues, total output is the more relevant bottom line (see table 4). Nevertheless, the changes in net exports are good indicators of the sectors with the greatest increases in output resulting from tariff removal. In the

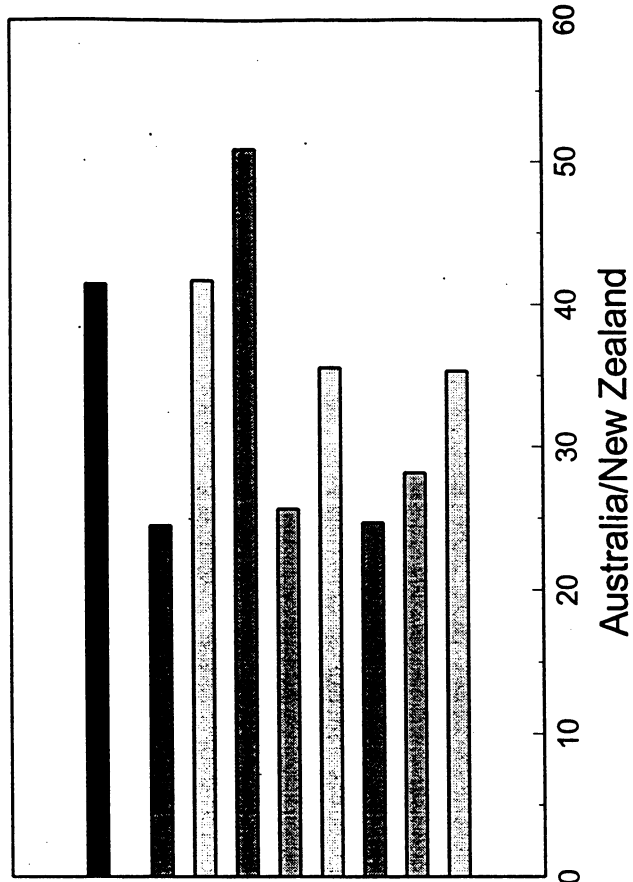
⁷ Note that changes in trade balances can often be more volatile than changes in single-direction trade flows, which are the more frequently reported outcome.

Table 3. Changes in demand for services as intermediate inputs
(% change from base year)

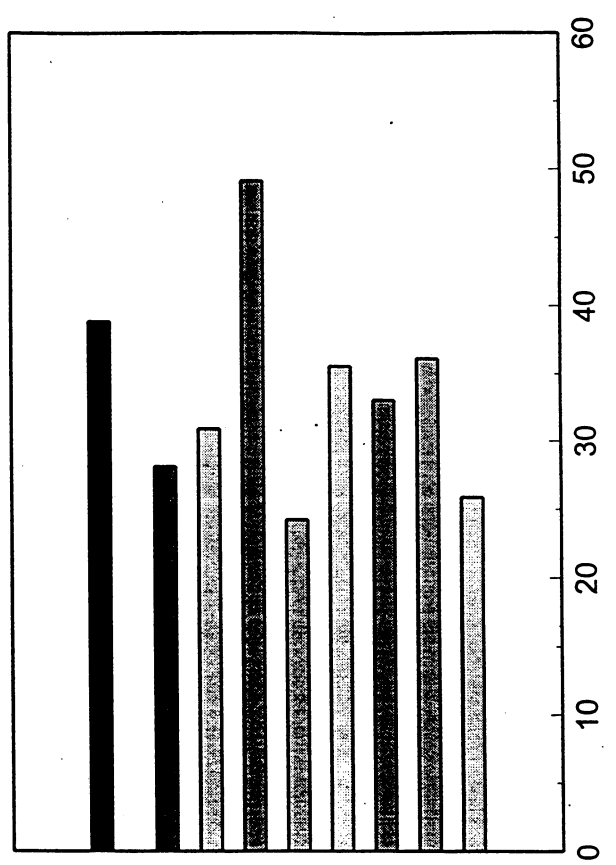
	EXP1	EXP2	EXP3
USA	1.73	3.23	3.28
Canada	3.46	5.71	3.55
Mexico/Chile	0.34	2.15	3.38
Australia/New Zealand	3.75	5.80	3.22
Japan	1.61	4.83	4.90
NIC of East Asia	4.59	6.34	2.81
China	8.96	10.71	3.27
Southeast Asia	11.25	16.41	4.44
EU	-0.29	0.22	1.48
ROW	-0.09	0.48	1.57

Figure 1: Shares of Capital in Value Added

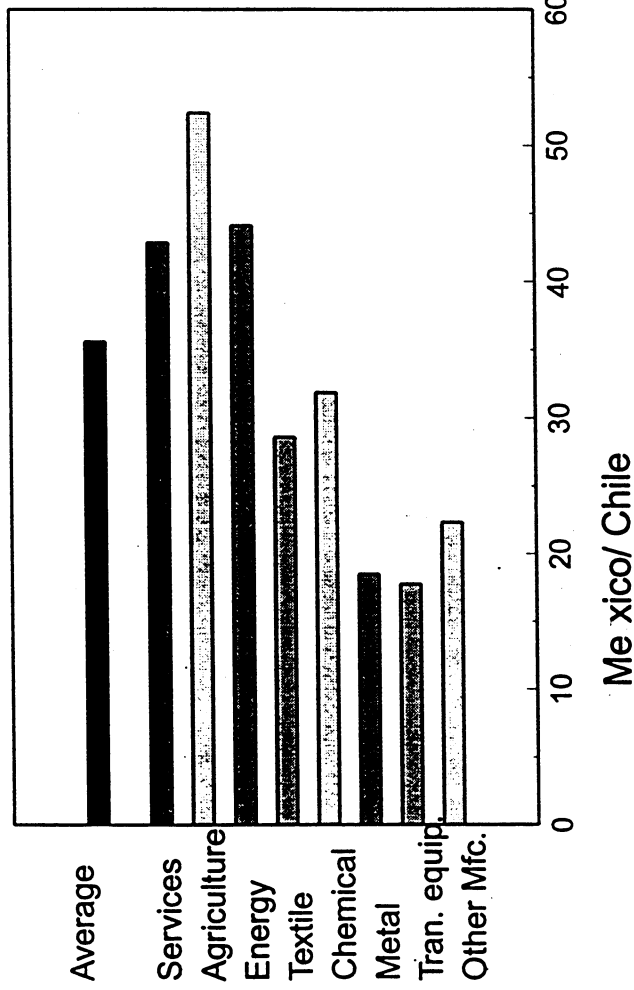
Canada



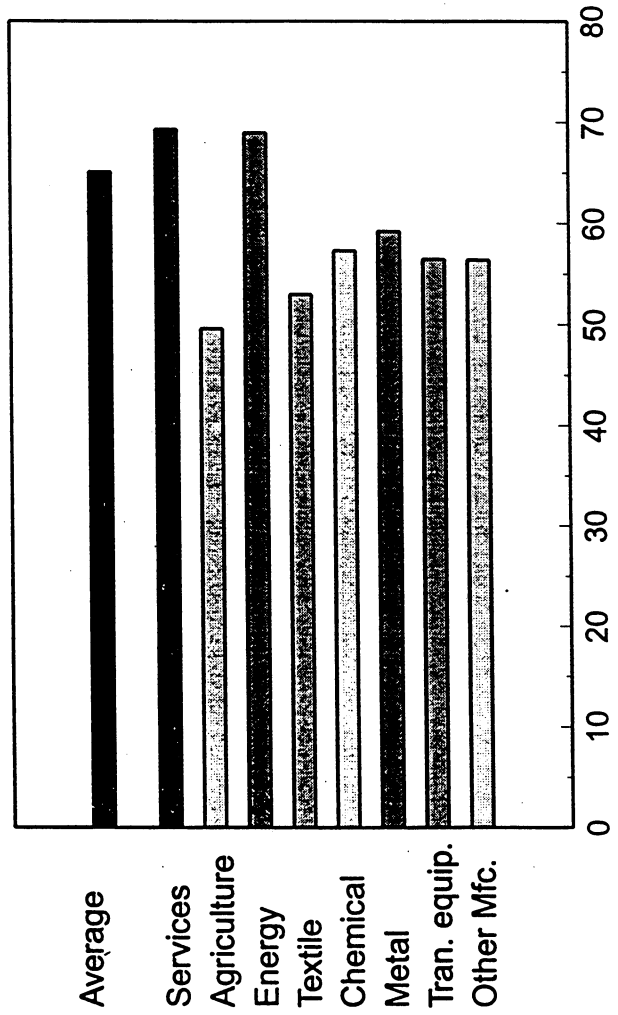
Australia/New Zealand



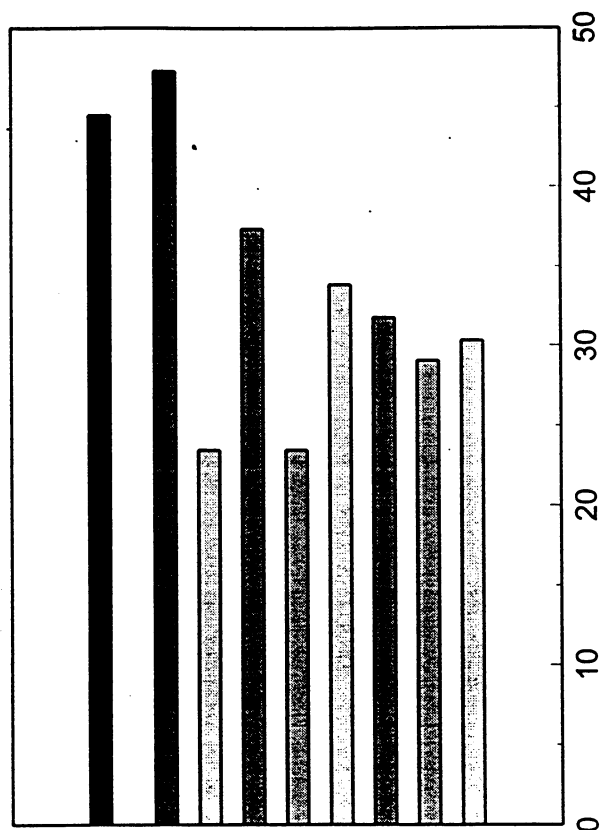
USA



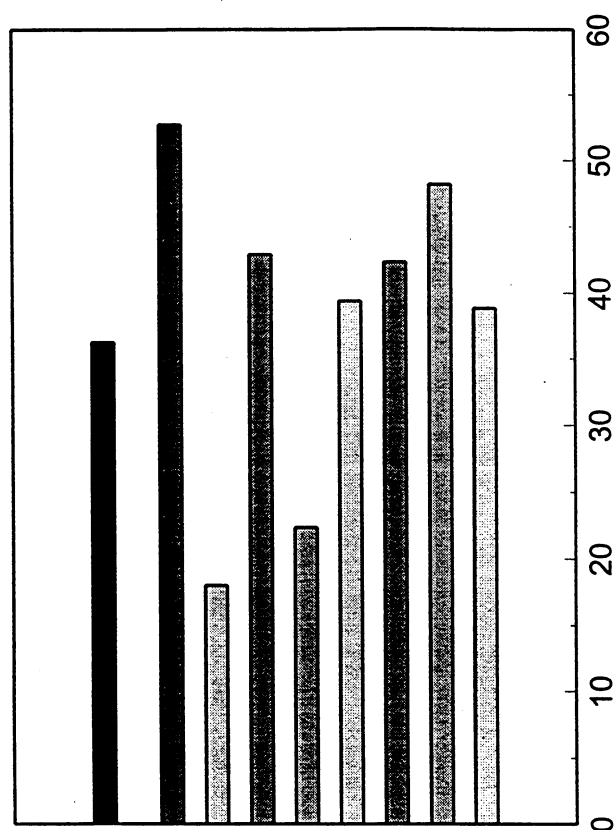
Mexico/Chile



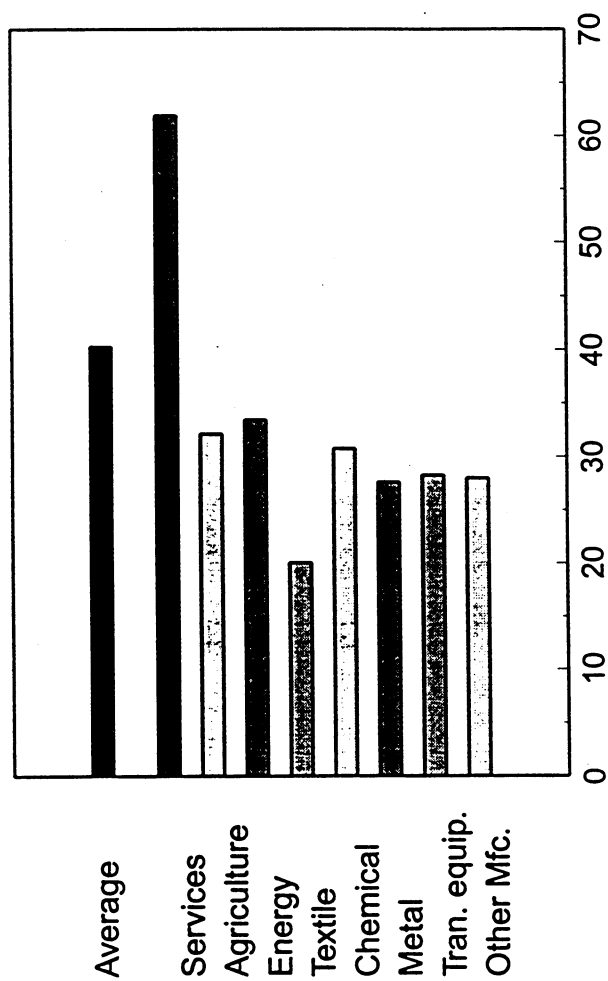
NIC of East Asia



Southeast Asia



Japan



China

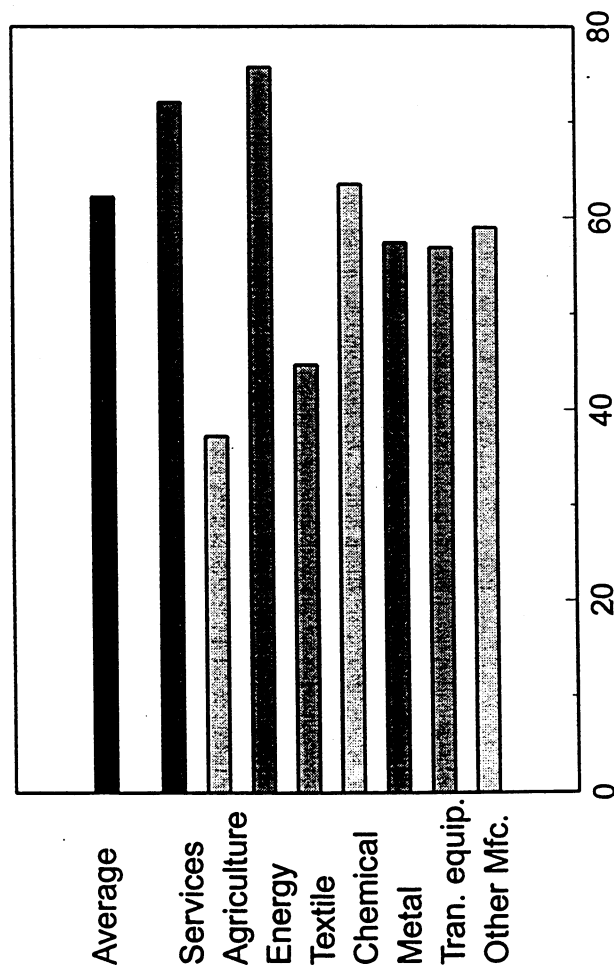
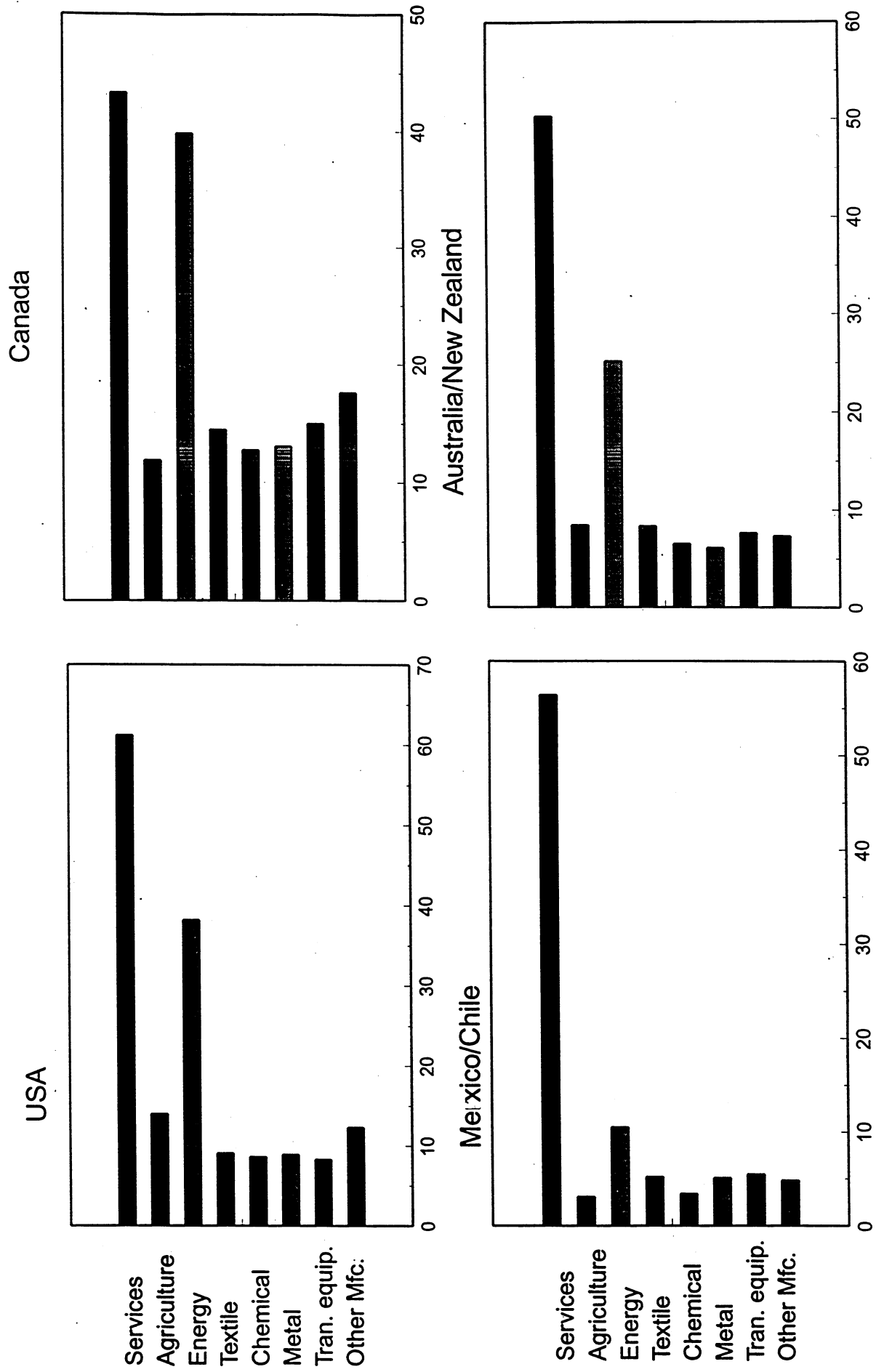
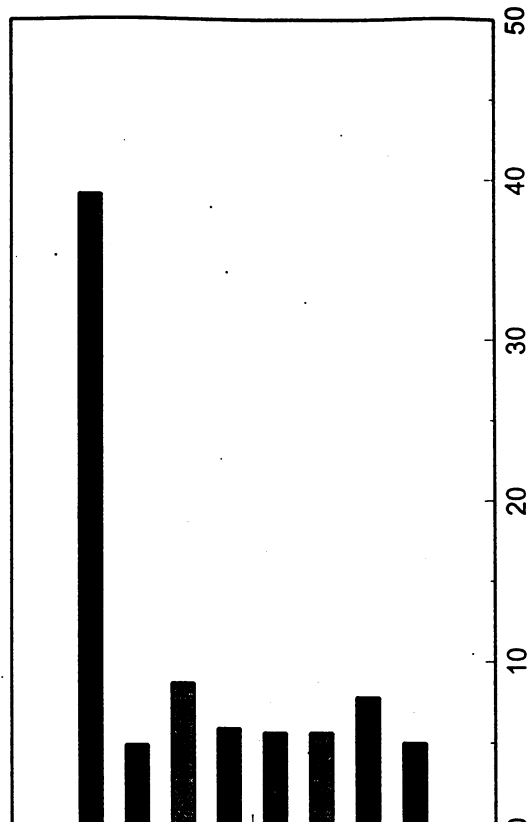


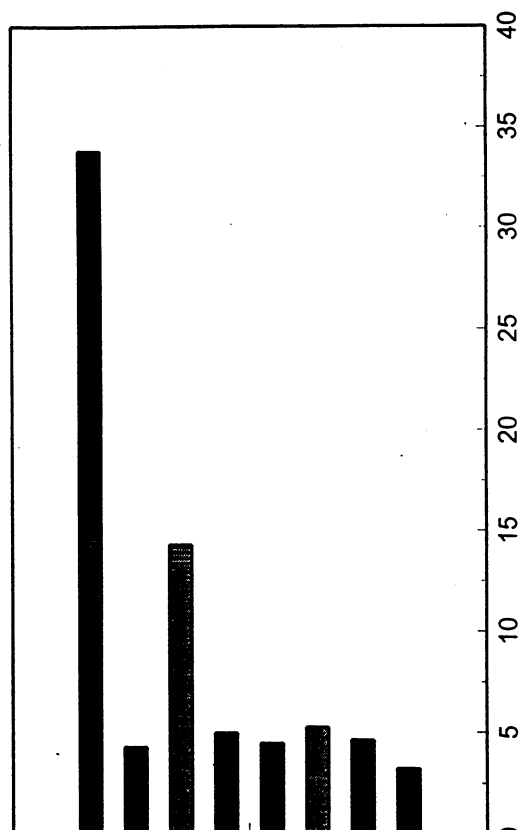
Figure 2: Shares of Services in Total Intermediate Inputs for Each Sector



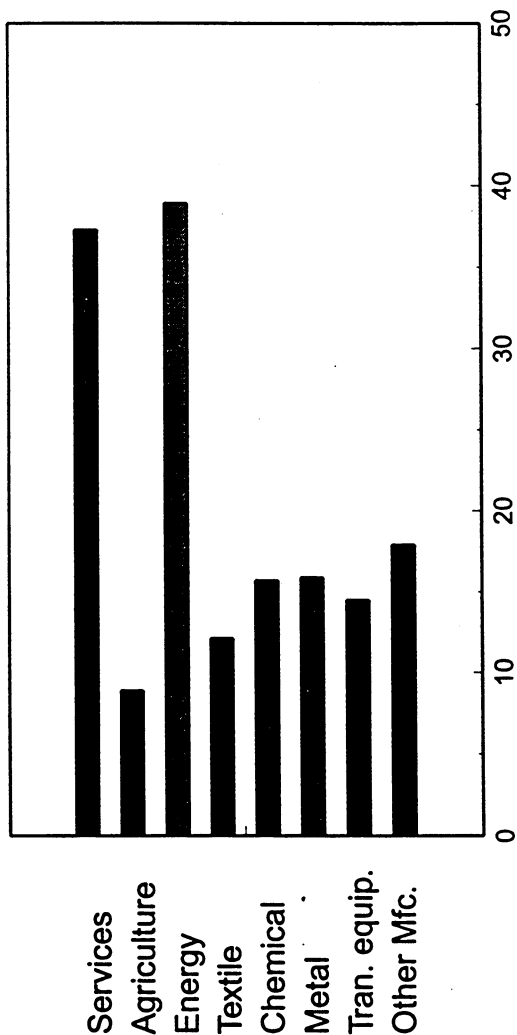
NIC of East Asia



Southeast Asia



Japan



China

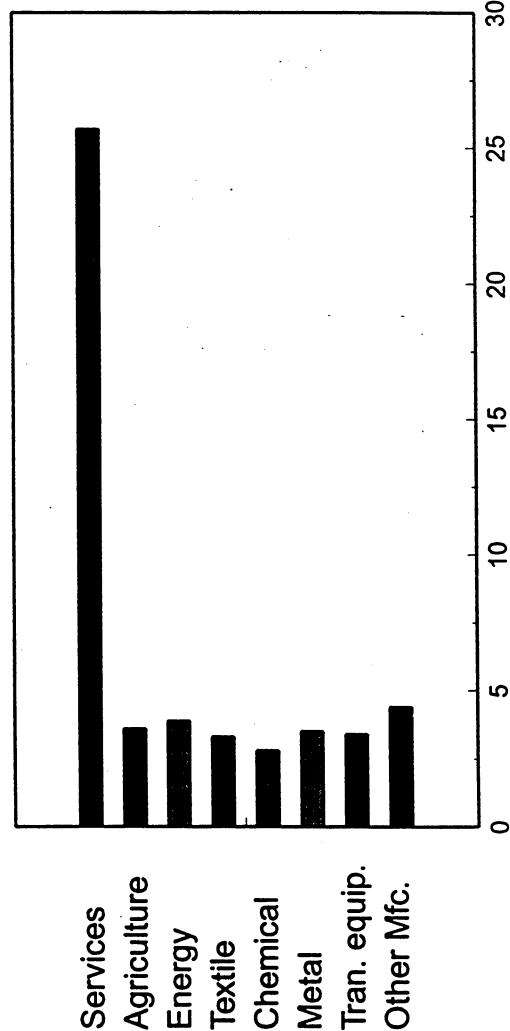


Table 4. Change in outputs from the base year (% change from base year)

	EXP1	EXP2	EXP3	EXP1	EXP2	EXP3
4.1 USA				4.5 Japan		
Private services	0.31	2.94	2.61	-0.98	1.48	2.45
Agriculture	6.78	8.25	1.39	-1.05	-0.04	1.02
Energy	2.14	3.17	1.01	0.18	1.95	1.78
Textile and paper	-1.20	-0.38	0.83	1.68	2.78	1.10
Petrochemicals	0.23	1.10	0.87	2.27	3.42	1.13
Metals	1.82	2.34	0.51	3.96	4.69	0.70
Transport industries	2.66	3.21	0.54	5.25	6.11	0.82
Other manufacturing	1.99	2.13	0.14	7.56	8.28	0.64
4.2 Canada				4.6 NIC of East Asia		
Private services	1.64	4.26	2.57	0.02	2.12	1.99
Agriculture	5.87	7.17	1.24	6.33	7.15	0.78
Energy	2.07	3.46	1.36	-0.33	0.01	0.38
Textile and paper	-0.51	0.63	1.14	23.91	24.93	0.86
Petrochemicals	0.46	1.76	1.29	6.10	6.77	0.66
Metals	1.79	2.56	0.75	5.03	5.54	0.50
Transport industries	1.04	2.06	1.01	2.58	3.18	0.57
Other manufacturing	1.77	2.15	0.38	9.41	9.90	0.45
4.3 Mexico/Chile				4.7 China		
Private services	-1.03	-0.82	0.78	18.97	17.41	-0.51
Agriculture	-0.74	-0.20	0.54	-5.00	-5.07	-0.07
Energy	5.23	6.37	0.83	10.61	11.46	0.62
Textile and paper	0.91	1.64	0.67	27.04	28.50	0.89
Petrochemicals	0.94	1.64	0.65	4.02	4.60	0.44
Metals	5.74	6.47	0.58	9.60	10.22	0.47
Transport industries	4.82	5.62	0.66	12.52	13.38	0.65
Other manufacturing	8.86	9.80	0.73	11.84	12.67	0.63
4.4 Australia/New Zealand				4.8 Southeast Asia		
Private services	0.09	2.45	2.46	1.22	2.20	1.80
Agriculture	20.37	21.46	0.93	-1.73	-1.20	0.51
Energy	-1.83	-1.37	0.42	10.38	10.37	-0.24
Textile and paper	-2.40	-1.56	0.88	25.70	26.61	0.60
Petrochemicals	1.65	2.52	0.86	1.87	2.35	0.45
Metals	0.65	1.07	0.41	6.12	6.37	0.15
Transport industries	-3.36	-2.92	0.45	0.98	1.19	0.20
Other manufacturing	-1.44	-1.09	0.33	19.81	20.23	0.25

case of services liberalization, the figures showing which sectors use the most services as intermediates is the best indicator of sectors growing more than average. Since both experiments involve removal of trade barriers, rationalization of resources, and welfare increases, the vast majority of sectors experience some growth in output. In the instances of declines, they are negligible.

In two respects these results differ from those of Brown *et al* (1996) mentioned above. While the structure of the experiments differ in the two cases, it is worth noting that under non-services tariff liberalization they find a widespread drift of labor resources out of services, whereas we find the services sector thriving in some countries while contracting in others. Under services trade liberalization they report an increase in services exports from Japan, though a drop in net exports, whereas we find both gross and net exports of Japan's services to decline. These differences are probably due to the specification in Brown *et al* of imperfect competition in all sectors except agriculture. This feature allows more scale economies to be achieved under trade expansion and forces fewer trade-offs as more output can be produced with fewer workers.

V. Conclusions

This paper describes a framework for modeling barriers to services trade as fixed costs and uses this framework to simulate the impact of trade liberalization. The removal of tariffs on all other sectors was found to have a notable impact on the structure of production and trade in the services sector. The APEC members showing the largest increase in net exports of services under this experiment were also the ones experiencing the greatest welfare gains and growth in services net exports under services trade liberalization. As tariff removal led to trade patterns more in line with comparative advantage, a number of the initial net trade balances were substantially reduced, indicating a movement countervailing to that producing the base trade balances. In contrast, services trade liberalization almost systematically reinforced existing trade balances, and maintained this role when simulated jointly with tariff removal. The relative use of capital and labor in services was found to be similar to that in sectors making the most use of services as an intermediate input. Therefore, the increase in demand for intermediate services under services liberalization tended to reinforce rather than counteract the role of primary factors in determining sectoral comparative advantage.

