U.S. International Trade Commission

The Impact of Trade Agreements:

Effect of the Tokyo Round, U.S.- Israel FTA, U.S.- Canada FTA, NAFTA, and the Uruguay Round on the U.S. Economy

Investigation No. TA-2111-1

Publication 3621

August 2003

Address all communications to
Secretary to the Commission
United States International Trade Commission
Washington, DC 20436

U.S. International Trade Commission

Washington, DC 20436
www.usitc.gov

The Impact of Trade Agreements: Effect of the Tokyo Round, U.S.-Israel FTA, U.S.-Canada FTA, NAFTA, and the Uruguay Round on the U.S. Economy

Investigation No. TA-2111-1

Publication 3621 **August 2003**

This report was prepared principally by

Research Division
Hugh M. Arce*, Chief*

Kyle Johnson, *Project Leader*
Russell Hillberry*, Deputy Project Leader*

Primary Reviewers
Arona Butcher, Jan Summers

Major Contributors

Office of Economics
Laurie-Ann Agama, Edward Balistreri, Michael Barry,
Nannette Christ, Judith Dean, Michael Ferrantino, James Fetzer,
Alan Fox, Thomas Jennings, Joshua Levy, and Ted Wilson

Office of Industries
John Davitt, *Industries Coordinator*
Gail Burns, William Chadwick, Jr., Roger Corey, Alfred Dennis,
Lisa Ferens, Cynthia Foreso, Christopher Johnson, Eric Land,
Deborah McNay, Michael Nunes, Laura Polly, Ryan Schroeder,
Steve Wanser, and Linda White

Supporting assistance was provided by:
Cecelia Allen, Monica Reed, and Wanda Tolson

Office of Publishing
Joyce Bookman, Paulette Henderson,
Keven Blake, and John Robertson

PREFACE

This report has been prepared in response to a requirement of the Trade Act of 2002, enacted on August 6, 2002. Section 2111 of that Act requires the International Trade Commission (USITC, or the Commission) to report to the Committee on Finance of the Senate and the Committee on Ways and Means of the House of Representatives regarding the economic impact on the United States of the following trade agreements: the Tokyo Round of Multilateral Trade Negotiations, the United States-Israel Free Trade Agreement, the United States-Canada Free Trade Agreement, North American Free Trade Agreement, and the Uruguay Round Agreements.

The Commission solicited public comment for this investigation by publishing notices in the Federal Register of September 19, 2002 (67 F.R. 182) and March 3, 2003 (68 F.R. 41). A public hearing was held on January 14, 2003. Appendix A contains a copy of section 2111 of the Trade Act of 2002, and of the *Federal Register* notices. Appendix F contains a list of witnesses who appeared at the hearing and a summary of the views of these witnesses and other interested parties who submitted written statements.

ABSTRACT

This report has been prepared in response to a requirement of the Trade Act of 2002 (19 U.S.C. 3811), enacted on August 6, 2002.[1] Section 2111 of that Act requires the International Trade Commission to report to the Senate Finance Committee and the House Ways and Means Committee regarding the economic impact on the United States of the following trade agreements: the Tokyo Round of Multilateral Trade Negotiations, the United States-Israel Free Trade Agreement, the United States-Canada Free Trade Agreement, North American Free Trade Agreement, and the Uruguay Round Agreements.

Assessing the economic impact of the five specified agreements on the United States is complicated by the difficulty in quantitatively specifying many of the actual policies implemented by the agreements, by the difficulty in disentangling these effects from the many other changes that have taken place over the past 25 years affecting the national economy, and by the difficulty of isolating the effects of the agreements from each other, since their implementation often overlaps. Nevertheless, it is quite clear that the major multilateral agreement (the Tokyo and Uruguay Round Agreements) have had more important effects on the economy than have the preferential agreements (U.S.-Israel, U.S.-Canada, and NAFTA). Further, measurable trade policy changes such as tariff reductions have had a large effect on trade growth, but they have accounted for less than half of the overall growth in trade. After accounting for the effects of trade policy, the residual growth in trade (over half) would be due to changes in population, productivity, technological progress, or other trends.

Findings contained in the report are derived from several types of analysis. Most importantly, an extensive review of economic literature covers most of the direct and indirect effects of trade policy on the U.S. economy. An analysis of trends in industry trade, output, and employment examines linkages between these trends and provisions of the trade agreements. Original empirical research describes the growth of trade with Mexico in response to the preferences that that country receives under NAFTA and the effects of trade policy in generating new trade flows. Also, an innovative simulation model and data base, applied consistently to the five agreements, provides insight into the relative magnitudes of their effects and provides a calculation of the scale of these effects derived from plausible assumptions in a theory-based framework.

[1] Pub. L. 107-210, 116, 2111, Stat. 933, 1021.

CONTENTS

CONTENTS—*Continued*

CONTENTS—*Continued*

CONTENTS—*Continued*

Page

CONTENTS—*Continued*

CONTENTS—*Continued*

CONTENTS—*Continued*

CONTENTS—*Continued*

CONTENTS—*Continued*

CONTENTS—*Continued*

CONTENTS—*Continued*

CONTENTS—*Continued*

CONTENTS—*Continued*

Page

Tables—*Continued*

CONTENTS—*Continued*

Page

Tables—*Continued*

CONTENTS—*Continued*

Page

Tables—*Continued*

Figures

CONTENTS—*Continued*

ITC READER SATISFACTION SURVEY

The Impact of Trade Agreements: Effect of the Tokyo Round, U.S.-Israel FTA, U.S.-Canada FTA, NAFTA, and the Uruguay Round on the U.S. Economy

The U.S. International Trade Commission (USITC) is interested in your voluntary comments (burden less than 10 minutes) to help assess the value and quality of our reports, and to assist in improving future products. Please **return survey by facsimile (202-205-2340) or by mail** to the USITC, or visit the USITC Internet home page (*http://reportweb.usitc.gov/reader_survey/readersurvey.html*) to electronically submit a Web version of the survey.

(Please print; r*esponses below not for attribution):*

Your name and title: ______________________________

Organization (if applicable): ______________________________

Which format is most useful to you? ❑ CD-ROM ❑ Hardcopy ❑ USITC Internet site

Circle your assessment of each factor below: **SA** = strongly agree, **A** = agree, **N** = no opinion, **D** = disagree, or **SD** = strongly disagree.

Value of this report:					
▶ Statistical data are useful	SA	A	N	D	SD
▶ Other non-numerical facts are useful	SA	A	N	D	SD
▶ Analysis augments statistical data/other facts	SA	A	N	D	SD
▶ Relevant topic(s)/subject matter	SA	A	N	D	SD
▶ Primary or leading source of information on this subject	SA	A	N	D	SD
Quality of this report:					
▶ Clearly written	SA	A	N	D	SD
▶ Key issues are addressed	SA	A	N	D	SD
▶ Charts and graphs aid understanding	SA	A	N	D	SD
▶ References cite pertinent sources	SA	A	N	D	SD

Other preferred source of information on this subject: ______________________________

Specify chapters, sections, or topics in report that are most useful: ______________________________

____

____

Identify any type of additional information that should have been included in report: ______________________________

____

____

Suggestions for improving report: ______________________________

____

____

Please update your mailing and electronic addresses below (voluntary)-

Mailing address: ______________________________

City, state, and zip code: ______________________________

E-mail address: ______________________________

OMB No.: 3117–0188

FOLD

UNITED STATES
INTERNATIONAL TRADE COMMISSION
WASHINGTON, DC 20436

OFFICIAL BUSINESS
PENALTY FOR PRIVATE, USE $300

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 12840 WASHINGTON, DC

POSTAGE WILL BE PAID BY ADDRESSEE

U.S INTERNATIONAL TRADE COMMISSION
500 E STREET, SW.
WASHINGTON, DC 20277–2840

ATTN:
OFFICE OF ECONOMICS
The Impact of Trade Agreements: Effect of the Tokyo Round, U.S.-Israel FTA, U.S.-Canada FTA, NAFTA, and the Uruguay Round on the U.S. Economy

Executive Summary

Section 2111 of the Trade Act of 2002[1] directs the U.S. International Trade Commission to report to the Senate Finance Committee and the House Ways and Means Committee regarding the economic impact on the United States of the United States-Israel Free Trade Agreement, the United States-Canada Free Trade Agreement (CFTA), the North American Free Trade Agreement (NAFTA), the Uruguay Round Agreements, and the Tokyo Round of Multilateral Trade Negotiations.[2] These agreements were negotiated and ratified under so-called "fast-track" authority,[3] which authorized the President to negotiate trade agreements on behalf of the United States. Fast-track authority also defined procedures for Congressional oversight of the negotiations and for Congressional input into the drafting of implementing legislation, and obliged Congress to vote to either accept or reject the implementing legislation without amendment.

A number of analytical challenges complicate measurement of the economic effects of trade agreements. Nonetheless, a broad body of economic research can be brought to bear on the issue. The research suggests that these trade agreements contributed to the growth in U.S. trade, but that other sources of trade growth were probably at least as important as the trade agreements. Research reviewed in this report links trade growth to higher average living standards, increased productivity, and increased earnings inequality. Direct links between the trade agreements and these phenomena are much weaker. A number of issues warrant further research, including the effects of unmeasured policy changes and growth in foreign outsourcing.

---

[1] "Not later than 1 year after the date of enactment of this Act, the International Trade Commission shall report to the Committee on Finance of the Senate and the Committee on Ways and Means of the House of Representatives regarding the economic impact on the United States of...

(1) The United States-Israel Free Trade Agreement

(2) The United States-Canada Free Trade Agreement

(3) The North American Free Trade Agreement

(4) The Uruguay Round Agreements (and)

(5) The Tokyo Round of Multilateral Trade Negotiations," Pub. L. 107-210, 2111, 116 Stat. 933, 1021

[2] The specific provisions of the agreements that emerged from these negotiations are detailed in chapter 2.

[3] The Trade Act of 2002 re-authorized fast track procedures along with additional requirements under the name "Trade Promotion Authority."

Chapter 1 of the report provides an overview of the study. Chapter 2 provides a review of the agreements' negotiations and commitments, and of the historical settings in which the agreements were negotiated. Chapter 3 provides a review of developments in the U.S. economy since 1974, the year Congress first authorized fast-track authority. In chapters 4-8, a variety of analytical techniques are used to assess the economic impact of the trade agreements. Information in these chapters can be brought to bear on eight questions of interest to trade policy makers:

- What complicates measurement of the economic impact of trade agreements?
- How large were the relative and absolute economic impacts of the agreements?
- To what degree are trade policy changes responsible for observed changes in the level and composition of U.S. trade?
- How has increased trade affected the distribution of wages in the United States?
- How has increased trade affected economic growth and measures of firm productivity?
- How have the trade agreements affected specific industries?
- What are interested party views about the effects of the agreements?
- What are the open questions and areas of ongoing research?

What complicates measurement of the economic impact of trade agreements?

Three important analytical challenges complicate measurement of the impact of trade agreements. First, the agreements considered in this report contain a number of policy changes that are difficult to measure. Most quantitative exercises focus on the role of tariff changes and changes in measurable nontariff barriers. Such studies do not capture the often significant effects of changes in unquantified non-tariff barriers, services and other non-quantifiable measures. Second, a number of technological, economic, and political changes have contributed to trade growth in the years since the negotiation each of these agreements was first authorized. Isolating the effect of trade agreements on trade growth in the midst of these other changes is difficult. Third, changes in the domestic economy that are sometimes attributed to trade growth may have other causes, such as changes in domestic economic policy or technological innovation. Any assessment of the effect of trade agreements must acknowledge the aforementioned difficulties.

An important feature of the trade agreements considered in this report is that they obliged the signatories to undertake significant policy changes in addition to tariff reduction. Nontariff policy changes included the removal of quantitative restrictions on trade, harmonization of customs procedures, agreements on scientific standards and other technical barriers to trade, disciplines on future trade policy, agreements on domestic and trade-related policies such as subsidies and government procurement, and agreements on trade-related investment measures and trade-related intellectual property rights. Measurement difficulties preclude quantitative assessments of the economywide impact of these policies. Consequently, most quantitative exercises will likely understate the economic effects of the five agreements. Chapter 5 identifies the sectors in which unquantified policy changes were important.

The agreements were not the only source of growing U.S. trade. A number of countries, including China, India, and Mexico, undertook significant unilateral economic reforms that led to greater participation in world markets. New transportation and communication technologies also facilitated trade. Growing incomes in the United States and in the rest of the world were another source of trade growth.

Growing trade was not the only source of significant U.S. economic change, and it is difficult to isolate the effects of trade growth from domestic changes. Chapter 3 reviews other significant changes to the U.S. economy, and discusses their relevance for measuring the effects of trade policy changes. Technological innovation, U.S. policy changes in other arenas, and demographic changes are among the more significant issues that masked the effects of trade policy changes.

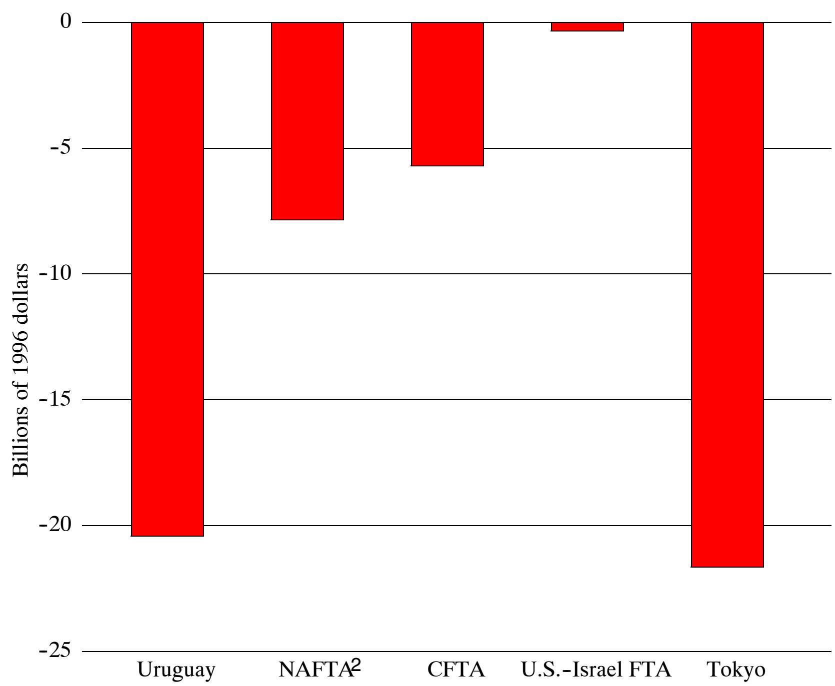
How large were the relative and absolute economic impacts of the agreements?

Chapter 7 reports the results of a numeric simulation that imposes pre-Tokyo Round trade barriers on an economic model of the United States. The model provides a consistent framework for evaluating the economy-wide effects of the measurable trade policy changes associated with the respective agreements. The primary value of the simulation is that it provides a succinct description of the agreements' relative economic impact; the agreements are measured by their effect on economic welfare.[4]

Figure ES-1 shows the incremental impact in 2001 of reimposing the quantifiable trade restrictions (tariffs and quantified non-tariff barriers only) eliminated by each of the trade agreements. The multilateral

[4] Welfare is a comprehensive measure that represents the income loss to U.S. citizens that would be equivalent to the economic impact of removing the agreements. Welfare is a net measure that includes all the positive and negative impacts of trade policy changes. This is not to say that specific measures presented are precise. Including other features in the model, such as scale economies or adjustment frictions, would affect the estimated welfare impact of removing the agreements.

Figure ES-1
Simulated marginal welfare impact of removing agreements in 2001[1]



[1] Displays the incremental impact in 2001 of reimposing the quantifiable trade restrictions eliminated by each of the agreements. The policies are imposed on a numeric model of the U.S. economy.

[2] Considers only the effect of Mexican policy changes and U.S. policy changes with respect to Mexico.

Source: USITC.

agreements–the Tokyo and Uruguay Round Agreements–likely had substantially larger impacts on the U.S. economy than the three preferential agreements. Because trade policy changes in the multilateral agreements apply to a larger share of U.S. trade and to a large number of trading partners, the measured economy-wide effects are larger than the effects of the preferential agreements. Similarly, the effects of NAFTA and CFTA are much larger than the effects of the U.S.-Israel FTA because U.S. trade with Mexico and Canada is much larger than trade with Israel. One important reason that the measured effects of NAFTA exceed those of CFTA is that Mexican tariff cuts in NAFTA were larger than the Canadian cuts under CFTA. The Uruguay Round Agreements and NAFTA have not yet been fully implemented, so the economic impact of these agreements is likely to be somewhat larger in the future.

Although model results are best understood as measures of the agreements' relative impacts, they may also be used as estimates of the economic effects of the quantifiable policy changes in the agreements. The model relies on particular assumptions about underlying economic behavior in the United States economy. The assumptions in the model used here are conventional, and the results are best understood as a conservative estimate of the effects of the agreements. Under the assumptions of the model, U.S. economic welfare in 2001 would have been $56 billion[5] lower (approximately 0.6 percent of U.S. gross domestic product (GDP)) if the measurable trade barriers (e.g., tariffs) eliminated by the trade agreements were reimposed.

To what degree are trade policy changes responsible for observed changes in the level and composition of U.S. trade?

Between 1974 and 2001, the value of U.S. exports and imports grew from $0.5 trillion to $2.5 trillion. Trade agreements were one of many factors that contributed to trade growth. Estimates of the direct effect of trade policy changes on trade growth attribute 15 to 25 percent of the historical increase in U.S. trade across all sectors to tariff reductions. These estimates encompass econometric estimates from the literature[6] and the Commission's simulation results in chapter 7. Chapter 8 notes that trade agreements may also increase the variety of traded goods as well as the volume of trade.

Other methods that attempt to assess indirect channels through which trade agreements may affect trade yield higher estimates of the share of historical trade growth explained directly or indirectly by liberalization. These indirect channels include outsourcing[7] and scale economies in shipping.[8] As discussed in chapter 6, trade agreements may also increase trade by reducing uncertainty about future trade policy. Though widely recognized, the role of reduced uncertainty about future trade policy in increased trade is difficult to quantify directly.

Preferential trading arrangements appear to have had a significant impact on the pattern of U.S. trade. Chapter 6 finds that the tariff cuts associated with

---

[5] All dollar figures are inflation adjusted, and reported in 1996 dollars.

[6] Scott L. Baier and Jeffrey H. Bergstrand, 2001, "The Growth in World Trade: Tariffs, Transport Costs, and Income Similarity", *Journal of International Economics*, vol. 53, pp 1-27.

[7] Kei-Mu Yi, "Can Vertical Specialization Explain the Growth in World Trade?" forthcoming in *Journal of Political Economy.* Draft available at *http://www.newyorkfed.org/rmaghome/economist/yi/pubs.html*, downloaded March 20, 2003. Using a model that links tariff reductions and foreign outsourcing, Yi estimates that as much as 53 percent of historic U.S. trade growth may be due to tariff reductions.

[8] David Hummels and Alexandre Skiba, "A Virtuous Circle? Regional Tariff Liberalization and Scale Economies in Transport," 2002, forthcoming in *FTAA and Beyond: Prospects for Integration in the Americas*, Inter-American Development Bank.

NAFTA explained approximately 1/3 of the growth in the Mexican share of U.S. imports from 1990-2001. Chapter 6 also finds that the average U.S. share of Mexican imports also rose as a result of NAFTA, but the effects of NAFTA were offset by the devaluation of the peso against the dollar.

How has increased trade affected the distribution of wages in the United States?

A widely noted phenomenon of the last two decades has been the increasing gap between wages paid to college-educated workers and wages paid to workers with a high school diploma. Evidence reviewed in chapter 3 indicates that workers with a college degree earned 57 percent more than high school graduates in 1975 and 111 percent more in 1999. The wage distribution across other measures of skill also increased over the period. In manufacturing, earnings of nonproduction workers were 53 percent higher than earnings of production workers in 1977 and 78 percent higher in 2000.

A large literature based on a standard trade modeling framework indicates that approximately 10 to 20 percent of the growth in the skilled wage premium over the last two decades can be attributed to international trade. These studies usually attribute most of the growing skill premium to technological change. Other, more controversial estimates attribute a larger share of the growth in the skill premium to international trade. One innovative contribution estimates that 40 percent of the growth in the wage premium may be attributable to a combination of international trade and foreign outsourcing.[9]

Most studies of the wage distribution evaluate the impact of increased trade, not the effects of trade policy changes. Other sources of trade growth, particularly developing country entry into world markets, may have been more important than trade policy changes in increasing the wage gap between skilled and unskilled workers. One study reviewed in chapter 4 finds no statistically significant effects of tariff reductions or falling transportation costs on wage inequality.[10] In this study, falling prices of labor intensive imports appear to have been much more important than tariff reductions.

How has increased trade affected economic growth and measures of firm productivity?

Productivity growth is a key determinant of a country's long-term standard of living. As chapter 3 notes, inflation-adjusted U.S. per capita GDP rose from $19,163 to $32,352 between 1974 and 2001. During that period, private sector labor productivity rose by 69 percent. Labor productivity in manufacturing was up 132 percent over the same period. Chapter 3 reviews a number of

---

[9] Robert C. Feenstra and Gordon H. Hanson, "The Impact of Outsourcing and High Technology Capital on Wages: Estimates for the United States, 1979-1990," *Quarterly Journal of Economics*, vol. 114, No. 3, August 1999, pp. 907-940.

[10] Jonathan E. Haskel and Matthew J. Slaughter, "Have Falling Tariffs and Transportation Costs Raised U.S. Wage Inequality?" *Review of International Economics*, forthcoming September 2003.

developments in the U.S. economy that might have contributed to labor productivity growth, including technological change, an increasingly educated work force, and higher rates of capital investment. Chapter 4 reviews literature investigating the possibility that increased trade and/or reduction in trade barriers contribute to productivity growth.

Cross-country studies of trade and economic growth ask if countries with lower trade barriers or more trade experience faster economic growth than countries with high trade barriers or less trade. In 1997, the Commission determined that the cross-country evidence linking trade and economic growth was mixed.[11] Subsequent studies have found positive links between more open trade policies and economic growth.[12] Critics argue that the link between trade policy and economic growth is still unproven.[13]

A nascent body of literature uses firm level data to consider the effects of trade and trade policy changes on firm behavior. Evidence from U.S. data suggests that more productive firms tend to become exporters. Evidence that becoming an exporter causes a firm to become more productive is mixed. The available evidence suggests that firms become more productive in the years prior to exporting, and in the initial year of exporting. There is little conclusive evidence that becoming an exporter raises a firm's long-term rate of productivity growth.[14] A subsequent study of U.S. data finds that industries with larger reductions in trade costs (tariffs and transportation costs) experienced faster productivity growth.[15] Studies using developing country data have found that industries competing most directly with imports experience the largest productivity increases after liberalization,[16] but there are not yet any studies of U.S. firm level data on this topic.

---

[11] U.S. International Trade Commission, *The Dynamic Effects of Trade Liberalization: an Empirical Analysis*, Publication No. 3069, 1997.

[12] Richard E. Baldwin and Elena Seghezza, "Testing for Trade-Induced Investment-Led Growth," National Bureau of Economic Research Working Paper No. 5416, 1996.

[13] Francisco Rodriguez and Dani Rodrik, "Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence," National Bureau of Economic Research Working Paper No. 7081, 1999.

[14] Andrew Bernard and J. Bradford Jensen, "Exceptional Exporter Performance: Cause, Effects, or Both?" *Journal of International Economics*, vol. 47, 1999, pp. 1-25.

[15] Andrew Bernard, J. Bradford Jensen, and Peter K. Schott, "Falling Trade Costs, Heterogenous Firms and Industry Dynamics," National Bureau of Economic Research Working Paper No. 9639, April 2003.

[16] See, for example, Nina Pavcnik, "Trade Liberalization, Exit and Productivity Improvements: Evidence from Chilean Plants," *Review of Economic Studies*, vol. 69, 2002, pp. 245-76.

How have the trade agreements affected specific industries?

Economic theory suggests that increased trade changes the composition of domestic output. All else equal, trade agreements should cause exporting sectors' share of output to increase, and import-competing sectors' share of output to decrease. Changes in industry shares of domestic output also have causes unrelated to trade agreements. The report takes two approaches to isolating the effects of trade policy on industry level output.

Chapter 5 examines the historical experiences of 10 sectors of the economy. Most sectors experienced considerable changes not directly related to trade policy, and the effects of the trade agreements on sectoral output were generally considered to be small, relative to other factors. Several sectors witnessed substantial growth in multistage international production processes, though it is unclear how important the agreements have been in fostering these changes. Two sectors–textiles and apparel, and metal and metal products–were most notably affected by increased competition from international markets, though the agreements were not the only reason for increased import competition.

Econometric analysis in chapter 6 identifies ex post statistical relationships between tariff changes in NAFTA and sectoral trade between the United States and Mexico. The study finds that the Mexican share of U.S. imports went up most in those sectors in which the U.S. tariff preference for Mexican goods was largest. Estimates suggest that a 1 percent change in the U.S. tariff preference given Mexican imports under NAFTA led to a 4.5 percent increase in Mexico's share of U.S. imports. The effect was even stronger in some sectors, such as textiles and apparel, where larger preferences were given and where non-tariff barriers were also removed. The econometric study also finds that the U.S. share of Mexican imports rose most in those sectors where the Mexican tariff preference toward U.S. goods was largest, specifically footwear, miscellaneous manufactures, and textiles and apparel.

What are interested party views about the effects of the agreements?

The Commission received input from 22 interested parties on the effects of the trade agreements in question through statements made in a public hearing and submissions of written comments.[17] Interested parties included labor unions, industry associations, and an employee of a public policy research organization. Many offered specific views about the contents of specific agreements. Most attention was paid to the most recent agreements – the Uruguay Round Agreements and NAFTA.

The interested parties that viewed the effects of the trade agreements favorably included associations of exporting firms, firms in industries with internationally integrated production processes, organizations supporting stronger international protection of intellectual property rights, and the

[17] The views of interested parties are summarized in appendix F.

representative of a policy research organization. Supporters of the agreements argued that the agreements had allowed them greater access to foreign markets, improved U.S. competitiveness, and protected intellectual property developed in the United States. Industry associations supporting the agreements included representatives of electrical manufacturers, research-based pharmaceutical manufacturers, and almond growers, as well as a representative of manufacturers as a whole. Some groups, including dairy producers, ranchers and cattlemen, forest and paper products, the scheduled airline industry and generic pharmaceuticals producers, expressed support for particular agreements, and qualified support, if any, for other agreements. In some cases, industry associations that generally supported the agreements argued that one agreement or another had not sufficiently reduced foreign country trade barriers.

Those that viewed the effects of the agreements negatively included a federation of labor unions and industry associations from import-competing sectors. Industry associations associated with the citrus, tomato, tuna, steel, ceramic tile, brushmaking, restaurant china, and non-woven fabric sectors stated that the market share of domestic producers had fallen owing to competition with low-priced imports. The representative of organized labor stated that the agreements had contributed to job loss, especially in manufacturing, as well as lower wages for its workers. An association of copper producers noted that low-priced copper imports had been detrimental to the domestic copper industry, but that the agreements had also lowered the cost of industry inputs. Other factors, including U.S. environmental regulation and antitrust law, were considered to have had more significant effects on the copper industry than the trade agreements.

What are the open questions and areas of ongoing research?

Difficulties in quantifying non-tariff measures complicate efforts to measure the impact of the agreements. Efforts to quantify non-tariff measures should be a priority, as more recent trade agreements have obliged the parties to undertake significant policy changes of the kind that are difficult to quantify. Ongoing research at the Commission is attempting to quantify specific nontariff measures.

The relationship between trade agreements and the growth of foreign outsourcing has received increasing attention in public policy discussions and in academic research. Theoretic models that allow tariff reductions to induce foreign outsourcing of low-skilled activities attribute greater increases in welfare and productivity growth to tariff reductions than do standard international trade models. These models also suggest that foreign outsourcing magnifies the effect of trade agreements on earnings inequality. The relative importance of trade policy and other factors in facilitating foreign outsourcing is still unclear.

Relatively little research has explored the effects on the United States of unilateral economic reforms in developing countries. Substantial reforms in countries that became significant U.S. trading partners are a plausible alternative explanation for many of the trade-related phenomena observed in recent years. A better understanding of how these reforms affected both the United States and these countries is needed. Recent research indicates that industries competing most directly with imports from poor countries experienced slower employment growth and higher rates of plant closure than other industries.[18]

Studies of firm-level data are relatively new in the international trade literature. Most studies use industry-level data to investigate the effects of trade, and overlook important differences in how firms within an industry respond to economic change. A number of studies reviewed in chapter 4 use firm-level data to measure the effects of trade policy changes. Many of these studies use firm-level data from developing countries to identify effects of trade policy on firm behavior. While some research linking trade to U.S. firm-level data has been done, further research on U.S. firm-level responses to trade policy changes would be useful.

---

[18] Andrew Bernard, J. Bradford Jensen, and Peter K. Schott, "Survival of the Best Fit: Exposure to Low-Wage Countries and the (Uneven) Growth of U.S. Manufacturing Plants," April 2003, manuscript. Available at internet address *http://www.som.yale.edu/Faculty/pks4/files/research/papers/emptvs_66.pdf*.

CHAPTER 1: Introduction

This report has been prepared in response to a requirement of the Trade Act of 2002 (19 U.S.C. 3811), enacted on August 6, 2002.[1] Section 2111 of that Act requires the International Trade Commission to report to the Senate Finance Committee and the House Ways and Means Committee regarding the economic impact on the United States of the following trade agreements: the Tokyo Round of Multilateral Trade Negotiations, the United States-Israel Free Trade Agreement, the United States-Canada Free Trade Agreement, the North American Free Trade Agreement, and the Uruguay Round Agreements.

Scope of the Study

As posed in the legislation, the issue to be addressed here is both simple and broad–to describe the economic impact on the United States of five major trade agreements implemented over the past 25 years. The five agreements, which include the last two major multilateral agreements negotiated under the General Agreement on Tariffs and Trade (GATT) as well as three preferential trade agreements, account for much of the trade liberalization that has occurred over the past quarter century.[2] An analysis of the effects of the policies implemented under the agreements is nearly equivalent to an analysis of the effects of trade liberalization in general on the United States over the period. In some cases the discussion in this report is framed in terms of the effects of trade agreements in general rather than the effects of the five agreements specified in section 2111 of the Trade Act of 2002. To the extent possible, however, the analysis is restricted to the effects of the five agreements. To assess the economic impact from the five trade agreements is a challenging task. It requires the isolation of the impact of trade agreements from those caused by an array of other trade policy events, changes in exchange rates, international conflicts, and demographic and technical change. In addition, most of the five agreements themselves had long and overlapping implementation phase-in periods (especially NAFTA and the Uruguay Round), further complicating the problem of observing their effects individually. To provide a reasonably complete and comprehensive description of the economic impact of these agreements requires the use of a variety of analytical tools.

[1] Pub. L. 107-210, 116 Stat. 933.

[2] The major trade liberalization in this period that was not directly a part of one of the five agreements was the accession of China to the World Trade Organization (WTO), bringing that country within the scope of the world trading system.

The agreements implement changes in tariffs, quotas, investment policies, and other policies that have had direct effects on imports and exports, as well as indirect effects on production and productivity, employment and earnings, and measures of general economic welfare. At some points in the current analysis, the Commission focuses on ways in which trade policy, as reflected in the agreements, affects trade directly through influencing the international flow of goods and services. By changing tariffs, quotas, and other policy instruments, the agreements generally reduce the relative prices at which products are traded internationally, thereby directly increasing trade flows. These changes then influence the output of these products, the location of their production and consumption, and the productivity and earnings of labor and capital engaged in that production. Indirect effects of trade policy are analytically much more difficult to quantify. At many points in the analysis contained in this report, the focus shifts from an emphasis on the effects of trade policy on trade flows to an emphasis on the effects of trade flows on these other important variables.

Approach of the Study

The Commission has employed multiple approaches to assess the effects on the U.S. economy of trade policy as implemented through the five specified trade agreements signed since 1979. As the primary approach, the Commission has relied on a review of literature to provide an assessment of the direct effects of trade agreements and trade policy on trade. An assessment through the economic literature is central to the analytical content of this report. For an additional perspective, industry research provides a basis to analyze effects on trade for specific industry sectors in the U.S. economy. The industry research describes trends in trade flows, industry output and employment, and consumption since 1978 and ties this description to an assessment of the effects of the trade agreements on the specific industries. Following the industry analysis, the Commission employs econometric and simulation models to examine specific policy-trade linkages. The first econometric analysis, in chapter 6, presents evidence on how a specific policy agreement (NAFTA) affects U.S. trade with a trading partner that receives preferential treatment under that agreement (Mexico). The simulation model in chapter 7 provides, among other things, a model of the effects of trade liberalization agreements on trade flows, and the indirect effects on output and the allocation of capital and labor to production in the aggregate. The model is unique in its use of a single methodologically consistent framework and an original database to look at the effects of all five agreements. Finally, the analysis in chapter 8 examines the ways in which tariff reductions have induced growth in the number of U.S. import sources for each product.

A public hearing was held in connection with this investigation on January 14, 2003. Interested parties presented their views on the subject trade agreements at this hearing and in written statements submitted in response to announcements that appeared in the *Federal Register.* A summary of these views is given in appendix F to this report.

Organization of the Report

Chapter 2 presents historical background on the five trade agreements themselves, with the principal issues involved in their negotiation and implementation, which serves to define the policy instruments used to make changes to trade flows and, ultimately, to the domestic economy. Broadly speaking, these policy instruments include tariff reductions and liberalization of nontariff measures, as well as subsidiary issues such as the treatment of customs procedures, phytosanitary restrictions, and intellectual property protections.

The Tokyo Round was the first round of multilateral trade negotiations to move beyond tariff reductions as a major part of the agreement.[3] A major objective of the round was to address various nontariff measures of trade protection that had become relatively (and absolutely) more important barriers to trade in the wake of earlier tariff reductions. The Trade Act of 1974, which included negotiating authority and fast-track procedures, was passed to address these concerns. Fast-track authority lasted until 1980 under this legislation and was renewed in 1979 for a further 8 years,[4] and was renewed again in the Omnibus Trade and Competitiveness Act of 1988 signed by President Reagan to permit negotiation of the Uruguay Round of GATT.[5] The authority for fast track was set to expire in 1993, but legislation extended it through April 16, 1994, to allow for negotiation not only of the Uruguay Round but also of the North American Free Trade Agreement. Fast-track authority expired on the set date in April 1994 and was not reauthorized until the passage of the Trade Act of 2002, at which point it was renamed Trade Promotion Authority.

Chapter 3 provides background on the development of the U.S. economy over the past 25 years, and chapter 5 extends into an analysis of the development of industry sectors in the economy. Where chapter 2 reviews trade policy instruments of economic change, chapter 3 looks at some of the objects of this change–trends in gross domestic product (GDP) growth, employment, capital growth, and productivity. The chapter also describes other phenomena that have developed since 1979, including population growth and technological progress, phenomena that account for much of the growth in trade, output, and employment.

---

[3] See chapter 2 of this report for a more complete discussion of the history of U.S. trade agreements.

[4] Trade Agreements Act of 1979, Pub. L. No. 96-39, 93 Stat. 144.

[5] Pub. L. No. 100-148.

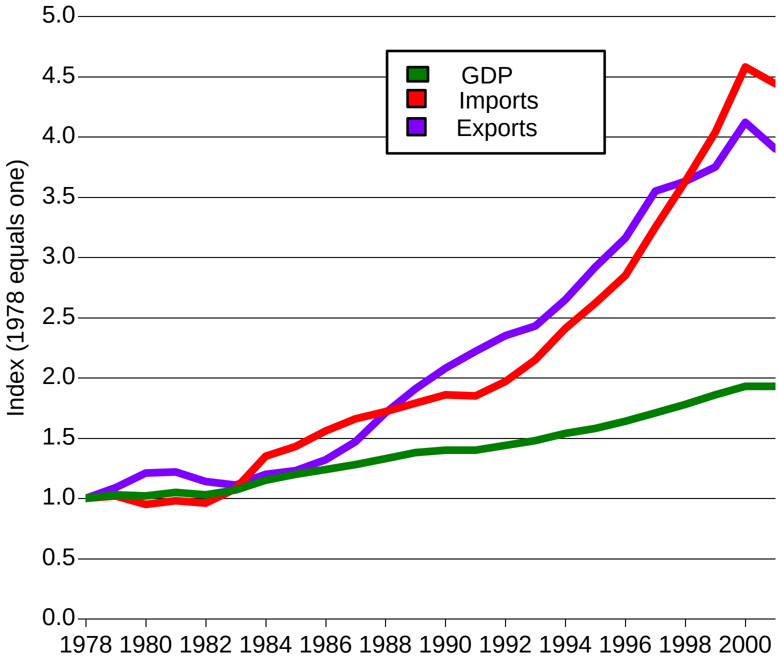
Trade has grown enormously over the decades since implementation of the Tokyo Round. Trade in goods and services, calculated as imports plus exports and measured in constant 1996 dollars, has grown from $0.5 trillion in 1974 to $2.5 trillion in 2001. Figure 1-1 provides an index of the relative growth of trade and GDP since 1978, the year before the signing of the Tokyo Round Agreements. In that time, GDP has approximately doubled, while trade has grown by a factor of four. The principal argument of chapter 3 is that much, or most, of the growth of the economy is owing to factors other than trade, and furthermore that growth in trade itself can be attributed to factors other than trade agreements and trade policy.

Chapter 4 of this report is a survey of economic literature addressing effects of trade and trade policy on economic outcomes. Because the types of effects are so varied, and the impacts of trade policy are in many cases so difficult to identify, the survey was prepared as an attempt to ascertain the findings of the economics profession at large and to provide these findings as the key part of the overall answers to the questions addressed in the current report.

The work reported in chapter 4 follows a number of threads because trade policy over time has proceeded in a number of different directions, having included bilateral and multilateral agreements, an increasing focus on nontariff measures, agricultural trade harmonization, and agreements on investment measures and services trade. Trade growth also has been far from uniform. Trade with some countries (such as Mexico and China) has grown much more rapidly than with others, and under very different circumstances. In particular, the tremendous growth in trade with China has taken place outside the scope of the five trade agreements that are the focus of this report. Trade in different products (textiles and apparel, electronics, services) has likewise grown at very different rates. In combination with trends in technology, productivity, and demography, both in the United States and the rest of the world, these trade developments contribute to changes in employment and the distribution of earnings and to industrial restructuring. All of these linkages need to be explored to gain an understanding of the effects of trade policy on the economy of the United States. In particular, much of the story on income and employment redistribution, industrial restructuring, and the realization and exploitation of productivity growth can be told at the level of specific industrial sectors.

Chapter 5 provides this perspective, examining factors that have affected output, employment, and productivity trends in all U.S. industry sectors during 1978-2001. These factors include domestic and foreign competitive conditions, macroeconomic factors, technological innovation, changes in industry structure, and government regulations. It describes the effect of the five trade agreements

Figure 1-1
Benchmark quantity indices for U.S. real income and trade, 1978-2001



Source: Edward J. Balistreri and Alan K. Fox, 2003, "TSCAPE: A Time Series of Consistent Accounts for Policy Evaluation," USITC Working Paper, 2003-05-A (May).

on the sectors.[6] The value of exports has grown fastest in the services, machinery and equipment, transportation equipment, miscellaneous manufactures, and chemicals sectors, while the value of imports has grown fastest in textiles and apparel, machinery and equipment, chemicals, miscellaneous manufactures, and services sectors. A notable development has been the growth of globally integrated manufacturing processes in sectors such as machinery and equipment, transportation equipment, and chemicals. Global integration has spurred two-way trade within these sectors.

---

[6] For the purposes of this investigation, all U.S. industries have been grouped into 10 sectors: Agriculture; chemicals and allied products; energy and fuels; forest and fishery products; machinery and electronics; mineral and metal products; miscellaneous products; services; textiles and apparel; and transportation equipment.

The literature review in chapter 4 reveals a number of areas in which understanding of the effects of trade policy is incomplete. The remaining chapters of the report attempt to fill some of the remaining gaps in that understanding. Chapter 6 contains original empirical analysis of the extent to which preferential trade policy changes, such as those implemented in NAFTA and in the U.S.-Israel and U.S.-Canada Free Trade Agreements, actually increase the import market shares of the beneficiaries to the agreement, which is a question central to research on the responsiveness of bilateral trade flows to trade policy changes.

Chapter 7 describes the results of using an original model and data base consistent with standard economic and trade theory, applied uniformly to the five agreements, to simulate the effects of the trade agreements on the U.S. economy. The model is methodologically similar to general equilibrium models that have frequently been used to simulate effects of proposed trade agreements. In the present context the model provides analyses of the individual and cumulative effects of the agreements.

Finally, chapter 8 considers how liberalization of trade policy increases the variety of trade that takes place, where “variety” can mean the import of traded products from new sources, or the import of new or previously untraded products. Much empirical trade analysis relies on an assumed ability to distinguish goods, especially goods from different trading partners, in the depiction of trade growth and trade shifts, but most analysis is unable to address the question of how such goods enter the trade system. Failure to account for such new trade can mean that estimates of the effects of trade policy are otherwise understated.

CHAPTER 2: Negotiation of Trade Agreements Under Trade Promotion Authority

Legislation and Agreements Approved Under Trade Promotion Authority

Overview

Congress delegates a portion of its constitutional charge to formulate and administer trade policy to the President through trade agreement authority.[1] This authority permits the President to negotiate and enter into trade agreements, whether bilateral or multilateral. Whereas the delegating authority to negotiate tariff agreements has proved straightforward, Congress devised a different means to delegate authority for trade agreements involving nontariff barriers to assure U.S. trading partners that the substantial changes to U.S. laws and administrative practices expected from any nontariff agreement would in fact come to be implemented as negotiated.

Under the Trade Act of 1974, the President was given authority for the first time to negotiate trade agreements involving nontariff barriers. Congress further agreed to expedited approval procedures to approve or disapprove–but not to amend–bills submitted to implement the nontariff agreements negotiated. This process was known informally as "fast track authority." Since then, the President has negotiated five agreements under this authority: the 1979 Tokyo Round Agreements, the 1985 U.S.-Israel Free Trade Agreement, the 1988 U.S.-Canada Free Trade Agreement, the 1993 North American Free Trade Agreement (NAFTA), and the 1994 Uruguay Round Agreements. Congress has subsequently passed the implementing bills submitted to enter these nontariff agreements into U.S. law through expedited approval procedures (See figure 2-1 for a timeline of events related to fast-track negotiating authority).

[1] Congress also delegates some of its authority, although to a lesser extent, through certain statutes establishing tariff preference programs.

Figure 2-1
Timeline of events related to fast-track negotiating authority, 1934-2002

1934	
June 12	The Reciprocal Trade Agreements Act of 1934 is signed into law by President Roosevelt. It authorizes the President to negotiate trade agreements with other governments and to implement changes resulting from these tariff negotiations without further Congressional authorization.
1962	
October 11	The Trade Expansion Act of 1962 is signed into U.S. law by President Kennedy. The Act provides the negotiating authority for the 1963-67 Kennedy Round of GATT multilateral trade negotiations (MTN). Results of the Kennedy Round exemplify the cumulative success of multilateral tariff reductions.
1973	
	President Nixon proposes a trade bill to authorize U.S. participation in the next round of GATT trade negotiations.
September 12 to 14	The Tokyo Declaration opens the 1973-79 GATT round of multilateral trade negotiations known as the Tokyo Round. The Tokyo Round is the first to include negotiations for nontariff trade barriers as well as tariff barriers.
1975	
January 3	The Trade Act of 1974 is signed into law by President Ford. The Act provides negotiating authority for U.S. participation in the Tokyo Round for a 5-year period through Jan. 2, 1980. The Act authorizes the President to enter into trade agreements on nontariff barriers, which the Congress will consider under special expedited approval procedures, so-called “fast-track” implementing procedures, that prohibit amendments to the implementing bill submitted by the President to enact the negotiated trade agreement. The Act also authorizes the U.S. Generalized System of Preferences (GSP).
1979	
January 4	President Carter notifies the Congress of his intention to enter into the multilateral trade agreements concluded by the Tokyo Round.
April 12	Negotiators initial the draft Tokyo Round agreements.

Figure 2-1—*Continued*
Timeline of events related to fast track negotiating authority, 1934-2002

June 19	President Carter submits implementing legislation to the Congress to enact the Tokyo Round Agreements under fast-track approval procedures in accordance with the 1974 Trade Act.
June 30	The Tokyo Round Agreements are signed by participating governments, formally concluding the 1973-79 Tokyo Round of GATT multilateral trade negotiations. Most of the agreements enter into force on Jan. 1, 1980; a few on Jan. 1, 1981.
July 26	The Trade Agreements Act of 1979 is signed into law by President Carter. The Act implements the Tokyo Round Agreements into U.S. law. The 1979 Trade Act also extends negotiating authority under fast-track implementing procedures through Jan. 2, 1988.
1980	
January 1	The Tokyo Round Agreements enter into force. The agreements on customs valuation and government procurement are exceptions, entering into force on Jan. 1, 1981.
1982	
November 24 to 29	The 38th session of the GATT Contracting Parties, at ministerial level for the first time in nearly a decade, fails to address in unified fashion the growing protectionist trade pressures stemming from a protracted downturn in the world economy.
1983	
November	President Reagan and Israeli Prime Minister Shamir agree to bilateral negotiations on a free trade area (FTA) between the United States and Israel.
1984	
January 17	Formal negotiations begin between the United States and Israel on a free trade area agreement.
September	The new Canadian government of Prime Minister Mulroney opens a review of ways to promote freer trade with the United States.
October 30	The Trade and Tariff Act of 1984 is signed into law by President Reagan. The 1984 Trade Act extends the President’s authority to grant trade preferences, negotiate bilateral free trade agreements, and enforce export restraint agreements such as on steel.

Figure 2-1—*Continued*
Timeline of events related to fast track negotiating authority, 1934-2002

1985	
April 22	The United States-Israel Free Trade Area Agreement is signed. The agreement eliminates tariff and nontariff barriers on most products traded between Israel and the United States by Jan. 1, 1995.
April 29	President Reagan submits implementing legislation to the Congress to enact the United States-Israel Free Trade Area Agreement.
June 11	The United States-Israel Free Trade Area Implementation Act of 1985 is signed by President Reagan into U.S. law. It is the first bilateral free trade area agreement negotiated by the U.S. Government.
August 19	The United States-Israel Free Trade Area Agreement enters into force.
September 26	Canadian Prime Minister Mulroney formally requests that the United States and Canada open negotiations on a United States-Canada Free Trade Agreement.
December 10	President Reagan notifies the Congress of his intention to enter into bilateral negotiations with Canada for a free trade area.
1986	
June 17	Formal negotiations begin on the United States-Canada Free Trade Agreement.
September 15 to 20	The Punta del Este Declaration opens the 1986-93 GATT round of multilateral trade negotiations known as the Uruguay Round. Scheduled to conclude within 4 years, the Uruguay Round is the first to extend negotiations beyond trade in goods to negotiate trade in services and other issues.
1987	
October 3	President Reagan notifies the Congress of his intention to enter into a bilateral agreement with Canada for a free trade area.
October 4	Negotiators initial the draft text of the U.S.-Canada FTA.
December 9	Negotiators finalize the text of the U.S.-Canada FTA.
1988	
January 1	The Harmonized System Convention enters into force. The Harmonized Tariff System (HTS) was designed by the Customs Cooperation Council, a technical body in Brussels, Belgium that analyzes and helps resolve customs problems, as a 6-digit “core” system of nomenclature for customs tariffs, statistical enumeration, and transport documentation.
January 2	The U.S.-Canada FTA is signed.
July 25	President Reagan submits implementing legislation to the Congress to enact the U.S.-Canada FTA into law.

Figure 2-1—*Continued*
Timeline of events related to fast track negotiating authority, 1934-2002

August 23	The Omnibus Trade and Competitiveness Act of 1988 is signed into law to provide negotiating authority and fast-track implementing procedures for the Uruguay Round negotiations. The 1988 Trade Act provides tariff and nontariff negotiating authority to the President through May 31, 1993. The 1988 Trade Act provides fast-track implementing procedures through May 31, 1991, with a provision for a 2-year extension through May 31, 1993.
September 28	President Reagan signs the U.S.-Canada Free Trade Agreement Implementation Act of 1988 into law.
December 5 to 9	The Midterm Review of Progress in the Uruguay Round is held in Montreal, Canada.
1989	
January 1	The Tariff Schedule of the United States is replaced with the Harmonized Tariff Schedule of the United States on January 1, 1989.
January 1	The U.S.-Canada FTA enters into force.
1990	
June	President G.H.W. Bush announces the Enterprise for the Americas Initiative, later known as the Free Trade Area of the Americas (FTAA).
September 25	President G.H.W. Bush notifies the Congress of his intention to enter into bilateral negotiations with Mexico for a free trade area.
December	The GATT ministerial conference at Brussels, Belgium, brings the Uruguay Round negotiations near collapse largely over disagreements about trade in agriculture.
1991	
February 5	President G.H.W. Bush informs the Congress of his intention to enter into trilateral negotiations for an agreement with Canada and Mexico for a free trade area, the formation of a North American Free Trade Agreement (NAFTA).
March 1	President G.H.W. Bush formally requests the Congress for renewal of fast-track authority to open the NAFTA and complete the GATT Uruguay Round negotiations.
June 12	Formal negotiations begin in Toronto, Canada, between Canada, Mexico, and the United States on a NAFTA.
December 4	The Andean Trade Preference Act (ATPA) is signed into U.S. law. The ATPA allows the President to grant certain unilateral preferential trade benefits to Bolivia, Colombia, Ecuador, and Peru in the form of reduced-duty or duty-free treatment for eligible products.

Figure 2-1—*Continued*
Timeline of events related to fast track negotiating authority, 1934-2002

December 20	GATT Director-General Arthur Dunkel issues the draft Final Act of the Uruguay Round negotiations, commonly known as the “Dunkel draft.” The draft provides the basis for negotiations to move forward from the impasse reached at the 1990 Brussels ministerial conference, largely over issues involving trade in agriculture.
1992	
January 13	The Uruguay Round negotiations are relaunched.
May 13	President G.H.W. Bush announces his intention to negotiate a bilateral agreement with Chile for a free trade area, once the NAFTA is concluded. Such an agreement would be the first under the FTAA initiative.
August 12	Negotiators initial the draft text for a NAFTA, 14 months after they began formal negotiations.
September 18	President G.H.W. Bush notifies the Congress of his intent to enter into the NAFTA with Canada and Mexico.
December 17	The Governments of Canada, Mexico, and the United States of America sign the NAFTA.
1993	
April 27	President Clinton formally requests the Congress to extend negotiating authority and fast-track implementing procedures for 120 days to conclude the Uruguay Round negotiations.
May 31	Negotiating authority and fast-track approval procedures for implementing legislation expire under the 1988 Trade Act.
July 2	Negotiating authority and fast-track approval procedures are amended to extend the time limit from May 31, 1993 to April 16, 1994 in order to complete the Uruguay Round negotiations. The extension requires the President to notify the Congress of his intention to enter into a trade agreement 120 days in advance of doing so. This provision effectively makes Dec. 15, 1993 the target date for conclusion of the Uruguay Round.
November 3	President Clinton submits implementing legislation to the Congress to enact the NAFTA under fast-track approval procedures.
November 17	The U.S. House of Representatives approves the NAFTA legislation.
November 20	The U.S. Senate approves the NAFTA legislation.
November 22	Mexico ratifies the NAFTA.
December 8	President Clinton signs the North American Free Trade Agreement Implementation Act into U.S. law.
December 15	Negotiators initial the draft text for the Uruguay Round Agreements, concluding the 1986-93 Uruguay Round after 7 years of negotiations.
December 30	Canada proclaims the NAFTA legislation.

Figure 2-1—*Continued*
Timeline of events related to fast track negotiating authority, 1934-2002

1994	
January 1	The NAFTA enters into force.
April 15	The Uruguay Round Agreements are signed by participating governments at Marrakesh, Morocco, formally concluding the 1986-93 Uruguay Round. The agreements enter into force on Jan. 1, 1995. The Uruguay Round was the first MTN to extend international trade disciplines beyond trade in goods, to trade in services and intellectual property rights. The Uruguay Round Agreements also established the World Trade Organization (WTO) to help carry out the Uruguay Round Agreements.
September 27	President Clinton submits implementing legislation to the Congress to enact the Uruguay Round Agreements under fast-track approval procedure.
December 8	President Clinton signs the Uruguay Round Agreements Act of 1994 that implements the Uruguay Round Agreements into law. In the Act, the administration fails to win from the Congress new negotiating authority under fast-track implementing procedures which would allow for further trade negotiations. This failure arises largely over disagreement about whether labor standards and environment issues should be formally included in trade agreement negotiations.
1995	
January 1	The Uruguay Round Agreements enter into force; the WTO is established.
June 7	The United States, Canada, and Mexico enter into plurilateral negotiations with Chile for its accession to the NAFTA.
2002	
August 6	The Trade Act of 2002 is signed into U.S. law by President G.W. Bush. The 2002 Trade Act provides tariff and nontariff negotiating authority to the President for a 3-year period through May 31, 2005, with provision for a 2-year extension through May 31, 2007. The 2002 Trade Act also provides fast-track implementing procedures (now called trade promotion authority).

Source: Compiled by the USITC.

Tariff vs. Nontariff Barrier Negotiating Authority

Congress has delegated a part of its authority over international trade to the President since implementation of the Reciprocal Trade Agreements Act of 1934.[2] With this authority, the President can negotiate with foreign governments to enter into multilateral tariff agreements and–without further congressional approval–proclaim reductions in U.S. tariff rates, subject to certain limits.[3] This general tariff authority has been a key feature of the first six rounds of multilateral trade negotiations held since 1947 under the auspices of the GATT.[4]

Trade negotiations prior to the Tokyo Round concentrated primarily on reducing or eliminating tariffs, with relatively little effort or progress made in reducing nontariff barriers or other trade-distorting measures such as subsidies.[5] To address both tariff and nontariff barriers in the Tokyo Round, Congress needed to grant additional negotiating authority to the President.

As before, Congress could delegate traditional tariff proclamation authority at a level sufficient to engage foreign governments in multilateral tariff negotiations but still retain its constitutional mandate to regulate international trade matters through limits it placed on tariff reductions, de minimis tariff elimination, tariff staging, etc. Preparing for the Tokyo Round negotiations, however, Congress found it problematic to devise a way to delegate authority to the President to negotiate on nontariff barriers that was sufficiently broad but which did not abrogate Congress's constitutional powers over international trade or ignore these barriers' impact on the people of the United States.[6]

Presidential authority to negotiate nontariff barriers

As a solution to granting the President sufficient authority to negotiate nontariff barriers while still retaining its constitutional role to oversee matters related to trade, Congress fashioned the trade agreement authority and approval process found in section 102 of the Trade Act of 1974[7] to encourage countries

[2] Pt. III, Pub. L. 316, 48 Stat. 943. Committee on Ways and Means, U.S. House of Representatives, *Overview and Compilation of U.S. Trade Statutes – 2001 Edition*, June 2001, pp. 227-229.

[3] Tariff reductions are limited to no more than half of current rates of duty. Tariff elimination is limited to current rates of duty that are 5 percent ad valorem or less, and certain staging conditions apply, such as limiting tariff reductions, to no more than 3 percent ad valorem in any one year, among other conditions. Committee on Ways and Means, *Overview*, p. 227. Reductions or eliminations beyond these limits requires Congressional approval.

[4] General tariff authority has also been called "tariff proclamation" authority.

[5] Committee on Ways and Means, *Overview*, pp. 228-229.

[6] Committee on Finance, U.S. Senate, *Trade Reform Act of 1974 - Report of the Committee on Finance - United States Senate—Together with Additional Views on H.R. 10710*, Rep. No. 93-1298, 93d Cong., 2d Sess., Nov. 26, 1974, pp. 75-76.

[7] Pub. L. 93-618, 88 Stat. 1978.

to participate in negotiations, anticipating that trade agreements emerging from nontariff barrier negotiations were likely to involve substantial changes to U.S. domestic laws.[8] Section 102 authority thus delegated power to the President to negotiate and enter into trade agreements on nontariff barriers provided that Congress retained the final authority to approve the implementing legislation for these trade agreements.

Although reserving final approval appeared to fulfill Congress' constitutional responsibility for overseeing the legislative process for trade agreements, it did nothing to alleviate foreign governments' concerns about the uncertainty of the legislative process for approving such agreements. The uncertainty of whether Congress would approve an implementing bill for a nontariff trade agreement without reopening negotiations to amend provisions that it disliked was seen as a major obstacle to engaging the active participation of potential trading partners in negotiations.

Congressional fast track implementing procedures

To encourage vigorous negotiations and commitments by foreign governments, Congress devised a special expedited approval process for implementing legislation. These fast-track implementing procedures were first set down in section 151 of the 1974 Trade Act. The key feature of the fast-track approval process was that amendments were prohibited to the implementing bill that the President submitted to incorporate the proposed nontariff trade agreement into U.S. domestic law. As such, the Congress could only vote to approve or disapprove the legislation–a strict up or down vote. To ensure that congressional views about the proposed trade agreement and recommendations about changes to U.S. law or administrative practice were considered during the negotiations, section 102 included a number of consultation and notification requirements. These consultations were intended to resolve problems in advance of formal submission and consideration of implementing legislation by Congress when the special fast-track implementing procedures were invoked.[9]

Past and present trade agreement authority

Section 102 authority under the 1974 Trade Act was granted for a 5-year period from the date of enactment, that is, from January 3, 1975 through January 2, 1980. The Trade Agreements Act of 1979 extended section 102 authority for an additional 8-year period, through January 2, 1988. Section 102 authority subsequently was replaced by similar authority under section 1102(b)

[8] Committee on Finance, *Trade Reform Act of 1974 – Report of the Committee on Finance*, Rep. No. 93-1298, p. 75.

[9] Committee on Ways and Means, *Overview*, pp. 234-235.

of the Omnibus Trade and Competitiveness Act of 1988.[10] Under this authority, a trade agreement could be entered into only if it made progress in meeting the applicable objectives set forth in section 1101 of the 1988 Trade Act.[11]

The 1988 Trade Act granted section 1102 authority from the date of its enactment on August 23, 1988 through May 31, 1991. Section 1102 authority was extended upon request of the President for 2 years, through May 31, 1993. The Congress amended section 1102 on July 2, 1993 to extend the negotiating authority and fast track approval procedures to April 16, 1994, in order to complete the Uruguay Round of GATT multilateral trade negotiations.[12]

The authority that lapsed in 1993 remained so until section 2103 of the Trade Act of 2002[13] granted authority to the President to negotiate trade agreements from the date of its enactment on August 6, 2002 through May 31, 2005.[14] Provisions in the 2002 Trade Act allow for a 2-year extension of section 2103 authority, through May 31, 2007.

Regional and Bilateral Trade Agreements

Congress delegated to the President the necessary authority to negotiate agreements on nontariff barriers in the Tokyo Round through section 101 of the 1974 Trade Act, section 102 authority of the 1974 Trade Act, and other presidential documents. The expedited approval procedures[15] included in section 151 of the 1974 Trade Act encouraged foreign governments to negotiate with their best offers, secure in the knowledge that Congress could not amend provisions separately, but instead had to approve or disapprove the whole agreement as concluded by the negotiators. The United States enacted

[10] Pub. L. 100-418, 102 Stat. 1123. Sec. 1102(a) authority was to enter into multilateral tariff agreements; sec. 1102(b) authority was to enter in multilateral nontariff agreements; sec. 1102(c) authority was for bilateral agreements regarding tariff and nontariff barriers.

[11] For further details, see section on the Uruguay Round Agreements.

[12] Committee on Ways and Means, *Overview*, pp. 229-230. Section 1102(c), which authorized the President to enter into bilateral agreements regarding tariff and nontariff agreements under the same terms and procedures as applied to multilateral trade agreements, also expired after May 31, 1993 following a similar 2-year extension request.

[13] Pub. L. 107–210, 116 Stat. 933.

[14] Section 2103(b)(3)(A).

[15] The expedited congressional approval procedures of sec. 151 of the 1974 Trade Act became referred to commonly as “fast track” although the 1974 and 1979 Trade Acts did not use the term. Sec. 1103(b) of the 1988 Trade Act used the term in its title “Application of Congressional ‘Fast Track’ Procedures to Implementing Bills.” Sec. 2103(b)(3) of the 2002 Trade Act calls the provisions of sec. 151 of the 1974 Trade Act by the name of “trade authorities procedures.”

the Tokyo Round Agreements in the Trade Agreements Act of 1979,[16] legislation that also extended the U.S. trade agreements authority until 1988.

Once the Tokyo Round Agreements entered into force in January 1980, major trading nations sought to open another round of multilateral trade negotiations, in large part to counteract the world recession that followed the 1973 and 1979 global oil price increases. This effort failed in November 1982, when world recession, high unemployment, and debt service problems in a number of major countries, such as Mexico, made many countries reluctant to agree to further trade concessions.[17] It was not until November 1985 that the GATT Secretariat began to establish a preparatory committee to develop an agenda and timetable for a new round of multilateral trade negotiations.[18] Finally, in September 1986, the ministerial declaration in Punta del Este, Uruguay, launched the eighth round of multilateral trade talks–the Uruguay Round of GATT trade negotiations.

The reluctance of other governments in 1982 to engage in multilateral liberalization shifted the United States' focus to other trade liberalization approaches, such as regional and bilateral initiatives, even though multilateral efforts have typically been the primary thrust of U.S. trade policy.[19] By the start of the Uruguay Round, the United States had already embarked on the complementary policy of pursuing trade liberalization through regional and bilateral agreements, with the idea of using them as building blocks toward future multilateral market opening.[20] The first of these was a bilateral free trade agreement between the United States and Israel in 1985. The second was a bilateral free trade agreement between the United States and Canada in 1988. The third, which began as a bilateral free trade agreement between the United States and Mexico, expanded to become a trilateral free trade agreement between the United States, Mexico, and Canada in 1993–the North American Free Trade Agreement or NAFTA. In addition, the U.S. President unveiled in 1990 the Enterprise for the Americas Initiative–a regional trade liberalization

[16] Pub. L. 96-30, 93 Stat. 145.

[17] Office of the United States Trade Representative (USTR), *Twenty-seventh Annual Report of the President of the United States on the Trade Agreements Program 1983*, transmitted to the Congress Apr. 10, 1984, p. 53. The GATT ministerial declaration in November 1982 called for positive steps to fight protectionism, avoid predatory trade practices, resolve outstanding trade problems, and pursue greater trade liberalization. The OECD ministerial declaration in May 1983 called for measures to ease trade restraints, end export subsidies and preferences to nonmarket economies, and promote economic and trade policies aimed at bolstering world economic recovery. The Group of Seven major industrialized democracies announced in its summit communique later in May 1983 a commitment to halt protectionism and reverse it by dismantling trade barriers. USTR, *Annual Report 1983*, p. 53.

[18] Council of Economic Advisors (CEA), *Economic Report of the President*, 1986 (GPO: Washington DC, 1986), p. 122.

[19] CEA, *Economic Report of the President*, 1991, pp. 252-253.