The Western APEC members were among those receiving the greatest welfare gains from services trade liberalization. For the U.S., the welfare gains from reducing trade barriers in services has the potential to equal or exceed that from even complete APEC tariff removal.

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Comments by Ellen E. Meade on

**The Cost of Regulation in the Japanese Service Industry
by Hiroki Kawai and Shujiro Urata**

and

**Liberalizing APEC Trade in Service
by Nancy Benjamin and Xinshen Diao**

I have not really looked much at this literature since the NAFTA debate about 5 years ago, and I have been involved more in European monetary issues. But being an outside observer allows me to pose questions rather than to answer them. The most interesting aspect of these two papers, I think, is the attempt to model barriers that restrict trade and/or production of services and which compute the gains associated with the liberalization of those barriers. We have seen models in the NAFTA context and subsequently of elimination of the traditional type barriers to trade.

The first paper by Kawai and Urata on Japan is a single-country model, and it makes the assumption that all services are nontraded, differing from the Benjamin and Xinshen world regional model that asserts that all services are traded. What differentiates private services from their remaining service sectors is that private sector services are characterized by imperfect rather than perfect competition. The Kawai and Urata paper notes the size of the TFP gap between the United States and Japan. They compute that gap and narrow it by 50 percent as an estimated productivity shock in effect: An estimate of liberalization of the restrictions on services in the domestic sector. As we would expect with the positive productivity shock, there are the associated improvements in income, consumption, and welfare.

The Benjamin/Xinshen paper is interesting because of its treatment of the imperfectly competitive private services sector. Fixed costs are used in this sector to represent the domestic barriers to entry. An implication of the model structure and assumptions is that the country's specific profit-maximizing price in this private services sector implies a positive relationship between the firm's market share and the price it charges. Thus domestic producers have a high market share in their national markets, and the price that domestic producers charge is high at home, higher than foreign producers in the domestic market, which have a small market share. Their model of liberalization of barriers and private services involves two changes: (1) a move to single pricing where producers, both domestic and foreign charge some weighed average price and (2) a reduction in the fixed cost by 10 percent, which is already noted, with an ad hoc 10 percent adjustment.

I agree with both papers, that these types of services, say banking and financial services or distribution, have domestic regulations that effectively provide some market power to domestic producers and limit the access of foreign producers to the domestic market. But to model such restrictions is difficult, and I am not convinced that either paper has addressed this problem.

For instance, can it be that the fixed cost to entry are simply differential fixed costs with higher fixed cost to foreign producers for access to the domestic market than the domestic producers themselves. The model structure in the Benjamin/Xinshen paper may not be fully necessary or the differential fixed costs may not be any more ad hoc than the assumptions made. I would feel more comfortable if the high market share for domestic producers in their model were more a direct result of

the domestic regulations in place. It would be nice to see some explicit linkage because the debate over restrictions on services emphasizes domestic regulations in giving the upper hand to the domestic producers. Both authors mentioned the key role of foreign direct investment, but they do not really treat it. We need a dynamic framework for treating foreign direct investment. The NAFTA debate made this need clear when liberalization of investment became crucial in many dynamic CGE models. When we talk about services and the importance of services, to leave out foreign direct investment is quite a problem.

Unlike the Benjamin/Xinshen paper, the Kawai/Urata paper is concerned with Japanese trade, but not the implications of trade worldwide for countries having different trading partners. Given their conclusions about the welfare loss to Japanese consumers because of the current restrictions, this paper should appeal to the Clinton administration. It is a clear signal about the implications of these regulations for consumers in Japan. And that brings me to a final comment: many models make an assumption about unchanged trade balance at a macro-economic level, looking at the sectorial differences across sectors. But the services debate makes it seem that both dynamics--allowing for an overall current account type movement and a current account type balance--are important, at least here in the United States.

Comments by Christopher Melly¹ on

**“The Cost of Regulation in the Japanese Service Industry,”
by Hiroki Kawai and Shujiro Urata**

Kawai and Urata estimate the cost of regulation in service industries in Japan using a computable general equilibrium (CGE) model. The model determines regulatory cost by estimating how improvements in total factor productivity in service industries affect prices, production, and employment throughout the economy. On the basis of this simulation, the authors find that the cost of regulation, which is presumed to be a partial cause of high prices and low productivity, is 9 percent of GDP and 270,000 yen (\$2,232) in per capita consumption. Such high values may be plausible given the ubiquitous nature of services, which comprise more than 70 percent of GDP and employment in Japan.

This paper reveals a number of interesting aspects about services in the Japanese economy. It is surprising to see just how much higher prices for services are in Japan than in the United States. According to Kawai and Urata, Japan’s prices for construction, financial services, transportation, and “other services” are twice the prices recorded in the United States. Even more striking, price levels are seven times higher in Japan for road freight transport and storage, and five times higher for legal, accounting, and other business services.

The paper also shows how service prices and productivity influence the rest of the economy. For example, out of all service sectors, prices for distribution services were found to have the single greatest effect on total prices, and increases in productivity in the construction and distribution sectors registered the largest positive effects on GDP. It may be obvious that these services have a major economic impact, but the paper also shows that productivity improvements in each service sector, except for construction, resulted in producer price declines *in all industry sectors*. While these price declines are characterized as of small magnitude, this demonstrates the wide reach of most service sectors throughout the economy.

So Kawai and Urata make the valuable contribution of showing that services play an important role in the economy and that improvements in services productivity would significantly improve overall welfare. But perhaps the most important concept to take away from the paper is how much work remains to be done. First, more effort needs to be expended to improve available data so that services may be analyzed at a more detailed level. According to Kawai and Urata, the sector that had the greatest effect on GDP is not a sector at all, but rather an amalgamation called “other services.” This is not very helpful. Second, the paper really provides only a rough sketch of what would happen in the event of a broad productivity shock. It does not explore how such a productivity change might occur and what would be the real world results. For instance, how might productivity actually be improved in the distribution sector? What regulations or market conditions are impeding productivity improvements? If these barriers were removed, who would benefit and how? These questions should be examined for each of the service sectors in future research.

A third major area of work is to determine the economic effects of international trade and investment in services. While the model assumes otherwise, services are indeed tradable on both a cross-border basis and through foreign affiliates – to the extent that cross-border services trade accounts for 21 percent of total U.S. trade and sales of services through foreign affiliates of U.S. firms exceed \$300 billion. The rights to invest and thereby establish a commercial presence in a foreign country and to

¹The author is with Office of Industries of the U.S. International Trade Commission. These comments are solely meant to represent the opinions of individual authors. They are not meant to represent in any way the views of the U.S. International Trade Commission or any of its individual Commissioners, or the U.S. government.

operate on an equal footing with local competitors are arguably the most important issues for international service firms. Presently, negotiations to liberalize trade and investment in telecommunications, financial services, and “other services” take place under vague assumptions that open trade and investment is a good thing, but just how good or who benefits remains unknown. Intuitively, the introduction of foreign competition, capital, technology, and know-how in the service sectors should result in lower prices and improved productivity. As Kawai and Urata show, such productivity improvements should yield significant gains in GDP and consumption. But clearly more research is needed to develop an understanding of the effects of trade and investment in service industries so that appropriate policies may be developed.

Comments by Alan V. Deardorff on

**Liberalizing Services Trade in APEC:
A General Equilibrium Analysis with Imperfect Competition**

by Nancy Benjamin and Xinshen Diao

This is a valuable paper addressing an issue of considerable importance. As is becoming well known, trade in services has been growing more rapidly than trade in goods, at the same time that trade in goods has itself been expanding as a share of overall economic activity. Only since the advent of the Uruguay Round of Multilateral Trade Liberalization has it even been recognized that trade in services exists. That international transactions in services do occur and have many of the features of trade in goods, except of course that they do not pass through customs. This last fact has meant that data on trade in services cannot be collected as easily as for trade in goods, and indeed for some types of services it is not obvious even what data to collect. For all of these reasons, efforts to model international trade in services have only recently begun. This is one of the first studies to attempt that, and it is therefore not surprising that it pioneers new ground. I will devote most of my attention to the innovations in the paper.

But first, let me say a few words about the paper's more conventional aspects. It reports on three policy experiments involving liberalization of trade in goods and services among the APEC countries. These experiments are performed using a computable general equilibrium (CGE) model that was apparently constructed for that purpose. The model has ten countries/regions and eleven sectors, all but one of which (the traded service sector that is the focus of attention) are modeled as perfectly competitive with goods differentiated by country of origin. This makes it a very conventional model, as it should be to avoid generating results from unusual modeling choices that are not meant to be the focus of attention.

The model itself is not reported in any detail, which is fine, given the purpose of the current paper. It would be helpful, however, to direct us to where we can find the details of the model (its equations, and more about the data being used) if we want to see them. There are also some questions that should be answered here about modeling choices, since we need to know these if we are to interpret the results. How is the model closed: that is, is final demand linked directly to factor income, or is some other mechanism used? How are factor markets handled: are some factors sector-specific, or are all of them immobile across industries; do all factor markets clear; are factor supplies fixed or do they respond to prices? Are there any international capital flows in the model, and if so, how are they determined? Is this entirely a real model, or do nominal exchange rates play a role? If so, how are they determined?

We also need to know a little more about the data used in the model, even outside of services. From what year do the data on trade, output, and factor uses come, and what are the sources? Are there separate input-output tables for each country/region, and how especially do you handle I-O tables for the regions that aggregate countries? We do not need to know much here, but a footnote or two could help to put the results in context.

We do need more, however, about your data on services. First, we need to know what you cover in the focus industry, "other private services." Clearly, from the definitions of sectors (9) and (10), you exclude trade, transportation, and government. (Does that mean that you allow no trade, nor trade liberalization, in trade and transportation services? That seems a major omission.) But we do not know what you also exclude in sector (8), "nontraded services," since not long ago all services might have been included in that category. Given the importance of sector (11) for your analysis, you really should list its

main components. We also need to know about your data on services trade, including not only its year and source, but also some indicators of the size of the gross and net flows, both absolutely and in relation to GDP.

Let me turn now to the main innovation in the paper: the modeling of services markets and especially of services trade liberalization. Past work has relied on embarrassingly crude estimates of barriers to trade in services. The barriers themselves were inferred by Hoekman (1996) from positions taken by countries in the Uruguay Round negotiations. This was a very clever technique, and a useful one in the absence of any other information, but the confidence one could place in these numbers was incredibly small. Brown et al. (1996) then used these numbers as though they were tariffs, removing them to reflect services trade liberalization. Yet if there is one thing that we do know about trade in services, it is that there are no tariffs on these transactions. Indeed, I have argued in Deardorff (1994) that there should be tariffs on services trade, and that the first step in the GATS should have been to replace all current discriminatory policies and regulations affecting services with tariffs. Such "tariffication" is being used successfully, we hope, as the starting point for liberalization of other NTBs in goods markets, and I see no compelling reason why it could not be done also in services.

But be that as it may, the fact remains that it has not been done, and we do not have anything like tariffs on international service transactions. Therefore, to model liberalization as removing these tariffs, as Brown et al. (1996) do, requires at best a large theoretical leap of faith.

Benjamin and Diao try to do better. They work within a model of service trade based on Mercenier (1995) in which service providers are imperfectly competitive and have fixed costs, and are able to price-discriminate across countries. They then model liberalization as both reducing the fixed costs and removing the market segmentation that permits price discrimination. Thus they find a new equilibrium with firms charging a single price in all countries, and they nudge that price in the downward direction by reducing fixed costs.

This is an ingenious method, but it is also sufficiently novel that I would like to know more about how it works before I will trust it as a representation of services trade liberalization.

First, I very much like the idea of modeling liberalization as a reduction in fixed costs. The kinds of impediments that countries place in the way of foreign service providers do strike me as raising fixed costs much more than variable costs. However, if I understand the paper correctly, the fixed costs that are reduced in the model apply to a firm's entire production, not just to its sales in a particular foreign market. This seems wrong to me, and I feel like a great opportunity is being missed. Surely, if the model could incorporate destination-specific fixed costs, this would provide an ideal tool for examining the effects of reducing all sorts of regulatory barriers to services trade.

Ideally, such an analysis should allow for the possibility not only of expansion of sales by existing providers, but also of entry, including by firms that currently exist but do not serve a particular foreign market because of these costs. The model would then capture the benefits not just of lower costs and lower prices due to that, but also (depending on the type of competition) additional benefits from greater competition.

The other dimension of liberalization as modeled here is the removal of market segmentation that permits price discrimination. This I have doubts about. My specialty is not industrial organization, and I

do not know much about how the possibility of market segmentation is usually thought to be determined. The most obvious obstacle to market segmentation would be arbitrage by buyers, who could buy in one place and sell in another if a firm charged two different prices. In fact that is usually an implausible scenario even for goods, and it seems downright impossible for services. There may well be other aspects of the problem that I am not thinking about, but it strikes me that market segmentation in services is likely to remain, regardless of any liberalization in services.

I am not sure that this is a problem for the paper, though. With market segmentation and price discrimination, the most likely direction of that segmentation is to charge a lower price abroad than at home. If somehow price discrimination were to disappear, one would expect home prices to fall and foreign prices to rise, exactly the opposite of what most of us would expect from trade liberalization. Indeed, I wonder if the authors did not find exactly this to be happening, and were motivated by that to add a reduction of fixed costs to their specification of trade liberalization.

So in the end, I have found the paper very stimulating and thought-provoking. I do not regard the numerical results of the paper to be definitive, since I have doubts about the particular ways that they were modeled. But I am intrigued by the approach and motivated to try similar things in the modeling that I do myself together with Drusilla Brown and Bob Stern. This paper points the way, I think, toward modeling removal of barriers to trade in services as a combination of reductions in fixed costs that are specific to foreign service firms selling in a domestic market, and a relaxation of barriers to entry.

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SESSION X

***DYNAMIC MODELING OF TRADE
LIBERALIZATION***

Modeling Trade Policies and U.S. Growth: Some methodological issues.

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ABSTRACT

Most analyses of trade policies are now done using dynamic numerical models. These intertemporal equilibrium models have proven very useful in discussing the link between policy and growth. There are, however, many difficult methodological issues that must be confronted in implementing such models, problems that are absent in traditional static models. We discuss these implementation issues and present our approach in dealing with some of them. We report the result of simulating the elimination of tariff and nontariff barriers in the U.S. to illustrate the effects of considering dynamic effects. We also report how different parameter values may affect the estimates of output and welfare.

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Our work has many collaborators but we must mention especially Peter Wilcoxon.

1. Introduction

The continual negotiations over trade liberalization among countries have prompted a large amount of applied research on the impact of changes in trade policies. Traditional approaches to this issue have been purely static.¹ These approaches ignore the effects of trade policy on capital formation and productivity growth.

Recent work has focused on dynamic modeling of the economy. These include Baldwin (1992), Goulder and Eichengreen (1992), Keuschnigg and Kohler (1994), the G-cubed model (McKibbin and Wilcoxen 1995), and Bohringer, Pahlke and Rutherford (1997). In Ho and Jorgenson (1994) we presented a model for analyzing the effect of trade liberalization on U.S. economic growth. All these models combine intertemporal modeling with detailed disaggregation by commodities (and often by regions) and thus capture the impact of trade policy on imports and exports, the sectoral composition of output, and capital formation. (The main feature that distinguishes our approach is that we utilize all the data available during the sample period rather than a single data point in calibrating our model.)

In Ho and Jorgenson (1994), for example, we reported that if tariffs in the U.S. and rest of the world had been eliminated in 1980, U.S. consumption of goods and services would have risen by only 0.16 percent in the first year. This is similar to the results of static analysis in Deardorff and Stern (1986) and Whalley (1985). However, consumption would have been 0.82 percent higher in the long run. The mechanism underlying this substantial growth in consumption is that trade liberalization reduces the price of capital goods relative to other prices. This leads to an increase in investment and more rapid growth of capital, thereby expanding both output and consumption. If the most significant quantitative restrictions had been eliminated along with tariffs in 1980, the consumption of goods and services would have been 1.08 percent higher in the long run, compared to a first year increase of only 0.36 percent. The difference over time is due to the impact of trade liberalization on U.S. capital formation and productivity growth.

Our results are fairly typical of those generated by intertemporal equilibrium models. Like static models the results here depends on the functional forms used. However, they confront a further difficulty that the results are also affected by the dynamic specification and projections of the exogenous variables. As we show, numerous assumptions have to be made, many of which appear wrong to the most casual observer.

In this paper we examine the methodological issues of dynamic modeling of trade impacts, whether with a one-country model or with a multi-region one. We then discuss our model's approach to some of these problems and briefly summarize our previous results. Rather than focusing on specific estimates of the effects of policy shocks we discuss how sensitive the results are to alternative specifications and assumptions, and to the use of different parameter values.

¹ The first of these is based on detailed partial equilibrium models, such as that of Hufbauer, Berliner, and Elliot (1986). The second approach uses multi-country general equilibrium models, such as the "Michigan Model" of Deardorff and Stern (1986) and the world trade model of Whalley (1985).

2 Issues in numerical dynamic models.

The importance of considering dynamic aspects in general equilibrium modeling is now well known. It allows a more flexible specification of expectations, it provides a transition path, and it makes clear the link between adjustment specification and the speed of adjustment. Current investment, and hence the structure of the economy, can react to expectations of future policies.

When modelers turn these ideas into numerical models many assumptions regarding the dynamic specification have to be made. Second, the immense data requirements for a detailed specification of a dynamic model are very daunting. We shall discuss here the specification issues that all builders of dynamic models face.² We divide our comments into three parts -- production, consumer behavior, and trade modeling.

2.1 Modeling production over time

We write the output of sector j in period t as:

$$Q_{jt} = f(KD_{jt}, LD_{jt}, M_{jt}, t) \quad (1)$$

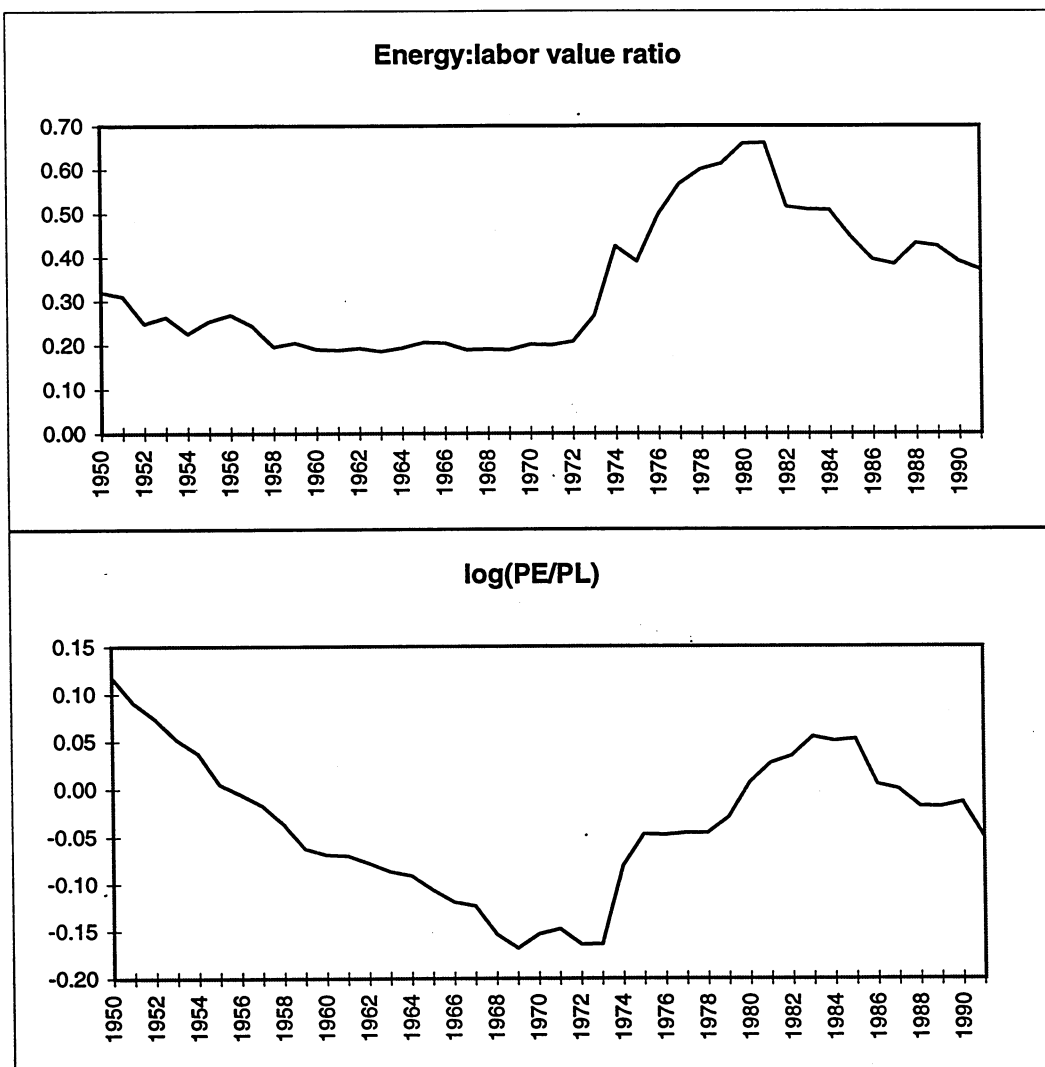
where KD_{jt} , LD_{jt} are the capital and labor input demands, and M_{jt} is intermediate input. First, let us consider constant returns to scale models. Many such models employ a Harrod-neutral specification where productivity growth comes from labor augmenting technical change. That is, the production function is written as $f(KD_{jt}, \lambda_t N_{jt}, M_{jt})$ where N is the number of hours worked and λ_t is the index of labor effectiveness. Such a specification is employed, for example, in the G-cubed model.

Harrod-neutrality implies that factor shares change only when prices change. However, many of the movements in input shares over time cannot be explained by price movements alone. Figure 1 illustrates this problem for a typical industry in the U.S., Primary Metals.³ The top graph gives the value ratio of energy to labor input, while the bottom graph gives the (log) ratio of the price of energy to the price of labor. The rapid rise in real wages in the postwar period is not accompanied by any significant change in the energy:labor value ratio, while the oil shocks did lead to a change. (For a more detailed discussion see Jorgenson, Gollop and Fraumeni (1987) Chap. 7). Simulations over the historical period using a Harrod-neutral form will therefore miss these changes. For simulations of the future, non-neutral production functions are required. Only if there will be no change or the change is completely random can a neutral form be used.

² The complete model is presented in a technical appendix available on request from the authors.

³ The construction of our data is described in the Appendix.

Fig. 1 Factor inputs and their prices for a typical industry



If it is decided to use nonneutral production functions then one must choose the exact formulation. The typical form used in empirical work contain linear and quadratic time terms. (See Diewert and Wales 1987 for a discussion of flexible functional forms.) A typical cost function, like the translog or Generalized McFadden, have the form:

$$cost(t) = \alpha_0 + f_1(p) + f_2(p'p) + f_3(p)t + \alpha_1 t + \alpha_2 t^2 \quad (2)$$

where p is the input price vector and t denotes time as the index of the level of technology. $p'p$ denotes the second order price terms. In the case of the translog, for example, the value shares in input factors (v_i) derived from the above cost function is:

$$v_i(t) = f_1' + f_2'(p) + f_3' t \quad (3)$$

The problem of using such a formulation in an infinite horizon model is obvious. The value shares would diverge to plus or minus infinity unless f_3 is zero (which implies neutral technical change). What is reasonable for estimation over a given sample period is unusable for dynamic models. The implementation of nonneutral technical change must therefore be done with nonstandard functional forms.

In our model we deal with this problem by modifying the standard translog and using a logistic time trend instead of a quadratic. That is, the t term above is replaced by a logistic $g(t)$. The coefficient on the price times time term gives the magnitude and direction of the bias. This bias gradually disappears over time. That is, a well defined steady state requires neutral technical change in the long run. Our functional form thus allows biased change in the near term and also satisfies this steady state requirement.

Other forms that allow for such flexibility may of course be used. Such flexibility, however, comes with a cost. The difficulty of estimating such highly parameterized forms are discussed in the econometric literature. (Diewert and Wales 1987). The first difficulty is that time series of output and inputs are required as opposed to a single input-output table. Secondly, numerical models require that production or cost functions have the appropriate curvature. Such curvature may not be produced in unconstrained estimation of the data.

A distinct but related problem is estimating the rate of technical progress. In eq. 2 this corresponds to the terms involving α_1 and α_2 . The formulation in (2) produces continual technical progress (or regress). If these functions are estimated separately for the different industries then the different estimates of the α 's will cause relative prices to diverge. This is not consistent with a steady state. The long run rate of technical progress must be equal across sectors. In our formulation we express the time term as a logistic function, $\alpha_1 g(t) + \alpha_2 g^2(t)$. This gives us a common long run growth rate of zero while allowing the current rates of technical progress be different across sectors.

In models where there is costly adjustment of capital the econometric difficulties are compounded by the lack of data on the value of "q" (value of installed versus uninstalled capital). Such

models have therefore resorted to using a priori plausible values of the adjustment parameter instead of estimating it.

These problems are magnified manifold if one wishes to incorporate economies of scale or learning-by-doing. Modeling scale economies and investment over time in a oligopolistic environment is so complex that strong assumptions have to be employed. Keuschnigg and Kohler (1994) is one of the few efforts at this, and they assume that firms engage in monopolistic competition and capital is mobile across all the firms in each industry. Their degree of returns to scale is taken, not from cost functions, but from engineering estimates.

2.2 Consumption, Engel curves and the steady state.

We next discuss the demand for goods and then turn to the demand for leisure and savings. Flexible modeling of household demand for commodities is akin to modeling production under scale economies and biased technical change. It is well known that Engel curves are not linear, that is, expenditure on some goods rise less than proportionally with income while other goods are income elastic.⁴

Most multisector models use simple Cobb-Douglas or LES formulations calibrated to some base year. This includes both Goulder-Eichengreen and some versions of G-cubed. These have unit income elasticity and would be unsuitable for "backcasting" or simulations over the historical period given this observed non-homotheticity.

Empirical work on commodity consumption functions have mostly ignored secular trends and attribute all nonprice changes to income effects. (In the language of production functions this means allowing for scale economies or diseconomies but no technical change.) An example of such estimates is Jorgenson and Slesnick (1987) which is incorporated into our model. In that paper the income elasticity for Food is estimated at 0.8, for Capital 1.0, and for Services 1.3.

Ignoring this feature of consumer behavior would bias the sectoral projections of the economy. The effects of policy shocks that change not just prices but incomes also, will not be captured by usual homothetic models. To illustrate the magnitude of this effect consider a policy shock that changes prices by 5% and incomes by 1%. Say that in a homothetic model this leads to a 5% quantity change due to price effects and a 1% change due to income effects. Using our estimates of the income elasticities the gap between Food and Services would then be off by 0.5%, that is, an error of about 0.5 out of 6.

Allowing for nonhomothetic demands, however, produces a long run problem similar to the biased technical change issue described above. If incomes rises to infinity due to exogenous productivity growth or endogenous growth, as in many models, then the demand for some commodity will vanish to a zero share and the demand for the most elastic commodity will rise to a 100% share. This is clearly unacceptable and there are two ways of dealing with it. One is to have a consumption function that approaches homotheticity. Another is to have zero long run productivity, and hence income, growth. In

⁴ This problem may be quite difficult. There is some evidence that the demand curves are of rank three, i.e. the curves need more than a quadratic term to fit well. (See Lewbel 1991 for estimates using U.S. data.)

our model we have chosen the second option, that is, we preserve the functional form in Jorgenson and Slesnick (1987) and the long run productivity growth is set to zero.

Labor and savings

Many of the numerical dynamic models in use, including ours, feature endogenous labor supplies and endogenous savings. To make this tractable the following specification, or something very similar, is used for aggregate household utility in all the dynamic models cited above :

$$U = \sum_{t=0}^{\infty} \frac{F_t^{\sigma}}{(1 + \rho)^t} \quad (4)$$

$$F_t = F(CC_t, LEIS_t)$$

$$CC_t = CC(C_1, C_2, \dots, C_m)$$

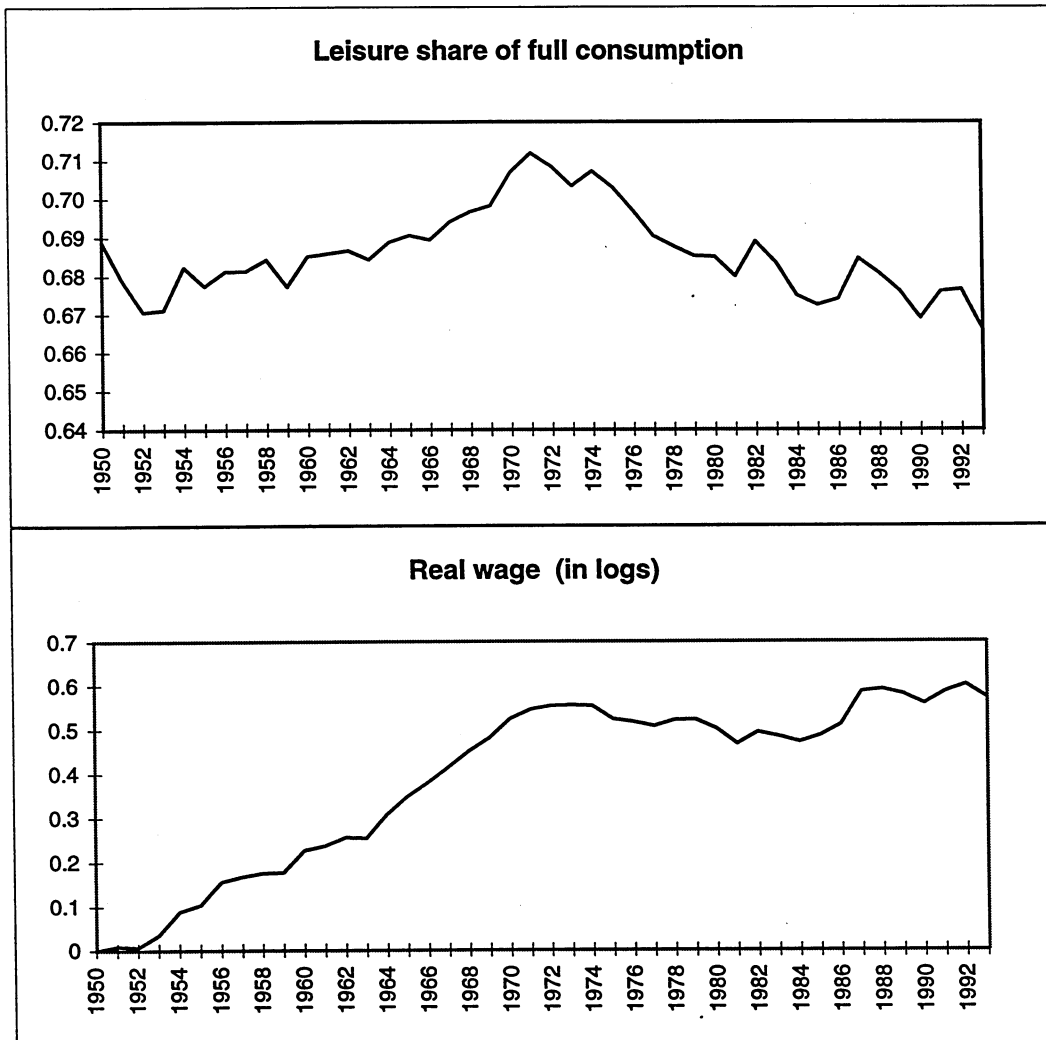
where F_t is full consumption and ρ is the rate of time preference. Full consumption is a function of leisure and a commodity aggregate (CC). The commodity aggregate is a function of the separate commodities (C_{it}) .

Unlike some static models which have disaggregated income classes or labor groups, all the infinite-lived models assume an aggregate household as in the theoretical literature. The above formulation means that consumption is assumed to be separable over time despite evidence to the contrary. (See Browning and Lusardi 1996 for a survey). An exception is the G-cubed model which incorporates liquidity constraints. It also assumes that commodities and leisure are separable. This is rejected by some empirical work, e.g. Browning and Meghir (1991).

Even if we are willing to ignore these rejections of the standard model at both the household and aggregate levels, implementing the above simple system in a numerical model still presents some difficulties. Writing leisure demand (or labor supply) in the above manner implies the existence of an aggregate labor supply curve. However, much of the empirical labor literature estimates labor supplies by demographic groups, e.g. prime age males, married women, and so on. Most do not test that the elasticities of the different groups are different.

What then should one put as the elasticity of labor supply in the aggregate function? Furthermore, how should one treat the secular trends in hours worked? To illustrate this problem Figure 2 plots the value share of leisure in full consumption and the price of leisure over time in the U.S. The value of leisure is defined as the after tax wage multiplied by the nonwork hours of all working age residents.

Fig. 2 Aggregate Leisure and wages in the U.S.



There are two trends in the U.S. labor supply. First we have the reduction in work hours in the immediate postwar period. Secondly, there is the rise in female participation rates after 1971. The first trend was accompanied by a rapid rise in real wages, the second had a relatively flat wage. Such data could obviously not be explained by a simple aggregate labor supply function. One could disaggregate the data into demographic groups but even this would not be able to capture the secular trend in female labor supply.

The approach that we chose to retain an aggregate labor supply equation and yet be able to track the historical data is to add a time term in the full consumption function. Again we choose a logistic form for the time function so that there is no long run change. In conclusion, existing empirical work on labor supply which concentrate on cross sectional data is not suitable for direct use in dynamic models. The changing behavior of different cohorts have to be taken explicitly into account. Modelers have to take care in interpreting the labor supply elasticities from the empirical literature.

2.3 Modeling trade over time.

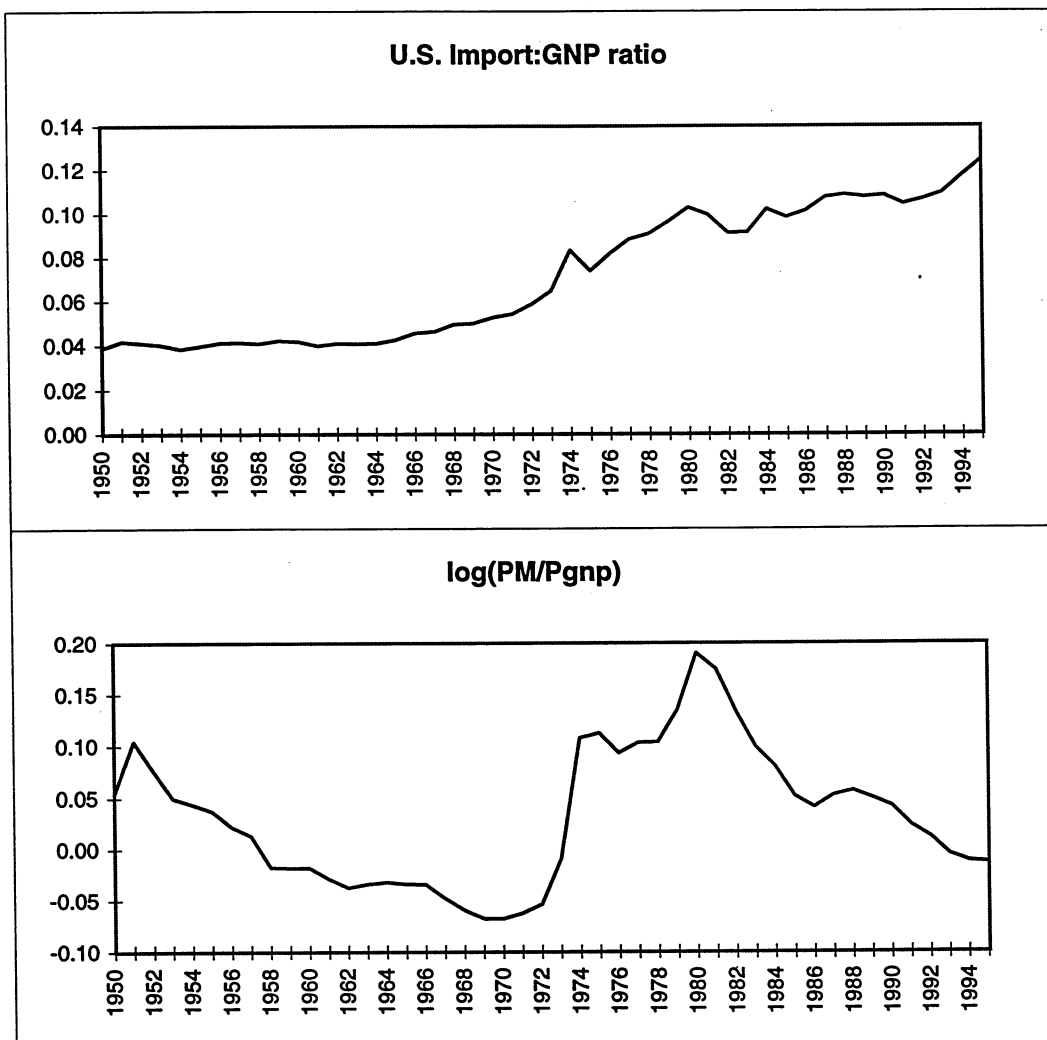
The empirical literature on trade functions -- import demands and export supplies -- is vast. See, for example, Goldstein and Khan (1984). These, however, concentrate on finding the price and income elasticities of imports or exports. Estimating functional forms suitable for use in numerical models like those discussed here are not the focus of such research. Like the production and consumption cases above there are special problems in specifying and estimating such trade functions.

The behavior of import and export shares in the U.S. parallels that of the labor supply, that is, there is a secular trend in quantities that is not accompanied by price movements. Figure 3 plots the aggregate commodity imports as a share of GNP and the ratio of import prices to the GNP deflator. (While one should, strictly speaking, use the price of domestic tradables, the difference between that and the GDP deflator is small in this context.) Very similar trends exist for data at the 2-digit level that we use in our model.

The import share rose throughout this period with a sharp acceleration in the 1970s. The price of imports relative to domestic goods prices however, showed no particular trend. Any import demand function that has only prices will fail to track these data by a large margin. Much of the empirical work with time series data use an income term, like aggregate activity, in addition to prices to explain these trends. However, we concur with Petri's conclusion (1984, p. 51) that the high income elasticities estimated are probably spurious. We therefore explain the share of imports using a time trend as in Petri (1984).

Here again we confront the problem that specifications that are reasonable for estimating over a given sample is unsuitable for use in dynamic models. Simple time trends would push imports to infinity. We have opted for a simple solution by using a logistic trend. From Fig. 3 it is clear that such a trend would be poorly estimated since U.S. imports seem to be rising with no end in sight. Another way of saying this is that there are fundamental changes in the world's supply of tradable goods over time, and import demand functions are shifting. These shifts do not appear to be converging and we must therefore make some assumption about the maximum possible shift. The assumption we have chosen is to have the logistic curve converging to a point close to the share at the end of the sample period.

Fig. 3. Import share and the price of imports



3. The Structure of the Model

We divide the U.S. economy among four sectors: businesses, households, governments, and the rest of the world. Since trade policy differs substantially among industries, we subdivide the business sector into the thirty-five industries listed in Table 1 below. These industries correspond approximately to two-digit industries in the Standard Industrial Classification. Our model distinguishes the same number of commodities as industries. Each industry produces a primary product; this is the commodity group in which the industry is predominant. Industries also produce secondary products, the primary products of other industries. The interindustry flows are illustrated in Figure 4.

We shall give an overview of the important features of the model here. The detailed equations are in Appendix A.

3.1 Consumer behavior

Our model of consumer behavior is based on full consumption, comprised of commodities and leisure time, following the structure in eqn. 4. Full consumption is allocated over time to maximize an intertemporally additive utility function, subject to an intertemporal budget constraint. The necessary conditions are expressed as an Euler equation, giving the growth rate of full consumption as a function of the discount rate and the growth rate of the price of full consumption. Current full consumption incorporates expectations about all future prices that are fulfilled by the solution of the model. This is the first component of our dynamic model of adjustment to changes in trade policy.

There is a single, exogenously given, time endowment. The U.S. population grew substantially during our sample period, 1947-1985. For later periods we project the population and transform it into a projection of the time endowment. In each period this endowment is divided between leisure time and the labor market. Our model allocates full consumption between commodities and leisure. Time in the labor market is allocated among the thirty-five industries; labor services are also included in final demands for personal consumption expenditures and public consumption. We assume that labor is perfectly mobile among sectors so that the wage rate in each sector is proportional to a single wage rate for the U.S. economy as a whole.

Finally, total expenditure on commodities by the household sector is allocated to the thirty-five commodities represented in the model, capital services, and labor services. We estimate price and total expenditure elasticities econometrically for each of 672 types of households.

3.2 Producer behavior

We represent producer behavior by means of econometric models for each of our thirty-five industries. We first express the output of each industry as a function of inputs of intermediate goods, capital services, and labor services. These production functions are characterized by constant returns to scale. The rate of productivity growth in each industry is endogenous and can be expressed as a function of the input prices. The intermediate inputs include the thirty-five commodities produced within the U.S. business sector. Each commodity group is allocated among intermediate demands by the thirty-five industries and final demands for private and public consumption, investment by households and businesses, and exports to the rest of the world.

Figure 4 Intersectoral flows.

Use Table

1		Industry	35					
C o m m o d i t y	1							
		A	C	I	G	X	M	QC
	35							
		NCI	NCI'					
		KD	KD'					VA
		LD	LD'					
		T						
		QI						

Make Table.

1		Commodity	35
I n d u s t r y	1		
		M	QI
	35		
		QC	

Figure 4 Continued.

A	Use matrix; commodities used by industries
M	Make matrix; Industries contribution to commodity supply.
C	Household consumption of nondurables and services only. Service flow from durables enter in the capital row of that column.
I	Investment in the domestic capital stock.
G	Government purchases of goods and services.
X	Exports of commodities (interest receipts are accounted separately)
M	Competitive imports (entered as a negative column)
NCI	Non-competitive imports
KD	Capital demanded by producers
LD	Labor demanded by producers
T	Sales tax on industry output NCI',KD',LD' are factor inputs allocated directly to final demand
QI	Industry output
QC	Commodity output of domestic producers
QS	= QC+M = Total commodity supply
VA	Total value added = GDP

Table 1. Import Demand Elasticities.

Industry	Substitution Elasticities			Import Price Elasticities				
	Stern	Sheills	Ours	Stern	Sheills	Petri	Cline	Ours
Agriculture			0.70				-0.90	-0.68
Metal mining			0.11				-0.22	-0.09
Coal mining							-0.22	
Oil & gas mining							-0.22	
Non-metal mining			0.34				-0.22	-0.34
Construction								
Food & kindred	1.13	0.31	0.65	-1.13	-0.21		-1.13	-0.62
Tobacco	1.13	-16.2	2.60	-1.13	-7.57		-1.13	-2.59
Textile mill	1.15	2.58	1.62	-1.14	-1.41	-1.2	-2.43	-1.54
Apparel	4.27	1.62	1.27	-3.92	-0.52	-1.2	-2.43	-1.01
Lumber & wood	1.76	0.26	1.76	-0.69	-1.32	-1.4	-0.96	-1.60
Furniture	3.10	12.13	1.49	-3.00	-9.56	-1.4	-0.96	-1.36
Paper	1.58	1.80	1.16	-0.55	-1.80	-1.4	-1.44	-1.07
Printing & publish	3.01	2.72	1.22	-3.00	-1.46	-1.4	-1.44	-1.20
Chemicals	2.61	9.85	1.20	-2.53	-6.82	-0.8	-0.97	-1.10
Petroleum refining	2.36	-0.34	1.09	-1.96	-0.79	-0.8	-0.97	-1.00
Rubber & plastic	5.71	2.67	1.76	-5.26	-1.32	-0.8	-3.57	-1.65
Leather	1.81	4.11	1.86	-1.58	-2.01		-2.46	-1.11
Stone Clay & Glass	1.63	4.29	1.86	-1.60	-2.86	-0.8	-1.37	-1.72
Primary metal	1.45	3.05	1.48	-1.42	-2.28	-1.6	-1.99	-1.29
Fabricated metal	3.67	1.54	1.13	-3.59	-0.94	-1.1		-1.08
Machinery	1.02	3.34	1.72	-1.02	-0.88	-0.9	-0.87	-1.53
Electrical machine	2.11	7.46	1.45	-1.00	-3.08	-0.6	-0.87	-1.23
Motor vehicles	3.59	2.01	1.52	-3.28	-1.24	-2.5	-2.53	-1.16
Transport. equipme	3.59	2.01	1.35	-3.28	-1.24	-2.5	-1.70	-1.28
Instruments	1.98	0.45	0.86	-1.08	-0.44	-0.9		-0.77
Misc. manufactures	1.98	3.55	1.52	-2.06	-2.37	-0.8	-4.44	-1.14
Transportation								
Communications								
Electric Utilities								
Gas Utilities								
Trade								
Finance, Insurance								
Services								
Govt Enterprises								

The industrial classification system is different for each study. All entries correspond to the categories used in this study.

Stern: Central tendencies in Stern, Francis and Schumacher (1976).

Sheills: Sheills, Stern and Deardorff (1986), sample period 1962-78.

Petri: Petri (1985), U.S. imports from rest of the world, excluding Japan, 1960-80.

Cline: Cline, et al. (1978), page 58.

Ours: Elasticities evaluated at 1983 shares, sample period 1964-85.

To implement our econometric approach to modeling producer behavior we have constructed a consistent time series of interindustry transactions tables for the U.S. economy, covering the period 1947-1985 on an annual basis. Empirical evidence on substitutability among inputs is essential in analyzing the impact of trade restrictions. A high degree of substitutability implies that the cost of these restrictions is relatively low, while a low degree of substitutability implies high costs of trade restrictions.

3.3 Investor behavior

In our model a single stock of capital is allocated among the thirty-five industries and the household sector. We assume that capital is perfectly malleable and mobile among sectors, so that the price of capital services in each sector is proportional to a single capital service price for the economy as a whole. The supply of capital available in every year is the result of past investment. This relationship is represented by an accumulation equation, giving capital at the end of each year as a function of investment during the year and capital at the beginning of the year. This backward-looking equation incorporates the whole past history of investment and constitutes the second component of our dynamic model of adjustment to changes in trade policy.

Our model of investor behavior also includes an equation giving the price of capital services in terms of the price of investment goods at the beginning and end of each period. The current price of investment goods incorporates expectations about future prices of capital services and discount rates through the assumption of perfect foresight or rational expectations. Under this assumption the price of investment goods is based on expectations that are fulfilled by the solution of the model. This forward-looking equation incorporates expectations about all future prices and is the third component of our dynamic model of adjustment to trade policy changes.

3.4 The Government

The government in this model imposes taxes, buys commodities, make transfers and borrows to finance its deficits. The government deficit is set exogenously since we do not have an equation (e.g. a portfolio choice model) to determine it in the steady state. That leaves us with two possible closures for the model, either endogenizing government purchases given fixed tax rates, or, fixing public spending and adjusting tax rates/lump sum taxes. Both methods are used depending on the simulation.

On the revenue side the government imposes taxes -- sales tax, import tariffs, capital income tax, labor income tax, property tax and wealth (estate) tax; and collects fees -- "non-tax revenues" and surpluses of government enterprises.

Government spending falls into 4 major categories -- purchases of goods, transfers (to household sector and foreign aid), interest payments on debt (to domestic and foreign bondholders), and subsidies to producers. Transfers and interest payments are included to maintain a realistic set of accounts, they are set exogenously and play no endogenous role.

3.5 Total Supply, Imports and the Rest-of-the-world.

The total supply of commodities in the U.S. economy comes from the output of domestic industries and "competitive" imports. Competitive imports are defined in the U.S. national income and

product accounts as commodities similar to those produced in the U.S. In our model purchasers of these commodities regard them as imperfect substitutes for the domestically produced counterparts. Noncompetitive imports enter directly into the production functions for each industry in the same way as other inputs. They also enter final demands for consumption by households and governments and investment by businesses and households. Some examples of noncompetitive imports are tropical agricultural products and tourism.

The demand for competitive imports is derived from a translog cost function with a logistic time trend to deal with the rising imports as described in section 2.3 above. The share of total supply due to imports is derived as:

$$\frac{PM_i M_i}{PS_i QS_i} = \alpha_0^i + \frac{\beta_0^i}{1 + e^{-\mu_i(t - \tau_i)}} + B^i \ln \frac{PM_i}{PC_i} \quad (5)$$

where PM and PC are the prices of the imported and domestic commodities, and PS is the price of the total supply. The corresponding quantities are denoted M , QC and QS . The value of total supply is :

$$PS_i QS_i = PC_i QC_i + PM_i M_i \quad (6)$$

The above import demand equation is estimated by applying two-stage least squares to annual data for the period 1960-85. We present the implied price elasticities of demand for imports in Table 1. For comparison we also present elasticities employed in previous studies. Imports of most manufactured commodities are price elastic, while imports of most primary commodities are price inelastic. For eighteen of our twenty-five highly tradable groups the values of R^2 are greater than 0.8.

Our model is limited to the U.S. economy, so that we do not model production by the rest of the world. Accordingly, we take the prices of competitive and noncompetitive imports into the U.S. as exogenously given; during our sample period, 1947-85, we set these prices equal to the actual data. Since our model determines prices, both domestic and foreign, relative to a numeraire given by the U.S. wage rate, we allow prices of imports from the rest of the world to change through the terms of trade, say e_t , and through tariffs levied on imports by the U.S. government, say θ_{it} and θ_{it}^n :

$$PM_{it} = (1 + \theta_{it}) e_t PM_{it}^* \quad (7)$$

$$PNCI_{it} = (1 + \theta_{it}^n) e_t PNCI_{it}^*$$

where PM_{it} and $PNCI_{it}$ are prices for competitive and noncompetitive imports paid by the U.S. and PM_{it}^* and $PNCI_{it}^*$ are prices received by the rest of the world. The terms of trade e_t is the price of goods in the U.S. relative to the price of goods in the rest of the world.

Exports.

Since we do not model production in the rest of the world, we express the demand for U.S. exports, say X_{it} , as a function of rest of the world output Y_t^* and the price of exports PC_{it} :

$$X_{it} = EX_{i0}(Y_t^*) [(1 + \theta_{it}^*) \frac{PC_{it}}{e_t}] \eta_i, \quad (8)$$

where $EX_{i0}(Y_t^*)$ represents actual U.S. exports during the sample period, 1947-85, and projected exports outside this period, θ_{it}^* is the rest of the world tariff rate on U.S. exports, and the term in square brackets is the price for U.S. exports faced by the rest of the world. We do not have the data on rest of the world imports from the U.S. required for estimation of the export price elasticities η_i . We take these elasticities as averages of import price elasticities of major trading partners of the U.S. These are given in Table 2.

The U.S. current account balance is the above commodity exports less commodity imports plus net factor income less transfers. Since the commodity flows are functions of the terms of trade e_t , the current account also depends of e_t . The current account is set exogenously like the government deficit and this constraint is met by the endogenous terms of trade.

3.6 The Markets, Equilibrium and Solution of model.

The intraperiod equilibrium obtains when the markets for goods and factors clear. The first set of markets is for the 35 commodities, the supply comes from the producers (via the make matrix) and imports, and the demands are from intermediate users, household consumption, investment, government demand and exports. These markets are cleared by the commodity prices.

Next we have the factor markets. The supply of the malleable capital is equated to the sum of the industry and household demands by an aggregate rental price. The demand for leisure translate into a supply of labor. The demand for labor comes from the producers and households and the market is cleared by the wage rate.

We have exogenous government deficits and tax rates. The "revenue, expenditure, deficit" constraint is met by an endogenous level of public spending on goods. Similarly the exogenous current account balance is met by the endogenous terms of trade, e_t .

Finally we have the savings and investment equation. This is determined from the Euler equation linking consumption between adjacent periods.

Our model may be described as a multi-sector Cass-Koopmans model. Intertemporal equilibrium obtains when the two dynamic equations of the model are satisfied – the Euler equation for full consumption, and the capital accumulation equation. The transversality condition must of course also hold.

The economy moves along the saddle path from a given initial capital stock to a steady state defined by two conditions. The first condition is that full consumption is constant (recall that there is no

Table 2. Export Price Elasticities.

Industry	Petri	Stone	Cline
Agriculture		-0.72	-0.61
Metal mining		-0.92	
Coal mining		-0.92	
Oil & gas mining		-0.92	
Non-metal mining		-0.92	
Construction	*		
Food & kindred		-1.975	-0.63
Tobacco		-1.975	-0.63
Textile mill	-1.6	-1.18	-1.57
Apparel	-1.6	-1.18	-1.57
Lumber & wood	-1.0	-1.5	-1.43
Furniture	-1.0	-1.5	-1.43
Paper	-1.0	-1.41	-1.53
Printing & publishing	-1.0	-1.41	-1.53
Chemicals	-0.5	-0.98	-1.47
Petroleum refining	-0.5	-1.72	-1.47
Rubber & plastic	-0.5	-2.10	-2.14
Leather	-1.6	-0.62	-1.49
Stone Clay & Glass	-0.7	-1.26	-1.56
Primary metal	-1.1	-1.65	-1.97
Fabricated metal	-1.1	-1.06	-1.59
Machinery	-0.9	-1.04	-1.59
Electrical machinery	-1.2	-1.05	-1.59
Motor vehicles	-0.9	-2.49	-1.55
Transport. equipment	-0.9	-2.49	-1.55
Instruments	-0.9	-1.18	-1.85
Misc. manufactures	-1.0	-1.55	-1.62
Transportation	*		
Communications	*		
Electric Utilities	*		
Gas Utilities	*		
Trade	*		
Finance, Insurance	*		
Services	*		
Govt Enterprises	*		

*Sectors assumed to have zero price elasticities. Trade and transportation exports are margins on exported goods; other service sectors have only negligible exports.

Petri: Petri (1984).

Stone: Stone (1979), average of import elasticities for EEC and Japan.

Cline: Cline, et al. (1978), average of Canada, EEC, Japan.

long run technical progress). The second is that investment exactly matches depreciation. The first condition implies that at the steady state the net marginal product of capital is equal to the rate of time preference.

The saddle path is calculated by iterating on a guess of the path of the costate variable until both intraperiod and intertemporal equilibrium conditions are satisfied. The procedure is described in more detail in the Appendix.

4. Effects of Trade Barriers.

In this section we summarize the results reported in Ho and Jorgenson (1994) where we estimated the impact of trade policy on U.S. economic growth. We constructed a base case for growth of the U.S. economy under actual trade policies, incorporating historical data for all exogenous variables. We then simulated the U.S. economy with a change in trade policy. The economic impact of the policy change is estimated by comparing the results of the two simulations. We initiate both simulations in 1980, immediately after the conclusion of the Tokyo Round negotiations in 1979.

4.1 Tariff reductions.

We first describe the effects of multilateral reductions in tariffs with no change in quantitative restrictions on trade. In Table 3 we present tariff rates on U.S. imports in 1980, following several rounds of tariff reductions under GATT that culminated in the Tokyo Round. The most highly taxed commodity imports were textiles, apparel, leather (mainly footwear), glass, and primary metals (mainly iron and steel). Total customs duties collected on U.S. imports amounted to \$7.2 billions or about 2.9 percent of total commodity imports of \$251 billions. For comparison the U.S. gross national product in 1980 was \$2,732 billions in prices of that year.⁵

To evaluate the economic impact of tariffs, we eliminate all domestic and foreign tariffs, beginning in 1980. In both the base case and alternative case simulations, we set the U.S. capital stock and all other state variables at the beginning of 1980 equal to their historical values. We then simulate the growth of the U.S. economy from 1980 to the year 2100. In the base case the government deficit and tax rates are exogenous, but government spending is endogenous. With all tariffs removed we set government expenditures equal to values from the base case. The exogenous government transfers and interest payments are kept the same in both simulations.

The economic impact of eliminating tariffs is summarized diagrammatically in Figures 5a and 5b. The vertical axis in these figures gives the percentage change in each variable from the elimination of tariffs. The impact of the tariff cut is to raise consumption of goods and services by 0.16 percent in the first year. From the first panel of Figure 5b we see that the price of capital goods is lower than in the base case and keeps falling. A falling price of capital goods leads to an increase in investment and boosts the growth of capital stock, as shown in Figure 5b. By the year 2000 the capital stock is 0.49 percent higher than in the base case.

⁵ Tariff rates given in Table 3 were calculated from data provided by Andrew Parks of the U.S. International Trade Commission, described in detail by Ho (1989), Appendix H. Tariff rates for the rest of the world are taken from Deardorff and Stern (1986).

Table 3. Tariff Rates in 1980.

NO.	Sector	Tariff rates		Tariff equiv.
		ROW	U.S.	
1	Agriculture		0.035	
2	Metal mining		0.000	
3	Coal mining		0.000	
4	Oil & gas mining		0.000	
5	Non-metal mining		0.003	
6	Construction		0.000	
7	Food & kindred		0.027	
8	Tobacco		0.111	
9	Textile mill	0.107	0.108	0.030
10	Apparel	0.207	0.218	0.063
11	Lumber & wood	0.027	0.020	
12	Furniture	0.103	0.035	
13	Paper	0.058	0.005	
14	Printing & publishing	0.029	0.008	
15	Chemicals	0.094	0.041	
16	Petroleum refining		0.000	
17	Rubber & plastic	0.058	0.067	
18	Leather	0.045	0.097	0.056
19	Stone Clay & Glass	0.105	0.091	
20	Primary metal	0.058	0.030	0.048
21	Fabricated metal	0.090	0.057	
22	Machinery	0.067	0.041	
23	Electrical machinery	0.096	0.055	
24	Motor vehicles	0.077	0.023	*0.047
25	Transport. equipment	0.077	0.026	
26	Instruments	0.078	0.065	
27	Misc. manufactures	0.078	0.058	
28	Transportation			
29	Communications			
30	Electric Utilities			
31	Gas Utilities			
32	Trade			
33	Finance, Insurance			
34	Services			
35	Govt Enterprises			

U.S. tariff rates are calculated from International Trade Commission data. Rest of the world (ROW) tariff rates are from Deardorff and Stern (1986). See Table 3.1b below for tariff equivalents of quotas. *1981 data.

Table 4. Tariff Equivalents of Selected Quotas.

	Textiles	Apparel	Leather	Metals	Autos
1973	0	0	0	0.032	0
1974	0.030	0.063	0	0.032	0
1975	0.030	0.063	0	0	0
1976	0.030	0.063	0	0	0
1977	0.030	0.063	0.056	0	0
1978	0.030	0.063	0.056	0.048	0
1979	0.030	0.063	0.056	0.048	0
1980	0.030	0.063	0.056	0.048	0
1981	0.030	0.063	0.056	0.048	0.047
1982	0.071	0.095	0	0.048	0.047
1983	0.071	0.095	0	0.048	0.047
1984	0.071	0.095	0	0.048	0.047
1985	0.071	0.095	0	0.048	0

Tariff equivalents of "voluntary" export restrictions are calculated from Hufbauer, Berliner, Elliot (1986) by aggregation to our model's industry classification.

Table 4b. Tariff Equivalents of Quotas on U.S Imports from Japan.

Sector	1970	1980
Textiles, Apparel	3.5	1.3
Primary Metal	6.0	7.0
Electrical Machinery	-	0.8

Petri (1984), page 138.