[20] CEA, *Economic Report of the President*, 1995, pp. 214-219.

effort still underway in 2003, known more widely today as the Free Trade Area of the Americas (FTAA). The following discussion reviews the main elements of the multilateral, plurilateral, and bilateral trade agreements negotiated under the section 102 authority and section 151 approval procedures first set down in the 1974 Trade Act.

1979 Tokyo Round Agreements

Setting

The context for the 1973-79 Tokyo Round can be illustrated by comparison with previous trade rounds. The 1963-67 Kennedy Round immediately preceding was the most significant and comprehensive multilateral trade agreement yet reached. Its success was due in large part to the use of a 50-percent cut in tariffs for industrial goods–a tariff cutting formula–as well as the large number of countries (62) that took part in these negotiations. Overall, the Kennedy Round resulted in an average tariff reduction for industrial products of 35 percent, liberalizing trade worth roughly $40 billion.

The very success of multilateral efforts at reducing tariff barriers had the effect of highlighting the nontariff barriers that remained. Thus, the Tokyo Round is perhaps most notable for the GATT plurilateral agreements on nontariff barriers that emerged, the first attempt to address nontariff barriers in a broad multilateral forum.[21] The Tokyo Round also went beyond previous multilateral negotiations in its treatment of trade in agriculture. As in previous rounds, the Tokyo Round in its multilateral format focused essentially on reducing trade barriers on industrial products (tropical agricultural products being a notable exception). However, under the umbrella of the multilateral Tokyo Round negotiations, a number of bilateral agreements also emerged that addressed for the first time tariff and nontariff barriers on temperate agricultural products.

Review of the negotiations

The seventh round of multilateral trade negotiations opened in Tokyo, Japan in September 1973. U.S. officials negotiated on tariff reductions under the general tariff authority found in section 101 of the Trade Act of 1974, and negotiated on nontariff barriers liberalization under the authority found in section 102.

---

[21] Distinctions between “multilateral,” “plurilateral,” and “bilateral” trade agreements can be valid descriptors but can also be subject to different interpretations. For further details, see section on the Uruguay Round Agreements.

The Tokyo Round Agreements were signed on June 30, 1979. The agreements were incorporated in the Geneva Protocol (1979), which contained the tariff concessions negotiated by a number of countries during the Round. A Supplementary Protocol was opened in November 1979 for additional signatures and concessions.[22] Most of the Tokyo Round Agreements entered into force on January 1, 1980, although a few did so on January 1, 1981. Tariff reductions were phased in over eight annual stages, beginning on January 1, 1980; U.S. staged reductions for a few more sensitive products' tariffs were continued through January 1, 1991.[23]

Overview of the agreement

Tariff barriers

For agricultural products, multilateral concessions by developed countries on exports of tropical products from developing countries were the first concrete results of the Tokyo Round. Most developed countries implemented their concessions in 1976 and 1977, with further concessions effective as of 1980. Approximately 46 developing countries submitted requests to 11 developed country participants for tariff and nontariff concessions on exports of tropical products and materials–including agricultural, raw material, mineral, semimanufactured, and manufactured products containing tropical products. Of 4,300 items with dutiable tariff lines that were tabled as requests, most-favored-nation (MFN) concessions and GSP concessions were granted on 2,855 tariff lines. Of the 2,855 items, 940 were implemented early in the negotiations in 1976 and 1977.

For industrial products, the GATT Secretariat estimated in 1980 that the total value of trade affected by MFN tariff reductions and bindings of prevailing tariff rates resulting from the Tokyo Round, amounted to more than $155 billion.[24] As a result of these cuts, the GATT estimated that the weighted average tariff on industrial products among the 19 major participants[25] was to decline from 7.0 to 4.7 percent–a 34 percent reduction in customs duty rates. The tariff cutting formula known as the "Swiss formula" was designed, in general, to result in the highest tariffs being reduced by the greatest amount and, consequently, harmonizing or bringing tariff rates for these countries more closely together.

---

[22] USTR, *Annual Report 1979*, pp. 39 to 51.

[23] Pres. Proc. 4707 of Dec. 11, 1979; 44 *FR* 72348, et seq.

[24] GATT, *Activities in 1979 and Conclusion of the Tokyo Round of Multilateral Trade Negotiations (1973-1979)* (Geneva: GATT, 1980), pp. 18-20.

[25] The 19 major trading partners were Austria, Belgium, Canada, Denmark, the European Communities, Finland, France, Germany, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, and the United States.

Nontariff barriers

The plurilateral agreements[26] addressing nontariff barriers for both agricultural and industrial products negotiated at the Tokyo Round of multilateral trade negotiations included:

- Agreement on Technical Barriers to Trade;[27]
- Agreement on Government Procurement;
- Agreement on Interpretation and Application of Articles VI, XVII and XXIII;[28]
- Agreement on Implementation of Article VII;[29]
- Agreement on Import Licensing Procedures;
- Agreement on Implementation of Article VI;[30]
- Arrangement Regarding Bovine Meat;
- International Dairy Arrangement; and the
- Agreement on Trade in Civil Aircraft.

In addition, the Tokyo Round resulted in several agreements aimed at improving the systemic functioning of the General Agreement, that is, the fundamental rules governing the multilateral trading system. These agreements[31] were entitled:

- Differential and More Favourable Treatment, Reciprocity and Fuller Participation of Developing Countries;[32]
- Declaration on Trade Measures Taken for Balance-of-Payments Purposes;

[26] General Agreement on Tariffs and Trade, *The Texts of the Tokyo Round Agreements* (Geneva: GATT, August 1986), pp. iii to v.

[27] Also known as the "Standards Code."

[28] Also known as the "Subsidies Code."

[29] Also known as the "Customs Valuation Code."

[30] Also known as the "Antidumping Code." The Antidumping Code was the only nontariff barrier agreement negotiated during the 1963-67 Kennedy Round.

[31] Whether decisions, declarations, agreements, understandings, undertakings, or another name, they were commonly referred to collectively as the "Framework Agreements."

[32] Also known as the "Enabling Cause."

- Safeguard Action for Development Purposes; and the
- Understanding Regarding Notification, Consultation, Dispute Settlement and Surveillance.

Tokyo Round bilateral negotiations

The United States exchanged major bilateral concessions on tariff and nontariff measures affecting trade in agriculture with Japan, the European Community (EC), and Canada, and on largely nontariff measures with Finland, Sweden, Norway, Switzerland, and Austria.[33] The United States reached major bilateral agreements on tariff and nontariff measures affecting trade in manufactures with Australia, New Zealand, and South Africa.

Japan agreed to bind the duty rate on soybeans at its existing tariff of free. In 1976, soybeans accounted for $675 million (over 6.7 percent) of total U.S. exports to Japan. Japan also agreed to undertake to increase its general and hotel-use import quota for high quality beef from 16,800 to 30,800 tons by April 1983,with the United States expected to be a major beneficiary. Japan agreed to reduce tariffs on agricultural products by an average of 18 percent.

The EC agreed to assure market access for a number of agricultural products, such as beef, poultry, and variety meats; canned fruit cocktail and peaches; certain fish, table grapes, and spirits (e.g. bourbon whiskey); dried prunes; rice; and tobacco. Assured market access indicated that the EC would reduce, harmonize, or bind tariffs, provide tariff-rate quotas, or adjust variable levy calculations. Of major interest to the United States, the EC agreed to a tariff-rate quota for high quality beef, with 10,000 tons in-quota that was levy free, and an over-quota tariff rate of 20 percent ad valorem. Of major interest to the EC, the United States agreed to increase the U.S. cheese quota from 17,700 to 44,000 tons for the EC.

Canada made concessions to the United States valued at around $600 million and, in exchange, the United States gave concessions amounting to about $350 million, in 1976 dollars. More than half the trade coverage of these concessions involved the livestock sector. Duty harmonization was a major element of trade liberalization in both directions, affecting cattle, pork, corn, and potatoes.

Australia agreed to reduce tariffs on 91 rate lines, of which tobacco was a key agricultural product; and computers, construction machinery, and scientific instruments were key industrial products of interest to the United States. Of interest to Australia, the United States agreed to liberalize U.S. nontariff measures controlling meat and dairy imports.

---

[33] USTR, *Annual Report 1979*, pp. 39 to 51.

New Zealand agreed to reduce tariffs on 76 rate lines, of which citrus, rice, tobacco, and turkey were key agricultural goods; and chemicals, engines, industrial machinery, medical equipment, and tools were key industrial goods of interest to the United States. The United States agreed to reduce tariffs on 36 rate lines, principally on meats (beef, lamb, veal), dairy products (butter, cheese, casein dairy mixtures), wool, and motorboat engines. The United States also agreed to establish for New Zealand a bilateral quota for cheese of 17,422 tons.

South Africa agreed to reduce tariffs by 50 percent on average for $27 million of U.S. products. South Africa also agreed to eliminate preferential tariffs on products from the United Kingdom, such as protein derivatives, earth moving machinery, and tools. The United States agreed to reduce tariffs by 29 percent on average for $74 million of South African products, principally fine wool, tanning extracts, diamonds, and certain scrap metals.

Impact of the agreement

Tariff negotiations resulted in multilateral tariff reductions covering $126 billion in trade in industrial products among the 19 major developed countries, according to the 1979 annual report[34] of the President to Congress following the negotiations. The tariff reductions were based on a tariff cutting formula, although there were a number of exceptions to the formula.[35] The cuts achieved a simple average tariff reduction among the major trading partners of about 35 percent. For the United States, the average tariff on industrial product imports was to decline from 6.1 percent ad valorem to 4.2 percent–a 32 percent reduction.[36] Multilateral tariff negotiations for agricultural products centered largely on concessions given by developed countries on exports of tropical products from developing countries. A number of bilateral trade negotiations on agriculture also emerged from the Tokyo Round, largely among the developed countries, and focused more on "market access measures"[37] where the combined effect of tariff and nontariff measures was difficult for negotiators to address separately.

---

[34] USTR, *Annual Report 1979*, pp. 39 to 51.

[35] The formula settled upon in December 1978 was originally proposed by Switzerland and, hence, was known as the "Swiss formula."

[36] USTR, *Annual Report 1979*, p. 50.

[37] USTR, *Annual Report 1979*, pp. 39 to 51.

1985 United States-Israel Free Trade Area Agreement

Setting

Following the failure to launch a new round of multilateral trade negotiations in 1982, U.S. trade policy efforts shifted focus toward bilateral and plurilateral discussions to liberalize trade.[38] Israel originally proposed the idea of a free trade area between the United States and Israel in 1981.[39] In November 1983, President Reagan and Israeli Prime Minister Shamir agreed to begin bilateral negotiations on a reciprocal free trade area between the United States and Israel. At the time, U.S. exports to Israel suffered from a severe tariff disparity as compared to exports from the EC, owing to an EC-Israel preferential trade agreement for industrial products. In addition to broader political goals involved in closer U.S.-Israelities, the U.S.-Israel FTA also sought to overcome this economic disadvantage for U.S. products.

Review of the negotiations

Negotiations began formally on January 17, 1984.[40] Section 1101 (extension of nontariff barrier negotiating authority) of the 1979 Trade Act had extended section 102 authority of the 1974 Trade Act to negotiate nontariff barriers, as well as the section 151 provisions of the 1974 Trade Act under which Congress agreed to consider the agreement and its implementing legislation under the fast-track approval procedures.[41] An agreement was signed on April 22, 1985 that was to eliminate tariff and nontariff barriers on most products traded between the United States and Israel by January 1, 1995.[42] The agreement was submitted to the Congress for approval on April 29, 1985, along with its statement of administrative action.[43] Congress approved the U.S.-Israel Free Trade Area Implementation Act of 1985,[44] which

---

[38] Staff of the U.S. House of Representatives, Committee on Ways and Means, *Trade Legislation Enacted into Public Law – 1981 through 1988*, Committee print, Jan. 27, 1989, 101st Cong., 1st Sess. (Washington DC, GPO: 1989), pp. 163-167.

[39] USTR, *Annual Report 1984-85*, p. 97.

[40] Ibid.

[41] Ibid.

[42] Committee on Ways and Means, *Trade Legislation*, Committee print, pp. 163-167.

[43] Committee on Ways and Means, *Trade Legislation*, Committee print, pp. 163-167. This notification began the period of 60 legislative days during which either the Senate Committee on Finance or the House Committee on Ways and Means could disapprove consideration of the agreement under the fast-track approval procedures of the 1974 Trade Act.

[44] Pub. L. 99-47 (H.R. 2268), 99 Stat. 82. See 19 U.S.C. 2112(b) and accompanying note.

was signed into U.S. law on June 11, 1985.[45] The U.S.-Israel Free Trade Area agreement was the first reciprocal bilateral agreement negotiated by the United States.

Overview of the agreement

The agreement eliminated tariffs for various products according to four different schedules: (1) upon entry into force of the agreement; (2) in 3 reductions to January 1, 1989; (3) in 8 reductions to January 1, 1995; and (4) after a 5-year period of no reductions, by negotiated reduction by January 1, 1995.[46] In the area of nontariff barriers, the agreement ended a variety of trade distorting practices. First, Israel agreed to eliminate export subsidies on industrial products, including processed agricultural goods. Israel agreed to accede to the GATT Subsidies Code on or before the agreement became effective. Second, the United States and Israel agreed to disciplines on taking actions for balance-of-payments reasons. Third, Israel agreed to automatic licensing for virtually all nonagricultural products, unless a specific reason is provided for nonautomatic licensing. Fourth, both countries agreed they could maintain import restrictions for agricultural policy purposes, with the exception of customs duties. Finally, the United States and Israel agreed to lower the GATT threshold for mutual procurement in order to expand access to their government procurement markets. The agreement also contains detailed safeguard provisions modeled after section 201 of the Trade Act of 1974; dispute settlement procedures; rules of origin similar to those detailed in the Caribbean Basin Economic Recovery Act;[47] and provisions for consultations through an ongoing Joint Committee.

1988 United States-Canada Free Trade Agreement

Setting

In late 1983, Canada released a comprehensive review of its trade policy during the early 1980s,[48] which highlighted the importance of U.S. trade to Canada, but rejected the idea of a comprehensive, preferential free trade agreement between the United States and Canada. The review instead recommended limited free trade agreements for particular sectors, resembling the 1965 U.S-Canada Auto Pact. Sectors initially considered by Canada as

---

[45] Committee on Ways and Means, *Trade Legislation*, Committee print, pp. 163-167.

[46] Committee on Ways and Means, *Trade Legislation*, Committee print, pp. 163-167.

[47] These rules of origin were essentially the judicially interpreted "substantial transformation" standard, under 19 U.S.C. 1304, as amended.

[48] USTR, *Annual Report 1984-85*, p. 98.

possibilities for such negotiations included steel, urban mass transit, petrochemicals, and textiles and clothing. Several joint working groups were established in 1984 to examine the possibility of negotiating these sectoral agreements. However, these working groups remained dormant during the Canadian election campaign that began in the summer of 1984. Once elected in September 1984, the new government of Prime Minister Mulroney began a review of ways to promote freer trade with the United States.

Review of the negotiations

On September 26, 1985, Prime Minister Mulroney formally requested that the United States and Canada open negotiations on a United States-Canada Free-Trade Agreement.[49] U.S. negotiators held talks under section 102 authority of the 1974 Trade Act, which had been extended by the 1979 Trade Act through January 3, 1988. Negotiations began on June 17, 1986. On October 3, 1987, President Reagan notified the Congress of his intention to enter into a free trade agreement with Canada. Negotiators completed a final text on December 9, 1987.[50] On January 2, 1988, President Reagan and Prime Minister Mulroney formally entered into the agreement. On July 25, 1988, the President transmitted to the Congress the United States-Canada Free-Trade Agreement Implementation Act of 1988. The Congress passed the act and on September 28, 1988, the President signed the act into law. The U.S-Canada FTA took effect on January 1, 1989.[51]

Overview of the agreement

The U.S-Canada FTA eliminated all tariffs on originating goods, reduced many nontariff barriers, liberalized investment practices, provided ground rules covering trade in services, and supported efforts at multilateral trade liberalization. Much of the value of the agreement to the United States lay outside the tariff area, by increasing the stability of cross-border trade, and by assuring that long-term commitments could be made by businesses and exporters without fear of arbitrary disruption from direct import restriction or other measures. The agreement addressed factors affecting trade in services, an area of increasing economic importance. Cross-border investment was also

[49] USTR, *Annual Report 1988*, pp. 21-24.

[50] USTR, *Annual Report 1988*, pp. 21-24.

[51] The CFTA remains in force technically, although it has been effectively suspended by adoption of the NAFTA. The NAFTA has incorporated all the bilateral CFTA obligations that the parties agreed should be continued under the NAFTA.

addressed in an effort to make this area more efficient.[52] In 1987, total bilateral goods and services trade between the two countries exceeded $166 billion.

The U.S-Canada FTA contained 21 chapters in eight broad sections: (1) objectives and scope; (2) trade in goods; (3) government procurement; (4) services, investment and temporary entry; (5) financial services; (6) institutional provisions; (7) other provisions; and (8) final provisions. The first section on objectives and scope comprising chapter 1 and 2 covers the overall aims of the agreement and the general definitions used in the agreement. Section 2 on trade in goods, comprising chapters 3 through 12, covers rules of origin for goods, border measures, national treatment, technical standards, agriculture, wine and distilled spirits, energy, trade in automotive goods, emergency action, and exceptions for trade in goods. Section 3 in chapter 13 covers government procurement. Section 4, comprising chapters 14 through 16, covers services, temporary entry for business persons, and investment. Section 5, in chapter 17, covers financial services. Section 6, comprising chapters 18 and 19, covers institutional provisions, and binational dispute settlement in antidumping and countervailing duty cases. Section 7, in chapter 20, covers other provisions. Section 8, in chapter 21, covers final provisions.

Impact of the agreement

The summary of the agreement's effects submitted by the Administration in its documentation to Congress estimated that duty-free trade between the two countries would result in a gain of between $1 billion and $3.5 billion in annual U.S. welfare.[53] U.S. exports to Canada were projected to increase by as much as $2.4 billion compared to a Canadian gain of $1.1 billion. Although more difficult to quantify, liberalization of nontariff barriers was to provide significant opportunities for U.S. businesses and exporters.

1993 North American Free Trade Agreement

Setting

After the U.S-Canada negotiations, the United States continued its bilateral and regional thrust toward trade liberalization with similar negotiations held

[52] President of the United States, "Statement of Administrative Action" (hereafter "SAA-CFTA"), p. 2-7; found at President of the United States, *Communication from the President of the United States transmitting the Final Legal Text of the U.S.-Canada Free-Trade Agreement, the Proposed U.S.-Canada Free-Trade Agreement Implementation Act of 1988, and a Statement of Administrative Action, Pursuant to 19 U.S.C. 2112(e)(2), 2212(a)*, 100th Cong., 2d Sess., H. Doc. 100-216, July 26, 1988, (GPO: Washington DC, 1993), p. 727-730 (hereafter, H. Doc. 100-216).

[53] SAA-CFTA; found at H. Doc. 100-216, pp. 3 to 7.

with its southern neighbor, Mexico. In June 1990, the United States and Mexican Presidents endorsed the goal of a comprehensive free trade agreement (FTA) between the United States and Mexico, and instructed their ministers to open negotiations. Congress had renewed U.S. trade agreement authority in the Omnibus Trade and Competitiveness Act of 1988,[54] which, although focused primarily on the next round of multilateral trade negotiations that began in 1986, also permitted U.S. negotiators to establish regional and bilateral trade agreements if possible.

Review of the negotiations

Following the June 1990 announcement, Canada expressed interest in three-way negotiations between the United States, Mexico, and Canada. Negotiations formally began in June 1991 and proceeded quickly based on previous bilateral discussions held between the United States and Mexico earlier when Mexico was preparing to accede to the GATT in 1986.

On August 12, 1992, Canada, Mexico, and the United States announced the completion of the negotiations, 14 months after they began.[55] The President submitted to Congress on November 3, 1993 the legislative package necessary for the agreement to be considered under the fast-track approval procedures. The package included the text of the agreement, schedules of concessions, an implementing bill, a Statement of Administrative Action required to implement the agreement, and certain administration statements required by Congress on how the agreement would affect U.S. economic interests. The U.S. House of Representatives approved the legislation on November 17, 1993; the U.S. Senate on November 20, 1993. Mexico ratified the agreement on November 22, 1993; and Canada proclaimed the legislation on December 30, 1993. The NAFTA entered into force on January 1, 1994.

Overview of the agreement

The NAFTA is a regionwide trade agreement aimed at progressively eliminating tariff and nontariff barriers to trade in originating goods, improving access for trade in services, establishing rules for investment, strengthening

---

[54] Pub. L. 100-418, 102 Stat. 1102, 19 U.S.C. 2902. For further details, see the section on the Uruguay Round Agreements.

[55] USTR, *Annual Report 1993*, pp. 45-46. On Sept. 25, 1990, President Bush notified the Senate Finance and the House Ways and Means Committees of his intent to negotiate an FTA with Mexico.This notification began the period of 60 legislative days during which either committee could decline in advance to consider any trade agreement negotiated under this authority using the fast- track approval procedures.The President also indicated that Canada had expressed a strong desire to participate in three-way negotiations with Mexico and the United States. On Feb. 5, 1991, the President again informed the two committees of the decision by the three governments to proceed with trilateral negotiations toward forming a North American FTA. USTR, *Annual Report 1991*, pp. 78-79.

protection for intellectual property rights, and creating an effective dispute settlement mechanism. Most tariff and nontariff barriers on eligible industrial products will be gradually eliminated over 10 years, including barriers to textiles and apparel that have substantial regional content. Moreover, the agreement provides that tariffs and most nontariff barriers on agricultural products will be phased out over 15 years. Investment rules aim to ensure national treatment and eliminate or significantly reduce most performance requirements in all sectors, particularly in investment barriers in the petrochemical and financial sectors in Mexico. The agreement liberalizes trade in services–in particular financial, land transportation, and telecommunications services–and also aims to protect intellectual property rights. It creates a dispute resolution structure and contains mechanisms to enforce national labor and environmental laws. Last, the NAFTA provides funds for environmental infrastructure and community adjustment along the U.S.-Mexican border.[56]

The NAFTA contains eight broad sections, both substantive and institutional: (1) general objectives and definitions; (2) trade in goods; (3) technical barriers to trade; (4) government procurement; (5) investment, services, and related matters; (6) intellectual property; (7) administrative and institutional provisions; and (8) final provisions. What follows is a brief overview of the agreement's provisions, drawing upon implementation documents submitted to Congress as part of its approval procedure for the agreement.[57]

Objectives

The first section contains chapters 1 and 2, which cover the objectives (establishment of the free trade area; objectives; relation to other agreements, including environmental and conservation agreements; and the extent of obligations) and the general definitions used in the agreement.[58]

---

[56] CEA, *Economic Report of the President*, 1995, pp. 220-221.

[57] President of the United States, "Statement of Administrative Action"; (hereafter "SSA-NAFTA"); found at President of the United States, *Message for the President of the United States transmitting North American Free Trade Agreement, Texts of Agreement, Implementing Bill, Statement of Administrative Action and Required Supporting Statements*, 103d Cong., 1st Sess., H. Doc. 103-159, Vol. 1, Nov. 4, 1993, (GPO: Washington DC, 1993), (hereafter, H. Doc. 103-159).

[58] *North American Free Trade Agreement between the Government of the United States of America, the Government of Canada and the Government of the United Mexican States*, vol. I, 1993 (hereafter *NAFTA*); found at H. Doc. 103-159.

Trade in goods

The provisions covering trade in goods are contained in chapters 3 through 8. NAFTA's principal rules governing trade in goods, which are found in chapter 3, require nondiscriminatory national treatment and trade between NAFTA countries; a phaseout of tariffs on qualifying goods produced in North America and traded between Canada, Mexico, and the United States; and the elimination of a wide variety of nontariff barriers and trade distorting measures.[59] Chapter 4 establishes the rules of origin to identify the goods that will be deemed to originate in the territories of the NAFTA parties and thus eligible for the benefits of the agreement.[60] Chapter 5 establishes procedures for customs administrations in each NAFTA country to follow, ensuring that uniform treatment of goods under NAFTA's rules of origin and marking rules will channel the benefits of lower tariffs to firms and individuals producing and trading qualifying goods within North America.[61] In general, goods wholly produced in the NAFTA region, meeting listed changes in tariff classification and other criteria, or made in the region from originating materials qualify for NAFTA benefits.

Chapter 6 establishes specific rules for trade in energy products and petrochemicals. It also covers certain Mexican reservations (exceptions) regarding NAFTA rules governing national treatment of investments in the energy and petrochemicals sectors, and governing trade in services related to these sectors.[62] Chapter 7 addresses the agriculture sector and sets out separate agricultural market access agreements between Mexico and the United States, and between Mexico and Canada. When considered in combination with the U.S-Canada FTA, these provisions largely create three separate bilateral agreements on agriculture between the NAFTA governments, rather than one trilateral agreement. Chapter 7 also deals with sanitary and phytosanitary (SPS) measures that protect human, animal, and plant life and health from risks of plant- and animal-borne pests and diseases, and from risks of additives and contaminants in foods and feedstuffs. The NAFTA establishes general requirements and procedures so that SPS measures do in fact protect against the risk targeted and do not act as disguised trade barriers.[63] Finally, chapter 8 sets out procedures and remedies available to domestic industries that have sustained, or are threatened by, serious economic injury due to increased imports. Special safeguard provisions apply elsewhere to agricultural and textile products.[64]

---

[59] SAA-NAFTA, p. 18; found at H. Doc. 103-159, p. 467.

[60] Ibid., p. 43; at p. 492. See general note 12 to the HTS.

[61] Ibid., p. 50; at p. 499.

[62] Ibid., p. 62; at p. 511.

[63] Ibid., p. 67, at p. 516; and SAA, p. 88, at p. 537.

[64] Ibid., p. 109; at p. 558.

Technical barriers to trade

Technical barriers to trade are covered by chapter 9, which establishes several procedural requirements concerning standards-related measures. Such measures include voluntary and mandatory product or service standards and the procedures used to determine whether a particular product or service meets these standards. This chapter establishes the requirements and procedures intended to distinguish legitimate measures taken to protect a nation's domestic interests from those measures that are obstacles to trade.[65]

Government procurement

Government procurement obligations are contained in chapter 10, which requires the three NAFTA countries to eliminate "Buy National" restrictions on the majority of nondefense goods and services that are supplied by firms in North America to the federal governments of member states.[66]

Investment and services

Chapters 11 through 16 on investment, services, and related matters set out the investment obligations of member governments toward investors from other NAFTA parties, provisions regarding cross-border trade in services and specific services sectors such as telecommunications and financial services, as well as provisions addressing competition policy and the entry of business persons engaged in investment or services matters. In chapter 1, each government agrees to four basic protections for investments made by persons from other NAFTA countries. These obligations include: (1) nondiscriminatory treatment; (2) freedom from performance requirements; (3) free transfer of funds related to an investment; and (4) expropriation only in conformity with international law. Chapter 11 also provides a mechanism for the settlement of disputes between an investor and the state, patterned after the standard investor-state dispute mechanism found in a U.S. bilateral investment treaty. This mechanism permits an investor to submit a claim to binding arbitration under internationally accepted rules.[67]

Chapter 12 establishes the basic rules regulating trade in services, which parallel those in the agreement regulating trade in goods. Each country retains the right to set licensing standards for trade in services, provided the actions are nondiscriminatory.[68] Chapter 13 addresses measures affecting access to and use of public telecommunications networks, as well as measures affecting the

---

[65] Ibid., p. 120; at p. 569.
[66] Ibid., p. 134; at p. 583.
[67] Ibid., p. 140, at p. 589; and p. 145, at p. 594.
[68] Ibid., p. 150; at p. 599.

right of firms and individuals from member countries to provide such services. It contains rules to protect firms that operate private communication networks, or provide enhanced services or computer services over another signatory's basic telephone network.[69] Chapter 14 sets down national treatment rules governing how each NAFTA government must treat financial institutions from other NAFTA parties operating in its territory. These rules cover financial institutions owned by investors from other NAFTA countries, investors who own or seek to own such institutions, and persons in other NAFTA countries that provide financial services on a cross-border basis. The rules apply to government measures in the financial sector at the federal, state, and local level.[70]

Chapter 15 on business conduct focuses on monopolies and state enterprises and is designed to complement and support the market-opening objectives of the agreement, particularly relating to the energy sector.[71] Chapter 16 addresses the temporary entry of business persons that are citizens of other NAFTA countries while preserving each country's right to protect its domestic labor force and carry out its own immigration policies.[72]

Intellectual property rights

The section on intellectual property establishes comprehensive standards for the protection and enforcement of intellectual property rights in the three NAFTA countries. These rules require each government to apply the substantive provisions of the world's most important intellectual property conventions, to include additional protections, and to enforce critical procedures to safeguard these rights.[73]

Institutional provisions

The section on institutional provisions sets rules to foster transparency in administering the agreement, establishes several bodies to provide administrative support, and establishes general and specific dispute settlement procedures for antidumping and countervailing duty matters. Chapter 18 includes requirements regarding the publication, notification, and administration of laws aimed at promoting the open and fair application of measures covered by the agreement.[74] Chapter 19 sets out procedures for binational panel review of final antidumping and countervailing duty

---

[69] Ibid., p. 160; at p. 609.
[70] Ibid., p. 163; at p. 612.
[71] Ibid., p. 173; at p. 622.
[72] Ibid., p. 174; at p. 624.
[73] Ibid., p. 184; at p. 633.
[74] Ibid., p. 193; at p. 642.

determinations, and for notification and review of trade law amendments.[75] Chapter 20 sets out detailed procedures for government-to-government dispute resolution under the NAFTA. This chapter also establishes a Free Trade Commission, the central institution of the NAFTA comprising ministers or similar officials designated by each country, and creates a NAFTA Secretariat to provide support to the Commission.[76]

Exceptions

Chapter 21 spells out general, national security, taxation, balance-of-payments, disclosure of information, and cultural industries exceptions to all or part of the agreement.[77] In chapter 22, provisions are made regarding the agreement's annexes, amendments to the agreement, its entry into force, accession to and withdrawal from the agreement, and the authentic text of the agreement.[78]

Impact of the agreement

The impact of the NAFTA on national income growth has proven difficult to isolate from other factors, particularly as the agreement's provisions are still in transition. Since the NAFTA went into effect in 1994, total trade has increased among Canada, Mexico, and the United States by approximately 128 percent, from $297 billion in 1994 to $676 billion in 2000, according to recent estimates cited by the administration.[79] The share of U.S. goods exported to NAFTA partners has increased from 14 percent to 37 percent during this period as trade restrictions previously limiting U.S. exports have decreased significantly. Nearly all of the $406 billion in bilateral trade in goods between Canada and the United States currently enters free of duty. When the agreement is fully implemented, some estimates have suggested that U.S. GDP could experience an increase between 0.1 percent and 0.5 percent, or roughly $10 billion to $50 billion relative to the size of the U.S. economy in 2000.[80]

---

[75] Ibid., p. 194; at p. 643.

[76] Ibid., p. 208; at p. 657.

[77] Ibid., p. 217; at p. 666.

[78] *NAFTA*, p. 22-1; at p. 1292.

[79] CEA, *Economic Report of the President,* 2002, pp. 279-280.

[80] CEA, *Economic Report of the President,* 2002, pp. 279-280. The report does not cite specific studies. Also, note that NAFTA has not yet been fully implemented. Results reported in chapter 7 of the current study reflect implementation as of 2001.

1994 Uruguay Round Agreements

Setting

In September 1986, the ministerial declaration in Punta del Este, Uruguay, launched the eighth round of multilateral trade negotiations known as the Uruguay Round. Although the major trading nations had sought to begin another round of negotiations after the Tokyo Round Agreements entered into force, these efforts failed in 1982 when many countries proved unwilling to make fresh concessions to liberalize world trade at a time of world recession. After further efforts and several years of delay, these negotiations began slowly in 1986.[81]

U.S. trade agreement negotiating authority was also delayed until the Congress passed the Omnibus Trade and Competitiveness Act of 1988, which was signed into law August 23, 1988. Section 1102(a) (agreements regarding tariff barriers) and section 1102(b) (agreements regarding nontariff barriers) of the 1988 Trade Act authorized the President to enter into trade agreements concerning tariff and nontariff barriers provided that the agreements made progress toward meeting the trade negotiating objectives set out in section 1101 of the 1988 Trade Act.[82] Trade agreement negotiating authority was granted through May 31, 1993, and U.S. implementing legislation for resulting agreements was subject to fast-track approval procedures. On July 2, 1993, the Congress amended section 1102 authority to extend these approval procedures from May 31, 1993 to April 16, 1994, to allow negotiators to conclude the Uruguay Round negotiations. This extension was subject to the President notifying the Congress of his intent to enter into an agreement at least 120 days prior to signing such a trade agreement (that is, by December 15, 1993).

---

[81] CEA, *Economic Report of the President*, 1986, p. 122.

[82] Section 1101 (19 U.S.C. 2902) sets out 16 principal negotiating objectives that involved (1) dispute settlement, (2) improvement of the GATT and multilateral trade negotiation agreements, (3) transparency, (4) developing countries, (5) current account surpluses, (6) trade and monetary coordination, (7) agriculture, (8) unfair trade practices, (9) trade in services, (10) intellectual property, (11) foreign direct investment, (12) safeguards, (13) specific barriers, (14) worker rights, (15) access to high technology, and (16) border taxes. More broadly, section 1101 also elaborated 3 overall objectives, charging U.S. negotiators to obtain (1) more open, equitable, and reciprocal market access; (2) the reduction or elimination of barriers and other trade-distorting policies and practices; and (3) a more effective system of international trading disciplines and procedures.

Review of the negotiations

In December 1988, negotiators held a mid-term review of progress in Montreal, Canada, to take stock of the Uruguay Round negotiations to date.[83] As disagreements over trade in agriculture played a lead role in the 1982 failure to launch new trade talks, so too did the same disagreements postpone conclusion of the mid-term review until April 1989. Nonetheless, the review did streamline the GATT dispute settlement procedures, institute the Trade Policy Review Mechanism on a provisional basis, and even produced some agreement concerning agricultural trade–specifically, the early implementation of market access concessions on imports of tropical agricultural products important to developing countries.

The Uruguay Round was scheduled to conclude in December 1990 in Brussels, Belgium, but an impasse over how to reform trade in agriculture deadlocked the ministerial conference. Subsequently, the GATT Director-General consulted with members about resuming negotiations until a draft text containing the likely elements of a final agreement emerged in December 1991. This draft Final Act became the basis for several more years of discussion. In November 1992, the United States and the European Union (EU) settled their differences concerning agriculture in the so-called Blair House accord. In July 1993, the four major trading partners–Canada, EU, Japan, and the United States–announced a market access agreement as part of an effort to push for a conclusion to the Uruguay Round. On December 15, 1993, the Uruguay Round of negotiations was concluded for all issues. On April 15, 1994, ministers met in Marrakesh, Morocco to sign the Uruguay Round Agreements among 125 participating governments.

Overview of the agreement

Goods, services, and intellectual property

The Uruguay Round of multilateral trade negotiations took more than 7 years to conclude, but once finished, it surpassed all other rounds of trade and tariff negotiations in the breadth of topics covered. While all previous rounds had failed to cover trade in agriculture in any substantive manner, the Uruguay Round Agreements included an Agreement on Agriculture that covered trade in agricultural products on the same basis as trade in industrial products. Though previous rounds applied only to trade in goods, the Uruguay Round Agreements apply to trade in goods, trade in services, and trade-related aspects of intellectual property rights, thus extending the multilateral trading rules to

[83] This section is based largely on material provided by the WTO, “Trading into the Future: the Introduction to the WTO,” April 1999, 2d edition; also available at Internet address *http://www.wto.org/english/thewto_e/whatis_e/tif_e/fact5_e.htm*, retrieved on Oct. 29, 2002.

cover the technological progress and globalization of production that has been transforming economies since the Second World War.

Single integrated package of agreements

Negotiators of the Uruguay Round incorporated all the resulting agreements together into a single package, so that a government accepting the rights and obligations of any one agreement had to accept the rights and obligations in all the multilateral agreements. This package included an integrated dispute settlement system intended to apply to all the Uruguay Round Agreements and member countries, something lacking under previous multilateral trading rules. Finally, the negotiators in the Uruguay Round agreed to institutionalize these rules by establishing an international organization–the World Trade Organization–to administer the Uruguay Round Agreements in a consistent manner.

WTO agreement and integral annexes

The Uruguay Round Agreements consist collectively of 22 agreements and some 30 ministerial decisions and declarations. On April 15, 1994, ministers signed in Marrakesh, Morocco, the "Final Act Embodying the Results of the Uruguay Round of Multilateral Trade Negotiations," a one-page document that indicated that they would submit for ratification to their legislatures a second document–the Marrakesh Protocol Establishing the World Trade Organization. Ratification of the WTO Agreement means that a government accepts not only the slim 12-page text of the WTO Agreement, but also the voluminous annexes that are an integral part of the agreement. The annexes comprise Annex 1 [no title], which contains three parts: Annex 1A–the Multilateral Agreements on Trade in Goods; Annex 1B–the General Agreement on Trade in Services; and Annex 1C–the Agreement on Trade-Related Aspects of Intellectual Property Rights; Annex 2–the Dispute Settlement Understanding; Annex 3–the Trade Policy Review Mechanism; and Annex 4–the Plurilateral Agreements.

Annex 1A covers the multilateral agreements on trade in goods, containing a large number of separate agreements. These agreements cover agriculture, sanitary and phytosanitary measures, textiles and clothing, technical standards, investment measures, customs valuation, antidumping measures, preshipment inspection, rules of origin, subsidies and countervailing measures, and safeguards. Annex 1B contains the General Agreement on Trade in Services, or GATS. The GATS is the first multilateral framework devised to address trade in services, an increasingly important component of world trade and the world economy. Annex 1C contains the Agreement on Trade-Related Aspects of Intellectual Property Rights, also known as the "TRIPs Agreement," the first multilateral agreement to bring intellectual property rights into the GATT framework of international trade disciplines. Annex 2 contains the Understanding on Rules and Procedures Governing the Settlement of Disputes, commonly known as the Dispute Settlement Understanding. The Dispute

Settlement Understanding is an integral part of the package of Uruguay Round Agreements and aims to provide a unified dispute settlement mechanism across all the Uruguay Round Agreements overseen by the WTO, a unified approach that was lacking under the previous GATT 1947 arrangement overseen by the GATT Secretariat. Annex 3 contains the Trade Policy Review Mechanism, a means by which member government trade policies can be examined to highlight policies that support the multilateral trading system as well as those that may not adhere to multilateral trade disciplines. Annex 4 covers several separate plurilateral agreements, which are administered through the WTO structure. Originally, in 1995, there were four plurilateral agreements: (1) the Agreement on Trade in Civil Aircraft; (2) the Agreement on Government Procurement; (3) the International Dairy Agreement; and (4) the International Bovine Meat Agreement. However, in 1997 the two sectoral agreements on bovine meat and dairy products were terminated, leaving only the Agreement on Government Procurement and the Agreement on Trade in Civil Aircraft in Annex 4 of the Uruguay Round Agreements.

In principle, a plurilateral agreement differs from a multilateral one in that the specific signatories to a plurilateral agreement receive additional rights in exchange for accepting additional obligations. Although all WTO members are signatories to the multilateral agreements embodied in the Uruguay Round Agreements and all members receive the same rights in exchange for accepting the same obligations, only the signatories to the plurilateral agreements are entitled to the rights provided by the additional rules found in the plurilateral agreement in exchange for accepting additional obligations that complement the multilateral WTO rules. Nonetheless, despite the separate nature of the plurilateral agreements, they are administered under the framework of the WTO institutionally in that the plurilateral disciplines extend or complement multilateral WTO rules.

GATT 1947 vs. GATT 1994

Annex 1A also includes several legal instruments of importance–the General Agreement on Tariffs and Trade 1994 (GATT 1994), and the Marrakesh Protocol to the GATT 1994. The very first provision in Annex 1A incorporates the provisions of the General Agreement on Tariffs and Trade 1947 (GATT 1947) and subsequently revises the interpretation of several GATT articles, to form the GATT 1994. The GATT 1947 entered into force on January 1, 1948, to reflect tariff negotiations held in 1947 and their attendant multilateral rules on trade in goods. The GATT 1994 entered into force on January 1, 1995, to reflect the Uruguay Round multilateral trade negotiations held from 1986 to 1993. Although GATT 1947 and GATT 1994 contain essentially the same provisions, they are nonetheless legally distinct from one another under international law, and a country could sign only one of them.

Whereas the 1947-48 Havana Conference discussed an International Trade Organization intended to administer the GATT 1947 trade rules governing the 1947 tariff negotiations, the International Trade Organization was never established. This lapse left the GATT 1947 to continue as a framework of trade rules for nearly 50 years, but with no major supporting institution. In contrast, the World Trade Organization was established specifically to administer the GATT 1994, both entering into force on January 1, 1995.

Marrakesh Protocol of national schedules of commitments

Annex 1A also includes the Marrakesh Protocol to the GATT 1994, a protocol that marks the legal and notional location within the framework of the Uruguay Round Agreements where WTO Members affix their national schedules of concessions and commitments as negotiated during the Uruguay Round. If considered literally, this section comprises thousands of pages of national schedules of concessions that are similar to national tariff schedules. It should be noted that market access concessions made as part of the negotiation of a multilateral agreement often do not appear explicitly under multilateral agreements but instead exist only in national schedules of concessions and commitments, e.g. the overall Uruguay Round multilateral commitment for developed countries to reduce their agricultural export subsidies by 36 percent over 6 years.

Impact of the agreement

Estimates of the impact of the Uruguay Round Agreements prove difficult owing to their continuing implementation and the difficulty of disentangling the agreements' effects from current events. In 1994, the GATT Secretariat released its overview of the results of the round.[84] The report said that estimates of the value increase in world income due to the liberalization of trade in goods ranged from $109 billion to $510 billion by the end of the agreements' implementation period in 2005. Estimates of the volume increase of world trade in goods ranged from 9 percent to 24 percent by 2005. Annual income gains–based on the upper range assumption of $510 billion by 2005–were estimated to be roughly $122 billion for the United States, $164 billion for the EU, $27 billion for Japan, and $116 billion for the developing countries and economies in transition[85] as a single group.

For agricultural products, countries agreed to maintain current access, and if current access was not at 3 percent of domestic consumption countries made a minimum access commitment at 3 percent with a commitment to increase to 5 percent by the end of the implementation period. The United States agreed to minimum market access commitments for, among others, 0.81 million tons of wheat, 1.8 million tons of coarse grains, 1.1 million tons of rice, and 0.73 million tons of dairy products. The participants' agreement to the tariffication of all agricultural products means that virtually only tariff barriers should

[84] GATT Secretariat, *The Results of the Uruguay Round of multilateral trade negotiations – Market access for goods and services: Overview of the results*, November 1994 (Geneva: GATT, 1994).

[85] This category comprises essentially the formerly centrally planned economies of Central and Eastern Europe.

remain in principle to distort trade in agriculture once all provisions are fully implemented. Participants also agreed to bind essentially 100 percent of agricultural tariffs, and to reduce those tariff by a weighted average of 36 percent, and not less than 15 percent for each tariff line. Bound tariff rates provide traders and investors with substantially greater market security and, as a consequence, can promote increased trade. Participants agreed to a 36 percent reduction in agricultural export subsidies, decreasing from $22.5 billion to $14.5 billion. Participants further agreed to a reduction in agricultural domestic support subsidies of 18 percent, decreasing from $197 billion to $162 billion, in total.

For industrial products, the developed countries agreed to tariff reductions that declined from an average of 6.3 percent ad valorem to 3.8 percent, roughly a 40 percent reduction. The proportion of industrial products entering developed country markets at a tariff rate of free (duty-free) is scheduled to double from 20 percent to 44 percent by 2005. The percentage of bound tariff rates rose from 78 percent to 99 percent for developed countries, from 21 percent to 73 percent for developing countries, and from 73 percent to 98 percent for transition economies. In the first multilateral negotiation of its kind, the participants agreed to market access commitments regarding trade in services. In addition, the Uruguay Round Agreements succeeded–through the Agreement on Textiles and Clothing–in establishing a framework under which international trade in textiles and clothing could be brought under GATT disciplines in the multilateral trading system. The agreement's 10-year phaseout of quotas is scheduled to conclude on January 1, 2005, when all remaining textile and clothing quotas are to be fully integrated into the GATT.

CHAPTER 3: Economic Changes in the United States Since the Beginning of the Tokyo Round

In 1974, the year Congress first granted the President fast-track negotiating authority, the applied U.S. tariff rate on imported goods was 4.64 percent.[1] By 2001, the applied tariff rate had fallen to 1.59 percent.[2] Tariff reductions, other U.S. trade policy changes, and reductions in foreign trade barriers–along with other factors such as growing incomes and improved transportation and communication technologies–increased the real value of U.S. trade in goods and services[3] from $0.5 trillion in 1974 to $2.5 trillion in 2001.[4] During that time, trade has grown faster than overall U.S. economic activity. The ratio of U.S. trade to GDP was 0.12 in 1974 and 0.28 in 2001.[5]

While growing international trade has undoubtedly affected the U.S. economy, a number of other changes were probably just as significant. The past three decades have seen substantial technological progress, deregulation of several large service industries, sizable increases in workers' average education level, and substantial growth in both the capital stock and the size of the population. The effects of these and other changes on the U.S. economy complicate efforts to measure the economic impact of trade agreements.

The principal purpose of this study is to identify those economic outcomes that can be credibly traced to trade policy changes. The key analytical difficulty in any such exercise is distinguishing the effects of trade policy from the effects of other sources of economic change. In the studies reviewed in

---

[1] The World Bank Group, World Development Indicators, CD-ROM. The applied tariff rate is calculated by dividing the value of import duties collected by the value of total imports. This measure tends to understate the true size of average tariffs because importers substitute away from high tariff goods. It is included here as an indicative aggregate measure of the degree to which the U.S. has reduced its tariffs over time.

[2] USITC calculations from U.S. Department of Commerce data.

[3] Total U.S. trade is measured as the value of imports plus the value of exports.

[4] USITC calculations from U.S. Department of Commerce (USDOC), Bureau of Economic Analysis, "Survey of Current Business," August 2002. Trade is measured in constant 1996 dollars.

[5] USITC calculations from USDOC, Bureau of Economic Analysis, "Survey of Current Business," August 2002.

subsequent chapters, researchers take different approaches to identifying the effects of trade and/or trade policy changes on the U.S. economy. Conclusions about the economic effects of trade and trade policy changes necessarily depend on the way in which a study controls for other sources of economic change. Because changes not related to trade policy have been so substantial, and because many of them have effects that look like the effects of trade policy changes, this section undertakes a review of significant changes in U.S. economic structure over the last three decades.

Particular attention is paid to those economic changes with a plausible link to trade policy changes. Theories of international trade[6] suggest that a policy of reducing trade barriers should have the following effects: 1) the share of U.S. output produced by exporting industries should increase and the share of U.S. output produced by import-competing industries should decrease, 2) average real incomes should rise, as the shift toward exporting sectors increases the value of U.S. output, and 3) the relative rate of return paid to factors of production will shift in favor of those resources employed more intensively in exporting industries and against those factors employed more intensively in import-competing industries.[7] All of these changes occurred between 1974 and 2001. This chapter reviews the historical changes in the economic variables of primary interest to trade policy makers, and identifies other changes in the U.S. economy that might have also contributed to observed outcomes.

Structure of U.S. Economy

The United States has seen considerable changes in the composition of output since the mid-1970s. At the broad level, production has shifted away from manufacturing, mining and agriculture, and toward services. Table 3-1 shows real gross domestic product (measured in 1996 dollars) and the share of

[6] The international trade models described here are those based on the concept of comparative advantage – the Ricardian and Heckscher–Ohlin models. For a discussion of these models, see for example, chapters 2 and 4 in Paul R. Krugman and Maurice Obstfeld, *International Economics: Theory and Policy, Sixth Edition*, (Boston: Addison Wesley, 2002).

[7] U.S. output is capital– and skill–intensive, relative to the rest of the world. In 1993, the United States had an estimated 19.4 percent of the world's skilled labor, 20.8 percent of the physical capital, and 2.6 percent of the unskilled labor. See William Cline, *Trade and Income Distribution* (Washington, D.C.: Institute for International Economics,1997), p.183. Donald Davis and David Weinstein, "An Account of Global Factor Trade," *American Economic Review*, vol. 91, No. 5, December 2001, pp. 1423–1453 found that U.S. production is more capital intensive than any other country in their sample. Given that the U.S. economy uses unskilled labor less intensively than the rest of the world, the Heckscher–Ohlin model (specifically, the Stolper–Samuelson theorem) of international trade suggests that more open trade policies should lead to a relative decline in the return to unskilled labor in the United States. The Heckscher–Ohlin model is reviewed in greater detail in the chapter 4 discussion of the effect of trade on the distribution of wages.

Table 3-1
Gross domestic product by industry sector

	1974		2001	
	Value	Share of total	Value	Share of total
	Million dollars[1]	*Percent*	*Million dollars*[1]	*Percent*
Agriculture[2]	145,369	3.5	128,541	1.4
Mining	101,411	2.5	127,070	1.4
Manufacturing . .	920,612	22.5	1,300,484	14.1
Services[3]	2,290,841	55.9	6,594,216	71.6
Government	613,465	15.0	1,171,017	12.7
Statistical discrepancy . .	27,182	0.6	(107,156)	-1.2
Total	4,098,880	100.0	9,214,176	100.0

[1] Chain-weighted 1996 dollars, deflated with real GDP deflator calculated from Bureau of Economic Analysis data.

[2] Includes Agriculture, Forestry and Fishing sectors.

[3] Includes Construction, Transportation and Communications, Wholesale Trade, Retail Trade, Finance, Insurance and Real Estate, and Services sectors.

Source: Bureau of Economic Analysis and staff calculations.

the total in each of the four aggregate sectors for 1974 and 2001. Every sector but agriculture has grown in absolute size. Only the services sector has increased its share of total U.S. GDP.

The most significant change in table 3-1 is the relative increase in services' share of output and the relative decrease in the manufacturing share of output. In discussions of trade policy, it is often asserted that trade policy changes are responsible for the relative decline of the manufacturing sector.[8] Since the United States is a net exporter of services and a net importer of manufactured goods, standard trade models would suggest that reductions in trade barriers would lead to some shift of U.S. production toward services and away from manufacturing. However, it is not clear that trade policy changes were large enough to cause a significant shift of resources from manufacturing to the

[8] See, for example, Robert E. Scott, "Fast Track to Lost Jobs: Trade Deficits and Manufacturing Decline are the Legacy of NAFTA and the WTO," Economic Policy Institute Briefing Paper, downloaded from *http://www.epinet.org/briefingpapers/118/bp118.pdf* on March 18, 2003.

service sector. A number of other significant changes have occurred that might also have contributed to the shift of U.S. output toward services, including increased relative preferences for services by households and firms, rapid productivity growth in manufacturing, and the deregulation of several large services industries.

There is considerable evidence that consumers allocate a larger share of income toward services as their incomes rise. In an earlier assessment of cross-country demand patterns, the Commission found that the share of national income devoted to consumption of services increases with a country's per capita income.[9] The Commission also found that, for countries with a high per capita GDP, the share of national income devoted to consumption of manufactured goods falls as income increases. Since the United States has a relatively high per capita GDP, this analysis suggests that growth in U.S. per capita GDP since 1974 should have increased services' share of household demand, and decreased the manufacturing share of household demand.[10]

Much as the Commission's earlier analysis suggested, economic growth in the United States has coincided with an increase in the consumption share of services and a decrease in the consumption share of manufactured goods. U.S. per capita GDP increased substantially over the period, from $19,163 in 1974 to $32,352 in 2001.[11] During that time, services' share of personal consumption expenditures went from 45.5 percent to 58.8 percent.[12] Meanwhile, manufactured goods' share of consumption expenditures fell from 28.0 percent to 24.4 percent.[13] One significant reason that U.S. production has

---

[9] USITC, *The Dynamic Effects of Trade Liberalization: An Empirical Analysis*, Publication 3069, October 1997, Washington, DC.

[10] For further evidence on the cross country relationship between services and average income, see table 4.2, World Development Indicators 1999, World Bank, Washington, DC, p.194. This evidence shows the share of services in production. The share of services in consumption is highly correlated with the share of services in production.

[11] Measured in constant 1996 dollars. Data are from table 8-7 of USDOC, Bureau of Economic Analysis,"National Income and Product Accounts"; downloaded from *http://www.bea.doc.gov/bea/dn/nipaweb/* on March 15, 2003.

[12] Commission calculations based on table 1-1 of USDOC, Bureau of Economic Analysis, "National Income and Product Accounts"; downloaded from *http://www.bea.doc.gov/bea/dn/nipaweb* on March 21, 2003.

[13] Commission calculations based on table 2-2 of USDOC, Bureau of Economic Analysis, "National Income and Product Accounts"; downloaded from *http://www.bea.doc.gov/bea/dn/nipaweb* on March 21, 2003. Reported shares are calculated from personal expenditures on durable goods plus non-durable goods, except food and energy. The National Income and Product Accounts do not isolate manufacturing activity in the food and energy sectors. Food processing and energy refining activities are grouped with agriculture and mining sectors, respectively. The figures here exclude food and energy sectors to avoid including non-manufacturing activities in the measures.

shifted toward services is that households have shifted their consumption patterns toward services over time.

Firms have also shifted demand toward services over time. In 1977, 40.7 percent of economywide expenditures on intermediates went to services; in 1999, 57.9 percent of intermediate input expenditures went to services.[14] Some part of the increased industrial demand for services can be attributed to the overall change in output–a growing services sector demands more services.[15] Even the manufacturing sector has become more dependent on service inputs over time.[16] Some part of this shift can be attributed to domestic outsourcing and related changes in industry employment practices. For example, workers employed by a temporary service have their employment and value added attributed to the service sector, even if their work involves manufacturing activities.[17] Management consulting activities are also attributed to the services sector; these activities would be counted in manufacturing if a manufacturing firm employed the consultants directly.

A second source of significant structural change has been the sizable change in the oversight of service sectors. Many large service sectors, including banking, transportation, communications, and energy services, experienced significant deregulation during this period. Historical assessments suggest that liberalized sectors experienced price declines of between 25 and

---

[14] Commission calculations based on the 1999 U.S. input-output table from USDOC, Bureau of Economic Analysis; data downloaded from *http://www.bea.gov/bea/industry/iotables/prod/table_list.cfm?anon=65#Tables* on March 24, 2003. The 1977 data obtained from Bureau of Economic Analysis staff interviews.

[15] A total of 74.2 percent of service industries' expenditure on intermediates goes to other service industries, and 32 percent of manufacturing expenditures on intermediates is spent on services. USITC calculations are based on the USDOC, Bureau of Economic Analysis' 1999 U.S. input-output table. Data are available at *http://www.bea.gov/bea/industry/iotables/prod/table_list.cfm?anon=65;* downloaded March 21, 2003.

[16] In 1977, 22.8 percent of manufacturers' intermediate expenditures were allocated to services. In 1999, 32 percent of manufacturers intermediate expenditures were on services. USITC calculations are based on the USDOC, Bureau of Economic Analysis' input-output tables available at *http://www.bea.gov/bea/industry/iotables/prod/table_list.cfm?anon=65*; downloaded March 21, 2003.

[17] Segal and Sullivan estimate that employees of temporary services firms account for 4.5 percent of all manufacturing employment. See Lewis M. Segal and Daniel G Sullivan, 1997, "The Growth of Temporary Services Work," *Journal of Economic Perspectives* vol. 11, 2, p 122.

75 percent.[18] Given the service sector's relatively small exposure to trade,[19] domestic deregulation probably had a more significant impact on the historical experience of the service sector. Since service sectors account for such a large share of output, the economywide impact of service sector deregulation was likely larger than the impact of the five trade agreements.[20]

Perhaps the most significant change in the manufacturing sector during this period has been the rapid increase in manufacturing productivity.[21] Figure 3-1 shows productivity indices for the manufacturing sector and for the total business sector, which includes manufacturing as well as all other private sector output, particularly services. Output per hour in the manufacturing sector increased 132 percent between 1974 and 2001. The broader business sector saw output per hour rise by only 69 percent over the same period. Manufacturing productivity increases have allowed total manufacturing output and value added to increase, even as manufacturing employment has fallen. Table 3-2 reports employment shares by industry for 1974 and 2001.

There have also been significant changes in the composition of output within the broad sectors just described. Table 3-3 reports changes in value added by manufacturing sector since 1977.[22] A sector's value added is its

---

[18] Clifford Winston, "U.S. Industry Adjustment to Economic Deregulation," *Journal of Economic Perspectives*, vol. 12, No. 3, Summer 1998, p.98. Significant price declines in the service sector would only increase the share of services expenditure if consumer demand for services is elastic. That is, if a 1 percent price decline induces consumers to increase their consumption of services by more than one percent, price declines associated with deregulation would increase the share of services in consumers' budgets.

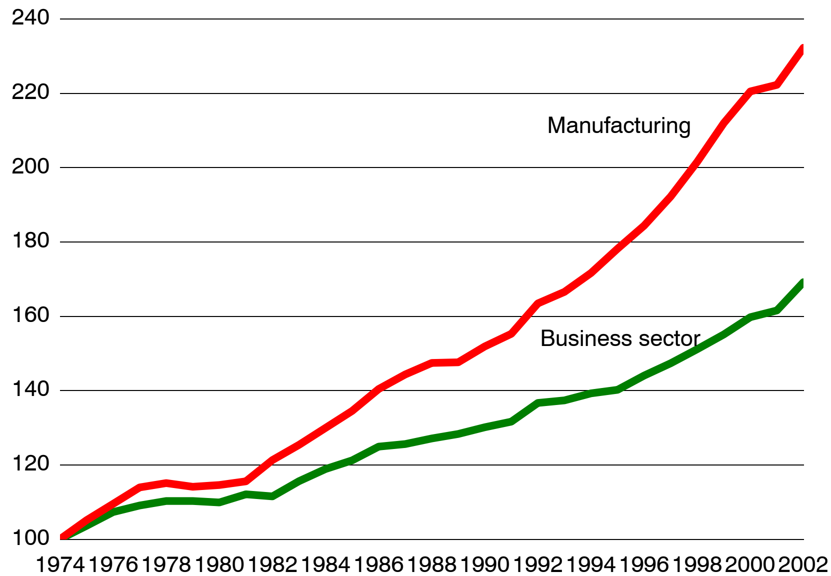
[19] In 2001, services accounted for 71.6 percent of output, 27.6 percent of exports and 14.9 percent of imports.

[20] Winston (1998) cites conservative estimates of the net benefits from the deregulation of inter-city transportation, such as airlines, railroads and motor carriers, which indicate deregulation of these sectors produced net benefits of $50 billion in 1996 dollars. The estimate in chapter 7 attributes a welfare gain of $56 billion to the five trade agreements. Since services deregulation also included sizable sectors not included in Winston's estimate (i.e. telecommunications, banking, natural gas and electricity), the impact of services deregulation was almost certainly larger than the impact of the five agreements.

[21] There is some evidence that increased trade, particularly increased imports, contributed to the growth in U.S. manufacturing productivity. This evidence is reviewed in chapter 4. Technological changes, increased capital intensity and increased skill levels of U.S. workers may also have played a role. The relative importance of various sources of productivity growth is considered in further detail later in this chapter.

[22] Data were not available for years prior to 1977. The Standard Industrial Classification (SIC) data system was revised in 1987, so it is difficult to summarize some of the industry experiences over the entire period.

Figure 3-1
Output per hour in manufacturing and business sectors, 1974-2002 (1974=100)



Source: Bureau of Labor Statistics and USITC calculations.

Table 3-2
Employment by industry sector

	1974		2001	
	FTE[1]	Share of total	FTE[1]	Share of total
	Thousands	*Percent*	*Thousands*	
Agriculture[2]	1,458	1.9	2,085	1.7
Mining	685	0.9	556	0.4
Manufacturing ..	19,538	25.3	17,319	13.9
Services[3]	40,324	52.2	85,464	68.4
Government	15,158	19.6	19,445	15.6
Total	77,163	100.0	124,959	100.0

[1] Full time equivalent workers.

[2] Includes agriculture, forestry and fishing sectors.

[3] Includes construction, transportation and communications, wholesale trade, retail trade, finance, insurance and real estate, and service sectors.

Source: Bureau of Economic Analysis and staff calculations.

Table 3-3
Changes in value added[1] by manufacturing sector, 1977-2000

	1977-87	1987-2000	1977-2000
		Percent	
Gross domestic product	35.5	50.9	104.4
Manufacturing	33.0	52.4	102.7
Durable goods	32.1	91.1	151.9
Machinery, except electrical	84.6	221.4	501.4
Furniture and fixtures	33.0	26.9	68.8
Miscellaneous manufacturing industries	17.0	40.7	64.6
Fabricated metal products	17.1	28.8	51.0
Lumber and wood products	42.2	-12.7	25.8
Motor vehicles and equipment	-12.8	36.5	19.0
Primary metal industries	-27.9	35.2	-2.5
Stone, clay, and glass products	-5.0	49.2	([2])
Electric and electronic equipment	([2])	507.3	([2])
Other transportation equipment	50.6	-27.6	([2])
Instruments and related products	([2])	-20.6	([2])
Nondurable goods	34.3	12.1	51.0
Rubber and miscellaneous plastics products	67.4	101.8	253.1
Chemicals and allied products	33.8	51.6	102.9
Petroleum and coal products	127.6	-12.2	99.8
Food and kindred products	49.3	13.4	69.4
Textile mill products	23.9	9.3	35.4
Paper and allied products	20.5	-2.7	16.7
Printing and publishing	25.1	-16.4	4.6
Apparel and other textile products	20.8	-14.7	3.0
Leather and leather products	-21.6	-24.2	-40.5
Tobacco products	-56.3	-72.5	-88.0

[1] Value added is a measure of industry size. A sector's value added is its contribution to GDP.

[2] Due to the change in SIC classification in 1987, data for this period are not available.

Source: Bureau of Economic Analysis.

contribution to GDP.[23] Growth in manufacturing value added has been most rapid in machinery, electronic equipment, and rubber and plastic products. Total value added in primary metal industries, tobacco products, and leather products has fallen. As with the broader sectoral classifications discussed above, there are a number of reasons why sectors might grow at differing rates, including changes in relative demands, technical change, and changes in trade patterns. Specific industry experiences are discussed in greater detail in chapter 5.

Cross-industry Reallocation and Frictional Unemployment

Changes in the composition of output may require productive resources to move from the sectors in relative decline to the sectors that are experiencing relative growth. The reallocation of resources across sectors can produce unemployment of inputs in the short- to medium-term.[24] For example, workers displaced from a shrinking sector may not have the appropriate skills to find jobs in growing sectors. Even if their skills are appropriate for work in growing sectors, workers leaving shrinking sectors may require some time to identify other jobs for which they are qualified.[25] Unemployment associated with the movement of resources between sectors is called "frictional" unemployment.[26]

Unemployment may also arise because macroeconomic fluctuations lead firms to require less labor during recessions or periods of slower economic growth. Fluctuations in the macroeconomy cause changes in the level of cyclical unemployment. When GDP is growing rapidly, cyclical unemployment falls. When GDP is falling (or growing slowly) cyclical unemployment rises.

---

[23] Sector value added is the difference between a sector's sales and its cost of materials. As the portion of revenues not allocated to materials, sector value added represents income earned by one or more factors of production.

[24] Many international trade models abstract from frictional unemployment associated with the movement of resources between sectors. For a theoretical perspective on trade, the movement of labor between sectors, and frictional unemployment, see Carl Davidson and Steven J. Matusz, 2000, "Globalization and Labour-Market Adjustment: How Fast and at What Cost?" *Oxford Review of Economic Policy*, vol. 16, No. 3, pp 42-56.

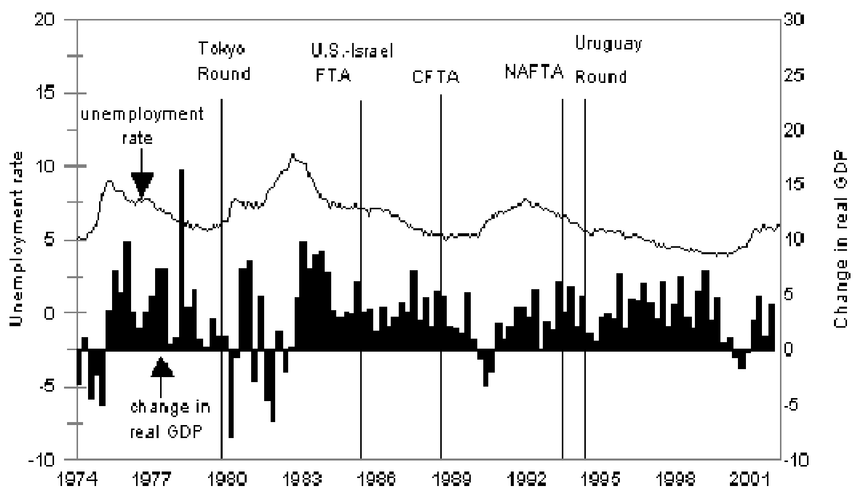
[25] Some discussions of unemployment distinguish structural unemployment (the unemployed worker's skills are not appropriate for any available job) and frictional unemployment (the unemployed worker's skills are appropriate for a job that exists, the worker has simply not found that job yet). For the purposes of this discussion frictional unemployment is intended to include both types of unemployment.

[26] The phenomenon is not constrained to labor adjustment. Changes in the composition of output may also lead sector-specific capital to go unused.

This section documents fluctuations in the unemployment rate since 1974, and provides some context as to the relative importance of frictional and cyclical causes for fluctuations in the unemployment rate.

Figure 3-2 shows the U.S. civilian unemployment rate and changes in the real gross domestic product from 1974 to 2002, overlaid with the implementation dates of the five agreements of interest. Fluctuations in the measured unemployment rate appear to be driven by cyclical changes in GDP because increases in the unemployment rate generally coincide with recessions, and reductions in unemployment coincide with sustained economic growth.

Figure 3-2
U.S. Civilian Unemployment rate, changes in real GDP and implementation dates of significant U.S. trade agreements, 1974-2001



Source: Bureau of Labor Statistics, Bureau of Economic Analysis, USITC calculations.

Statements linking employment levels with the trade balance emerge frequently in public policy debate.[27] However, a historical review of U.S. trade deficit and unemployment figures suggests that periods of increased trade deficits have been associated with low unemployment, and vice versa. Like the unemployment rate, changes in the trade balance are primarily driven by changes in macroeconomic circumstances. Periods of strong economic growth fuel increasing demand for all goods, including imported products, increasing the demand for labor and reducing unemployment.[28] Figure 3-3 shows that cyclical increases in the trade deficit are typically associated with decreases in the unemployment rate.

Post-employment Experiences of Displaced Workers

While there do not appear to have been structural changes in the unemployment rate over the period, one topic of interest to policy makers is the experience of workers who are displaced as a result of economic change. A growing body of research explores information contained in the Displaced Worker Survey, which reports the characteristics and experiences of workers whose job losses are due to a plant closing, an employer going out of business, or a layoff from which he/she was not recalled.[29] These figures count the number of workers who lost their jobs in a particular manner. They are not a measure of economywide employment. The primary reason for collecting

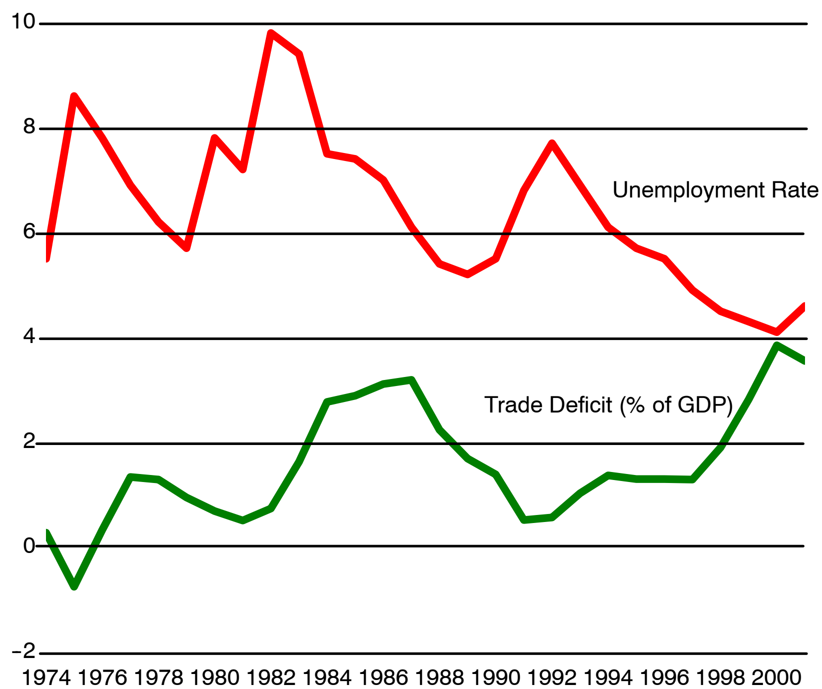
---

[27] See, for example, Robert E. Scott, "NAFTA's Hidden Costs," in *NAFTA at Seven* (Washington, DC: Economic Policy Institute, 2001), p. 3, and Gary C. Hufbauer and Jeffrey J. Schott, NAFTA: An Assessment (Washington, D.C.: Institute for International Economics, 1993), p.14. Scott argues that an increase in the U.S. bilateral trade deficits with Canada and Mexico of $46.2 billion induced 766,030 actual and potential lost jobs. Hufbauer and Schott use a similar methodology in a forward-looking evaluation of NAFTA. They assume that NAFTA would reduce the trade deficit, and attribute 170,000 new jobs to NAFTA. Trade-deficit-driven "job-counting" exercises do not take into account the ability of trade policy changes to affect the relative price of inputs, nor do they consider behavioral responses to relative price change.

[28] The trade deficit has grown over time, from 0.3 percent of GDP in 1974 to 3.6 percent of GDP in 2001. International economists attribute growth in the trade deficit to increased U.S. borrowing on international financial markets. Because U.S. national savings have not kept pace with the borrowing requirements of U.S. households, firms and governments, the United States has become a net borrower from the rest of the world. An accounting identity equates the current account deficit (a broad measure of the trade deficit) and the capital account surplus. In order to be a net borrower of international assets, the U.S. must have a current account deficit. See Krugman and Obstfeld, 2000, pp. 300-322.

[29] The Displaced Worker Survey is a supplement to the Current Population Survey collected by the U.S. Census Bureau on behalf of the Bureau of Labor Statistics. The data are available at *http://www.bls.census.gov/cps/dispwkr/sdata.htm.*

Figure 3-3
U.S. unemployment rate and trade deficit



Source: Bureau of Labor Statistics, Bureau of Economic Analysis, and U.S. Census Bureau - Foreign Trade Division.

such data is to better understand the experiences of those "individuals with established work histories, involuntarily separated from their jobs by mass layoff or plant closure (rather than because of individual job performance), who have little chance of being recalled to jobs with their old employer."[30] Kletzer estimates that, by this definition, approximately 17 million workers were displaced from a manufacturing job during the period 1979 to 1999.[31]

[30] Lori G. Kletzer, "Job Displacement," *Journal of Economic Perspectives*, vol. 12, No. 1, Winter 1998, p 116.

[31] Lori G. Kletzer, *Job Loss from Imports: Measuring the Costs*, (Washington, D.C.: Institute for International Economics, September 2001).

Assessments of Displaced Worker Survey data suggest that displacements are strongly cyclical, with job loss rates rising in recessions and falling in expansions.[32] Displaced workers report longer periods of unemployment than workers who are laid off from jobs in which they expect to be reemployed.[33] Farber finds that over the period 1981-1995, post-displacement earnings were 13 percent lower than pre-displacement earnings. Earnings losses were not uniform across all displaced workers– approximately one-third of displaced workers report earnings losses of 25 percent or more, whereas 30 to 40 percent report earning more in their post-displacement job than on their pre-displacement job.[34] A study of tax returns from Pennsylvania found that 4 years after displacement, displaced workers earned $2000 per quarter less than equivalent workers that were not displaced.[35] Kletzer cautions that data from Pennsylvania, a traditional industrial state, may not be representative.[36]

A significant reason for earnings losses is the inability of displaced workers to find full-time employment.[37] The evidence also suggests that the probability of unemployment is associated with various characteristics of displaced workers. Farber finds that those without a college degree, women, and minorities are at a disadvantage in finding subsequent employment.[38] Kletzer cites a number of papers that find that "the post-displacement earnings of those who change industry are lower than the earnings of comparable individuals who stay in the same industry."[39] Chapter 4 presents evidence that the post-displacement experiences of workers displaced from sectors with large import shares are reasonably similar to the experiences of other workers displaced from manufacturing overall.

Economic Growth and Productivity

The U.S. economy has experienced substantial growth since 1974. In that year, real GDP was $4.1 trillion; by 2001 it was $9.2 trillion.[40] This change

---

32 Kletzer, 1998, p. 117.

33 Ibid., p. 121.

34 Henry S. Farber, 1997, "The Changing Face of Job Loss in the United States," Industrial Relations Section Working Paper 382, Princeton University, cited in Kletzer, 1998, p. 123.

35 Louis S. Jacobson, Robert J. LaLonde, and Daniel G. Sullivan, *The Costs of Worker Dislocation* (Kalamazoo, MI: W.E. Upjohn Institute for Employment Research, 1993), pp. 124-126, cited in Kletzer, 1998.

36 Kletzer, 1998, p. 126.

37 Ibid., p. 124.

38 Farber 1997, cited in Kletzer 1998, p.123.

39 Kletzer, 1998, p. 129.

40 Measured in 1996 chain-weighted dollars. USDOC, Bureau of Economic Analysis, "Survey of Current Business," August 2002.

represents a 3 percent average annual growth rate over the period.[41] The simplest models of economic growth suggest a number of reasons for growth in real GDP since 1974.[42] Population growth and higher work force participation rates have produced a much larger labor supply and growing employment. The American labor supply also has become more productive because current workers are better educated than workers in the 1970s. Another source of economic growth and increased labor productivity has been substantial growth in the capital stock. Finally, there is evidence that inputs are being combined more efficiently than they were in the past, as measures of total factor productivity have also risen. Each of these sources of growth is discussed in more detail in the next section.

Growth in Factor Inputs

One important reason U.S. GDP has risen since 1974 has been the substantial growth in the supply of labor.[43] In 1974, total nonfarm employment in the United States was 78.3 million; by 2001, it had reached 131.9 million, a 68 percent increase.[44] One reason for labor force growth has been growth in the U.S. population, from 213.8 million[45] in 1974 to 277.8 million[46] in 2001, a 30 percent increase.[47] The labor supply is also larger because labor force participation rates have grown, from 61.3 percent in January 1974 to 66.8 percent in December 2001.[48] Female labor force participation rates have grown even faster, from 45.1 to 60.0 percent over the same period.[49]

---

[41] Commission calculations.

[42] For an introduction to models of economic growth, see Robert Barro and Xavier Sala-i-Martin, Economic Growth (New York: McGraw-Hill Inc., 1995). The sources of growth identified in this paragraph are consistent with the model proposed in N. Gregory Mankiw, David Romer and David N. Weil, "A Contribution to the Empirics of Economic Growth," *Quarterly Journal of Economics*, vol. 107, No. 2 May, pp. 407-437.

[43] Discussions of macroeconomic fluctuations often attribute growth in employment to growing GDP. Since this discussion focuses on sources of long run growth in GDP, it treats GDP growth as an outcome of a growing labor supply. This treatment is consistent with the literature on long-run economic growth.

[44] U.S. Bureau of labor statistics. Found at internet address *http://data.bls.gov/cgi-bin/surveymost?ee*, retrieved Jan. 16, 2003.

[45] U.S. Census Bureau. Found at Internet address *http://eire.census.gov/popest/archives/pre1980/popclockest.txt*, retrieved Jan. 16, 2003

[46] U.S. Census Bureau projection. Found at internet address *http://www.census.gov/population/projections/nation/summary/np-t1.pdf.* Retrieved Jan. 16, 2003.

[47] Commission calculation.

[48] Civilian labor force participation rate, U.S. Department of Labor (USDOL), Bureau of Labor Statistics. Found at Internet address *http://www.bls.gov/cps/home.htm*, retrieved Jan. 16, 2003.

[49] Ibid.

A second source of GDP growth has been growth in the stock of capital–the machinery, equipment, factories, infrastructure, and other investment goods that make future production possible. In 2001, the total value of private fixed assets (measured in current dollars) was $22.1 trillion, a 109 percent increase in real terms from 1974.[50] The capital stock is the accumulated value of past investment, net of depreciation. Gross private domestic investment as a share of GDP has risen over the period, from 13.7 percent in 1974 to 17.1 percent in 2001.[51]

Productivity Measures and Changes in Productivity

While increases in labor supply and the capital stock have been important, another component of economic growth has been improvements in the overall efficiency of U.S. production. In the discussion of sectoral experiences, it was noted that output per hour had increased over the period, especially in the manufacturing sector. The "output per hour"measure, also known as "labor productivity," is the most straightforward measure of productivity growth. However, as the broadest measure of productivity, the labor productivity measure commingles several sources of productivity growth.

Labor productivity in the private business sector increased by 69 percent between 1974 and 2001, while labor productivity in the narrower manufacturing sector increased by 132 percent. While labor productivity is the broadest and most easily understood measure of productivity, it does not differentiate between various sources of productivity growth. Growth in labor productivity only indicates that output is growing faster than employment.

A significant contributor to labor productivity growth has been growth in the capital intensity of production. As noted, the capital stock grew by 109 percent between 1974 and 2001, while employment grew by 69 percent. These differential rates of growth imply that the amount of capital per worker (the capital intensity of production) has increased.

For many purposes, economists wish to distinguish between increased capital intensity and other sources of productivity change. The primary measure of productivity used in the studies reviewed next is total-factor productivity

---

[50] Measured by chain-weighted quantity index (1996=100) of net fixed assets in the United States. Figures are net of depreciation, meaning that the capital stock does not include machinery or equipment that has outlived its own productive life (worn out). USDOC, Bureau of Economic Analysis, "National Incomes and Product Accounts," tables 2.1 and 2.2, found at Internet address *http://www.bea.gov/bea/dn/faweb/AllFATables.asp*, retrieved Jan. 16, 2003.

[51] Commission calculations based on data from USDOC, Bureau of Economic Analysis, "National Incomes and Product Accounts, found at internet address *http://www.bea.gov/bea/dn/nipaweb/index.asp*, retrieved Jan. 16, 2003.

(TFP), which measures those changes in U.S. output that cannot be explained by growth in the labor supply and capital stock.[52] TFP is a residual measure, with some portion of real GDP growth attributed to growth in the capital stock and the labor supply; and the remaining growth attributed to TFP. Increases in TFP can be attributed to technological change, education, efficiency improvements, returns to scale, reallocation of resources, and other factors. Increases in TFP may have been influenced by growing international trade.

TFP has been an important source of economic growth in the past few decades. The U.S. Department of Labor's Bureau of Labor Statistics calculations indicate that TFP in the private business sector rose by 24.5 percent between 1974 and 2000.[53] This calculation suggests that even had the size of the labor force and capital stock remained constant, private business sector output would have risen by 24.5 percent simply because existing capital and labor are now combined more efficiently than they were in 1974. TFP has grown even faster in the manufacturing sector–a 35.7 percent increase from 1974 to 2000.[54]

One important component of TFP is human capital, the set of knowledge, skills, and experience embodied in the labor force. Education statistics are thought to be an indicative measure of the economywide stock of human capital. The U.S. labor force is better educated than it was in 1974. At that time, 61.2 percent of Americans over the age of 25 had completed 4 years of high school, and 13.3 percent had completed 4 years of college. By 2000, the number of Americans over 25 years of age who completed 4 years of high school had risen to 84.1 and those that had completed 4 years of college rose to

---

[52] For more on TFP, also known as multifactor productivity, see USDOL, Bureau of Labor Statistics,. "Why is Multi-factor productivity important?" Found at Internet address *http://wwwbls.gov*, retrieved Oct. 16, 2002.

[53] Commission calculations based on data from USDOL, Bureau of Labor Statistics. Data available at *http://www.bls.gov/news.release/prod3.t01.htm*, retrieved Jan. 16, 2003.

[54] Commission calculations based on data from USDOL, Bureau of Labor Statistics. Data available at *http://www.bls.gov/news.release/prod5.t01.htm*, retrieved Jan. 16, 2003. Measures of manufacturing productivity also account for changes in the prices of materials and energy, since these are significant inputs into manufacturing activities. For a detailed explanation of methods used to measure productivity in manufacturing, see William Gullickson, "Measurement of productivity growth in manufacturing," *Monthly Labor Review*, July 1995, available at *http://www.bls.gov/opub/mlr/1995/07/art2full.pdf*. One reason such adjustments are necessary for the years 1974-2001 is the fall in the real price of energy. Refiners' crude oil acquisition costs (measured in 1996 dollars) were $24.77 per barrel of oil in 1974. By 2001, they had fallen to $20.77 per barrel. See U.S. Energy Information Administration data available at *http://www.eia.doe.gov/emeu/aer/pdf/pages/sec5-201.pdf*.

25.6 percent.[55] These figures suggest a substantial increase since 1974 in the human capital embodied in the U.S. work force.[56]

Some measures of TFP growth separate the effects of changes in human capital from other sources of TFP growth. Table 3-4 provides Bureau of Labor Statistics estimates of labor productivity growth for various time periods relevant to this study. Labor productivity grew most quickly in the 1995 to 2000 period, at a 2.7 percent annual rate. Growth in labor productivity is decomposed into three parts–increased capital intensity, changes in labor composition (including human capital), and total factor productivity.

Table 3-4
Contributions of labor, capital, and productivity to U.S. private non-farm business output per hour

(Percent average annual growth rates)

	1973-1979	1979-1990	1990-1995	1995-2000
Output per hour of all persons	1.3	1.6	1.5	2.7
Contribution of capital intensity	0.7	0.8	0.5	1.1
Contribution of labor composition	0	0.3	0.4	0.3
Total factor productivity	0.6	0.5	0.6	1.4

Source: "Multifactor Productivity Trends, 2000," Bureau of Labor Statistics.

Possible Sources of Output and Productivity Growth

The literature review in chapter 4 considers two types of interactions between trade and technological change. Studies of the relationship between increased trade and increasing wage inequality usually note that certain kinds of productivity growth have economic effects similar to those of increased

[55] U.S. Census Bureau. Found at Internet address *http://www.census.gov/population/socdemo/education/tableA-2.txt*, retrieved Jan. 16, 2003.

[56] Another potential contributor to human capital is the work experience of the labor force. In recent years, as the baby boom generation has aged, the measured experience of the U.S. work force has increased considerably. See "Changes in the Composition of Labor for BLS Multifactor Productivity Measures, 1999," USDOL, Bureau of Labor Statistics, found at Internet address *http://www.bls.gov/mfp/mprlabor.pdf*, downloaded March 24, 2003.

trade.[57] Other studies explore the possibility that more open trade contributes to faster productivity growth. If increased international trade contributes to productivity growth, some of the effects of technological change can be attributed to trade and trade policy. This chapter explores sources of productivity growth that are not directly associated with trade.

A growing body of literature considers the effects of technical innovation in information technology sectors[58] during a time period that roughly coincides with years in which the trade agreements of interest were enacted. Recent research has paid special attention to the role of information technology as a source of productivity growth. There is some disagreement about the degree to which information technology has had broad economywide effects on productivity. Some authors attribute significant economywide changes in measures of productivity to information technology.[59] Others argue that the productivity-enhancing effects of information technology have largely been limited to durable goods manufacturing sectors.[60] Evidence of substantial technological change suggests that it is a significant source of economic change, particularly in manufacturing, and warrants discussion as a plausible alternative to trade growth in explaining various economic outcomes.

Changes in the Distribution of Wages Across Measures of Skill

One topic of concern to trade policy makers and empirical economists has been the growing gap between the wages paid to skilled and unskilled labor. Economic research reviewed in chapter 4 suggests that growing international trade has contributed to growth in the skilled wage premium, though other factors like technological change appear to be more important. There are a number of measurement issues that complicate efforts to determine the effects of trade and other causes on the skilled wage premium. This section reviews the relevant measurement issues, describes the historical experience of the wage distribution since the mid-1970s, and reviews those sources of economic change that might have contributed to a growing skill-premium.

---

[57] Technological progress that increases the productivity of one input relative to another can either magnify or offset the impact of trade on the returns to the owners of each input. In the following discussion, skill-augmenting technological change is the most relevant kind of productivity growth. One example of skill augmenting technological change is the introduction of new technologies that increase the

[58] Authors sometimes differ in the sectors considered to be information technology sectors. productivity of skilled workers more than they increase the productivity of unskilled workers.

[59] Dale Jorgenson, "Information Technology and the U.S. Economy," *American Economic Review*, vol. 91, No. 1, 2001, pp. 1-32. Jorgenson defines information technology as computers, communications equipment and software.

[60] Robert J. Gordon, "Does the New Economy Measure Up to the Great Inventions of the Past?" *Journal of Economic Perspectives*, vol. 14, No. 4, 2000, pp 49-74.

Measuring the Premium Paid to Skilled Labor

A number of measurement issues complicate efforts to understand changes in the level and distribution of labor compensation over time. Rising health insurance costs and the introduction and growth of other nonwage benefits make wage data imperfect indicators of changes in total labor compensation. Relative price changes, increased quality and the introduction of new goods complicate efforts to adjust wage growth for changes in inflation. Difficulties in measuring skill also make it difficult to measure the relationship between skill and wages.

More than one-fourth of total labor compensation payments are made in the form of nonwage benefits such as health insurance premiums, retirement benefits, and paid leave.[61] Given the importance of nonwage payments, studies of changes in the distribution of labor compensation should also account for changes in nonwage benefits. Unfortunately, data on total labor compensation payments are not always available for skill categories and the time periods for which economic analysis is needed. Studies that use wage data tend to underestimate growth in labor compensation over time, leaving out growth in non-wage benefits.

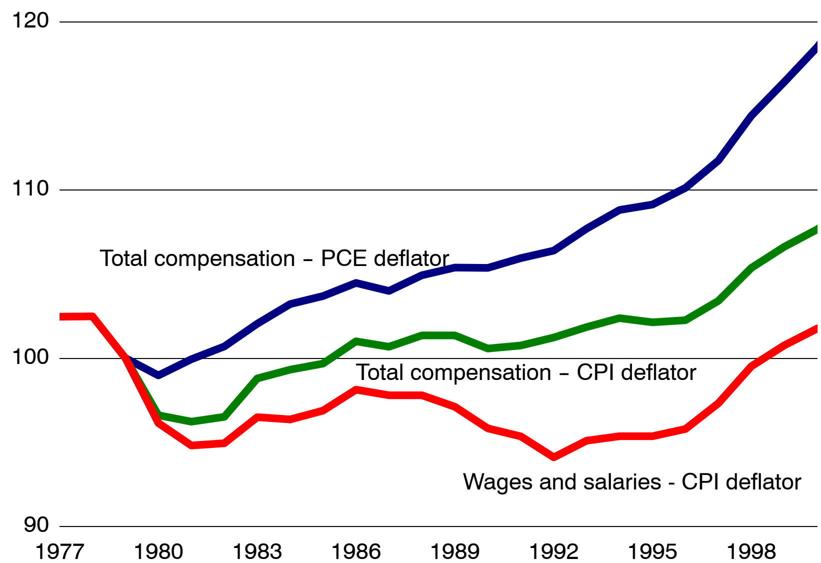
A second complication in measuring labor payments over time is identifying appropriate measures of inflation. Figure 3-4 shows how the measurement issues complicate efforts to determine how real wages have changed over time. The figure shows three series: nominal wages and salaries deflated by growth in the consumer price index (CPI), nominal total compensation deflated by growth in the CPI, and nominal total compensation deflated by the Bureau of Economic Analysis's personal consumption expenditures (PCE) price index.[62] Based on the first series, one might conclude that real wages had remained stagnant over most of the period considered. Including growth in paid benefits, and deflating this measure by the PCE index, one can conclude that total real payments to labor have grown by 20 percent since 1979.

---

[61] In 1999, 27 percent of labor compensation went in the form of nonwage benefits. See USDOL, Bureau of Labor Statistics, *Employer Costs for Employee Compensation, 1986-1999*, table 1, p.2. Downloaded from *http://www.bls.gov/ncs/ect/sp/ecbl0013.pdf*, March 26, 2003.

[62] The PCE index is suggested in Lawrence F. Katz and David H. Autor, "Changes in the Wage Structure and Earnings Inequality," *Handbook of Labor Economic*s, vol. 3A, (Amsterdam, The Netherlands: Elsevier, 1999) pp. 1463-1548. The more familiar CPI is known to have a number of weaknesses that bias it upward as a measure of inflation. The Boskin Commission estimated that upward biases in the CPI raise the estimated rate of consumer price inflation by between 0.8 and 1.6 percent per year. U.S. Social Security Administration, *The Boskin Commission Report: Toward a More Accurate Measure of the Cost of Living*, December 1996, downloaded from *http://www.ssa.gov/history/reports/boskinrpt.html#cpi6* March 25, 2003.

Figure 3-4
Measures of Real Labor Compensation (1979=100)[1]



[1] Total compensation data not available before 1979.

Source: USITC calculations based on Bureau of Labor Statistics and Bureau of Economic Analysis data.

A third source of measurement difficulty arises in characterizing skill. Two differences in worker characteristics receive much of the attention. Many cross-industry studies relate differences in the wage/compensation payments to the type of work. Workers are also often categorized by levels of educational attainment.

Historical Experience

Much of the research on the relationship between international trade and the distribution of wages stems from evidence summarized by Katz and Autor, who provide a comprehensive review of the literature on wage distribution.[63] Among their conclusions, Katz and Autor state:

[63] Lawrence F. Katz and David H. Autor, "Changes in the Wage Structure and Earnings Inequality," *Handbook of Labor Economics*, vol. 3A, (Amsterdam, The Netherlands: Elsevier, 1999) pp. 1463–1548.

1. Wage dispersion increased substantially for both men and women from the end of the 1970s to the mid-1990s. The weekly earnings of the 90th percentile worker relative to the 10th percentile worker increased by over 25 percent for both men and women from 1979 to 1995. The available evidence suggests earnings inequality has expanded even more dramatically if one includes the very top end (top 1 percent) of the distribution. This pattern of rising wage inequality was not offset by changes in nonwage compensation favoring the low-wage workers.

2. Wage differentials by education, occupation and age (experience) have increased. The relative earnings of college graduates and those with advanced degrees increased dramatically in the 1980s. But the gender differential declined both overall and for all age and education groups in the 1980s and 1990s.

Evidence motivating these conclusions is presented here.

Figure 3-5 shows the time path of real earnings for production and nonproduction workers in manufacturing, with earnings deflated by growth in the PCE price index, for the years 1977 to 2000. Figure 3-5 shows that the wages of those actually engaged in production have stayed relatively flat, while earnings of workers in management and other nonproduction activities (administrative work, factory maintenance) have risen. In 1977, nonproduction workers earned 53.2 percent more than production workers. In 2000, nonproduction workers earned a 77.7 percent premium over production workers. Real earnings of nonproduction workers grew by 22.1 percent between 1979 and 2000, while real earnings of production workers rose by only 5.3 percent.[64]

Figure 3-6 shows the evolution of real mean annual earnings for workers based on educational attainment, with earnings deflated by the BEA's PCE price index.[65] All data points are normalized relative to the earnings of those with a high school diploma in 1975. Those with a college degree earned 57 percent more than high school graduates in 1975, and by 1999 college graduates earned 111 percent more. Those with a graduate degree earned 113 percent more than high school graduates in 1975, and 175 percent more in 1999.[66]

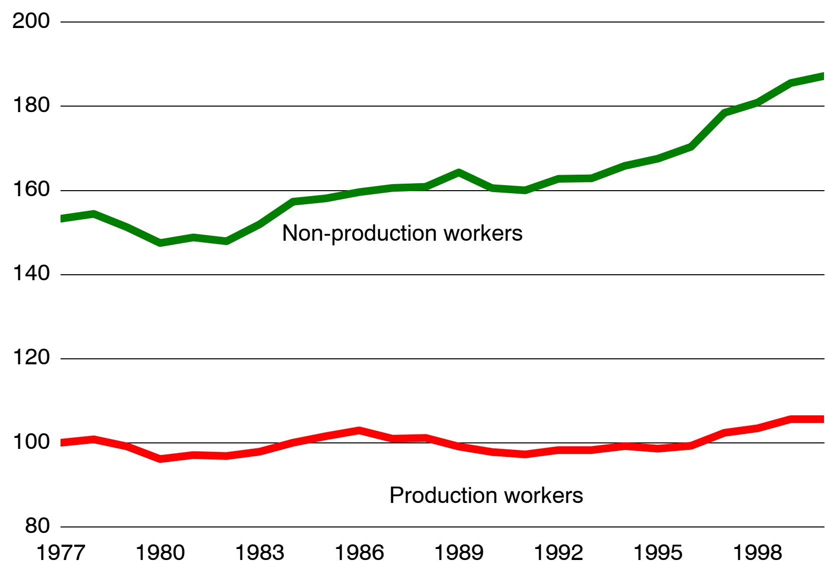
---

[64] Commission calculations based on data from the U.S. Census Bureau's "Annual Survey of Manufactures, 2000," and the Bureau of Economic Analysis' PCE price index.

[65] Earnings data are taken from the U.S. Census Bureau, *http://www.census.gov/population/socdemo/education/tableA-3.txt*, downloaded March 26, 2003. Census also reports a series on earnings of workers with some college education. These workers earned a 6 percent premium over high school graduates in 1975,and a 16 percent premium in 2001.

[66] Commission calculations based on data from U.S. Census Bureau and Bureau of Economic Analysis data.

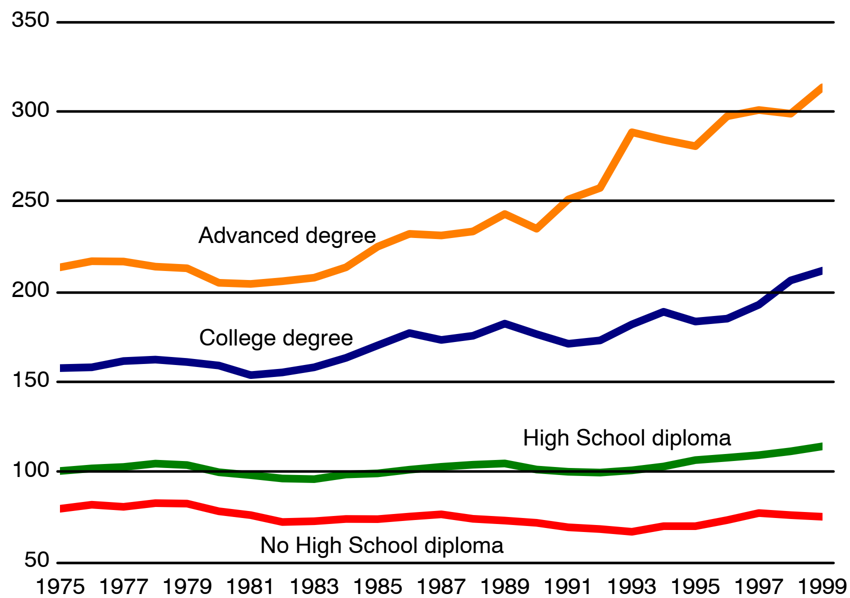
Figure 3-5
Real production and non-production earnings in manufacturing, 1977-2000[1] (Production workers, 1977=100)



[1] Deflated by chained price index for personal consumption expenditures. Data classification changes make current earnings data incomparable with pre-1977 data.

Source: Bureau of Labor Statistics and USITC calculations.

Figure 3-6
Real earnings by educational attainment, 1975-1999[1] (High School diploma, 1975=100)



[1] Deflated by chained price index for personal consumption expenditues.

Source: U.S. Census Bureau, Bureau of Economic Analysis, and USITC calculations.

CHAPTER 4: The Effects of Trade Liberalization on the U.S. Economy in Historical Perspective: A Literature Review

Overview

This chapter is devoted to providing a summary and overview of the economic literature bearing on the question of whether or not the five agreements in particular or U.S. trade liberalization policies in general have had an observable and significant effect on U.S. economic activity from the mid-1970s onward. The question can be viewed from a number of perspectives, and the present review does not exhaust the literature that has been brought to bear on the issue.

This literature review has three primary purposes. First, it seeks to draw out any emerging consensus that may already exist on the economic impact of recent trade liberalization, particularly liberalization affecting the United States. Second, the review provides a motivating background for the new quantitative analysis presented in chapters 6 through 8, particularly with regard to the choice of problems addressed and methods employed. Third, the review provides, to the extent feasible, a basis for comparison for the empirical findings presented in chapters 6 through 8. Throughout this chapter, short citations are provided for works referenced. A bibliography appears as appendix E of this report, providing full citation information.

Types of Literature Reviewed

Evidence of the economic effects of trade liberalization falls into two broad categories. The first section of the review looks at studies that examine one or more of the five agreements explicitly. Studies of the particular agreements fall into two categories–ex ante and ex post studies. Ex ante studies are usually done prior to an agreement, generally in an attempt to contribute to the debate about whether to enter into an agreement or how to formulate it, and they usually involve simulation methods. Studies in this category typically produce estimates of the change in economic welfare expected from an agreement, and may also present estimated changes in expected trade flows. This review treats as ex ante studies those that have publication dates after agreements have gone into effect, but that use simulation methods and data of a type indicating they could have been executed ex ante. Ex post studies consist of attempts to determine, after an agreement has gone into effect, whether or not it has had an economic impact by utilizing data from the post-agreement period.

The second section of the review looks at studies that examine the economic effects of increasing exposure to trade, or increasingly liberalized trade policies, on one or more economic variables without reference to a particular agreement. This body of literature examines the relationship between trade liberalization and economic growth and productivity, looking at the role of trade liberalization for wages, employment and income distribution, and has begun to address the extent to which trade liberalization increases the variety of goods available to firms and consumers.[1]

Methodologies Employed In The Literature

While the methodological issues involved in each branch of literature will be discussed more fully in those sections of the review, some general points are in order here.

The ex ante studies of particular agreements use simulation methods, most commonly computable general equilibrium (CGE) modeling. A CGE model represents a national economy, or a world economy consisting of multiple nations or regions. Each of these nations or regions consists of a certain number of sectors or industries. The base data of the model represent the economic situation in each region and sector as it existed in a particular base year. The regions are connected to each other by international trade (exports and imports), and sectors are connected to each other by supply and demand. In other words, regions buy goods and services from one another, and a certain part of their output is delivered to final demand or GDP and consumed by households or governments, invested, or accounted for by international trade. The interconnections among regions and sectors can be altered or disrupted by various sorts of government policies. For example, the trade relationships can be influenced by tariffs and nontariff measures, and the other markets by taxes and subsidies.

[1] The division between studies of particular agreements and studies addressing general economic effects of trade liberalization is not always sharp. In cases in which a study of a particular agreement also covers its effects on growth, productivity, labor markets, or product variety, that study will be discussed either in the second section or in both sections, as warranted.

A "run" or simulation of the CGE model consists of altering the policies of interest. To ask, "What are the effects of NAFTA?" by this method means approximately, "What would the base-year economy have looked like with the pre-NAFTA trade barriers removed?" Advantages of the CGE approach include the fact that it provides "controlled experiments" that isolate the effects of policies of interest (because in the real world other things change besides NAFTA), and that it disciplines the results obtained according to the logic of economic theory. In addition, because all markets are interconnected, it is possible to obtain estimates of the effect of changing one policy on any other variable in the system, regardless of how small such effects might be.

Limitations of the approach arise from the inevitable simplifications necessary to represent the complexities of the actual economy, even in a large model, and from the data requirements needed to run larger models. The models' quantitative estimates are also sensitive to the choice of behavioral parameters such as the elasticity of substitution–the parameter that measures the degree to which buyers are willing and able to switch between varieties of particular goods. Moreover, even when great care is taken to insure that a simulation model is based on economic logic and calibrated to observable data, experiments that validate the full structure of the model against historical experience are difficult to perform.[2]

The ex post studies rely on a variety of econometric techniques and use historical data. Particularly when these studies involve time-series data (e.g. import or export data for 1970-2001, of which one asks the question whether, for example, NAFTA made any difference from 1994 onward) the difficulty faced by the researcher is that it is not possible to conduct pure "controlled" experiments with historical data, because the data values from 1994 onward are influenced not only by the presence of NAFTA, but by all other forces influencing the economy during that period of time. Statistical techniques attempting to sort out which of these forces are operating, and at what degree of strength, may be more or less successful depending on whether actual historical circumstances allow the "signal" of changing trade policy to be easily separated from such other forces, or from the "noise" of purely unexplainable fluctuations in the variables in question.

[2] In a critique of the ex post validation experience with CGE models of NAFTA, Kehoe (2002) made the case that models available to policymakers prior to the implementation of NAFTA substantially understated NAFTA-induced increases in trade. However, this finding does not per se indicate that the models are misspecified, since it is well-understood that much of the growth in international trade in any historical period is due to income growth, which may not be explicitly accounted for in a model that is designed to isolate the economic effects of the trade agreement alone. Fox (2000) showed that it was possible to do a good job of tracking historical changes in U.S.-Canada trade after the U.S.-Canada FTA, using a CGE model which took account of factors such as changes in the capital stock, labor supply, and total expenditure.

The ability to discern policy effects, in turn, depends on whether enough time has passed to permit a statistically significant comparison between the pre-agreement and post-agreement period. For these reasons, the ex post studies are fewer in number, and are more recent in date. Nonetheless, such work is attracting increasing effort on the part of economists, particularly because policymakers inevitably wish to have information regarding the actual effects of the policies they have just chosen, as well as advance estimates of the effects of policies they are about to choose.

The research relating openness to trade and open trade policies to economic growth, productivity, labor, and product variety, uses a wide variety of statistical and econometric techniques that will be discussed in general terms in the following sections, and in more detail in the underlying works cited.

Principal Findings

There is a broad consensus in the available literature on the following results:

1. *Ex ante estimates of the effects on the United States of trade liberalization arising from particular agreements generally have been modest, on the order of less than 0.5 percent of GDP even for large liberalizations like the Tokyo Round, NAFTA, and the Uruguay Round*. The estimated percentage increase in aggregate exports and imports is usually greater than that for GDP. More than one agreement, in more than one study, has been estimated ex ante to increase output in U.S. agriculture and decrease it in textiles and apparel. This is consistent with the significant prior degree of import restraints in foreign markets for agriculture and the U.S. market for textiles and apparel, respectively. The amount of information researchers have on the state of play of multilateral negotiations influences the results they obtain. Studies that obtain large estimates of the benefits of liberalization by invoking scale economies may not be consistent with empirical evidence obtained ex post, such as for the U.S.-Canada FTA.

2. *Econometric estimates of the effect of tariff reductions on trade suggest that tariff reductions explain approximately 25 percent of the growth in world trade*. Other phenomena, notably reductions in the cost of air transportation, appear to have been at least as important a source of world trade growth. Foreign outsourcing also contributed to world trade growth. A model that assumes that tariff reductions induce foreign outsourcing attributes as much as one half of world trade growth to tariff reductions.

3. *Available ex post estimates of the effect of NAFTA have found that the NAFTA liberalizations have increased U.S.-Mexico trade in both directions*. While earlier studies had some difficulties identifying these

increases at all, improved methodologies and a longer post-NAFTA time period have enabled them to be identified with increasing precision, associating them with particular products that have now benefitted from especially deep NAFTA tariff cuts.

4. *Openness to trade and more liberal trade policies are associated with faster rates of economic growth both in the United States and abroad*. There have been many studies relating trade liberalization to rates of economic growth across countries, and as their methodology has improved, early skepticism about the robustness of the trade-growth connection has diminished somewhat. It is easier to show a link between economic growth and investment, which in turn may increase as a result of trade liberalization.

5. *The available literature associating international trade and productivity has mostly focused on the experience of developing economies, though there are some relevant studies for the United States*. Foreign growth and productivity gains may influence U.S. outcomes by increasing U.S. exports. Studies for both the United States and other countries suggest a possible short-term relationship between productivity and increased trade, but the direction of causation may well be reversed (e.g. firms become productive first, and then export, rather than vice versa). Evidence that exposure to trade causes industry output to shift from less-productive to more-productive firms is relatively strong, while evidence for a possible link between trading opportunities and scale economies is sketchy at best. There is also some industry-level evidence for higher rates of productivity growth in industries exposed to import competition or trade policy liberalization.

6. *Since the 1970s, there has been a steady rise in the wages of more-skilled U.S. workers relative to less-skilled U.S. workers*. Economic theory suggests that a possible cause for this is the increase in U.S. imports from developing countries, relative to the U.S. economy as a whole. A consensus of a wide range of studies, using a variety of methods, is that at most 10-20 percent of the growth in the "skilled wage premium" can be attributed to international trade, with the rest most likely accounted for by technological change increasing the demand for skilled labor. Evidence on the transition experiences of workers affected by increasing imports, or in sectors influenced by trade policy, suggests that their transitions from old to new jobs are not markedly different in terms of wage changes or duration of unemployment from other workers in the economy.

7. *Recent increases in trade in intermediate goods, known variously as "outsourcing" or "production sharing," may provide an additional channel through which increases in trade may affect U.S. wages, as less-skilled portions of vertically integrated production processes are*

located overseas. Some estimates indicate that as much as 40 percent of increases in the relative wages of nonproduction workers in the 1970s and 1980s may be attributable to outsourcing, but these estimates do not rule out the possibility that technological changes such as increased computerization may have played an equally large or larger role.

8. *A significant portion of recent increases in international trade consists of "new" goods, that is, goods coming from destinations that they did not come from before*. This is particularly true of the increase in U.S. imports from Mexico post-NAFTA. It appears that such increases can be linked to specific cuts in tariffs. Estimates for one developing country suggest that as much as a third of the gains of trade liberalization may be due to increased import product variety.

Economic Effects Attributed To Particular Agreements Negotiated Under Trade Promotion Authority

Simulation Analyses of U.S. Trade Policy Changes

Comprehensive assessments of the economic impact of trade policy changes often rely on models that simulate economic responses to changes in trade policy in an environment that mimics observed economic relationships. The primary relationships represented in simulation models of international trade are the geographic trade pattern among nations and input-output relationships within national economies. When a simulation model is given a trade policy "shock," such as the implementation of tariff reductions embodied in an agreement, the model traces the effects of the shock through the bilateral trade and input-output relationships in a manner consistent with a particular economic theory. Model results depend primarily on the size of the shock, the degree to which agents in the model are assumed to readjust their behavior when the shock changes relative prices, and theoretical assumptions about the nature of competition and production.

The standard economic simulation model used in trade policy analysis is a static general equilibrium model that assumes perfectly competitive markets, constant returns to scale in production, and differentiation of products by country of origin.[3] Models of this type have been used for trade policy analysis

[3] See Devarajan et al. (1997).

since the Tokyo Round.[4] Experience with the standard models suggests that significant trade policy liberalizations raise economic welfare by between 0.5 and 1 percent of GDP.[5] Most of the studies reviewed in this section are consistent with this finding, though the estimated effects on the United States are typically smaller.[6] However, alternate assumptions about the size of the shock, the nature of market competition, the technology of production, and the degree to which there are economic links between current and future behaviors can affect the results.

Economywide general equilibrium models are particularly useful for producing estimates of the effect of trade policy changes on sectoral output and employment, and bilateral trade flows. They can also provide estimates of changes in wages and capital returns, as well as summary measures of economic welfare.[7] Most simulation studies reviewed below suggest that U.S. production, wages, the rental rate of capital, exports, and imports increase modestly as a result of implementation of each of the agreements.

Consistent with economic theory, the models report that trade policy liberalization reallocates resources across sectors. Some sectors, primarily export-oriented sectors that benefit from foreign tariff reductions, grow as a result of the agreement. Output falls in other sectors, primarily those that face significant import competition and a significant change in U.S. import restraints. As in the aggregate results, sectoral estimates suggest that the relative impact of liberalization on the United States appears to be modest,

---

[4] The earliest of this work was Brown and Whalley (1980). See also Deardorff and Stern (1983).

[5] The similarity of this result across experiments is so consistent that the 0.5 to 1.0 percent figure has been given a name–the Harberger constant (after Arnold Harberger, who first described the measurement of these types of losses). See Rutherford and Tarr (2002).

[6] Because of the large size of the U.S. economy, trade accounts for a smaller share of output than in most countries. The United States also has a large share of services in output, and services are less likely to be traded than goods. Thus, economy-wide effects of trade liberalization on the U.S. economy are smaller, in relative terms, than for most other countries. Moreover, trade agreements have historically done much less to liberalize services trade than goods trade.

[7] Because model estimates can predate the implementation of an agreement, model results are sometimes misinterpreted as predictions that can be verified after the agreement has been implemented and economic variables observed, which is not a correct understanding of the model output. The model only measures the effect of trade policy changes, but leaves constant all other sources of economic change that might affect one or more variables. Because it is impossible to account for all other sources of economic change, it is not possible to verify the model ex post simply by comparing the model to observed changes in economic data. Model verification exercises must incorporate other economic shocks, including exchange rate movements, economic growth, and technological change, before the results can be compared with data that are observed ex post.

especially when compared to other changes that were expected to simultaneously occur in economy. The relatively modest degree of sectoral output and employment shifts suggests that adjustment costs associated with liberalization (worker dislocation and plant closure) are correspondingly modest.

Recent developments in economic theory, along with greater computing power and data availability, have allowed researchers to consider the effects of trade policy changes using alternative models of economic behavior. Models that differ from those with the basic structure described above began to be widely used at the time of the Uruguay Round and NAFTA negotiations.[8] In general, models that included scale economies in production, imperfect competition, or dynamic investment flows and an endogenous price of capital showed larger economic responses to trade policy changes. Model experiments that removed both tariffs and nontariff barriers also produced larger effects than model experiments that removed only tariffs.

While the diversity of policy simulation approaches makes it difficult to summarize results, an overview captures a sense of the reasonable bounds for the impacts of trade policy. Table 4-1 provides a guide to the simulation studies reviewed as background for this chapter. The selection of studies reviewed is representative rather than exhaustive; many of the studies discussed here contain citations to further studies. The table shows a description of key assumptions and the predicted impact on welfare, exports, and imports from each of the models surveyed, by trade agreement. Sectoral results for each study are also reported in Table 4-2. The table lists sectors for which the largest impacts on output, exports, and imports are expected for the NAFTA and the Uruguay Round agreements.

Overall Impact on U.S. Economy

Although the ex ante studies were done using different base periods and methodologies for various experiments, most show that overall U.S. welfare,[9] wages, the rental rate of capital, exports, and imports were expected to increase

[8] Earlier examples of CGE trade analyses exploiting scale economies, product differentiation and oligopolistic behavior include studies of the Canadian economy by Harris and Cox. See Harris (1984), Cox and Harris (1985 and 1986). The first two of these papers modeled unilateral free trade and stylized, multilateral free trade as it affected Canada. Cox and Harris covered the effects on Canada of a limited sectoral trade agreement with the United States. Because these studies only reported effects for Canada, they are not included in table 4-1.

[9] Welfare is measured as equivalent variation, as most studies report it. Equivalent variation is useful for measuring welfare changes in situations in which prices change, such as changes in trade policy. It is defined as the amount of additional income that one has to provide at the old prices to make one equally as well off as they would be at the new prices. This number is positive for an increase in welfare, and is usually measured in terms of the preferences of one or more representative consumers in the model.

Table 4-1
Summary of selected simulation studies: Predicted impact on U.S. welfare, imports, and exports

Agreement	Study	Market	Investment	Sectors	Regions	Base Year	Welfare	Exports	Imports	Is Final Agreement Used ?	Experiment
							—— Percentage change ——				
Tokyo Round	Brown and Whalley (1980)	CRTS	Static	5	4	1973	0.065		1.6	No	Tariff cuts from Swiss formula
	Deardorff and Stern (1986)	CRTS	Static	29	35	1976	0.040	1.9	1.6	Yes	Tariff cuts and NTB removal
	Whalley (1984)	CRTS	Static	33	4	1973	0.000			Yes	Tariff cuts
		CRTS	Static	33	4	1973	0.200			Yes	Tariff cuts and NTB removal
CFTA	Brown and Stern (1989)	IRTS	Static	29	4	1976	0.085	4.9	4.0	No	Tariff elimination
	Brown, Deardorff, and Stern (1992)	IRTS	Static	29	29	1989	0.100	1.1	1.1	Yes	Tariff elimination
NAFTA	Brown, Deardorff, and Stern (1992)	IRTS	Static	29	29	1989	0.100	1.7	1.6	No	Tariff elimination
		IRTS	Static	29	29	1989	0.300	2.0	1.8	No	Tariff elimination and expansion of some quotas
		IRTS	Static	29	29	1989	0.100	0.6	0.5	No	Tariff elimination for U.S. and Mexico
		IRTS	Static	29	29	1989	0.200	0.9	0.7	No	Tariff elimination for U.S. and Mexico and expansion of some quotas
	Burfisher, Robinson, and Thierfelder (1994)	CRTS	Static	11	3	1987				No	Tariff and quota elimination (US and Mexico) with internal migration
		CRTS	Static	11	3	1987				No	Tariff and quota elimination (US and Mexico) with internal and international migration
		CRTS	Static	11	3	1987				No	Tariff and quota elimination (US and Mexico) with no migration

See notes on last page of table

Table 4-1—*Continued*
Summary of selected simulation studies: Predicted impact on U.S. welfare, imports, and exports

Agreement	Study	Market	Investment	Sectors	Regions	Base Year	Welfare	Exports	Imports	Is Final Agreement Used ?	Experiment
							—— Percentage change ——				
	Lopez, Markusen, and Rutherford (1994)	IRTS	Static	4	4	1989	0.000			No	Tariffs and NTBs elimination for autos, engines, and parts
		IRTS	Static	4	4	1989	-0.008			No	Tariffs and NTBs elimination for autos, engines, and parts with a North American content provision
		IRTS	Static	4	4	1989	-0.010			No	Tariffs and NTBs elimination for autos, engines, and parts with a North American content provision and trade balance
	Roland-Holst, Reinert, and Shiells (1994)	CRTS	Static	26	3	1988	0.080	0.3	0.4	No	Removal of tariffs
		CRTS	Static	26	3	1988	1.870	8.3	9.4	No	Removal of tariffs and NTBs
		IRTS	Static	26	3	1988	1.660	8.0	8.6	No	Removal of tariffs and NTBs
		IRTS[1]	Static	26	3	1988	2.550	10.4	12.3	No	Removal of tariffs and NTBs
	Trela and Whalley (1994)	CRTS	Static	5	4	1986	0.010			No	Removal of textile and apparel tariffs and quotas
		CRTS	Static	3	4	1986	0.005			No	Removal of U.S. bilateral steel quotas and tariffs
Uruguay Round	Brown, Deardorff, Fox and Stern (1996)	IRTS	Static	29	9	1990	0.300	2.9	2.5	Yes	Tariff reductions on industrial products with nontariff barriers set to zero (no MFA reform)

See notes on last page of table

Table 4-1—*Continued*
Summary of selected simulation studies: Predicted impact on U.S. welfare, imports, and exports

Agreement	Study	Market	Investment	Sectors	Regions	Base Year	Welfare	Exports	Imports	Is Final Agreement Used ?	Experiment
							—— Percentage change		*——*		
		IRTS	Static	29	9	1990	0.700	4.2	3.9	Yes	Reduction of 25 percent for services ad valorem tariff equivalents with nontariff barriers set to zero
		IRTS	Static	29	9	1990	0.900			Yes	Both of above
	Francois, McDonald, and Nordstrom (1996)	CRTS	Static	19	3	1992	0.170			Yes	Based on Final Act
		IRTS	Static	19	3	1992	0.280			Yes	Based on Final Act
		CRTS	Dynamic[2]	19	3	1992	0.260			Yes	Based on Final Act
		IRTS	Dynamic[2]	19	3	1992	0.450			Yes	Based on Final Act
		CRTS	Dynamic	19	3	1992	0.380			Yes	Based on Final Act
		IRTS	Dynamic	19	3	1992	0.620			Yes	Based on Final Act
	Goldin and van der Mensbrugghe (1994)	CRTS	Dynamic	20	22	1985 to 1993	0.000			Yes	Based on Final Act
	Haaland and Tollefsen (1994)	IRTS	Static	15	4	1985	0.020			No	Reduce tariffs and NTBs on goods by 33 percent
		IRTS	Static	15	4	1985	0.020			No	Reduce NTBs on services by 33 percent
		IRTS	Static	15	4	1985	0.050	39.9	37.5	No	Reduce tariffs on goods and NTBs on goods and services by 33 percent
		IRTS	Static	15	4	1985	0.030			No	Reduce tariffs and NTBs on goods by 33 percent and NTBs on services by 10 percent
		IRTS	Static	15	4	1985	-0.110			No	Trade War-increase NTB's by 10 percent
		IRTS	Dynamic	15	4	1985	0.110			No	Reduce tariffs on goods and NTBs on goods and services by 33 percent

See notes on last page of table

Table 4-1—*Continued*
Summary of selected simulation studies: Predicted impact on U.S. welfare, imports, and exports

Agreement	Study	Market	Investment	Sectors	Regions	Base Year	Welfare	Exports	Imports	Is Final Agreement Used ?	Experiment
							—— *Percentage change* ——				
	Harrison, Rutherford, and Tarr (1994)	CRTS	Static	22	24	1992	0.216			Yes	Based on Final Act
		IRTS	Static	22	24	1992	0.224			Yes	Based on Final Act
		CRTS	Dynamic	22	24	1992	0.428			Yes	Based on Final Act
		IRTS	Dynamic	22	24	1992	0.449			Yes	Based on Final Act
		CRTS	Static	22	12	1992	0.185			Yes	Based on Final Act
	Hertel, Martin, Yanagishima, and Dimaranan (1994)[3]	CRTS	Static	10	15	1992	0.400	7.7	7.5	Yes	Based on Final Act
	Nguyen, Perroni, and Wigle (1995)	CRTS	Static	9	10	1986	0.200			Yes	Based on Final Act

[1] Contestable markets, other IRTS model assumes Cournot competition, see p. 4-16.
[2] Savings rate held fixed.
[3] Hertel, Martin, Yanagishima, and Dimaranan's (1994) estimates are based on a combined impact on both the U.S. and Canada.

Notes.—CRTS = constant returns to scale. IRTS = increasing returns to scale.

Source: USITC summary of cited studies.

Table 4-2
Summary of selected simulation studies: Predicted impact on output, exports, and import by sector- NAFTA

Study	Market	Investment	Experiment	Output increases by one percent or more	Output decreases by one percent or more	Exports increase by ten percent or more	Imports increase by ten percent or more
Brown, Deardorff, and Stern (1994)	IRTS	Static	Tariff elimination	Textiles	Glass Products; Nonferrous Metals	Footwear; Clothing; Furniture, Fixtures	Glass Products; Electrical Machinery
Burfisher, Robinson, and Thierfelder (1994)	CRTS	Static	Tariff and quota elimination (US and Mexico) with internal migration	Corn		Corn, Program Crops; Fruit/vegetables, Oil/Gas	
	CRTS	Static	Tariff and quota elimination (US and Mexico) with internal and international migration	Corn		Corn, Program Crops; Fruit/vegetables, Oil/Gas, Consumer Durables, Capital Goods	
	CRTS	Static	Tariff and quota elimination (US and Mexico) with no migration	Corn		Corn, Program Crops; Fruit/vegetables, Oil/Gas, Consumer Durables, Capital Goods	
Lopez, Markusen, and Rutherford (1994)	IRTS	Static	Tariffs and NTBs elimination for autos, engines, and parts	Engines (North American firms only)	Engines (foreign firms only)		
	IRTS	Static	Tariffs and NTBs elimination for autos, engines, and parts with CR content	Engines and autos (North American firms only for each) and parts	Engines and autos (foreign firms only)		
	IRTS	Static	Tariffs and NTBs elimination for autos, engines, and parts with CR content and trade balance	Engines and autos (North American firms only for each) and parts	Engines and autos (foreign firms only)		
Roland-Holst, Reinert, and Shiells (1994)	CRTS	Static	Removal of tariffs and NTBs	Most sectors		Transport Equipment	

See notes on last page of table

Table 4-2—*Continued*
Summary of selected simulation studies: Predicted impact on output, exports, and import by sector-Uruguay Round

Study	Market	Investment	Experiment	Output increases by one percent or more	Output decreases by one percent or more	Exports increase by ten percent or more	Imports increase by ten percent or more
Trela and Whalley (1994)	CRTS	Static	Removal of textile and apparel tariffs and quotas		Apparel		
	CRTS	Static	Removal of U.S. bilateral Steel Quotas and tariffs		Steel		
Brown, Deardorff, Fox and Stern (1996)	IRTS	Static	Tariff reductions on industrial products with nontariff barriers set to zero (does not include MFA reform)	Footwear, Leather Products			Iron and Steel
	IRTS	Static	Reduction of 25 percent for services ad valorem tariff equivalents with nontariff barriers set to zero			Transportation, Financial Services, Personal Services	Transportation, Financial Services, Personal Services
Francois, McDonald, and Nordstrom (1996)	CRTS	Static	Based on Final Act	Fishery; Transport equipment; Non-ferrous metal	Apparel; Textiles		
	IRTS	Static	Based on Final Act	Fishery; Transport equipment; Non-ferrous metal; Fabricated metal; Chemical, rubber, and plastics; Lumber; Mining; Other machinery; Other manufactures and equipment	Apparel; Textiles; Non-Grain Crops		
	CRTS	Dynamic[1]		Fishery; Transport equipment; Non-ferrous metal	Apparel; Textiles		

See notes on last page of table

Table 4-2—*Continued*
Summary of selected simulation studies: Predicted impact on output, exports, and import by sector-Uruguay Round

Study	Market	Investment	Experiment	Output increases by one percent or more	Output decreases by one percent or more	Exports increase by ten percent or more	Imports increase by ten percent or more
	IRTS	Dynamic**	Based on Final Act	Fishery; Transport equipment; Non-ferrous metal; Fabricated metal; Chemical, rubber, and plastics; Lumber; Mining; Other machinery; Other manufactures and equipment; Grains	Apparel; Textiles		
	CRTS	Dynamic	Based on Final Act	Fishery; Transport equipment; Non-ferrous metal; Fabricated metal; Chemical, rubber, and plastics	Apparel; Textiles		
Francois, McDonald, and Nordstrom (1996)	IRTS	Dynamic	Based on Final Act	Fishery; Transport equipment; Non-ferrous metal; Fabricated metal; Chemical, rubber, and plastics; Lumber; Mining; Other machinery; Other manufactures and equipment; Grains	Apparel; Textiles		
Haaland and Tollefsen (1994)	IRTS	Static	Reduce tariffs and NTBs on goods by 33 percent		Agriculture and industrial machinery; Office machinery; Electrical goods; Transport equipment; Textiles and clothing; Other manufacturers		
	IRTS	Static	Reduce NTBs on services by 33 percent		Transport services		
	IRTS	Static	Reduce tariffs on goods and NTBs on goods and services by 33 percent		Agriculture and industrial machinery; Office machinery; Electrical goods; Transport equipment; Textiles and clothing; Other manufacturers; Transport services	Food, beverage and tobacco; Paper and printing products; Agriculture and industrial machinery; Electrical goods; Metal products; Textiles and clothing; Other manufactures; Rubber and plastic products; Transport services; Financial services	All but Chemical products

See notes on last page of table

Table 4-2—*Continued*
Summary of selected simulation studies: Predicted impact on output, exports, and import by sector-Uruguay Round

Study	Market	Investment	Experiment	Output increases by one percent or more	Output decreases by one percent or more	Exports increase by ten percent or more	Imports increase by ten percent or more
Hertel, Martin, Yanagishima, and Dimaranan (1994)	CRTS	Static	Based on Final Act	Primary Agriculture; Natural Resources; Transport Industries and Equipment	Textiles; Wearing Apparel; Light Manufactures; Heavy Manufactures		

[1] Saving rate held fixed.

Notes.—CRTS = constant returns to scale. IRTS = increasing returns to scale.

Changes in imports and exports for Roland-Holst, Reinert, and Shiells (1994) are based on increases from Canada, Mexico and the rest of the world which all are greater than 10 percent.

Source: USITC summary of cited studies.

modestly as a result of implementation of each of the agreements.[10] Employment and output, while shifting from one sector to another, in most models do not grow significantly owing to assumptions about full employment in the models. The main focus of most of the studies is the effect on U.S. welfare, and most find that U.S. welfare as a percentage of GDP increases by much less than 1 percent of GDP.[11] For the Tokyo Round, welfare estimates range from zero to 0.2 percent of GDP, the impact on welfare being less than 0.1 percent for GDP in both cases where only tariff cuts are considered. With the exception of Roland-Holst, Reinert et al. (1992), the impact on welfare was less than 0.1 percent for studies of the U.S.-Canada FTA and NAFTA, even when nontariff barriers are considered.[12] For the Uruguay Round, the estimated impact on welfare is greater than that found for the other agreements, but is still less than one percent of GDP. The impact is also greater for the Uruguay Round than for the other agreements when only estimates with constant returns to scale and static investment are assumed, with the welfare impact ranging from 0.17 to 0.40 percent of GDP.

Studies also generally estimate that U.S. exports and imports increased as a result of the agreements. Although the impact on exports and imports was reported to be less than a 2-percent increase for the Tokyo Round, the U.S.-Canada FTA, and NAFTA, the impact is greater than 2 percent for all Uruguay Round studies.[13] Similarly, most studies find that output, and the rental rate on capital would increase by modest amounts, usually less than 0.5 percent.

---

[10] Surveys of studies that make this assessment for the United States are Burfisher et al. (2001); see p. 126; and Kehoe and Kehoe (1994). Studies that make this assessment about the overall effect of a particular agreement on all countries for the Tokyo Round include Deardorff and Stern (1986); for the Uruguay Round, Perroni (1996).

[11] See the discussion of the Harberger constant in footnote 4.

[12] Note that Hertel, et al. (1995) reports combined results for the United States and Canada. The exception was a model of NAFTA in Roland-Holst et al. (1994). They report welfare effects ranging from 0.08 percent to 2.55 percent of GDP. The main difference between the conclusions of Roland-Holst, et al. and those of other NAFTA researchers is that Roland-Holst, et al. generate high estimates that included the elimination of all nontariff barriers among NAFTA countries, even if those nontariff barriers were not explicitly phased out. As noted below, their estimates of the magnitude of those barriers are controversial.