Figure 5a. Dynamic Effects of Tariff Elimination

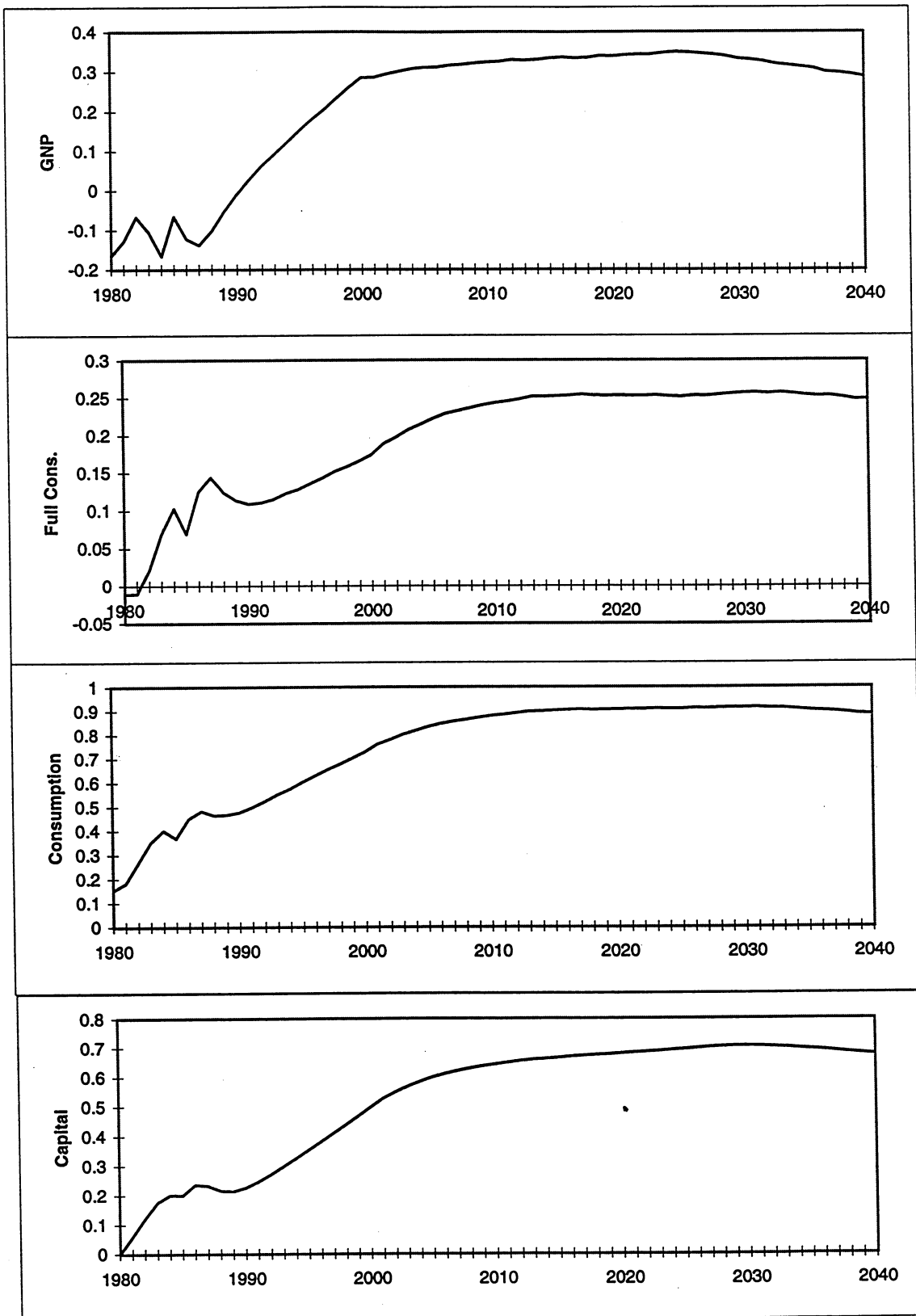
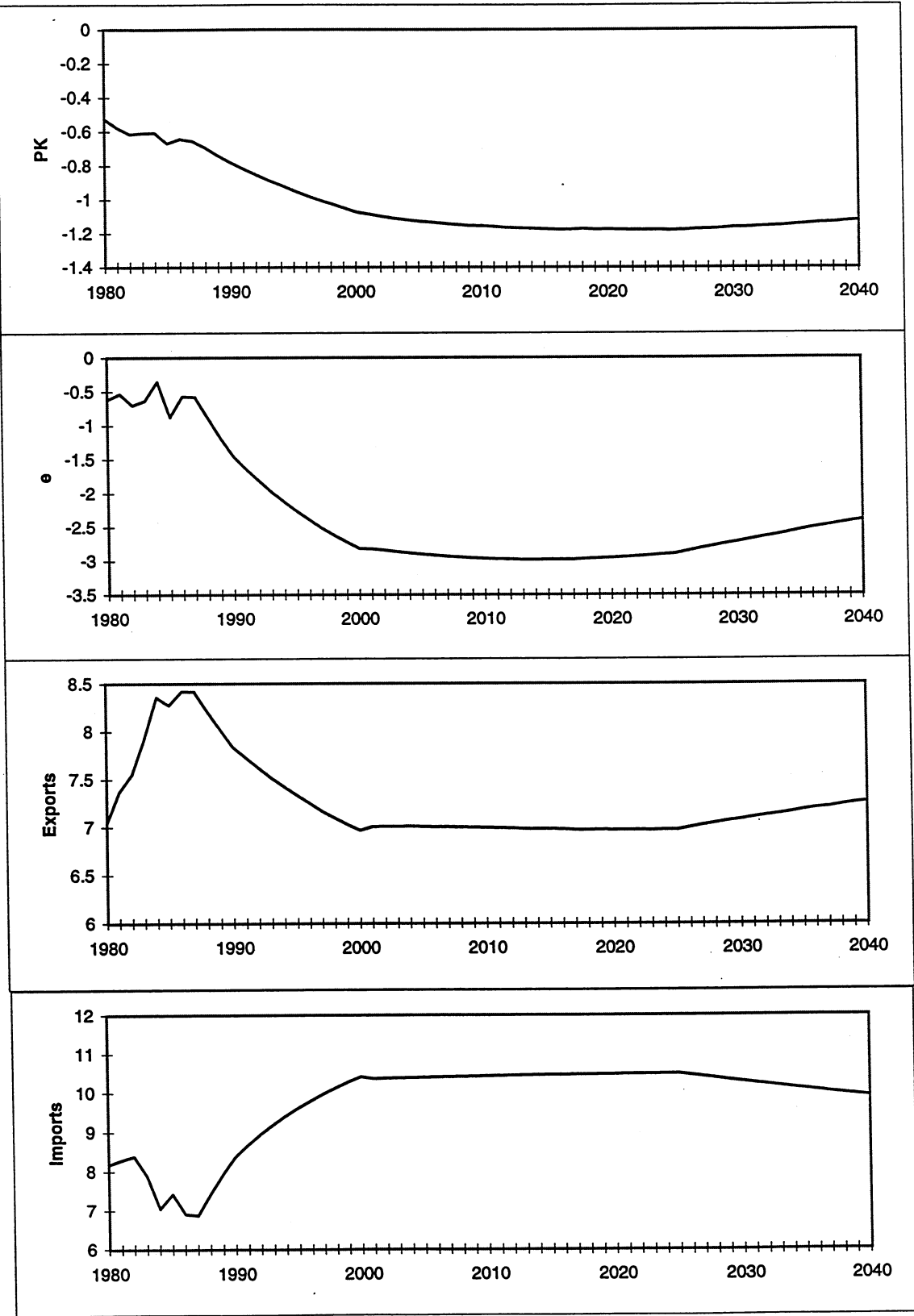


Figure 5b. Dynamic Effects of Tariff Elimination



Lower commodity prices and an investment boom induce higher import demands. U.S. exports also increase with reduced tariffs in the rest of the world. From Table 3 we see that these tariffs are generally higher than those in the U.S. Given the elasticities we have employed, the initial impact is greater for exports than for imports. Since the current account balance is exogenous, the terms of trade e , must fall to stimulate higher imports. The required decrease of 0.6 percent in the terms of trade is very substantial. The quantity of exports increases by 6.7 percent while the quantity of imports rises by 7.5 percent.

Over time the difference between the two simulations increases, due to the growth in capital stock resulting from the elimination of tariffs. By the year 2000 full consumption is 0.17 percent higher; this is comprised of an increase of 0.74 in consumption of goods and services and a decrease of 0.6 percent in leisure. The terms of trade decline over time, since U.S. prices fall but rest of the world prices remain constant, implying an increase in U.S. international competitiveness. As a consequence, the quantity of exports is only 6.5 percent higher in the year 2000, while the quantity of imports is 9.7 percent higher.

Table 5 gives the sectoral effects of tariff elimination in the initial year, while Table 6 shows the effects after twenty years. Raw material industries such as mining have small trade flows; the small decreases in exports are due to the fall in the terms of trade. Agricultural trade is largely governed by quantitative restrictions, including trade embargoes, that we do not explicitly model. The small changes in trade should be interpreted with this in mind. Similarly, the industries producing nontradables -- trade, finance, and services -- have small declines in exports, due mainly to the terms of trade. Commodities with the highest tariff levels -- textiles, apparel, rubber, leather, and glass -- show the largest gains in imports. Chemicals, electrical machinery (which includes computers), and instruments have the highest rest of the world tariffs and the most substantial increases in exports.

The output and employment effects of tariff reductions largely parallel the shifts in imports and exports. Chemicals, primary metals, machinery, electrical machinery, and instruments show the largest gains in output and employment. Since the capital stock is initially fixed in supply, capital must be drawn from other sectors to these export oriented industries. Import penetration is so high in the food, furniture, and leather industries that domestic output actually falls. Capital and labor shift from these sectors to sectors that are more competitive internationally.

4.2 Quantitative restrictions.

With successive reductions in tariff rates, trade policy has shifted away from tariffs to quantitative restrictions like quotas and "voluntary" export restraints on suppliers of U.S. imports. As a concrete example, world trade in apparel is governed by Multi-Fiber Agreements that allocate quotas to each exporting country. The quotas are highly detailed, covering many categories of apparel. Some countries attain these limits while others are constrained in only a few or even none of the categories. Another example is motor vehicles, where Japanese exports to the U.S. in the 1980s are under "voluntary" export restrictions, while European exports are not.

Table 5 Sectoral Effects of Eliminating All Tariffs in 1980 (% change).

Sector	Output	Capital	Labor	Exports	Imports
Agriculture	-0.32	-0.44	-0.47	-0.34	2.09
Metal mining	2.17	2.08	2.04	-0.43	2.31
Coal mining	0.36	0.26	0.17	-0.44	0.84
Oil & gas mining	0.08	0.00	0.16	-0.56	0.69
Non-metal mining	0.75	0.59	0.35	-0.42	0.97
Construction	0.23	0.05	0.22	-0.14	
Food & kindred	-0.34	-0.45	-0.44	-0.31	1.62
Tobacco	-0.42	-0.47	-0.52	-0.30	20.56
Textile mill	1.42	0.88	0.17	18.94	20.23
Apparel	1.71	-0.26	0.09	29.07	31.06
Lumber & wood	0.25	-0.06	-0.35	3.39	4.59
Furniture	-0.51	-0.66	-0.72	16.25	6.03
Paper	0.85	0.71	0.69	8.64	1.98
Printing & publishing	0.70	0.70	0.57	3.57	2.27
Chemicals	2.47	2.39	2.36	14.58	8.01
Petroleum refining	0.17	0.10	0.12	-0.62	0.75
Rubber & plastic	1.71	1.58	1.45	12.74	15.07
Leather	-1.40	-2.17	-1.75	5.93	16.93
Stone Clay & Glass	0.37	0.23	0.00	18.04	20.38
Primary metal	2.34	1.74	1.74	11.80	7.48
Fabricated metal	1.63	1.17	1.24	15.56	8.67
Machinery	2.51	1.94	1.87	11.11	10.52
Electrical machinery	2.29	1.84	2.06	16.77	11.17
Motor vehicles	1.84	1.44	0.85	13.08	5.76
Transport. equipment	2.93	2.30	2.38	12.65	7.09
Instruments	3.78	3.62	3.50	15.35	9.81
Misc. manufactures	1.44	1.23	1.07	12.94	11.23
Transportation	0.26	0.15	0.15	-0.01	0.78
Communications	0.28	0.26	0.24	-0.05	
Electric Utilities	0.22	0.21	0.13	-0.06	0.09
Gas Utilities	0.40	0.32	0.34	-0.03	
Trade	0.26	0.22	0.22	-0.02	
Finance, Insurance	0.08	0.08	0.07	-0.07	0.65
Services	0.02	-0.01	-0.09	-0.11	0.61
Govt Enterprises	0.30	0.31	0.27	-0.10	
Household		-0.54	-0.27		
Government		0.00	-0.82		

Entries are percentage change in the first period from the base case. Output is industry output, not commodity supply. Imports are competitive imports only.

Table 6. Eliminating all trade barriers vs. tariffs only after 20 years
(percentage change from base case).

	No tariffs	No barriers
Capital	0.50	0.54
Full consumption	0.17	0.26
Consumption	0.74	0.96
C.P.I.	1.00	1.25
Exports	6.54	7.19
Imports	9.72	10.68
Price of capital	-.72	-1.30

Table 7. Elimination of all Trade Barriers vs. Tariffs: effects on GNP growth.

	Annual GNP growth rate %		
	Base case	No tariffs	No barriers
1980:1990	3.47	3.48	3.50
1980:2000	2.34	2.37	2.38

We have modeled all quantitative restrictions by assuming that the realized import prices reflect the full effects. The primary justification for this approach is simplicity. More specifically, we assume that quotas result in a higher world price of imports PM_{it}^* . Hufbauer, Berliner and Elliott (1986) have provided estimates of the tariff equivalents of quantitative restrictions on U.S. imports. While bearing in mind the many limitations of the concept of a tariff equivalent, these tariff rates are consistent with the assumptions of constant returns to scale and perfect competition employed in our model for all industries.

We next consider the economic impact of eliminating all domestic and foreign tariffs and the tariff equivalents of quantitative restrictions for textiles, apparel, shoes, steel and automobiles given in Table 4. These are the most significant restrictions, but do not exhaust U.S. quotas. We have ignored restrictions on agricultural products and motor vehicles other than autos. We simulate the elimination of quantitative restrictions by reducing the rest of the world price of U.S. imports PM_{it}^* . Under this change in trade policy foreigners lose rents that accrue to them under quotas.

As before, we begin our simulation in 1980 and continue through the year 2100. We have combined tariffs with quantitative restrictions to provide an estimate of the impact of eliminating both types of trade barriers. The results given in Figure 6a and 6b are similar but more substantial in magnitude than those for tariff reductions alone. The only exception is the terms of trade e_t . In our simulations the elimination of quantitative restrictions is unilateral. Given the exogenous trade balance, the terms of trade must rise in some years to cover the increased U.S. imports of textiles, steel, autos, and shoes. In the initial year the fall in the terms of trade is only 0.53 percent compared with 0.61 percent for tariffs alone.

By the year 2000 the economic impacts of eliminating all trade barriers are considerably greater than the effects of tariff cuts alone. The percentage changes at the aggregate level are shown in Table 6. These impacts arise from reductions in import prices for all the five quota items and the implied reduction in the price of investment goods. Investment goods industries are large consumers of steel; automobiles are included among these industries.

The sharp drop in the price of investment goods due to the elimination of auto quotas raises the U.S. investment level and economic growth rate. These quotas were eliminated in 1985, so that the impact on the growth rate fell. The effects of the elimination of all tariff barriers on growth of the U.S. gross national product is summarized in the Table 7.

The sectoral effects of eliminating all trade barriers are given in Table 8. This can be compared with Table 5 for tariff cuts alone. The sectoral effects are quite similar, except for the commodities subject to quotas. Apparel imports, for example, rise by forty-two percent, compared to a gain of only thirty-one percent for tariff cuts alone. For iron and steel the gain is fifteen percent versus only seven percent; for leather the gain is twenty-eight percent versus seventeen percent. These shifts translate into parallel output changes. The leather industry's output falls by 2.5 percent by comparison with 1.4 percent with tariff cuts alone, while textile output rises by only 1.2 percent compared to 1.4 percent. Resources move out of apparel; since textiles, its main intermediate input, also falls in price, the output of apparel actually rises.

Figure 6a. Dynamic Effects of Eliminating Tariffs and Quotas

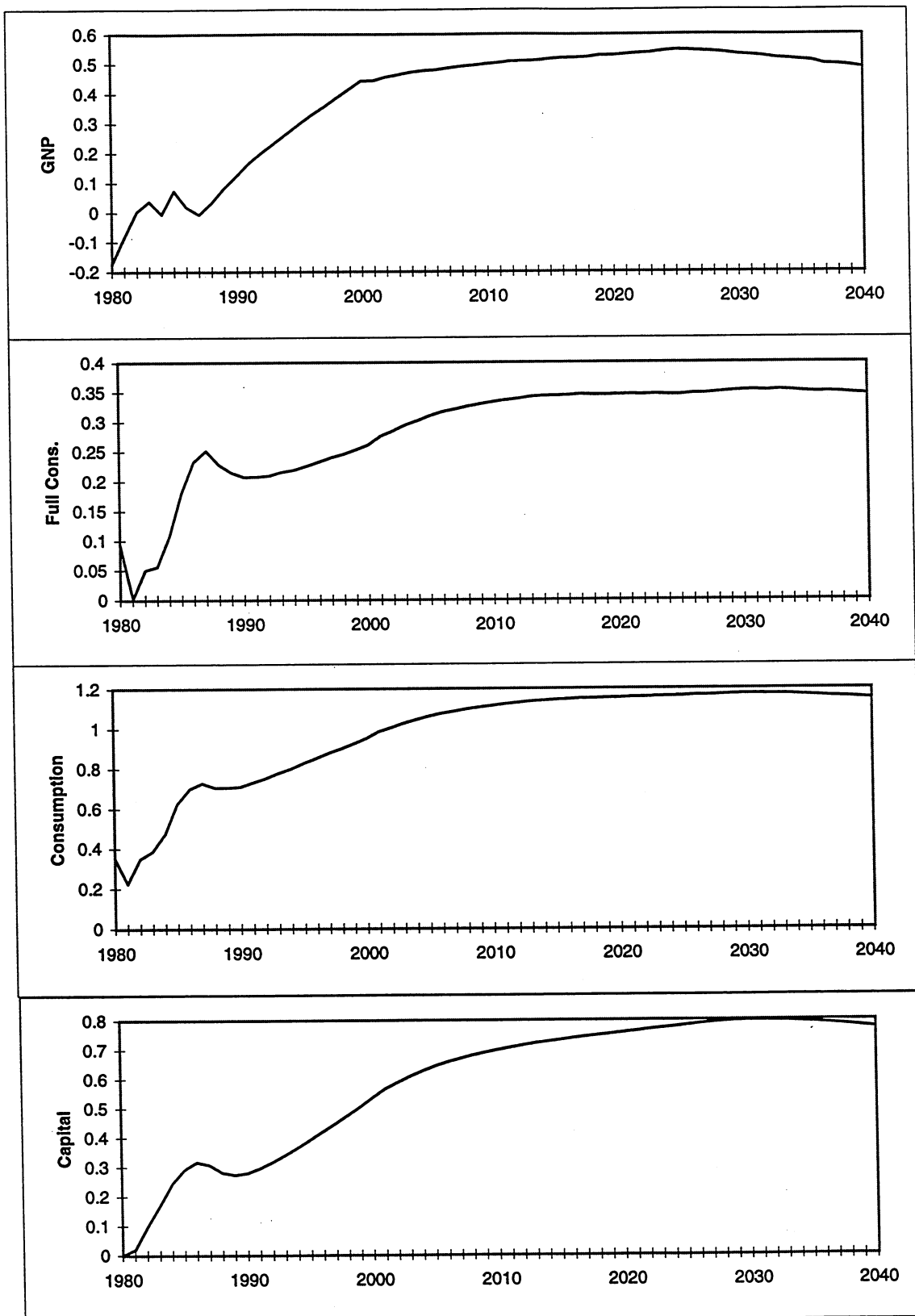


Figure 6b. Dynamic Effects of Eliminating Tariffs and Quotas

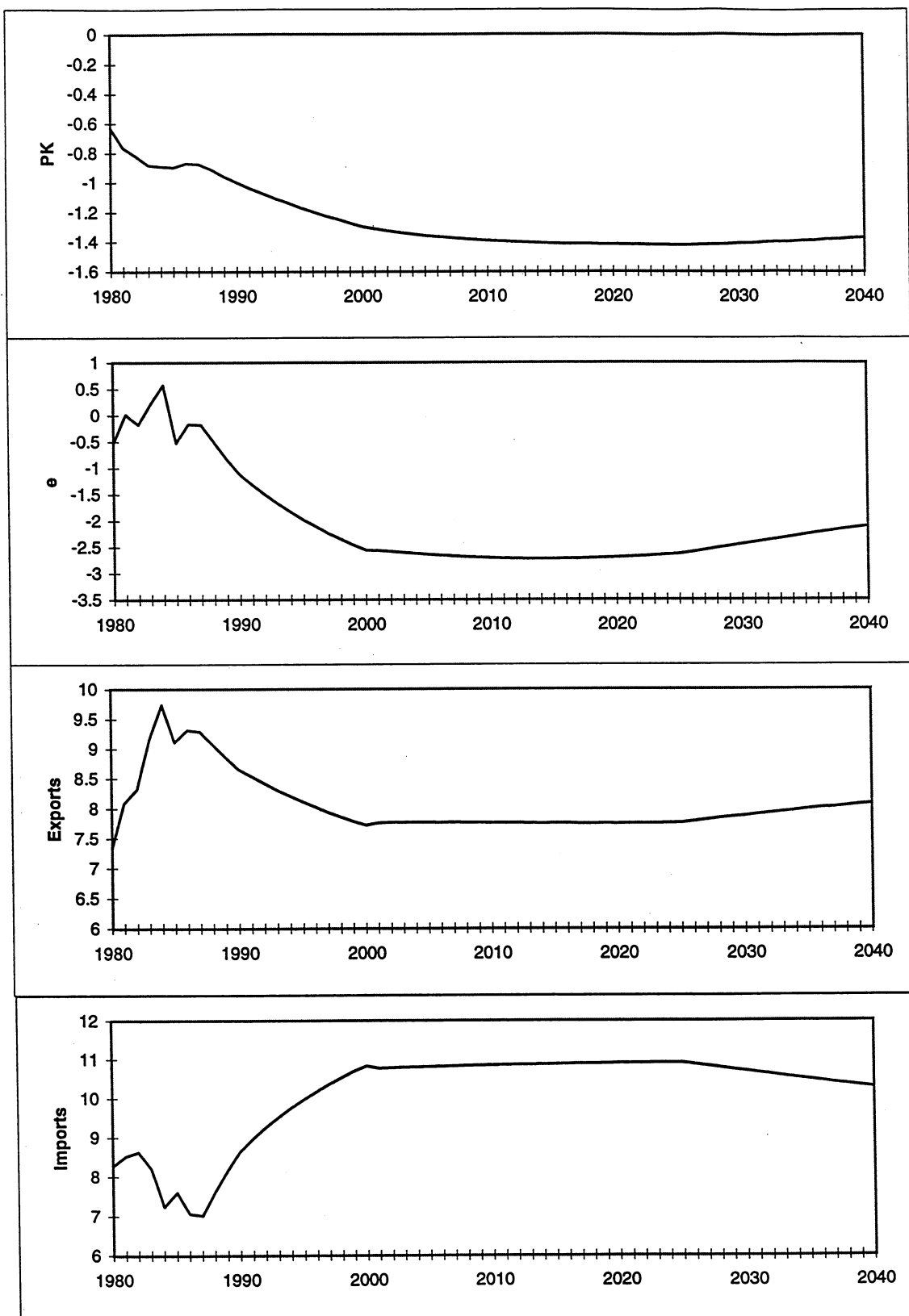


Table 8. Sectoral Effects of Eliminating Tariffs and Selected Quotas.

Sector	Output	Capital	Labor	Exports	Imports
Agriculture	-0.34	-0.43	-0.51	-0.14	1.97
Metal mining	2.10	2.09	1.86	-0.18	2.20
Coal mining	0.30	0.24	0.02	-0.27	0.60
Oil & gas mining	0.07	0.00	0.15	-0.32	0.56
Non-metal mining	0.50	0.32	0.03	-0.23	0.68
Construction	-0.15	-0.30	-0.17	-0.21	
Food & kindred	-0.50	-0.56	-0.62	-0.13	1.37
Tobacco	-0.54	-0.54	-0.73	-0.09	20.06
Textile mill	1.19	0.61	-0.24	19.91	25.64
Apparel	2.01	-0.46	-0.09	33.60	42.31
Lumber & wood	-0.12	-0.45	-0.83	3.81	3.91
Furniture	-1.20	-1.35	-1.49	16.81	4.93
Paper	0.81	0.67	0.62	8.94	1.75
Printing & publishing	0.90	0.93	0.72	3.89	2.29
Chemicals	2.45	2.38	2.31	15.13	7.74
Petroleum refining	0.18	0.19	0.09	-0.44	0.62
Rubber & plastic	1.30	1.21	1.01	13.44	14.38
Leather	-2.52	-3.59	-3.04	11.27	27.56
Stone Clay & Glass	-0.04	-0.16	-0.47	18.83	19.56
Primary metal	2.40	1.33	1.32	13.57	15.09
Fabricated metal	1.66	0.86	0.95	16.42	8.23
Machinery	2.36	1.59	1.45	11.96	9.87
Electrical machinery	2.02	1.46	1.72	17.94	10.52
Motor vehicles	1.58	1.13	0.29	13.95	5.02
Transport. equipment	2.87	2.15	2.10	13.15	6.70
Instruments	3.56	3.40	3.21	16.41	9.42
Misc. manufactures	1.50	1.28	1.02	14.58	10.89
Transportation	0.10	-0.01	-0.03	0.00	0.49
Communications	0.21	0.20	0.14	-0.07	
Electric Utilities	0.23	0.25	0.05	-0.02	0.12
Gas Utilities	0.35	0.31	0.25	-0.03	
Trade	0.10	0.06	0.05	-0.04	
Finance, Insurance	0.04	0.09	-0.01	-0.09	0.46
Services	-0.01	-0.04	-0.15	-0.15	0.45
Govt Enterprises	0.23	0.28	0.18	-0.14	
Household		-0.40	-0.50		
Government			-0.99		

Entries are percentage change from base case in 1980. Imports are competitive imports only.

In summary, the economic impact of quantitative restrictions is substantial, even though only a few commodities are affected by them. Elimination of these restrictions on the five items we have considered would produce a gain in U.S. consumption that exceeds the gain from abolishing all remaining tariffs. A multilateral reduction of nontariff barriers would probably have had an even greater impact, given the likelihood that quantitative restrictions in the rest of the world are even higher than those in the U.S.

4.3 Sensitivity Analysis

There are two major issues with the parameters used in this and any other model. The first is the usual variance of estimated parameters due to the error term. The second is the assumption of the functional forms, e.g. our logistic trends. Using quadratic instead of logistic trends would produce different parameter estimates of the price elasticities and other coefficients. This would not be the place to discuss the econometric issues in detail, we would merely follow the sensible practice of using different parameter values and report the sensitivity of the results to the various parameters. (A more ambitious project would be to use the estimated variances to give confidence intervals for our estimates, as suggested by a discussant. This is a very involved exercise, as can be seen in the small model used in Pizer 1996.)

Trade Elasticities

For our exercise the most important parameter imprecision is the set of price elasticities in the import demand equations and the export elasticities taken from the literature. The strong feeling in the literature is that these substitution elasticities are biased downwards (Goldstein and Khan 1985). One problem is that aggregates are dominated by the low elasticity-high price volatility components, which would bias the estimates downwards. Following Deardoff and Stern (1986) we therefore, simply doubled all elasticities in our sensitivity analysis.⁶ We used the 1985 shares to calculate the more elastic parameters. The export elasticities η_i are simply doubled.

In the steady state the capital stock gain due to a multilateral tariff elimination is 0.75%, in contrast to the 0.59% gain for base elasticities. Aggregate commodity consumption is 1.07% higher compared to 0.82% previously. Leisure falls 0.07% with the higher real wage. The real price of capital is 1.36% lower vs. 0.68%.

The steady state sectoral results of eliminating tariffs beginning in 1980 for the two sets of parameters are given in Table 9. The first three columns of numbers are the % changes in the section 4.1 experiment, the last three columns are the changes with the doubled elasticities. The differences are unfortunately large (or fortunately depending on one's emphasis). The elasticities obviously have a significant effect on the estimates of output response, it may even change the sign.

Overall, the magnitudes of export and import changes are increased and with no changes in sign. Output responses are different. Despite the increased aggregate labor supply some sectors show a reduction in output in response to the increased import competition. That is, in the more elastic case the

⁶ The elasticity of substitution is : $E = \frac{B}{share} + share - 1$ where B is the price coefficient of eqn. 5.

Table 9. Sensitivity test using more elastic trade parameters.

Sector	Base elasticities			Doubled elasticities		
	Output	Exports	Imports	Output	Export	Import
Agriculture	-0.56	-0.88	1.85	-1.59	-2.94	5.71
Metal mining	2.74	-1.13	2.39	2.91	-3.72	2.68
Coal mining	0.29	-1.37	1.83	-0.32	-4.20	3.92
Oil & gas mining	0.08	-1.12	2.19	-0.47	-2.56	3.63
Non-metal mining	1.32	-1.15	2.01	1.23	-3.76	3.12
Construction	-0.05	-0.53	0.00	-0.02	-0.63	0.00
Food & kindred	-0.98	-0.66	2.48	-1.68	-2.27	5.30
Tobacco	-0.83	-0.78	15.08	-1.48	-2.54	32.51
Textile mill	1.04	17.44	22.83	-2.55	34.31	39.56
Apparel	2.54	31.52	24.59	-2.28	66.07	39.73
Lumber & wood	0.22	2.17	4.89	-0.55	2.12	9.60
Furniture	-0.22	15.03	5.55	-0.04	28.84	11.36
Paper	1.00	7.09	3.45	0.87	12.30	7.33
Printing & publishing	0.96	2.18	3.45	1.01	1.83	6.55
Chemicals	3.31	13.56	8.97	4.74	25.76	16.41
Petroleum refining	0.54	-1.70	2.63	0.56	-4.02	5.65
Rubber & plastic	1.99	10.78	13.85	1.23	18.51	23.16
Leather	-1.56	9.09	14.76	-12.87	13.47	22.39
Stone Clay & Glass	0.51	17.05	12.38	-0.39	32.60	21.65
Primary metal	2.76	10.23	9.13	2.91	17.73	15.83
Fabricated metal	1.83	13.91	7.00	2.49	26.43	12.40
Machinery	3.54	9.63	11.79	6.43	16.58	40.20
Electrical machinery	3.55	15.84	11.53	4.24	29.95	20.00
Motor vehicles	2.89	12.52	8.93	2.78	23.14	17.94
Transport. equipment	3.77	10.79	7.87	6.10	19.62	17.07
Instruments	4.70	13.82	10.38	8.42	24.65	21.46
Misc. manufactures	1.90	13.21	8.93	-1.11	23.24	13.91
Transportation	0.32	0.01	1.99	0.33	0.02	2.86
Communications	0.55	-0.14	0.00	0.71	-0.17	0.00
Electric Utilities	0.76	0.22	0.65	0.86	0.41	0.56
Gas Utilities	0.84	0.13	0.00	1.22	0.37	0.00
Trade	0.11	-0.07	0.00	0.11	-0.09	0.00
Finance, Insurance	0.24	-0.12	1.91	0.26	-0.15	2.85
Services	0.02	-0.27	1.82	0.03	-0.34	2.75
Govt Enterprises	0.45	-0.16	0.00	0.55	-0.20	0.00

Entries are % changes between "no-tariffs" and "base" case.
Base trade elasticities are those estimated in Ho (1989).

Textile, Apparel, Lumber, and Miscellaneous Manufacturing industries have negative output responses to tariff reduction, while in the base elasticities case they are positive due to stronger export effects.

Time preference and labor supply

We now turn to other parameters in the model. The value of ρ , the rate of time preference, estimated over 1948-85 is 0.0288. In the alternative case we use a value of 0.04. The effect of this is very modest. Trade liberalization in this case produces a slightly smaller long run increase in the capital stock. For a given set of tariff rates, the rate of investment is of course higher in a $\rho = 0.03$ economy than in a $\rho = 0.04$ } economy. The *percentage* change in investment due to a reduction in tariffs is, however, roughly the same. (The steady state capital stock is 29,100 billion dollars in the base parameter case and 26,200 in the $\rho = 0.04$ case.)

Using a different value of the time preference parameter means using a different utility function and therefore utility comparisons must be made carefully. The equivalent variation of the welfare gain in the $\rho = 0.0288$ case is 0.14% (i.e. the change in utility value of the discounted stream of consumption as a percentage of initial wealth). The equivalent variation of the welfare gain in the $\rho = 0.04$ case is a similar 0.13% as reported in Table 10. In other words the percentage change is very similar but the levels are different.

As noted in section 2.2 above we have tried to track the secular increase in labor supply (i.e. the decrease in leisure per capita) using an exogenous time trend. In appendix equation A.8 the estimated values of the time trend parameters are $\beta_0 = 0.04$, $\mu = 0.585$. To simulate the effect of not tracking this shift we set the value of this β_0 to 0 and repeated the above calculations. That is, the base case with this new value of β_0 is simulated and then the tariffs are set to zero and a new path calculated. The effects of trade liberalization under this "no labor supply shift" scenario is reported in Table 10.

With no increase in the labor supply the paths of GDP and capital are lower than the base parameter case. The percentage increase in output and work hours due to the elimination of tariffs is, however, slightly bigger. This means a bigger percentage reduction in leisure and thus a smaller increase in full consumption and utility. The equivalent variation of trade liberalization is thus smaller, 0.10% versus 0.14%.

The other problem parameter discussed in section 2 is the labor supply price elasticity. We estimate the value of the share elasticity in the goods-leisure tier of the utility function to be 0.0375 (this is the first element of the 2x2 B matrix in appendix equation A.6.) A value of $B_{11} = 0$ corresponds to the Cobb-Douglas case of unit elasticity, our value estimated from time series aggregate data is a little less elastic than that. To see the effects of a more inelastic labor supply we set the value of B_{11} to twice the base case. The results (also reported in Table 10) are not surprising, a more inelastic function leads to a smaller increase in labor supply due to a rise in the real wage when the prices of goods fall due to the tariff cuts. This leads to a smaller increase in long run output and capital. The effect on capital accumulation is plotted in Fig. 7. (The bold line gives the effect of trade liberalization on the path of capital stock using original parameters, the dotted line gives the effect using more inelastic parameters.) The welfare effect of trade liberalization, measured in terms of this different utility function, is thus lower than the base parameter case, 0.12% versus 0.14%.

Table 10. Sensitivity analyses of different values of time preference and leisure trends.

	dK	dY	E.V.
Base case ($\rho = 0.0288$, $\beta_0 = 0.04$, $\beta^{CL} = 0.0375$)	0.65%	0.71%	0.14%
High time preference case ($\rho = 0.04$)	0.64%	0.80%	0.13%
No labor supply shift case ($\beta_0 = 0$)	0.68%	0.46%	0.10%
More inelastic labor supply ($\beta^{CL} = 0.0750$)	0.53%	0.57%	0.12%

dK = Change in steady state capital stock due to trade liberalization

dY = Change in steady state GDP due to trade liberalization

E.V. = Equivalent variation as share of Wealth due to liberalization

It is clear from comparing the various rows of Table 10 that there is no systematic relation between the effect on steady state capital, output and welfare. These must be calculated separately for a complete sensitivity analysis. There are some parameters that affect the level of the projections but has little effect on the percentage change, and hence are less of a worry. These include the rate of time preference, the population growth rate, and the exogenous rate of long-run neutral technical progress.

5 Conclusion

In this paper we have described some of the issues that must be addressed in implementing dynamic multi-sector general equilibrium models of trade policy and economic growth. Such models are useful in that they can capture dynamic adjustments by businesses and households to changes in policy. These effects predominate in the long run, so that economic impacts estimated from static models may be substantially understated.

Our specific estimate is that a multilateral elimination of tariffs alone beginning in 1980 raised long run consumption by 0.82% compared to an initial gain of only 0.16%. Eliminating both tariffs and nontariff barriers lead to a long-run gain in consumption of 1.08% versus 0.36% in the first year. The ratio of welfare cost to the tariffs is about 2. With more comprehensive estimates of tax equivalents of the quotas that we have ignored here the welfare and growth effects would of course be higher.

These estimates are sensitive to the assumptions of the model and the parameter values used. We have illustrated the magnitude of the effect using different key parameters on welfare, output and capital accumulation. As is well known, using more elastic substitution elasticities will lead to gains that are bigger than the base case ones. We have also performed sensitivity analysis on parameters that are not substitution elasticities. It is hoped that this is useful for users of numerical models to get a sense of the range of uncertainty.

The degree of sensitivity found here highlights again the need to carefully relate the results of numerical models to the underlying assumptions, of which many must be made in this kind of analysis. Complete Monte Carlo investigations of the sort econometricians do may not be feasible for complicated models like these but even limited sensitivity tests would be very useful.

TECHNICAL APPENDIX IS AVAILABLE ON REQUEST.

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DATA APPENDIX

The data for this model covers the period 1974 to 1985 and follows the methodology of Christensen and Jorgenson (1973) and Jorgenson, Gollop, and Fraumeni (1987) (JGF). The goal of the exercise is to construct a time series of input-output tables (Both “use” and “make” matrices) over which one can estimate the production and demand function. In addition we also need financial accounts that are not in the i-o tables.

The constructions of the i-o matrices are described in Wilcoxon (1988), basically, the official tables published every 5 years are interpolated using annual industry data.⁷ The capital and labor inputs (the value-added rows in the i-o table) are updated with some improvements following the approach in JGF. The detailed investment data from the BEA is cumulated into stocks of capital by Divisia aggregation, the rental price of capital is calculated from National Income Accounts (NIA). Labor input is aggregated over the labor force cross-classified by sex, age, educational attainment and industry. With the Divisia aggregation we take into account the different productivities of the various groups, instead of a simple sum of hours.

The final demand columns are estimated from the NIA and “bridge tables” from the official i-o tables. Imports are aggregated from trade data classified according to the SITC,⁸ and price indices from the BLS are used where available (unit values are used otherwise). The financial accounts (stocks of debt, government accounts, tax rates, etc.) are from the *US Worksheets* which are revised of Christensen and Jorgenson.

The top tier of the production functions are estimated using the “use matrix,” while the bottom tiers are from Hudson and Jorgenson. The first two stages of the household model are estimated from aggregate data in the *US Worksheets*. The top tier of the Consumption function is from Jorgenson and Slesnick, while the bottom tiers are estimated from the i-o table, as are the investment functions. The import share equations are estimated from the “import” and “total output” columns of the i-o table. All estimates are reported in Chapters 4 and 5 of Ho (1989).

⁷ I-O data are from the Bureau of Economic Analysis, the latest version is described in the *Survey of Current Business* May 1984. Annual industry output and prices are from the Bureau of Labor Statistics database *Time Series on Output, Prices, and Employment*.

⁸ At the 4-digit level and supplemented by more detailed data where necessary to get a better price index. The former are from the OECD data base and the 7-digit data from the Census Bureau’s *US Imports by SITC*.

Unilateral versus Multilateral Trade Liberalization: The Importance of International Financial Flows

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ABSTRACT

This paper explores the impact on economies of trade liberalization under alternative regional and multilateral arrangements: unilateral liberalization; liberalization as part of the ASEAN regional grouping; liberalization as part of the APEC regional grouping; or liberalization as part of a multilateral trade liberalization regime. A primary focus is on the role of international financial flows during the liberalization process. The paper is based on a Dynamic Intertemporal General Equilibrium model (DIGEM) called the Asia-Pacific G-Cubed Model. It is shown that the long run gains from a country's own liberalization tend to be large relative to the gains from other countries liberalizing although this varies across countries. It is also shown that there is a significant difference between the effects on GDP (production location) and the effects on consumption per capita of the alternative liberalization approaches across countries. This difference reflects the adjustment of international financial flows. The timing of liberalization is also shown to matter. With open capital markets the gains from credibly announced trade liberalization are realized before the reforms are put in place because there is a rise in global investment which raises the global capital stock. In addition there is a reallocation of capital via financial market adjustment. This paper also demonstrates that for some economies, there can be short run adjustment costs to trade liberalization because resources cannot be instantly reallocated across sectors in an economy. These adjustment costs from own liberalization can be reduced if more countries also liberalize. The nature of the dynamic adjustment suggests that other macroeconomic policies may play an important role during the early period of phased-in trade liberalization.

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1. Introduction

When a country reduces barriers to international trade, there are a number of factors that determine the nature of the gains and losses that result in both the short run and the longer run. Some of the key mechanisms through which gains are realized are direct, but many others are indirect and require the use of an economy wide model to capture these effects. In addition, the time profile of liberalization as well as the fact that it is not costless to restructure any economy complicate the analysis in the short run. Many studies and the professional debate in general, tend to ignore the short run adjustment issues of trade liberalization. This complicates the political barriers to trade liberalization once the liberalization begins because the gains take a while to materialize and are widely dispersed yet the costs are usually highly visible and incurred in the short term. This of course differs across economies and depends on whether liberalization is being undertaken during a period of rapid or stagnant economic growth. With highly visible short run job losses, the resolve of liberalizers are sorely tested. The nature of these adjustment problems are important to explore empirically because it needs to be recognized in advance that some costs may be incurred while achieving more substantial medium term and long term gains. However, understanding the likely adjustment path is also important for formulating appropriate macroeconomic policy responses in order to ease the transition. It is reassuring to know from many CGE studies that gains will be achieved in the long run from trade liberalization, but it is possibly more important for policy makers to know what the road will look like during the adjustment process.

Computable General Equilibrium (CGE) models have become a popular tool for calculating the various direct and indirect effects of trade liberalization and have given a range of useful insights. The sorts of mechanisms that these models capture are clear. In the case of unilateral liberalization, a reduction in trade barriers tends to reduce import prices which increases the purchasing power of consumers, thus making consumers directly better off. The change in relative prices induces firms to reallocate resources away from protected sectors towards other more efficient activities which tends to raise economic efficiency in the economy. CGE models are particularly useful for calculating how much the efficiency gains will be and how much consumption will rise as a result of these processes in the longer run.

However, there are a number of other gains that many standard CGE models ignore. One aspect is if there is imperfect competition or increasing returns to scale (see Francois et al (1995)). Another occurs if the removal of distortions increases the return to capital and stimulates investment in the economy. These dynamic effects can be much larger than the efficiency triangles many CGE modelers calculate (See McKibbin and Salvatore (1995) and Kouparitsas (1997)). Once allowance is made for the reality that financial capital is mobile internationally and these financial flows are related to the real returns to physical capital then further complications arise. If domestic saving does not rise as the return to capital rises from trade liberalization and these additional investments are made by foreign owners of capital, then additional GDP will be generated in the economy but this won't show up directly as a domestic consumption gain because the returns will be repatriated to foreign owners of capital (see Manchester and McKibbin (1995)). Thus it is important in evaluating trade liberalization in terms of income or consumption gains rather than changes in production or GDP (see McKibbin (1996)). In all evaluations of trade liberalization, understanding the dynamic path of adjustment is crucial.

The gains to an economy from the liberalization of another economy are also transmitted through a number of channels. The reduction in trade barriers in foreign economies (*ceteris paribus*) will stimulate the demand for exports which will raise income in the home economy although not by the full value of increased exports because these exports need to be produced with resources that otherwise would be

domestically consumed. Secondly owners of capital in the home economy may be able to invest in the liberalizing economy leading to additional income gains if those investments realize a higher rate of return than in the home economy.

The process becomes more complicated in the case where trade reform is phased in or where an economy exhibits short term Keynesian features either due to wage stickiness or adjustment costs in allocating physical capital or where asset prices adjust quickly in response to international financial capital flows yet other prices are more sticky. In this case overshooting of the exchange rate (e.g. Dornbush (1976)) during the adjustment process can complicate the standard insights.

This paper has a number of goals all of which are aimed at improving our understanding of the magnitude of the above factors. The first goal is to determine the extent to which longer run gains from trade liberalization for particular economies are due to domestic liberalization versus gains from other countries liberalizing. This provides direct evidence for the arguments by economists such as Garnaut (1996) that trade liberalization is a prisoners delight (all participants gain) rather than a prisoners dilemma (where a gain by one country is a loss for another). Trade liberalization under four alternative trade groupings are considered in this paper: **unilateral** liberalization; **ASEAN** liberalization; **APEC** liberalization; and **multilateral** liberalization involving APEC and European economics. In each case the trade liberalization is phased in according to the timetable underlying the APEC Bogor declaration in which industrial economies reduced barriers to trade to zero by 2010 and developing economies by 2020 (the exception is that Taiwan, Korea and Singapore follow the 2010 timetable)². This type of liberalization assumes the concept of “open regionalism” defined by Garnaut (1996) in which liberalization is non discriminatory. Thus the paper does not focus on regional trading blocs per se. Discriminating and non-discriminating trade reform in ASEAN versus APEC regional groups using an earlier version of the same multi-country model are explored further in McKibbin (1996).

The second goal of the paper is to show the difference between the allocation of production across economies as a result of trade liberalization versus the gain in welfare which we measure by gains in real consumption per capita. It is quite possible for GDP to fall in a country but for consumption to rise because the additional income is generated by shifting production overseas. In the model underlying this study, labor is assumed to be immobile across economies but there is a high degree of financial capital mobility (which over time implies mobility of physical capital in response to arbitrage between financial returns and the real rate of return to physical capital adjusted by the cost of moving physical capital). Therefore to the extent that trade liberalization leads to a reallocation of capital to take advantage of high rates of return from other countries liberalization, there can be a fall in GDP but higher income to domestically owned factors of production and therefore higher consumption generated.

The third goal is to explore the short run adjustment process when there is allowance for Keynesian style rigidities in labor markets; costly to adjust physical capital stocks and exchange rate overshooting from a combination of sticky wages and flexible asset prices.

This study can be distinguished from other studies of trade liberalization such as in Dee and Walsh (1994), Francois et al (1995), Goldin and van der Mensbrugghe (1995), Harrison et al (1995), Hertel et al

² Trade in services is assumed not to be liberalized even though we can explore this in the modelling framework. This will be explored in future research.

(1995), Huff et al (1995) Martin et al (1995) or Murtough et al (1994) because the model used in this paper is not from the class of static or period linked CGE models that have been used in these earlier studies. This study follows the alternative Dynamic Intertemporal General Equilibrium (DIGEM) approach focusing on the dynamic adjustment to trade reform as in Manchester and McKibbin (1995), McKibbin (1994) using the MSG2 model; McKibbin and Salvatore (1995) using the GCUBED model; and McKibbin Pearce and Wong (1995) and McKibbin (1996) using the Asia Pacific G-Cubed Model³.

The model used in this paper is derived from the G-Cubed model developed by McKibbin and Wilcoxon (1995). Because of this link, this model is named the Asia-Pacific GCUBED model (AP-GCUBED). As with the GCUBED model, this new model captures simultaneously the macroeconomic and sectoral linkages in a global model with partially forward looking asset market and spending decisions (assuming rational expectations). The AP-GCUBED model has country/regional dis-aggregation of: Korea, Japan, Thailand, Indonesia, China, Malaysia, Singapore, Taiwan, Hong Kong, Philippines, Australia, United States, India, Rest of the OECD, Oil exporting developing countries, Eastern Europe and Former Soviet Union and all other developing countries. Each country/region has an explicit internal macroeconomic and sectoral structure with sectoral dis-aggregation in production and trade into 6 sectors based on data from standardized input/output tables.

Section 2 gives a brief overview of the theoretical basis of the AP-GCUBED model. The alternative scenarios for trade liberalization are analyzed in section 3. The results are examined in two parts. The longer term outcomes are examined first in order to determine for each economy whether the gains arise from own liberalization or various forms of coordinated liberalization. The dynamic adjustment path is then explored for a subgroup of countries focusing on how economic activity and trade and capital flows adjust to trade liberalization that is gradually phased in.

A conclusion is presented in section 4.

2. The AP- GCUBED model

The AP-GCUBED multi-country model is based on the GCUBED model developed in McKibbin and Wilcoxon (1995). It combines the approach taken in the MSG2 model of McKibbin and Sachs (1991) with the dis-aggregated, econometrically-estimated, intertemporal general equilibrium model of the U.S. economy by Jorgenson and Wilcoxon (1989). The MSG2 model had one sector per country. The Jorgenson-Wilcoxon model has 35 separate industries, each of which is represented by an econometrically estimated cost function. The AP-GCUBED model has 6 sectors in each of 17 economies.

The GCUBED model was constructed to contribute to the current policy debate on global warming, trade policy and international capital flows, but it has many features that make it useful for answering a range of issues in environmental regulation, microeconomic and macroeconomic policy questions. It is a world model with substantial regional dis-aggregation and sectoral detail. In addition, countries and regions are linked both temporally and intertemporally through trade and financial markets.

³ See also Kouparitsas (1997) for a dynamic model of NAFTA trade reform in a 3 country model. This alternative but very similar approach has evolved from the real business cycle literature and has many similarities to the supply side approach taken in the G-Cubed model.

Like MSG2, GCUBED contains a strong foundation for analysis of both short run macroeconomic policy analysis as well as long run growth consideration of alternative macroeconomic policies. Intertemporal budget constraints on households, governments and nations (the latter through accumulations of foreign debt) are imposed. To accommodate these constraints, forward looking behavior is incorporated in consumption and investment decisions. Unlike MSG2, the GCUBED model also contains substantial sectoral detail. This permits analysis of environmental and trade policies which tend to have their largest effects on small segments of the economy. By integrating sectoral detail with the macroeconomic features of MSG2, GCUBED can be used to consider the long run costs of alternative environmental regulations and trade policy changes yet at the same time consider the macroeconomic implications of these policies over time. The response of monetary and fiscal authorities in different countries can have important effects in the short to medium run which, given the long lags in physical capital and other asset accumulation, can be a substantial period of time. Overall, the model is designed to provide a bridge between computable general equilibrium models and macroeconomic models by integrating the more desirable features of both approaches. The AP-GCUBED model differs from the GCUBED model because of the focus on the Asia-Pacific region as well as having 6 sectors compared to 12 for GCUBED. The theoretical structure is essentially the same.

The key features of AP-GCUBED are summarized in Table 1. The country and sectoral breakdown of the model are summarized in Table 2. It consists of seventeen economic regions with six sectors in each region (there are also two additional sectors in each region that produce the capital good for firms and the household capital good). The seventeen regions in AP-GCUBED can be divided into two groups: 14 core countries/regions and three others. For the core regions, the internal macroeconomic structure as well as the external trade and financial linkages are completely specified in the model. Our approach for each country is to first model them assuming the theoretical structure we use for the "generic" country but calibrating each country to actual country data. We then proceed country by country to impose institutional features, market structures, market failures or government regulations that cause certain aspects of these economies to differ from our generic country model. In this paper we have only just begun this process, therefore the countries we represent in the region are endowed with resources, trading patterns, saving and investment patterns etc that are based on actual data for these countries but in many important ways may not be truly representative of these countries because of institutional factors that we are still implementing into the model.

Each core economy or region in the model consists of several economic agents: households, the government, the financial sector and the 6 production sectors listed in table 2. Each of these economic actors interact in a variety of markets, both domestic and internationally.

Each of the six sectors within each country is represented by a single firm in each sector which chooses its flexible inputs (labor, energy, materials) and its level of investment in order to maximize its stock market value subject to a multiple-input production function (KLEM), knowledge that physical capital is costly to adjust once it is in place, and subject to a vector of prices it takes to be exogenous. Energy and materials are an aggregate of inputs of intermediate goods. These intermediate goods are, in turn, aggregates of imported and domestic commodities which are taken to be imperfect substitutes. Due to data limitations we assume that all agents in the economy have identical preferences over foreign and

Table 1: Summary of Main Features of AP-GCUBED

- ☺ Specification of the demand and supply sides of economies;
- ☺ Integration of real and financial markets of these economies with explicit arbitrage linkage real and financial rates of return;
- ☺ Intertemporal accounting of stocks and flows of real resources and financial assets;
- ☺ Imposition of intertemporal budget constraints so that agents and countries cannot forever borrow or lend without undertaking the required resource transfers necessary to service outstanding liabilities;
- ☺ Short run behavior is a weighted average of neoclassical optimizing behavior based on expected future income streams and Keynesian current income;
- ☺ The real side of the model is dis-aggregated to allow for production of multiple goods and services within economies;
- ☺ International trade in goods, services and financial assets;
- ☺ Full short run and long run macroeconomic closure with macro dynamics at an annual frequency around a long run Solow/Swan/Ramsey neoclassical growth model.
- ☺ The model is solved for a full rational expectations equilibrium at an annual frequency from 1995 to 2070.

Table 2: Overview of the AP-GCUBED Model

Regions:

United States
Japan
Australia
Rest of the OECD
India
Korea
Thailand
Indonesia
China
Malaysia
Singapore
Taiwan
Hong Kong
Philippines
Oil Exporting Developing Countries
Eastern Europe and the former Soviet Union
Other Developing Countries

Sectors:

Energy
Mining
Agriculture
Non Durable Manufacturing
Durable Manufacturing
Services

Agents

Households
Firms
Governments

Markets:

Final Goods
Services
Factors of production
Money
Bonds
Equities
Foreign Exchange

domestic varieties of each particular commodity. We represent these preferences by defining six composite commodities that are produced from imported and domestic goods.

Following the approach in the MSG2 model, we assume that the capital stock in each sector changes according to the rate of fixed capital formation and the rate of geometric depreciation. The investment process is assumed to be subject to rising marginal costs of installation, with total real investment expenditures in sector equal to the value of direct purchases of investment plus the per unit costs of installation. These per unit costs, in turn, are assumed to be a linear function of the rate of investment. One advantage of using an adjustment cost approach is that the adjustment cost parameter can be varied for different sectors to capture the degree to which capital is sector specific.

The price of labor is determined by assuming that labor is mobile between sectors in each region, but is immobile between regions. Thus, wages will be equal across sectors. The wage is assumed to adjust to varying degrees based on labor market institutions in the different economies. In the long run, labor supply is given by the exogenous rate of population growth, but in the short run, the hours worked can fluctuate depending on the demand for labor. For a given nominal wage, the demand for labor will determine short run unemployment in each industry. This will vary across industries depending on the composition of demand for each sectors good.

The solution of the optimization problem also gives that the rate of gross investment in sector h is a function of "Tobin's q " for that sector. Following the MSG2 model, it is assumed that investment in each sector is a weighted average of forward looking investment and investment out of current profits.

Households consume a basket of composite goods and services in every period and also demand labor and capital services. Household capital services consist of the service flows of consumer durables plus residential housing. Households receive income by providing labor services to firms and the government, and from holding financial assets. In addition, they also receive transfers from the government.

Aggregate consumption is chosen to maximize an intertemporal utility function subject to the constraint that the present value of consumption be equal to human wealth plus initial financial assets. Human wealth in real terms is defined as the expected present value of future stream of after tax labor income of households. Financial wealth is the sum of real money balance, real government bonds in the hand of the public, net holding of claims against foreign residents and the value of capital in each sector. The solution to this maximization problem is the familiar result that aggregate consumption is equal to a constant proportion of private wealth, where private wealth is defined as financial wealth plus human wealth. However, based on the evidence cited by Campbell and Mankiw (1987) and Hayashi (1982)) we follow the approach in the MSG2 model and assume that only a portion of consumption is determined by these intertemporally-optimizing consumers and that the remainder is determined by after tax current income. This can be interpreted as liquidity constrained behavior or a permanent income model in which household expectations regarding income are backward-looking. Either way we assume that total consumption is a weighted average of the forward looking consumption and backward-looking consumption.

Once the level of overall consumption has been determined, spending is allocated among goods and services based on relative prices.

We take each region's real government spending on goods and services to be a fixed share of GDP and assume that it is allocated among final goods (consisting of both domestically produced and imported goods), services and labor in fixed proportions, which we set to 1992 values. Total government outlays include purchases of goods and services plus interest payments on government debt, investment tax credits and transfers to households. Government revenue is generated from sales tax, corporate income tax and personal income taxes, and by issuing government debt. We assume that agents will not hold government bonds unless they expect the bonds to be paid off eventually. This transversality condition implies that the current level of debt will be equal to the present value of future budget surpluses.⁴

The implication of these constraints is that a government running a budget deficit today must run an appropriate budget surplus as some point in the future. Otherwise, the government would be unable to pay interest on the debt and agents will not be willing to hold it. To ensure that the constraint holds at all points in time we assume that the government levies a lump sum tax in each period equal to the value of interest payments on the outstanding debt.⁵ In effect, therefore, any increase in government debt is financed by consols, and future taxes are raised enough to accommodate the increased interest costs. Thus, any increase in the debt will be matched by an equal present value increase in future budget surpluses. Other fiscal closure rules are possible, such as requiring the ratio of government debt to GDP to be unchanged in the long run. These closures have interesting implications but are beyond the scope of this paper.

The seventeen regions in the model are linked by flows of goods and assets. Flows of goods are determined by the import demands described above (based on demand for goods for consumption, investment and government uses).

Trade imbalances are financed by flows of financial assets between countries (except where capital controls are in place). We assume that existing wedges between rates of return in different economies are generated by various restrictions that generate a risk premium on country denominated assets. These wedges are assumed to be exogenous during simulation. Thus when the model is simulated the induced changes in expected rates of return in different countries generate flows of financial capital reacting to return differentials at the margin.

Determining initial net asset positions and hence base-case international capital flows is non-trivial. We assume that capital flows are composed of portfolio investment, direct investment and other capital flows. These alternative forms of capital flows are perfectly substitutable ex ante, adjusting to the expected rates of return across economies and across sectors. Within an economy, the expected return to each type of asset (i.e. bonds of all maturities, equity for each sector etc) are arbitrated, taking into account the costs of adjusting physical capital stock and allowing for exogenous risk premia. Because physical capital is costly to adjust, any inflow of financial capital that is invested in physical capital (i.e. direct investment) will also be costly to shift once it is in place. The decision to invest in physical assets is based on expected rates of return. However, if there is an unanticipated shock then ex-post returns could vary significantly. Total net

⁴ Strictly speaking, public debt must be less than or equal to the present value of future budget surpluses. For tractability we assume that the government is initially fully leveraged so that this constraint holds with equality.

⁵ In the model the tax is actually levied on the difference between interest payments on the debt and what interest payments would have been if the debt had remained at its base case level. The remainder, interest payments on the base case debt, is financed by ordinary taxes.

capital flows for each economy in which there are open capital markets are equal to the current account position of that country. The global net flows of private capital are constrained to zero.

The data used in the AP-GCUBED model comes from a number of sources. Unlike the GCUBED model we have not yet estimated the CES production elasticities of substitution. We currently assume the production function are Cobb-Douglas.

The input-output tables for the Asia-Pacific economies are from the Institute of Developing Economies. The Australian table is from the Australian Bureau of Statistics. In lieu of obtaining input-output tables for the aggregate ROECD region, we currently create the tables for this region based on the U.S. table and adjusted for actual final demand components from aggregate ROECD macroeconomic data. In effect, we are assuming that all countries modeled share the same production technology but differ in their endowments of primary factors and patterns of final demands. This assumption is a temporary necessity while we complete construction of the AP-GCUBED database.