[13] Although there are no known ex ante CGE studies of the U.S.-Israel Free Trade Area, Sawyer and Sprinkle (1986) use a simple partial-equilibrium framework to show that U.S. imports (net of trade diversion) increase by $127.3 million (1983 dollars) and U.S. exports to Israel increase by $9.4 million.

Scale Economies and Imperfect Competition

The impact of trade liberalization in models allowing for scale economies and imperfect competition depends on the type of imperfect competition[14] introduced and the degree of scale economies[15] assumed. Although in most cases the introduction of imperfect competition increases the agreements' measured impact on U.S. welfare, the estimated magnitude of the impact varies widely. These mixed results are not surprising since the gains from trade that accrue by taking advantage of scale economies and introducing more competition may be dominated by profit shifting, as illustrated in the strategic trade policy literature.[16]

Early applications of increasing returns to scale to CGE modeling of trade liberalization, such as those done ex ante for the Canadian economy by Harris (1984) and Cox and Harris (1985, 1986), assumed substantial scale economies based on engineering estimates, and consequently produced large estimates of welfare gains. Subsequent empirical work on the U.S.-Canada FTA indicated that scale economies of the magnitude assumed were likely not realized in practice. There is better empirical evidence for a "selection effect" of trade liberalization, i.e. that average productivity may rise through exit of the less efficient firms in an industry, with a consequent increase in the market share of more efficient firms.[17]

In many cases, incorporation of scale economies and imperfect competition increases estimates of the gains in economic welfare.[18] This relation is clearest

[14] The textbook ideal of "perfect competition" involves a large number of producers and consumers in each industry trading a homogeneous (identical) product under conditions of free entry and exit and perfect information. The market structure of perfect competition as usually described involves firms producing under constant returns to scale. Even standard CGE models depart somewhat from the assumption of homogeneous product by differentiating among products produced in different countries. Thus, "product differentiation" in the models described as "imperfect competition" below refers to product differentiation within a country. There is more than one potential model of imperfect competition, depending on which of the above assumptions are relaxed, and in what manner.

[15] In models with scale economies, also known as "increasing returns to scale," when output increases, the cost of production increases at a slower rate, so that average or unit costs decline. By contrast, in cases of constant returns to scale, costs increase proportionately with output, so that average or unit costs remain constant.

[16] For example, see Brander and Spencer (1984).

[17] Feenstra (2003). The section of this chapter on trade and productivity discusses studies pertaining to the selection effect, as well as Head and Ries (1999) with respect to scale economies and the U.S.-Canada FTA.

[18] The presence of scale economies is typically measured by estimates of the cost disadvantage ratio, which is a measure of the ratio of average costs to marginal costs in base data. A variety of types of imperfect competition have been assumed. Although typically firms are allowed to enter and exit, driving profits to zero, in some models the number of firms is held fixed.

in studies that use both types of models. Direct comparisons of studies can be potentially misleading because of differences in underlying assumptions other than those made about scale economies. Market behavior under conditions of imperfect competition is complex, and studies using this type of model are difficult to compare to studies that assume perfect competition. Studies that incorporate models of both perfect and imperfect competition offer better comparisons.

For NAFTA, Roland-Holst, et al., consider three market structures: perfect competition with constant returns to scale, Cournot competition, and contestable markets. Cournot competition assumes that firms compete by choosing quantities of output after observing the output of other firms. Any given firm will choose a smaller output if other firms in the industry are observed to choose a larger output, taking into account the amount of the market left over. Each firm has different reactions to different observed outputs of firms, with the degree of this reaction depending on the number and market shares of other firms in the market and the elasticities that are assumed in the model. For contestable markets, it is assumed that existing firms set price equal to average cost to deter entry from other firms.[19] While the Cournot model assumes that firms can freely enter and exit the industry, the contestable markets model assumes that the number of firms is held fixed. The authors find that assuming Cournot competition decreases the gain in U.S. welfare, real GDP, and employment[20] resulting from NAFTA compared to the perfectly competitive case, although introducing contestable pricing causes gains in all of these indicators.[21] They claim that because firm entry is not restricted in their Cournot specification, aggregate gains are reduced in most countries as “crowding in” by new market entrants drives incumbent firms up their average cost curves.[22]

For the Uruguay Round, Harrison et al. (1995) assume a similar Cournot model and find that U.S. welfare increases slightly from 0.216 percent to 0.224 percent of GDP, compared to their standard constant returns to scale model. Francois et al. (1995) assume that imperfect competition takes the form of monopolistic competition where increased specialization in intermediate products makes the final goods sectors more productive because of a greater variety in choice of specialized inputs.[23] They find that assuming this form of imperfect competition increases the impact on welfare from 0.17 percent to 0.28 percent of GDP. This study estimated a larger impact than Harrison, et al.

[19] De Melo and Tarr (1992), p. 152.

[20] Most ex ante studies assume a fixed labor supply, so aggregate employment does not change when trade policies change. Roland-Holst et al. assume an excess supply of labor and a fixed wage. Under these assumptions, the trade agreements increase employment.

[21] Roland-Holst, et. al (1994). See table 2-8 on p. 70.

[22] Ibid, p. 71.

[23] Francois, et al. (1995), pp. 150.

(1996) due to the use of higher estimates of the cost disadvantage ratios and the use of a form of imperfect competition that captured gains from increased input varieties, in addition to the gains from lower average costs in expanding sectors that were captured in both studies.[24]

Sectoral Results

Although most studies found that U.S. welfare and other economic indicators increased in aggregate, the results for these economic indicators were mixed when reported by individual U.S. sectors. While exports and imports experience some growth for most sectors in all studies, the impact on output, employment, and prices in particular sectors depended on the specifics of each agreement and structure of the economies involved in the agreement, as well as the level of aggregation of the model being used.

In Deardorff and Stern (1986) implementation of the Tokyo Round agreements results in a shift in employment toward the agriculture, forestry and fish sector, which increases by 1.7 percent from its 1976 level, and away from employment in production of nontradable goods.[25] Their simulation features the removal of substantial U.S. or global non-tariff barriers in the agriculture sector.

For NAFTA, studies found a variety of results. Roland-Holst, et al. (1994) found that U.S. output in transportation equipment would increase by 17.6 percent, which the authors attribute to trade diversion. Brown et al. (1994) find that output in glass products would decrease by 11.8 percent, while the largest increase in output would be an increase of slightly greater than one percent for textiles. Burfisher et al. (1994) find that output of corn in the United States, which was disaggregated from the food sector, increased by 4.9 percent to 6.7 percent as compared to changes of less than 0.3 percent in all other sectors, including the aggregate farm sector of which it is part. At the implementation of NAFTA about 30 percent of rural Mexican workers worked in the highly protected maize sector.[26] Also, Trella and Whalley (1994) find that removal of both textile and apparel quotas and steel quotas would decrease U.S. output of apparel by 5.0 percent and steel by 10.7 percent, with only a 0.1 percent reduction in production of textiles.

Sectoral results from studies estimating the effects of the Uruguay Round usually report that textile and apparel sectors sustained the greatest impact. The reduction in trade barriers in these sectors, particularly reforms to the

---

[24] See Harrison, et al. (1995), pp. 241, appendix C, pp. 280-284 and Francois, et al., (1995), p. 141 for discussions about the differing specifications between two of the models. The specification for Roland-Holst, et al. (1994) is discussed on pp. 60-68.

[25] Deardorff and Stern (1986) table 4-5, pp. 56-57, p. 58. Note that overall employment is exogenous in their model and can only shift across sectors.

[26] Brown et al. (1992), p. 1514.

Multi-Fiber Arrangement (MFA), were very important in the Uruguay Round Agreements.[27] Various studies of implementation of the Uruguay Round found that the removal of quotas under the ATC made up a large part of the increase in welfare from the entire agreement, ranging from 30 percent to 80 percent of all welfare gains for the U.S.[28]

Studies that report changes in sectoral output attributable to trade agreements find that, as a rule, the most significant percentage changes for importing markets consist of output decreases in the apparel sector, followed by the textile sector. Harrison, et al. (1995) found that U.S. employment was most impacted in the textile and apparel sectors, where estimated employment falls by 10 percent and 25 percent respectively; and that the only sector positively affected by more than 1percent is the agriculture sector.[29] Similarly, product prices are most changed in the wearing apparel sector (a 10-percent decrease), the paddy rice sector (an 8.5-percent increase), and the wheat sector (a 5.6-percent increase) with the only sectors changing by more than 1.0 percent being other agricultural sectors and textiles.[30] Also, although they find that the welfare gains for the United States decline when a more aggregated 12-region model was estimated instead of the standard 24-region model, they caution that in some cases the more disaggregated model did not always generate larger efficiency gains from liberalization.[31]

The estimated impact of liberalization on the United States appears to be modest, both in the aggregate and by sector, when compared to other changes that simultaneously occurred or were expected to occur in the economy.[32] Compared to the increase in real GDP between 1979 and 2001,which grew from $4.1 trillion to $9.2 trillion in constant 1996 dollars, the gain in overall welfare attributable to trade agreements was small.

Hertel, et al. (1996) provided an example of a study with a useful comparison between baseline changes in the economy and additional changes expected as a consequence of liberalization. The authors found that expected increases in output for the United States and Canada between 1992 and 2005

---

[27] The MFA was replaced by the Agreement on Textiles and Clothing (ATC), under which quotas will be eliminated at the end of 2004.

[28] Harrison, et al. (1995), Francois, et al. (1995), and Hertel et al. (1995). However, while another study shows that liberalization in textiles and clothing contributed about 30 percent of the welfare impact on the United States, it shows that liberalization in agriculture contributed more than 40 percent of the welfare impact. Perroni (1996), table 4, p. 16. This data is originally from Nguyen et al. (1995).

[29] Harrison, et al. (1995) appendix B.

[30] Ibid.

[31] Ibid, pp. 230-231.

[32] Deardorff and Stern claim that small tariff reductions (from 8 percent to 6 percent) imply a small impact and claim that the “effect of the Tokyo Round on trade, employment, and welfare should be measured in tenths, or even hundredths of a percent.” Deardorff and Stern (1986), p. 59.

were not much different whether or not trade liberalization in the Uruguay Round took place.[33] Output in the textile sector was projected to increase by 30 percent between 1992 and 2005 in the absence of liberalization, but by only 7 percent if the Uruguay Round were included.[34] While the difference between 30 percent and 7 percent represents significantly less output than would otherwise have been produced, use of the dynamic baseline showed that the general effect of increased demand was likely to outweigh MFN tariff removal. The authors projected an increase for the United States and Canada of 41 percent in aggregate GDP between 1992 and 2005 in the absence of the agreement, which can be usefully compared to the modest increase in economic welfare of 0.4 percent of GDP attributed to the agreement.[35]

Nontariff Barriers

The impact of removing nontariff barriers was generally found to be larger than that of lowering tariffs. Although nontariff barriers are difficult to quantify, the gains from their elimination may be larger than the gains from removing tariffs. The estimated effects of nontariff barriers on welfare can be significantly altered by the modelers' assumptions about who gets the rents from such barriers, and about how the barriers are measured.[36]

Whalley (1984) finds that by accounting just for the quantifiable nontariff barriers that were to be eliminated as part of the Tokyo Round, the impact on U.S. welfare increased from $430 million (less than one-tenth of 1 percent of 1973 GNP) to $2.22 billion.[37] Using a similar model, Brown and Whalley (1980) find that eliminating all nontariff barriers increased the impact on U.S.

---

[33] Hertel, et al. (1995), table 14, p. 92. The underlying assumptions driving demand seem to be modest for the 1992 to 2005 period: A 10-percent increase in population, 13-percent increase in the labor force, 43-percent increase in the capital stock, 67-percent increase in human capital, 4-percent increase in total factor productivity growth, and 41-percent increase in real GDP. The assumption for total factor productivity was based on a Global Trade Analysis Project (GTAP) simulation and the other assumptions are estimates by the International Economic Analysis and Prospects Division of The World Bank (Hertel et al. (1995), Table 6, p. 82.)

[34] Hertel, et al. (1995), table 14, p. 92.

[35] Hertel, et al. (1995), table 6, p. 82.

[36] In the case of quota-type barriers, if the quota is assumed to be administered by the exporting country (as in the case of MFA quotas), the rents accrue to the exporter, and eliminating the barrier causes income from these rents to fall for the exporting country. If the quota is assumed to be held by a domestic interest, or sold by the importing country, the same drop in rents affects primarily the income of the importing country. Modeling of nontariff measures other than import quotas still involves at least an implicit assumption about who earned the quota prior to liberalization.

[37] Whalley (1984), table 9-3, p. 167.

welfare from $780 million (in 1973 US$) to $2.04 billion.[38] Deardorff and Stern (1986) also conclude that elimination of unquantifiable nontariff barriers has a significant impact on welfare, possibly even outweighing welfare gains from tariff reduction.[39]

The relatively large impact of removing nontariff barriers is strikingly clear in the Roland-Holst, et al. (1994) study, in which estimates of removing tariffs from all NAFTA countries are compared to estimates of removing both tariffs and nontariff barriers from all NAFTA countries.[40] The estimated increase in welfare for the United States is 0.08 percent for removal of tariffs only, but 1.87 percent of GDP when nontariff barriers also are removed.[41] The impact on real GDP is similar, while the relative impact on imports and exports is even more striking. The estimated increase in imports changes from 0.38 percent to 9.37 percent of GDP and the estimated increase in exports changed from 0.28 percent to 8.29 percent of GDP.[42]

However, the large size of these estimates is controversial because these ad valorem equivalents were not taken from a direct measure of the trade costs of nontariff barriers. The measures used by Roland-Holst, et al., which were based on the number of tariff lines covered by at least some nontariff barriers, misrepresented and may have substantially overstated the degree to which nontariff barriers imposed a cost on international trade, thereby inaccurately measuring and probably overstating the benefits of removing these barriers.

Other NAFTA studies that focused on specific nontariff barriers yielded a smaller impact. Trella and Whalley (1994) found that removal of textile and apparel quotas between NAFTA countries increased welfare by 0.01 percent of GDP over a 1-year period and removal of steel quotas between NAFTA countries increased welfare by 0.006 percent of GDP over 40 years.

Various studies on implementing the Uruguay Round found that the removal of quotas under the WTO's Agreement on Textiles and Clothing make

---

[38] Brown and Whalley (1980) table 14, p. 864. It is important to note that abolition of all non-tariff barriers without the duty reductions from the Tokyo Round would decrease U.S. welfare by $1.55 billion (1973 U.S. dollars). This emphasizes that the whole may be greater than the sum of the parts in measuring the welfare gains from reducing non-tariff barriers.

[39] Deardorff and Stern (1986), pp. 61-63, qualitatively estimate the effects of changes in custom valuation, government procurement, import-licensing procedures, subsidies and countervailing duties, and product standards. They also note that the nontariff barriers not covered by the Tokyo Round maybe more important than the tariff and nontariff barrier concessions that were included.

[40] The proxy for nontariff barriers is an ad valorem equivalent previously estimated by the authors in Roland-Holst et al. (1992).

[41] Roland-Holst, et al. (1994), table 2-8, p. 70.

[42] Ibid.

up a large part of the increase in welfare from the entire agreement, ranging from 30 percent to 80 percent of all welfare gains for the United States.[43]

Investment Dynamics

Studies that allow for dynamic investment flows and a fixed price of capital show a larger impact on U.S. welfare as a result of implementing the agreements, generally doubling estimates of the impact of the Uruguay Round on welfare. Unlike the results for scale economies and imperfect competition, the impact can be assessed by comparing studies that allow for investment dynamics and those which do not.[44]

Typically studies account for investment dynamics by assuming that the initial level of the capital stock was optimal and then allowed the rate of investment to fluctuate so that the capital stock adjusts to its new optimal level as a result of the policy shock while holding the rental rate of capital constant. By comparison, in the static model, the level of investment is held fixed while the rental rate of capital adjusts to the trade liberalization introduced in the model. In the dynamic model, the change in investment alters the amount of resources in the economy, making the impact on welfare larger while the change in the rental rate of capital in the static model does not significantly affect welfare. However, Harrison, et al. (1996) note that by holding other factors constant, these models provide an upper bound on potential welfare gains in the long run, given that the forgone consumption necessary to obtain the larger capital stock is ignored.[45]

Dynamic models of this type were used in studies of the Uruguay Round, generally doubling the impact of the agreement. Harrison, et al. (1996) show that the impact on welfare increased from 0.22 percent to 0.45 percent of GDP when they allow the capital stock to be endogenous (determined within the model by the behavior of other variables) and hold the price of capital fixed in each country, the opposite of the static case.[46] However, effects on employment and prices by sector changed only slightly when the capital stock is endogenized.[47] Likewise, Haaland and Tollefsen (1994) find that the impact on

[43] See the discussion at footnote 25.

[44] One study for which such a comparison can be made is Goldin and van der Mensbrugghe (1995). However the investment dynamics introduced in their model are much different than those used in the other studies.

[45] Harrison, et al. (1995), p. 231.

[46] Ibid, p. 232, table 4, p. 221, table 9, p.229, table 10, p. 232, and table 13, p.239. This results from is the result using their “the preferred increasing returns to scale model. The results from the constant returns to scale model show that the impact on welfare increase from to 0.22 percent to 0.43 percent of GDP.

[47] Harrison, et al. (1995), appendix B.

welfare increases from a 0.05-percent increase to a 0.11-percent increase when shifting from a static model to a dynamic model.[48]

Francois, et al. (1996) find that the impact on U.S. welfare and real wages was larger when allowing for an endogenous capital stock and an endogenous saving rate.[49] Assuming constant returns to scale, they find that the impact on U.S. welfare increases from 0.17 percent to 0.26 percent of GDP when the capital stock is allowed to be endogenous and the savings rate is fixed, thus keeping the capital-to-GDP ratio constant. Welfare increases more, to 0.38 percent of GDP when both the capital stock and saving rate are endogenous.[50] Moreover, the impact on real wages roses from a 0.30-percent increase to a 0.38-percent increase when the capital stock is endogenous. The impact rises higher, to a 0.51-percent increase, when the saving rate is also endogenized.[51] With increasing returns to scale, the shock to U.S. welfare increases from 0.28 percent to 0.45 percent of GDP when endogenizing capital but fixing the savings rate, and increased further to 0.62 percent of GDP when both are endogenized.[52] Likewise the impact on the real wage rises from a 0.32-percent increase to 0.45-percent increase of GDP when allowing the capital stock is allowed to be endogenous, and grows to a 0.62-percent increase when the saving rate is also endogenized.[53]

Conclusion

Despite various model specifications and different forms of trade liberalization, most of the models surveyed here showed that the expected impact on welfare, exports, imports, and other economic factors from these trade agreements was modest compared to general trends in the economy. Whether these models capture the full impact from trade liberalization is still an open question. In this regard, model validation with respect to historical data is difficult to perform, and should be borne in mind.[54] However, the present work with nontariff barriers, imperfect competition, and the dynamic impact of investment shows the potential for future development of CGE models in these areas, which may reveal other gains from trade liberalization that have not yet been analyzed.[55]

---

[48] Haaland and Tollefsen (1994), table 17, p. 24.

[49] Francois et al. (1995), table 21, p. 164.

[50] Ibid p. 164, p. 151.

[51] Ibid, table 15, p. 157.

[52] Ibid, table 21, p. 164.

[53] Ibid, table 16, p. 158.

[54] See Kehoe (2002).

[55] See Rutherford and Tarr (2002) for examples of this potential.

General Economic Effects of Trade Liberalization in the "Fast-Track" Era

Studies Evaluating Sources of Trade Growth

This section reviews the econometric literature on trade liberalization and trade growth. While many studies link U.S. economic outcomes to growth in trade, relatively few identify the role of trade policy changes directly. Non-policy changes such as improved transportation and communication technologies also contributed to trade growth.

In order to provide some context for later studies that assess the impact of growing international trade on the U.S. economy, this section of the literature review seeks to better understand the role that trade policy changes have played in increasing trade. Most recent studies on this topic have attempted to explain growth in world trade, not just U.S. trade, and this literature review reflects that emphasis. The literature considers three alternatives to trade policy changes as causes for trade growth: U.S. and global income growth, innovations in transportation and communication technologies, and growth of multistage production processes.[56]

The studies reviewed below take two approaches to measuring the effects of trade policy on trade, and comparing them with other possible causes of trade growth. Econometric studies identify a list of possible sources of trade growth, and use statistical hypotheses and correlation patterns to attribute causation to one phenomenon or another. Simulation methods are used to consider complex models that are not easily estimated with econometric methods. Econometric studies of trade growth are often designed to attribute all observed trade growth to one cause or another.[57] Simulation studies typically consider individual phenomena and leave the rest of trade growth unexplained.[58] The new analysis in the present report includes econometric applications in chapters 6 and 8, the first evaluating the impact of NAFTA and

---

[56] Another possible source of global trade growth–but one that does not appear to be addressed in the literature explaining global trade growth–is unilateral economic reform in developing countries such as India and China. At least one study (Bernard, et al. 2003) reviewed links U.S. economic outcomes to the entry of poor countries into world markets. No studies were identified that linked global trade growth directly to economic reforms in developing countries. Chapter 8 notes that 2.5 percent of U.S. import growth over the period can be attributed to trade in new product-country pairs.

[57] Such studies require the assumption that the author has included all of the main sources of trade growth as explanatory variables. If one source of trade growth has been left out, the procedure may attribute trade growth to another source, when it should be attributed to the missing source.

[58] Simulation studies require the author to quantify specific behavioral relationships that define the economy's response to trade policy changes. Estimates from a simulation study are based on the assumption that these responses have been quantified correctly.

the second considering increases in product variety. A simulation study of all five agreements is presented in chapter 7.

All of the studies reviewed in this section use an economic model to evaluate historical experience. An economic model is needed to provide a framework for assigning trade growth to various sources. While models provide needed clarity, they also shape conclusions, to some extent. Two particular questions about model features are relevant to this discussion. First, is trade growth assumed to be proportionate to income, or does the model allow income growth to produce a disproportionate increase in trade? In some cases, authors do not explicitly assume proportionate trade and income growth, but the measures they report may require us to interpret their models in that way for the purposes of this discussion.[59] Second, in what manner does the model allow trade policy changes to interact with other sources of trade growth? Models that allow interaction between trade policy changes and other trade-inducing phenomena attribute a greater portion of trade growth to trade policy changes.

The studies reviewed below suggest that the direct effect of trade policy changes explain at most one-fourth of the growth in world trade.[60] Other factors, particularly income growth, appear to explain a larger share of trade growth. When the economic model used to explain trade growth allows trade policy changes to interact with other economic changes, especially falling transportation costs and the growth of multistage production, trade policy changes explain a greater part of total trade growth. One model with interactions between tariff changes and multistage production attributes half of trade growth to tariff reductions.

The Role of Trade Policy in Explaining Trade Growth

In an article in Brookings Papers on Economic Activity, Krugman (1995) explains that the causes of the growth in world trade are in dispute. He notes that journalistic discussion of the growth in world trade tend to emphasize changes in transport and communication technologies, while the academic literature tends to emphasize the role of trade policy changes. Research since 1995 has brought forth further evidence on this discussion, but it remains difficult to assign any one cause a leading role.

[59] Several authors seek to explain growth in the ratio of exports to GDP. This measure would remain constant if exports and GDP grew proportionately.

[60] Since U.S. tariff reductions over the period are more modest than tariff reductions in the rest of the world, it is likely that a smaller share of U.S. import growth can be directly attributable to trade policy changes.

Baier and Bergstrand (2001) use an econometric approach to address the issue, estimating a gravity model of trade (a model that empirically relates trade to measures of the size of the trading economies and of the distance between them) to explain trade growth among members of the Organization for Economic Cooperation and Development (OECD), an organization that includes most of the world's developed countries. Baier and Bergstrand consider the period 1958-1988, during which intra-OECD trade increased by 148 percent. They conclude that about two-thirds of the trade growth in the period can be attributed to growing incomes, about one-fourth to tariff reductions, and less than one-tenth is attributed to lower transport costs.[61]

Baier's and Bergstrand's paper is perhaps the most straightforward assessment of the relative importance of various explanations for world trade growth. While useful, a number of qualifications should be made before any conclusions are drawn. First, the international transport cost data used in this assessment appear to be poorly correlated with more reliable measures of trade costs.[62] Second, the experiment does not contain measures of nontariff barrier removal, which might have given more weight to trade policy changes. Third, the model measures trade in final goods, and does not allow the growth in multistage production to account for trade growth. Finally, the model does not allow trade policy changes to interact with other sources of trade growth. These qualifications are addressed in individual papers that follow, but none of the subsequent literature has provided the comprehensive overview that Baier and Bergstrand provide.

A number of technological improvements in transportation, particularly the containerization of freight, have suggested to many that international transport costs may have declined significantly in recent years. A recent article by Hummels (1999) evaluates this hypothesis. Hummels notes that freight rates average about 12 to 15 percent of the value of imported products, so freight rates are a larger impediment to trade than existing tariffs. Ocean shipping freight charges rose through the 1970s, peaked around 1985, and have fallen back to early 1970 levels. Air freight rates have fallen considerably over time, which is significant because air freight now accounts for nearly 25 percent of import value (Hummels 2001). Overall, Hummels concludes that freight rates

[61] Baier and Bergstrand consider a fourth potential cause of trade growth, growing similarity of incomes across countries. The economic model posited by Baier and Bergstrand suggests that increased income similarity should increase trade flows. They attribute little, if any, of world trade growth to this fourth cause.

[62] In order to obtain transport cost data for all countries in their sample, Baier and Bergstrand use matched country trade data from the International Monetary Fund to infer transport costs. Some countries, including the United States, collect direct evidence on freight costs. It does not appear that the transport cost data inferred from International Monetary Fund statistics match up well with the directly observed data available elsewhere. See Hummels and Lugovskyy (2002).

as a whole are not appreciably lower than in early 1970s,[63] but that rapid declines in air freight rates signal an important quality improvement in transportation technologies. Other innovations such as containerization and faster ocean shipping may also have improved speed, even if these technological changes have not produced lower measured freight rates.

In another article, Hummels (2001) uses the difference between ocean and air freight charges to estimate the value of faster shipping times to time-sensitive importers. Air freight rates are typically 2.5 times higher than ocean freight rates, yet 30 percent of U.S. imports arrived by air in 1998, so Hummels postulates that a large number of importers are time sensitive. Using an econometric model that evaluates importers' willingness to pay for faster shipping, he concludes that the use of air freight and falling air freight charges imply significant reductions in the tariff equivalent of time costs associated with trade. Hummels estimates that the introduction of lower-cost air freight since 1950 has been equivalent to a 23-percent tariff reduction for manufactured goods.[64] Hummels argues that these reductions may have been particularly important in facilitating the growth of multiple-stage production in manufacturing.

A growing body of literature seeks to better understand multiple-stage production, also known as "outsourcing," "production fragmentation," and "vertical specialization." Most trade models, such as the one used in Baier and Bergstrand, assume that traded goods cross only one national border. In recent years, manufacturers have "sliced up the value chain," segmenting production of goods into multiple stages in multiple countries. By the time final assembly is completed, some components may have crossed several international borders. As evidence in the growth of this phenomenon, Feenstra (1998) reports the ratio of merchandise trade to merchandise value added. In 1970, the value of traded goods divided by value added in goods-producing industries was 13.7 percent; by 1990 the ratio had grown to 35.8 percent.[65] By 2000, the ratio measured by Feenstra had risen to 56.7 percent.[66] Other industrial countries also saw increases in the Feenstra measure.

Hummels et al. (2001) use a similar concept, "vertical specialization," which is a measure of the value of a country's imports that are embodied in its

---

[63] Data on the freight charges associated with U.S. trade are available beginning with 1974. U.S. freight charges in 1998 were approximately 30 percent lower than in 1974. However, data from other freight series suggest that 1974 rates may have been about 30 percent higher than 1973 rates because of increased fuel prices. The difference between the imputed 1973 data and the actual 1998 charges suggests very little change in the average freight charges between 1973 and 1998. See Hummels (1999).

[64] Note that the tariff reductions embodied in the five agreements considered here implied average tariff reductions of only 3 percent (see chapter 3).

[65] Feenstra (1998), table 2.

[66] USITC calculations based on USDOC, Bureau of Economic Analysis data. Note that trade is measured in total value terms, not value added, so this ratio is not constrained to be less than 100 percent.

exports. In 1972, 6 percent of U.S. merchandise export value was imported intermediates; by 1990 that figure had risen to 11 percent of value. The vertical specialization measure for the OECD increased from 16.2 to 19.8 between 1970 and 1990. This suggests that some part of U.S. and OECD trade growth can be explained by increased fragmentation of production. Hummels et al. provide a decomposition total trade growth. After accounting for trade growth associated with GDP growth, about 30 percent of industrialized country trade growth between 1970 and 1990 can be attributed to vertical specialization.[67] Estimates for the United States over a similar period indicate that 14 percent of U.S. export growth not explained by growing output was due to vertical specialization.

Yi (2001) builds a simulation model in which tariff reductions could facilitate vertical specialization. Yi notes that the merchandise export share of output tripled over the period 1962-1999. Standard final goods models could not explain this growth without implausible assumptions about consumers' willingness to substitute imports for domestic production. Yi demonstrates that a model allowing tariff reductions to induce vertical specialization can explain a larger portion of world trade growth. In Yi's model, tariff reductions explained only 35 percent of the growth in exports. That 35 percent occurred when tariff reductions were assumed not to induce increased vertical specialization. When tariffs were allowed to induce vertical specialization, the model explained 53 percent of observed export growth. This model indicated that the role of tariff reductions can be magnified if tariff reductions interact with other phenomena.[68]

Hummels and Skiba (2003) investigate the interaction between tariff rates and transportation costs. The authors suggest a number of reasons why lower tariffs might be associated with lower transport costs. For example, lower tariffs may induce increased trade volumes, which may in turn facilitate competition among shippers, thus lowering transport costs. Larger trade volumes may also justify increased investment in transport infrastructure. Hummels and Skiba demonstrate that containerized shipping is more likely on routes with higher trade volumes. Using an econometric model linking freight

[67] Where Baier and Bergstrand attribute a specific share of trade growth to income growth, Hummels et al. measure that part of the trade growth exceeding growth in GDP. Thus, Hummels, et al. explain that portion of trade growth not explained by proportionate growth in trade and GDP.

[68] Yi's simulation techniques do not assign all the trade growth to one cause or another, as Baier and Bergstrand's econometric techniques do. In Yi's model, trade growth unexplained by the simulation model is left unexplained. Simulation models like Yi's might overemphasize trade growth if the trade cost reductions were sufficiently large. For example, including the tariff equivalent reductions in the time costs of transport generated by Hummels (2001) would likely lead Yi's model to generate more trade growth than was actually observed. While simulation models allow investigations of more complex phenomena, such as the interaction between trade costs and vertical specialization, they do not allow a comprehensive decomposition of the growth in trade.

rates to trade volumes, they find that a doubling of trade volumes reduces transport costs by one-third. Thus, if tariff reductions induce trade, they should also lead to lower freight charges. Like the Yi model, this model suggested that tariff reductions might have spillover effects that magnify the impact of tariffs on trade.

In a recent controversial piece, Rose (2002) finds that a country's date of World Trade Organization (WTO) membership is uncorrelated with a large number of measures of liberal trade policy. This finding appears to imply that membership in the WTO does not induce trade liberalization. However, such a conclusion ignores several important institutional features of the WTO. First, much WTO-induced liberalization takes place not at the time of membership, but in the rounds of WTO-sponsored negotiations taking place after membership. Second, a good deal of apparent unilateral liberalization taking place prior to WTO membership takes place in order to satisfy the members of a country's WTO accession party in a process which typically lasts five to ten years, or longer. Thus, the particular year in which a country gains its seat in the General Council, as analyzed by Rose, reflects relatively little of the country's actual policy interactions with the WTO.

Conclusion

Econometric estimates of the effect of tariff reductions on trade suggest that tariff reductions explain anywhere from 25 percent to 50 percent of the growth in world trade, with models that assume that tariff reductions induce foreign outsourcing yielding higher estimates. Other phenomena, notably reductions in the cost of air transportation, appear to have been at least as important a source of world trade growth.

Estimates of the Effects of the Agreements on Trade

This section presents the relevant findings of quantitative studies that use data for the period after the agreements came into effect.[69] Most of the extensive literature that examines the impact of these agreements on trade are ex ante analytical studies. Only a few use actual data to explicitly analyze preferential trading arrangements and to determine if these arrangements were trade-creating or trade- diverting. In addition, very few of these studies investigate the direct impact of the agreements. Most employed the gravity model to capture the impact of the agreements on trade. Gravity models frequently use binary variables to capture this impact. One problem with this

[69] Empirical studies of the Tokyo and Uruguay Rounds tend to be political economy case studies, such as Baldwin and Murray (1997), and Ray and Marvel (1995). No studies were found dealing with the U.S.-Israel FTA.

approach is that the estimated coefficient on the binary variable measures the trade effect of the agreements as well as all other events during this period that affected trade. To overcome this, more recent studies have attempted to use a more direct measure of the agreements. The estimated coefficient in these studies provides a more direct measure of the impact of tariff reductions due to the agreements but does not capture the impact of nontariff barrier reductions owing to the agreements.

A growing body of studies looks explicitly at preferential trade arrangements and their impact on trade. Most of these studies use the gravity model to determine the impact of the formation of trading blocs on trade flows. Examples include Frankel (1997), Gould (1998), Krueger (1999), and Baier and Bergstrand (2001). More recent studies employ a more direct measure of an agreement to measure its impact on trade. These include Clausing (2001), Romalis (2001), and Agama and McDaniel (2003).

Frankel (1997) uses the gravity equation to examine the impact of trading blocs on intraregional trade and finds that even after holding constant for the natural determinants of bilateral trade, preferential trading blocs boost trade among member countries in the European Community, Association of Southeast Asian Nations, the Australia-New Zealand Closer Economic Relations, the Andean Pact, and the Southern Common Market Agreement (Mercosur). Frankel also examines broader regional groups including Western Europe, Western Hemisphere and Asia and again finds statistically significant effects. Frankel cautions that it may not be possible to distinguish from the data whether true concentration effects were coming from the formal regional trading blocs or from the broader regional groups, given the overlap in membership.

Gould (1998) finds that NAFTA had an effect on U.S.-Mexico trade, but no effect on U.S.-Canada or Canada-Mexico trade. Gould reports that both U.S. imports from Mexico and U.S. exports to Mexico were, on average, about 16 percent higher for each year during the 1994-1996 period than they would have been without NAFTA. Gould reports the cumulative impact of NAFTA during this period to be $20.5 billion in U.S. imports, and $21.3 billion in exports. In contrast to these two studies, Krueger (1999) finds no evidence that NAFTA had any significant effects on North American trade.

In a new application of the gravity model to the analysis of preferential trade arrangements, Adams et al. (2003) extensively review existing gravity model studies of such agreements as well as undertake new analysis of sixteen bilateral and plurilateral agreements over the period 1970-1997. This analysis takes account of many econometric issues associated with gravity modeling, such as variation across industries and across the provisions of different trade agreements, controlling for a wide variety of distance measures, and carefully handling the large number of observations with zero trade.

Adams et al. find that the model they estimate attributes net trade diversion to twelve of the sixteen agreements under study. Both previous literature and their own model associate net trade diversion with NAFTA, while their model associates net trade creation with the U.S.-Israel Free Trade Agreement, which had not been previously analyzed using this technique. In a separate analysis of the investment provisions of preferential trade agreements, Adams et al. find that such provisions were associated with larger stocks of direct investment between NAFTA and the rest of the world (both inward and outward), but smaller intra-NAFTA investment stocks.

More recent studies attempt to use more direct measures of the agreements to assess the impact on trade. Clausing (2001) was the first to exploit the variation in tariffs at the detailed commodity level in an attempt to better isolate the trade effects of the U.S.-Canada FTA . Clausing finds that the U.S.-Canada FTA had significant effects on trade between Canada and the United States over the 1989-1994 period. Clausing's regression results indicate that U.S. imports from Canada were 26 percent higher owing to the agreement. Clausing estimates that over half (54 percent) of the $42-billion increase in U.S. imports from Canada is attributable to the agreement. In another study, Romalis (2001) uses a methodology similar to Clausing's to examine the impact of NAFTA on North American trade. Romalis calculates the tariff preference owing to NAFTA for one year and examined its impact across industries, finding that NAFTA had a substantial effect on North American trade. Romalis reports that the estimated effect of an additional 1-percent preference is a 0.23- to 0.28-percentage point increase in Canada's share of U.S. imports. Similarly, an additional 1-percent preference is associated with a 0.18- to 0.28-percentage point increase in Mexico's share of U.S. imports. In a third study, Agama and McDaniel (2002) extend the work done by Romalis to capture the time-varying effects of the tariff preference and find that, on average, an additional 1-percent preference corresponds to a 11.2- to 16.5-percent increase in U.S. import demand for Mexican goods over the 1989 to 2001 period. During the NAFTA period, an additional 1-percent preference corresponds to a 3.8- to 4.4-percent increase in U.S. import demand for Mexican goods. On the export side, the authors find that a 1-percent increase in the NAFTA tariff preference corresponds to about a 5.1- to 6.7-percent increase in Mexico's demand for U.S. goods.

There is a consensus in the literature that trade agreements have the potential to increase trade among member countries. However, questions initially raised by Viner (1950) and Meade (1955) remain about the extent to which these trade agreements are net trade creating or net trade diverting.[70] Viner and Meade argue that preferential trading arrangements[71] can either enhance or reduce welfare, depending on the relative magnitudes of the trade

[70] Trade agreements increase trade within the trading bloc as low-cost member countries displace high-cost domestic producers (trade creation), and divert trade away from non-member countries outside the bloc as member countries reorient trade away from low-cost, nonmember countries towards higher-cost member countries (trade diversion).

[71] Unless otherwise indicated, the terms "preferential trading arrangement" and "regional trading arrangement" will be used interchangeably.

creation and trade diversion effects. Some economists, such as Krueger (1999) and Burfisher et al. (2001) argue that although this distinction has been modified and amended in a number of ways, the original Viner and Meade conclusion that preferential trading arrangements can enhance or reduce welfare remains. Therefore, the issue of the net effect of preferential trading arrangements on welfare is an empirical one. Other economists, such as Wall (2003), argued that integration affects trade in numerous ways, and few studies fit into the simple Vinerian dichotomy between trade creation and trade diversion.

One significant non-Vinerian way for integration to affect trade is through increasing returns to scale. If economies of scale can be realized, they offer individual firms an opportunity to achieve greater international competitiveness.[72] This issue has been explored in the previous section on simulation modeling in the context of the Cox and Harris estimates of the effects of the U.S.-Canada FTA. The issue, which will be discussed further in the section on productivity, is whether significant gains from scale as a result of trade liberalization can be inferred using estimates of scale effects that are reasonable as opposed to implausibly large.

Most ex ante studies using simulation methods maintain the orthodox assumptions underlying the pure theory of international trade, including the assumptions of perfect competition and production and consumption of homogeneous traded goods. A large number of ex post studies use the gravity model to determine the impact of a specific trading agreement on trade. Gravity models are less restrictive than CGE models in that they do not require strong explicit assumptions about the structure of the economy in order to provide results. Burfisher et al. (2001) argue that although gravity models do not incorporate the features of many trade theory models, they provide an empirical way to control for income changes and other macroeconomic shocks.

In its original form, the gravity equation relates the value of bilateral trade flows to national income and distance. Researchers have commonly extended the gravity model beyond its original form in an ad-hoc fashion.[73] Dummy variables (binary variables indicating, in this case, the existence of a trade agreement) have typically been used to measure the impact of a trading agreement on trade. Examples of gravity studies include Rose (2000), Feenstra, Markusen and Rose (2001) and Frankel and Rose (2002). These studies included new variables such as common colonial ties, common colonizer, remoteness, landlocked condition, and land area in their models, as well as a single dummy variable to control for trade within any regional trading arrangement instead of a set of dummy variables, as in earlier studies. Despite the lack of agreement among researchers about which additional variables

[72] See DeRosa (1998).

[73] Most authors include additional variables to control for differences in geographic factors, colonial ties, exchange rate volatility and trade policy.

should be included in the extended gravity model, the general consensus is that members of a common trading arrangement tend to trade more with each other than they would otherwise. However, unless additional structure is imposed either in the estimation or in the interpretation of the results, this finding cannot for many studies readily be interpreted as a confirmation or falsification of Vinerian hypotheses about trade creation and trade diversion. This consensus among empirical researchers has recently been questioned by Ghosh and Yamarik (2003, forthcoming) who used extreme bounds analysis[74] to test the robustness of the hypothesis that regional trading arrangements are trade creating and find that the trade-creation effect of most of these arrangements is fragile.

A few studies examine the effect of the U.S.-Canada FTA on bilateral trade. For example, Trefler (2001) uses an econometric framework to assess the impact of tariff cuts under the agreement on Canadian imports of manufactured goods from the United States as a share of Canadian output. Trefler find that the U.S.-Canada FTA tariff cuts were a statistically significant determinant of these import shares. According to Trefler, the tariff cuts explain most of the large shift in import shares experienced by the most impacted industries. For example, the ratio of imports to output increased by 72 percent for the most affected industries, and this number was very close to the 67 percent attributed to the FTA.

Other studies examine the impact of NAFTA on North American trade. As noted, most of these studies use the gravity model to measure the impact of NAFTA. Gould (1998) uses the gravity model to examine the impact of NAFTA on the growth of North American trade over 1980-1996, and concluded that NAFTA had an effect on U.S.-Mexico trade, but had no effect on U.S.-Canada or on Canada-Mexico trade. Gould compared his model predictions of bilateral trade flows to actual bilateral flows over this period, and concluded that both U.S. imports from Mexico and U.S. exports to Mexico

[74] The traditional econometric approach to the specification problem is to apply certain criteria tests such as correct signs, significant t-values and high R-squares to search for the "best" specification. This approach encourages selective reporting from a large set of estimated models. The extreme bounds analysis of Leamer (1982), and Leamer and Leonard (1983) avoids the selective reporting bias of the traditional approach by explicitly incorporating prior information and following a systematic approach to testing the robustness of coefficient values. Utilizing this approach, Ghosh and Yamarik (2003, forthcoming) summarize the previous gravity model literature into two priors–trade creation and trade creation and diversion. For each prior, the k-regressors are divided into two categories: "free" variables and "doubtful" variables. The free variables were always included in previous studies, whereas the doubtful variables were not always included. An application of extreme- bounds analysis yields the minimum and maximum values for the coefficient of each free variable when all possible combinations of the doubtful variables are considered.

were on average about 16 percent higher each year during 1994-1996 due to NAFTA. This translated into a cumulative NAFTA impact of $20.5 billion in imports, and $21.3 billion in exports over this time period.

Krueger (1999) uses a gravity model to study North American trade patterns. She analyzes data for 61 countries over 6 years, comprising every other year over the 1987-1997 period, but finds little evidence that NAFTA had any significant effect on North American trade at the aggregate level. Krueger also uses "shift-and-share" analysis to examine North American trade at the SITC 1-digit level and reports large increases in Mexican exports of particular categories of goods, most notably machinery and equipment. Krueger finds that in instances where Mexico's share of the U.S. market increased dramatically, Mexico's share of third country markets also increased. She offers a number of explanations for this result. One is that NAFTA was primarily trade creating and not trade diverting. An alternative is that the exchange rate change in 1995 was probably a more important factor than NAFTA in explaining the increases in trade in individual commodity groups. Krueger concluded that other events, especially those affecting trade through the real exchange rate and Mexico's other trade liberalization such as the Uruguay Round, appear to have dominated whatever effects NAFTA may have had on trade patterns over this time period.

Burfisher et al. (2001) examine changes in bilateral trade data for three sectors–agriculture, autos, and textiles–to determine the impact of NAFTA. The authors reported that between 1993 and 1998, U.S. agricultural exports to NAFTA partners increased by an annual average rate of 9.5 percent compared to a 2.8-percent annual increase to non-NAFTA partners. U.S. agricultural imports from NAFTA countries increased by an average of 13.8 percent annually compared to a 7.7-percent annual increase from non-NAFTA countries. The study found evidence of increased integration in the North American auto industry since NAFTA went into effect. The data showed that U.S. auto imports from Mexico more than doubled between 1993 and 1998, and U.S. auto exports to Mexico increased 14-fold, albeit from a low base, during this period.

The authors report that since NAFTA, U.S. imports of textiles and apparel from Mexico have risen, while imports from East Asia have declined. U.S. textiles export shares to Mexico rose from 13.4 percent in 1993 to 31.0 percent in 1999, but U.S. textiles export shares to East Asia fell from 14.5 percent to 10.3 percent during this period. The results were similar for apparel trade. U.S. apparel import shares from Mexico increased from 4.0 percent in 1993 to 13.5 percent in 1999, whereas U.S. apparel import shares from East Asia declined from 70.7 percent in 1993 to 55.4 percent in 1999. U.S. apparel export shares rose from 17.5 percent in 1993 to 31.6 percent in 1999. Other industry studies, such as Wylie and Wylie (1996), found that while there is some trade diversion, the increase in NAFTA trade is dominated by trade creation.

Soloaga and Winters (2001) use the gravity model to study preferential trading arrangements and found no evidence of trade diversion for NAFTA.

Coughlin and Wall (2000) use the gravity model to analyze how NAFTA has changed the pattern of exports of U.S. states to foreign geographic destinations. Wall (2003) uses the gravity model to examine how NAFTA has changed the regional pattern of North American trade and finds significant differences across countries and regions.

There are a number of ex post empirical studies on preferential trading arrangements that used alternative methods to the gravity model to capture the trade effects of specific agreements. For example, the USITC NAFTA study (1997) uses import demand and export demand functions to estimate the effects of the NAFTA on U.S. trade with Canada and Mexico using an error-correction model and monthly data from January 1989 to October 1996 at the 4-digit SIC level. Trade flows are assumed to be functions of prices of traded goods and domestic substitutes, income in the importing country, and, in the case of U.S. exports for which the two prices are denominated in different currencies, exchange rates. The effect of NAFTA is identified using dummy variables for 1994, 1995, and 1996. A trade flow at the 4-digit SIC sector is identified as having a NAFTA-induced increase or decrease in trade if the dummy variables were of the same sign and statistically significant for all 3 years.

Using this methodology, the USITC NAFTA study (1997) finds that NAFTA had a significant effect on the level of U.S. trade with Mexico, but finds no significant additional effects of the agreement on U.S. aggregate trade with Canada during this period. As a result of NAFTA, the volume of U.S. imports from Mexico is estimated to have increased by 1.0 percent in 1994, 5.7 percent in 1995, and 6.4 percent in 1996. On the export side, the study estimates that, as a result of NAFTA, the volume of U.S. exports to Mexico was higher by 1.3 percent in 1994, by 3.8 percent in 1995, and by 3.2 percent in 1996. Further, the USITC states that NAFTA resulted in significant changes in the volume of bilateral trade for a modest number of industries. With respect to U.S.-Mexico trade, the study attributes significant growth in U.S. exports to Mexico in 13 industries to the agreement, but finds no industries showing decreased exports to Mexico due to NAFTA during this period. On the import side, the USITC attributes significant growth in U.S. imports from Mexico in 16 industries to NAFTA, and reportes significant declines in 7 industries because of the agreement. With respect to U.S.-Canada trade, the USITC finds that U.S. exports to Canada increased significantly because of NAFTA in 10 industries and declined significantly in 8 industries. Similarly, the USITC finds that U.S. imports from Canada increased significantly in 13 industries due to NAFTA, and declined significantly in 8 industries.

Romalis (2001) uses a methodology similar to Clausing (2001) to examine the impact of NAFTA on North American trade. He uses a conceptual framework to develop reduced-form equations in which the shares of U.S. imports of commodities from Canada and Mexico are dependent on the tariff preferences the U.S. affords to Canada and Mexico under NAFTA. Romalis calculates the tariff preference afforded to NAFTA partners and examines its impact across industries. He concludes that NAFTA had a substantial effect on

North American trade. However, Romalis finds no evidence of trade creation and concluded that NAFTA has been primarily trade diverting.

Conclusion

Ex post studies of U.S. trade performance in the "fast-track" period have focused on NAFTA, due to considerations of data availability. These estimates have demonstrated that the NAFTA liberalizations have increased U.S.-Mexico trade in both directions. While earlier studies had some difficulties identifying these increases at all, improved methodologies and a longer post-NAFTA time period have enabled them to be identified with increasing precision, associating them with particular products that have now experienced especially deep NAFTA tariff cuts

Effects on Growth and Productivity

For several decades now, researchers have investigated whether more open trade has dynamic effects on a country's economy. Does freer trade cause a country to grow faster? If so, exactly how does this happen? Many empirical studies have posited that freer trade increases a country's growth rate by raising the productivity of a country's labor and capital (total factor productivity or TFP). The channels through which this could occur include: exposure to increased competition in the global market; access to new technology via trade in information or imitation of new products; and increased foreign direct investment (FDI) that may bring new technology.

Researchers testing the relationship between trade and growth most often examine cross-country evidence. They test whether or not countries with relatively open trade policies, such as the United States, have grown faster than countries with relatively restrictive trade policies. When a time dimension is added, they are able to test whether changes in trade policies across countries have affected growth rates. Research covering groups of developing countries helps us understand whether or not multilateral trade liberalization raises growth in foreign countries, thus increasing the market for U.S. exports.

Much empirical research has been devoted to testing for evidence of the effect of trade openness on GDP growth, via its effect on total factor productivity. Using country-level data, researchers have found a large amount of evidence that more open economies do grow faster. Although this work is limited by imperfect measures of trade openness, as well as lack of precision in modeling links between trade policy and growth, progress on both of these problems has been made. Recent work shows that the positive effects of trade openness on growth are evident for the United States and other industrial countries, as well as for developing countries. These results hold for different time periods, and for many different measures of trade openness. New evidence also suggests that the links between trade openness and growth may be indirect, with trade liberalization inducing more investment, and thereby more growth.

Researchers have also looked at firm-level data to see if there is any evidence that trade liberalization has increased productivity at the microeconomic level. For example, if increased exposure to global competition makes firms more efficient, we might expect to see firms that produce export- or import-competing goods exhibiting higher productivity than firms producing nontraded goods. In addition, we might expect that less competitive exporting and import-competing firms would either become more efficient or drop out of the market, as a result of being exposed to trade. Remaining firms would also be likely to price more competitively, since monopoly power would be eroded by new foreign competition. With greater access to foreign markets, firms might be able to take advantage of economies of scale, or might access imported intermediate inputs more cheaply. Both of these factors would lower firms' production costs. Finally, sectors with relatively high levels of FDI might show relatively high productivity, due to technological spillovers from the foreign firms. One of the most important limitations of this work has been lack of data to accurately measure firm productivity. Another difficulty has been the explicit accounting for entry and exit of firms when testing the effects of trade liberalization on productivity.

Researchers studying trade and productivity most often examine evidence across industries within a single country. Many recent studies have examined U.S. firms in detail. Similar studies for other industrial countries can corroborate the strength of the results for the United States. Studies of other industrial and developing countries can suggest whether or not multilateral trade liberalization has increased the efficiency of industries globally, contributing to higher incomes and expanding markets worldwide.

Evidence from the United States, other industrial countries, and developing countries thus far suggests that exporting firms are more productive than nonexporting firms, and that more productive firms self-select to export. Exporting itself may not increase productivity beyond the first year. In contrast, import-competing industries do appear to experience increased productivity after trade liberalization. Much of this increase occurs because resources shift from less to more efficient firms. Some evidence suggests that exposure to competition does reduce mark-ups in import-competing industries, and possibly encourages more efficient scales of production. FDI may raise firm level productivity, at least among the partners in joint ventures. Though the presence of foreign firms may be associated with decreased productivity in domestic-owned firms within the same industry, they could generate positive spillovers for upstream local suppliers.

Trade Liberalization and GDP Growth

The relative openness of industrial countries like the United States, compared to developing countries, and the vast differences in standard of living between industrial and developing countries spurred initial empirical work on possible links between trade and growth. Edwards (1993) surveys a large number of these studies and finds evidence that, across developing countries, freer trade is associated with more rapid growth. However, there were no comprehensive aggregate measures of a country's trade restrictiveness at the time of the Edwards study.

The most popular proxy– the ratio of exports to GDP (or total trade to GDP)–does not necessarily reflect changes in a country's trade policy. In addition, higher rates of GDP growth might cause high export-to-GDP ratios and vice versa, introducing bias into the estimation procedure. Though the researchers suggest several ways in which trade openness could affect growth, they do not test these links in their analyses. Edwards concludes that the two most important areas for future research are in developing better measures of openness directly linked to policy variables, and better models of the channels through which trade liberalization could affect growth.

Direct links between unilateral liberalization and growth

The USITC dynamic effects study (1997) reviews a large body of work from the 1990s that tested for a direct relationship between unilateral trade liberalization and growth. This research analyzes average annual growth across large numbers of countries between 1960-1990 or a time period within that span. The sample of countries examined have a wide variation of income levels, though most often they included only developing countries. All of these studies made attempts to address the issues of measurement and model specification. Some studies developed single composite indices that reflected overall trade policy (e.g., Dollar (1992) and Sachs and Warner (1995)). Others use multiple indicators of trade openness (e.g., average tariff rates, coverage of non-tariff barriers, the black market premium on the exchange rate) to test whether or not their results are influenced by the choice of openness measure (e.g. Edwards (1992) and Harrison (1996)). Virtually all of these studies find evidence that openness positively affected average annual growth rates, although the strength of these results depends on the measure of trade openness used. Often only a few measures of openness appear to be strongly related to growth.

Harrison's 1996 study is particularly noteworthy because it demonstrates the serious weaknesses arising from ignoring time series data. Previous studies had measured the openness of a country in the initial year of study. A researcher studying growth between 1960 and 1990, for example, would use a measure of openness calculated for 1960. But clearly many countries in the sample liberalized trade during the long time period under examination. In addition, the Kennedy and Tokyo Rounds occurred during that period, as well as a number of preferential or regional trade agreements. Thus, one would not be surprised if the openness of a country in 1960 was not related to its growth during the following 30 years. Harrison uses data across countries and over time, capturing changes in trade policy during this time period. Harrision's results show that a much larger number of openness measures had positive, significant effects on growth than previous studies suggested.

Edwards' 1992 study demonstrates the importance of modeling links between trade liberalization and growth. Edwards posits that a country's growth was dependent on local innovation and the rate at which the world's knowledge was growing. Local innovation would depend in part on the stock of knowledge and human capital already available in the country. Countries with very low initial stocks of knowledge would experience larger benefits from the "catch-up factor," access to world knowledge. More open countries would have more access to new ideas from the rest of the world. However, it is likely that a more educated work force would increase a country's ability to absorb these new ideas. Thus, Edwards suggests TFP growth would be influenced by initial GDP per capita, openness, and human capital. He finds evidence that these three effects were indeed significant in explaining the dispersion of growth across countries.

The 1997 USITC study concludes that the evidence regarding links between trade openness and growth is mixed. This conclusion is largely based on the fact that no good single measure of openness exists, and that many of the trade openness indicators used by researchers are not necessarily correlated with each other (Pritchett (1996) and Lee and Swagel (1997)). Because it is not clear a priori which indicators better capture the overall restrictiveness of a country's trade policy, different measures could yield very different conclusions. The studies by Edwards and Harrison are thus important in that they test the sensitivity of their results by using many different indicators of trade openness. In each case they find multiple indicators that are positively associated with growth. However, the debate on measuring openness has not been resolved.

Rodriguez and Rodrik (1999) sharply criticize the trade and growth evidence, due chiefly to the shortcomings of the trade policy measures, although they also criticize model specification. They emphasize that poor measurement of trade openness could pick up the effects of other variables, wrongly attributing them to trade policy. In addition, correlations between trade policy variables and other omitted macroeconomic policies could bias the estimates of the effects of trade policy itself. A notable example is the black market premium on foreign exchange, which Rodriguez and Rodrik show is the key component of measures like the Sachs-Warner[75] openness index. Rodriguez and Rodrik dismiss the black market premium as consistent with a number of different macroeconomic policies and unlikely to accurately reflect trade policy itself. Yet there is much evidence that the black market premium reflects distortions from foreign exchange licensing, which is often directly and purposely linked to quotas and other nontariff barriers to trade. It is not clear

[75] The Sachs-Warner index is a dummy variable indicating whether a given economy is considered to be "open" or "closed" in a given year. See Sachs and Warner (1995).

that this critique can really dismiss all evidence based on poor measurement, particularly in regressions using data with time series observations on trade policy and a wide variety of measures of trade policy.

The most recent studies have examined evidence from both industrial and developing countries for evidence of a link between trade openness and growth. Edwards (1998) estimates growth over two time periods, 1960-1990, and 1980-1990, using panel data for 93 countries, including the United States and 21 other industrial countries. From this Edwards calculates 10-year averages of TFP growth for each country. Using the model from his 1992 study, Edwards estimates the effects of trade openness on TFP growth itself, with 9 alternative measures of openness or restrictiveness. Edwards finds that openness is positively and significantly related to growth. A 1-percent decrease in the average import tariff, for example, raises TFP growth by 0.05 percent to 0.11 percent. This significant positive relationship is robust to the use of several of the other eight openness measures. There is also strong evidence for a "catch-up" effect. Finally, human capital is also strongly significant and more important in magnitude than openness for explaining total factor productivity growth. Interestingly, Edwards finds evidence that enforcement of property rights is an important factor in explaining this growth, whereas estimates of other political or macro variables are not.

Greenaway et al. (1998) investigate growth in 69 countries, including the United States and 21 other industrial countries, over the period 1975-1993. They limit their empirical testing to three composite measures of openness/trade liberalization, but each of these was based on multiple indicators, such as nontariff barrier coverage, import tariffs (mean and dispersion), black market premium, commitment to trade policy reform, existence or absence of state monopolies in the export sector, and whether or not the country is socialist. These indices are used to capture both the immediate effect of trade reform and its average effect during the post-reform period. The authors also add three new insights with respect to model specification. First, in an attempt to capture the dynamic links between trade openness and TFP growth, the authors specify a per capita GDP growth function that includes investment, human capital, and population growth. Second, they allow trade reform to have lagged effects. Third, they correct for second-order serial correlation. Results for all three measures show a significant positive relationship between freer trade and growth.

Greenaway et al. find that in any given year, a 1-percentage-point increase in the trade openness measure raised per capita GDP growth by 0.005 percent to 0.01 percent in that year, by 0.004 percent to 0.02 percent in the next year, and by 0.002 percent to 0.02 percent two years later. All three measures suggest that the largest effects occur one or two periods after initial liberalization. Results also suggest that the impact of a specific trade liberalization on growth is smaller than the impact of a country's openness over time.

Frankel and Romer (1999) investigate the relationship between the volume of trade (trade share) and income levels, rather than trade liberalization and growth. Because of the difficulty of measuring trade openness accurately, the authors propose measuring the geographic component of trade shares. The authors use a gravity model to explain the trade share, which was calculated as exports plus imports as a share of GDP. The authors also use distance and the sizes of trade partners, measured by population and area, as explanatory variables. This yields a geographic component of trade shares–a factor that is not endogenous or correlated with macroeconomic variables. They then test whether geographic trade share and trading partner size could explain the dispersion of income levels across 150 countries, including the United States and about 28 other industrial countries, in 1985. The authors find that the geographic component of trade share has a large, positive and marginally significant effect on income level. They note that the geographic component is only one component of the effects of trade on growth; hence it is likely to understate the effect of openness on income levels. The authors also decompose income growth (1960-1985), and find a large and marginally significant effect of the geographic component of trade share on per capita income growth. A one-percentage point increase in the trade share raises per capita income growth by about 1.3 percent.

Indirect links between unilateral and multilateral liberalization, investment, and growth

In a sensitivity analysis of cross-country growth regressions, Levine and Renelt (1992) find that the link between trade openness and growth was not robust to changes in measures of openness, nor to the inclusion of varying sets of explanatory variables. Instead, they find that freer trade strongly increased investment, and that higher investment strongly increased growth. These results were robust, and suggest an indirect link between trade liberalization and growth via investment.

Recent papers by Baldwin and Seghezza (1996a, 1996b, 1997, 1998) place greater emphasis on the indirect link between freer trade, investment, and growth. They argue that freer trade may increase the return to capital, generating trade-induced, investment-led growth through such channels as reductions in the cost of imported intermediates; increased demand for investment goods (assuming tradables are relatively capital-intensive compared to non-tradables); and the competitive effects of investment goods, other tradable goods, and/or the financial sector.

Baldwin and Seghezza (1996b) test the impact of trade liberalization on average annual growth in the United States and 38 other industrial countries between 1960 and 1989. In a significant departure from previous studies, they posit that trade openness directly affects the rate of physical capital accumulation, thereby indirectly affecting growth. To capture this link, the authors use a two-equation simultaneous model of growth and investment, and weighted average ad valorem import charges to measure trade restrictions.

Results suggest that reductions in trade barriers at home and abroad generat higher rates of investment, with reductions in the home-country trade barriers having a larger impact than reductions in trade barriers abroad. Baldwin and Seghezza's main finding is that a 1-percent drop in home country trade-weighted import charges raises investment by about 1 percent, while a 1-percent drop in the foreign country's barrier against the home country raises investment by about 0.82 percent. A 1-percent increase in investment raised GDP growth by about 0.24 percent. However, there was little evidence of a significant direct link between trade liberalization and growth. These results held for some of the alternative openness measures used.

Wacziarg (2001) analyzes growth in 57 countries, including the United States and 20 other OECD countries, between 1970 and 1989. The author develops a model in which trade policy affects growth indirectly. However, he includes six channels through which this might occur–incentives for better macroeconomic policy (maintaining stability); impact on government size; lower degree of price distortion; higher rates of investment in physical and human capital; increased exposure to new technology; and technology transmission through FDI. To avoid the many problems with measuring trade openness, Wacziarg estimates the trade policy component of the trade share. Somewhat analogous to Frankel and Romer, the author estimates the influence of trade policy variables (tariffs and nontariff barriers) on trade share, as well as the influence of factor endowments and geographic variables. The estimated coefficients on the policy variables were used as weights to construct an index reflecting the net impact of trade policy on trade share. Like Baldwin and Seghezza, Wacziarg estimates these effects simultaneously, using an eight-equation system. Wacziarg's results show that an 8.5-percent increase in the trade policy measure (equivalent to one standard deviation) is associated with a 0.61-percent increase in the annual growth rate. Among the eight channels through which this occurred, investment was the most important (63 percent of the total effect), followed by technology transmission (23 percent).

Several studies explicitly examine the role of FDI in influencing aggregate growth. The USITC dynamic effects study (1997) examines a number of these studies, which are again based on cross-country analysis using large groups of developing countries. These studies find evidence that increased FDI contributes to higher aggregate growth, but that the ability of a country to absorb these benefits depends upon its own policies and/or characteristics. Balasubramanyam et al. (1996), for example, found that the impact of FDI on growth was stronger for countries with relatively export-promoting policies. Borensztein et al. (1998) argue that FDI may have a more significant effect on growth than domestic investment, but this effect only holds if a country has a minimum amount of human capital available. USITC (1997) also discusses evidence suggesting that multinational firms do transfer technology and may generate at least some positive spillovers in the host country.