Trade shares are based on the United Nations SITC (Standard Industry Trade Classification) data for 1992 with sectors aggregated from 4 digit levels to map as closely as possible to the SIC (Standard Industry Classification) used in the U.S. input/output data. This data is from the International Economic Databank at the ANU.

The parameters on shares of optimizing versus backward looking behavior are taken from the MSG2 model. These are based on a range of empirical estimates (see Campbell and Mankiw (1987) and Hayashi (1982)) as well as a tracking exercise used to calibrate the MSG2 model to the experience of the 1980s (see McKibbin and Sachs (1991)). It is important to stress that the results in this paper are very sensitive to the range of parameters used in the model. In particular the substitution possibilities in production are important. It is worth stressing that the adjustment cost model of capital accumulation implies that short run changes in inputs for a given relative price change will be lower than the long run substitution possibilities (despite having the same partial substitution elasticities in the short and long runs) precisely because physical capital is fixed in the very short run and therefore substitution possibilities are reduced.

AP-GCUBED is solved using the same software as the MSG2 model. The model has approximately 7,400 equations in its current form with 140 jumping or forward looking variables, and 263 state variables. For further details on the model the reader should refer to McKibbin and Wilcoxen (1995), McKibbin and Bok (1993) and McKibbin and Wong (1998).

3. Results for Trade Liberalization

The results for trade liberalization in each country under each regional grouping are presented in this section. Results are first presented for the longer run outcomes focusing on the year 2020. Next the dynamics of adjustment for various countries are examined in some detail. There are a vast number of results and in this section a subset are presented to illustrate various key points.

To generate the results we first solve the model from 1996 to 2070 to generate a model baseline based on a range of assumptions. Table 3 contains the aggregated tariff rates for each sector and each region in the model based on a WTO tariff database supplied by the Centre for International Economics.

These tariff rates are assumed to be unchanged for the horizon of the baseline simulation. Other crucial assumption needed for generating the baseline include assumptions about population growth and sectoral productivity growth by country as well as fiscal and monetary policy settings. The issue of projection using a model such as the AP-GCUBED model is discussed in detail in Bagnoli et al (1996).

Once the baseline is generated each simulation is run and results are reported as a percentage deviation from this baseline. For each tariff reduction simulation countries are assumed to reduce tariff rates from the levels shown in table 3 to zero over the period specified. In each case industrial economies are assumed to reduce tariffs in equal increments from 1996 through 2010. Developing countries are assumed to reduce tariffs by 2020. Taiwan, Singapore and Korea are assumed to follow the timetable for non developing economies.

It is important to stress that macroeconomic policy is assumed not to respond to undesirable fluctuations in short run economic activity. Monetary policy is assumed to be targeting a stock of nominal money balances in each economy. Fiscal policy is defined as a set of fixed tax rates (apart from a lump sum tax on households that varies to satisfy the intertemporal budget constraint facing the government) and government spending constant relative to simulated GDP. With higher output, tax revenues rise implying a move towards fiscal surplus in each economy. In McKibbin (1996), higher growth meant lower fiscal deficits. In this paper the higher growth leads to higher government spending and therefore fiscal deficits are relatively constant.

Table 3: Initial Tariff Rates

	Agriculture	Energy	Mining	Durable Manufacturing	Non Durable Manufacturing
United States	6.7	0.5	0.0	8.5	26.2
Japan	148.8	1.1	0.6	4.9	59.4
Australia	1.9	0.7	0.7	13.9	15.2
Indonesia	11.0	1.5	2.4	16.4	11.4
Malaysia	104.0	2.5	3.5	13.7	57.4
Philippines	104.0	5.8	10.2	24.1	63.3
Singapore	9.9	2.1	0.0	0.2	9.6
Thailand	107.6	6.9	10.9	33.4	70.5
China	16.7	14.0	18.7	45.1	43.5
Taiwan	12.6	14.3	23.5	39.3	42.1
Korea	105.0	2.8	4.4	16.0	41.0
Hong Kong	0.0	0.0	0.0	0.0	0.0
India	24.0	0.9	3.2	15.7	20.7
ROECD	6.9	0.4	0.2	8.2	16.5

Source: Centre for International Economics aggregations based on WTO/World Bank data.

a. Longer Run Results

Tables 4 through 7 show results for GDP, consumption, investment and exports under the four assumptions about the group of countries undertaking the trade liberalization. The results in each table are the percentage deviation from what otherwise would have occurred by 2020 relative to the baseline projection of the model without any trade liberalization.

First refer to the results for real GDP in Table 4. The first column contains the country names. The second column shows that the percentage deviation in US GDP from own liberalization is -0.04% relative to baseline by 2020. This compares to a gain in GDP of 0.23% under both APEC (column 4) and multilateral (column 6) liberalization. For each country, GDP is higher when liberalization is

Table 4: Percentage Change in real GDP in 2020 from Trade Liberalization

	Own	ASEAN	APEC	Multilateral
United States	-0.04	0.03	0.23	0.23
Japan	-0.95	-0.01	-0.87	-0.86
Australia	0.62	0.01	0.77	0.82
Indonesia	1.58	1.99	6.19	6.93
Malaysia	1.09	1.44	1.77	1.84
Philippines	-0.28	-0.18	1.99	2.26
Singapore	0.64	0.79	0.91	1.09
Thailand	-1.42	-1.14	1.00	1.40
China	0.46	-0.01	0.91	1.01
India	0.24	0.00	0.12	0.49
Taiwan	0.96	0.05	1.80	1.92
Korea	-0.66	-0.04	0.08	0.17
Hong Kong	0.00	0.04	0.16	0.18
ROECD	0.05	0.00	0.07	0.12

Table 5: Percentage Change in Real Consumption in 2020 from Trade Liberalization⁶

	Own	ASEAN	APEC	Multilateral
United States	0.23	0.20	1.89	1.73
Japan	0.35	0.02	0.84	0.89
Australia	1.74	0.06	1.93	2.03
Indonesia	2.86	3.45	9.45	10.34
Malaysia	9.05	10.73	14.61	15.00
Philippines	3.96	4.28	7.09	7.42
Singapore	1.71	3.66	5.86	6.09
Thailand	3.73	4.31	7.10	7.53
China	2.34	0.06	3.88	4.12
India	1.03	0.04	-0.06	1.11
Taiwan	5.06	0.26	10.05	10.74
Korea	1.43	0.02	4.28	4.63
Hong Kong	0.00	0.43	0.09	0.00
ROECD	0.66	0.03	0.30	0.97

⁶ Note that results for consumption and exports are now expressed as percentage deviation from baseline. In earlier versions of this paper they were expressed as percent of GDP deviation from baseline.

Table 6: Percentage Change in Real Investment in 2020 from Trade Liberalization

	Own	ASEAN	APEC	Multilateral
United States	-0.14	0.33	2.84	2.66
Japan	-1.92	-0.12	-1.78	-1.85
Australia	3.55	-0.05	4.39	4.51
Indonesia	3.16	3.37	7.01	7.63
Malaysia	0.47	1.26	2.79	3
Philippines	2.37	2.53	3.5	3.58
Singapore	-0.49	-0.22	0.73	0.88
Thailand	0.4	0.49	1.8	2.01
China	0.62	-0.08	0.75	0.8
India	0.8	-0.03	-0.21	0.73
Taiwan	2.94	-0.11	4.37	4.51
Korea	-0.55	-0.16	0.31	0.36
Hong Kong	0	0	0.52	0.48
ROECD	0.99	-0.01	1.06	2.06

Table 7: Percentage Change in Real Exports in 2020 from Trade Liberalization⁷

	Own	ASEAN	APEC	Multilateral
United States	14.49	0.16	14.63	21.90
Japan	10.08	0.66	13.28	15.24
Australia	8.51	1.36	18.76	21.77
Indonesia	3.00	4.76	13.20	15.78
Malaysia	12.57	15.33	19.92	22.13
Philippines	12.67	14.93	30.95	34.46
Singapore	1.88	3.66	10.97	13.25
Thailand	22.30	24.00	34.93	38.31
China	12.17	0.76	19.77	21.93
India	8.65	2.72	14.76	32.40
Taiwan	11.77	0.95	17.24	18.71
Korea	7.57	0.72	14.17	16.00
Hong Kong	0.00	0.90	8.91	10.85
ROECD	5.35	0.49	6.68	12.08

⁷ Note that results for consumption and exports are now expressed as percentage deviation from baseline. In earlier versions of this paper they were expressed as percent of GDP deviation from baseline

undertaken with other countries in a group than undertaken alone. The highest gains for GDP occur under multilateral liberalization. For some countries (U.S., Japan, Philippines, Thailand and Korea), own liberalization leads to a reduction in GDP. This implies that capital flows out of the liberalizing economy into other economies as a result of the trade reforms. This is not necessarily a negative outcome as can be seen from the results in table 5 for consumption in each economy. All countries have higher consumption by 2020 under unilateral liberalization despite the fact that GDP fell for some countries. This is because the return to capital that is freed up as a result of the liberalization is higher than under baseline but some of this higher return is being earned outside the domestic economy.

The consumption results follow the same pattern as the GDP results as you move across the table from left to right, in the sense that consumption is higher when liberalizing with a group of countries relative to liberalizing alone. This suggests that trade liberalization, at least in the longer run, should be “prisoners delight” in the Garnaut(1996) sense. A country’s own liberalization raises consumption and the liberalization by other countries raises your consumption even more. One point to note from the consumption and GDP comparison is that for some countries the gains from own liberalization more than outweigh the gains to the same country from other countries liberalizing. For example the gains to Australia from APEC liberalization increase Australia’s gain from own liberalization by 11% and multilateral liberalization increases these gains by 17%. In contrast for the United States, own liberalization gains are small and most of the gains come from other countries liberalizing. These relative differences reflect a number of factors including the amount of liberalization being undertaken domestically relative to the amount being undertaken overseas (i.e. the US does not need to do much). It also reflects the degree to which other liberalizing economies are markets for home country products, the composition of home country production relative to the extent of distortions being removed in similar sectors in foreign economies as well as each country’s initial reliance on international trade for income generation. The asymmetries across economies in many of these factors underlay the dispersion of results in tables 4 and 5.

Table 5 illustrates another important point. For members of APEC, liberalization within this regional grouping captures most of the gains from multilateral liberalization because APEC is so large. It should be stressed that many developing countries are not counted in the multilateral liberalization exercise.

Table 6 shows the percentage change in real private investment by 2020 relative to what it otherwise would have been in 2020. As indicated in the results for GDP, physical investment in some economies falls as a result of trade liberalization. This fall in domestic investment is more than offset by a rise in home investment in foreign economies. Overall world investment rises.

Table 7 shows the effect of own versus alternative group liberalizations on real exports of each economy by 2020. In each case for each country, international trade expands. When an individual economy reduces tariffs, the nominal exchange rate depreciates which causes a real depreciation and stimulates demand for exports. This also reflects the falling input costs in export sectors from the reduction in tariffs. In the group liberalizations these exchange rate effects are diminished because as more countries liberalize there are less countries to depreciate against. Nonetheless the stimulus to world trade is reinforced by the demand spillover effects of foreign countries reducing their tariffs and raising their demand for home country exports. In each case more countries liberalizing leads to a larger expansion of exports for each country.

The results for 2020 accord with results from many studies using CGE models apart from the impact of endogenous capital accumulation and savings behavior incorporated in the AP- GCUBED model.

b. Dynamic Adjustment

Now turn to the dynamic adjustment from the time the tariff reductions are announced until 2020. There are a vast amount of results for each country. Rather than presenting pages of numbers a few select results will be presented in order to draw out some key insights.

Figure 1 presents the time path of real GDP for 4 countries: Australia, Taiwan, China and Indonesia. These countries are selected to represent a range of experiences. Australia is an industrialized economy liberalizing by 2010, Taiwan is a developing economy liberalizing by 2010, China is a developing economy liberalizing by 2020 and Indonesia is also a developing country but also part of the ASEAN regional bloc.

The first point to note is that GDP rises in each of these countries in the medium term with the increase rising with the more countries participating. The ASEAN liberalization has a tiny impact on non-ASEAN economies and even for Indonesia leads to small gains relative to own liberalization.

Now focus on the results for Australia in figure 1. In the short run, the credible announcement of future tariff reductions leads to a reduction in GDP as firms begin to restructure in the early periods. The gains to tariff reduction only accumulate over time as tariffs are cut although some of these gains are bought forward through access to forward looking asset markets. In the short run from 1996 through 1997 GDP grows less quickly than base but after 1997 grows more quickly than baseline. By the year 2000 GDP is equal to the baseline GDP and after 2000 is permanently above the baseline. For Australia and a range of countries not shown here, own liberalization is costly in terms of GDP loss in the short term but substantially more beneficial in the medium and long term. Secondly, this figure and other results indicate that the more that other countries liberalize, the smaller the loss in short run GDP and the larger the gain in long run GDP. This is true for all countries in the model. Depending on the discount rate of political leaders this may explain why countries are reluctant to undertake trade liberalization without having foreigners also liberalizing. The problem with this strategy is that although all the short term costs are the result of own liberalization, most of the medium and long term gains are also due to own liberalization. Thus free riding on the liberalization of other countries may be an inferior policy strategy in the medium term. Unfortunately short sighted policymakers would usually choose the no liberalization strategy because of the short term costs of own liberalization.

The results for Australia also apply for each other economy although in some cases such as Taiwan, China and Indonesia, the short run losses disappear quickly. In the case of Indonesia, where there is a lot of growth already in the baseline, the absorption of dislocated resources occurs more quickly.

The results for consumption are shown in figure 2 for the same group of countries. This is similar in many ways to the path of GDP (note the different scales) except that for some countries the large future gains in income, cause consumption to rise more quickly than GDP. These countries are also the countries that experience a trade balance deficit in the early periods of liberalization as consumers borrow from the rest of the world to take advantage of the future income gains. In Australia the pickup in consumption relative to GDP occurs from 2002. Before that year, the Keynesian style business cycle induced by sticky nominal wages leads to a low consumption path for a number of years. Most household consumption is constrained by the short term slowdown in economic activity and the short term rise in unemployment caused when prices fall but nominal wages are sticky. This effect is dampened in other economies by more rapid labor market adjustment.

Figure 1: Effects on GDP of trade Liberalization Under Alternative Regional Groupings 1996 - 2020

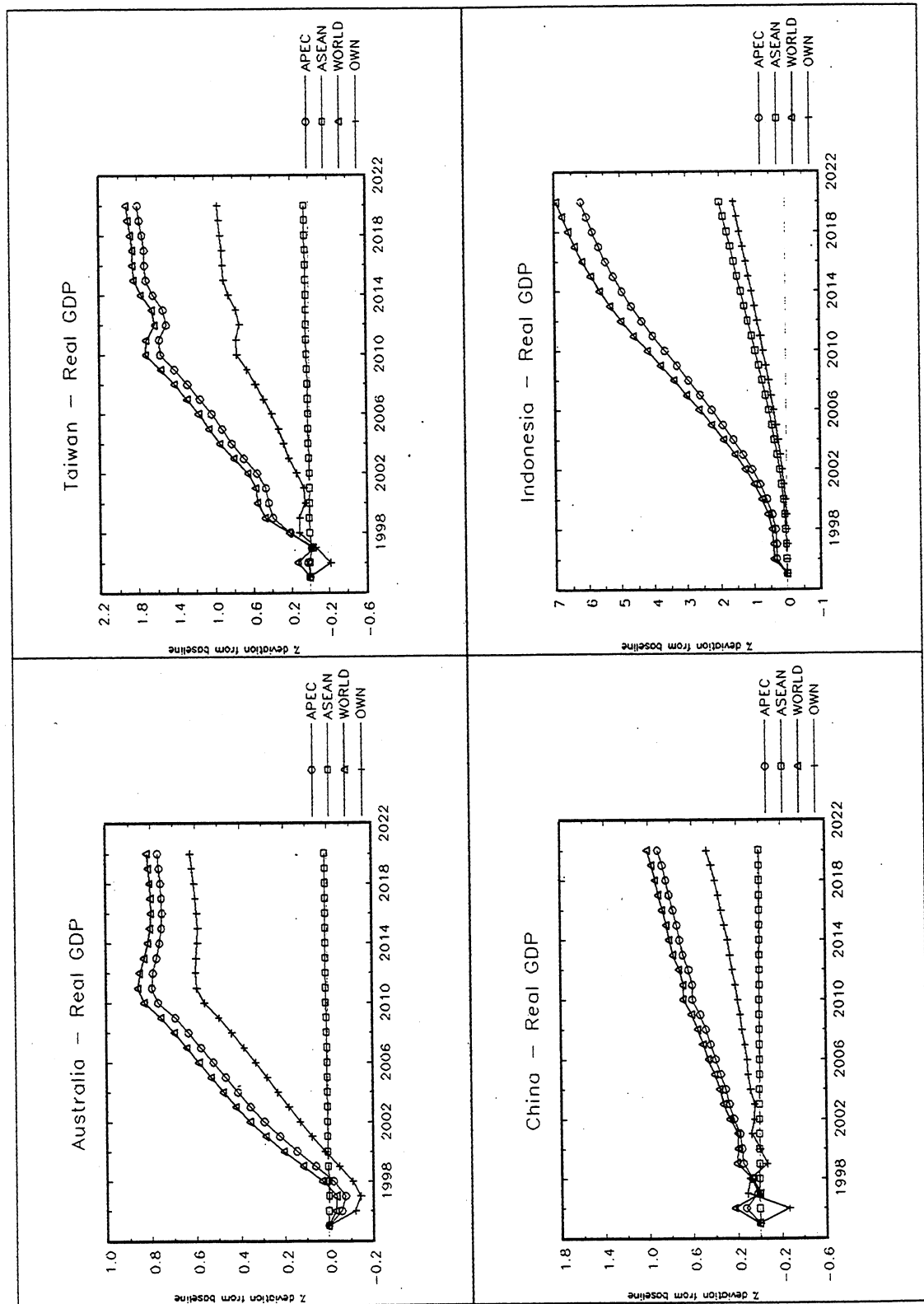
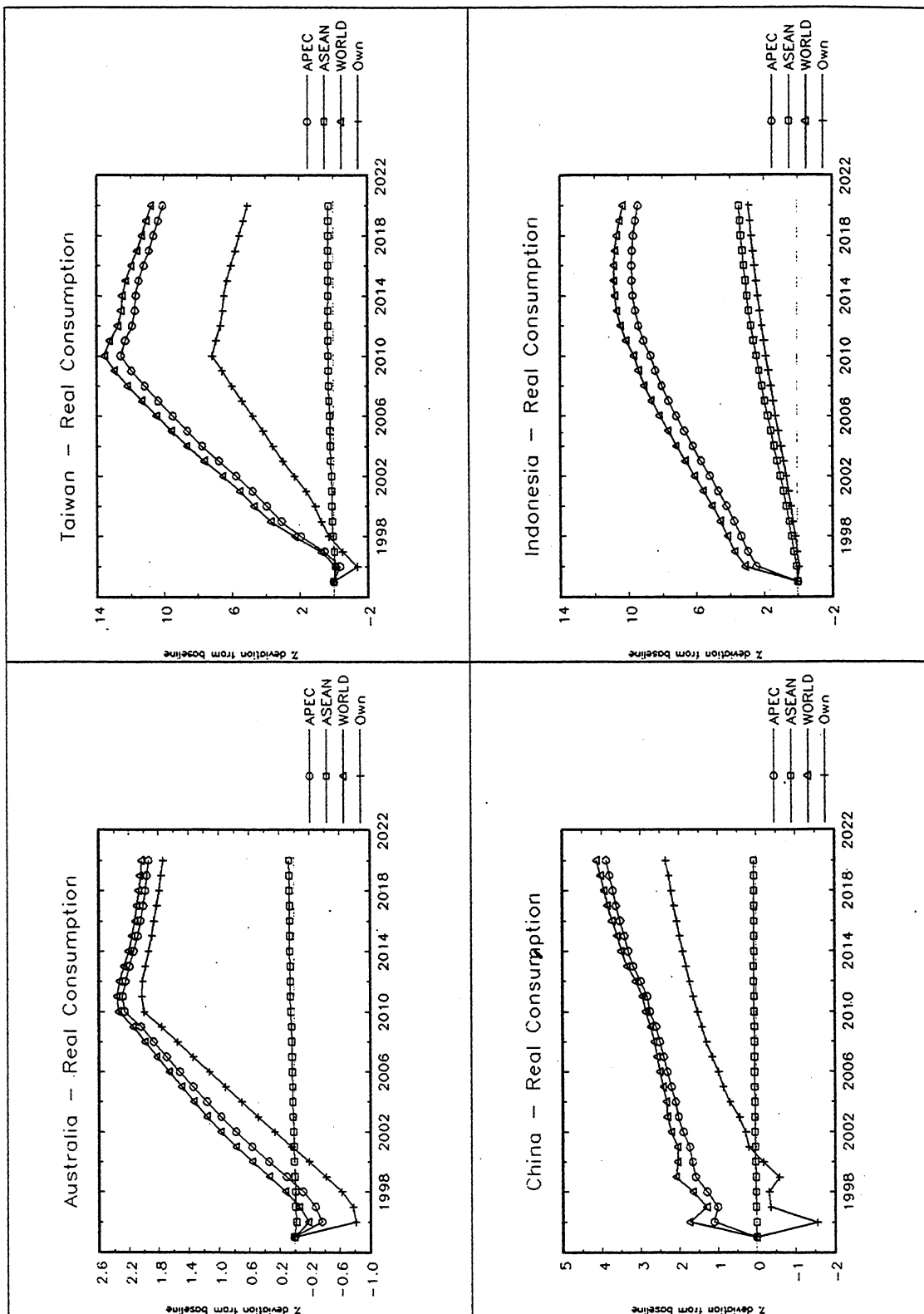


Figure 2: Effects on Private Consumption of Trade Liberalization Under Alternative Regional Groupings 1996-2020



Next it is interesting to look at what adjustment occurs in the trade accounts of a representative economy under own liberalization. Results for changes in exports, imports and the trade balance (as a percent of GDP) for own liberalization in Taiwan are contained in figure 3. When the policy of future tariff reductions is announced in 1996, there is a realization that in the future, the real exchange rate will depreciate. Financial markets are rational in this model and therefore the current nominal exchange rate depreciates in anticipation. With sticky nominal wages, the real exchange rate also depreciates in 1996. This reduces imports initially and increase exports. The trade balance improves slightly. Over time as the tariff cuts are implemented, exports continue to rise through reduced input costs and imports also rise due to the fall in home prices for these imports. The trade balance begins to deteriorate as households raise consumption relative to income in anticipation of future wealth gains and as the fiscal deficit marginally worsens due to the loss in tariff revenue. This borrowing against future income is not concentrated in the first few periods because households in this model are relatively myopic and future income only raises perceived wealth over relatively short time horizons. Once liberalization is complete in 2010, note that the trade balance begins to improve again reflecting the fact that debt accumulated pre 2010 to raise consumption and investment levels must be serviced over time. The trade balance improvement reflects this repatriation of borrowing as well as repatriation of returns to equities from direct foreign investment in Taiwan. While the trade balance improves this is reflected in both higher exports and imports.

Similar qualitative results for own liberalization can be found for the other economies although there are quantitative differences across economies.

Results for the trade balance adjustment in Taiwan under the alternative regional groupings is shown next in Figure 4. The case of own liberalization is the same as that shown in figure 3. In the case of both APEC and multilateral liberalization the deterioration in the trade balance is much greater. In this case the expected gains are also much greater and thus households borrow more to raise consumption and domestic firms borrow more to raise investment. Foreign capital also flows into Taiwan to take advantage of the higher expected returns in Taiwan. The real exchange rate depreciation is smaller in the short run because the inflow of capital tends to bid up the price of the Taiwanese dollar in real effective terms. Similar patterns occur for other economies although those economies undertaking the larger liberalization tend to attract greater capital inflows and countries such as the United States and ROECD regions tend to supply the capital to these liberalizing regions.

5. Conclusion

This paper has offered empirical estimates of the long run gains to trade liberalization for a range of countries primarily in the Asia Pacific region under alternative assumptions about the grouping of countries. It is found that in the medium to long term substantial gains are realized from own liberalization AND additional gains emerge for all countries from other countries' liberalization. Multilateral liberalization leads to larger overall economic gains for each country.

It is also found that the adjustment path to a phased liberalization can exhibit short run costs as resources begin to be reallocated before the trade reforms are implemented. To the extent that this is a problem, liberalization by other countries at the same time as own liberalization helps to reduce the short run adjustment costs. There is an irony for some countries, such as Australia, in that a substantial part of the long run gains are the result of own liberalization however this liberalization is also the source of short run costs. These costs are related directly to the extent of labor market rigidities.

Figure 3: Trade Adjustment in Taiwan During Unilateral Liberalization 1996 to 2010

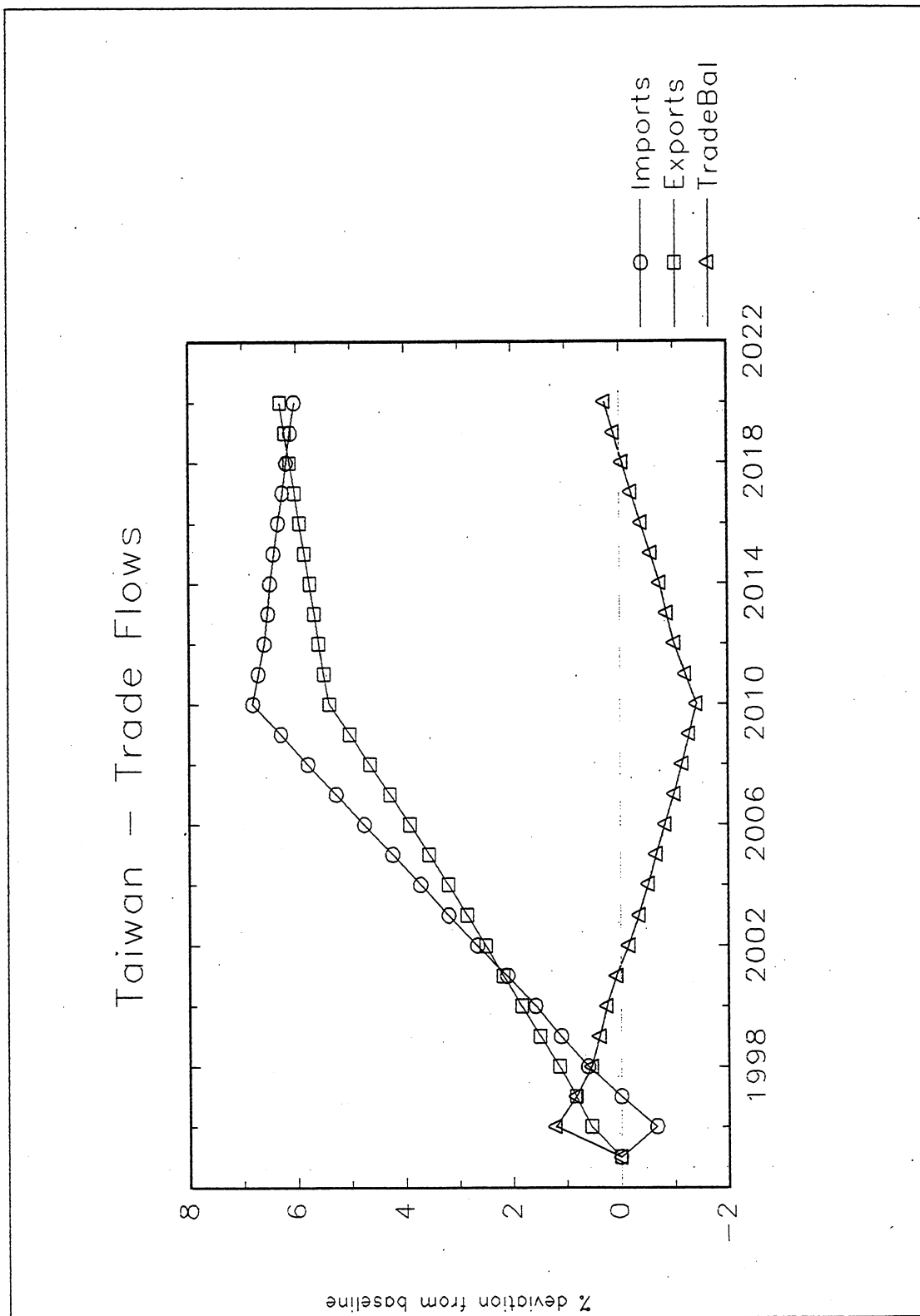
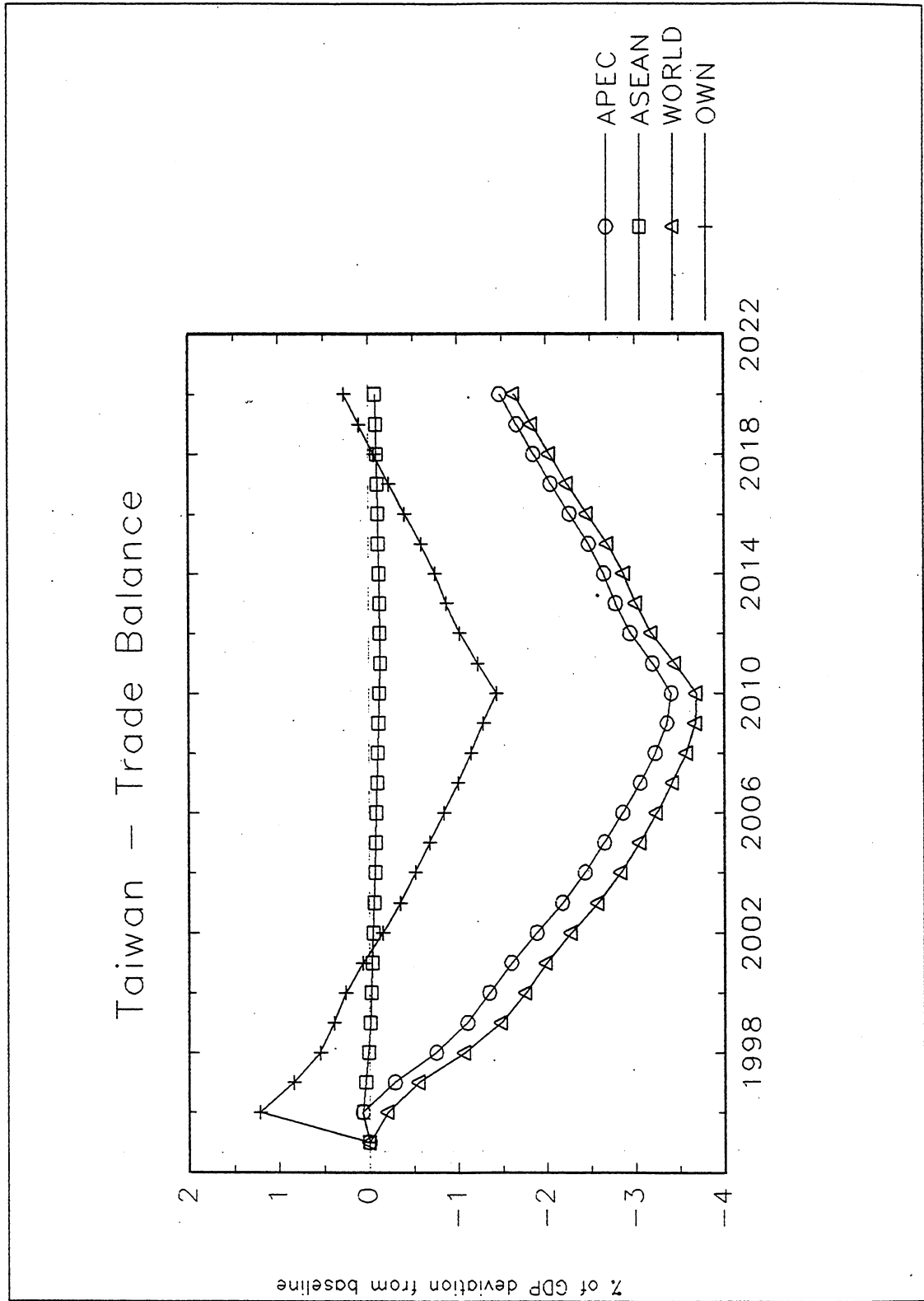


Figure 4: Trade Balance Adjustment in Taiwan Under Alternative Regional Trade Liberalizations



A significant amount of further research is required. The nature of the adjustment path is likely to be importantly affected by the timing of tariff cuts. In this paper a simple linear implementation is assumed but the issue of optimal timing of tariff reductions is not addressed (see Wong (1997)). Also the role for macroeconomic policy adjustment in the short run is suggested by the results for this paper but not directly evaluated. Finally and perhaps most importantly a great deal of sensitivity analysis as well as more precise econometric estimates of key parameters would improve our understanding of the robustness of the results in this paper. Despite these obvious caveats, the results here are raise some new insights for policy makers who must deal with the realities of policy changes in a world of highly integrated global capital markets. Incorporating factors these as well as adjustment dynamics enriches our understanding of a number of key policy issues that standard CGE models have not been able to address.