Trade Liberalization and Productivity

A number of studies of productivity utilize longitudinal micro-level datasets, i.e., data which follow the performance of particular firms over time. In particular, the U.S. Bureau of the Census' Longitudinal Research Database (LRD) is widely used in studies of U.S. firms. In their 2000 survey, Bartelsman and Doms (2000) review many of these studies in the course of examining the literature on manufacturing productivity in industrial countries. The LRD is a large dataset containing information on U.S. manufacturing plants over time. From the descriptive statistics, Bartelsman and Doms conclude that the amount of productivity dispersion across U.S. industries is very large, and is persistent over time; a large proportion of productivity growth is due to exit and entry (resource reallocation); and highly productive firms today are more likely to be productive in the future. They also observe that regulation that inhibits resource reallocation can be detrimental to productivity growth, that productivity of an establishment is related to the productivity of the firm that owns it, and that the choice of technology across establishments is correlated with the level of human capital in the establishments.

Bartelsman and Doms emphasize that it is easier to identify such stylized facts in the micro-level data than to isolate econometrically the effects of potential underlying determinants of productivity changes such as international exposure, domestic regulation, ownership structure, managerial quality, technology choice, and human capital, and that much observed variation in individual firms' productivity performance remains unexplained.

Global competition and the productivity of exporting and import-competing firms

If increased exposure to global competition makes firms more efficient, one might expect to see exporters and import-competing firms exhibiting higher productivity than firms producing for the domestic market only. Examining the U.S. Census LRD, Bernard and Jensen (1995) find a strong correlation between exporting and productivity. In their 1999 study, Bernard and Jensen find that U.S. exporting firms are 50 percent to 60 percent larger and 7 percent to 22 percent more capital-intensive than firms producing for the domestic market only. U.S. exporting firms also had 12-percent to14-percent higher labor productivity, and pay 9-percent to 18-percent higher wages than nonexporting firms. The question was whether exporting itself raises firm productivity, or whether more productive firms choose to be exporters.

Using data for more than 50,000 plants per year for 1984, 1987, and 1992, Bernard and Jensen calculate the differential between U.S. exporters and U.S. nonexporters with respect to wages, employment, TFP, and a number of other factors. They attempt to determine whether exporter status helps explain these differentials. Their results suggest that more productive firms self-select to be exporters, and that future exporters already have desirable performance characteristics several years prior to entering the export market. In fact, future exporters grow faster in the years prior to entering the export market than future nonexporters do. Exporting appears to raise growth rates in the initial year, but seem to have little effect on growth rates after that.

Tybout (2000) summarizes evidence found in developing country studies, which by far accounted for the largest share of the literature on this subject to date. He concludes that exporting firms do have higher productivity than nonexporting firms, but again due to self-selection, with the more productive firms selecting to export. The efficiency gap between exporting and nonexporting firms does not seem to grow over time, suggesting that little improvement occurs once already efficient firms have begun to export. However, the gap grew in some firms in some industries, so longer term effects cannot be ruled out. Recent work by Aw et al. (2000) suggests that productivity is a critical factor in Taiwan firms' decision to export, and that in some cases Taiwan firms' productivity did increase after entering the export market. However Aw, et al. found little evidence of these effects for Korean firms. Delgado, et al. (2002) argue that self-selection is the main determinant behind relatively high productivity among Spanish exporting firms.

A recent study of United Kingdom manufacturing firms also provided evidence that exporting firms are generally more productive than nonexporting firms, and that these firms self-select–i.e., firms that are more productive choose to enter the export market (Girma, Greenaway, and Kneller (2002)). However, in contrast to earlier studies, Girma et al. try to compare the performance of exporting firms to nonexporters with similar characteristics (size, wage levels, and initial productivity level). Their results show that exporting firms tend to have higher productivity than nonexporters, not only in the first year of exporting, but also in the second year. Thus, exporting appears to increase productivity growth. They also find that the degree to which exporting affects productivity growth in the initial year depends upon the export-intensity of the firm.

One serious difficulty in all of these studies is measurement of productivity. Bartelsman and Doms (2000) point out that researchers usually measure the change in the value of a firm's output, deflated by an industry price index. If quality improvements have taken place that are not reflected in the price deflator, this will bias downward the estimate of firm productivity. In addition, if there is imperfect competition in an industry and differentiated products, prices may differ across firms. Assuming a single price deflator for an industry will incorrectly assign higher productivity to firms with higher-than-average prices. Finally, if firms' choices of inputs today are affected by their expectations of productivity in the future, some of the impact of productivity change will not be picked up by standard TFP calculations.

Several recent studies have taken up these issues. The USITC's dynamic effects study (1997) reviews Harrison's 1994 study, in which the measure of productivity is revised to allow for market power and scale economies. This correction leads to stronger effects of trade liberalization on productivity than are obtained without it. Katayama et al. (2002) provide evidence that standard measures of plant productivity growth are biased downward owing to product differentiation and differences in firm mark-ups. As a result, these measures tend to underestimate the productivity of exporting firms.

Pavcnik (2002) provides evidence (from Chilean firms) that the endogeneity between a firm's choice of inputs and its expectations of future productivity creates a large downward bias in the measurement of firm productivity. Pavcnik also notes that plant closings can be a problem. Firms that are relatively more productive today are less likely to shut down. If plant profitability is at all correlated with investment in capital, this will introduce a bias in the calculation of firm productivity growth. Pavcnik finds evidence of significant bias when the correlation problem is not corrected.

Another serious difficulty is export market entry and exit. As Bernard and Jensen (1999) note, a large amount of entry into and exit out of the export market occurs in any given year within U.S. manufacturing. New entrants experience the fastest growth in employment, wages, TFP, shipments, value added, and other indicators, followed by incumbent exporters (those who have remained in the market for at least one year). Exiting exporters show slower growth on all indicators. Yet in Bernard and Jensen's analysis, the determinants of entry and exit are not accounted for when testing for a relationship between exporting and productivity. If exiting firms are indeed less productive than those that continue to export, a bias can be introduced in the estimated effect of exporting on productivity.

The USITC dynamic effects study (1997) presents a detailed discussion of studies examining the performance of import-competing firms for the United States, other industrial countries, and developing countries. Two studies using U.S. firm-level data and several different measures find that increased import competition raises an industry's efficiency, once industry concentration was taken into account. Caves and Barton (1990) found that a one standard deviation increase in import competition (a 10-percent increase in imports) increase an industry's efficiency by 0.05 standard deviations. For highly concentrated industries, MacDonald (1994) finds that a 5-percent increase in import share over three years was associated with a 3.7-percent increase in annual labor productivity growth over the next three years. In addition, an industry-level study using U.S. data from 1958-1984 shows evidence that freer trade might cause a short-run drop in productivity, but a long-run increase (Harrison and Revenga (1995)).

Many of the developing country studies described in the USITC dynamic effects study (1997) also show evidence that increased import competition raises productivity in import-competing firms. Harrison (1994), for example, finds that firms in Côte d'Ivoire had higher levels of productivity after trade reform, and that low-protection sectors showed higher productivity increases than high-protection sectors. Tybout (2000) also cites evidence that protected industries show higher productivity dispersion than nonprotected industries.

Pavcnik (2002) also discusses the question of productivity of import-competing firms in a developing-country context. Pavcnik classified

Chilean firms as net exporters or net importers and allowed for different responses to trade liberalization between the two groups and finds strong evidence that there were significant plant closings after Chile's major trade liberalization (1979-1986), and that a much larger proportion of these took place in import-competing sectors than export sectors. Thus, much of the adjustment to trade liberalization was experienced in the form of plant exit. She finds strong evidence that aggregate industry productivity increased in six out of eight sectors, growing the most in import-competing sectors, and the least in non-traded goods sectors, and suggesting that exposure to global competition does increase efficiency in import-competing sectors.

Trefler examines the impact of the U.S.-Canada FTA on Canadian firms. Using data on more than 1,000 plants, Trefler examines labor productivity, TFP, and many other variables before (1980-1986) and after (1988-1996) the implementation of the FTA. One of the important innovations in this study was that it directly examined the impact of the changes in tariffs at the industry level, on the firms in that industry. This focus allows Trefler to see whether or not the size of the tariff cut influences the industry's performance. For industries subject to large tariff cuts, Trefler finds that employment, output, and the number of plants fell in the short run. However, these same industries experienced very large productivity growth over the longer term.

Head and Ries (1999) address the question of potential rationalization of Canadian industry as a result of the U.S.-Canada FTA. In principle, exposure of domestic firms to a larger market was thought in the policy debate on the FTA to potentially generate substantial efficiency gains through domestic rationalization, with a smaller number of Canadian firms enjoying increased scale economies.

Head and Ries note that data on Canadian manufacturing seem to indicate the occurrence of post-FTA rationalization. In the 6 years following the agreement (1988-94), manufacturing output per plant grew significantly while the number of plants fell. Yet their tests suggest that the net effect of US-Canada FTA liberalization on scale economies was smaller than predicted prior to the agreement. While lower U.S. tariffs toward Canada enabled a 10-percent increase in output per plant for Canadian firms, lower output owing to lower Canadian tariffs tended to offset this effect almost entirely. The authors attribute the observed rise in aggregate output per plant to non-FTA effects, such as a shift in output toward high scale industries, undercounting of small plants in the data, and a depreciation of the Canadian dollar.

Trefler (2001), who measures short-run and long-run effects separately and finds long-run productivity gains for Canadian firms after implementation of the trade agreement, argues that a large part of these long run gains were a result of reallocation of resources from less efficient plants to more efficient plants. Pavcnik also finds that the increase in productivity experienced by Chilean industries following a period of liberalization (1979-1986) was largely due to reallocation of resources within industries, from less efficient plants to more efficient plants. These results taken together suggest that firm selection effects (entry and exit) play an important role in facilitating gains from trade liberalization, with scale economies of secondary importance, if any.

Using industry-level data, Benjamin and Ferrantino (2001) evaluate productivity growth in 13 OECD countries and 18 manufacturing sectors, with data from the 1980s. Within individual sectors, the authors find strong convergence effects within the OECD. Controlling for this convergence, they find evidence of a positive relationship between low tariffs and productivity growth, though none between import penetration and productivity growth. As in other studies, the authors find a positive association between high productivity growth and strong export performance.

Bernard et al. (1980) test whether or not aggregate industry productivity in U.S. manufacturing rises as trade costs (tariffs and transport costs) fall due to the closing of lower productivity nonexporting plants; entrance of more productive nonexporters into the export market; and increase in output of the more productive exporting firms. U.S. trade costs were measured for 5-year intervals from 1977-1996. Again using the Census LRD, the authors find that a 10-percent decline in trade costs is associated with a 1.5-percent increase in annual productivity growth rates. Declining trade costs do appear to increase the probability of plant closure and the probability of successful entry into exporting, though both of these results are only weakly significant. Low-productivity plants are the quickest to shut down, and highly productive plants that do not produce export products are the most likely to begin exporting. A 1-percent decline in trade costs also causes exporters to increase foreign sales by about 1 percent, though again this result is only weakly significant.

There are a number of limitations in this work, however, which suggest the need for more study. The authors' results show that only a very small part of TFP growth or labor productivity growth can be explained by changes in trade costs and some industry characteristic dummy variables. This suggests that there are omitted variables that explain a large part of the productivity variation across U.S. manufacturing plants. In estimating the probability of plant closure, the authors use plant labor productivity, exporter status, and change in trade costs as determinants. Yet their first test and a subsequent test reveals that these three variables influence each other, calling into question the reliability of the results. In addition, the questions of plant closure and of entry into the export market appear to call for some kind of duration model, since plant survival in the last period is contingent on plant survival in the first period, and only a plant that survives can become an exporter.

Reductions in price distortions and production costs

Trade liberalization means domestic firms face increased foreign competition, which makes it more difficult to maintain monopoly power in a market, and thus should result in lower price-cost margins, and expanded output–the "imports as discipline" hypothesis. In addition, access to the global market could lower production costs through economies of scale, or cheaper imported intermediate inputs. While the effect of freer trade on productivity via these channels is important for both industrial and developing countries, it is likely to be larger in countries with small domestic markets. Tybout notes that several studies provide evidence to support the imports-as-discipline hypothesis. For example, both Harrison (1994) and Levinson (1993) find evidence that the more highly protected firms had higher price-cost markups, and some evidence that these mark-ups fell with trade liberalization in Côte d'Ivoire and Turkey. Krishna and Mitra (1998), incorporating flexibility in returns to scale in their analysis, find strong evidence that India's 1991 liberalization reduced price-cost margins in a variety of Indian industries. Because explicit trade policy measures are not used in these studies, however, it is possible (as Tybout notes) that these results capture other effects, such as exchange rate appreciation, or reflect falling relative import prices rather than reductions in market power.

In a recent study, Kim (2000) tests for the impact of trade liberalization on productivity of Korean firms, via its effects on price-cost markups and scale efficiency. Using data on 36 manufacturing sectors, Kim calculates TFP for eight periods between 1966 and 1988. The author then estimates a modified form of the production function, which incorporates the possibility of imperfect competition and increasing returns to scale, as well as interactions between these characteristics and trade policy. In contrast to the earlier studies that used binary variables to represent post-liberalization periods, Kim uses three alternate measures of trade policy (tariffs, quota coverage, and the price gap between goods sold domestically and those sold internationally). Kim find strong evidence that Korean firms are imperfectly competitive, and display increasing returns to scale. Although tariffs appear to be unrelated to TFP growth, reductions in quota coverage and reductions in price gaps significantly increase TFP growth. In addition, reductions in quota coverage significantly reduce price-cost markups and increase scale efficiency.

FDI, technological spillovers, and firm productivity

Trade liberalization typically involves liberalization of FDI as well. Many have argued that sectors with relatively high levels of FDI might show relatively high productivity, due to technological spillovers from the foreign firms. Evidence from firm-level studies appears to be mixed. Doms and Jensen (1998) find that foreign-owned firms in the United States have 2.3-percent to 3.7-percent higher TFP than domestic-owned firms. When comparing foreign multinationals to U.S. multinationals, they find that U.S. multinational firms' domestic plants are the most productive, but that foreign-owned firms are more productive than U.S. domestic firms with no overseas assets. While this evidence supports the idea that firms that invest abroad have relatively higher productivity, it does not directly test for evidence of spillovers from these foreign firms to the domestic counterparts in the same sector.

Studies that examine industrial and developing country FDI in specific developing countries show evidence that FDI brings with it more efficient technology, but the evidence on diffusion is mixed. Haddad and Harrison (1993) find foreign-owned firms to be more productive than their domestic counterparts, and firms in industries with a relatively high multinational presence to be more productive than firms in other industries, in Mexico and Morocco. Aitken and Harrison (1999), using Venezuelan plant-level data, find that foreign equity participation is positively correlated with plant productivity, though only for small firms. However, higher multinational presence is associated with less productive domestic-owned firms. As Tybout and the authors note, this may be because the multinational firms bid up the cost of skilled workers and/or attract demand away from local competitors. The authors conclude that some of the positive association between productivity and multinational presence is due to the tendency for multinationals to invest in the relatively productive sectors, and that benefits from this investment do not spill over to domestic-owned firms, but are internal to the joint venture.

More recently, Smarzynska (2002) tests for FDI spillovers using Lithuanian firm-level data. As in Pavcnik, Smarzynska calculated TFP growth correcting for endogeneity between expectations of future productivity and the firm's choice of inputs today. Smarzynska introduces two innovations in the study. First, she looks for evidence of spillovers within the industry and at other points in the production process. Second, she investigates whether spillovers are both local and regional. She finds evidence that suggests the presence of spillovers between foreign affiliates and their domestic upstream suppliers, but no evidence of spillovers between firms in the same industry. Local firms appear to benefit from spillovers in their immediate region as well as from spillovers from other parts of the country. While type of foreign ownership appears unimportant, foreign firms producing for the local market appear to generate greater productivity benefits than those producing for export.

Conclusion

A wide variety of evidence now points to an association between trade liberalization and faster rates of economic growth, both in the United States and abroad. When research focuses on particular causes of economic growth, such as increased investment or accelerated productivity gains through technological change, evidence for the linkage between freer trade and more rapid growth Methodological improvements have diminished somewhat early skepticism about the robustness of the trade-growth connection.

In the case of productivity gains, many studies find that causation runs from productivity to exports rather than vice versa, so that firms which become more productive choose to export. There is also relatively strong evidence that exposure to trade causes industry output to shift from less-productive to more-productive firms, and some industry-level evidence for higher rates of productivity growth in industries exposed to import competition or trade policy liberalization. Evidence of direct links between trade liberalization and scale economies remains harder to identify.

Effects on Labor Outcomes

Over the last three decades, reductions in U.S. tariffs and increased trade volumes have coincided with growth in the gap between wages paid to skilled and unskilled workers in the United States. For example, the ratio of wages for nonproduction to production workers in the U.S. manufacturing industry increased 16 percent between 1977 and 2000 (figure 3-5 in the previous chapter).[76] In addition, between 1975 and 1999 the mean real earnings of workers 18 years old and over increased by 47 percent for those with an advanced degree while those with no high school degree decreased by 6 percent (figure 3-6). A sizable economic literature has sought to better understand the degree to which trade in general, and trade policy in particular, has contributed to the growing wage gap.

Studies that evaluate trade policy changes generally find little or no measurable impact on U.S. labor market outcomes. For example, Haskel and Slaughter (2000)[77] model the share of price changes resulting from trade policy changes, and their estimates suggest that tariff changes in the 1970s and 1980s had no significant impact on the wage premium. In addition, most studies of NAFTA and the U.S.-Canada FTA find that these agreements had little or no effect on U.S. labor market outcomes.

Studies of displacement of individual workers in trade-sensitive industries, in general, find that although import-competing displaced workers' experiences are similar to non-import-competing displaced workers, import-competing displaced workers are slightly older, more likely female, and slightly less likely to be re-employed. Depending on the source data, geographic coverage, and sample period, findings differ on the effect of displacement on subsequent earnings if re-employed. Relatively few studies, however, evaluate a direct link between trade policy changes and job displacement or wage inequality. This section also reviews a growing literature on the transition costs associated with adjustment of labor.

A considerably larger literature investigates the impact of changes in the level and composition of U.S. trade on labor market outcomes. While these studies make no direct link to trade policy changes or to specific trade agreements, their conclusions can offer insight into the effects of trade on the U.S. economy. Most of these studies suggest that increased trade has contributed to growing inequality in wages. Other economic forces, however, such as rapid technological change, appear to have had a greater impact than trade. Consensus estimates suggest that approximately 10 percent to 20 percent of the growth in the wage gap should be attributed to changes in international

[76] For a discussion of the use of production activity as a proxy for worker skill level, see Feenstra and Hanson (2001), footnote 4, pg. 3.

[77] Haskel and Slaughter (2000) p. 16. In checking for robustness, they concluded, "all checks yielded the same qualitative finding: mostly insignificant mandated changes in the U.S. skill premium."

trade. These studies are reviewed in the next section, along with a variety of studies that reach conclusions different from the consensus view.

Economic Theory

The best-known statements from trade theory about wages come from the Heckscher-Ohlin model, a widely-used workhorse of academic theory.[78] This model, in its simplest form, describes a situation with two countries, two goods, and two factors or inputs into the production process. The two factors are usually described as labor and capital, and can also be usefully thought of as skilled labor and unskilled labor. The model requires stringent assumptions including identical technology and tastes, homogeneous products, two goods produced by two factors (or more generally, n factors and m goods), incomplete specialization, and constant returns to scale. A main result of the model, the Stolper-Samuelson theorem, describes long-run results of trade where factors of production are completely mobile, such as the liquidation and redeployment of capital or the training of labor.[79]

The Stolper-Samuelson theorem, which links product prices to factor prices, has also assumed importance in the debate on trade and wages (Stolper and Samuelson (1941), pp. 58-73)). This theorem explains what happens when a country faces altered relative prices for its exports and imports. These alterations can occur when a tariff is imposed or removed or when other fluctuations in world markets alter the terms of trade. When the relative price of one good increases, the economic returns will increase for the factor that is

---

[78] For a basic discussion of the Heckscher-Ohlin model, see Krugman and Obstfeld (2000), pp. 66-91, 729-731; Caves et al. (2002), pp. 107-128, S-23 - S-27; and Markusen et al. (1995), pp. 98-126, 445-451. For more detailed explanations, see Bhagwati et al. (1998), pp. 53-90, 107-130; and Wong (1995), pp. 23-138. Wong intermingles the treatment of the Ricardian, Heckscher-Ohlin and specific factors models.

[79] Another result of the Heckscher-Ohlin model is the Factor-Price Equalization Theorem, which states that if countries that share the same technology engage in international trade, and if trade equalizes prices, then the rewards to labor and capital (or skilled labor and unskilled labor) will be equalized in the trading countries. The implication for advanced countries like the United States, which is relatively more skilled-labor abundant, is that free trade would cause the wages paid less-skilled workers to fall to an absolute international level and increase wages of less-skilled workers in developing countries. This theorem is consistent with the popular notion that free trade would cause U.S. less-skilled worker wages to fall to the much lower world average wage. Conditions in the real world, however, diverge sharply from the strict theoretical assumptions required for the Factor-Price Equalization Theorem to hold, such as international differences in technology, the tendency of consumers to prefer goods produced in their home countries, transport costs, and scale economies. Nonetheless, the tendency for trade liberalization to cause at least some price convergence across countries means that in principle, some associated wage convergence takes place as well, with the amount and speed of such convergence being a matter for empirical investigation.

more intensely used in the production of that good. The economic returns to the other factor will decline. For example, if the relative prices of goods using mostly unskilled labor decline relative to the prices of goods using mostly skilled labor, then the wages of unskilled labor should fall relative to the wages of skilled labor, and vice versa. Consequently, changes in international trade or trade policy that affect relative wages should be evident in concomitant changes in relative prices of goods. The implication for advanced countries, such as the United States, which is relatively skilled-labor abundant and would witness a relative decline in unskilled-labor intensive product prices, is that trade liberalization would decrease the real wage of less-skilled labor.

The Heckscher-Ohlin model assumes that workers in all industries earn the same wage at any point in time, and similarly that capital in all industries earns the same rate of return. A corollary of this is the prediction that if trade liberalization leads to lower relative prices for unskilled-labor-intensive goods, all affected workers tend to oppose that liberalization, while all owners of capital (or skilled workers) tend to support it. In reality, proposals to raise the price of imports tend to be supported actively by both workers and firms in the industry involved. Workers in other industries with similar skill sets and educational levels generally have little comment, positive or negative, about the policy changes. This outcome occurs because workers in different industries are in fact different, as is capital equipment used in different industries. These facts are reflected in the specific-factors model, which focuses on the differing experiences of workers across industries as trade is liberalized.[80] As mentioned above, the Heckscher-Ohlin model assumes that factors are completely mobile, whereas the specific-factors model assumes that some factors of production are tied to a particular industry and cannot move at all. If trade liberalization leads to increased imports, and the price falls for domestic goods that compete with those imports, capital or labor resources in the import-competing industry that cannot move receive lower rates of return, while immobile resources in the expanded export industry receive higher rates of return. The specific factors model explains why the views of workers and firms about trade liberalization tend to be influenced relatively heavily by industry type, rather than by the particular assets or skills that those firms or workers possess.

The situation in actual labor markets represents an intermediate position between that represented by the Heckscher-Ohlin model, in which workers can move freely between industries without any change in wages, and the limited labor mobility of the specific factors model. The compensation of workers reflects in part specific job skills or "human capital" acquired in the industries and firms for whom they work. A significant portion of these skills are

[80] For expositions of the specific-factors model, see Krugman and Obstfeld (2000), pp. 37-65 and pp. 723-728; Caves et al. (2002), pp. 91-106, and pp. S-17 - S-22; Markusen et al. (1995), pp. 127-141 and pp. 452-464; Bhagwati et al. (1998), pp. 91-106 ff.; and Wong (1995).

industry-specific, and thus are not worth as much when the worker changes jobs or industries. Other skills are more universally useful. If market conditions generate new opportunities, workers may actually find that their skills are worth more in a different job or industry, and change jobs for that reason. Thus, some workers will move from industry to industry depending on the market forces affecting those industries, but may experience significant costs, such as reduced wages, if their skills are firm or industry specific. This means that labor markets create significant incentives for workers to remain in their current jobs. Workers generally move from one industry to another only when market conditions change. These changing conditions may be positive, as when better job opportunities arise, or negative, as when jobs are lost in a certain sector.

In summary, international trade theory predicts that for a country such as the United States, rich in physical and human capital, and which has traditionally placed import restrictions on goods made with less-skilled labor, trade liberalization may lower the returns to less-skilled labor. This prediction, though useful, is made under a simplified set of assumptions that abstract from the rich variety of phenomena occurring in actual labor markets.

Empirical Studies of Wage Inequality

Since the 1970s, there has been a steady rise in the wages of more-skilled U.S. workers relative to the wages of less-skilled workers, and increasing income inequality. This trend is apparent whether workers are compared by education, occupational category, or other proxies of skill, or whether income inequality is measured by wages, family income, or poverty levels. For example, wages of college graduates were approximately 38 percent higher than those of high-school graduates in 1979, but were 63 percent higher in 1993 (Burtless (1997)). In 1985, median weekly earnings of males working full time in managerial and professional specialty occupations were 79 percent higher than for operators, fabricators, and laborers; by 2000 they earned 104 percent more.[81]

Although there is a general consensus that increasing inequality has been driven by declining demand for less-skilled workers resulting in an increasing skilled-wage premium, the sources of this demand shift and growing wage gap are still at issue. Two commonly cited causes are increased international trade, or more accurately increased competition from low-wage or developing countries, and technological change. Increased imports of goods produced with less-skilled labor might have pushed down the relative wage of such labor, particularly if such imports pushed down the relative price of such goods. Alternately, technical change may have increased the demand for intellectual labor relative to manual labor, for example, for computer skills relative to

[81] USITC calculations using Bureau of Labor Statistics data.

mechanical skills. This could account for the change in relative wages even in the absence of influences from international trade.

Katz and Autor provide a comprehensive discussion of recent changes in wage structure and a review of various explanations.[82] The authors cite three main explanations for increasing inequality: (1) an increased growth rate of the relative demand for highly educated and more-skilled workers driven by skill-based technological changes, (2) rising globalization pressures in reducing manufacturing production employment and thereby shrinking the relative demand for the less educated, and (3) a slowdown in the rate of growth of the relative supply of skills and an increased rate of unskilled labor immigration.

Katz and Autor used a supply-demand-institution framework to assess these three primary explanations. They found that, "Substantial secular increases in the relative demand for more-educated and more-skilled workers appear necessary to explain . . . the evolution of the wage structure," and within-industry skill upgrading "appears to be the major driving force in the rise in the relative demand for the more skilled."[83] The authors added that skill-biased technological change appears to be a key factor and is somewhat more important than international trade changes.

A prevalent method of understanding the various analyses is to categorize studies based on the type of data employed, product price or trade volume. Arguing from the Stolper-Samuelson theorem, if imports of unskilled-labor-intensive goods depress U.S. wages of unskilled labor, the relative prices of such goods should be falling. Some studies suggest that relative prices of unskilled-labor-intensive goods in the United States have not fallen (Lawrence and Slaughter (1993)). In light of the Stolper-Samuelson theorem, this finding can then be interpreted as meaning that increased imports have had minimal effect on the wages of unskilled labor. Studies of this type usually conclude that most of the increase in the skilled-wage premium is due to technological change. For example, Slaughter's 1998 review of the literature found that, in general, product-price changes explain very little of rising inequality. Also, Harrigan (2000) analyzed the role of prices and finds that the direct impact of import prices on wages is negligible. In reviewing nine price-based studies, Slaughter found that the results are relatively sensitive to the selection and weighting of industries sampled and to the decade considered, whereas the results are relatively insensitive to the extent of data aggregation and skills measurement choice (Slaughter (2000)). The treatment of certain industries, such as computers for which appropriate price measures are problematic, can significantly affect study results (Sachs and Shatz (1994)).

---

[82] For a general overview of historic changes in wage structure and inequality, see Katz and Autor (1999). See also Feenstra (2000).

[83] Katz and Autor (1999), p. 1539.

Several criticisms have been made of studies that use product prices to infer the effect of trade on wages. A common critique is that unskilled and skilled labor may not be well-measured by proxies such as production and nonproduction workers. Also, price-based studies ignore other factors that shift prices such as change in consumer demand/taste, increasing per capita income, and falling real value of minimum wage. Another concern with price-based studies is that other features of the world changed at the same time as product prices. In particular, the U.S. supply of college graduates relative to less-educated workers has increased in recent decades. The results of such studies can be sensitive to various model specifications.[84] In a recent study, Haskel and Slaughter (2000) disaggregated the share of price changes resulting specifically from trade policy changes. This approach allowed the authors to address two common criticisms of price-based studies. The first criticism is that many studies model the United States as a small country or price taker, and the second is that studies implicitly assume that all domestic product price changes are due to trade policy or do not directly link the share to trade policy changes. Haskel and Slaughter, however, segregated domestic and international determinants of price changes in order to assess the effect of trade-induced price changes. They analyzed the sector bias of price changes induced by changes in U.S. tariff and transportation cost reductions during the 1970s and 1980s. Based on various estimations, they did not find strong evidence that falling tariffs and transportation costs mandated rises in inequality working through price changes. In addition, although the authors documented that tariff and transportation reductions during the 1970s and 1980s were concentrated in unskill-intensive sectors, these reductions were likely not large enough to greatly affect prices (Haskel and Slaughter (2000)).

Other studies, also known as factor-content studies, attempt to explain changes in relative wages by changes in import volumes rather than changes in product prices. In this approach, traded goods are considered to embody the labor they contain, with imports representing an addition to the supply of U.S. labor (thus depressing wages) and exports representing a reduction in the supply of U.S. labor (thus increasing wages). The effect of imports is thus analogous to the effect of immigration. Some studies attempting to infer changes in relative wages from changes in import and/or immigration volumes have estimated relatively high wage effects (Borjas, Freeman and Katz (1997)) while others estimated much smaller impacts (Katz and Murphy (1992), Borjas and Ramey (1993)). For example, Borjas, Freeman, and Katz estimate that 40 percent of the increase in the log wage ratio between all other workers and high school dropouts can be attributed to the increased relative supply of dropouts from trade and immigration; while Katz and Murphy (1992) find that “the effects on relative labor demands of trade were quite moderate,” and

[84] For an example of critiques of price-based studies, see William R. Cline (1997), pp. 90-92.

estimate that “changes in trade caused a reduction of 0.63 to 1.48 percent in demand for male high school dropouts and a reduction of 2.22 to 4.00 percent for female high school dropouts.”[85]

Some of the highest and most controversial estimates assume that imports from developing countries in effect embody the much larger quantity of labor that is actually used to make the goods in developing countries.[86] Such methods attribute nearly all of the relative decline in U.S. wages of unskilled labor to international trade. One criticism of factor-content studies is that they treat changes in the production of goods as output shocks that affect employment at existing wages. But if wages adjusted rapidly with import penetration it would reduce the labor cost competitiveness of imports and reduce import flows, leading to a possible underestimate of labor/wage effects (Freeman (1995)). In addition, factor-content studies tend to ignore how demand for output may respond to changes in prices. By ignoring potential consumer response, these studies may overstate import displacement of local production and ensuing labor/wage estimates.[87]

In a series of papers, Leamer considers the impact of increases in imports of less-skilled-labor intensive goods on the U.S. wage distribution.[88] These papers took advantage of the relationship between high wages and high effort, as measured by hours worked. Weekly wages and weekly hours worked are correlated strongly since at least 1970, and high wage-high effort jobs tend to be concentrated in capital-intensive industries. By lowering the relative price of low-wage, low-effort jobs, Leamer argues that increased imports of less-skilled-labor intensive goods affect the distribution of wages throughout the economy, including for the large majority of U.S. workers employed in services, and not only in import-competing manufacturing industries. In

---

[85] Borjas et al. (1997) and Katz and Murphy (1992).

[86] This approach is associated with Wood (1994). A more recent estimate of this type is Kucera and Milberg (2002). This study used a counterfactual factor-content analysis to measure the employment effects of manufacturing trade expansion over 1978-1995 for 10 OECD countries, including the United States. The authors concluded that the United States experience net loss of 2.0 million manufacturing jobs, representing a 9.9-percent decline in manufacturing labor demand (as a percent of the average manufacturing employment for the 1978-1995 period). They also concluded that most of the net loss is accounted for by trade with non-OECD countries (US: 1.29 million of 2.03 million is accounted for by non-OECD trade); that most of the net loss is concentrated in relatively labor-intensive industries; and that deindustrialization (decline in manufacturing share of employment) is more highly correlated with the employment effects from trade with OECD rather than non-OECD countries. They also noted that “to the extent trade is the culprit, it is the employment effects of North-North trade that most closely track the overall change in the manufacturing share of employment in each [OECD] country.” (p. 8.)

[87] Freeman (1995), p. 27.

[88] For example, Leamer (1999) and Leamer and Thornburg (2000).

testimony before the U.S. Trade Deficit Review Commission, Leamer indicated that in contrast to the academic consensus that trade does not matter much for relative wages or the loss of manufacturing jobs, he viewed the evidence as "not compelling in either direction."[89]

Outsourcing and wages

More recently, researchers have paid increasing attention to the possible effect of the global disaggregation or fragmentation of the production process on wages. Feenstra and Hanson (2001) provide a comprehensive survey of studies analyzing international production sharing and its effect on wages. Trade in intermediate inputs, labeled as "outsourcing" or "global production sharing", involves relocating low-wage, low-skilled parts of a vertically integrated production process overseas (e.g. manufacture of components) while retaining high-wage, high-skilled operations in the home country (e.g. final assembly, R&D, or headquarters functions), and shipping the components to maintain coordination of production.[90] The authors argue that trade in intermediate inputs is a potentially important explanation for the increasing wage gap. They show that both trade in inputs and skill-biased technical change will shift demand away from low-skilled activities and raise relative demand for higher skilled labor.

The authors argue that recognizing the increase in outsourcing helps to resolve several of the empirical arguments to support the contention that international trade does not have much effect on U.S. wages, including (1) the relatively small magnitude of trade flows between the United States and developing countries, (2) the apparently contradictory movement between import prices and relative wages, and (3) the fact that changes in employment shares by skill level primarily take place within industries, rather between industries as one would expect if Stolper-Samuelson forces were linking imports to wages.

On the first point, the ratio of trade to GDP understates the increasing trade intensity of the U.S. economy because of the increasing share of services in GDP. A more appropriate measure, the ratio of merchandise trade to merchandise value-added, has trended upward significantly over time for the United States, rising from 13.2 percent in 1913 to 35.8 percent in 1990. The estimated share of imported intermediate inputs to manufacturing has almost doubled from 1972 to 1990, rising from 6.5 percent to 11.6 percent of total intermediate purchases (Feenstra and Hanson (1999)). Advanced economies other than the United States also engage in outsourcing. Second, when prices are compared within industries rather than across industries, the authors find

[89] January 21, 2000, p. 60. Downloaded at *http://www.ustdrc.gov/hearings/21jan00/p07012100.pdf* on May 7, 2003.

[90] Evidence on outsourcing as observed in the Section 9802 production-sharing program, and its economic effects, is discussed in Feenstra et al. (2000).

that domestic prices are increasing relative to import prices. This trend is consistent with foreign outsourcing, and unlike similar price comparisons based on cross-industry comparisons (e.g. Lawrence and Slaughter (1993)), this method can be used to support a claim that lower import prices are associated with a relative fall in the less-skilled wage. The presence of outsourcing also can explain the relatively large share of the shift toward more-skilled or nonproduction labor that occurs within industries. Rather than attribute this phenomenon entirely to skill-biased technological change, relocation of the less-skilled jobs through outsourcing and importation of the components can account for many of the changes in the observed data even with technology remaining constant.

Estimates of the effects of outsourcing on the relative wage of nonproduction and production workers are sensitive to choices in econometric methodology, and the choice between outsourcing and technological upgrading as explanations for the increased wage premium is not yet entirely resolved. Feenstra and Hanson (1999) consider the period from 1972-90, during which the average increase in U.S. nonproduction wages relative to production wages was 0.72 percent per year. A simple analysis attributes 15 percent of this increase (0.11 percent per year) to outsourcing, but this estimate increases to 30 percent (0.25 percent per year) if increased computer use rather than outsourcing is considered to be the structural cause. Analyses allowing for interactions between the explanatory variables and quantities of labor and capital attribute 40 percent of the relative increase in wages to outsourcing (0.29 percent per year), but alternately attribute 75 percent of the increase (0.56 percent per year) to increased computer use.

Agreement-Specific Analysis

There exist few studies and reviews that investigate the specific effects on labor markets of the five agreements identified in this report. A 1997 USITC statistical analysis of NAFTA identifies effects (positive or negative) on employment for 20 of the 120 disaggregated industries reviewed, of an absolute magnitude of negligible to 15 percent in either direction. These sectors account for approximately 3 percent of the total labor force and 17 percent of the manufacturing labor force (USITC (1997a)). Elsewhere, Ferrantino (2001) argues, “the effects of NAFTA on the U.S. economy have been relatively small,” and have minimal impact on overall levels of unemployment. Using new unemployment insurance claims as a benchmark, Ferrantino estimates that, “the highest available estimates of NAFTA job loss attribute no more than 0.5 percent of U.S. layoffs to NAFTA. On an economywide basis, job ‘creation’ or ‘destruction’ of this magnitude is relatively small compared to the amount of fluctuation in employment levels over the business cycle.”[91]

[91] Ferrantino (2001), pp. 4-5.

Two recent studies of NAFTA and the U.S.-Canada FTA conclude that trade-induced wage effects are more likely to occur in the economies of the United States' smaller trading partners than in the larger U.S. labor market. In an econometric analysis of the North American labor market, Robertson uses a three-region labor supply-demand model with 1987-1997 household-level data from the United States and Mexico to examine labor market integration, concluding that, although there is a large wage differential between the United States and Mexico, the labor markets are closely integrated, and that evidence of this integration precedes NAFTA and may be largely the result of migration (Robertson (2000), p. 742). Robertson's method is designed to analyze changes in the Mexican labor market. By assuming that the larger U.S. labor market drives such changes, he is precluded from analyzing NAFTA's effect on the U.S. labor market directly.[1] In a recent study, Trefler (2001) analyzes the short-run costs and long-run efficiency gains of the U.S.-Canada FTA, but does so only from the Canadian perspective. In testing for the endogeneity of U.S. employment, output, value added, and number of plants, however, Trefler concluded that the effect of the FTA was swamped by more fundamental movements in industry demand and supply.

Non-Agreement-Specific Analysis

A number of econometric studies have attempted to identify the relative influences of U.S. or developed country trade and technology changes in increasing the relative wages of skilled workers over the past two decades. Although these studies have used a variety of methodological assumptions about the linkage between trade and wages, studies and literature reviews spanning the last 15 years have generally found that trade accounts for a relatively small amount of the changes in wage and income distribution of developed countries. In an early review of the literature, Freeman (1995, p. 25) found that, "Standard factor content analysis studies indicate that trade can account for 10 to 20 percent of the overall fall in demand for unskilled labor needed to explain rising wage differentials in the United States or rising joblessness in Europe." Later, a comprehensive literature review published by

[1] Robertson treats Mexico as a small country and the United States as a large country, consequently invoking the assumption that Mexico is too small to affect aggregate wages in the United States. After controlling for exchange rate movements, the rate of wage convergence slows after NAFTA, and Robertson posits a possible explanation in that if migration is the primary vehicle in labor market integration, increasing opportunities for Mexicans within Mexico as a result of NAFTA may help to explain the reduced convergence rate. (p. 744) Robertson qualifies that it is too early to evaluate the complete effect of NAFTA on labor-market integration because with the 1990 announcement, actors may have changed their behavior before, during or after NAFTA; full provisions will take 15 years to enter, with the most controversial slated for later; and the December 1994 peso collapse triggered a recession that may mask the responsiveness of Mexican wages to changes in U.S. wages. (p. 763).

the Institute for International Economics (Cline (1997)) concluded that proponents exist at both extremes. Wood (1994) attributed all of rising inequality to trade, while Berman et al. (1994), Bound and Johnson (1992), and Lawrence and Slaughter (1993) attributed almost no causation to trade. The Institute for International Economics' review found that "The majority view attributed rising wage inequality primarily toward skill-biased technology change (ibid., pp. 15 and 139)."

After surveying almost 30 economic estimates of the impact of trade on rising U.S. wage inequality, Cline (1997, p. 144) concludes that international influences contributed about 20 percent of the rising wage inequality in the 1980s. A recent International Monetary Fund literature review concluded that trade accounted for only about 10 or 20 percent of the changes in wages and income distribution in the advanced economies (Slaughter and Swagel (1997), p. 3) More recently, Slaughter (1998, p. 452) reviewed research on the effect of international trade on labor markets and found that, "Despite unresolved methodological differences, the current consensus is that trade accounts for a positive yet relatively small share of rising inequality."

New insights into the experiences of displaced workers and their relationship to international trade have been obtained from the analysis of large microeconomic data sets on individuals and households. Much of this work is reviewed in USITC (2002). Briefly, Kletzer (2001) finds that workers displaced from jobs in import-competing industries are approximately equal in educational attainment and job tenure, slightly older, and significantly more likely to be female. Relative to other displaced manufacturing workers, those displaced from import-competing industries are slightly less likely to be reemployed as of the survey date, in part due to the lower re-employment rates of displaced females. Their subsequent earnings are similar to those of other displace manufacturing workers, with about 36 percent of such workers reporting earning the same or more on their new jobs and 25 percent of such workers reporting earnings losses of 30 percent or more.[93]

The USITC analyzed the possible labor efforts of simultaneously removing U.S. import restraints, including tariffs and most quantifiable nontariff measures[94] The USITC model results showed that if all significant U.S. import restraints had been unilaterally removed in 1999, approximately 175,000 full-time equivalent (FTE) workers would have been displaced from their current industries and would need to seek employment in industries other than those being liberalized. Approximately 155,000 of these FTE workers would

[93] Kletzer (2001), table 3-3, p. 36.

[94] USITC 92002), chapter 2,. While this analysis is in fact an ex ante analysis of a hypothetical liberalization rather than an expost analysis of an actual one, and thus methodologically similar to the CGE analyses reviewed earlier in the chapter it is discussed at this point in order to highlight its implications for labor transition.

have been in the textile and apparel sectors. Based on the experience of similar workers surveyed for the U.S. Department of Labor's Bureau of Labor Statistics, the estimated one-time increase in workers receiving unemployment compensation as a result of removing all significant import restraints is approximately 111,000, equal to about two days' worth of new claims. This estimate took into account the fact that workers in the affected industries are significantly more likely to receive unemployment insurance. Overall, the measurable effect on aggregate U.S. unemployment of removing all significant U.S. import restraints on a phased-in basis, rather than simultaneously, likely would be too small to measure. About 17,000 net additional FTE workers would be drawn into the labor market nationwide as a result of removing all significant import restraints.

Conclusion

The changes in less-skilled wages and income inequality paralleled a trend toward increasing trade, particularly with less-developed countries, leading many observers to attribute these wage changes, and the concomitant displacement of workers, to international trade. These views found a foothold in economic theory, and the debate led to a flowering of studies attempting to quantify the impact of trade liberalization on wages and income. The broad thrust of these studies and the literature is that changes in technology and educational patterns probably drive most of the recent changes in the U.S. income distribution, with changes in international trade playing a secondary but non-trivial role. While growing trade volumes appear to have had an impact on the wage distribution, there is little evidence that trade policy changes have been responsible for significant changes in the wage distribution.

Effects on Product Variety

There are more than 17,000 statistical reporting categories in the Harmonized Tariff Schedule, and the United States had more than 200 trading partners in 2001.[95] For purposes of analytical simplicity, economists and other trade policy analysts frequently ignore much of this detail by aggregating across countries and products. While aggregation may be a helpful abstraction for many trade policy questions, assessments of product level data can provide some valuable insights into the changing nature of international trade. This section reviews the academic literature on increasing product variety in international trade.

The literature establishes an important fact: a significant portion of the trade growth over the last three decades can be attributed to growth in the

[95] USITC calculations using data downloaded from International Trade Resources web page *http://www.macalester.edu/research/economics/PAGE/HAVEMAN/Trade.Resources/TradeConcordances.html*, downloaded Nov. 13, 2002, and U.S. Commerce dept data.

number of import sources per commodity. Countries trade more products and with a larger number of countries than in the past. Growth in the number of product-country pairs, particularly the number of products imported from low wage countries, constitutes a sizable portion of the growth in U.S. and global trade.[96] While the emergence of a new product-country pair may in many cases represent importation of an old commodity from a new source, data gathered in this fashion may at least form a useful initial proxy for the extent to which increasing trade is accounted for by product differentiation.

Hummels and Klenow (2002) point out that the value of a given aggregate trade flow can be understood as the product of the number of products traded and the average value per traded product. Hummels and Klenow argue that changes in the number of products traded have substantially different economic consequences than changes in the average value per traded product. Growth in the number of imported products can indicate that consumers and intermediate goods buyers in the United States have access to a wider variety of goods. Following Romer (1994) and Feenstra (1994), Hummels and Klenow argue that the economic gains from growth in the number of imported products can be quite large, relative to estimates of the gains from trade that ignore this dimension.

Schott (2001) investigates changes in the sourcing pattern of U.S. imports at the product level over the period 1972-1994. He divides the world's countries into three groups, according to their per capita income: high, middle and low.[97] He finds a substantial decrease in the number of manufactured products that the United States imports exclusively from high income countries. Much of the growth in manufactured imports over the period occurs in product categories in which at least one low income country enters the U.S. market. While the share of U.S. imports from low income countries remains small (only 8 percent of U.S. import value in 1994), growth in the number of categories with low income exporters suggests that a growing share of U.S. industries face price competition from low-income countries.[98]

Hillberry and McDaniel (2002) use the Hummels and Klenow methodology to decompose growth in North American trade flows since NAFTA. Using data

---

[96] The emergence of new traded products over time has also been identified as a possible source of upward bias in the import price index. This in turn implies that published estimates of the income elasticity of import demand may also be upward-biased. See Feenstra and Shiells (1997).

[97] Countries with per capita incomes of in the 30th percentile or less are considered low. Countries with per capita incomes in the 30th to 70th percentiles are middle income, and countries with incomes in the 70th percentile or higher are considered high income.

[98] Schott also notes sizable disparities between price of goods from low income and high income countries. Men's shirts from Japan are about 30 times as expensive as men's shirts from the Philippines. That Japanese shirts remain in the market despite this price gap suggests that high-income countries produce higher quality goods than low-income countries, and that some consumers are willing to pay more higher quality products.

at the HS10-digit product level, they decompose growth in U.S. imports and exports with its NAFTA partners from 1993 to 2001. They find that 23.8 percentage points of the 190-percent increase in U.S. imports from Mexico occurred in products that the United States did not import from Mexico in 1993. Of the 69-percent increase in imports from Canada, 4.4 percentage points occurred in products not imported from Canada in 1993. U.S. exports also benefitted from an increase in the number of traded varieties. An estimated 3.4 percentage points of the 35 percent increase in exports to Canada, and 8.3 percentage points of the 93 percent increase in exports to Mexico, were attributable to the growth in the number of products the U.S. exports to those markets.

Most economic analyses measure the benefits from growth in trade among products that are continuously traded. Consumer benefits are measured as a function of the lower prices that occur when additional imports compete with domestically produced goods. Schott, Hummels and Klenow, and Hillberry and McDaniel all show that growing trade also increases the number of varieties that U.S. importers have available to them. Theoretic models by Romer and Feenstra suggest that getting access to more varieties may well be more valuable to importers than lower priced goods. Welfare gains from additional sources occur if consumers have a taste for variety, or if producers benefit from having access to a greater number of specialized intermediate inputs.

Klenow and Rodriguez-Clare (1997) assess the benefits to Costa Rica from its trade liberalization in the late 1980's. They note sizable increases in the number of imported sources for each product as a result of trade liberalization. They also find that changes in the number of import sources per commodity can be linked to changes in tariffs. They estimate that a 1-percent decrease in tariffs causes a 0.34-percent increase in the number of import sources available to intermediate producers and 0.73-percent increase in the number of import sources available to consumers. Accounting for growth in the number of import sources, Klenow and Rodriguez-Clare estimate the benefits to Costa Ricans from trade liberalization are equivalent to a 1.5-percent increase in national income. Ignoring the benefits of added variety in import sources reduces the estimated welfare gain to that of a 1-percent increase in national income. Thus, one-third of Costa Rica's economic benefit from trade liberalization is attributable to increased variety of sources for import products.

One of the empirical analyses in chapter 8 links growth in the number of imported varieties to reductions in U.S. tariff levels. Econometric methods establish that commodities within larger tariff reductions generally had the largest increases in the number of import sources. Simulation modeling based on a variant of the Klenow-Rodriguez-Clare model shows that variety growth may account for as much as three-quarters of the economic benefits associated with tariff reduction.

Conclusion

A significant portion of recent increases in international trade consists of "new" goods, that is, goods coming from destinations that they did not come from before. This is particularly true of the increase in U.S. imports from Mexico post-NAFTA. It appears that such increases can be linked to specific cuts in tariffs. Estimates for one developing country suggest that as much as a third of the gains of trade liberalization may be due to increased import product variety.

CHAPTER 5: Industry Sector Analysis

Introduction

This chapter provides a brief overview of output, employment, and productivity trends in all U.S. industry sectors (including services) during 1978-2001 and describes the effects of the five trade agreements on each sector. It examines other factors that have affected developments in these sectors including domestic and foreign competitive conditions, macroeconomic influences, technological innovation, changes in industry structure, and government regulations. For the purposes of this investigation, all U.S. industries have been grouped into 10 sectors. Unless otherwise noted, these sectors are based on the major industrial groups defined by the 1987 Standard Industrial Classification (SIC) system. These sector groupings do not necessarily conform to the industry aggregations used in previous Commission investigations and, consequently, the estimated effects of trade agreements on particular sectors may not be comparable to other investigations. For example, the Commission's three-year review of NAFTA[1] provided detailed analyses of 67 industry sectors.

The data presented in the tables in this chapter are based on official statistics of the Department of Commerce, Bureau of Economic Analysis and Bureau of the Census, and U.S. Department of Labor, Bureau of Labor Statistics. All shipment, trade, and consumption values presented in this chapter have been converted to real (1996) dollars using the Bureau of Economic Analysis' implicit price deflator. Each sector discussion, with the exception of services, contains a table presenting major trade issues addressed by one or more of the five agreements that are relevant to the sector. The "X's" that appear in the table indicate that a particular trade issue was covered by the corresponding agreement regardless of whether the agreement effectively addressed the issue or significantly affected trade in the sector. The five trade agreements also addressed certain cross sectoral trade issues such as countervailing and antidumping measures that were not included in these tables.

[1] U.S. International Trade Commission, *The Impact of the North American Free Trade Agreement on the U.S. Economy and Industries: A Three Year Review*, June 1997, USITC Pub. 3045.

Trade liberalization since the Tokyo Round has affected U.S. producers directly, by reducing or eliminating tariffs and other trade barriers, and indirectly, by encouraging market integration and the adoption of new business strategies such as outsourcing and production sharing. As a result, outsourcing and production sharing have increased significantly in the chemicals, machinery and equipment, transportation, miscellaneous product, and textile sectors. These developments have allowed U.S. producers to concentrate on core competencies, reduce inventories and input costs, and increase their competitiveness in global markets. Transparent institutional frameworks for dispute settlement such as those established in the Uruguay Round and government policies that provide guarantees for foreign investment have further encouraged market integration by eliminating much of the risk of moving capital and products across national borders.

Many factors in addition to the five subject trade agreements have significantly affected U.S. trade in specific sectors during the past two decades. Revolutionary advances in information and communications technology sparked global demand for electronics products which, in turn, spurred U.S. exports of advanced computer and communications equipment and U.S. imports of commodity-type electronics products. The oil crises of the 1970s were a major impetus behind a sharp increase in U.S. demand for imports of small, fuel-efficient Japanese vehicles. Quotas, trigger price mechanisms, and voluntary restraint agreements restricted many types of U.S. steel imports during the period under review, while the Multifiber Arrangement and the Caribbean Basin Economic Recovery Act largely determined the quantity, source, and composition of U.S. textile and apparel imports. U.S. crude oil trade has been principally affected by price levels which fluctuate erratically as supply and demand are driven by myriad global events.

Many diverse factors have also affected U.S. regional trade during the period under review including financial crises in Latin America during the 1980s, in Mexico during 1994, and in East Asia during 1997-98. These events and the exchange rate fluctuations associated with them significantly contributed to ebbs and flows in U.S. trade with each of those regions. U.S. trade has also been strongly affected by the economy-wide growth rates of major markets, changes in government policy, and investments in infrastructure such as ports, roads, and telecommunication networks. China has emerged as both a major global supplier and market in recent years largely because it has a very large and growing domestic market, it has revised its policies and reformed institutions to attract foreign investment, and it has made vast improvements in the infrastructure necessary to accommodate increased manufacturing and trade.

Services, chemicals and allied products, and machinery and electronics increased their share of non-government GDP in the United States, while the transportation sector maintained its share, and all other sector shares decreased during 1978-2001. The services sector, as discussed in this report, is a large and diverse aggregation of industries that is much larger than the other sectors.

Its share of non-government GDP expanded from 68.3 percent to 78.6 percent during 1980-2001 (table 5-1). Growth in the services sector was largely driven by increases in telecommunication, business, and financial services. Innovations in telecommunication and information technologies have led to the creation of new services, such as mobile telephony, the Internet, and Internet advertising, and have increased productivity in existing services, such as finance and design. Other sectors also underwent significant change. Advancements in medical knowledge and improved standards of living contributed to the expansion of the pharmaceutical industry, which accounted for much of the growth in the chemicals sector. The machinery and electronics sector also benefitted from technological developments which have revolutionized the production of electronic equipment by steadily decreasing the size and cost of electronic components while steadily enhancing their performance. These developments combined with fierce competition have spurred market expansion for electronic equipment, such as cellular telephones and personal computers. The strong growth of the U.S. economy as a whole and its salutary effect on the construction industry have been the primary factors affecting the expansion of the machinery subsector.

The value of shipments in the minerals and metals and the textiles and apparel sectors decreased significantly during the period, largely owing to foreign competition and technological advances that have lowered production costs. Much of the decrease in the minerals and metals sector can be attributed to lower prices for primary metal products, especially steel. The total quantity of steel product shipments increased by 11 percent during the period, whereas the total value of these shipments decreased by 60 percent. The value of shipments in the U.S. textile and apparel sector decreased by 25 percent during the period as imports from lower-wage countries replaced U.S.-made products in many market segments.

Employment shifted significantly during 1978-2001 from the manufacturing sectors to the services sector. The share of total private employment[2] accounted for by the services sector increased from 70 percent to 82 percent while employment in each of the manufacturing sectors, with the exception of the chemicals sector and the forest and fishery sector, decreased during the period. Employment cutbacks in the manufacturing sector were due to decreased production, increased labor productivity, or both. Cutbacks were sharpest in the minerals and metals sector, the textiles and apparel sector, and the energy and fuels sector where output decreased significantly during the period. Increased labor productivity in the machinery and electronics sector, and the transportation equipment sector allowed firms to reduce employment while increasing output.

---

[2] Does not include farm workers or government employees.

Table 5-1
Real private gross domestic product[1] and employment by industry sector, 1980 and 2001

	Real private GDP[1]				Employment[2]			
	1980		2001		1980		2001	
Sector	**Value**	**Share of total[3]**	**Value**	**Share of total[3]**	**Employment**	**Share of total[3]**	**Employment**	**Share of total[3]**
	Billion dollars	*Percent*	*Billion dollars*	*Percent*	*1,000 employees*	*Percent*	*1,000 employees*	*Percent*
Services	3,140.7	68.3	6,588.2	78.6	48,507	69.5	86,045	82.5
Machinery and electronic	298.6	6.5	557.7	6.7	4,288	6.1	3,642	3.5
Agriculture	203.3	4.4	226.3	2.7	1,777	2.5	1,725	1.7
Chemicals and allied products	113.6	2.5	214.8	2.6	1,871	2.7	1,980	1.9
Minerals & metals	206.7	4.5	201.7	2.4	3,601	5.2	2,856	2.7
Transportation equipment	93.3	2.0	170.5	2.0	1,881	2.6	1,760	1.7
Forest and fishery products	131.2	2.9	169.5	2.0	[3]2,641	3.8	[3]2,911	2.8
Energy and fuels	215.4	4.7	111.4	1.3	1,004	1.4	544	0.5
Miscellaneous products	139.1	3.0	100.1	1.2	2,139	3.1	1,853	1.8
Textiles and apparel	60.2	1.3	43.0	0.5	2,111	3.0	1,044	1.0
Total	4,598.5	100.0	8,383.2	100.0	69,820	100.0	104,360	100.0

[1] Real private GDP equals output less purchases of intermediate inputs. It does not include federal, state, or local government contributions to GDP.
[2] Does not include farm or construction workers. Agriculture employment is primarily in good processing.
[3] Includes employment for SIC 24 (number and wood products, except furniture), 26 (paper and allied products), and 27 (printing, publishing, and allied industries).

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of Economic Analysis, and U.S. Department of Labor, Bureau of Labor Statistics.

Services was also the largest sector in terms of U.S. trade, increasing its share of total exports from 19 percent to 32 percent and its share of total imports from 15 percent to 17 percent during 1980-2001 (table 5-2). U.S. exports increased in all sectors during this period with the exception of agriculture and energy and fuels, while U.S. imports increased for all sectors except energy and fuels. Most of the decrease in the value of energy and fuels can be attributed to lower oil prices during the latter part of the period.

Views of Interested Parties

A public hearing was held in connection with this investigation on January 14, 2003. Interested parties presented their views on the subject trade agreements at this hearing, and in written statements submitted in response to announcements that appeared in the *Federal Register*. A summary of these views is given in appendix F to this report. In addition, those views are provided in this chapter where they apply to specific industries. Several parties presented statements that pertain to the effects of the trade agreements on the country as a whole, or on broad segments of the country. These general views, which are provided by the AFL-CIO, by economist Ben Goodrich, by the International Intellectual Property Alliance, and by the National Association of Manufacturers, are presented here.

AFL-CIO[3]

The AFL-CIO is a voluntary federation of 65 national and international labor unions that represent 13 million workers.

U.S. trade policies have resulted in "exploding trade deficits and staggering job losses, especially in [the] manufacturing sector; significant impingement on the power of the national government and state and local authorities to regulate in the public interest; and dilution of protections under domestic trade laws." The United States should "go back to square one" and recraft its trade policies "to ensure that they promote and protect workers' rights and the environment in the United States and other nations."

Uruguay Round

The U.S. trade deficit in goods and services nearly quadrupled during 1994-2002 and these deficits have substantially retarded GDP growth. Growing trade deficits have also eliminated a net total of 3 million actual and potential jobs from the U.S. economy. Most (65 percent) job losses were in the manufacturing sector. Displaced workers in import-competing sectors have had difficulty finding jobs in growing sectors. Further, real manufacturing wages have not kept pace with the cost of living.

---

[3] AFL-CIO, written submission to the Commission, Feb. 14, 2003.

Table 5-2
U.S. trade by sector, 1980 and 2001

Sector	Exports 1980 Value	Exports 1980 Share of total[1]	Exports 2001 Value	Exports 2001 Share of total[1]	Imports 1980 Value	Imports 1980 Share of total[1]	Imports 2001 Value	Imports 2001 Share of total[1]
	Billion dollars	*Percent*	*Billion dollars*	*Percent*	*Billion dollars*	*Percent*	*Billion dollars*	*Percent*
Services	83.4	18.7	273.5	32.1	72.7	15.1	196.4	16.8
Machinery and equipment	92.6	20.7	186.7	21.9	51.9	10.8	264.8	22.6
Transportation equipment	51.4	11.5	106.5	12.5	52.3	10.9	183.7	15.7
Chemicals and allied products	42.8	9.6	83.0	9.8	21.4	4.4	90.0	7.7
Miscellaneous	23.1	5.2	54.2	6.4	26.8	5.6	110.0	9.4
Agriculture	74.7	16.7	51.2	6.0	31.0	6.4	39.1	3.3
Minerals and metals	39.5	8.8	46.0	5.4	51.9	10.8	74.1	6.3
Forestry and fish products	17.9	4.0	24.9	2.9	22.1	4.6	43.2	3.7
Textiles and apparel	7.2	1.6	14.6	1.7	15.1	3.1	69.5	5.9
Energy and fuels	14.2	3.2	10.6	1.2	135.4	28.2	101.6	8.7
Total	446.8	100.0	851.2	100.0	480.6	100.0	1,172.4	100.0

[1] Data may not sum to 100 due to rounding.

Source: USITC calculations.

These factors have affected local businesses and have eroded state and local tax bases. The Uruguay Round Agreements (URA) have negatively affected the power to regulate in the public interest as the WTO dispute resolution procedures have challenged domestic laws and regulations design to protect the environment, health and safety, consumers, or workers. The URA has also weakened the substance of U.S. trade laws and reduced the ability to effectively implement these laws. If global competition remains unchecked, it will make the world increasingly "unstable" by creating greater inequality and "weaker democracies."

NAFTA

NAFTA has been a "dismal failure" and workers' wages in all three NAFTA countries have fallen or stagnated. The trade surplus that the United States had with Mexico before NAFTA is now a deficit and the deficit that it had with Canada is now much larger. These deficits eliminate job opportunities. NAFTA also has caused jobs to shift from "relatively high-paying manufacturing jobs with good benefits and higher union density to service sector jobs that pay less and provide fewer benefits." The effect has been particularly negative on the textile and apparel sector and the automotive goods sector. Wage disparities between manufacturing production workers in Mexico and the United States have increased, encouraging U.S. production to shift to Mexico and undocumented Mexican workers to move to the United States. "NAFTA has also made it less risky and more lucrative to move production to Canada and Mexico" thereby "undermining the bargaining position of U.S. workers."

Benjamin Goodrich[4]

Benjamin Goodrich is employed by the Institute for International Economics. However, the views expressed in his submission are his own and do not necessarily reflect the views of individual colleagues or the members of the Institute's Board or Advisory Committee.

Mr. Goodrich generally holds a favorable view of all the subject trade agreements. His submission emphasizes a number of points for the Commission to keep in mind when evaluating the effects of the subject trade agreements on the U.S. economy. It also discusses the merits and shortcomings of various economic models that can be used to estimate the counterfactual condition expressed as "What would the U.S. economy look like if the United States had not implemented a certain trade agreement?"

---

[4] Benjamin Goodrich, Institute for International Economics, written submission to the Commission, Jan. 3, 2003.

International Intellectual Property Alliance[5]

The International Intellectual Property Alliance (IIPA) represents the U.S. copyright-based industries in bilateral and multilateral efforts to improve international protection of copyrighted materials. IIPA's six member trade associations represent over 1,100 U.S. companies producing and distributing materials protected by copyright laws throughout the world.