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Comments by Ralph Bryant on

**Modeling Trade Policies and U.S. Growth: Some Methodological Issues by
Mun S. Ho and Dale Jorgenson**

and

**Regional and Multilateral Trade Liberalization: The Effects on Trade, Investment and Welfare by
Warwick McKibbin**

MR. BRYANT: I think both these modeling efforts here are important. They carefully examine a disaggregated sectoral intertemporal story. This painstaking empirical work does not get the attention or professional gold stars that it deserves. So I am really pleased that these papers are in the conference.

The Ho/Jorgenson paper looks only at the effects on the United States, but the McKibbin paper compares the results of liberalization for other countries. The Warwick paper is interesting, progressing from our own liberalization all the way through to multilateral liberalization. His qualitative conclusions seem the same that Jeffrey Lewis stressed earlier in the afternoon. So let me come to the question of limitations, and turn first to the Ho/Jorgenson model. And indeed, we saw almost nothing about the results from that model of trade liberalization, because Mun talked about the difficult issues in numerical models, of adequately modeling the short run, and then getting long-run convergence to a steady state that makes sense. The discussion is thoughtful, but I am a little uncomfortable with the choices made in their model. Forcing the long-run growth rate to be zero means that income growth is zero, and long-run productivity change, and long-run growth in population and change in labor supply are also zero. As he admitted, these are not acceptable assumptions about the very long run. I am not confident (as he seems to be) that this zero will not have any effect on the results for the first few decades, which we are concerned about. I prefer model convergence to the long run, where you get a positive growth rate in technical change, maybe in demographics. We could be not too comfortable with the thought that population growth rate might go to zero.

When worrying about participation rates, it gets even harder to see that we get exactly to zero in labor supply growth rates. Could we find some way (for example, when we worry about the nonhomotheticity in consumption) to have a positive income growth in the long run. And in the production function, I like to see us converge toward a neutral technical progress with a positive growth rate, rather than converging to zero. Our goal should be to get the models to work this way. Mun spent so much time talking about that. But the Ho/Jorgenson model is unsatisfying, as a one-country model is, for making these assumptions. Prices and output in the rest of the world are exogenous, and the budget deficit and the U.S. current account balance is exogenous.

The model has a lot of intertemporal action in saving and investment, but we should think of the savings and investment identity as having four pieces to it. It says, "Private saving plus a government budget balance is equal to domestic investment and the balance on current account." Of those four pieces, they are freezing two to be exogenous, which means that key channels of interaction between the United States and the rest of the world are just being shut off. And we know from the models G-cubed and others, when you allow for that kind of endogenous determination of the current account, exchange rates, and interest rates, then the cross-border changes are really important.

The Warwick presentation emphasized how much capital could flow, and hence, how big a difference you could have between GDP and GNP, or between GDP and consumption. Let me call New

Zealand a true-blue small open economy from which you would specify the rest of the world as exogenous in all respects. Prices, output employment, the world interest rate would be given, and the home interest rate would be very closely tied to the world interest rate, especially if home-currency-denominated assets were good substitutes for foreign currency denominated assets.

If you think about that model for the United States as a small open economy, the U.S. interest rate is closely tied to the world interest rate. And in those circumstances, for shocks or policy actions originating within the United States, virtually the entire variation in national savings would have to be matched by improvements or deteriorations in the current account. The current account and exchange rate would be the endogenous places where you would see a lot of the adjustment action. So the analyst who is interested in international interdependence, would see the Ho/Jorgenson model as unsatisfactory when it freezes the current account in the budget deficit. The model is a strange mixture of a small open economy model, and something else which does not clearly fall into any of the theoretical categories.

Of course, the United States is not a small open economy. When things like output and employment change in the United States, they have a nontrivial effect on the rest of the world. Changes in U.S. interest rates put significant pressure on world interest rates, and vice versa. Any division of the net change in U.S. national saving between higher domestic investment and a change in current account in the balance of payments is important.

It is difficult to say what that split is. We look at the United States reducing tariffs, and we look at foreign countries reducing tariffs. And the Ho/Jorgenson paper describes results in output and employment within the United States, especially across sectors. Analogous things are going to happen in the rest of the world. If the sequencing differs, enormous changes in current accounts and exchange rates occur. Now that they have the terms of trade changing endogenously, it is hard to model with a single country that freezes everything in the rest of the world. If I could see the results from the Ho/Jorgenson model, where (1) first you tried own liberalization of tariffs, the U.S. acts alone, then you (2) add in the effects of the U.S. reducing nontariff barriers, and then (3) you get to the simulations that you actually have done, which has the rest of the world reducing tariffs, too, with the United States, I think we would probably get more insight into how the model works and does not work if you looked at liberalization by the United States.

Another set of simulations would have been at least as interesting. And then I found myself asking about the possibility of your constructing a "world model," where a world is in quotation marks here. You have the United States as you have modeled it, and you have another country that is a mirror image of the United States, but you work out carefully all the international interactions, so that things like the current account, the whole savings and investment equilibrium, and exchange rate and the interests rates in the countries are endogenously determined. My conjecture is that you would learn something interesting from that, but different from your model, run the way it is. Now, to be fair, I do not know enough about the Ho/Jorgenson model.

But for sure, in the Wilcoxon/McKibbin model, you are not really dealing with the problem that Mun is so worried about, of nonhomothetic demands. So if you have the demand for services within the income elasticity of 1.3, and foods 0.8, I think that that problem is not in yet in the G-cubed model. Another big thing has to do with demographics and aging inasmuch as they may change consumption and saving behavior and have enormous consequences for current accounts and exchange rates.

Now, let us take a couple of more minutes to talk about figure 2, where you can see the chart for consumption. It shows that you get a dip even more striking for consumption than it is for real GDP, say, in Australia. You see short-run costs, in terms of output and consumption, and big long-run gains, but it takes quite a while for the long-run gains to manifest themselves.

But another deep normative question is not addressed. The people that are getting those consumption gains in 2020 are not the same people that are paying the costs in 1997 and 1998 and 1999. When we look at that path for consumption per capita, how do we think about those gains in 2020 compared with the costs in 1998? Should we not think about applying a discount rate? If we look at the present value of the integral of the costs, and we look at the present value of the integral of the gain, then we must ask which discount rate to use? Such a hard normative question with intergenerational equity issues at stake has no simple correct answer. In some work about the consequences of budget actions, the United States may reduce the budget deficit today, and we get the same kind of short-run costs but very big long-run gains. Because the capital stock is higher, production is higher, the net foreign asset position is stronger, so that consumption per capita can be much higher. But how do we weigh those against each other?

I have played with using different discount rates, and if I pick a discount rate that is something like the real interest rate we have today, those big long-run gains in consumption per capita start to look pretty small, because they are discounted back to the present. And those short-run costs that policymakers focus on, as Warwick said quite rightly, look pretty big.

That kind of a discount rate makes the trade-off for policy actions tough. On the other hand, if you use a discount rate of zero, which is implicitly what you do if you look at those graphs and you're not applying a present value of calculation, then of course the integral of the future gains is huge, relative to the short-run costs. And every sensible policymaker should be reducing U.S. tariffs or the U.S. budget deficit.

A last thought: Models like this are full of problems and deficiencies, and people who work on them the most, know about those deficiencies better than those who have not. And empirical models like this might look pretty untransparent or difficult to you, until you start trying to answer the questions by sucking the eraser on the end of your pencil. And then the models start to look very good.

Comments by Delfin S. Go on

**Modeling Trade Policies and U.S. Growth: Some Methodological Issues by
Mun S. Ho and Dale Jorgenson**

The work of Ho and Jorgenson is a serious and significant piece of applied, dynamic general equilibrium modeling. Although dynamic models have become increasingly popular in analyzing the impact of trade policy, what distinguishes the work of Ho and Jorgenson, as part of the on-going, sophisticated program of research that Dale Jorgenson undertakes with several associates, is the unparalleled use of careful econometrics in estimating the equations of the model. While most researchers have been content to choose the parameters and calibrate their models from a single data point, Ho and Jorgenson estimate their parameters and utilize all available, historical observations in the sample period. The amount of data and effort that have gone into the work are clearly enormous. For example, to look at the empirical evidence on substitutability among production inputs, a consistent time series of interindustry transactions tables for the U.S. economy covering the entire period of 1947-85 on an annual basis is constructed. The specifications and estimations of the demand and production system are definitely representative of the best contemporary work in the field and should serve as a reference for others. All this background work, amply cited in the paper, have already been discussed elsewhere; the present paper focuses instead on methodological issues raised in the special context of an intertemporal framework.

A fundamental question often raised regarding applied general equilibrium models is whether the structure imposed by microeconomic theory is in fact reflective of the real world. This is true regardless of whether the model is estimated statistically or calibrated more traditionally with assumed parameters, and whether the model is static or dynamic. Of the several restrictions that are normally imposed to make economic sense or to ensure a stable equilibrium, the assumption of homotheticity is the most serious and most often violated by data. What Ho and Jorgenson showed is that the problem is best tackled by econometric method and that the actual shifts in the U.S. economy, particularly those that are not explained by relative price movements, are difficult to model or calibrate without time-series data. They also showed that many solutions create special problems in a dynamic context. The compromises they take while maintaining theoretical consistency, are quite ingenious. And it is here, I think, where the added discipline required to 'fit' the model to long-term patterns also shines, and the dividends are clear.

Take, for example, the observations that import and export shares in the U.S. economy are rising significantly over time and which appear independent of relative price movements or the general level of economic activity. Their solution is to make use of the logistic curve as an additional exogenous variable to model these biased shifts. This also prevents shares from going over one hundred or below zero percent in an infinite-horizon framework, particularly if a simple time trend is employed instead. Eventually, the biased shifts are removed and homotheticity is returned at the long term steady state, 50 or more years away from the last period of interest. For the same reasons, the logistic function is employed in several places with similar problems - whether it is to model nonlinear engel curves, rapid technical change observed in some industries, or empirical issues relating to the aggregate labor supply deriving from exogenous trends in work hours, female participation, or rise in real wage. Most other dynamic models would simply ignore these patterns and concentrate on the dynamic specifications and calibration. But as Ho and Jorgenson pointed out, ignoring them would not reflect historical observations and can lead to erroneous projections; moreover, incorporating them haphazardly can create problems in a dynamic setting.

The sophisticated blend of theory, flexible forms, awareness of historical shifts, and econometrics should by itself invite greater confidence in Ho and Jorgenson, at least when compared to other dynamic models. In many ways, it does. However, it is still difficult to translate the statistical tests of individual regressions and draw statistical confidence on the model as a whole. What is also gained in incorporating rational expectations makes it harder to simulate extra sample period. Checking if the model tracks history on an annual basis is not easy since every shock will be anticipated, unless of course every shock is unanticipated and the simulation is a string of one period runs. To be sure, these are longstanding issues affecting all dynamic modeling. Some progress is already being made in the statistical inference of simple models (see, for example, Abdelkalek and Dufour (1996). "Statistical inference for computable general equilibrium models, with application to a model of the Moroccan economy." University of Montreal.) But it needs to be extended for elaborate models such as Ho and Jorgenson.

Although employing logistic curves is innovative and reasonable, their presence signifies that there is still much we do not know about what drives the secular trends and how to model them. In the face of great refinement everywhere else in the model, their presence does seem arbitrary. There is also the problem of determining where we are in the curve, in the rapidly rising part or close to the maximum point? For example, Ho and Jorgenson assume that the export share near the end of the sample period is close to the maximum. I think it probably would be difficult to pin down exact positions without comparing distinct experiences or characteristics of several countries.

Does the result make good economic sense? The fear that the high degree of sophistication will make the model opaque and hard to decipher is unfounded. The impact of trade policy and its description is in fact easy to follow and understand. Moreover, the *raison d'être* for intertemporal models is to estimate the dynamic gains of trade policy, which is not possible with static models. Here, Ho and Jorgenson show that a multilateral elimination of both tariffs and non-tariff barriers would lead to a 1.08 % rise in long term consumption, compared to only 0.36 % in the first year. The latter is comparable to the result of a static model without the impact of trade liberalization on capital accumulation and productivity growth. The dynamic impact is most clearly seen in the several figures they provided.

The factor of about 3 between the long- and short-term impact on consumption is indeed a good way of highlighting the difference. The difference seems numerically high until one realizes that the full impact occurs only in the steady state, theoretically in the infinite time, which needs to be discounted properly. This points to the problem of how to compare the welfare gain of a dynamic model to the static case that is without capital accumulation and productivity growth. I wonder if the ratio will be as high if we compare a single welfare measure obtainable from the intertemporal utility with a comparable measure for the static case. For the latter, the first-year result can be assumed to continue in perpetuity and a comparable welfare measurement can be derived by discounting the constant consumption with the rate of time preference. In Devarajan and Go ("The simplest dynamic general equilibrium of an open economy" *Journal of Policy Modeling*, forthcoming), we show that the difference is insignificant for a simple, aggregate dynamic model of an open economy without productivity growth. In an elaborate and disaggregated model with possibilities for significant resource reallocation and for endogenous productivity growth in individual industries depending on relative input prices, the difference may still be numerically high but not by a factor of 3.

Notwithstanding these criticisms, many of which are minor quibbles really, I would like to say that this piece of work gives me enormous pleasure to read and is a perfect antidote to routine and

complacency in dynamic modeling. I look forward to the next improvement of an on-going work that is a standard in applied general equilibrium modeling.

Comments by Michael A. Kouparitsas on

**Regional and Multilateral Trade Liberalization: The Effects on Trade, Investment and Welfare
by Warwick J. McKibbin**

Evaluating and/or predicting the impact of free trade agreements is a difficult task since it involves multisectoral and multilateral analysis. Given the complexity of the problem analysis is typically conducted within the confines of a quantitative model of international trade. Currently, the dominant approach uses detailed simulation models with many households and firms to measure how different industries, household income groups, and countries are affected by changes in trade policy. This approach employs models that are designed to tell us something about the long-run impact of trade policy change. These models ignore any transitional effects associated with the change in trade policy and are therefore appropriately referred to as static trade models.

Although widely used, static models have a number of shortcomings, which in the aggregate understate the benefits of trade liberalization and overstate the sectoral or individual costs of trade liberalization. This has encouraged the development of quantitative dynamic models that tell us something about the short- and long-run effects of changes in trade policy. Warwick McKibbin's analysis of Asian Pacific Economic Cooperation (APEC) trade liberalization adds to this small, but growing literature on dynamic trade policy analysis. The move to dynamic models has opened up a new set of methodological issues relating to: model specification; model evaluation; experiment design; and more directly the appropriate way to measure the welfare effects of trade liberalization. I will use this opportunity to add to this literature by critiquing the method adopted in McKibbin's APEC study.

The centerpiece of any trade liberalization analysis is a measure of the effect that the trade policy will have on the level of economic well-being (typically referred to as economic welfare) both nationally and internationally. In general, measures of economic welfare are theoretical constructs. A widely used measure of the change in liberalization-associated welfare that can easily be obtained from quantitative trade models is a "Hicksian compensating variation." In the context of APEC, the compensating variation is that level of consumption you would need to give households in each country in the pre-liberalized environment to make them indifferent to APEC liberalization. In other words, the compensating variation measures the amount of additional consumption goods households would need to have in the pre-liberalized environment to make them as well off as under APEC liberalization. In simple models where consumption goods are the only thing to enter the household's utility function the compensating variation is simply the change in the level of consumption that flows from the policy change. In more complicated models that allow for leisure or government spending to enter the household's utility function the compensating variation will differ significantly from the change in the level of consumption expenditure. In a static setting a Hicksian compensating variation measures the change in welfare associated with a costless move from the pre-liberalized long-run equilibrium to the liberalized long-run equilibrium. In other words, the level of consumption you would need to give households in the initial long-run equilibrium to make them as well off as under the new long-run equilibrium. The main problem with static trade models is that they ignore the potential costs associated with the transition from one long-run equilibrium to another. A key advantage of dynamic models is that they trace out the time path of all variables in the economy over the short- and long-run. Households in a dynamic model solve an optimization problem that involves maximizing the sum of current and discounted future utility. In this setting King (1990) proposes the following dynamic analogue to Hicks's static compensating variation. The dynamic compensating variation is the permanent change in pre-liberalization consumption that would make households indifferent to the consumption path associated with liberalization.

McKibbin does not measure welfare changes using a dynamic compensating variation measure. He instead measures changes in welfare associated with APEC liberalization as the change in the level of consumption from the pre-liberalized long-run equilibrium and liberalized long-run equilibrium. There are two weaknesses with this approach. First, government expenditure enters the households' utility function in McKibbin's model, so measuring welfare gains by changes in consumption expenditure ignores the welfare effects associated with changes in government spending. My rough calculations suggest that McKibbin's consumption measure overestimates the static welfare gains of trade liberalization. Second, by focusing on long-run comparisons (that is, static welfare analysis) he ignores the transition costs associated with the move to the liberalized equilibrium and in so doing overstates the welfare improvement from APEC liberalization.

In general it is not possible to generate an analytical solution for the class of dynamic multisector trade model used in the McKibbin paper, so they are solved using numerical techniques. A consequence of this is that the model's parameters must be defined before one can apply numerical solution methods. These models are typically parameterized using estimates from previous trade liberalization studies, estimates from the broader econometric's literature, and data on sectoral production and international trade flows. An obvious question that follows from this approach is how well do these models fit historic data. Static models only tell us something about the long-run. Therefore statistics from static models can only be compared to first-moment aspects of the data, which include trade, production, and expenditure shares. This is undesirable because estimates of the output and welfare effects of trade liberalization policies are sensitive to the choice of elasticities of substitution in trade, production, and consumption and the appropriateness of these parameters can only be evaluated by studying the model's second moment characteristics. Second moment features of the data include the variance and covariance of time-series. Dynamic models produce this information, so the choice of elasticities in a dynamic model is easily evaluated by looking at the model's second moment characteristics.

McKibbin's parameterization is based on an ad hoc set of parameters. In many cases his parameter set differs significantly from its static counterparts. For example, static models, such as Whalley (1985), typically assume Leontief production functions, McKibbin adopts Cobb-Douglas production functions. This makes simple comparisons of his work with static models impossible. McKibbin's model evaluation is limited in that he follows the static literature in comparing the model's first moment characteristics with the data, but provides no evaluation of his model on the second moment dimension. In addition, there is no formal sensitivity analysis despite the fact that page 13 states that the paper's results are sensitive to the choice of elasticities of substitution. Clearly, more work needs to be done in this paper and the literature more generally to rectify these deficiencies. Until then the results of McKibbin's paper and all trade liberalization analysis involving quantitative static or dynamic trade models have more qualitative than quantitative content.

In the absence of analytical solutions one learns about the functioning of models by running controlled experiments and analyzing the model's impulse response function. Intuition is developed from these exercises. McKibbin's work is lacking in this regard. One of the more interesting results in his paper which is not fully explained is why unilateral liberalization in his model makes the liberalizing country better off. This result is interesting because we rarely observe unilateral liberalization, except in the case of very small open economies. My own dynamic trade liberalization analysis (see, Kouparitsas, 1997) suggests that the reason why we do not observe widespread unilateral liberalization is that the liberalizing country is made unambiguously worse off. In contrast, my work suggests that we observe a great deal of multilateral liberalization because in that setting all participants are made better off. The intuition for my

work is well described by simple trade theory which argues that countries which have some monopoly power over their exports experience a significant decline in their real income, thorough worsening terms of trade, which makes them worse off. In a multilateral setting their terms of trade deterioration from own liberalization is offset by terms of trade improvements following liberalization in other countries. The only way to rationalize McKibbin's result is an appeal to small country models in which the liberalizing country faces a given world price for its exports and imports. This would require a higher degree of substitution in trade than is assumed in the McKibbin model.

Future dynamic research will no doubt address the methodological issues raised in this note, many of which seem to be an overhang from the static approach. McKibbin must be applauded for adding to the dynamic literature and the broader trade policy debate with a very rich and careful analysis of APEC liberalization. Although this type of work is in its early stages of development, it clearly dominates static trade analysis along many dimensions and should therefore replace it as the dominant paradigm for unilateral and multilateral trade liberalization analysis.

References

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- Kouparitsas, M.A., 1997, A dynamic macroeconomic analysis of NAFTA, Federal Reserve Bank of Chicago Economic Perspectives, January/February, 14-35.
- Whalley, J.B., 1985, Trade liberalization among world trading areas, (MIT Press: Cambridge, MA)

APPENDIX A

REQUEST LETTER

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF THE UNITED STATES TRADE REPRESENTATIVE
WASHINGTON, D.C. 20508



NOV - 1 1996

RECEIVED
OFC OF THE SECRETARY
US INT'L TRADE COMM
96 NOV - 1 P12:48

006028

The Honorable Marcia Miller
Chairman
U.S. International Trade Commission
500 E Street, S.W.
Washington, D.C. 20436

Dear Madam Chairman:

Increasing economic ties among the complex and rapidly growing economies of the Asia Pacific Economic Cooperation (APEC) forum region have heightened awareness of remaining barriers to trade in these 18 members' economies. A substantial share of world trade is conducted in the APEC region. The Administration needs to assess the effects of reducing barriers to APEC trade and investment in a manner which takes into account the full range of barriers and distortions currently in operation.

The APEC agenda has moved beyond traditional concerns of tariff reduction to embrace such issues as non-tariff barriers, deregulation, intellectual property rights, standards and conformance, customs procedures, investment, oligopolistic behavior, services, and government procurement. The recognition that present policies and practices can induce barriers and distortions to trade and investment has led to examination of the potential for trade liberalization through changes in these policies and practices.

The use of general equilibrium, economy-wide modeling of trade liberalization has contributed substantially to public understanding of the benefits of earlier rounds of trade liberalization. Historically, such modeling has focused on liberalization of tariffs and quantitative restrictions to trade whose measurement is relatively straightforward. As trade and investment liberalization now covers a much wider range of issues, it is essential that analysis of such liberalization moves toward unifying expertise in these new issues with traditional modeling tools. Such new modes of analysis will lead to a more comprehensive understanding of current barriers to trade and improved assessments of the benefits of further liberalization.

To aid us in this assessment, under authority delegated by the President and pursuant to section 332(g) of the Tariff Act of 1930, as amended, I request that the Commission institute an investigation to review research analyzing the implications of APEC trade liberalization within the context of a broad understanding of tariff and non-tariff barriers. The Commission's investigation should be confined to reviews of work meeting recognized academic standards.

In conducting this investigation, I request that the Commission organize a public symposium in Washington, D.C. in which economic researchers would be invited to present papers on their research on the economic environment in APEC and the implications for future trade liberalization. Such papers would fall into three categories:

- Papers identifying and assessing the impact of barriers to trade and investment in the APEC region other than tariff barriers and quantitative restrictions. This category includes any other non-tariff barriers as well as policies and practices with respect to regulation, intellectual property rights, standards and conformance, customs procedures, investment, oligopolistic behavior, services, and/or government procurement which materially limit trade and investment but for which there has hitherto been relatively little quantitative assessment.
- Papers emphasizing general equilibrium modeling of APEC liberalization with economy-wide perspectives.
- Papers which bridge and synthesize the above two areas of interest would be particularly welcome.

To promote an objective, critical assessment of this body of inquiry, economic researchers recognized as experts in their fields should be invited to provide a critical assessment of the merits and limitations of the methods and data employed in the research. For balance, there should be a minimum of two such written comments for each invited paper presented in the symposium. Each session will include public discussion of papers and discussants' comments. Furthermore, all papers presented in the symposium are expected to describe any technical assumptions and methods employed to obtain the results presented and provide full details about the data and scenarios evaluated.

I would envisage a report on this investigation consisting of four parts: (1) an assessment of the principal results presented at the symposium, both with respect to identified trade barriers and distortions in the APEC area and with respect to modeling of APEC liberalization, (2) a compilation of the technical papers submitted in the symposium, together with any revisions or comments the authors may make in response to the critiques received in the symposium, (3) a compilation of the written critiques of those papers, and (4) an objective summary and critical evaluation by the Commission of the analytical frameworks and of the main findings of these papers.

Although the research papers presented will likely be of a technical nature, the Commission's summary should address a broader, nontechnical audience. The summary should focus on the major economic findings of the research presented, as well as on any underlying patterns suggested by the body of research results. It should identify areas of broad consensus as well as areas of differences and a critical assessment of these differences. The summary should also detail what has been learned about barriers and distortions currently not subject to formal

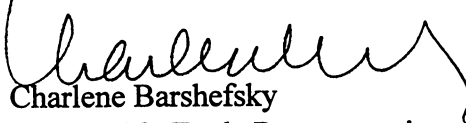
quantitative assessment and how such assessment might be developed in the future. Such a summary will be invaluable to the Administration in assessing the issues raised within APEC negotiations.

Since discussions regarding trade policy changes are ongoing in APEC, I request that the symposium and the Commission's final report, with symposium papers as revised, be made available within 18 months of receipt of this letter.

In view of the outstanding instruction to the Commission on the security classification of reports prepared by the Commission at the request of the U.S. Trade Representative, it is the expectation of this office that the Commission's report will be made available to the public in its entirety. Therefore, the report should not contain confidential business or national security information.

The Commission's assistance in this matter is greatly appreciated.

Sincerely,



Charlene Barshefsky
Acting U.S. Trade Representative

APPENDIX B

FEDERAL REGISTER NOTICE

Commission may also be obtained by accessing its internet server (<http://www.usitc.gov> or <ftp://ftp.usitc.gov>).

SUPPLEMENTARY INFORMATION:

Background.—These investigations are being instituted in response to a petition filed on November 26, 1996, by the Paslode Division of Illinois Tool Works Inc., Vernon Hills, Illinois.

Participation in the investigations and public service list.—Persons (other than petitioners) wishing to participate in the investigations as parties must file an entry of appearance with the Secretary to the Commission, as provided in sections 201.11 and 207.10 of the Commission's rules, not later than seven days after publication of this notice in the Federal Register. Industrial users and representative consumer organizations have the right to appear as parties in Commission antidumping investigations. The Secretary will prepare a public service list containing the names and addresses of all persons, or their representatives, who are parties to these investigations upon the expiration of the period for filing entries of appearance.

Limited disclosure of business proprietary information (BPI) under an administrative protective order (APO) and BPI service list.—Pursuant to section 207.7(a) of the Commission's rules, the Secretary will make BPI gathered in these investigations available to authorized applicants representing interested parties (as defined in 19 U.S.C. 1677(9)) who are parties to these investigations under the APO issued in the investigations, provided that the application is made not later than seven days after the publication of this notice in the Federal Register. A separate service list will be maintained by the Secretary for those parties authorized to receive BPI under the APO.