Both NAFTA and the Uruguay Round have played an important role in elevating the standards of copyright protection and enforcement around the world although the NAFTA intellectual property provisions, which in several ways, provide better copyright protection than that of the Uruguay Round TRIPS[6] agreement. NAFTA's Intellectual Property Rights chapter still contains problematic issues regarding secondary uses of sound recordings and Canada's extension of its "cultural industries" exclusion to intellectual property. The multilateral reach of TRIPS and the regional reach of NAFTA have provided firm foundations for countries to improve their copyright laws and enforcement mechanisms to protect both domestic and foreign rightsholders. The TRIPS agreement achieved major obligations desired by the copyright industry. The enforcement obligations of the TRIPS agreement provide a comprehensive foundation for the development of the procedures and remedies necessary for effective enforcement against copyright piracy.

National Association of Manufacturers[7]

The National Association of Manufacturers (NAM) represents about 14,000 U.S. manufacturing companies, including approximately 10,000 small and medium-sized firms, and more than 200 sector specific industrial trade associations.

All of the trade agreements under investigation have been "unambiguously" positive for the U.S. economy.

NAFTA

NAFTA has been an important source of U.S. manufacturing export growth. "The U.S. merchandise trade deficit with Mexico is mainly caused by U.S. oil imports and U.S.-Mexico trade in the highly integrated automotive sector." GDP in motor vehicles increased at an average annual rate of 4.8 percent during 1995-99 (while the rest of GDP grew at 3.8 percent.) In addition, "NAFTA has contributed to making U.S. manufacturing firms more

---

[5] Maria Strong, Vice President and General Counsel, International Intellectual Property Alliance, written submission to the Commission, Feb. 14, 2003.

[6] Trade-related aspects of intellectual property rights.

[7] Frank Vargo, Vice President, International Economic Affairs, National Association of Manufacturers, written submission to the Commission, Mar. 31, 2003.

globally competitive by permitting easier access to cheaper industrial inputs and allowing bigger companies to reallocate resources in such a way as to facilitate just-in-time manufacturing and outsource low-skill, low-pay activities to Mexico while retaining high-skill, high wage activities in the United States." NAFTA has improved regional competitiveness by "facilitating the improvement of North America's transport infrastructure." "NAFTA has not shifted U.S. foreign direct investment in manufacturing to Mexico and Canada." "Foreign direct investment from other countries into Mexico and Canada, ... has increased under NAFTA" sustaining stable economies in these countries that "benefit U.S. economic and national security interests."

Uruguay Round

The URA has "benefitted U.S. manufacturing in multiple ways." It has cut industrial tariffs, most importantly in the zero-for-zero or tariff-harmonization agreements that eliminated tariffs for major industrial sectors among a critical mass of participating countries. It has also incorporated intellectual property right protection into the system of global trading rules; improved the GATT subsidies code; made progress in defining and proscribing the use of certain trade-related investment measures by governments; and established a binding dispute mechanism for resolving government-government commercial disputes. Although the effects of the URA were generally positive, they failed to increase "effective market access for U.S. manufactured exports to the newly industrializing economies of developing nations."

Services[8]

Overview

In 2001, the service sector accounted for $6.2 trillion, or 66.9 percent, of real gross domestic product (GDP) and employed 79 million workers, representing 63.2 percent of the U.S. workforce.[9] Financial services accounted for 29.9 percent of the total value of the sector; retail trade for 15.4 percent; transportation and public utilities for 12.7 percent; and wholesale trade for 12.1

---

[8] For the purposes of this investigation, principal service sectors include transportation and public utility services, wholesale trade, retail trade, financial services, and other services, the latter of which includes business services and most professional services.

[9] U.S. Department of Commerce, Bureau of Economic Analysis (BEA), *Industry Accounts Data*, found at *http://www.bea.doc.gov/bea/dn2/gpo.htm*, retrieved Dec. 18, 2002.

percent during the same year.[10] During 1987-2001,[11] real GDP in the service sector increased at an average annual rate of 3.8 percent.[12]

The United States is the world's largest exporter and importer of services. U.S. services exports grew 8.3 percent annually during 1987-2001, and totaled $243.3 billion in 2001,[13] which represented approximately 20 percent of global services.[14] In 2000, other major service exporters such as the United Kingdom, Germany, France, and Japan each accounted for less than 10 percent of global service exports. In 2001, the United States imported services valued at $175.8 billion.[15] This level reflected average annual growth of 4.5 percent, and likely represented approximately 15 percent of global imports.[16] No other country accounted for more than 10 percent of global services imports. In 2001, the United States enjoyed a services trade surplus of $67.5 billion, the largest in the world.

U.S. service firms have significantly expanded their presence in foreign markets in recent years. U.S. direct investment stock in foreign service affiliates measured $1.4 trillion in 2001, reflecting 19.3 percent average annual growth during 1987-2001.[17] By 2001, U.S. outbound investment stock in service affiliates accounted for 65 percent of total U.S. direct investment abroad.[18] In 2001, the U.S. investment position in service industries was largest in finance; wholesale and retail trade; computer-related services; communication services; and electric, gas, and sanitary services.[19] As a

[10] Ibid.

[11] The services sector discussion focuses on the period 1987-2001 because reliable data for the sector are not available prior to 1987, and the two subject trade agreements that entered into force prior to 1987 did not address the services sector.

[12] U.S. Department of Commerce, BEA, *Industry Accounts Data*, found at *http://www.bea.doc.gov/bea/dn2/gpo.htm*, retrieved Dec. 18, 2002.

[13] Ibid.

[14] Organization for Economic Cooperation and Development (OECD), *Services: Statistics on International Transactions: Partner Country Data and Summary Analysis, 1999-2000,* July 2002, p. 8. Approximations of global export shares are based on 2000 data.

[15] U.S. Department of Commerce, BEA, *Survey of Current Business*, Oct. 2002, p. 67. Import data have been deflated using the implicit price deflator for gross domestic product (base year 1996).

[16] Ibid., and OECD, *Services: Statistics on International Transactions* July 2002, p. 8. Approximations of global import shares are based on 2000 data.

[17] U.S. Department of Commerce, BEA, *Survey of Current Business,* Aug. 1990, p. 98; and July 2001, p. 29.

[18] U.S. Department of Commerce, BEA, *Survey of Current Business*, Sept. 2002, pp. 95-96.

[19] Ibid., pp. 95-96.

consequence of direct investment overseas, U.S. service firms' sales through affiliates exceeded cross-border exports by 42 percent in 2000.[20]

Labor productivity in the services sector grew slowly, averaging 1.2 percent per annum during 1987-2001, despite rapid acceleration in productivity growth in the years following 1995. Yet, there was significant variation in productivity growth among the service industries. Labor productivity in the wholesale trade industry increased by an average annual rate of 4.5 percent; retail trade by 2.5 percent; finance by 2.3 percent, and transportation and public utilities by 2.0 percent. Other services, however, exhibited little change in productivity during the period.[21] Further disaggregation shows greater divergence within these broad industry groupings. Several service industries, including the securities, banking, telecommunication, energy and water utilities, wholesale trade, and retail trade service industries, rank very high in labor and total factor productivity growth.[22] Productivity growth in these industries is greater than that in nondurable goods manufacturing, and comparable to that in durable goods manufacturing. At the other end of the spectrum are health services, education, air transportation, business services, and many professional services, which exhibited little productivity growth.[23]

Employment in the service sector increased at an average annual rate of 2.6 percent during 1987-2001.[24] Job creation was slow in the wholesale trade and financial service industries as relatively strong productivity growth moderated demand for workers. By contrast, employment grew rapidly in other services, where overall low productivity levels continued to create demand for additional workers. Wages in the service sector grew by 1.7 percent per annum, on average, during 1987-2001.[25] Wage growth was led by financial services, while wages in the transportation and public utilities industry and the retail trade industry trailed. In 2001, average annual salaries ranged from a high of

---

[20] U.S. Department of Commerce, BEA, *Survey of Current Business*, Oct. 2002, p. 67. Cross-border supply and sales through affiliates are two means of delivering services to foreign consumers. Cross-border supply refers to when a service is delivered to a consumer in a territory that is different from the territory of the service supplier. Affiliate trade occurs when a service supplier establishes a commercial presence in a foreign market.

[21] U.S. Department of Commerce, BEA, *Industry Accounts Data*, found at *http://www.bea.doc.gov/bea/dn2/gpo.htm*, retrieved Dec. 18, 2002.

[22] See USITC, *Recent Trends in U.S. Services Trade*, inv. No. 332-345, May 2001, Pub. 3409, pp. 21-2 to 21-6.

[23] Ibid. Professional services generally require accreditation by a professional body responsible for standards. Business services include services that do not require accreditation, such as data processing services.

[24] U.S. Department of Commerce, BEA, *Industry Accounts Data*, found at *http://www.bea.doc.gov/bea/dn2/gpo.htm*, retrieved Dec. 18, 2002.

[25] Ibid.

$161,879 for securities and commodities brokers to a low of $22,759 for workers in personal services, such as laundry, cleaning, and garment services.[26]

Technological change, particularly in the area of information technology, has resulted in the creation of new service industries and the transformation or reform of long established industries. Internet services provision, energy and financial derivatives trading, and pay-per-view entertainment services are examples of new services enabled by the application of advanced computer and communication technologies. The parameters of competition in professional services, such as advertising and architectural services, have been transformed by the advent and application of new information technologies. The Internet has compelled advertising firms to develop the ability to create and effectively target Internet advertisements.[27] Communications technology has enabled many professional and business services, such as architectural and engineering firms, to operate a virtual 24-hour office, relaying design work from offices on one continent to another, allowing work on time-sensitive projects to continue around the clock. Architectural and engineering firms enhanced the benefits of the 24-hour virtual offices by employing new computer assisted design (CAD) technology. Communications and computer technology have also benefitted the transportation and distribution industries by enabling firms to improve their logistics and tracking services. Information technologies, such as cellular communications and multi-firm interaction over electricity networks, have often been the focus of reform within the telecommunication and energy services industries.

Outsourcing has also had a significant impact on the service sector as service firms have focused on developing highly differentiated and high quality services while reducing operating costs. Air transporters buying the services of freight forwarders, wholesale traders and retailers buying advertising services, or a commodities or securities broker paying another broker to execute a specific trade are examples of outsourcing. In the transportation and public utilities sector, real intermediate inputs (a proxy for outsourcing) increased by 4.5 percent per annum, on average, during 1987-2000; in wholesale services, by 4.6 percent; in retail services, by 2.9 percent; in financial services, by 4.6 percent; and in other services, by 6.7 percent. Intermediate inputs as a share of gross output increased in real terms in the transportation and public utilities, financial, and other service industries during 1987-2000.[28] Surveys conducted

---

[26] U.S. Department of Commerce, BEA, *Survey of Current Business*, Aug. 2002, Table 6.6C, p. 81.

[27] USITC, "Internet Advertising," *Industry, Trade, and Technology Review*, Sept. 1998, pp. 1-16.

[28] U.S. Department of Commerce, BEA, *Survey of Current Business*, June 2000, p. 52; and Nov. 2001, p. 32.

by the Outsourcing Institute in 1997 showed that companies with more than $80 million in annual revenues increased outsourcing by 26 percent in that year alone. Reportedly, information technology was the fastest growing outsourced activity, followed by human resources, marketing and sales, and financial services.[29]

Effect of Trade Agreements on the Sector

While the subject trade agreements have contributed to increased trade in services, their effects are likely overshadowed by external market conditions. Trade in services was not covered by the Tokyo Round of Multilateral Trade Negotiations or the U.S.-Israel FTA, and therefore the agreements are not addressed in the following discussion. The U.S.-Canada FTA provided for a partial liberalization of trade in services that was subsequently expanded by the NAFTA to include virtually all aspects of cross-border trade in services. NAFTA also provides for enhanced access and for fair, transparent, and non-discriminatory treatment in the provision of cross-border services between NAFTA members. NAFTA also establishes governing principles and rules covering temporary access, which is vitally important to many service providers. Generally, U.S. service firms face more favorable market access and national treatment conditions in Canada and Mexico than they did before NAFTA. One of the major achievements of the Uruguay Round was the General Agreement on Trade in Services (GATS). The GATS improved legal certainty and regulatory transparency, and discouraged the implementation of new trade impediments where commitments had been scheduled. However, GATS commitments generally bound current market conditions and, while preventing a worsening of the trade regime, did not achieve significant trade liberalization.[30]

U.S.-Canada FTA[31]

U.S.-Canadian trade in services increased at an average annual rate of 5.6 percent during 1989-2001, reaching $42.4 billion at the end of the period.[32] U.S. exports of services to Canada totaled $13.3 billion in 1989, and reached $24.3 billion in 2001, a 5.1 percent average annual increase (table 5-3). U.S.

---

[29] Claude E. Barfield and Cordula Thum, *The New World of Services: Implications for the United States* (Miami: Institute for International Professional Services, 2001), p. 13.

[30] USTR, *WTO Services Trade Negotiations,* found at *http://www.ustr.gov/sectors/services/gat.pdf,* retrieved June 3, 2003.

[31] The U.S.-Canada FTA includes several sections relating to services including investment, temporary entry, and financial services.

[32] U.S. Department of Commerce, BEA *Survey of Current Business,* Oct. 2002, pp. 86-107; Oct. 1999, pp. 68-81; Nov. 1996, pp. 86-99; Sept. 1994, pp. 107-116.

Table 5-3
Services: U.S. trade with Canada and Mexico, 1988-2001

Year	1988	1989	1990	1991	1992	1993	1994
	Million dollars						
U.S. import value							
Canada	8,350	8,640	9,130	9,716	8,688	9,223	10,132
Mexico	5,068	5,976	6,731	7,056	7,269	7,410	7,849
All other	67,584	70,679	82,349	83,162	84,422	91,307	101,120
Total	81,002	85,295	98,210	99,934	100,379	107,940	119,101
	Percent						
U.S. import growth							
Canada	-	3.5	5.7	6.4	-10.6	6.2	9.9
Mexico	-	17.9	12.6	4.8	3.0	1.9	5.9
All other	-	4.6	16.5	1.0	1.5	8.2	10.7
Total	-	5.3	15.1	1.8	0.4	7.5	10.3
Canada/Total	10.3	10.1	9.3	9.7	8.7	8.5	8.5
Mexico/Total	6.3	7.0	6.9	7.1	7.2	6.9	6.6
	Million dollars						
U.S. export value							
Canada	10,703	13,323	15,684	17,750	17,380	16,971	17,216
Mexico	4,911	4,822	8,590	9,666	10,492	10,440	11,344
All other	85,357	99,790	112,958	125,021	135,816	144,177	158,797
Total	100,971	117,935	137,232	152,437	163,688	171,588	187,357
	Percent						
U.S. export growth							
Canada	-	24.5	17.7	13.2	-2.1	-2.4	1.4
Mexico	-	-1.8	78.1	12.5	8.5	-0.5	8.7
All other	-	16.9	13.2	10.7	8.6	6.2	10.1
Total	-	16.8	16.4	11.1	7.4	4.8	9.2
Canada/Total	10.6	11.3	11.4	11.6	10.6	9.9	9.2
Mexico/Total	4.9	4.1	6.3	6.3	6.4	6.1	6.1

See footnotes at end of table.

Table 5-3—*Continued*
Services: U.S. trade with Canada and Mexico, 1988-2001

Year	1995	1996	1997	1998	1999	2000	2001
	Million dollars						
U.S. import value							
Canada	11,160	12,451	13,923	15,487	15,559	17,130	18,133
Mexico	7,930	8,918	9,830	9,816	9,434	10,999	10,954
All other	109,691	115,733	128,038	142,163	148,248	173,931	163,218
Total	128,781	137,102	151,791	167,466	173,241	202,060	192,305
	Percent						
U.S. import growth							
Canada	10.1	11.6	11.8	11.2	0.5	10.1	5.9
Mexico	1.0	12.5	10.2	-0.1	-3.9	16.6	-0.4
All other	8.5	5.5	10.6	11.0	4.3	17.3	-6.2
Total	8.1	6.5	10.7	10.3	3.4	16.6	-4.8
Canada/Total	8.7	9.1	9.2	9.2	9.0	8.5	9.4
Mexico/Total	6.2	6.5	6.5	5.9	5.4	5.4	5.7
	Million dollars						
U.S. export value							
Canada	17,927	19,492	20,484	19,126	21,105	23,465	24,276
Mexico	8,705	9,442	10,799	11,629	12,643	14,104	14,580
All other	177,136	193,699	207,701	213,177	222,744	239,909	227,353
Total	203,768	222,633	238,984	243,932	256,492	277,478	266,209
	Percent						
U.S. export growth							
Canada	4.1	8.7	5.1	-6.6	10.3	11.2	3.5
Mexico	-23.3	8.5	14.4	7.7	8.7	11.6	3.4
All other	11.5	9.4	7.2	2.6	4.5	7.7	-5.2
Total	8.8	9.3	7.3	2.1	5.1	8.2	-4.1
Canada/Total	8.8	8.8	8.6	7.8	8.2	8.5	9.1
Mexico/Total	4.3	4.2	4.5	4.8	4.9	5.1	5.5

Source: Compiled by the U.S. International Trade Commission based on data provided by the U.S. Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business*.

imports of services from Canada totaled $8.6 billion in 1989, and reached $18.1 billion in 2001, a 6.4 percent average annual increase. Over the period, the U.S. services trade surplus with Canada increased by an average annual rate of 2.3 percent.

Although the data indicate growing trade between the United States and Canada, there is limited evidence that the U.S.-Canada FTA has had a significant effect on trade between the two countries. In 1989, U.S.-Canadian trade accounted for 10.8 percent of total U.S. trade in services. This figure declined fairly consistently until 2001, when Canada accounted for 9.2 percent of the total. Although trade with Canada was growing, U.S. trade with other countries was growing at a faster rate. During 1989-2001, U.S.-Canadian trade in services grew at an annual rate of 5.6 percent, slightly less than the average growth rate of 7.0 percent for total U.S. trade in services with all countries. This slower-than-average pace allowed the United Kingdom to supplant Canada as the second largest export market for U.S. services in 2001.

Data for individual industries within the services sectors reaffirm the limited effects of the U.S.-Canada FTA. Within the services sector, the travel industry accounts for the largest portion of U.S. cross-border trade, both for Canada and all countries in total. U.S. trade with Canada in the travel industry totaled $13.0 billion in 2001 and accounted for 30.6 percent of all U.S.-Canadian services trade. U.S. travel exports to Canada increased at an average annual rate of 1.6 percent during 1989-2001, far below the growth rate for all countries.

NAFTA

U.S. trade in services with Canada increased at an average annual rate of 6.5 percent during 1994-2001, reaching $42.4 billion at the end of the period.[33] U.S. exports of services to Canada totaled $17.2 billion in 1994, and reached $24.3 billion in 2001, a 5.0 percent average annual increase. U.S. imports of services from Canada totaled $10.1 billion in 1994, and reached $18.1 billion in 2001, an 8.7 percent average annual increase. As imports rose faster than exports, the U.S. trade surplus in services declined 2.0 percent during the period. U.S.-Mexican trade in services increased at an average annual rate of 4.2 percent during 1994-2001, totaling $25.5 billion.[34] U.S. exports of services to Mexico totaled $11.3 billion in 1994 and $14.6 billion in 2001, which represented a 3.7 percent average annual increase. U.S. imports of services

[33] U.S. Department of Commerce, BEA, *Survey of Current Business,* Oct. 2002, pp. 86-107; Oct. 1999, pp. 68-81; Nov. 1996, pp. 86-99; Sept. 1994, and pp. 107-116.

[34] Ibid.

from Mexico totaled $7.9 billion in 1994 and $11.0 billion in 2001, a 4.9 percent average annual increase.[35] Trade with Mexico accounted for 6.3 percent of all U.S. services trade in 1994 and 5.6 percent in 2001.

Trade in services between the United States and Canada and Mexico has increased steadily since the NAFTA entered into force, yet the correlation between the growth in trade and any trade creating effects of the Agreement appear to be low. For example, although U.S.-Canadian trade in business, professional, and technical services,[36] rose by an annual rate of 15.2 percent during 1994-2001, the growth was likely due to factors other than the NAFTA, as there were few barriers to such trade in place before 1994. Generally, these services became more prominent because demand for them increased significantly during the economic expansion of the late 1990s. In contrast, financial services is one service industry where the effects of NAFTA are regarded as significant. NAFTA has raised foreign investment ceilings, thereby facilitating greater investment by U.S. banking and security firms in Mexico.

Uruguay Round

One of the major achievements of the Uruguay Round was the General Agreement on Trade in Services (GATS), the first multilateral, legally enforceable agreement on trade and investment in services. The GATS comprises a framework of general regulatory obligations, schedules wherein WTO Members identify market access and national treatment commitments, and annexes that specify the parameters of negotiations and establish work programs as necessary. The GATS improved legal certainty and regulatory transparency, and discouraged the implementation of new trade impediments where commitments had been scheduled. However, because WTO members' market access and national treatment commitments generally bound the status quo, the GATS did not achieve significant trade liberalization.[37]

Data for the period suggest that the GATS had little or no effect on U.S. cross-border services trade. On average, U.S. cross-border services exports increased at a slower annual rate during the five years following the GATS' entry into force–5.9 percent–than in the five years prior, when exports increased by 8.1 percent annually. This, combined with relatively rapid import growth in the latter period, resulted in a 2.7-percent average annual growth in the U.S. service trade surplus during 1995-99, compared to 15-percent average annual growth during 1990-94.[38]

---

[35] U.S. exports of services to Mexico were disrupted in 1995, 1996, and, to a lesser extent, in 1997 by effects of the peso devaluation on Mexico's economy.

[36] U.S.-Canadian trade in business, professional, and technical services accounted for 11.9 percent of total U.S. trade in services in 2001.

[37] USTR, *WTO Services Trade Negotiations,* found at *http://www.ustr.gov/sectors/services/gat.pdf,* retrieved June 3, 2003.

[38] U.S. Department of Commerce, BEA, *Survey of Current Business*, Oct. 2002, p. 67. During 1995-99, services trade reflected broad economic currents as well as trade

Although the GATS did not fully liberalize cross-border trade, its provisions regarding the establishment of a commercial presence appear to have contributed to the rise in U.S. direct investment abroad during the 1990s, and consequent increased sales of services through foreign affiliates. Such sales grew at an average annual rate of 16.8 percent during 1995-99.[39] Bolstered by the strong growth in foreign direct investment, U.S. parent firms' stock in foreign service affiliates increased by 14 percent per annum, on average, during 1990-98.[40]

Views of Interested Parties

Air Transportation Association[41]

The Air Transportation Association (ATA) is the principal trade and service organization of the U.S. scheduled airline industry.

Of the 5 subject trade agreements, only the URA covers commercial air transport although the ATA generally supports all of these and other agreements that liberalize trade with foreign partners. However, some free trade agreements, such as the U.S.-Singapore FTA, cover express delivery services similar to those provided by certain ATA members. Even so, there is not yet industry consensus on this approach to liberalization.

The URA, particularly the General Agreement on Trade in Services (GATS), covers limited aspects of commercial air transportation. The GATS Annex on Air Transport Services covers three sub-sectors, two of which the United States has taken exemptions on. ATA supports the U.S. government position that liberalization of air transportation services can best be achieved under the current, broad exclusion from the GATS of most activities in this sector. ATA believes that the existing venues and mechanisms for air transport liberalization are sufficient.

---

[38]—*Continued*

agreements. Export prospects were likely dampened in the latter 1990s by relatively weak economic growth in continental Europe and Japan, the principal U.S. services export markets. For example, average annual growth of gross domestic product during 1995-99 measured 2.3 percent in France, 1.5 percent in Germany, and 1.0 percent in Japan. By contrast, U.S. gross domestic product averaged 4.1-percent annual growth during this period, which stimulated services imports. OECD, *Quarterly National Accounts, No. 1, 2000*.

[39] U.S. Department of Commerce, BEA, *Survey of Current Business*, Oct. 2002, p. 67.

[40] USITC, *Examination of U.S. Inbound and Outbound Direct Investment*, Jan. 2001, Pub. 3383, p. 3-22.

[41] Edward A. Merlis, Senior Vice President, Legislative and International Affairs, Air Transportation Association written submission to the Commission, Jan. 21, 2003.

Machinery and Electronics[42]

Overview

The United States is the world's largest producer and consumer of machinery and electronic products. The sector includes a large and extremely diverse group of industries that manufacture products ranging from cellular telephones to farm tractors. The electronics subsector, which is dominated by the computer hardware, communications equipment, and electronic component industries, has significantly expanded and evolved since the implementation of the Tokyo Round Agreements in 1980. The machinery subsector, on the other hand, is primarily composed of mature industries such as those producing refrigeration and heating equipment, construction machinery, and farm equipment that, for the most part, have changed comparatively little during this period. Despite apparent differences, the two subsectors share certain characteristics. They are both dominated by a relatively small number of producers that are headquartered primarily in the United States, Japan, the EU, and Korea. Further, industries in both subsectors tend to be globalized in terms of production, sourcing of inputs, and sales.

U.S. shipments of machinery and electronics, as a group, increased at a relatively modest average annual rate of 2.5 percent, from $488.1 billion to $833.5 billion[43] during 1978-2000 (table 5-4). Most of this growth occurred during the last 10 years of the period aided by the vibrant U.S. economic expansion of 1991-2000 and sharply increasing demand for sector products. U.S. apparent consumption of sector products increased by 79 percent during 1991-2000. However, the value of shipments and apparent consumption each fell by 18 percent when this expansion ended in 2001. Growth rates for individual subsectors did not necessarily follow the same trends; factors affecting production and demand differed widely, causing shipment, employment, and wage trends to move independently of one another. The share of total sector shipments from each subsector changed appreciably during the period. Electronic components and communications equipment, which each accounted for more than 7 percent of the value of sector shipments in 1978, had increased to 18 percent and 12 percent, respectively, in 2001 while the share accounted for by computer and office equipment increased from 9 percent to 12 percent. During the same period, the share of the sector total that comprises construction, mining, and materials handling equipment decreased from 12 percent to 7 percent, and the general industrial equipment share decreased from 8 percent to 6 percent.

---

[42] For the purposes of this investigation, the machinery and electronics sector includes all industries classified in groups 35 and 36 of the Standard Industrial Classification of 1987. This sector also includes electrical equipment. Although computer equipment and office machinery is classified in SIC group 35 with industrial and commercial machinery, in this chapter it will be treated as part of the electronics subsector.

[43] In real (1996) dollars.

Table 5-4
Machinery and electronics sector:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
						Billions of constant (1996) dollars						
Shipments	488.1	521.8	520.3	524.4	479.5	484.6	531.0	526.6	509.1	513.1	538.2	541.4
Imports	45.7	49.4	51.9	55.5	53.7	64.0	86.6	92.2	105.2	114.9	131.4	133.3
Exports	72.6	80.7	92.6	94.7	82.6	74.2	76.9	72.9	71.8	80.2	99.3	107.1
Apparent consumption	461.2	490.5	479.5	485.2	450.6	474.4	540.7	545.9	542.6	547.9	570.3	567.7
Trade balance	26.7	31.4	40.8	39.2	28.9	10.2	-9.7	-19.4	-33.4	-34.7	-32.1	-26.3
						Percentage						
Imports/apparent consumption	9.9	10.1	10.8	11.4	11.9	13.5	16.0	16.9	19.4	21.0	23.0	23.5
Exports/shipments	14.9	15.5	17.8	18.1	17.2	15.3	14.5	13.8	14.1	15.6	18.5	19.8
						1,000 workers						
Total employment	4,046	4,301	4,288	4,294	3,965	3,756	4,086	4,054	3,864	3,777	3,853	3,869
Production workers	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	2,368	2,383
						Constant (1996) dollars						
Hourly earnings	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	13.06	12.94
						$1,000 per worker						
Labor productivity	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	227	227

See footnotes at end of table.

Table 5-4—*Continued*

Machinery and electronics sector:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Billions of constant (1996) dollars											
Shipments	526.3	498.3	516.7	544.1	603.5	667.5	702.4	738.2	741.2	750.8	833.5	680.5
Imports	130.2	129.5	141.9	159.8	191.7	225.6	227.0	241.9	250.4	276.0	320.6	264.8
Exports	117.7	120.8	125.4	133.2	152.0	175.3	183.6	207.3	196.2	199.9	226.6	186.7
Apparent consumption	538.7	507.0	533.2	570.7	643.2	717.8	745.8	772.9	795.4	827.0	927.5	758.5
Trade balance	-12.5	-8.7	-16.4	-26.6	-39.7	-50.3	-43.4	-34.7	-54.2	-76.1	-94.1	-78.1
	Percentage											
Imports/apparent consumption	24.2	25.5	26.6	28.0	29.8	31.4	30.4	31.3	31.5	33.4	34.6	34.9
Exports/shipments	22.4	24.2	24.3	24.5	25.2	26.3	26.1	28.1	26.5	26.6	27.2	27.4
	1,000 workers											
Total employment	3,768	3,591	3,457	3,456	3,560	3,692	3,775	3,857	3,913	3,808	3,847	3,642
Production workers	2,315	2,192	2,123	2,144	2,243	2,340	2,377	2,433	2,463	2,390	2,396	2,210
	Constant (1996) dollars											
Hourly earnings	12.83	12.81	12.81	12.82	12.84	12.79	12.96	13.21	13.44	13.69	13.81	13.90
	$1,000 per worker											
Labor productivity	227	227	243	254	269	285	296	303	301	314	348	308

[1] Includes SIC 35 (industrial and commercial machinery and computer equipment) and 36 (electronic and other electrical equipment and components, except computer equipment).

[2] Not available.

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of Economic Analysis and Bureau of the Census; and U.S. Department of Labor, Bureau of Labor Statistics.

Production increases were more than matched by gains in labor productivity so that the increase in sector output coincided with a decrease in sector employment. Total employment for machinery and electronics decreased slightly, from 3.7 million in 1978 to 3.6 million in 2001, and fluctuated between 3.4 million and 3.9 million during the interim. Real average wages for production workers in the group increased by 7 percent from $13.08/hour to $13.98/hour during 1988-2001,[44] while labor productivity increased by 36 percent from $227,000 per worker to $308,000 per worker.

The electronics subsector, especially communications equipment, computer equipment, and electronic components, led sector growth during the period. The real value of electronic component shipments more than quadrupled between 1978 and 2000, while the real value of communications equipment and computer and office equipment nearly tripled. However, shipments of each of these products decreased significantly during 2001. Productivity gains were especially high for electronics subsector industries such as communications equipment and electronic components. Output per production worker increased by 110 percent in the communications equipment industry and by 58 percent in the electronic components industry during 1988-2001.

The electronics subsector's significant growth in output and productivity reflects a pervasive transformation shaped by technological advances, huge growth in U.S. and global demand for subsector products, increasing globalization, and intense competition. Throughout this transformation, the U.S. electronics subsector has been a leading innovator in industries such as telecommunications and computer equipment, and semiconductors. U.S. innovative strength has led to continuous improvements in manufacturing technology which allowed the production of ever-smaller integrated circuits (chips) containing an ever-larger number of components. Since chips are the heart of most electronic devices, these improvements led to lower prices relative to performance and contributed to the growth and development of the computer and telecommunications equipment industries. Lower prices, in turn, created new markets for chips in high volume end uses such as children's toys, home appliances, and automobiles.[45] In fact, the share of the total cost of an average automobile accounted for by electronic components increased from approximately 1 percent in 1980 to between 8 and 15 percent in 2000.[46]

---

[44] Employment and wage data were not available for all production workers in these groups prior to 1988 due to changes in classification.

[45] Thomas Walter Smith, "Semiconductors", July 18, 2002, Standard & Poors Industry Survey, p.1, found at *http://www.netadvantage.standardandpoors/netahtml/IndSur/sec/sec30702.htm,* retrieved Nov. 2, 2002.

[46] U.S. Department of Commerce, "Microelectronics," *U.S. Industry and Trade Outlook 2000* (New York, NY: McGraw-Hill, 2000), p. 16-1.

The introduction of the IBM personal computer (PC) in 1981 and commercial cellular telephone service in 1983 contributed significantly to the growth of the electronics subsector. IBM's decision to use open architecture in its PC design spawned competition that could use off-the-shelf components to create IBM clones. This decision and the adoption of Microsoft DOS in the 1980s, which standardized computer operating systems, made personal computers a product that could be easily mass produced to meet escalating demand. The creation of a cellular telephone infrastructure, its subsequent upgrades, and the demand for cellular handsets with the latest features have driven much of the growth of the telecommunications equipment industry and have increased the number of new players in the U.S. market.

The 1984 breakup of the AT&T monopoly in local telecommunication service and the spinoff of Lucent Technologies from AT&T in 1996 promoted greater competition among telecommunications equipment manufacturers for sales to U.S. local and long distance service providers that had previously relied on in-house production. The creation of the Worldwide Web in 1989 vastly increased the resources available through the personal computer and greatly enhanced its value as a communications tool. In addition, the privatization of European telecommunication service providers and the liberalization of the markets for these services during the 1980s and 1990s forced these entities to increase their investment in communications equipment to remain competitive with new entrants to the market, thereby creating new export opportunities for U.S. firms.[47]

The leading position of the U.S. electronics industry in advanced technologies throughout the period was supported by significant investment in research and development, an educated and technically skilled workforce, and numerous institutions of higher learning with curricula tailored to electronic and computer engineering.[48] Strong competition within the U.S. market has promoted the flexibility required to adapt to changing market conditions, and U.S. firms were often among the first to adopt new, more efficient, business models.[49] For example, in recent years, many U.S. firms have turned to outsourcing, contract manufacturing, and production sharing in lower wage countries to reduce costs and focus production on higher value operations. This approach allows many firms to remain competitive despite the most significant competitive weakness of the U.S. electronics industry—its relatively higher labor costs vis-à-vis emerging suppliers Asia, Mexico, and Eastern Europe.[50]

---

[47] Multimedia Telecommunications Association, *1998 Multimedia Telecommunications Market Review and Forecast* (Arlington, VA: MMTA Market Research Board, 1998), pp. 12-13.

[48] National Science Foundation, "Higher Education in Science and Engineering," in *Science and Engineering Indicators 2002* (Arlington, VA: National Science Board, 2002), vol. 1, pp. 2-1 to 2-50.

[49] Stephen Shankland, "High-tech Manufacturers Add Brains to Brawn," *Cnet News.Com*, Aug. 18, 2000, found at *http://news.cnet.com*, retrieved Apr. 4, 2001.

[50] Deutsche Bank Securities, Inc., Global Equity Research, *Supply and Demand: Uneven Odds*, Jan. 17, 2003, p.12.

The machinery subsector has not undergone the dramatic transformations that have characterized the electronics industry since 1980. Whereas changes in the electronics sector created new markets and stimulated demand for a wide variety of new products and services, the machinery sector, for the most part, manufactured products for traditional markets and end uses. Products such as construction and farm machinery typically are durable and not much innovation occurs from year to year so that sales are driven by factors such as crop prices and interest rates rather than technological advances. Many types of heating, air conditioning, farm, construction, and mining equipment have become marginally more efficient during this period or more environmentally friendly, although they have remained largely unchanged. Demand for machinery products is affected by a number of cyclical factors and, for the most part, moves with general economic upswings and downturns. Interest rates have a large impact on demand because most major machinery purchases are financed. Construction machinery is affected by the level of construction activity and government spending on public buildings, roads and other infrastructure. Mining equipment is affected by many of the same factors– a large share of this equipment is used to quarry stone and gravel used by the construction industry– and by the price of various minerals and metals. Farm equipment sales typically rise and fall with interest rates and crop prices.

The number of production workers employed in the machinery subsector as a whole remained steady at 1.2 million during 1988-2001,[51] while production increased by 27 percent. Productivity gains were among the highest in the construction machinery, refrigeration and heating equipment, and farm machinery subsectors, each increasing by 30 percent or more during the period. Wages for production workers in these three subsectors increased by an average of 35 percent.

Globalization and consolidation increased in industries such as farm machinery, construction equipment, and heating, ventilation, and air conditioning (HVAC) equipment. Major manufacturers of farm machinery such as John Deere, Case, Caterpillar, AGCO, and New Holland and HVAC equipment such as York, Trane, and Rheem, are multinational businesses that manufacture throughout the world, producing equipment to meet local market needs.[52] The United States and Canada have been the largest producers of high-horsepower farm equipment during the period, while Europe has dominated the production of mid-range equipment, and Japan has been the world's leading producer of small-scale equipment. Despite the growing number of production facilities located in foreign markets by U.S.-headquartered firms, export sales continue to account for a significant share of U.S. machinery production.

---

[51] Employment data were not available for this subsector prior to 1988.

[52] U.S. Department of Commerce, "Production Machinery," *U.S. Industry and Trade Outlook 2000* (New York, NY: McGraw-Hill, 2000), p. 18-8; York International Corporation, 2002 Form 10-K; American Standard Companies Inc. 2002 Form 10-K, and *About Rheem* found at www.rheemac.com/press/081402.html, retrieved May 28, 2003.

Effect of Trade Agreements on the Sector

Although the subject trade agreements are not the primary factors driving the expansion of the sector, they addressed a broad range of trade issues that contributed to the expansion (table 5-5). Four of the five trade agreements– Tokyo Round Agreements, the U.S.-Canada FTA, NAFTA, and the Uruguay Round agreements– likely had measurable positive effects on U.S. sector trade. The U.S.-Israel FTA did not have a measurable effect on U.S. trade primarily because Israel accounts for such a small share of total sector trade. The Uruguay Round Agreements likely had a significant effect on trade of electronic equipment through the Information Technology Agreement and the Basic Telecommunications Agreement. The former eliminated tariffs on many information technology products in most major markets and the latter opened telecommunications services to competition in all major markets which, in turn, spurred demand for telecommunications equipment.

However, most of the growth in production and trade that has taken place in the U.S. machinery and electronics industry since 1980 can be attributed to factors other than the 5 trade agreements that are the subject of this investigation (table 5-20). These factors include very strong growth in demand, the development of new technologies and applications; increased deregulation and privatization of the telecommunication services industries (the major customers for telecommunications equipment); the rapid evolution of wireless communications, data communications, and Internet services;[53] increased production sharing and global outsourcing of equipment and components by U.S., EU, Japanese, and Canadian producers. Macroeconomic factors such as exchange rate fluctuation and economic crises in Mexico (1995) and several Asian countries (1998) have also had a major impact on sector trade. As discussed below the magnitude of these effects on the U.S. economy varies among the 5 agreements.

Tokyo Round

The effect of Tokyo Round agreements on the U.S. machinery and electronics sector was modest at best. The trade-weighted average tariff concessions by the EC, Canada, and Japan for sector imports from the United States were 2.1 percentage points, 5.3 percentage points, and 7.8 percentage points, respectively. The trade-weighted average U.S. tariff on sector imports was relatively low (5.4 percent) during 1979, the year prior to the entry into force of the agreement, and had fallen only 2.5 percentage points by 1987, the year of the final tariff reduction under the agreement. Increased trade during this period can be primarily attributed to factors discussed above such as privatization and technological advances in the electronics industry, rather than trade liberalization.

---

[53] Telecommunications Industry Association (TIA), *2001 MultiMedia Telecommunications Market Review and Forecast* (Washington, DC: TIA, 2001), pp. 3-15.

Table 5-5
Machinery and electronics: Trade issues addressed in trade agreements and U.S. tariffs

Trade issues and U.S. tariffs	Tokyo Round	U.S.-Israel	U.S.-Canada	Uruguay Round	NAFTA[1]
Tariffs[2]	(1979) 5.4% (1987) 2.9%	(1984) 0.6% (1995) 0.2%	(1987) 2.3% (1998) <0.1%	(1994) 2.1% (1999) 0.7%	(1993) 1.2% (2001) 0.1%
Technical barriers	X		X	X	X
Import licensing	X				
Customs valuation	X			X	
Government procurement	X	X	X	X	X
Offsets		X	X		
Rules of origin		X	X	X	X
Restrictions on telecom equipment purchases			X		
TRIMs[3]				X	
TRIPS[4]				X	

[1] The NAFTA provides that tariffs be eliminated by Jan. 1, 2003 for all industrial goods and by Jan. 1, 2008 for all other goods.

[2] Average trade-weighted ad valorem or ad valorem equivalent tariff. Trade weights for the Tokyo Round and Uruguay Round are based on U.S. imports from the world during the years indicated. Trade weights for the bilateral treaties and NAFTA are based on U.S. imports from the relevant countries. Unless otherwise noted, dates n parentheses represent the year immediately prior to the entry into force of the agreement and the year of the final tariff reduction for most products and markets.

[3] Trade-related investment measures.

[4] Trade-related aspects of intellectual property rights.

Source: U.S. Trade Representative, *Annual Report of the President of the United States on the Trade Agreements Program*, various issues; U.S. Trade Representative, *Trade Policy Agenda and Annual report,* various issues; and U.S. International Trade Commission, *Operation of the Trade Agreements Program,* various issues.

The Tokyo Round agreements addressed several market access barriers that were important to the sector such as government procurement and technical barriers although significant obstacles remained. Government procurement was especially important to the telecommunications industry because most telecommunication service providers–the largest customers for telecommunications equipment–were government-owned during the 1980s.

Between 1980, the year of the first stage of the Tokyo Round tariff reductions, and 2000, total U.S. trade in machinery and electronics products increased at an average annual rate of 6.9 percent, reaching $547 billion before dropping by 17.5 percent in 2001. U.S. sector imports increased more than six-fold, reaching $321 billion, while sector exports nearly tripled to $264 billion during 1980-2000. A sector trade surplus of $41 billion in 1980 became a $94-billion deficit by 2000. International trade became increasingly important to the sector during this period as globalization increased and production sharing became a more widely accepted business model. Imports as a share of U.S. apparent consumption increased from approximately 11 percent to 35 percent and exports as a share of shipments increased from 18 percent to 27 percent during 1980-2001.

U.S.-Israel FTA[54]

It is likely that most of the growth in U.S.-Israel sector trade since 1985 has resulted from factors other than the U.S.-Israel FTA because most sector imports already entered the United States duty-free prior to 1985. The average trade-weighted tariff for U.S. imports of sector products from Israel was only 0.6 percent in 1984, and Israel continues to account for a very small share of U.S. sector trade. Although trade has grown steadily since the FTA was signed, Israel still accounts for less than one percent of total sector trade. Further, the FTA did not specifically address product standards, a significant barrier to U.S. trade in electronics products. Israel tends to apply European standards, and this has become a recurring issue in talks between the United States and Israel.

U.S. trade in sector products with Israel increased at an average annual rate of 10.2 percent during 1985-2000 reaching $5.2 billion, before decreasing by 27 percent in 2001. The value of U.S. sector imports from Israel increased by 652 percent during 1985-2000 while sector exports to Israel approximately tripled (table 5-6).

U.S.-Canada FTA

The U.S.-Canada FTA had a moderate effect on U.S. sector trade and production,although factors other than the trade agreement were responsible for most sector growth. The average U.S. trade-weighted tariff on sector imports from Canada was 2.3 percent in 1987 and was almost zero in 1998. Rapidly

[54] The U.S.-Israel FTA was signed in 1985 and was fully implemented by Jan. 1, 1995.

Table 5-6
Machinery and electronics: U.S. trade with Israel, 1984-2001

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992
					Million dollars				
U.S. import value									
Israel	346.5	460.2	465.2	581.9	697.7	679.6	688.2	744.3	872.1
All other	86,247.8	91,765.8	104,720.8	114,307.8	130,706.4	132,636.3	129,483.4	128,748.8	140,984.8
Total	86,594.3	92,226.0	105,186.0	114,889.7	131,404.0	133,315.8	130,171.6	129,493.0	141,856.9
					Percent				
Israel/Total	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.6	0.6
U.S. import growth									
Israel	—	32.8	1.1	25.1	19.9	-2.6	1.3	8.1	17.2
All other	—	6.4	14.1	9.2	14.4	1.5	-2.4	-0.6	9.5
Total	—	6.5	14.1	9.2	14.4	1.5	-2.4	-0.5	9.6
					Millions of constant (1996) dollars				
U.S. export value									
Israel	796.2	747.8	701.6	709.4	845.8	943.6	961.5	1,006.4	907.5
All other	76,125.3	72,111.6	71,061.7	79,435.8	98,421.8	106,110.5	116,738.0	119,787.8	124,508.4
Total	76,921.4	72,859.4	71,763.3	80,145.2	99,267.6	107,054.1	117,699.5	120,794.2	125,415.9
					Percent				
Israel/Total	1.0	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.7
U.S. export growth									
Israel	—	-6.1	-6.2	1.1	19.2	11.6	1.9	4.7	-9.8
All other	—	-5.3	-1.5	11.8	23.9	7.8	10.0	2.6	3.9
Total	—	-5.3	-1.5	11.7	23.9	7.8	9.9	2.6	3.8

See footnotes at end of table.

Table 5-6—*Continued*
Machinery and electronics: U.S. trade with Israel, 1984-2001

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of constant (1996) dollars								
U.S. import value									
Israel	975.9	1,205.7	1,218.8	1,272.7	1,402.1	1,542.9	1,665.5	3,000.9	2,079.8
All other	158,774.9	190,485.1	224,371.4	224,701.0	240,536.4	248,883.9	274,365.2	317,601.8	262,683.2
Total	159,750.8	191,690.8	225,558.2	226,973.7	241,938.5	250,426.8	276,030.8	320,602.7	264,763.1
	Percent								
Israel/Total	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.9	0.8
U.S. import growth									
Israel	11.9	23.6	0.9	4.6	10.2	10.0	8.0	80.2	-30.7
All other	12.6	20.0	17.8	0.6	6.6	3.5	10.2	15.8	-17.3
Total	12.6	20.0	17.7	0.6	6.6	3.5	10.2	16.2	-17.4
	Millions of constant (1996) dollars								
U.S. export value									
Israel	1,169.4	1,268.9	1,698.0	1,803.9	1,640.4	1,637.7	1,972.2	2,211.7	1,708.2
All other	131,978.9	150,755.8	173,561.9	181,783.9	205,616.1	194,561.2	197,928.0	224,340.0	185,006.1
Total	133,148.2	152,024.6	175,259.9	183,587.7	207,256.6	196,198.8	199,900.1	226,551.7	186,714.3
	Percent								
Israel/Total	0.9	0.8	1.0	1.0	0.8	0.8	1.0	1.0	0.9
U.S. export growth									
Israel	28.9	8.5	33.8	6.2	-9.1	-0.2	20.4	12.1	-22.8
All other	6.0	14.2	15.1	4.7	13.1	-5.4	1.7	13.3	-17.5
Total	6.2	14.2	15.3	4.8	12.9	-5.3	1.9	13.3	-17.6

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

growing demand for sector products in both markets and the presence of major electronics producers on both sides of the border to meet this demand were the principal factors spurring trade growth between Canada and the United States during this period. Most of the beneficial effects of the trade agreement were due to the elimination of technical barriers and discriminatory government procurement procedures rather than tariff elimination because tariffs were already relatively low. Trade-weighted average U.S. tariffs on imports of sector products from Canada were 2.3 percent in 1987, the year before the FTA took effect, and had fallen to almost zero by 1998. The positive trade effects were sufficient to have a measurable effect on U.S. sector production and employment because of the large share of total sector trade accounted for by Canada.

Canada was the second-largest U.S. trading partner for sector products in 1988 and has remained among the top three during every succeeding year. U.S. trade with Canada in sector products increased at an average annual rate of 8.4 percent during 1988-2000, reaching $67.0 billion before decreasing 21.5 percent during 2001 (table 5-7). This growth rate exceeded the average growth of 7.3 percent for U.S. sector trade with all countries during 1988-2000. U.S. exports of machinery and electronic products to Canada increased 95.2 percent to $31.9 billion during 1988-2001, and U.S. imports of sector products from Canada increased 124.3 percent to $20.7 billion during the same period. Canada's share of total U.S. sector imports fluctuated between 7.0 percent and 8.9 percent during 1988-2001 while its share of sector exports fluctuated between 15.7 percent and 20.1 percent of the total with neither showing an apparent trend.

NAFTA

NAFTA has had at least a moderate effect on U.S. trade in sector products, although the impact of the factors discussed above, most notably increased U.S. demand, has been greater. The GSP program already provided duty-free treatment for most U.S. sector imports from Mexico. The average U.S. trade-weighted tariff on sector imports from Mexico was only 1.2 percent in 1993 and had decreased to 0.1 percent by 2001. However, NAFTA permanently eliminated tariffs for all sector products, unlike the GSP tariff concessions which were dependent on periodic renewal of the program and regular reviews to determine country and product eligibility. Thus, NAFTA removed much of the risk associated with foreign investment in production operations in Mexico that exported to the United States. It is likely that the Mexican tariff concessions had a small to moderate positive effect on U.S. exports of sector products because Mexico's average trade-weighted tariff on sector imports from the United States decreased significantly (from 13.6 percent to 2.3 percent) during 1991-99,[55] and Mexico's importance as a market for sector

[55] Data were not available for 1993 and 2001.

Table 5-7
Machinery and electronics products: U.S. trade with Canada and Mexico, 1987-2001

Year	1987	1988	1989	1990	1991	1992	1993	1994
	Millions of constant (1996) dollars							
U.S. import value								
Canada	8,327.5	9,223.2	10,377.2	11,289.8	11,499.8	11,773.7	12,460.0	15,242.5
Mexico	6,688.4	8,650.5	9,542.9	9,493.1	9,976.4	11,382.2	12,872.7	17,657.3
All other	99,873.7	113,530.4	113,395.8	109,388.8	108,016.9	118,701.0	134,418.1	158,791.0
Total	114,889.7	131,404.0	133,315.8	130,171.6	129,493.0	141,856.9	159,750.8	191,690.8
	Percent							
Canada/Total	7.3	7.0	7.8	8.7	8.9	8.3	7.8	8.0
Mexico/Total	5.8	6.6	7.2	7.3	7.7	8.0	8.1	9.2
U.S. import growth								
Canada	—	10.8	12.5	8.8	1.9	2.4	5.8	22.3
Mexico	—	29.3	10.3	-0.1	5.1	14.1	13.1	37.2
All other	—	13.7	-0.1	([1])	-1.3	9.9	13.2	18.1
Total	—	14.4	1.5	-2.4	-0.5	9.6	12.6	20.0
	Millions of constant (1996) dollars							
U.S. export value								
Canada	15,088.5	16,330.8	16,848.4	24,127.7	22,459.1	23,434.8	25,355.2	29,356.1
Mexico	6,298.0	8,500.2	9,103.1	9,849.9	11,138.8	13,193.1	13,508.5	16,275.9
All other	58,758.7	74,436.6	81,102.5	83,721.9	87,196.3	88,788.0	94,304.5	106,392.6
Total	80,145.2	99,267.6	107,054.1	117,699.5	120,794.2	125,415.9	133,148.2	152,024.6
	Percent							
Canada/Total	18.8	16.5	15.7	20.1	18.6	18.7	19.0	19.3
Mexico/Total	7.9	8.6	8.5	8.4	9.2	10.5	10.2	10.7
U.S. export growth								
Canada	—	8.2	3.2	43.2	-6.9	4.3	8.1	15.9
Mexico	—	35.0	7.1	8.2	13.1	18.4	2.4	20.5
All other	—	26.7	9.0	3.2	4.2	1.8	6.2	12.8
Total	—	23.9	7.8	9.9	2.6	3.8	6.2	14.2

See footnotes at end of table.

Table 5-7—*Continued*
Machinery and electronics: U.S. trade with Canada and Mexico, 1987-2001

Year	1995	1996	1997	1998	1999	2000	2001
	Millions of constant (1996) dollars						
U.S. import value							
Canada	17,727.3	18,340.9	19,372.3	20,909.3	22,484.6	28,115.6	20,686.9
Mexico	20,511.2	23,607.4	27,597.8	31,470.8	37,280.9	45,233.1	43,211.5
All other	187,349.7	185,025.4	194,968.4	198,046.8	216,265.2	247,254.1	200,864.7
Total	225,558.2	226,973.7	241,938.5	250,426.8	276,030.8	320,602.7	264,763.1
	Percent						
Canada/Total	7.9	8.1	8.0	8.4	8.2	8.8	7.8
Mexico/Total	9.1	10.4	11.4	12.6	13.5	14.1	16.3
U.S. import growth							
Canada	16.3	3.5	5.6	7.9	7.5	25.0	-26.4
Mexico	16.2	15.1	16.9	14.0	18.5	21.3	-4.5
All other	18.0	-1.2	5.6	1.6	9.2	14.3	-18.8
Total	17.7	0.6	6.6	3.5	10.2	16.2	-17.4
	Millions of constant (1996) dollars						
U.S. export value							
Canada	31,762.8	32,464.1	36,458.5	36,436.9	36,711.1	38,890.0	31,884.6
Mexico	15,176.2	18,337.3	23,587.2	24,613.8	26,949.6	31,908.0	25,944.3
All other	128,321.0	132,786.3	147,210.9	134,148.1	136,239.4	155,753.7	128,885.4
Total	175,259.9	183,587.7	207,256.6	196,198.8	199,900.1	226,551.7	186,714.3
	Percent						
Canada/Total	18.1	17.7	17.6	18.6	18.4	17.2	17.1
Mexico/Total	8.7	10.0	11.4	12.6	13.5	14.1	13.9
U.S. export growth							
Canada	8.2	2.2	12.3	-0.1	0.8	5.9	-18.0
Mexico	-6.8	20.8	28.6	4.4	9.5	18.4	-18.7
All other	20.6	3.5	10.9	-8.2	0.8	14.3	-17.3
Total	15.3	4.8	12.9	-5.3	1.9	13.3	-17.6

[1] Less than 0.5 percent.

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

products grew. NAFTA further stimulated cross-border investment in this sector by requiring greater consistency and transparency in Mexico's banking regulations.

Mexico was the second largest export market and import source for U.S. sector products in 1993, the year before the NAFTA entered into force, accounting for 8.1 percent and 10.2 percent of total sector imports and exports, respectively. By 2001, Mexico's import share had more than doubled and it had increased its share of U.S. sector exports to 13.9 percent. U.S. sector trade with Mexico increased at an average annual rate of 14.7 percent during 1994-2000 before decreasing by 10.4 percent in 2001.

Uruguay Round

The Uruguay Round Agreements had a slight to moderate effect on sector trade especially U.S. exports, although most of the increase in U.S. trade following the implementation of the Round can be attributed to factors discussed above. Much of the effect of the Round was due to the Information Technology Agreement (ITA) which eliminated tariffs on all information technology products, such as computers, semiconductors, and telecommunications equipment. Although the agreement entered into force in July 1997, the products subject to the ITA here covered by the residual proclamation authority of the Uruguay Round Agreements Act. Prior to the entry into force of the ITA, U.S. tariffs on information technology products were generally low. However, tariffs for U.S. information technology exports in certain growing markets such as India and Indonesia were 30 percent to 40 percent.

Trade-weighted average U.S. tariffs for sector imports from all trading partners were only 2.1 percent during 1994 and were reduced to 0.7 percent in 1999. Although the Agreement on Government Procurement positively affected U.S. exports, the high value required for contracts to qualify under this agreement mitigated the benefits likely to accrue to U.S. producers. In addition, tariff reductions for most telecommunications equipment did not occur because the United States made these reductions contingent upon receiving a sufficient number of WTO signatories for the Government Procurement Agreement. It did not receive the necessary signatures. U.S. tariffs on most electronics equipment were ultimately eliminated by the Information Technology Agreement which entered into force on July 1, 1997.

During 1995-2000, U.S. trade in machinery and electronic products increased at an average annual rate of 6.4 percent, reaching $547 billion before dropping 17 percent in 2001. U.S. sector imports increased by 17 percent and sector exports increased by 7 percent during 1995-2001, causing an already negative trade balance to increase by $28 billion.

Views of Interested Parties

National Electrical Manufacturers Association[56]

The National Electrical Manufacturers Association (NEMA) is the largest trade association representing the interests of U.S. electrical industry manufacturers. NEMA has more than 400 member companies, most of which are small and medium-sized, that manufacture products used in the generation, transmission, distribution, control, and use of electricity.

NEMA supports world-wide elimination of tariffs on electrical, electronic, and medical imaging equipment through WTO zero-for-zero tariff elimination; through regional agreements; and through bilateral trade agreements.

NAFTA

Approximately one-half of U.S. exports of NEMA-type products are destined for Canada and Mexico, and NAFTA has been the motor driving the growth of these exports since 1994.

Uruguay Round

"The Uruguay Round (UR) did not go far enough in eliminating tariffs in [NEMA's] industries." Many countries refused to sign the UR agreement to eliminate tariffs on medical equipment, and the medical equipment "zero-for-zero" did not cover some critical components and parts of medical devices. "High tariffs remain a major barrier" to NEMA's member sales "outside the EU, NAFTA, and Japan," "particularly in more advanced developing countries that are rapidly industrializing." Standards and technical barriers remain in the European Union (EU) and Japan which hamper the sales of NEMA members and although tariffs in these countries are still relatively low they still cost NEMA members millions of dollars.

Agriculture[57]

Overview

The United States is the world's largest producer and exporter of agricultural products, accounting for 19.5 percent of global agricultural exports

[56] Statement by Timothy Richards, General Electric, on behalf of the National Electrical Manufacturers Association (NEMA), written submission to the Commission, Mar. 28, 2003.

[57] For the purpose of this investigation, agricultural products are composed of SIC groups 01, 02, 20, and 21. Principal U.S. products in this sector include corn, wheat, soybeans, cotton, tobacco, and hay; horticultural products such as fruits, vegetables, and

in 1999.[58] The U.S. agricultural sector consists of millions of farms and ranches producing raw agricultural goods and a much smaller number of food companies that process, package, and market these goods. The food companies tend to be large multinational corporations, whereas much of the raw agricultural produce is grown on family farms.

Technological innovations in farming have led to greater productivity, which is reflected in the ability of fewer farmers to produce more food on less farmland, at lower cost to consumers. This is a long term trend, which has led to the consolidation of U.S. farms as well as a net decline in U.S. farmland. The number of U.S. farms steadily decreased from about 2.3 million to 1.9 million during 1978-97 while the average farm increased in size from 449 acres to 487 acres. The number of farms decreased, in part, because economic competition pushed some farmers out of business while average size increased as farmers sought to achieve larger economies of scale. This trend also led to higher productivity through, for example, more capital spending on farm equipment, irrigation, and genetically modified seed and plant varieties. However, the high cost of obtaining these technological innovations and the specialized skills needed to utilize them meant that smaller, outdated operations could not compete with larger, updated farms. Increased productivity along with increased international trade have resulted in, in general, lower prices for farm commodities and greater abundance, with consumers spending less, on average, for food as a percentage of household income.

The value of sector shipments has remained relatively constant, declining slightly from $706.2 billion to $701.1 billion during 1978-2000 (table 5-8). Small variations in shipments from year to year were, in large part, the result of price fluctuations. While overall sector output changed little from 1978 to 2001, there were significant changes within the sector. For example, major agricultural crops such as grains, oilseeds, cotton, and tobacco experienced falling prices and a decline in the U.S. share of world production. Declining U.S. tobacco consumption and increasing production in other countries contributed to a large decrease in the value of U.S. tobacco production. In contrast, the value and global share of U.S. vegetable and poultry production increased.

The number of hired farm workers increased from approximately 880,000 in 1994 to 991,000 in 2001.[59] The number of farm workers is difficult to estimate, in part, because much of the work is temporary or part-time and varies greatly according to the time of year, and work is often done by farm operators and/or family members. Further, many farm workers are migrant

---

[57]*—Continued*

other garden products; livestock such as poultry, cattle, calves, hogs, sheep, and lambs; and livestock products such as dairy foods, meat and related products, leather, and wool.

[58] FAS Online, *http://www.fas.usda.gov/cmp/highlights/1998/marketshare.htm*.

[59] These were the only years for which employment data are available. As reported from official statistics of the USDA, National Agricultural Statistics Service.

Table 5-8

Agricultural products:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
	Billions of constant (1996) dollars											
Shipments	706.2	729.5	718.4	684.8	654.5	678.3	653.3	628.6	626.5	641.6	670.1	687.8
Imports	31.2	32.3	31.0	28.1	24.6	26.5	28.1	28.5	29.8	28.0	27.5	27.3
Exports	62.9	68.8	74.7	71.8	57.3	56.8	54.7	41.4	36.6	39.7	49.8	52.6
Apparent consumption	674.5	693.1	674.7	641.1	621.7	648.0	626.7	615.8	619.7	629.9	647.8	662.5
Trade balance	31.8	36.4	43.7	43.7	32.7	30.3	26.6	12.8	6.8	11.7	22.3	25.3
	Percentage											
Imports/apparent consumption	4.6	4.7	4.6	4.4	4.0	4.1	4.5	4.6	4.8	4.5	4.2	4.1
Exports/shipments	8.9	9.4	10.4	10.5	8.8	8.4	8.4	6.6	5.8	6.2	7.4	7.7
	1,000 workers											
Total employment:												
Agricultural workers[2]	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])	([3])
Processed food workers[4]	1,795	1,803	1,777	1,742	1,705	1,682	1,676	1,665	1,665	1,672	1,681	1,694
	Constant (1996) dollars											
Hourly earnings:												
Agricultural workers[5]	([3])	([3])	([3])	6.04	6.04	6.24	5.82	6.00	6.24	6.28	6.26	6.44
Processed food workers[6]	12.06	12.03	12.08	12.03	12.08	12.58	11.91	11.82	11.82	11.74	11.61	11.48

See footnotes at end of table.

Table 5-8—*Continued*

Agricultural products:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Billions of constant (1996) dollars											
Shipments	686.3	669.5	669.2	672.7	668.7	687.2	697.0	714.4	703.5	692.6	699.0	701.1
Imports	27.9	27.0	28.7	28.2	29.4	31.3	34.5	37.1	37.7	38.7	39.3	39.1
Exports	51.5	49.2	52.0	50.2	53.8	62.8	65.7	60.9	54.8	49.8	51.9	51.2
Apparent consumption	662.7	647.3	646.0	650.7	644.3	655.8	665.9	690.6	686.4	681.6	686.4	688.9
Trade balance	23.6	22.2	23.3	22.0	24.4	31.4	31.1	23.8	17.1	11.1	12.7	12.2
	Percentage											
Imports/apparent consumption	4.2	4.2	4.4	4.3	4.6	4.8	5.2	5.4	5.5	5.7	5.7	5.7
Exports/shipments	7.5	7.4	7.8	7.5	8.0	9.1	9.4	8.5	7.8	7.2	7.4	7.3
	1,000 workers											
Total employment:												
Agricultural workers[2]	([3])	([3])	([3])	([3])	880	954	935	1,004	983	989	952	991
Processed food workers[4]	1,710	1,716	1,710	1,723	1,721	1,734	1,733	1,727	1,724	1,720	1,721	1,725
	Constant (1996) dollars											
Hourly earnings:												
Agricultural workers[5]	6.38	6.21	6.60	6.65	6.66	6.67	6.79	7.21	7.24	7.42	7.58	7.68
Processed food workers[6]	11.35	11.27	11.32	11.29	11.33	11.36	11.40	11.45	11.59	11.73	11.87	11.88

[1] Includes SIC 01 (agricultural production - crops), 02 (agriculture production livestock and animal specialties), 20 (food and kindred products), and 21 (tobacco products).

[2] Includes full- and part-time hired farm workers. U.S. Department of Agriculture, National Agricultural Statistics Service, Agricultural Statistics Board.

[3] Not available.

[4] Data for SIC 20 and SIC 21.

[5] Wage rate for all hired farm workers, except for agricultural service workers. U.S. Department of Agriculture, National Agricultural Statistics Service, Agricultural Statistics Board.

[6] Wage rate for production workers employed in SIC 20 and SIC 21.

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of Economic Analysis and Bureau of the Census; and U.S. Department of Labor, Bureau of Labor Statistics, except as noted.

laborers who move from one crop to another. Similarly, packing and processing plants may be extremely busy for a few weeks during the harvest season, but need fewer workers during the remainder of the year. Average hourly wage rates for hired farm workers has increased steadily, from $6.04 in 1981 to $7.68 in 2001 (table 5-8).[60]

Many growers reported lower commodity prices and increasingly difficult financial conditions during 1978-2001.[61] Growers received an increasingly smaller percentage of the retail value of agricultural products while processors, distributors, and marketers received an increasingly larger share. This trend may indicate a loss of pricing power for growers that sell to corporations and retail establishments, which have become larger and more vertically and horizontally integrated. In order to gain more pricing power, many growers have joined cooperatives that negotiate prices and share profits with their grower members. Farm prices are also influenced by government programs that vary greatly by crop, but often provide price support, purchase schemes, target prices, and in the past, export subsidies, or general assistance to farmers. The Export Enhancement Program (EEP) was announced by USDA on May 15, 1985, and is operated under authority of the Agricultural Trade Act of 1978 as amended, the Uruguay Round Agreements Act, and the Federal Agriculture Improvement and Reform Act of 1996.[62] Consistent with its export subsidy commitments under the Uruguay Round Agreement on Agriculture, the United States has established annual ceilings by commodity with respect to export quantities and budget outlays. A formula known as an Aggregate Measure of Support (AMS) was established for eac commodity o measure the total amount of government support, as well as reduction levels.[63] The commitment to

---

[60] Ibid.

[61] Prices at the consumer level do not necessarily reflect the prices received by farmers. Most of the shipment value for agricultural products is added after the products leave the farm in the packing, processing, and marketing stages.

[62] Other agricultural export assistance programs include the Market Access Program (MAP) which is designed to create, expand, and maintain foreign markets for U.S. agricultural commodities; the Foreign Market Development Program (FMD) which assists U.S. nonprofit trade organizations in developing and maintaining foreign markets for U.S. agricultural programs; the Dairy Export Incentive Program (DEIP) which assists exporters of U.S. dairy products in meeting prevailing world prices for targeted dairy products; the CCC Export Credit Guarantee Programs (GSM) 102/103 which helps guarantee financing of agricultural sales; the Supplier Credit Guarantee Program (SCGP) which guarantees a portion of payments due from importers; the Quality Samples Program (QSP) which assists in providing commodity samples to potential foreign importers; and the Facility Guarantee Program (FGP) which provides payment guarantees to facilitate the financing of facilities for U.S. agricultural products in emerging markets.

[63] United States domestic support: Deriviation of the 1986-88 base aggregate measurement of support (AMS) and the base for reductions, from World Trade Organization and Economic Research Service. *http://www.ers.usda.gov/briefing/FarmPolicy.*

respect the quantity ceilings became effective July 1, 1995; the commitment to respect budgetary outlay ceilings became effective October 1, 1995.[64]

Trade is essential to the U.S. agricultural sector, with revenue from U.S. exports accounting for between 20 and 30 percent of total farm income between 1978 and 2001.[65] Lower prices for U.S. products and improved access through trade agreements have permitted U.S. farmers to expand their share of foreign markets. However, owing to falling world prices for bulk agricultural commodities, the total value of U.S. exports during this period has remained relatively stagnant. Historically, bulk commodities–wheat, rice, coarse grains, oilseeds, cotton, and tobacco–accounted for most U.S. agricultural exports. However, in the 1990s, as population and incomes rose worldwide, U.S. exports of high-value products (HVP)–meats, poultry, live animals, oilseed meals, oils and oil seeds, fruits, vegetables, and beverages–expanded steadily in response to demand for more food diversity. Whereas bulk commodities accounted for over two-thirds of U.S. agricultural exports in 1978, by 2000 the HVP share had increased to 65 percent.[66]

Live animals and meat such as beef, pork, and poultry accounted for about $8 billion of U.S. exports in 2001. The fastest growing U.S. exports during 1978-2001 were beverages (including juices and wines), vegetables, and vegetable products. The main destinations for U.S. agricultural exports during the period were Canada, China, the EU, Hong Kong, Japan, Mexico, South Korea, and Taiwan. These top export destinations have varied little during the last decade.[67]

U.S. agricultural exports have exceeded U.S. agricultural imports since the late 1950s, generating a surplus in U.S. agricultural trade. However, the U.S. agricultural export surplus narrowed from 1978 to 2001 as imports grew and exports declined. Imports during this period increased from $31.2 billion in 1978 to $39.1 billion in 2001, while exports declined from $62.9 billion to $52.6 billion, causing a decrease in the trade surplus from $31.8 billion to $13.6 billion. The trade surplus during this period peaked in 1980 and 1981 at $43.7 billion and fell to its lowest level of $6.8 billion in 1986. Apparent consumption remained relatively stable from 1978 to 2001, rising slightly from $674 billion to $687 billion, in constant 1996 dollars. The import share of U.S. consumption rose slightly from about 4.6 percent to 5.7 percent during this period, while exports as a percentage of U.S. shipments fell slightly, from about 8.9 percent to 7.5 percent.

---

64 From FASonline, *http://www.fas.usda.gov/excredits/eep.html*, USDA Foreign Agricultural Service, Aug. 9, 2002.

65 It varied from a low of about 20 percent in 1985, to a high of about 30 percent in 1980, and was about 25 percent in 2002. USDA/ERS, U.S. Agricultural Trade, from U.S. Agricultural Baseline Projections to 2010, Feb. 2001.

66 USDA/ERS, U.S. Agricultural Trade, from U.S. Agricultural Baseline Projections to 2010, Feb. 2001.

67 Ibid.

U.S. agricultural imports grew throughout the 1980s and 1990s, in part, because of the appreciation of the dollar versus the currencies of many major trading partners. Alcoholic beverages, including wine, beer, malt beverages, and distilled sprits, were the largest category of U.S. agricultural imports in 2001, totaling nearly $8 billion. Horticultural products such as fruits, vegetables, nuts, and nursery products such as ornamental plants, and including items not produced in the United States such as coffee, cocoa, and rubber also accounted for a large percentage of U.S. agricultural imports. Animals and animal products were another important category of imports. In the last two decades, U.S. sector import sources varied little and came primarily from Australia, Brazil, Canada, Columbia, the EU, Indonesia, and Mexico.[68]

Effect of Trade Agreements on the Sector

While the Tokyo Round and the U.S.-Israel FTA had minimal effects on agricultural products, the U.S.-Canada FTA and NAFTA phased out most existing tariffs between Canada, Mexico, and the United States. Each of the five agreements also addressed a range of additional trade issues in the sector (table 5-9). In addition, the Uruguay Round was the first multilateral round that required most countries to convert existing quantitative restrictions on trade in agriculture into bound tariff rates and tariff-rate quotas, and bound all participants to significant phased reductions of tariffs.

However, some of the trade effects of reduced agricultural tariffs may have been moderated by other protective measures in the industry. Many national governments have a long tradition of protecting their domestic growing and processing industries from foreign competition and have placed some of the most varied and formidable trade barriers in the agriculture sector. Grower organizations in many countries wield important political and economic power which help to influence national trade policy in favor of protection. Self-sufficiency in food production has been the goal of many governments as a national security issue. Further, in many parts of the world, the cultivation of agricultural products such as rice in parts of Asia and wine and grape production in Southern Europe has long been part of the national culture and tradition, and international trade is often perceived as a threat.

Agricultural trade barriers can take many forms because food is subject not only to tariffs and quotas but to a variety of sanitary and phytosanitary standards that may vary from country to country. In the past, trade agreements that succeeded in lowering tariff rates often led to the appearance of nontariff barriers (NTBs) such as time-consuming port inspections, unusual sanitary standards or packaging requirements, shelf-life rules, or food-additive rules that impede trade. Later agreements would attempt to address some of these nontariff barriers.

---

[68] Ibid.

Table 5-9
Agricultural products: Trade issues addressed in trade agreements and U.S. tariffs

Trade issues and U.S. tariffs	Tokyo Round	U.S.-Israel	U.S.-Canada	Uruguay Round	NAFTA[1]
Tariffs[2]	(1979) 3.2% (1987) 3.5%	(1984) 5.3% (1995) 0.2%	(1987) 2.4% (1998) <0.1%	(1994) 6.3% (1999) 1.6%	(1993) 2.4% (2001) 0.4%
Technical barriers	X			X	X
Import licensing	X	X		X	X
Minimum access				X	
Government procurement	X	X	X	X	X
SPS		X		X	X
Rules of origin		X	X	X	X
Quotas	X			X	X
TRIMs[3]			X	X	X
TRIPS[4]	X	X		X	X

[1] The NAFTA provides that tariffs be eliminated by Jan. 1, 2003 for all industrial goods and by Jan. 1, 2008 for all other goods.

[2] Average trade-weighted ad valorem or ad valorem equivalent tariff. Trade weights for the Tokyo Round and Uruguay Round are based on U.S. imports from the world during the years indicated. Trade weights for the bilateral treaties and NAFTA are based on U.S. imports from the relevant countries. Unless otherwise noted, dates in parentheses represent the year immediately prior to the entry into force of the agreement and the year of the final tariff reduction for most products and markets.

[3] Trade-related investment measures.

[4] Trade-related aspects of intellectual property rights.

Source: U.S. Trade Representative, *Annual Report of the President of the United States on the Trade Agreements Program*, various issues; U.S. Trade Representative*, Trade Policy Agenda and Annual report,* various issues; and U.S. International Trade Commission*, Operation of the Trade Agreements Program,* various issues.

Tokyo Round

Between 1980, the year of the first stage of the Tokyo Round tariff reductions, and 2000, total U.S. trade in agricultural products decreased by 13.7 percent, as U.S. imports increased by 26.8 percent while U.S. exports declined by 30.5 percent (table 5-8). Imports as a share of U.S. apparent consumption grew from 4.6 percent in 1978 to 5.6 percent in 2000, while U.S. exports as a share of shipments fell from 8.9 percent to 7.4 percent.

The most important effect of the Tokyo Round on the U.S. agricultural sector may have been to lay the groundwork for the subsequent URAA discussed in more detail at the end of this section. The Tokyo Round had little effect on average U.S. tariff rates in agriculture. In fact, U.S. tariffs increased slightly from 3.2 percent to 3.5 percent during 1979-87. The Tokyo Round mainly affected manufactured products, and used the "Swiss" formula designed to result in a fairly deep overall reduction in tariffs while cutting high rates proportionately more than low ones. The same formula was used to reduce agricultural rates during the 1994 GATT Agreement on Agriculture.

As part of the Tokyo Round, the GATT Arrangement Regarding Bovine Meat (1980-1994) entered into effect on January 1, 1980. The primary objectives of the Arrangement were to promote the expansion, liberalization, and stability of the international meat and livestock market by improving the international framework of world trade to the benefit of consumers, producers, importers, and exporters; to encourage greater international cooperation in all aspects affecting trade in bovine meat and live animals; and to secure additional benefits for the international trade of developing countries in bovine meat and live animals.

Also a part of the Tokyo Round, the International Dairy Arrangement entered into effect on January 1, 1980. The primary objectives of the Arrangement were to advance the expansion and liberalization of world trade in dairy products under as stable as possible market conditions, on the basis of mutual benefit to exporting and importing countries, and to further economic and social development in developing countries.

The International Dairy Arrangement was concluded in the Tokyo Round of multilateral trade negotiations in 1979. The Arrangement covered fresh and preserved milk and cream, butter, cheese and curd and casein with the purpose of expanding and liberalizing world trade in dairy products. The Arrangement established minimum export prices for skimmed milk powder, wholemilk powder, buttermilk powder, anhydrous milk fat, butter, and cheese. It was replaced by the International Dairy Agreement when the WTO was established on January 1, 1995. Owing to non-participation by some major dairy exporting countries (including Australia and the United States), the operation of the minimum price regime was untenable. As a result, the Agreement was terminated as of January 1, 1998.[69]

---

[69] International Dairy Agreement. Annual Reports from 1995 and 1997.

U.S.-Israel FTA

The United States-Israel Free Trade Agreement (FTA) eliminated most trade barriers between the two countries. However, according to the United States Trade Representative, substantial barriers remain with regard to Israel's agricultural sector.[70] U.S. agricultural exports to Israel after the agreement rose slightly, from $438.7 million in 1984 to $461.5 million in 2001. During this period, Israel never accounted for more than 1 percent of U.S. agricultural exports. The U.S. share of Israel's agricultural imports averaged 38 percent in the 5 years prior to the agreement and dropped to 29 percent in the following 5 years. Bulk commodities dominated U.S. agricultural exports to Israel, with 93 percent of the total value prior to the agreement and 87 percent in the following 5-year period.

U.S. agricultural imports from Israel have historically been low, and rose from $82.2 million in 1984 to $113.2 million in 2001 (table 5-10). During this period, the share of U.S. agricultural imports that came from Israel remained unchanged at about 0.3 percent. Two-thirds of total U.S. agricultural imports from Israel are consumer-oriented goods such as dairy products, biscuits, and wafers, which grew 44 percent following the FTA, while horticultural imports from Israel doubled.[71]

Although tariffs were significantly reduced, the agreement permitted each country to maintain NTBs for the protection of sensitive agricultural products. Israel maintained levies and fees on a wide range of agricultural products and placed quotas and bans on others. Such NTBs as well as certain technical barriers to trade continue to hamper U.S. access to the Israeli market. On the other hand, the reduction in duties and setting of tariff-rate quotas for nearly 100 products has helped increase certain U.S. exports such as frozen fruit and breakfast cereals to Israel. Israel's import liberalization programs with other countries and new trade agreements have diluted U.S. advantages under the bilateral agreement.

The substantial NTBs on agricultural imports in Israel led to the 1996 Agreement on Trade in Agricultural Products (ATAP), establishing a program of gradual and steady market access liberalization for food and agricultural products. The ATAP was negotiated, in part, in an effort to reconcile the inconsistencies between the 1985 Agreement and the global trade rules that resulted from the Uruguay Round. The Uruguay Round and Israel's membership in the newly formed WTO required the Government to transform into tariffs all administrative or nontariff barriers to trade, which had been allowed under the FTA. The ATAP is comprehensive and provides for immediate and meaningful access for U.S. farm products in the Israeli market The agreement reduced duties and established TRQs for nearly 100 U.S.

---

[70] USTR, *2001 National Trade Estimate Report on Foreign Trade Barriers,* (USTR, Washington, DC), p. 201.

[71] Michael Kurtzig and Daniel Pick, "U.S.-Israel FTA," in Burfister and Jones (eds.), *Regional Trade Agreement and U.S. Agriculture*, USDA Agricultural Economics Report No. 771 (November 1988).

Table 5-10
Agricultural products: U.S. trade with Israel, 1984-2001

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992
	Millions of constant (1996) dollars								
U.S. import value									
Israel	82.2	90.2	97.2	86.1	70.4	83.9	83.7	75.5	73.4
All other	27,971.0	28,452.3	29,654.2	27,926.2	27,390.5	27,177.1	27,841.9	26,888.1	28,635.5
Total	2,805.0	28,542.4	29,751.5	28,012.3	27,460.9	27,261.0	27,925.6	26,963.6	28,708.9
	Percent								
Israel/Total	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
U.S. import growth									
Israel	—	9.7	7.8	-11.5	-18.2	19.2	-0.2	-9.9	-2.8
All other	—	1.7	4.2	-5.8	-1.9	-0.8	2.5	-3.4	6.5
Total	—	1.7	4.2	-5.9	-2.0	-0.7	2.4	-3.5	6.5
	Millions of constant (1996) dollars								
U.S. export value									
Israel	438.7	375.8	350.7	358.9	454.6	397.4	402.1	383.2	456.1
All other	54,219.2	40,977.1	36,239.4	39,377.8	49,319.8	52,191.1	51,109.2	48,803.6	51,533.8
Total	54,657.9	41,352.9	36,590.2	39,736.7	49,774.4	52,588.5	51,511.4	49,186.8	51,989.9
	Percent								
Israel/Total	0.8	0.9	1.0	0.9	0.9	0.8	0.8	0.8	0.9
U.S. export growth									
Israel	—	-14.3	-0.7	0.2	26.7	-12.6	1.2	-4.7	19.0
All other	—	-24.4	-11.6	8.7	25.3	5.8	-2.1	-4.5	5.6
Total	—	-24.3	-11.5	8.6	25.3	5.7	-2.1	-4.5	5.7

See note at end of table.

Table 5-10—*Continued*
Agricultural products: U.S. trade with Israel, 1984-2001

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of constant (1996) dollars								
U.S. import value									
Israel	77.5	66.1	81.1	86.8	94.2	108.6	109.0	103.9	113.2
All other	28,159.9	29,315.3	31,261.5	34,432.6	36,961.1	37,583.2	38,634.3	39,180.5	38,949.0
Total	28,237.4	29,381.4	31,342.6	34,519.4	37,055.2	37,691.8	38,743.2	39,284.4	3,906.0
	Percent								
Israel/Total	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
U.S. import growth									
Israel	5.6	-14.7	22.6	7.1	8.5	15.4	0.3	-4.6	8.9
All other	-1.7	4.1	6.6	10.1	7.3	1.7	2.8	1.4	-0.6
Total	-1.6	4.1	6.7	10.1	7.4	1.7	2.8	1.4	-0.6
	Millions of constant (1996) dollars								
U.S. export value									
Israel	416.4	494.9	574.7	684.5	592.2	442.7	501.4	549.2	461.5
All other	49,783.5	53,273.7	62,170.7	64,964.5	60,258.0	54,370.2	49,316.9	51,383.1	50,783.1
Total	50,199.9	53,768.6	62,745.4	65,649.0	60,850.3	54,812.9	49,818.3	51,932.3	51,244.6
	Percent								
Israel/Total	0.8	0.9	0.9	1.0	1.0	0.8	1.0	1.0	0.9
U.S. export growth									
Israel	-8.7	18.9	16.1	19.1	-13.5	-25.3	13.3	9.5	-16.0
All other	-3.4	7.0	16.7	4.5	-7.2	-9.8	-9.3	4.2	-1.2
Total	-3.4	7.1	16.7	4.6	-7.3	-9.9	-9.1	4.2	-1.3

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

products and allowed for the free entry of many other U.S. products. The ATAP was negotiated with a 5 year time frame which lapsed in 2001, after which the two sides committed to seek further improvements. Under ATAP, all U.S. food and agricultural products have access to the Israeli market under one of three different categories: unlimited duty-free access; duty-free TRQs; or preferential tariffs, which are generally set at least 10 percent below Israel's Most-Favored Nation (MFN) rates.

Some of the remaining obstacles to free trade between the United States and Israel include product standards such as weights and measures, and kashrut (Kosher) certification. Israel requires that many household products be sold in fixed package sizes (e.g., 200, 400, or 500 grams), using metric measures. This trade barrier particularly hurts U.S. exports of vegetables, fruits, and pasta. In 1994, Israel established the Israeli Kosher Meat Import Law prohibiting all imports of non-kosher meat.

U.S.-Canada FTA

U.S. bilateral trade with Canada in agricultural products grew substantially during the years following the agreement. U.S. agricultural imports from Canada grew from $3.4 billion in 1987 to $10.0 billion in 2001, while U.S. agricultural exports to Canada during this period grew from $2.4 billion to $7.4 billion (table 5-11).

The United States is Canada's largest supplier of agricultural imports. Fruits, vegetables, and other horticultural products account for about one-half of U.S. sector exports to Canada (table 5-11). Other important U.S. exports to Canada include livestock products, grains, oilseeds, and sugar products. Leading U.S. sector imports include livestock products, grains, and oilseeds. The United States has become increasingly important for Canadian agricultural exports, taking over one-third of Canada's total agricultural exports in 2001. Under the U.S.-Canada FTA (CFTA), the United States and Canada agreed to eliminate most existing tariffs and most nontariff barriers. Quantitative restrictions such as quotas and licenses were left in place, to be addressed in the Uruguay Round. The agreement excluded domestic price support programs and border measures for both countries and access at preferential rates to over-TRQ rate lines. However, both pledged to develop mutually advantageous rules and disciplines on subsidies and dumping, both contentious agricultural issues. The CFTA dispute settlement panel resolved two significant agricultural trade disagreements–U.S. countervailing duties on Canadian pork and Canadian durum wheat pricing. The panel ruled in Canada's favor in both cases and the United States accepted the decisions. The panel, operating bilaterally, was envisioned as being more expedient than a GATT panel. The United States sought to include new provisions in the North American Free Trade Agreement (NAFTA) to address trade-distorting border measures, a major area of dispute.[72]

---

[72] USDA/ERS "U.S.-Canada Free Trade Agreement: Trade Disputes and Settlement," Apr. 1993, , Agriculture Information Bulletin Number 664-1.

Table 5-11
Agricultural products: U.S. trade with Canada and Mexico, 1987-2001

Year	1987	1988	1989	1990	1991	1992	1993	1994
	Millions of constant (1996) dollars							
U.S. import value								
Canada	3,453.3	3,672.9	4,052.1	4,439.3	4,572.6	5,509.3	6,086.5	6,352.8
Mexico	2,492.8	2,360.2	2,850.0	3,128.3	2,931.8	2,717.0	3,007.2	3,117.1
All other	22,066.3	21,427.8	20,358.9	20,358.0	19,459.3	20,482.7	19,143.7	19,911.4
Total	28,012.3	27,460.9	27,261.0	27,925.6	26,963.6	28,708.9	28,237.4	29,381.4
	Percent							
Canada/Total	12.3	13.4	14.9	15.9	17.0	19.2	21.6	21.6
Mexico/Total	8.9	8.6	10.5	11.2	10.9	9.5	10.7	10.6
U.S. import growth								
Canada	—	6.4	10.3	9.6	3.0	20.5	10.5	4.4
Mexico	—	-5.3	20.8	9.8	-6.3	-7.3	10.7	3.7
All other	—	-2.9	-5.0	([1])	-4.4	5.3	-6.5	4.0
Total	—	-2.0	-0.7	2.4	-3.5	6.5	-1.6	4.1
	Millions of constant (1996) dollars							
U.S. export value								
Canada	2,357.9	2,550.7	2,695.8	4,898.0	5,130.8	5,380.4	5,673.4	5,811.5
Mexico	1,523.7	2,769.2	3,267.7	2,947.7	3,330.8	4,116.9	3,849.5	4,797.9
All other	35,855.2	44,454.5	46,625.1	43,665.7	40,725.2	42,492.7	40,677.0	43,159.2
Total	39,736.7	49,774.4	52,588.5	51,511.4	49,186.8	51,989.9	50,199.9	53,768.6
	Percent							
Canada/Total	5.9	5.1	5.1	9.5	10.4	10.4	11.3	10.8
Mexico/Total	3.8	5.6	6.2	5.7	6.8	7.9	7.7	8.9
U.S. export growth								
Canada	—	8.2	5.7	81.7	4.8	4.9	5.5	2.4
Mexico	—	81.8	18.0	-9.8	13.0	23.6	-6.5	24.6
All other	—	24.0	4.9	-6.4	-6.7	4.3	-4.3	6.1
Total	—	25.3	5.7	-2.1	-4.5	5.7	-3.4	7.1

See footnote at end of table.

Table 5-11—*Continued*
Agricultural products: U.S. trade with Canada and Mexico, 1987-2001

Year	1995	1996	1997	1998	1999	2000	2001
				Millions of constant (1996) dollars			
U.S. import value							
Canada	6,607.3	7,705.7	8,315.0	8,588.4	8,750.1	9,207.4	10,036.3
Mexico	4,019.1	3,906.7	4,214.0	4,704.0	4,860.0	5,098.8	5,111.0
All other	20,716.2	22,907.0	24,526.3	24,399.4	25,133.1	24,978.3	23,915.2
Total	31,342.6	34,519.4	37,055.2	37,691.8	38,743.2	39,284.4	39,062.5
				Percent			
Canada/Total	21.1	22.3	22.4	22.8	22.6	23.4	25.7
Mexico/Total	12.8	11.3	11.4	12.5	12.5	13.0	13.1
U.S. import growth							
Canada	4.0	16.6	7.9	3.3	1.9	5.2	9.0
Mexico	28.9	-2.8	7.9	11.6	3.3	4.9	0.2
All other	4.0	10.6	7.1	-0.5	3.0	-0.6	-4.3
Total	6.7	10.1	7.4	1.7	2.8	1.4	-0.6
				Millions of constant (1996) dollars			
U.S. export value							
Canada	5,960.8	6,167.5	6,696.3	6,848.8	6,775.1	7,164.8	7,429.7
Mexico	3,537.9	5,387.5	5,018.6	5,916.9	5,351.0	6,006.2	6,671.0
All other	53,246.7	54,093.9	49,135.4	42,047.2	37,692.2	38,761.2	37,143.9
Total	62,745.4	65,649.0	60,850.3	54,812.9	49,818.3	51,932.3	51,244.6
				Percent			
Canada/Total	9.5	9.4	11.0	12.5	13.6	13.8	14.5
Mexico/Total	5.6	8.2	8.3	10.8	10.7	11.6	13.0
U.S. export growth							
Canada	2.6	3.5	8.6	2.3	-1.1	5.8	3.7
Mexico	-26.3	52.3	-6.9	17.9	-9.6	12.3	11.1
All other	23.4	1.6	-9.2	-14.4	-10.4	2.8	-4.2
Total	16.7	4.6	-7.3	-9.9	-9.1	4.2	-1.3

[1] Less than 0.5 percent.

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

NAFTA

U.S. agricultural trade with its NAFTA partners has grown rapidly. U.S. exports to and imports from its NAFTA partners increased by 48.1 percent and 66.6 percent, respectively, during 1993-2001 (table 5-11). The share of both U.S. agricultural exports to and imports from NAFTA partners continues to grow, as might be expected from preferential access to each other's markets. U.S. agricultural imports from Canada grew from $3.4 billion in 1987 to $10.0 billion in 2001, while those from Mexico grew from $2.5 billion to $5.1 billion during the same period. U.S. agricultural exports to Canada during this period grew from $2.4 billion to $7.4 billion, and those to Mexico rose from $1.5 billion to $6.8 billion. The value of Canadian and Mexican agricultural exports as shares of total U.S. imports grew from 12.3 percent to 25.7 percent, and from 8.9 percent to 13.1 percent, respectively, while the shares of U.S. agricultural exports accounted for by Canadian and Mexican agricultural imports rose from 5.9 percent to 15.6 percent, and from 3.8 percent to 13.0 percent, respectively.

Although NAFTA contributed to the growth in trade between the 3 NAFTA partners, much of this growth might have occurred without NAFTA as a result of unusual weather conditions, population growth, changes in exchange rates, and macroeconomic performance. Furthermore, many of the concerns expressed prior to the agreement about the loss of agricultural employment and environmental degradation never materialized. A USDA study showed that for most commodities, NAFTA's influence is relatively small, generating only a small increase in the export or import of a particular commodity with either Canada or Mexico. For a handful of commodities, NAFTA has had a much larger impact, with an increase of trade volume of 15 percent or more that is directly attributable to the agreement. This is particularly true for commodities whose trade was severely restricted prior to NAFTA. U.S. rice exports to Mexico have more than doubled since NAFTA with the reduction of tariffs, while U.S. cotton exports to Mexico and Canada have tripled. U.S. pear and apple exports to Mexico have increased by at least 15 percent. Imports of sugar from Mexico have grown considerably as the sugar quota was liberalized, and Canadian potato imports have been boosted by U.S. tariff reductions.[73]

NAFTA's agricultural component comprises three separate agreements: the original U.S.-Canada FTA, a U.S.-Mexico component, and a Canada-Mexico component. Some agricultural provisions, including rules on sanitary and phytosanitary provisions, are trilateral. Under NAFTA, most quantitative restrictions on agricultural trade between the United States and Mexico were eliminated. Many tariffs were eliminated immediately, with others scheduled to be phased out over periods of 5 to 15 years. By 2008, all agricultural provisions will be implemented, but most became effective by January 1, 2003.

[73] Effects of North American Free Trade Agreement on Agriculture and the Rural Economy, Agriculture and Trade Reports, USDA, Economic Research Service, Publication WRS-02-01, July 2002.

The agricultural provisions of the U.S.-Canada FTA were incorporated into NAFTA. Under these provisions, all tariffs affecting agricultural trade between the United States and Canada, with a few exceptions for items covered by Uruguay Round tariff-rate quotas (dairy, poultry, eggs, peanut butter, and sugar products), were removed on January 1, 1998. Mexico and Canada reached a separate bilateral NAFTA agreement on market access for agricultural products. The Mexican-Canadian agreement eliminated most tariffs either immediately or over 5, 10, or 15 years. Tariffs and TRQs between the two countries affecting trade in dairy, poultry, eggs and sugar are also maintained.

Uruguay Round

During the Uruguay Round, the negotiating parties agreed to convert all quantitative restrictions to bound tariffs,[74] a process known as 'tariffication.' The conversion of NTBs (which in addition to quotas included some import prohibitions and discretionary import licensing) to bound tariffs was a key achievement of the Uruguay Round.

Developed countries agreed to reduce all agricultural tariffs, including those resulting from tariffication from their base-period rates,[75] by a total of 36 percent, with a minimum cut of 15 percent for each tariff. The cuts were to take place in equal installments over 6 years, beginning with the first cut in 1995. Developing countries are bound to cut tariffs an average of 24 percent over 10 years. Least-developed countries were not required to reduce their tariffs. Tariff-rate quotas were established for products previously protected by NTBs with relatively low in-quota tariffs up to a minimum access level. Although the Agriculture Agreement began the process of reducing agricultural tariffs, protection for agricultural commodities continues to stand out as a major distorting feature of international trade. For manufactured goods, the industrial countries' import-weighted average tariff has been reduced from about 40 percent to under 4 percent since 1949; for agricultural goods, in contrast, the simple average for industrial countries' post-Uruguay Round bound tariffs is estimated to be 45 percent.[76]

Some of the key accomplishments of the Uruguay Round were concessions and commitments from members regarding market access, domestic support

---

[74] Tariffs are considered legally "bound" within GATT/WTO when a country agrees not to raise them above a certain level, subject to a penalty.

[75] For tariffs that were already bound, the base was the current bound rate; for existing but unbound tariffs, the base was the 1986 tariff rate; and for duties that resulted from tariffication of NTBs, the base was the level of protection provided by NTBs during the 1986–88 period.

[76] John Wainio, Paul Gibson, and Daniel Whitley, "Options for Reducing Agricultural Tariffs," *Background for Agricultural Policy Reform in the WTO: The Road Ahead,* USDA, Economic Research Service, 2001, ERS–E01–001.

and export subsidies, and the Agreement on Sanitary and Phytosanitary Measures. Overall, the results of the negotiations provide a framework for the long-term reform of agricultural trade and domestic policies.

Views of Interested Parties

Blue Diamond Growers[77]

Blue Diamond Growers is a nonprofit farmer-owned marketing cooperative that markets almonds, hazelnuts, macadamia nuts, and pistachios for its members. The almonds are grown exclusively in California and are the largest tree crop in the State. Almonds are the largest valued agricultural export from California. Over 75 percent of the world's supply of almonds is produced in California.

Tokyo Round and Uruguay Round

Blue Diamond Growers (BDG), and almonds in general, benefitted significantly from the Tokyo and Uruguay Rounds. These agreements opened markets for almonds worldwide. As a result of these two agreements, U.S. almond exports increased by 25 percent to Europe, 1,100 percent to Eastern Europe, 300 percent to the Middle East, and 200 percent to Asia during 1996-2002.

U.S.-Israel Free Trade Agreement

BDG, and almonds in general, benefitted from the United States-Israel Free Trade Agreement until the agreement was renegotiated in 1995. U.S. almond exports were adversely affected by the 1995 changes which increased duties on U.S. exports of almonds to Israel by a factor of four thereby closing the market for U.S. exports. In 1997, a TRQ was applied which allowed limited access of almonds to Israel, but was too restrictive to provide meaningful amounts of trade. BDG believes that if all barriers to trade with Israel were removed, almond exports to Israel would grow from about $10 million in 2002 to about $25 million within five years.

U.S.-Canada Free Trade Agreement

BDG, and almonds in general, benefitted significantly from the U.S.-Canada Free Trade Agreement which enhanced and stabilized market access. The value of U.S. almond exports to Canada grew by 90 percent during 1996-2002 reaching $37 million.

---

[77] Susan Brauner, Director of Public Affairs, Blue Diamond Growers, written submission to the Commission, Mar. 27, 2003.

NAFTA

BDG, and almonds in general, benefitted significantly from NAFTA because it enhanced and stabilized market access. The value of U.S. almond exports to Mexico grew by about 300 percent during 1996-2002, reaching about $11 million.

Florida Citrus Mutual[78]

Florida Citrus Mutual (FCM) is a voluntary cooperative association whose active membership consists of more than 11,000 Florida growers of citrus for processing and fresh consumption. FCM accounts for as much as 80 percent of all oranges grown in the United States for processing into juice and other citrus products. The 6-year staged reduction of U.S. tariffs on orange juice from WTO-member countries under the URA, and the 15-year staged elimination of the U.S. tariff and tariff rate quota on orange juice from Mexico under NAFTA encouraged under-priced imports, which contributed directly to the erosion of U.S. processing orange prices and grower earnings. FCM believes that this damage occurred without any counterbalancing positive effects on U.S. orange juice exports.

Uruguay Round

The URA has increased the inflow of under-priced Brazilian orange juice into the U.S. market with severe negative consequences for the U.S. citrus industry. Brazil, the world's largest orange juice producer, was the primary beneficiary of the United States' URA commitment to reduce orange juice tariffs by 15 percent. These staged tariff reductions led to the plunging import unit value of Brazilian juice. In 2002, the average value per liter of imports from Brazil was 31 percent less than the average during the 5 years prior to URA implementation (1990-1994).

NAFTA

NAFTA has adversely affected U.S. orange growers by increasing Mexico's exports of orange juice to the United States. The United States has committed to a 15 year phase-out schedule for U.S. tariffs on Mexican orange juice. The United States is Mexico's largest export market for orange juice, and Mexico has the ability to divert fruit from fresh domestic consumption into orange juice processing. U.S. imports from Mexico have not risen as rapidly as expected as a result of NAFTA, primarily owing to droughts and citrus diseases in Mexico as well as the strong Mexican peso and heavy competition from Brazil and CBERA-eligible orange juice. However, U.S. imports of frozen

---

[78] Andrew Lavigne, Executive Vice President and CEO, Florida Citrus Mutual and Matthew T. McGrath, Barnes, Richardson & Colburn, on behalf of Florida Citrus Mutual, written submission to the Commission, Mar. 31, 2003.

concentrated orange juice from Mexico have exceeded the NAFTA TRQ in every year, except 2001. The primary effect of Mexican imports has been to erode U.S. prices. In 2002, the average price from Mexico was 25 percent less than the average during the 5 years prior to NAFTA implementation (1989-1993).

Florida Tomato Exchange[79]

The Florida Tomato Exchange (FTE) represents a substantial majority of the fresh tomatoes produced in the state of Florida.

During the winter months Florida produces most of the tomatoes grown commercially in the United States. The FTE supports free trade and open markets, but only provided such trade is fair. The growers represented by FTE are not subsidized, do not receive price supports, or deficiency payments, loan guarantees, or export credit assistance.

NAFTA

Many years prior to passage of NAFTA, FTE presented statements to Congress, USTR, and USITC that tomatoes were an import-sensitive commodity and, without meaningful safeguard provisions regarding tomato imports from Mexico, Florida's tomato growers would be substantially harmed. NTE's recommendations for safeguard provisions were not adopted, but rather other "traditional" safeguard provisions were used. After NAFTA was enacted in 1994, Mexico flooded the U.S. market with fresh tomatoes. When NTE attempted to use the NAFTA safeguard provisions that were intended solely to assist Florida's tomato and pepper growers, they were unsuccessful. Estimates of the harm to NTE's growers totaled approximately $125 million per winter season, and over $1 billion to date. A major tomato packing house in Florida closed its door. The industry estimates that upwards of 10,000 workers in Florida have lost their jobs as a direct result of NAFTA. The NTE filed an antidumping suit, and in 1995 the U.S. Department of Commerce preliminarily found that Mexican producer-exporters dumped tomatoes in the U.S. market. A suspension agreement was negotiated and a second suspension agreement was negotiated by Commerce in December 2002. Although the NAFTA package included transitional assistance for workers displaced by NAFTA, the monetary and work assistance were deficient and many or most workers did not complete this training and others who followed and would have been eligible, did not even try. The only relief that was useful to the industry was the long-standing antidumping statute.

---

[79] Reginald L. Brown, Executive Vice President, Florida Tomato Exchange, written submission to the Commission, Feb. 11, 2003.

National Milk Producers Federation and U.S. Dairy Export Council[80]

The National Milk Producers Federation (NMPF) is a national farm commodity organization that represents dairy farmers. The U.S. Dairy Export Council (USDEC) is a non-profit organization that represents the export trade interests of U.S. milk producers, dairy cooperatives, proprietary processors, export traders, and industry suppliers.

Tokyo Round

The Tokyo Round had only "marginal impact on global agricultural trade" including dairy products. "Unlike the Uruguay Round, which succeeded it, the Tokyo Round left most non-tariff trade barriers, export subsidies, and domestic support programs virtually untouched." Tariffs and other import barriers were negotiated on the basis of a request/offer approach, which resulted in many of the most sensitive products being subjected to minimal access improvements or being excluded from the negotiations altogether. The Tokyo Round also led to positive agreements, including the International Dairy Agreement and the cheese quota.

The International Dairy Agreement provided for minimum export prices for some key dairy products in an attempt to bolster world prices although within four years of implementation, the EU developed a substantial domestic dairy surplus and began to export butter at below the minimum agreed prices. In reaction, the United States withdrew from the Agreement.

"The Tokyo Round agreement on U.S. cheese import quotas helped shield the industry from heavily subsidized European dairy imports" but also resulted in higher cheese imports because the United States established quotas above previous import levels. Prior to this agreement, cheeses valued below certain fixed prices were permitted to enter the United States only with an import license, which allowed the government to restrict volumes below levels that would undermine the dairy price-support program. The Tokyo Round institutionalized the large, subsidized dairy trade from the EU and consequently a distorted world dairy trade situation overall.

The U.S.-Canada Free Trade Agreement

Although the U.S.-Canada Free Trade Agreement (CFTA) phased out most import restrictions and agricultural tariffs over a ten-year period, dairy was excluded from these commitments and U.S. dairy exporters have virtually no access to the Canadian market. Canada and the United States agreed to maintain import quotas on dairy and certain other products.

---

[80] Peter Vitaliano, Ph.D., Vice President, Economic Policy and Market Research, National Milk Producers Federation, written submission to the Commission, Mar. 31, 2003.

NAFTA

"NAFTA has had a positive qualitative and quantitative impact on U.S. dairy producers and processors." Under NAFTA, all non-tariff barriers to agricultural trade between the United States and Mexico were eliminated, and most tariffs were eliminated over a ten-year period, including those applying to dairy products. Unlike CFTA, NAFTA provides for the phased elimination of all dairy tariffs between the United States and Mexico. Stringent rules of origin were written into NAFTA in order to ensure that the benefits of preferential access would only accrue to those items produced in North America. Tariffs on all dairy products reduce to zero over a ten-year phase out period, except on skim milk powder exported from the United States to Mexico, which will be eliminated over 15 years.

U.S.-Israel Free Trade Agreement

The U.S.-Israel FTA "has not been beneficial to the U.S. dairy industry."

Uruguay Round

The Uruguay Round Agreements (URA) "achieved many of the objectives for improving disciplines for global agricultural trade that could not be achieved in previous GATT negotiations." The URA established international discipline that eased future negotiations although the United States paid a heavy price to accomplish the agreement in the form of tariff disparities among countries. "Perhaps the most significant accomplishment of the UR market access agreement in agriculture was the conversion of all non-tariff measures into tariffs" including U.S. Section 22 dairy import quotas, EU variable import levies, and the Canadian and Japanese import licensing systems.

The URA also required countries to reduce agricultural export subsidies by 21 percent in volume terms and 36 percent in budgetary outlays which primarily affected the EU which, even after the agreement, continues to maintain about 72 percent of world dairy export subsidies. The export subsidies commitment left a huge competitive advantage with the EU and helped them build a market in the United States at the expense of domestically produced cheese, butter, and milk protein powders.

Further, the URA required all countries to establish ceilings for the amount of support afforded producers through internal support mechanisms. The agreement left the EU with a "huge competitive advantage" that has "harmed the U.S. dairy industry." "On the other hand, expenditures in programs such as the de minimis clause as well as the green box have assisted the [U.S.] dairy industry as well as the U.S. agriculture overall."

The Ranchers-Cattlemen Action Legal Fund-United Stockgrowers of America[81]

The Ranchers-Cattlemen Action Legal Fund - United Stockgrowers of America (R-CALF USA) is a non-profit association that represents thousands of U.S. cattle producers on issues concerning national and international trade and marketing. R-CALF USA's membership consists primarily of cow-calf operators, cattle backgrounders, and feedlot owners. Its members are located in 42 states, and the organization has over 30 local and state cattle association affiliates.

U.S.-Canada FTA and NAFTA

For live cattle, there was a significant increase in imports from Canada. Prior to the USCFTA, imports of Canadian cattle into the United States remained flat and averaged 368,000 head per year from 1978 to 1988. In 1989, U.S. imports began a generally strong upward trend with imports during the past five years averaging over 1,160,000 head annually. Live cattle imports from Mexico, on the other hand, have not increased. For the five years prior to NAFTA, imports from Mexico averaged 1,089,379 head annually, but for the most recent five year period averaged only about 938,177 annually. U.S. exports of live cattle to Canada are restricted, but a post-NAFTA agreement, the Northwest Pilot Program, has led to increased exports when certain sanitary conditions are met. U.S. shipments of live cattle to Canada grew from 40,000 head in 1996 to 349,536 head in 2000. U.S. exports of live cattle to Mexico have generally increased since NAFTA, from 62,683 head in 1994, to 363,887 head in 2001.

U.S. imports of beef from Canada increased markedly following the USCFTA, growing from 81,138 metric tons in 1990 to 335,163 metric tons in 2000. During the same time period, U.S. exports of beef to Canada remained flat, slipping from 90,892 in 1991 to 87,480 metric tons in 2000. U.S. beef exports to Mexico have grown significantly following NAFTA. Since 1995, U.S. exports have risen steadily with export volumes some 2.5 times greater than in the years prior to NAFTA, to about 178,749 metric tons, and worth some $531 million. U.S. beef imports from Mexico have increased considerably since NAFTA, growing from 591,340 kilograms in 1994 to 3,412,582 kilograms in 2001, worth about $15 million.

Prior to the USCFTA and NAFTA, U.S. tariffs on imports of Canadian and Mexican beef limited access into the U.S. market. However, the U.S. Meat Import Law, which was replaced by a tariff rate quota during the Uruguay Round, was even more important in controlling the amount of imported beef entering the U.S. market.

---

[81] Leo R. McDonnell, Jr., President, R-CALF USA, written submission to the Commission, Feb. 14, 2003.

Tokyo Round

Prior to the completion of the Tokyo Round, Japan controlled imports of beef through quotas. During the Tokyo Round, the United States sought a larger allotment within Japan's quota for higher quality grain-fed beef. An agreement was reached between the United States and Japan in 1978 and led to increased access for U.S. beef in the Japanese market.

U.S. Israel Free Trade Area Agreement

In 1985, the United States and Israel signed an FTA calling for the phasing out of tariffs by 1995. In 1996, the United States and Israel signed the Agreement on Trade in Agricultural Products (ATAP). The ATAP was set to expire on Dec. 31, 2001. However, it was extended through 2002 with tariffs and tariff rate quotas maintained at 2001 levels. Despite the FTA, exports of U.S. frozen beef to Israel were, as of 2001, subject to a TRQ of 8815 metric tons, and fresh and chilled U.S. beef was subject to a TRQ of 1,217 metric tons. In-quota imports of these products enter duty-free. U.S. beef exports to Israel are small totaling only $203,000 in 2001, mostly frozen product. An important impediment to U.S. beef exports to Israel is the Israeli Kosher Meat Import Law of 1994, which bans the importation of any meat or meat product that is not certified as kosher by Israel's chief rabbinate.

Uruguay Round

The Uruguay Round promoted U.S. exports of beef to Japan and Korea, but not the EU. As part of the Uruguay Round, the United States and Japan signed the Beef-Citrus Agreement which phased out Japan's import quota and 25 percent tariff on beef. These were replaced with a 70 percent tariff in 1991, which was reduced to 60 percent in 1992 and 50 percent in 1993. The phasing out of Japan's quota had a dramatic impact on U.S. exports of beef and offal to Japan, which rose by almost 90 percent by value from 1988 to 1990. During this time, exports by volume rose by 50 percent. The Beef-Citrus Agreement, while not necessarily part of the formal Uruguay Round negotiations, was negotiated after the Uruguay Round began. Concessions made by Japan during Uruguay Round continue to benefit the U.S. beef industry. The United States is the main beef exporter to Japan with 48 percent of Japan's import market.

The Beef-Citrus Agreement between the United States and Japan served as a model for opening the Korean market to imports of U.S. beef. During Uruguay Round negotiations, Korea and the United States reached agreement on global access to the Korean beef market. Under the Uruguay Round Agreement on Agriculture, Korea agreed to increase its minimum imports of beef two-fold to 225,000 metric tons by 2000. Imports of beef by Korea would be unrestricted as of 2001, but a tariff of 41.2 percent would be imposed on such imports, which would decrease to 40 percent in 2004. The U.S. beef industry has benefitted from concessions made by Korea during Uruguay Round negotiations. In 2001, U.S. exports to Korea constituted 57 percent of Korea's beef imports.

In contrast to Japan and Korea, the outcome of Uruguay Round negotiations with regard to cattle and beef with the EU has not been positive for U.S. producers. Despite a finding of the WTO that the EU's ban on the importation of beef treated with growth promoting hormones violates the SPS Agreement, the EU continues to block shipments of most U.S. beef. Furthermore, while the EU made cuts in subsidies for the cattle and beef industry as a result of the Uruguay Round, this sector retains strong government support. The EU's cattle producers remain heavily subsidized, and the 2002 budget for the EU's beef sector was approximately $8.2 billion, or about 17 percent of the EU's agricultural budget. As part of its Uruguay Round commitments, the EU agreed to reduce export subsidies for beef from 1.9 billion ECUs in 1995 to 1.3 billion ECUs in 2000. This amounted to a 26 percent cut in export subsidies for beef. According to the USDA, export refunds provided by the EU in 2000 for beef totaled $750 million. The U.S. live cattle industry, by contrast, receives little government support, and in 2000 provided no beef export subsidies to producers.

Chemicals and Allied Products[82]

Overview

The United States is one of the world's largest producers of chemicals and allied products, along with Japan and the EU. The value of U.S. shipments was an estimated $623 billion[83] in 2001, accounting for approximately 25 percent of the world total (table 5-12).[84] In 2001, domestic shipments of basic chemicals[85] and pharmaceuticals[86] each accounted for approximately 18.0 percent of total domestic chemical industry shipments.[87] Other industry subsectors with significant domestic production are the soaps, cleaning compounds and toilet preparations subsector (9 percent) and the plastics and rubber products subsector (25 percent).[88]

Of the more than 2,500 companies producing chemicals in the United States, multinational firms, both U.S. and foreign-based, accounted for the

[82] For the purposes of this investigation, chemicals and allied products comprise SIC groups 28 and 30.

[83] Current dollars.

[84] "Finances: Industry Pulled Back Again," *Chemical & Engineering News,* June 24, 2002, pp. 44–45.

[85] NAICS code 3251. Includes basic organic and inorganic chemicals, industrial gases, dyes and pigments.

[86] NAICS code 3254.

[87] "Finances: Industry Pulled Back Again," *Chemical & Engineering News,* June 24, 2002, p. 45.

[88] Ibid.

Table 5-12

Chemicals and allied products:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
	Billions of constant (1996) dollars											
Shipments	357.8	372.3	367.9	374.6	341.5	355.3	378.5	370.1	366.4	408.1	444.7	461.7
Imports	18.9	20.2	21.4	22.2	20.2	24.4	28.7	29.1	28.9	30.3	35.3	36.2
Exports	30.8	38.9	42.8	41.1	36.0	35.6	36.9	34.6	34.9	39.3	46.8	49.1
Apparent consumption	345.9	353.6	346.5	355.7	325.8	360.2	370.4	364.6	360.5	399.1	433.2	448.7
Trade balance	11.9	18.7	21.4	18.9	15.7	11.3	8.1	5.5	5.9	9.0	11.5	13.0
	Percentage											
Imports/apparent consumption	5.5	5.7	6.2	6.2	6.2	6.8	7.8	8.0	8.0	7.6	8.2	8.1
Exports/shipments	8.6	10.5	11.7	11.0	10.5	9.6	9.7	9.3	9.5	9.6	10.5	10.6
	1,000 workers											
Total employment	1,888	1,930	1,871	1,881	1,804	1,786	1,862	1,862	1,844	1,867	1,923	1,962
Production workers	1,250	1,276	1,214	1,225	1,156	1,153	1,215	1,209	1,206	1,227	1,270	1,295
	Constant (1996) dollars											
Hourly earnings	13.06	13.02	13.09	13.14	13.39	13.54	13.51	13.59	13.67	13.62	13.52	13.39
	$1,000 per worker											
Labor productivity	286	292	303	306	295	308	312	306	304	333	350	357

See footnote at end of table.

Table 5-12—*Continued*
Chemicals and allied products:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Billions of constant (1996) dollars											
Shipments	460.1	451.0	456.2	465.4	488.5	517.0	518.1	549.9	550.0	551.7	570.5	543.5
Imports	36.8	37.2	41.1	42.9	48.0	55.1	59.7	65.4	69.8	77.9	88.3	90.0
Exports	51.3	54.3	54.4	54.5	61.3	70.2	70.6	77.8	76.1	77.5	86.1	83.0
Apparent consumption	445.6	434.0	442.9	453.7	475.2	501.8	507.3	537.6	543.6	552.1	572.7	550.6
Trade balance	14.5	17.0	13.3	11.7	13.3	15.1	10.9	12.3	6.4	-0.4	-2.1	-7.1
	Percentage											
Imports/ apparent consumption	8.3	8.6	9.3	9.5	10.1	11.0	11.8	12.2	12.8	14.1	15.4	16.4
Exports/ shipments	11.2	12.0	11.9	11.7	12.6	13.6	13.6	14.1	13.8	14.1	15.1	15.3
	1,000 workers											
Total employment	1,974	1,938	1,962	1,990	2,010	2,018	2,017	2,032	2,048	2,044	2,045	1,980
Production workers	1,287	1,242	1,234	1,276	1,319	1,343	1,337	1,345	1,366	1,369	1,367	1,302
	Constant (1996) dollars											
Hourly earnings	13.32	13.30	13.36	13.27	13.16	13.20	13.36	13.44	13.69	13.89	14.11	14.31
	$1,000 per worker											
Labor productivity	358	363	370	365	370	385	387	409	403	403	417	417

[1] Includes SIC 28 (chemicals and allied products) and 30 (rubber and miscellaneous plastics products).

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of Economic Analysis and Bureau of the Census; and U.S. Department of Labor, Bureau of Labor Statistics.

majority of production. These major producers are extremely diversified, producing a broad spectrum of products. Typically, they are also vertically integrated throughout most of the chemical production scheme, from the production of building-block chemicals through chemical intermediates to final products. Of the 50 largest chemical-producing firms worldwide, 17 are U.S.-based, and approximately 18 others have active chemical plants in the United States.[89] Additionally, there are many specialized firms that produce a very limited range of products, and depend on larger diversified firms for their raw materials.

Chemical production[90] closely parallels overall U.S. manufacturing output over the period 1978-2001.[91] Shipments of the chemicals and allied products industry increased from $358 billion (in constant 1996 dollars) in 1978 to nearly $571 billion in 2000. In 2001, the recession coupled with an excess of inventoried materials caused shipments to decline to $543 billion.[92] The trends in apparent consumption closely echo the patterns of domestic production, although the ratio of imports to consumption increased from 5.5 percent in 1978 to 16.4 percent in 2001. Apparent consumption increased from $346 billion to $551 billion in 2001, an increase of more than 59 percent. U.S. production continued to supply the overwhelming majority of demand from the domestic market for chemicals, plastics, pharmaceuticals, and rubber products.

U.S. exports of chemicals and allied products steadily increased along with U.S. production in recent years and accounted for 15.3 percent of U.S. shipments in 2001 as compared to 8.6 percent in 1998. The composition of U.S. exports closely mirrors U.S. production. The industry is a major supplier of chemical raw materials and intermediates, as well as finished chemical products to many foreign markets. Generally, the majority of U.S. chemical trade involves inter-company transfers or trade between associated firms. As such, the patterns of trade remains fairly steady from year-to-year.

Employment in the U.S. chemicals and allied products industry increased slightly from 1.9 million workers in 1978 to 2.0 million in 2000, before

---

[89] "Global Top 50," *Chemical & Engineering News,* July 23, 2001, pp. 23-27.

[90] Industrial production indices published by the American Chemical Society in the journal *Chemical & Engineering News.* "Facts & Figures," *Chemical & Engineering News,* June 10, 1985, p. 27; "Facts & Figures," *Chemical & Engineering News,* June 23, 1997, p. 41; and "Facts & Figures," *Chemical & Engineering News,* June 24, 2002, p. 61.

[91] Exceptions include instances that arose from rapidly increasing or decreasing feedstock (and natural gas) prices or changes in the availability of feedstock materials, particularly during the late 1970s.

[92] "At Last, Chemical Earnings Rise," *Chemical & Engineering News,* Aug. 19, 2002, p. 19.

decreasing by 3.2 percent in 2001.[93] Labor productivity over the 1978-2001 period increased considerably, as a result of technical improvements. The industry made considerable efforts several times during this period to restructure and re-engineer production pathways to remove bottlenecks that had previously impaired productivity. Most of these efforts occurred as a direct result of unexpected stresses on the domestic industry.

U.S. chemical sector wages remain higher than the average for overall U.S. manufacturing, and increased during 1978-2001, from $13.06 per hour to $14.31 per hour. In 1982, workers in the chemicals and allied product sector earned wages 17 percent higher than the average for overall U.S. manufacturing, and in 2001 chemicals and allied products industry workers earned wages more than 25 percent higher.[94]

The chemical sector has continuously worked to increase efficiencies of production, remaining mindful of the painful rationalizations of the late 1970s and early 1980s. At the present time, the large multinational producers that dominate the U.S. industry have significant competitive advantages due to their size and structure, which provide economies of scale and easier access to capital.

According to various industry analysts,[95] the U.S. chemical industry has become less competitive in recent years. Cost differentials for major feedstock materials are the major disadvantage of the U.S. industry vis-à-vis petroleum- and gas-rich nations with developed and developing chemical industries, particularly those in East Asia and the Middle East. Expensive domestic environmental regulations also place an additional cost burden on U.S. producers, as well as producers in the EU and Japan.[96] Rising worldwide feedstock costs since 2000, declining world product demand, increasing foreign chemical production capacity, and the strong dollar have made it increasingly difficult for U.S. chemical producers to compete in U.S. and foreign markets. The result has been a significant downward pressure on U.S. chemical industry earnings.[97] This temporary industry weakness and the strength of the dollar has made the U.S. market more attractive to foreign producers.[98]

---

[93] Employment data obtained from Bureau of Labor Statistics database; based on SIC code 28, chemicals and allied products, retrieved from *http://data.bls.gov/cgi-bin/dsrv* on Aug. 14, 2002 and from *http://146.142.4.24/cgi-bin/surveymost*, on May 24, 2001 and "Employment: Cuts Continued Trend," *Chemical & Engineering News,* June 24, 2002, pp. 66-67.

[94] "Employment: Cuts Continued Trend," *Chemical & Engineering News,* June 24, 2002, p. 66-67.

[95] "World Chemical Outlook," *Chemical & Engineering News,* Dec. 17, 2001, p. 26.

[96] Ibid.

[97] Ibid., pp. 26-28.

[98] Ibid., pp. 26.

Domestic production capacity for primary petrochemicals expanded during the late 1990s to meet expected downstream growth. When downstream growth fell short of expectations, serious oversupplies of certain key chemical building blocks, particularly ethylene, resulted and some domestic firms were forced to shut down operating facilities that were becoming non-competitive.[99] Continued overseas capacity expansions in Saudi Arabia, China, and Singapore also added significantly to world production capacity. As a result, U.S. industry capacity utilization continued to decline through the end of 2001.

The pharmaceutical industry was the fastest growing chemicals subsector during 1978-2001. U.S. pharmaceutical shipments during 1978-2000 increased 222 percent to $85.4 billion in 2000 before declining to $80.8 billion in 2001.[100] This growth resulted from several factors, including the passage of major trade agreements, advancements in medical knowledge, and increased standards of living. For the United States, growth occurred in both domestic and overseas sales (through international trade or overseas subsidiaries).[101] Historically, the U.S. pharmaceutical industry has been composed of large multinational companies headquartered in Europe, the United States, and Japan. In the last 20 years there have been multiple mergers of companies headquartered in different countries, i.e. the mergers of Glaxo (United Kingdom) and Smith Kline (United States).[102] In addition, virtually all research-based pharmaceutical companies have production facilities located throughout the world that manufacture active ingredients and/or finished products. Generic producers have also become a major influence in the pharmaceutical industry both domestically and throughout the rest of the world. By increasing price competition, generic producers have had a significant effect on domestic and global pharmaceutical markets.

The pharmaceutical industry also has been subject to structural change, differing international regulations, and industrial policies that have affected production, sales, trade and profits. In addition, the rapid increase in medical research and development during this period has resulted in a number of new and very profitable products, which are protected by multi-year patents. This profitability is enhanced by the fact that these products are not sold directly to the consumer, but rather are prescribed by a physician, with insured patients paying only a portion of the cost. Finally, the United States, relative to most

[99] "2001 Chemical Industry Review," *Chemical & Engineering News,* Dec. 24, 2001, pp. 13-17.

[100] In constant 1996 dollars, compiled from official statistics of the BEA.

[101] Data collected by the Pharmaceutical Research and Manufacturers of America show that domestic sales and overseas sales by domestic companies (in current dollars) increased 908 percent from $16 billion in 1978 to $149 billion in 2000.

[102] "Business Concentrates," *Chemical & Engineering News,* Mar. 18, 2002, pp. 12-13 and "Pfizer Captures Pharmacia," *Chemical & Engineering News,* July 22, 2002, p. 9.

other countries, has very few direct price controls, giving companies the opportunity to charge higher prices.[103] Under such circumstances, tariff reductions have not been shown to be a major influence on pharmaceutical prices.

Effect of Trade Agreements on the Sector

Although the 5 major trade agreements that are the subject of this investigation have had a significant effect on this sector, trade patterns were affected to a far greater extent by other factors, both economic and technological in nature. Among these factors are continued product and process innovations and development in both the industrial segment and the commercial segment of the sector. Such innovations during the past 20 years significantly improved U.S. competitiveness by allowing the chemical production process to become much more efficient. Constant innovation in the sector which allowed for a broadening of product usage, particularly in the area of plastics and other synthetic composite materials provided for growth through replacement of such "traditional" materials as metals and glass. Table 5-13 presents trade issues addressed by the subject trade agreements that were relevent to the sector.

Tokyo Round

During 1980-2001, total trade in the chemicals and allied products sector increased at an average annual rate of 4.9 percent, exceeding the 3.5 percent overall rate for all manufacturing sectors. Imports of sector products increased at a rate exceeding 7.0 percent, reaching $90 billion in 2001. In contrast, exports increased at a rate of only 3.2 percent, reaching $83 billion in 2001, creating a sectoral trade deficit during 1999-2001 after maintaining a surplus throughout 1978-98. Overall, the trade surplus reached its highest level ($21.4 billion) in 1980, and fluctuated somewhat erratically downward during the rest of 1981-2001. Much of the variation and fluctuation seen in both the import and export statistics for this period is derived from pricing changes for sector goods.[104]

The effect of the Tokyo Round on the U.S. chemical and allied products sector likely was less significant than other factors influencing the sector. Increased domestic industrial efficiencies resulting from the need to compete in a rapidly changing world chemical market, and technological innovations throughout the sector, particularly during the late 1980s and early 1990s, had a much more pronounced effect on sector trade and output.

---

[103] This environment is changing, as the government and group health companies are developing policies to reduce drug prices.

[104] This resulted from irregular changes in the cost of many of the industry sector's primary inputs, related to changes in the price of energy materials such as crude petroleum and natural gas.

Table 5-13
Chemicals and allied products: Trade issues addressed in trade agreements and U.S. tariffs

Trade issues and U.S. tariffs	Tokyo Round	U.S.-Israel	U.S.-Canada	Uruguay Round	NAFTA[1]
Tariffs[2]	(1979) 0.1% (1987) 0.6%	(1984) NA (1995) NA	(1987) 0.5% (1998) <0.1%	(1994) 0.6% (1999) 0.4%	(1993) 0.2% (2001) <0.1%
Technical barriers	X			X	
Import licensing	X				
Customs valuation	X			X	X
Government procurement	X	X	X	X	X
Offsets		X			
Rules of origin		X	X	X	X
TRIMs[3]				X	X
TRIPs[4]				X	X

[1] The NAFTA provides that tariffs will be eliminated by Jan. 1, 2003 for all industrial goods and by Jan. 1, 2008 for all other goods.
[2] Average trade-weighted ad valorem or ad valorem equivalent tariff. Trade weights for the Tokyo Round and Uruguay Round are based on U.S. imports from the world uring the years indicated. Trade weights for the bilateral treaties and NAFTA are based on U.S. imports from the relevant countries. Unless otherwise noted, dates in parentheses represent the year immediately prior to the entry into force of the agreement and the year of the final tariff reduction for most products and markets.
[3] Trade-related investment measures.
[4] Trade-related aspects of intellectual property rights.

Source: U.S. Trade Representative, *Annual Report of the President of the United States on the Trade Agreements Program*, various issues; U.S. Trade Representative*, Trade Policy Agenda and Annual report,* various issues; and *U.S. International Trade Commission, Operation of the Trade Agreements Program,* various issues.

U.S.-Israel FTA[105]

There was little or no impact on overall U.S. trade of chemicals and allied products as a result of the U.S.-Israel FTA. Although total trade with Israel in this sector increased at an average annual rate of 10.5 percent during 1984-2001, exceeding the 5.9 percent rate for the overall sector, Israel accounted for less than 0.9 percent of sector trade in 2001. Much of the increase in trade resulted from growth in Israeli demand and significant growth in Israel's chemical sector, particularly in pharmaceuticals. For example, during 1989-2001, U.S. imports of pharmaceutical preparations[106] increased from \$479,000 to more than \$502 million, accounting for almost one-half of the \$1.1 billion of U.S. sectoral imports from Israel in 2001 (table 5-14).