Conference.—The Commission's Director of Operations has scheduled a conference in connection with these investigations for 9:30 a.m. on December 17, 1996, at the U.S. International Trade Commission Building, 500 E Street SW., Washington, DC. Parties wishing to participate in the conference should contact Larry Reavis (202-205-3185) not later than noon, December 16, to arrange for their appearance. Parties in support of the imposition of antidumping duties in these investigations and parties in opposition to the imposition of such duties will each be collectively allocated one hour within which to make an oral presentation at the conference. A nonparty who has testimony that may aid the Commission's deliberations may

request permission to present a short statement at the conference.

Written submissions.—As provided in sections 201.8 and 207.15 of the Commission's rules, any person may submit to the Commission on or before December 20, 1996, a written brief containing information and arguments pertinent to the subject matter of the investigations. Parties may file written testimony in connection with their presentation at the conference no later than three days before the conference. If briefs or written testimony contain BPI, they must conform with the requirements of sections 201.6, 207.3, and 207.7 of the Commission's rules.

In accordance with sections 201.16(c) and 207.3 of the rules, each document filed by a party to the investigations must be served on all other parties to the investigations (as identified by either the public or BPI service list), and a certificate of service must be timely filed. The Secretary will not accept a document for filing without a certificate of service.

Authority: These investigations are being conducted under authority of title VII of the Tariff Act of 1930; this notice is published pursuant to section 207.12 of the Commission's rules.

By order of the Commission.

Issued: November 27, 1996.

Donna R. Koehnke.

Secretary.

[FR Doc. 96-30823 Filed 12-03-96; 8:45 am]

BILLING CODE 7020-02-P

[Investigation 332-372]

The Economic Implications of Liberalizing APEC Tariff and Nontariff Barriers to Trade

AGENCY: United States International Trade Commission.

ACTION: Institution of investigation, scheduling of public symposium, and call for papers.

EFFECTIVE DATE: November 25, 1996.

SUMMARY: Following receipt on November 1, 1996 of a request from the U.S. Trade Representative, the Commission instituted Investigation No. 332-372, The Economic Implications of Liberalizing APEC Tariff and Nontariff Barriers To Trade, under section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1332(g)). As requested, the investigation will seek to provide an objective, critical report, based on a symposium to be held by the Commission, on the identification and assessment of the impact of nontariff barriers (NTBs) to trade and investment in APEC and on the general equilibrium modeling of

APEC trade liberalization. The Commission will confine the investigation to studies that are already underway or have been recently completed. The Commission will offer the opportunity for all economic researchers selected for participation in the symposium to present their findings on the evaluation of NTBs to trade and investment in the APEC region and the general equilibrium modeling of APEC trade liberalization at the symposium. To promote an objective, critical assessment of this body of inquiry, economic researchers recognized as experts in their fields will also be designated to provide a critical assessment of the merits and limitations of the methods and data employed in the research. The final report will be submitted to USTR approximately six months after the symposium. The final report will consist of four parts: (1) an assessment of the principal results presented at the symposium, both with respect to identified trade barriers and distortions in the APEC area and with respect to modeling of APEC liberalization, (2) a compilation of the technical papers submitted in the symposium, together with any revisions or comments the authors may make in response to the critiques received in the symposium, (3) a compilation of the written critiques of those papers, and (4) an objective summary and critical evaluation by the Commission of the analytical frameworks and of the main findings of these papers.

FOR FURTHER INFORMATION CONTACT:

Nancy Benjamin, Office of Economics, at (202-205-3125). The media should contact Margaret O'Laughlin, Office of External Relations (202-205-1819). Hearing impaired individuals are advised that information on this matter can be obtained by contacting the TDD terminal on (202-205-1810).

Call for Papers

The Commission encourages all parties currently engaged in the evaluation of NTBs to trade and investment among APEC members or the general equilibrium modeling of APEC trade liberalization to present their work at the symposium. The purpose of the symposium is to examine critically, through peer review by recognized experts, studies recently completed or currently being developed that meet recognized academic standards. Research within the scope of this investigation include the following:

- Papers identifying and assessing the impact of barriers to trade and investment in the APEC region other than tariff barriers and quantitative

restrictions. This category includes any other non-tariff barriers as well as policies and practices with respect to regulation, intellectual property rights, standards and conformance, customs procedures, investment, oligopolistic behavior, services, and/or government procurement which materially limit trade and investment but for which there has hitherto been relatively little quantitative assessment.

- Papers emphasizing modeling of APEC trade liberalization with economy-wide perspectives.
- Papers which bridge and synthesize the above two areas of interest would be particularly welcome.

Papers presented at the symposium must meet the following criteria:

(1) All papers must describe any technical assumptions and methods employed to obtain the results presented and provide full details about the data and scenarios evaluated. This requirement is critical because the purpose of the symposium is to provide an objective critical assessment of this research.

(2) The research described in papers emphasizing modeling of APEC trade liberalization must be economy-wide in scope, whether they are multi-country models or single-country models. Economy-wide models include all sectors of the economies represented, though with varying degrees of disaggregation, and allow for explicit analysis of the complex interactions inherent in comprehensive economic policy changes, such as free trade agreements, even when the focus of such analysis is on a particular sector. Research within the scope of this investigation include both (i) computable general equilibrium (CGE) trade policy modeling; and (ii) economy-wide, multi-sector macroeconomic models. The research should take into account the effects of APEC trade liberalization on production, income, trade, employment, and prices. Because scheduling will be tight, persons interested in presenting papers or participating as discussants should submit a curriculum vitae and description of the relevant research to Nancy Benjamin (202-205-3125) or William Donnelly (202-205-3223), Research Division, Office of Economics, U.S. International Trade Commission, by May 30, 1997.

Discussants will be designated to provide detailed written critiques of the papers reviewed. All papers to be presented must meet recognized academic standards. It is also required that all papers be technically transparent and provide technical details about the methods and data

employed to obtain results. The final scheduling of papers and discussants will be made by Commission staff and will be published in a subsequent Federal Register notice by July 15, 1997. All papers must be provided to the Commission in a form ready for distribution 30 days prior to the symposium, and must meet the criteria outlined above.

SYMPOSIUM: The symposium will be held on September 11 and 12, 1997 at the U.S. International Trade Commission, 500 E Street, SW., Washington DC. Members of the public may attend the symposium and there will be an opportunity for brief technical comments on the papers from the audience. Those who would like to attend the symposium are requested to indicate their intention by sending a letter or fax to the Office of Economics, U.S. International Trade Commission (fax no. 202-205-2340) by September 2, 1997.

By order of the Commission.

Issued: November 27, 1996.

Donna R. Koehnke.

Secretary.

[FR Doc. 96-30896 Filed 12-03-96; 8:45 am]

BILLING CODE 7020-02-P

DEPARTMENT OF JUSTICE

Notice of Lodging of Consent Decree Pursuant to the Comprehensive Environmental Response Compensation and Liability Act of 1980 as Amended

In accordance with Department of Justice policy, 28 CFR 50.7 notice is hereby given that a proposed consent decree in *United States v. Farber, et al.*, Civil No. 86-3736, was lodged on November 19, 1996, with the United States District Court for the District of New Jersey. The decree resolves claims against Benjamin Farber in the above-referenced action under the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") for contamination at the Syncon Resins Site in South Kearny, New Jersey (the "Site"). In the proposed consent decree, Mr. Farber agrees to a judgment against him in the amount of \$19 million, agrees to reimburse the Environmental Protection Agency ("EPA") for \$750,000 in past response costs incurred by EPA at the Site, pay the net proceeds of the sale of the Site and pay a percentage of any insurance recovery relating to the Site. This settlement was reached based on an assessment of Mr. Farber's ability to pay.

The Department of Justice will receive, for a period of thirty (30) days from the date of this publication, comments relating to the proposed consent decree. Comments should be addressed to the Assistant Attorney General for the Environment and Natural Resources Division, Department of Justice, Washington, D.C. 20530, and should refer to *United States v. Farber, et al.*, DOJ Ref. Number 90-11-3-116.

The proposed consent decree may be examined at the Office of the United States Attorney, 970 Broad St., Room 502, Newark, New Jersey, 07102; the Region II Office of the Environmental Protection Agency, 290 Broadway, New York, NY 10278; and the Consent Decree Library, 1120 G Street, N.W., 4th Floor, Washington, D.C. 20005, (202) 624-0892. A copy of the proposed consent decree may be obtained in person or by mail from the Consent Decree Library. In requesting a copy, please refer to the referenced case and enclose a check in the amount of \$8.00 for the Consent Decree (25 cents per page reproduction costs), payable to the Consent Decree Library.

Bruce S. Gelber.

Deputy Section Chief, Environmental Enforcement Section, Environment and Natural Resources Division.

[FR Doc. 96-30891 Filed 12-3-96; 8:45 am]

BILLING CODE 4410-15-M

Notice of Lodging of Settlement Agreements Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act

Notice is hereby given that proposed Settlement Agreements in *United States v. H. K. Porter Company, Inc., et al.*, Civil Action No. 96C-579 and *In Re H. K. Porter Company, Inc.*, Bankruptcy No. 91-00468WWB were lodged with the United States District Court for the Western District of Pennsylvania on November 4, 1996 and filed with the United States Bankruptcy Court for the Western District of Pennsylvania on November 6, 1996. The proposed Settlement Agreements resolve the claims of the plaintiff, the United States of America, filed against defendant, H. K. Porter, Inc. ("Porter") in district court and bankruptcy court pursuant to Sections 106 and 107 of the Comprehensive Environmental Response, Compensation and Liability Act ("CERCLA"), 42 U.S.C. 9601 *et seq.*

The Settlement Agreements pertain to the Bollinger Steel Superfund Site ("Site"), located in the Borough of Ambridge, Beaver County, Pennsylvania. They require Porter, a

APPENDIX C

PROGRAM FOR THE SYMPOSIUM

Evaluating APEC Trade Liberalization: Tariff and Nontariff Barriers

September 11-12, 1997

U.S. International Trade Commission

Washington, DC 20436

September 11, 1997--9:00am--Opening remarks by Chairman Miller

9:15am

***Session Chair -- Robert Weiner, George Washington University
SAIS, Johns Hopkins University***

1. Trade Policy Measures

Magnus Blomström
Stockholm School of Economics

Regional Integration and Foreign Direct Investment

David Richardson
Syracuse University

Competition Policies and Trade in an Asia-Pacific Context

Break 10:30am

10:45am

Session Chair -- Robert Hahn, American Enterprise Institute and Harvard University

2. Deregulation

Clifford Winston
Brookings Institution

U.S. Industry Adjustment to Economic Deregulation

Claude Barfield
American Enterprise Institute

Deregulation and Trade

Break 12:00pm

1:30pm--Opening remarks by Commissioner Crawford

1:35

Session Chair --Edward Lincoln, The Brookings Institution

3. Case Studies A

Mark Tilton
Purdue University

Japanese Group Boycotts and Closed Government Procurement as Barriers to Trade

Diane Manifold
U.S. International Trade Commission

Japanese Corporate Activities in Asia: Implications for U.S.-Japan Relations

2:45pm

Session Chair – José Tavares de Araujo, Organization of American States

4. Case Studies B

Yu-Shi Mao
Unirule Institute of Economics

China's Nontariff Trade Barriers

David Ingersoll
U.S. International Trade Commission

*Barriers to Trade in Selected Sectors by
ASEAN Members: How Important are
NTBs? (with Kim Frankena)*

Break 3:45pm

4:00pm

Session Chair -- Dennis Yao, University of Pennsylvania

5. Business Networks

James E. Rauch
University of California, San Diego

*Ethnic Chinese Networks in
International Trade (with Vitor Trindade)*

Gary Hamilton
University of Washington

*The Organization of the Taiwanese and
South Korean Economies: A Comparative
Analysis (with Robert Feenstra)*

September 12, 1997--9:15am--Opening remarks by Vice Chairman Bragg

9:20

*Session Chair -- Carlos Alberto Braga, Telecommunication & Informatics Division
World Bank*

6. Services and Intellectual Property Rights

Walter Park
American University

*Patent Systems in APEC: Role in
Nontariff Trade Barriers and Strategic
Trade Policies*

Ray Trewin
The Australian National University

*Measuring Trade Impediments to Services
within APEC (with Malcolm Bosworth,
Christopher Findlay, and Tony Warren)*

Break 10:30am

10:45am

Session Chair – Maurice Schiff, World Bank

7. Public Practices

Simon Evenett
Rutgers University and The Brookings
Institute

*The Effect of Liberalizing Government
Procurement Practices on APEC Nations’
Imports*

Praveen Dixit
Economic Research Service, USDA

*State Trading in Agriculture: an Analytical
Framework (with Tim Josling)*

1:30pm

Session Chair – Jeffrey Lewis, World Bank

8. General Equilibrium Modeling of Trade Liberalization A

Innwon Park
National University of Singapore

*Strategic Interests of ASEAN in Regional
Trading Arrangements in the Asia-Pacific
Region (with Kong-Yam Tan, and Mun-
Heng Toh)*

Philippa Dee
Industry Commission, Australia

*The Comprehensiveness of APEC’s Free
Trade Commitment*

2:45pm

Session Chair – Ellen E. Meade, Federal Reserve

9. General Equilibrium Modeling of Trade Liberalization B

Shujiro Urata and Hiroki Kawai
Waseda University, Japan

*The Cost of Regulation in the Japanese
Service Industry*

Xinshen Diao
Economic Research Service, USDA

*Liberalizing APEC Trade in Services
(with Nancy Benjamin)*

Break 3:45pm

4:00pm

Session Chair -- Ralph Bryant, The Brookings Institution

10. Dynamic Modeling of Trade Liberalization

Mun S. Ho
Harvard University

*Modeling Trade Policies and U.S Growth:
Some Methodological Issues (with
Dale Jorgenson)*

Warwick McKibbin
The Australian National University
and The Brookings Institution

*Regional and Multilateral Trade
Liberalization: The Effects on Trade,
Investment and Welfare*

APPENDIX D

ABSTRACTS OF THE PAPERS

Abstracts

Regional Integration and Foreign Direct Investment

Magnus Blomström

This paper discusses how regional integration agreements may affect the inward and outward flows of foreign direct investments in the integrating region. It presents a conceptual framework for analysis and evidence from three case studies focused on different kinds of regional integration: North-North integration (Canada-U.S. FTA), North-South integration (NAFTA), and South-South integration (MERCOSUR). The investment response to an integration agreement is found to depend on: the motives for foreign direct investment in and by the country or region in question, the policy environment changes brought about by the agreement, the locational advantage of the country or region, and the competitiveness of local firms in the integrating region.

Competition Policies and Trade in an Asia-Pacific Context

J. David Richardson

"Behind the border" barriers to international trade and investment raise issues from the realm of competition policy. The paper describes the fundamental purposes of competition policies and how they interact with trade and investment policies. It then presents a ranking of competition policy issues according to the degree of economic and political consensus on directions leading to significant welfare improvements. These policy issues are then evaluated according to particular characteristics of the East Asian context. Vertical integration, strategic alliances, regulatory exemptions for certain sectors or regions, and national treatment for investors were identified as especially promising areas for greater convergence of approach among APEC members. The paper then proposes cooperative measures and the negotiation of a Trade-Related Antitrust Measures (TRAMs) agreement as productive, natural outgrowths of current trade dispute resolution.

U.S. Industry Adjustment to Economic Deregulation

Clifford Winston

This paper develops a framework to analyze the long run adjustment of U.S. industries to economic deregulation, highlighting the role of intensified competition, innovations in operations, marketing, and technology, and adjustments to external shocks. I apply this framework to industries that have recently undergone substantial deregulation--airlines, motor carriers, railroads, banks, and natural gas--and conclude that these industries have become far more efficient because of deregulation and provided large benefits to consumers. I conclude that the same adjustment process and positive outcome for consumers will result from the forthcoming deregulation of communications and electricity.

Regulatory Reform and Trade Liberalization

Claude Barfield

This study points out that both trade liberalization and regulatory reform aim to achieve truly contestable markets. After describing the nature and benefits of domestic regulatory reform, the paper proposes harnessing regulatory reform to the purposes of trade liberalization. The basic principles of transparency, national treatment, minimal distortion of trade, and due process are proposed for governing the commitments of WTO members in future negotiations that relate to domestic regulations, such as those affecting services. For regulatory requirements such as product standards and testing, international Mutual Recognition Agreements are recommended as a means to increase market contestability. Eventually the WTO could provide the framework for negotiating an international code of regulatory rules.

Japanese Group Boycotts and Closed Government Procurement as Barriers to Trade

Mark Tilton

This paper draws on my book, *Restrained Trade: Cartels in Japan's Basic Materials Industries* to look at two industries in which Japan has high domestic prices, but few imports and a large volume of exports. The study considers arguments that quality problems account for low import penetration in Japan, but finds it is not a sufficient explanation. Rather, in both the cement and steel cases a host of non tariff barriers block imports into the market. Private barriers, that by rights ought to be dismantled by Japan's Fair Trade Commission, include group boycotts or refusals to deal, in which an industry as a group agrees to deny sales to a firm in order to prevent it from going around the industry's cartel. Far from stamping out private non-tariff barriers, the weight of the Japanese government's policies has been to support and supplement them.

Japanese Corporate Activities in Asia: Implications for U.S.-Japan Relations

Diane L. Manifold

In Japan, certain business practices that are employed by the keiretsu to maintain stability and prices have the effect of raising the costs and risks of doing business for outsiders, and of making it difficult to access the market. A central question about Japanese investments abroad is whether similar organizational structures and practices of keiretsu are in evidence in markets with extensive Japanese investments. If this is the case, what are the likely implications for foreign market access as a result of such activities? There is a possibility that the keiretsu integrated across borders and operating in downstream distribution channels could become exclusive or closed to non-keiretsu companies. In both cases, from an international trade policy viewpoint, this could constitute a "Transplanted Trade Barrier" (TTB) or measures, policies or practices which, when transferred from one economy to another may have the impact of impeding imports or market access. This paper provides additional insight into the organization and functions of keiretsu in selected countries, particularly with regard to their implications for market access. Based on a survey of Japanese companies in three Asian economies, a majority of Japanese affiliated companies have ties to the keiretsu in Japan. The companies include manufactures, suppliers, retailers, banks and trading companies which are involved in the production and distribution of both capital and consumer goods. The "keiretsufication" of certain industries may affect market opportunities in Asia for non-keiretsu suppliers and distributors, including both domestic and foreign firms.

China's Nontariff Trade Barriers

Yu-shi Mao

During the Pre-reform period in China, planned economy determined the policy and practice in foreign trade sector which is used as a means to balance shortage and surplus. Trading companies were not profit oriented. Examples of allocation distortion are given. The state-ownership exacerbate these distortions. After reform began, restructuring in trading sector gradually removed these distortions, but still a lot to be done. Major non-tariff barriers are discussed, especially regarding entry and foreign exchange. All forms of non-tariff barriers are counted according to the "General list of tariff and non-tariff measures for import/export." A section focusing on the efficiency loss due to these barriers are expounded. Finally, the prospect of future changes are expected, particularly on the problem on equity and efficiency in international trade.

Barriers to Trade in Selected Sectors by ASEAN Members: How important are NTBs?

Kim Frankean and David Ingersoll

At the November 1997 Vancouver Ministerial, APEC Ministers pledged to dismantle barriers via pursuit of liberalization in selected sectors. This paper identifies sectors facing barriers in multiple Southeast Asian markets, measures the gap between domestic and imported prices for products within one of those sectors (petrochemicals), and identifies governmental policies in one ASEAN market (Thailand) that may explain such price gaps. It finds that relatively few sectors face barriers across multiple ASEAN markets, that gaps between domestic and imported prices exist for petrochemicals in Thailand that cannot be explained by tariffs alone, and that Thai policy, notably government ownership and support, have played a major role in the Thai petrochemical market. Still, price gaps have shrunk considerably in recent years, in line with a gradual governmental retreat from past policies and steady build-up of domestic capacity.

Ethnic Chinese Networks in International Trade

Victor Trindade and James E. Rauch

Ethnic Chinese networks, as proxied by ethnic Chinese population shares, are found to have a positive effect on bilateral international trade, especially in differentiated products. Evidence is presented indicating that this effect is unlikely to be attributable to any cross-country taste similarity created by ethnic Chinese populations. Ethnic Chinese networks are estimated to increase differentiated product trade for the typical APEC country pair by 30.2 percent in 1990. Some tentative welfare conclusions and even more tentative policy recommendations are also presented.

The Organization of the Taiwanese and South Korean Economies: A Comparative Analysis

Robert Feenstra and Gary G. Hamilton

With case studies of Korea and Taiwan, this paper examines the development and implications of contrasting types of economic structures expressed through different forms of business networks. Detailed firm-level data on the proportions of intra-group sales reveals a small number of large, vertically integrated business groups in Korea and many smaller business groups selling intermediate goods to independent downstream firms in Taiwan. The study then describes a formal model of firms' pricing decisions under conditions allowing entry and exit of both business groups and independent firms. Simulation of the model shows that several configurations of inter-firm networks represent stable outcomes of cross-market pricing decisions, and that two of these outcomes approximate the organization of the Korean and Taiwanese economies. While model results indicate that more than one kind of economic organization is economically rational, nothing in the theory itself would suggest that economic factors alone predispose an economy to any one type of economic organization.

Patent System in APEC: Role in Nontariff Trade Barriers and Strategic Trade Policies

Walter G. Park

Do differences in national patent systems constitute nontariff barriers to trade (NTBs)? Are national patent systems an instrument of strategic trade policy (STP)? Is the harmonization of patent systems necessary to reduce patent-related NTBs and STPs? This paper describes the state of patent laws across APEC nations, examines case studies of patent-related NTBs and STPs, and assesses whether patent harmonization in APEC will help reduce trade distortions. It is argued that some patent reforms are needed to reduced or avoid patent-related NTBs and STPs, that the harmonization of patent laws itself is a limited solution. Patent laws per se are often not the source of trade distortion by the practices of strategic private and public interests. More attention needs to be shifted to competition rules and to

determining which features of patent systems are most conducive to social welfare

Measuring Trade Impediments to Services within APEC

Malcolm Bosworth, Christopher Findlay, Ray Trewin and Tony Warren

The measurement of impediments to trade in services within the APEC region is addressed in this paper. This work builds upon major methodological and practical issues encountered in measuring such impediments in the 1995 PECC Survey of Impediments to Trade and Investment in the APEC Region. Conceptual and measurement issues in deriving partial equilibrium estimates of the effects of service trade impediments are discussed. The feasibility and use of partial estimates, especially price-impact measures, as a means of benchmarking competitive outcomes is examined. A current joint research project involving the Australian National University, the Australian Industry Commission and the University of Adelaide will be drawn upon in which a seven step approach is being developed to identify, evaluate and measure the impact of Australian impediments to services trade. Australia's telecommunications sector is used as a case study of how to measure the domestic economic efficiency gains of regulatory reforms. Some important areas for future work, including the important link to services trade of foreign direct investment controls, are highlighted. Such work should be of interest to economic modellers as it will provide some insights into how partial measures of impediments can be constructively used to model the economic gains from trade liberalisation of services within APEC.

Liberalizing Government Procurement in APEC Nations

Simon J. Evenett

In recent years East Asian nations have increased their expenditures on infrastructure projects, raising the concern that biased government procurement policies are retarding the growth of import volumes. The effect of central government procurement policies (which result in all purchases of tradeable goods being supplied by domestic producers) on bilateral import volumes is modeled and then estimated using data from fourteen APEC nations. These estimates are used to forecast the percentage increase in a nation's import volumes should its central government procurement policies cease entirely to discriminate against foreign suppliers of tradeable goods. The forecasted increases were larger in nations where the ratio of government spending on tradeable goods to its private sector's spending on tradeable goods is larger. Since this ratio differs significantly across the fourteen APEC nations studied, the percentage increase in import volumes due to liberalizing government procurement policies varies from approximately one per cent for Australia, Canada and the United States to approximately twelve per cent for Indonesia, Malaysia and Singapore.

State Trading in Agriculture: An Analytical Framework

Praveen M. Dixit and Tim Josling

This paper highlights some of the recent concerns regarding agricultural state trading enterprises (STEs) and proposes an analytical framework to examine the trade impacts of such entities. Issues associated with discriminatory pricing, exclusive rights to sell and purchase commodities, and unfair competitive advantage vis-a-vis private traders are expected to be major concerns on the export side, while on the import side, the relevance of tariffication in the presence of STEs is being questioned. Our paper proposes that, in most instances, tariff equivalents are the most relevant methodology to quantify the trade impacts of agricultural STEs. But, obtaining empirical information that would enable the calculation of such measures is not an easy task. To that end, a classification scheme which highlights the different types of STEs in terms of their ability to distort trade is proposed. Quantification can then focus on those most likely to impact trade.

Strategic Interests of ASEAN in Regional Trading Arrangements in the Asia-Pacific Region

Innwon Park, Kong-Yam Tan and Mun-Heng Toh

This paper examines the strategic interests of ASEAN countries within APEC when forming regional alliances in the pursuit of trade liberalization. Employing a Computable General Equilibrium (CGE) model, the effects of the various Free Trade Area arrangements on ASEAN as a whole as well as on each individual ASEAN country are analyzed. The model adopts the Almost Ideal Demand System (AIDS) specification for imports. This specification allows import expenditure elasticities to be different from one and allows cross-country substitution elasticities to vary for different pairs of countries. The model also specifies avenues for trade-productivity links. A strong case is made for ASEAN to extend the boundaries of its trade liberalization strategy to a larger regional framework.

The Comprehensiveness of APEC's Free Trade Commitment

Philippa Dee

Comprehensiveness is an important feature of APEC's goal of free and open trade and investment. Both services trade liberalisation and trade facilitation measures add significantly to the benefits from liberalisation of merchandise trade. But were agriculture to be excluded, the APEC region would forgo benefits amounting to fully 60 per cent of the gains from liberalisation of merchandise trade. Not only would the efficient agricultural exporters in the region stand to lose in an economy-wide sense, but so too would the economies that currently maintain relatively high protection of agriculture and rob themselves of gains from improved efficiency and greater specialisation. Comprehensiveness is also important as a principle guiding progress. The efficiency costs of trade restrictions are a function of disparities in assistance, as much as of levels. Liberalisation efforts that focus on lowly or moderately assisted sectors, leaving untouched the high levels of assistance in sensitive sectors, risk increasing the disparities in assistance. The potential costs of this approach are illustrated by examining the impact of some of the likely nominations for 'early voluntary liberalisation' initiatives.

The Cost of Regulation in the Japanese Service Industry

Hiroki Kawai and Shujiro Urata

The Japanese service industry has expanded rapidly, accounting for more than three-quarters of its GDP or employment in the 1990's. However, the Japanese service industry suffers from inefficiency and the prices of services are high. These unfavorable characteristics of the Japanese service industry, which are largely due to extensive regulations, result in substantial costs to the Japanese economy. The simulation results, using a CGE model, indicate that the cost of regulations in the service industry is as large as nine percent of GDP. The cost to an average Japanese consumer would be approximately 270,000 yen or US\$2,300.

Liberalizing Services Trade in APEC: A General Equilibrium Analysis with Imperfect Competition

Nancy Benjamin and Xinshen Diao

This paper presents a general equilibrium investigation of services trade liberalization in APEC using a global multi-country, multi-sector applied general equilibrium model with an imperfectly competitive service sector. Reducing the service sector's nontariff barriers is modeled by eliminating the possibility for oligopolistic firms to price-discriminate between client countries within APEC and lowering the fixed costs of the firms doing service exporting business. The results suggest that services trade liberalization almost systematically reinforces existing trade balances. The increase in demand for intermediate

services tends to reinforce rather than counteract the role of primary factors in determining sectoral comparative advantage. Tariff liberalization in the region has a contrasting effect on trade and welfare compared to services liberalization. The Western APEC members received the greatest welfare gains from services trade liberalization, while the developing economies which start out with the highest levels of tariff protection gained more if only tariffs were eliminated.

Modeling Trade Policies and U.S. Growth: Some Methodological Issues

Mun S. Ho and Dale W. Jorgenson

Most analyses of trade policies are now done using dynamic numerical models. These intertemporal equilibrium models have proven very useful in discussing the link between policy and growth. There are, however, many difficult methodological issues that must be confronted in implementing such models, problems that are absent in traditional static models. We discuss some of these implementation issues and present our approach in dealing with them. We report the result of simulating the elimination of tariff and nontariff in the U.S. to illustrate the effects of considering dynamic effects.

Unilateral Verses Multilateral Trade Liberalization: The Importance of International Financial Flows

Warwick J. McKibbin

This paper explores the impact on economies of trade liberalization under alternative regional and multilateral arrangements: unilateral liberalization; liberalization as part of the ASEAN regional grouping; liberalization as part of the APEC regional grouping; or liberalization as part of a multilateral trade liberalization regime. The paper is based on a Dynamic Intertemporal General Equilibrium model (DIGEM) called the Asia-Pacific G-Cubed Model. It is shown that the long run gains from a country's own liberalization tend to be large relative to the gains from other countries liberalizing although this varies across countries. It is also shown that there is a significant difference between the effects on GDP (production location) and the effects on consumption per capita of the alternative liberalization approaches across countries. The timing of liberalization is also shown to matter. With open capital markets the gains from credibly announced trade liberalization are realized before the reforms are put in place because there is a rise in global investment which raises the global capital stock. In addition there is a reallocation of capital via financial market adjustment. This paper also demonstrates that for some economies, there can be short run adjustment costs to trade liberalization because resources cannot be instantly reallocated across sectors in an economy. These adjustment costs from own liberalization can be reduced if more countries also liberalize. The nature of the dynamic adjustment suggests that other macroeconomic policies may play an important role during the early period of phased-in trade liberalization.

APPENDIX E

LIST OF PARTICIPANTS

List of Participants

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