The U.S.-Canada FTA

There was, at most, a modest impact on total U.S. trade of chemicals and allied products as a result of the U.S.-Canada FTA. Total trade with Canada in this sector increased at an average annual rate of 9.3 percent during 1987-2001, exceeding the 5.9 percent rate for the overall sector. U.S. sectoral imports from Canada increased from \$5.4 billion in 1987 to \$20.8 billion in 2001, representing an average annual rate of growth of 10.1 percent, while sectoral U.S. exports to Canada increased at an average annual rate of 9.6 percent, reaching \$18.7 billion in 2000, before declining to \$17.6 billion in 2001 (table 5-15). Although cross-border trade of plastics[107] and industrial organic chemicals[108] used by the chemical sector increased modestly, much of the growth in trade in the chemicals sector is due to increases in the unit values of traded pharmaceuticals, among the fastest growing industries within the sector.

NAFTA

There was, at most, a modest impact on trade of chemicals and allied products as a result of the NAFTA. U.S. sector trade with Canada and Mexico increased at an average annual rate of 9.3 percent growth during 1994-2000, before declining by 2.5 percent during 2000-2001. Total sector imports from Canada and Mexico increased by 85.3 percent during 1994-2001 and total U.S. sector exports to Canada and Mexico increased by 53.0 percent. During the period, U.S. sectoral imports from sources other than Canada and Mexico rose by 88 percent, while U.S. sectoral exports to markets other than Canada and Mexico increased by 29 percent suggesting a measurable positive effect on U.S. sector exports to Mexico.

---

[105] The U.S.-Israel FTA was signed in 1985 and was fully implemented on Jan. 1, 1995.

[106] SIC classification 2834.

[107] SIC classification 2821.

[108] SIC classification 2869.

Table 5-14
Chemical and allied products: U.S. trade with Israel, 1984-2001

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992
	Millions of constant (1996) dollars								
U.S. import value									
Israel	167.3	211.8	215.1	244.1	263.4	320.5	349.0	346.8	371.1
All other	28,558.7	28,881.5	28,705.9	30,040.6	35,034.1	35,835.8	36,413.6	36,876.3	40,728.2
Total	28,726.0	29,093.3	28,921.0	30,284.7	35,297.5	36,156.3	36,762.6	37,223.1	41,099.3
	Percent								
Israel/Total	0.6	0.7	0.7	0.8	0.8	0.9	1.0	0.9	0.9
US. import growth									
Israel	—	26.6	1.6	13.5	7.9	21.7	8.9	-0.6	7.0
All other	—	1.1	-0.6	4.7	16.6	2.3	1.6	1.3	10.5
Total	—	1.3	-0.6	4.7	16.6	2.4	1.7	1.3	10.4
	Millions of constant (1996) dollars								
U.S. export value									
Israel	112.4	115.4	124.8	148.2	175.0	183.4	220.5	249.8	265.3
All other	36,735.9	34,458.7	34,732.3	39,181.3	46,621.5	48,943.2	51,079.2	54,004.7	54,104.0
Total	36,848.3	34,574.1	34,857.1	39,329.4	46,796.4	49,126.6	51,299.7	54,254.6	54,369.3
	Percent								
Israel/Total	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5
U.S. export growth									
Israel	—	2.6	8.2	18.7	18.1	4.8	20.3	13.3	6.2
All other	—	-6.2	0.8	12.8	19.0	5.0	4.4	5.7	0.2
Total	—	-6.2	0.8	12.8	19.0	5.0	4.4	5.8	0.2

See notes at end of table.

Table 5-14—*Continued*
Chemical and allied products: U.S. trade with Israel, 1984-2001

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of constant (1996) dollars								
U.S. import value									
Israel	455.6	531.0	544.1	625.2	664.7	727.7	728.9	861.7	1,091.3
All other	42,405.8	47,474.2	54,554.8	59,091.6	64,762.2	69,045.5	77,214.2	87,414.3	88,951.1
Total	42,861.4	48,005.2	55,098.9	59,716.9	65,427.0	69,773.3	77,943.1	88,276.0	90,042.4
	Percent								
Israel/Total	1.1	1.1	1.0	1.1	1.0	1.0	0.9	1.0	1.2
US. import growth									
Israel	22.8	16.6	2.5	14.9	6.3	9.5	0.2	18.2	26.7
All other	4.1	12.0	14.9	8.3	9.6	6.6	11.8	13.2	1.8
Total	4.3	12.0	14.8	8.4	9.6	6.6	11.7	13.3	2.0
	Millions of constant (1996) dollars								
U.S. export value									
Israel	232.7	260.1	333.3	365.9	372.3	379.5	367.9	403.1	435.3
All other	54,308.6	61,079.4	69,900.4	70,229.5	77,378.5	75,743.9	77,161.9	85,737.4	82,537.6
Total	54,541.3	61,339.5	70,233.6	71,595.3	77,750.8	76,123.4	77,529.7	86,140.5	82,973.0
	Percent								
Israel/Total	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
U.S. export growth									
Israel	-12..3	11.8	28.1	9.8	1.8	1.9	-3.1	9.6	8.0
All other	0.4	12.5	14.4	0.5	10.2	-2.1	1.9	11.1	-3.7
Total	0.3	12.5	14.5	0.5	10.1	-2.1	1.9	11.1	-3.7

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

Table 5-15
Chemical and allied products: U.S. trade with Canada and Mexico, 1987-2001

Year	1987	1988	1989	1990	1991	1992	1993	1994
	Millions of constant (1996) dollars							
U.S. import value								
Canada	5,383.7	6,385.4	7,075.0	7,360.6	7,534.5	8,592.1	9,594.6	11,587.9
Mexico	892.8	1,285.8	1,126.1	1,187.4	1,264.0	1,476.6	1,457.0	1,937.2
All other	24,008.2	27,626.4	27,955.3	28,214.6	28,424.6	31,030.7	31,809.8	34,480.1
Total	30,284.7	35,297.5	36,156.3	36,762.6	37,223.1	41,099.3	42,861.4	48,005.2
	Percent							
Canada/Total	17.8	18.1	19.6	20.0	20.2	20.9	22.4	24.1
Mexico/Total	3.0	3.6	3.1	3.2	3.4	3.6	3.4	4.0
U.S. import growth								
Canada	—	18.6	10.1	4.0	2.4	14.0	11.7	20.8
Mexico	—	44.0	-12.4	5.5	6.5	16.8	-1.3	33.0
All other	—	15.7	1.2	9.3	7.4	9.2	2.5	8.4
Total	—	16.6	2.4	1.7	1.3	10.4	4.3	12.0
	Millions of constant (1996) dollars							
U.S. export value								
Canada	5,714.1	6,387.2	6,560.7	9,129.7	9,534.6	10,191.7	11,239.1	12,480.3
Mexico	2,508.5	3,237.8	3,413.0	3,525.9	3,823.8	4,511.1	4,881.9	6,238.2
All other	31,106.9	37,171.4	39,152.9	38,644.1	40,896.2	39,666.5	38,420.3	42,621.0
Total	39,329.4	46,796.4	49,126.6	51,299.7	54,254.6	54,369.3	54,541.3	61,339.5
	Percent							
Canada/Total	14.5	13.7	13.4	17.8	17.6	18.8	20.6	20.4
Mexico/Total	6.4	6.9	7.0	6.9	7.1	8.3	9.0	10.2
U.S. export growth								
Canada	—	11.8	2.7	39.2	4.4	6.9	10.3	11.0
Mexico	—	29.1	5.4	3.3	8.5	18.0	8.2	27.8
All other	—	19.5	5.3	-1.3	5.8	-3.0	-3.1	10.9
Total	—	19.0	5.0	4.4	5.8	0.2	0.3	12.5

See notes at end of table.

Table 5-15—*Continued*
Chemical and allied products: U.S. trade with Canada and Mexico, 1987-2001

Year	1995	1996	1997	1998	1999	2000	2001
	Millions of constant (1996) dollars						
U.S. import value							
Canada	13,779.7	14,588.6	16,261.2	16,539.3	17,579.2	20,048.9	20,802.1
Mexico	2,535.5	2,822.8	3,286.9	3,443.5	3,901.1	4,214.9	4,255.2
All other	38,783.7	42,305.5	45,878.9	49,790.5	56,462.9	64,012.2	64,985.1
Total	55,098.9	59,716.9	65,427.0	69,773.3	77,943.1	88,276.0	90,042.4
	Percent						
Canada/Total	25.0	24.4	24.9	23.7	22.6	22.7	23.1
Mexico/Total	4.6	4.7	5.0	4.9	5.0	4.8	4.7
U.S. import growth							
Canada	18.9	5.9	11.5	1.7	6.3	14.1	3.8
Mexico	30.9	11.3	16.4	4.8	13.3	8.1	0.1
All other	12.5	9.1	8.5	8.5	13.4	13.4	1.5
Total	14.8	8.4	9.6	6.6	11.7	13.3	2.0
	Millions of constant (1996) dollars						
U.S. export value							
Canada	13,522.7	14,404.7	15,921.8	16,507.3	17,622.5	18,712.3	17,636.4
Mexico	5,877.3	7,034.9	8,603.2	9,467.6	10,049.2	12,082.6	10,996.0
All other	50,833.6	49,155.8	53,225.8	50,148.5	49,858.0	55,345.7	54,340.5
Total	70,233.6	70,595.3	77,750.8	76,123.4	77,529.7	86,140.5	82,973.0
	Percent						
Canada/Total	19.3	20.4	20.5	21.7	22.7	21.7	21.3
Mexico/Total	8.4	10.0	11.1	12.4	13.0	14.0	13.3
U.S. export growth							
Canada	8.4	6.5	10.5	3.7	6.8	6.2	-5.8
Mexico	-5.8	19.7	22.3	10.1	6.1	20.2	-9.0
All other	19.3	-3.3	8.3	-5.8	-0.6	11.0	-1.8
Total	14.5	0.5	10.1	-2.1	1.9	11.1	-3.7

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

Uruguay Round

During 1995-2001, total U.S. trade in the chemicals and allied products sector increased at an average annual rate of 5.6 percent, exceeding the 3.9 percent rate of growth in the manufacturing sector. Import growth exceeded 8.5 percent, reaching $90 billion in 2001, while export growth averaged 3.0 percent, reaching $86.1 billion in 2000, before declining to $83 billion in 2001. The sector trade balance began declining in 1995, and became negative for the first time in 1999. The decline in the U.S. sector trade balance can largely be attributed to changing international trade patterns, increasing competition from firms locating overseas, and the decreasing competitiveness of the U.S. industry.

However, there have been some significant effects of the URA on an industry level within this sector. In particular, the U.S. pharmaceutical industry was affected by the Uruguay Round Elimination of Duties on Pharmaceuticals and the TRIPS Agreement. When the Uruguay Round Agreements (URA) went into effect on January 1, 1995, 17 countries (eventually increasing to 21) agreed to eliminate tariffs on approximately 7,000 finished and intermediate pharmaceutical products.[109] The average pre-URA rates for pharmaceutical products eliminated under the zero for zero[110] agreement were 5.89 percent for the EU, 4.73 percent for Japan, and 4.23 percent for the United States.[111]

Because the costs of developing new pharmaceuticals are substantial and the enforcement of patent rights is an important element in recouping costs, the TRIPS agreement likely has had a positive influence on the growth of the industry. In particular, the TRIPS agreement extends U.S. patents on pharmaceutical (and other) products, patented since the treaty was ratified, from 17 to 20 years.[112]

Additionally, during the period under consideration, some countries have unilaterally introduced commercial policies to stimulate economic development. As chemical synthesis of pharmaceutical products is often a multi-step process, with different steps potentially taking place in different

---

[109] They are currently listed in the Pharmaceutical Appendix to the Harmonized Tariff Schedules (HTS). Basically, the general (NTR) tariffs were eliminated on all finished pharmaceutical products listed in chapter 30, and active ingredients listed in chapter 29 under the sub-headings 2936, 2937, 2939, and 2941. Background information is found in USITC, inv. No. 332-402, Advice Concerning the Addition of Certain Pharmaceutical Products and Chemical Intermediates to the Pharmaceutical Appendix to the Harmonized Tariff Schedule of the United States, Apr. 1999.

[110] See USITC, inv. No. 332-402, Advice Concerning the Addition of Certain Pharmaceutical Products and Chemical Intermediates to the Pharmaceutical Appendix to the Harmonized Tariff Schedule of the United States, Apr. 1999.

[111] David Michels and Elizabeth Nesbitt, "The Uruguay Round Elimination of Duties on Pharmaceuticals: Developments in the 2 Years Since Implementation," Industry Trade and Technology Review, Oct. 1997, pp. 1-12.

[112] Post-hearing submission of the Generic Pharmaceutical Association.

countries, the elimination of tariffs among participating countries should increase the efficiency with which pharmaceutical goods are produced. However, beginning in the 1990s, Ireland introduced a regime of low corporate tax rates with the intention of attracting high-tech companies to manufacture in Ireland. With this tax structure and companies' use of transfer pricing incentives, Ireland soon became a major producer and exporter of pharmaceutical products.[113] Irish exports of pharmaceutical products to the United States increased from $635 million in 1995 to almost $12 billion in 2001.[114]

Views of Interested Parties

Generic Pharmaceutical Association[115]

The Generic Pharmaceutical Association (GPA) represents more than 140 companies that manufacture and support the generic pharmaceutical industry and whose membership accounts for more than 90 percent of generic drugs dispensed in the United States.

GPA supports the need for both pharmaceutical innovation and the preservation of intellectual property rights, as provided for in the trade negotiations conducted over the last two decades. The association notes, however, that their membership is uniquely impacted by the agreements on intellectual property, and as a consequence, increased oversight is required to insure that its interests are appropriately addressed.

Under the Uruguay Round, the TRIPS agreement established a patent term of 20 years, for products patented after June 7, 1995. This agreement obliged the United States to lengthen patent terms from 17 years to 20 years, thereby, increasing the time during which the consumer is denied access to lower-priced pharmaceuticals. GPA cited a 1995 study that calculated "(t)he annual generic savings lost by American consumers due to delayed generic entry will range from $200 million in some years to $500 million in other years."[116] This study also calculated that the U.S. Government could lose $1.25 billion over the two years following the publication's release, based on purchases for Medicaid, Medicare, the Veteran's Administration, and the Department of Defense.

---

[113] Clay Boswell and Feliza Mirasol, "Sourcing Pharmaceutical Manufacturing from Offshore Facilities," Chemical Marketing Reporter, Oct. 25, 1999, p. 28.

[114] U.S. International Trade Commission, Shifts in U.S. Merchandise Trade, various years.

[115] Kathleen D. Jaeger, R.Ph., J.D, President & CEO, Generic Pharmaceutical Association, written submission to the Commission, Feb. 14, 2003.

[116] Stephen W. Schondelmeyer, "Economic Impact of GATT Patent on Currently Marketed Drugs," PRIME Institute, College of Pharmacy, University , Mar. 1995.

Pharmaceutical Research and Manufacturers of America[117]

The Pharmaceutical Research and Manufacturers of America (PhRMA) is the national association representing the U.S. research-based pharmaceutical industry.

PhRMA is highly supportive of each of the subject trade agreements and PhRMA members have reaped enormous benefits from these trade agreements which have opened up foreign markets to U.S. exports. The industry benefitted greatly from the improved intellectual property protection, reduced technical barriers to trade, and "the zero for zero" initiative of the United States that eliminated duties on many active ingredients and intermediates.

While the U.S. industry has fared well with these treaties, not all trade agreements were created equal. The most acceptable agreement would be one that provides intellectual property protection comparable to that found in the United States, whereas the TRIPS agreement established only a minimum level of protection for intellectual property protection. More recent multinational and bilateral agreements have improved the protection for intellectual property rights that was initiated in the TRIPS agreement and extended and clarified in the NAFTA. For example, the U.S.-Jordan FTA provided for improved data protection, allowed biotech products to be patentable, limited compulsory licensing, and extended the patent period to allow for time lost because of regulatory delays.

Other elements of the trade agreements have also been quite beneficial. The WTO Agreement on Technical Barriers to Trade extended the work of the Tokyo Round. The plurilateral Agreement on Government Procurement limited the ability of government procurement practices to create artificial barriers to trade. The Agreement on Government Standards reduced the ability of countries to use regulations, standards, and testing and certification procedures as tools to restrict trade. The association supports measures that such as those embodied in the U.S.-Jordan FTA that protect the pharmaceutical industry from parallel imports, a practice in which products are sold at a lower price in one country (usually a poor country) and then resold at a higher price, by a third party, in another country (usually a richer country).

---

[117] Andrew W. Shoyer, USITC hearing testimony on behalf of the Pharmaceutical Research and Manufacturers of America, Jan. 14, 2003.

Mineral and Metal Products[118]

Overview

The United States is a major producer and consumer of mineral and metal products.[119] This sector is composed of five subsectors (in decreasing shipment order for 2001): fabricated metal products except machinery and transportation equipment (fabricated metal products); primary metals; stone, clay, glass, and concrete products (structural minerals); nonmetallic minerals, except fuels (nonmetallic minerals); and metallic ores/concentrates.[120] Fabricated metal products and primary metals together represented roughly 80 percent of total sector output in terms of value throughout the period. Structural minerals represented most of the remaining output, with combined shipments of metallic ores and concentrates and nonmetallic minerals representing only about 5 percent of sector output. Competitive changes during 1978-2001 have been the result of rapidly expanding foreign production most evident in primary metals and metallic ores and concentrates subsectors. Therefore, the remainder of this section focuses on these particular subsectors.

The primary metals and metallic ores/concentrates subsectors are heavily concentrated as typically a handful of producers account for most production in

[118] For the purposes of this investigation, mineral and metal products comprise SIC groups 10, 14, 32, 33, and 34.

[119] Reliable data on world output and the U.S. position relative to other countries for the diverse collection of products in this sector are not available. Such information is available for specific products/product groups. In 2001, U.S. raw steel production ranked third globally; unwrought aluminum, third; refined copper, second; gold, second; glass, first; and cement, third.

[120] In macroeconomic definitions, fabricated metal products, primary metals, and structural minerals are *manufactured* products; nonmetallic minerals and metallic ores/concentrates are *mined* products. Fabricated metal products include, for example, steel beams, fasteners, cutlery, hand tools, metal cans, plumbing fixtures, springs, etc. Primary metals include ferrous (e.g., steel and related steel alloy metals) and nonferrous (e.g., aluminum, copper, precious metals) metal and metal alloys in unwrought (basic, unfabricated shapes such as an ingot or cathode) and wrought forms (semifabricated shapes such as bare wire, sheet, strip, pipe/tube) that are typically used as inputs for the production of fabricated metal products. Structural minerals include cement, dimensional stone (such as granite shaped for buildings), and glass windshields. Nonmetallic minerals include sand, gravel, uncut dimensional stone, etc. which typically are used as inputs for structural minerals. Metallic ores/concentrates include iron, copper, zinc, and lead ores/concentrates that are typically used as inputs for primary metal products.

each industry or broad industry segment,[121] the most notable exception being the steel industry, which is characterized by a large number of producers. The level of integration between these industries and industry segments is not extensive, although it is common for some industries to produce other metals as byproducts. Primary metal producers are typically integrated with domestic upstream metallic ore/concentrate operations. Exceptions include certain metals, such as aluminum, for which the United States lacks natural resources and imports metallic concentrates to feed the corresponding domestic primary metal operations. Companies that produce metal/metal alloys from mined materials are typically separate entities from companies that produce such products from recycled materials. The notable example is the steel segment, which is composed of integrated producers that manufacture steel primarily from iron ore and separate secondary producers that manufacture steel from scrap. In certain industries, such as copper, unwrought and wrought producers are typically separate companies. Most companies in these subsectors have a national orientation, although certain U.S.-based companies own foreign aluminum, copper, gold, and to a lesser extent, steel operations. Foreign-based companies own certain U.S. operations that produce steel, copper, and gold products

U.S. shipments of mineral and metal products fluctuated downward during 1978-2001, by 18 percent to an estimated $470 billion in 2001 (table 5-16).[122] The overall decline in the value of shipments was led by a 40 percent decrease for primary metal products to $145 billion, largely due to reduced prices. In terms of quantity, there was a small but steady increase in shipments of most primary metal products, with fluctuations related to general economic conditions such as an energy crisis and shifts in the dollar exchange rate. However, prices have generally decreased in both nominal and real terms for most metals since the 1980s. This is largely a result of surging production in less developed countries.[123]

U.S. steel[124] shipments declined sharply in value from $148.5 billion to $70.8 billion, 52 percent, during 1978-2001 while quantities shipped increased by 1 percent to 109,463 metric tons, but not before dropping by 35 percent to a low of 67,866 in 1982. Most of the decline occurred during 1978-82, when the

---

[121] Major industries include steel, aluminum, copper, gold, silver, lead, zinc. Industries are further segmented by type of processing (unwrought versus wrought) and by type of feed material (mined versus recycled).

[122] Annual production totals are overstated as they were derived by summing production for each subsector, which results in the double counting of input materials.

[123] National Research Council, *Competitiveness of the U.S. Minerals and Metals Industry* (Washington, D.C.: National Academy Press, 1990), p. 13.

[124] Steel is defined here as Standard Industrial Classification (SIC) industry 331, blast furnace and basic steel products, and SIC 332, iron and steel foundries.

Table 5-16
Minerals and metals products:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
	Billions of constant (1996) dollars											
Shipments	571.4	602.1	552.1	533.6	428.1	450.3	461.1	446.1	433.8	449.4	492.6	490.0
Imports	49.5	51.6	51.9	52.0	42.4	41.8	50.8	48.4	52.2	47.8	54.8	52.4
Exports	25.0	36.2	39.5	32.6	24.0	21.7	21.4	18.7	17.8	19.9	28.5	30.3
Apparent consumption	596.0	617.4	564.5	552.9	446.5	470.3	490.6	475.8	468.1	477.4	518.9	512.2
Trade balance	-24.6	-15.4	-12.4	-19.4	-18.4	-20.1	-29.5	-29.7	-34.3	-28.0	-26.3	-22.2
	Percentage											
Imports/apparent consumption	8.3	8.4	9.2	9.4	9.5	8.9	10.4	10.2	11.1	10.0	10.6	10.2
Exports/shipments	4.4	6.0	7.2	6.1	5.6	4.8	4.6	4.2	4.1	4.4	5.8	6.2
	1,000 workers											
Total employment	3,758	3,865	3,601	3,537	3,076	2,902	3,044	2,985	2,878	2,854	2,928	2,953
Production workers	2,915	2,990	2,728	2,666	2,260	2,145	2,284	2,239	2,156	2,146	2,217	2,232
	Constant (1996) dollars											
Hourly earnings	14.51	14.58	14.52	14.68	14.57	14.98	14.14	14.04	13.94	13.70	13.61	13.45
	$1,000 per worker											
Labor productivity	196	201	202	200	189	210	202	199	201	210	222	220

See footnote at end of table.

Table 5-16—*Continued*

Minerals and metals products:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Billions of constant (1996) dollars											
Shipments	465.3	423.1	426.6	432.6	468.6	498.1	503.6	524.1	531.3	525.6	523.7	470.1
Imports	47.8	44.1	44.7	46.8	56.8	61.7	63.6	68.9	75.7	74.9	86.1	74.1
Exports	33.3	35.5	35.9	40.3	37.7	43.7	45.4	48.2	47.7	46.4	52.3	46.0
Apparent consumption	479.8	431.7	435.3	439.1	486.7	516.1	520.8	544.9	559.3	554.2	557.5	498.2
Trade balance	-14.5	-8.6	-8.8	-6.5	-19.1	-18.0	-18.2	-20.8	-28.0	-28.5	-33.8	-28.1
	Percentage											
Imports/apparent consumption	10.0	10.2	10.3	10.7	11.7	12.0	12.2	12.7	13.5	13.5	15.4	14.9
Exports/shipments	7.2	8.4	8.4	9.3	8.1	8.8	9.0	9.2	9.0	8.8	10.0	9.8
	1,000 workers											
Total employment	2,900	2,760	2,692	2,690	2,770	2,845	2,863	2,903	2,944	2,944	2,972	2,856
Production workers	2,180	2,014	2,023	2,102	2,172	2,172	2,188	2,224	2,257	2,254	2,280	2,168
	Constant (1996) dollars											
Hourly earnings	13.33	13.27	13.23	13.21	13.23	13.20	13.33	13.35	13.48	13.64	13.78	13.78
	$1,000 per worker											
Labor productivity	214	206	212	214	223	230	230	236	236	233	230	217

[1] Includes SIC 10 (metal mining), 14 (mining and quarrying of nonmetallic minerals, except fuels), 32 (stone, clay, glass, and concrete products), 33 (primary metal industries), and 34 (fabricated metal products, except machinery and computer equipment).

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of Economic Analysis and Bureau of the Census; and U.S. Department of Labor, Bureau of Labor Statistics.

value of shipments fell by almost 43 percent to $85.1 billion. During 1982-86, U.S. steel producers, primarily integrated producers of flat-rolled steel, reportedly lost $12 billion and approximately 25 companies filed for bankruptcy.[125] U.S. steel consumption during this period stagnated, imports rose, prices declined, and U.S. capacity utilization was low. Also, in the early 1980s, the appreciating value of the U.S. dollar further enhanced the competitiveness of foreign steel producers. From 1982 through 2001, the value of U.S. steel sector shipments declined by another 17 percent while the quantity shipped increased by 61 percent.

Despite producing higher quantities of primary metal products, the U.S. share of world metals production declined during 1978-2001.[126] U.S. primary metal operations have had to compete with lower cost foreign operations, especially those in less developed countries that typically have higher quality natural resources, lower labor costs, more favorable mining investment requirements,[127] and in many cases lower environmental compliance costs.[128] In some cases, U.S. producers began importing certain products they previously produced domestically. For example, beginning in the early 1990s, the U.S. steel industry produced a significant portion of steel mill products from imported semifinished steel[129] to take advantage of lower-cost steel production capabilities in other countries, including Australia, Brazil, Mexico, and Russia. Semifinished steel imports were used in about 6 percent of U.S. steel production in 2001.

During 1978-2001, apparent consumption of mineral and metal products fluctuated downward by 16 percent to $498.2 billion, reflecting general economic trends and price reductions for most primary metals and related products. Contrasting the overall decline in the value of U.S. shipments of the sector, U.S. imports of mineral and metal products increased by 50 percent to $74.1 billion during 1978-2001. Imports of fabricated metal products led the growth, increasing by 204 percent to $23 billion in 2001.

---

[125] Thomas R. Howell, William A. Noellert, Jesse G. Kreier, and Alan William Wolff, *Steel and the State: Government Intervention and Steel's Structural Crisis*, (Boulder, CO: Westview Press 1988), pp. 501 and 503.

[126] National Research Council, *Competitiveness of the U.S. Minerals and Metals Industry*, p. 2.

[127] Many developing countries have reformed their mining laws to make them more favorable to foreign mining investments by loosening exploration regulations, reducing corporate tax rates, and streamlining permit processing. See U.S. Department of Commerce, "Metals and Industrial Minerals Mining," *U.S. Industry and Trade Outlook 1998* (New York City: McGraw-Hill Trade, Nov. 1997), p. 1-1.

[128] Although environmental regulations are more common worldwide, developing countries tend to have insufficient resources for strict government enforcement of these regulations. Ibid.

[129] Solid forms that must be further processed by steel mills before sale to consuming industries.

In conjunction with decreasing shipments and increasing imports, sector employment dropped by 902,000 (24 percent) during 1978-2001 (table 5-16). Employment in the steel industry declined from 561,000 employees in 1978 to 224,000 in 2000 (latest year available), a decrease of 60 percent. At the same time, steel and nonferrous metals industries made large investments in labor-saving technologies that increased overall labor productivity by 11 percent.[130] Hourly earnings for the overall sector decreased by 5 percent following mine and plant consolidations and wage concessions.[131]

The U.S. competitive position for primary metals and metallic ores/concentrates started to deteriorate significantly during the late 1970s/early 1980s as foreign production, especially in less developed countries, began to grow quickly.[132] Ownership, investment, and tax incentives[133] as well as the prospect of utilizing low-cost labor and rich natural resources has attracted investment and spurred the development of metal industries in these countries. Foreign production of steel in developing countries increased significantly, even in countries with limited steel-making raw materials. This occurred mostly as a result of government policies that stimulated the creation of a domestic steel industry because it was considered an essential component of development. Increased production contributed to real price declines for most metals and metal products, which were further exacerbated by overproduction by the less developed countries to counter price decreases.[134]

During the same period, U.S. Government regulations concerning metal production may have added to the competitive disadvantages faced by U.S. operations. According to industry sources, increasingly strict environmental regulations with regard to emissions and remediation of discontinued operations added significant costs to U.S. operations.[135] In addition, development of new mining operations has been hindered by attempts during

---

[130] The steel industry's cost reduction efforts maintained constant-dollar productivity despite a decline in real steel prices. Productivity per worker in 2001 was almost unchanged from that in 1987, at about $218,000 per employee.

[131] National Research Council, *Competitiveness of the U.S. Minerals and Metals Industry*, p. 19.

[132] For example, Chile's copper mine production (in terms of the amount of copper in the mined material) increased from less than 1.3 million metric tons in the early 1980s to over 4.7 million metric tons in 2001.

[133] "Metals and Industrial Minerals Mining," *U.S. Industry and Trade Outlook 1998*, p. 1-1.

[134] *Competitiveness of the U.S. Minerals and Metals Industry*, pp. 12-13.

[135] As a frame of reference, the estimated cost of complying with federal environmental regulations was 10 percent of the price of each metal in 1990 (Competitiveness of the U.S. Minerals and Metals Industry, p. 14). Remediation for one discontinued U.S. mine site reportedly cost $65 million. See Alistair MacDonald, Talmac Consulting, *Industry in Transition: A Profile of the North American Mining Sector* (Winnipeg, Canada: International Institute for Sustainable Development, 2002), p. 94.

the last decade to revise the 1872 Mining Law, which governs access to public lands for metallic ore/concentrate operations. Although the Law has not been changed,[136] uncertainty regarding possible revisions in ownership and royalty provisions have likely discouraged the development of U.S. mining operations.[137] Exploration activity for untapped metal ore deposits has declined steadily, and few new operations have been instituted since the mid-1990s.

Further, U.S. labor costs for metals production were among the highest in the world and a strong dollar during the period gave imported products a competitive advantage by lowering the relative price of foreign-produced metals in the U.S. market.[138] In particular, the strong-dollar policies of the early 1980s resulted in a surge of steel imports.[139] Beginning in 1985, as highlighted by the Plaza Agreement of September 1985,[140] the U.S. dollar was managed at a more competitive level and steel imports eased, although the dollar continued to strengthen during the 1990s. Other costs, especially legacy costs associated with employee pension and medical insurance liabilities for the U.S. steel industry, have also contributed to high labor costs.[141]

---

[136] The Mining Law of 1872, which deals with land tenure, has not been changed, however, U.S. federal government administrations have implemented and revised regulatory actions to administer mining activities of public lands. See *Industry in Transition: A Profile of the North American Mining Sector*, p. 71 and Marc Humphries and Carol Hardy Vincent, Congressional Research Service, "IB89130: Mining on Federal Lands," found at *http://www.NCSEonline,org/NLE/CRSr...cfm?&CFID=8027258&CFTOKEN=66301521*, retrieved May 28, 2003, pp. 1-2.

[137] New cost increases to the U.S. mining industry without offsetting cost reductions in other areas may make U.S. deposits uneconomical compared with those in nations that are rewriting their mining laws to attract mining investment, particularly developing countries. See Humphries and Vincent, "IB89130: Mining on Federal Lands," p. 5. and "Metals and Industrial Minerals Mining," *U.S. Industry and Trade Outlook 1998*, p. 1-1.

[138] *Competitiveness of the U.S. Minerals and Metals Industry,* pp. 14-15.

[139] USITC, *U.S. Global Competitiveness: Steel Sheet and Strip Industry* (inv. No. 332-231), USITC Pub. 2050, Jan. 1988, pp. 11-127.

[140] The Plaza Agreement of September 1985 was an effort to coordinate policy in the major industrialized economies—France, Germany, Japan, United Kingdom, and the United States—that included manipulating foreign exchange markets. See Geoffrey P. Miller, "The Role of a Central Bank in a Bubble Economy," found at *http://www.gold-eagle.com/editorials/cscb002.html*, retrieved Nov. 5, 2002.

[141] USITC, *Information obtained in the Investigation (Carbon and Alloy Steel Flat, Long, and Tubular Products),* vol. 2 of *Steel* (inv. No. TA-201-73), USITC Pub. 3479, Dec. 2001, pp. Overview-31 to Overview-35.

To encourage more efficient operating conditions, the U.S. metals industry reduced production capacity by closing high-cost plants and rationalizing operations (including consolidation of producers in many metal industries); disposed of non-core interests and focused assets on metal production to achieve cost reductions through economies of scale; reduced management requirements; and increased financial resources for new, more efficient technologies. Certain metal industries further specialized production by separating types of operations such as unwrought and wrought to focus expertise on each phase of production. Labor cost reductions were achieved through layoffs, wage reductions, and by broadening the scope of many union jobs to increase personnel flexibility.[142]

To further improve production efficiency, U.S. producers have aggressively adopted new technologies in the production of metallic ores and primary metals. Automated computer-based control systems have been integrated into the production system for better quality control. There have been several advances in the production process to improve efficiencies (reduce energy requirements, increase productivity) and lower environmental effects. Copper and gold producers greatly expanded their use of leaching[143] techniques, which provided a cost effective means of extracting desired metals from low-grade ores. Leaching was developed prior to 1980 but put into extensive commercial use during 1980-2001.

The U.S. steel industry has adopted key cost-saving technologies, including basic-oxygen and electric furnace steelmaking, which replaced the energy intensive open hearth process, and continuous casting of semifinished forms, which offered significant labor, capital, and energy savings.[144] The adoption of these technologies by the U.S. industry started before 1978[145] and was essentially completed in 1991.[146] Minimill production of flat-rolled steel products, using thin-slab casting, was also commercialized during this period.[147] This technology reduces economies of scale for flat-rolled steel production and significantly reduces the capital investment required per unit of output.

During 1978-2001, U.S. imports of sector products were subjected to numerous antidumping and countervailing duty orders issued for primary metals, including steel products, brass sheet/strip, unwrought magnesium, and tungsten ore concentrates. In addition, the United States implemented a number of actions during the period in response to petitions by steel companies seeking relief from the effects of imports under antidumping, countervailing duty, or

---

[142] *Competitiveness of the U.S. Minerals and Metals Industry*, p. 19.

[143] Leaching is the extraction of desired metal from ore by selectively dissolving it in a suitable, usually chemical, solution.

[144] USITC, *Steel*, vol. 2, p. Overview-20.

[145] Basic-oxygen steelmaking and continuous casting were also being installed in new steelmaking facilities in developing countries and elsewhere prior to the 1980s.

[146] USITC, *Steel*, vol. 2, p. Overview-20.

[147] Ibid.

safeguard statutes. Specific programs included specialty steel quotas (1976-80),[148] a trigger price mechanism ("TPM") (1978-82),[149] U.S.-E.C. steel voluntary restraint agreements ("VRA") (1982-84),[150] specialty steel measures (1983-84),[151] and the extended VRA program (1984-92).[152] A review of each program and its impact on the steel industry follows at the end of this overview.

Global competitive conditions have spurred consolidation among producers and the closure of high-cost operations in the United States and other industrialized nations. Many of these producers have invested in metal production in developing countries with large resources of metal ores as well as lower labor and energy costs. Host countries for these off-shore operations combine lower-cost operating advantages with advanced technology to produce steel at highly competitive prices.

Effect of Trade Agreements on the Sector

The five trade agreements subject to this investigation had little impact on the U.S. mineral and metal products sector relative to other factors such as the competitive problems discussed above, decreased real metal prices, increased production sharing, and increased U.S. consumption of imported products that had no tariffs during 1980-2001. Macroeconomic factors also contributed significantly to sector trade including exchange rate fluctuations, general economic fluctuations, and the economic crises in Mexico (1995) and Asia

---

[148] In June 1976 the President imposed quotas on imports of stainless steel and tool steel products on a regional or, in the case of the larger suppliers, a country-by-country basis. USITC, *U.S. Global Competitiveness: Steel Sheet and Strip Industry* (inv. No. 332-231), USITC Pub. 2050, Jan. 1988, p. 11-120.

[149] In exchange for the agreement of U.S. steel companies to withdraw a number of antidumping petitions against Japanese and EU steel exporters, the Administration implemented the TPM, a system based on reference prices. Ibid., p. 11-123.

[150] The Voluntary Restraint Agreement limited EC exports of steel mill products accounting for about 64 percent of EC exports in 1982 to fixed percentages of the U.S. market for the products. In return, the U.S. steel companies withdrew antidumping complaints against the European producers. Ibid., p. 11-127.

[151] The specialty steel measures were a four-year program of import relief consisting of increased duties on stainless steel sheet, strip and plate, and quotas on stainless steel bar and wire and certain tool steel products. Ibid., p. 11-29.

[152] The extended VRAs with the EC (also known as the nine-point U.S. Government policy for the steel industry), and eventually 16 other countries, limited U.S. imports of various steel mill products. Ibid., p. 11-130 and USITC, *Steel Industry Annual Report On Competitive Conditions in the Steel Industry and Industry Efforts to Adjust and Modernize* (inv. No. 332-289), USITC Pub. 2436, Sept. 1991, p. 1-1.

(1998).[153] The relevance of each trade agreement's impact on this industry sector is discussed below.

Tokyo Round

The Tokyo Round likely had a minimal effect on sector trade. The average U.S. tariffs on sector imports were relatively low before the agreement (table 5-17) as they were for major foreign markets, including Japan and the European Community.[154] Although reduced U.S. tariff rates facilitated import growth, the change in trade was also a result of the deteriorating competitive position of U.S. industries, declining real metal prices during the 1980s, and the appreciation of the U.S. dollar. These developments are revealed in the steady decline of exports during the early 1980s compared with relatively stable imports and consumption (table 5-16).

From 1980 (the year of the first stage of Tokyo Round tariff reductions) to 2000, U.S. total trade (imports plus exports) in sector products increased at an average annual rate of 2.1 percent to $138 billion although significant year-to-year fluctuations occurred, then dropped by 13 percent in 2001. This sector trend generally matched trends in the U.S. economy as a whole, with downturns occurring during the early 1980s, 1990s, and the year 2000. U.S. exports of sector goods increased by 16 percent to $46 billion during 1980-2001 while imports increased by 43 percent to $74 billion, causing the trade deficit to more than double (table 5-16). International trade became an increasingly important factor for this sector as the ratio of exports to shipments increased by about 3 percentage points to 9.8 percent during 1980-2001 and imports to apparent consumption increased by 6 percentage points to 15 percent.

U.S.-Israel FTA

The U.S.-Israel FTA (FTA) had a moderate effect on sector trade with Israel, particularly for U.S. exports, but an insignificant effect on total sector

---

[153] These crises contributed to lower world consumption and lower or stagnating metal prices. Consumption of sector products strongly correlates to performance of a country's economy, especially building construction, automobile, and machinery production.

[154] However, there was a relatively large disparity between U.S. and Canadian tariffs on each others products before and after the Tokyo Agreement. Before the Agreement, Canada's average base rate on U.S. sector products was 10 percent versus the U.S. comparable rate of 3 percent on Canadian products. After the agreement, Canadian concession rates on U.S. products averaged 6 percent compared with U.S. concession rates of 2 percent on Canadian products. See "Twenty-Fourth Annual Report of the President of the United States on the Trade Agreements Program: 1979," ch. in *The Trade Agreements Program of the United States: Annual Reports of the President, 1957-1985*, compiled by Bernard D. Reams Jr., vol. 3, (Buffalo, NY: William S. Hein & Company, Inc., 1989) p. 54-58.

Table 5-17
Minerals and metals products: Trade issues addressed in trade agreements and U.S. tariffs

Trade issues and U.S. tariffs	Tokyo Round	U.S.-Israel	U.S.-Canada	Uruguay Round	NAFTA[1]
Tariffs[2]	(1979) 3.6% (1987) 3.1%	(1984) 0.4% (1995) 0.1%	(1987) 1.5% (1998) <0.1%	(1994) 3.0% (1999) 1.7%	(1993) 1.0% (2001) 0.2%
Technical barriers	X		X	X	X
Import licensing	X	X		X	
Customs valuation	X			X	X
Government procurement	X	X	X	X	X
Offsets		X			
Rules of origin		X	X	X	X
TRIMs[3]			X	X	X
TRIPs[4]		X		X	X

[1] The NAFTA provides that tariffs will be eliminated by Jan. 1, 2003 for all industrial goods and by Jan. 1, 2008 for all other goods.
[2] Average trade-weighted ad valorem or ad valorem equivalent tariff. Trade weights for the Tokyo Round and Uruguay Round are based on U.S. imports from the world during the years indicated. Trade weights for the bilateral treaties and NAFTA are based on U.S. imports from the relevant countries. Unless otherwise noted, dates in parentheses represent the year immediately prior to the entry into force of the agreement and the year of the final tariff reduction for most products and markets.
[3] Trade-related investment measures.
[4] Trade-related aspects of intellectual property rights.

Source: U.S. Trade Representative, *Annual Report of the President of the United States on the Trade Agreements Program*, various issues; U.S. Trade Representative, *Trade Policy Agenda and Annual report,* various issues; and *U.S. International Trade Commission, Operation of the Trade Agreements Program,* various issues.

trade and the industry because Israel only accounted for about 1 percent of exports and less than 0.5 percent of imports for U.S. mineral and metal products during 1985-2001 (table 5-18). The U.S.-Israel FTA eliminated the industrial product preferential trade agreement with the European Community (EC) that created severe tariff disparity on U.S. products compared with those from Europe.[155] In contrast to U.S. exports, the agreement is not likely to have had as significant an effect on U.S. imports from Israel because the average U.S. tariffs on sector imports were already less than one-half percent (table 5-17).

During 1985-2001, U.S. total trade with Israel in mineral and metal products increased at an average annual rate of 3 percent, to about $646 million, compared with a 3.7 percent rate for all countries (table 5-18). U.S. exports of sector products to Israel more than doubled to $407 million while U.S. imports from Israel increased by 9 percent to about $239 million. U.S. exports to and imports from Israel increased for all five subsectors comprising mineral and metal products during 1989 (earliest year specific product data available) through 2001. Arms and ammunition were the fastest growing exports and imports, which accounted for a range of 20-43 percent of total sector trade with Israel.[156] However, the agreement did not apply to arms and ammunition, goods for which both countries already exempted from tariffs if they were imported with the Governments' authorization for military purposes.[157] In contrast, total trade in steel fell slightly from $25.5 million in 1989 to $24.7 million in 2001, but ranged from a low of $16.6 million to a high of $34.1 million during this period.

U.S.-Canada FTA

The U.S.-Canada FTA had a minimal effect on sector trade. Instead, production sharing was probably the more important reason for trade growth. The Agreement also likely contributed to an increase in integration between U.S. and Canadian industries which may have further contribute to increased trade between the countries. Prior to the implementation of this treaty, Canada did have a British preferential tariff (BPT) that placed U.S. products at a

---

155 U.S. Trade Representative (USTR), "U.S.-Israel Free Trade Agreement," *Annual Report of the President of the United States on the Trade Agreements Program 1984-1985*, issue 28, Feb. 1986, p. 97.

156 U.S. exports of arms and ammunition to Israel fluctuated upward for a 238-percent increase to $194 million in 2001, with ranges from a low of almost $39 million in 1994 and a high of $244 million in 1998. During the same time frame, U.S. imports from Israel fluctuated upward for a 204-percent increase to $59 million, with ranges from a low of almost $10 million in 1997 to the high of $59 million in 2001.

157 See *Bulletin International Des Douanes (Israel 1975-1976)*, 8th ed., No. 41 (Brussels: International Customs Tariffs Bureau, 1975), p. 181 and United States International Trade Commission, *Tariff Schedules of the United States Annotated 1980*, sch. 8, part 3, item 832.00, p. 753.

Table 5-18
Minerals and metals products: U.S. trade with Israel, 1984-2001

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992
	Millions of constant (1996) dollars								
U.S. import value									
Israel	189.8	217.9	218.3	202.0	206.6	146.4	119.4	109.2	133.4
All other	50,630.7	48,169.1	51,926.7	47,619.2	54,587.5	52,267.9	47,716.6	43,977.8	44,531.8
Total	50,820.6	48,387.0	52,145.1	47,821.1	54,794.1	52,414.2	47,836.0	44,087.0	44,665.2
	Percent								
Israel/Total	0.4	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3
U.S. import growth									
Israel	—	14.8	0.2	-7.5	2.3	-29.2	-18.4	-8.5	22.2
All other	—	-4.9	7.8	-8.3	14.6	-4.3	-8.7	-7.8	1.3
Total	—	-4.8	7.8	-8.3	14.6	-4.3	-8.7	-7.8	1.3
	Millions of constant (1996) dollars								
U.S. export value									
Israel	161.6	183.7	136.2	109.4	125.7	222.2	274.0	347.1	247.9
All other	21,183.7	18,489.6	17,694.3	19,759.9	28,347.4	30,028.5	33,044.3	35,112.7	35,667.5
Total	21,345.3	18,673.3	17,830.5	19,869.3	28,473.1	30,250.7	33,318.3	35,459.7	35,915.4
	Percent								
Israel/Total	0.8	1.0	0.8	0.6	0.4	0.7	0.8	1.0	0.7
U.S. export growth									
Israel	—	13.7	-25.9	-19.7	14.9	76.7	23.3	26.7	-28.6
All other	—	-12.7	-43.0	11.7	43.5	5.9	10.0	6.3	1.6
Total	—	-12.5	-4.5	11.4	43.3	6.2	10.1	6.4	1.3

See note at end of table.

Table 5-18—*Continued*
Minerals and metals products: U.S. trade with Israel, 1984-2001

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of constant (1996) dollars								
U.S. import value									
Israel	156.5	165.3	155.3	125.2	152.3	171.2	214.4	267.2	238.5
All other	46,648.3	56,584.0	61,554.7	63,480.0	68,750.3	75,496.8	74,727.8	85,793.8	73,885.1
Total	46,804.7	56,750.0	61,710.0	63,605.2	68,902.6	75,668.1	74,942.1	86,061.1	74,123.7
	Percent								
Israel/Total	0.3	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3
U.S. import growth									
Israel	17.3	5.7	-6.1	-19.4	21.7	12.4	25.2	24.7	-10.7
All other	4.8	21.3	8.8	3.1	8.3	9.8	-1.0	14.8	-13.9
Total	4.8	21.3	8.7	3.1	8.3	9.8	-1.0	14.8	-13.9
	Millions of constant (1996) dollars								
U.S. export value									
Israel	259.1	232.1	286.2	501.1	448.4	485.8	353.3	356.2	407.4
All other	40,055.0	37,424.8	43,401.1	44,880.1	47,700.2	47,177.0	46,047.0	51,890.6	45,632.5
Total	40,314.1	37,656.9	43,687.3	45,381.2	48,148.6	47,662.8	46,400.3	52,246.9	46,039.9
	Percent								
Israel/Total	0.6	0.6	0.7	1.1	0.9	1.0	0.8	0.7	0.9
U.S. export growth									
Israel	4.5	-10.4	23.3	75.1	-10.5	8.4	-27.3	0.8	14.4
All other	12.3	-6.6	16.0	3.4	6.3	-1.1	-2.4	12.7	-12.1
Total	12.3	-6.6	16.0	3.9	6.1	-1.0	-2.7	12.6	-11.9

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

disadvantage compared with those imported from the United Kingdom.[158] The U.S.-Canada FTA would have eliminated the disparity by January 1998 with the bilateral tariff phase-out between the two countries.[159] Average U.S. tariffs on sector imports were relatively low at 1.5 percent before the agreement (table 5-19); following the Tokyo Round, Canadian tariffs on sector imports ranged from 2.0 to 10 percent ad valorem.[160]

During 1988-2001, U.S. total trade with Canada in mineral and metal products grew at an average annual rate of 2.9 percent, to $31 billion (table 5-19). Canada has been the single largest U.S. trading partner in this sector since 1987, just prior to the agreement taking affect, accounting for 25 to 28 percent of U.S. total sector trade. U.S. exports of sector products to Canada increased by 80 percent to almost $14.6 billion, most of which was accounted for by iron and steel and fabricated articles of iron or steel followed by valves[161] (used primarily to control the flow of liquids, gases, and solids through piping systems).[162] U.S. exports to Canada of iron and steel and fabricated products of iron or steel each doubled in 1990 from the previous year to $1.1 billion and $1.6 billion, respectively.[163] Despite fluctuations, neither product group dropped below the 1990 export value, and iron and steel exports doubled to $2 billion while fabricated products of iron or steel rose to

---

[158] See *Bulletin International Des Douanes (Canada 1985-1986)*, 17th ed., No. 57 (Brussels: International Customs Tariffs Bureau, 1975).

[159] USTR, *2001 National Trade Estimate Report on Foreign Trade Barriers* (Washington: GPO, 2001), p. 30.

[160] "Twenty-Fourth Annual Report of the President of the United States on the Trade Agreements Program: 1979," *The Trade Agreements Program of the United States: Annual Reports of the President, 1957-1985*, pp. 54-55.

[161] The United States has long been the world's largest single producer of valves and similar devices, and Canada has been a major export market since before the trade agreement, accounting for approximately one-fourth of U.S. valve exports in 1983. See USITC, *Summary of Trade and Tariff Information: Taps, Cocks, Valves, and Similar Devices and Parts*, USITC Pub. 841, Oct. 1984, pp. 14-19.

[162] Markets for these products cover a broad spectrum of industries including shipbuilding and repair, petroleum refining, petrochemicals, pulp and paper, water and sewage treatment facilities, processed food and beverages, and power generation.

[163] Although Canada is reported to be the world's largest exporter of minerals and metals, it accounts for less than 1 percent of the world's pig iron and raw steel production, relying on imports to supplement its requirements. For production data, see U.S. Department of the Interior, U.S. Geological Survey, The Mineral Industry of Canada (2001), by Alfredo C. Gurmendi, Table 1: Production of mineral commodities, found at *http://minerals.usgs.gov/minerals/pubs/country/2001/camyb01.pdf*, retrieved Mar. 14, 2003 and U.S. Department of the Interior, U.S. Geological Survey, Mineral Commodity Summaries: Iron and Steel 2001, p. 2, found at *http://minerals.usgs.gov/minerals/pubs/commodity/iron_&_steel/350302.pdf*, retrieved Mar. 14, 2003.

Table 5-19
Minerals and metals products: U.S. trade with Canada and Mexico, 1987-2001

Year	1987	1988	1989	1990	1991	1992	1993	1994
	Millions of constant (1996) dollars							
U.S. import value								
Canada	11,586.4	13,253.0	13,341.1	10,975.0	10,818.4	11,280.4	12,128.1	13,960.2
Mexico	2,461.5	2,840.9	3,371.1	3,199.1	2,713.8	2,743.3	2,999.6	3,704.5
All other	33,773.3	38,700.2	35,702.1	33,661.9	30,554.8	30,641.6	31,677.1	39,085.5
Total	47,821.1	54,794.1	52,414.2	47,836.0	44,087.0	44,665.2	46,804.7	56,750.2
	Percent							
Canada/Total	24.2	24.2	25.5	22.9	24.5	25.3	25.9	24.6
Mexico/Total	5.2	5.2	6.4	6.7	6.2	6.1	6.4	6.5
U.S. import growth								
Canada	—	14.4	0.7	-17.7	-1.4	4.3	7.5	15.1
Mexico	—	15.4	18.7	-5.1	-15.2	1.1	9.3	23.5
All other	—	-52.6	-7.8	([1])	-9.2	0.3	3.4	23.4
Total	—	-42.7	-4.3	-8.7	-7.8	1.3	4.8	21.3
	Millions of constant (1996) dollars							
U.S. export value								
Canada	7,214.5	8,070.7	7,604.5	10,593.3	9,985.8	10,274.2	11,018.9	10,604.1
Mexico	1,622.9	2,279.4	3,004.3	3,347.7	4,093.8	4,775.0	4,460.2	5,407.9
All other	11,031.9	18,123.1	19,641.9	19,377.3	21,380.2	20,866.2	24,835.0	21,644.9
Total	19,869.3	28,473.1	30,250.7	33,318.3	35,459.7	35,915.4	40,314.1	37,656.9
	Percent							
Canada/Total	36.3	28.3	25.1	31.8	28.2	28.6	27.3	28.2
Mexico/Total	8.2	8.0	9.9	10.1	11.6	13.3	11.1	14.4
U.S. export growth								
Canada	—	11.9	-5.8	39.3	-5.7	2.9	7.3	-3.8
Mexico	—	40.5	31.8	11.4	22.3	16.6	-6.6	21.3
All other	—	64.3	8.4	-1.4	10.3	-2.4	19.0	-12.8
Total	—	43.3	6.2	10.1	6.4	1.3	12.3	-6.6

See footnote at end of table.

Table 5-19—*Continued*
Minerals and metals products: U.S. trade with Canada and Mexico, 1987-2001

Year	1995	1996	1997	1998	1999	2000	2001
	Millions of constant (1996) dollars						
U.S. import value							
Canada	15,736.4	16,423.5	17,077.6	17,095.6	17,346.4	19,094.2	16,348.7
Mexico	4,785.7	5,544.2	6,366.0	7,212.9	7,588.7	8,506.0	7,791.4
All other	41,187.9	41,637.5	45,459.0	51,359.5	50,007.0	58,460.9	49,983.6
Total	61,710.0	63,605.2	68,902.6	75,668.1	74,942.1	86,061.1	74,123.7
	Percent						
Canada/Total	25.5	25.8	24.8	22.6	23.2	22.2	22.1
Mexico/Total	7.8	8.7	9.2	9.5	10.1	9.9	10.5
U.S. import growth							
Canada	12.7	4.4	4.0	0.1	1.5	10.1	-14.4
Mexico	29.2	15.9	14.8	13.3	5.2	12.1	-8.4
All other	5.4	1.1	9.2	13.0	-2.6	16.9	-14.5
Total	8.7	3.1	8.3	9.8	-1.0	14.8	-13.9
	Millions of constant (1996) dollars						
U.S. export value							
Canada	11,612.5	11,864.3	13,611.5	15,197.1	15,743.9	17,364.5	14,559.9
Mexico	4,866.4	6,131.3	6,522.9	7,331.4	7,881.7	9,658.3	8,147.8
All other	27,208.3	27,385.7	28,014.2	25,134.3	22,774.8	25,224.1	23,332.2
Total	43,687.3	45,381.2	48,148.6	47,662.8	46,400.3	52,246.9	46,039.9
	Percent						
Canada/Total	26.7	26.1	28.3	31.9	33.9	33.2	31.6
Mexico/Total	11.1	13.5	13.6	15.4	17.0	18.5	17.7
U.S. export growth							
Canada	9.5	2.2	14.7	11.7	3.6	10.3	-16.2
Mexico	-10.0	26.0	6.4	12.4	7.5	22.5	-1,568.0
All other	25.7	0.7	2.3	-10.3	-9.4	10.8	-7.5
Total	16.0	3.9	6.1	-1.0	-2.7	12.6	-11.9

[1] Less than 0.5 percent.

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

almost $4 billion in 2001. At the same time, U.S. imports from Canada increased by 23 percent to $16.3 billion, of which aluminum and fabricated articles of iron and steel accounted for most of the growth.[164]

NAFTA

The NAFTA likely had a minimal effect on sector trade. However, other factors like production sharing, the Maquiladora Program,[165] and the peso devaluation of 1996 were probably more important reasons for trade growth. Although NAFTA resulted in the phase-out of Mexico's relatively high 10-15 percent ad valorem tariff rates for most sector products, Mexico is a relatively small consumer for most sector products. By comparison, the average U.S. tariffs on sector products were relatively low at 1 percent ad valorem before the agreement. The foreign investment protection and government procurement elements of this agreement likely have affected U.S. sector exports. Opportunities increased for U.S. firms to sell tubular oil goods to the government-owned Mexican petroleum industry and for U.S. steel distributors to invest in Mexico.

During 1994-2001, U.S. total trade in sector products with NAFTA partners Mexico and Canada combined grew at an average annual rate of 4.8 percent, to almost $47 billion, compared with a rate of 3.5 percent for sector trade with all countries.[166] In 1994, Mexico displaced Japan as the second largest U.S. trade partner for this sector. Since then, Mexico and Canada together have accounted for 35-40 percent of U.S. total trade. U.S. exports of sector products to Mexico and Canada increased by 42 percent to about $23 billion,[167] of which

---

[164] Mineral and Metal Products showing the largest trade growth, aluminum and iron and steel, have been major components of U.S./Canada production sharing operations since before implementation of this agreement. See USITC, Imports Under Items 806.30 and 807.00 of the Tariff Schedules of the United States, 1982-1985, (inv. No. 332-237), USITC Pub. 1920, Dec. 1986, pp. 3-2 to 3-4, 4-10, and F-2 to F-3.

[165] An increasing share of imports from production-sharing operations enter the United States under duty-free provisions of NAFTA rather than under the production-sharing provisions of the U.S. Harmonized Tariff Schedule, Chapter 98, particularly with the elimination of the customs merchandise processing fee on July 1, 1999. See USITC, "Note," *Production Sharing: Use of U.S. Components and Materials in Foreign Assembly Operations, 1994-1997 (U.S. Imports Under the Production-Sharing Provisions of Harmonized Tariff Schedule Chapter 98)*, (inv No. 332-237), USITC Pub. 3146, Dec. 1998.

[166] U.S. total trade with Mexico alone expanded at an average annual rate of 8.6 percent to $16.4 billion while that with Canada expanded by 3.4 percent to $31.9 billion.

[167] During 1994-2001, exports to Mexico increased by 57 percent to $8.6 billion and that to Canada increased by 38 percent to $15.5 billion.

fabricated iron or steel metal products accounted for most of the growth to Canada. The leading exports to Mexico were insulated electric conductors along with iron and steel and fabricated articles of iron or steel. U.S. imports from both countries increased by 37 percent, to $24 billion.[168] The growth of imports from Mexico tended to span a wide variety of mineral and metal products led by insulated electric conductors, valves, and fabricated articles of iron or steel.[169] As with the U.S.-Canada FTA, aluminum and fabricated articles of iron or steel accounted for most of the import growth from Canada.

Uruguay Round

The Uruguay Round Agreement likely had a minimal effect on sector trade. The movement of U.S. manufacturing to developing countries with more competitive production costs as discussed in the overview, and the bilateral agreements between the United States, Canada, and Mexico most likely had the greatest impact on trade through 2001.[170] Nontariff barriers that continue to be a significant impediment to the steel industry are trade-distorting subsidies, which are being addressed in, among other places, the Organization for Economic Co-Operation and Development (OECD).[171]

During 1995-2001, U.S. total trade in mineral and metal products grew at an average annual rate of 2.2 percent to $120 billion. U.S. exports increased by 5 percent to $46 billion in 2001 and imports increased by 20 percent to $74 billion (table 5-16). A wide range of sector products comprised this growth, of which fabricated articles of iron and steel led the rise in exports. Platinum-group metals (PGM) and fabricated iron or steel products were the overwhelming product leaders in import growth, each recording an increase of just over $3 billion. However, unlike most fabricated iron or steel products, PGMs entered the United States duty-free before the enactment of this agreement.[172] Globalization and growing competition in developing countries

---

[168] During 1994-2001, imports from Mexico increased by 110 percent to $7.8 billion and imports from Canada increased by 17 percent to $16.3 billion.

[169] Mineral and Metal Products showing the largest trade growth, insulated electric conductors and valves, are major products of U.S./Mexico production sharing operations. See *Production Sharing: Use of U.S. Components and Materials in Foreign Assembly Operations, 1994-1997*, pp. 3-39 to 3-53.

[170] Canada and Mexico have been the dominant U.S. trading partners during the period.

[171] OECD, *OECD High Level Meeting on Steel: Progress Made on Cutting Subsidies, Overcapacity*, Dec. 19, 2002, found at *http://www.oecd.org/oecd/pages/document/print_template/0,3371,EN-document-39-non director...*, retrieved Mar. 7, 2003.

[172] The increase in PGM imports was due primarily to the sustained demand of the automotive and electronic industries for the product's unique catalytic and electrical properties. Having only one PGM mining operation, the United States is almost totally dependent on import sources, primarily from South Africa and Russia.

led to some shifting among top U.S. trading partners for this sector. Although Canada and Japan dominated U.S. trade before enactment of this Uruguay Round Agreement, Japan's relative importance was overshadowed by Mexico in 1994 and again by China in 2001. Together, these four countries–Canada, Mexico, China, and Japan–[173] accounted for 52 percent of sector total trade in 2001, a 4 percentage point increase since 1995.

Views of Interested Parties

American Restaurant China Council[174]

The American Restaurant China Council (ARCC) is a trade association that represents a substantial majority of U.S. Commercial Chinaware production.[175] The ARCC member companies are Buffalo China, Inc., The Hall China Company, and The Homer-Laughlin China Company.

Tokyo and Uruguay Rounds

The Tokyo and Uruguay Round tariff reductions led to large surges of low-priced imports that eroded U.S. market share for commercial chinaware. Following the Tokyo Round tariff reduction on commercial chinaware from 48-percent to 35-percent, product imports increased more than eightfold to nearly five million dozens during 1979-1994. These imports captured a substantial share of the U.S. market, resulting in either the transfer or shut down of a number of U.S. manufacturers operations and the loss of hundreds of American jobs. Imports continued to increase during the Uruguay Round tariff reduction staging to over 6.8 million dozens by year end 2000, dropping to 5.8 million dozens in 2001 due to the U.S. economic slowdown. This flow of U.S. imports is not offset by significant U.S. export opportunities due largely to high tariff rates overseas, onerous testing and certification requirements, and national preferences to buy domestic production, particularly in Europe.

The U.S. Government has historically recognized that commercial chinaware is an import sensitive product by limiting the industry's tariff reduction requirements during the Tokyo Round and by granting a 10-year

[173] Listed in decreasing order of value of total trade with the United States in 2001.

[174] Susan Esserman and Melanie Schneck, Steptoe & Johnson, LLP on behalf of the American Restaurant China Council, written submission to the Commission, February 14, 2003.

[175] Commercial chinaware (HTS 6911.10.10 and HTS 6912.00.20) is "especially designed for use by hotels, restaurants, and other commercial establishments and institutions that require stronger, thicker, more durable and more sanitary chinaware."

staged reduction in the Uruguay Round.[176] During this time, the industry made significant capital improvement investments to lower production costs and increase efficiency in an effort to ensure its future competitiveness. However, the commercial chinaware market remains intensely price sensitive and any future tariff elimination or accelerated tariff reduction would threaten the U.S. industry's survival. ARCC also states that maintaining import tariffs for commercial chinaware would have no discernible effect on consumers (restaurants and hotels) because it is generally recognized that the cost of chinaware represents an insignificant part of their (the consumers') operating costs.

Nucor Corporation and TXI Chaparral Steel[177]

Nucor Corporation (Nucor) and TXI Chaparral Steel (Chaparral) are two of the largest steel producers in the United States. Nucor produces a variety of flat-rolled and long products and Chaparral produces only long products, including beams, hot-rolled bar, and rebar.

NAFTA and the URA have provided foreign exporters and investors greater access to the U.S. market, but reciprocating benefits for U.S. exporters and investors have not reached full potential. Nucor and Chaparral contend that many developing countries maintain high import tariffs on products such as steel even though their producers are in a position to effectively "compete internationally without protection." These producers have the advantage of a protected home market from which to penetrate other markets, particularly the United States. Further, most developed countries have made it more difficult, if not impossible, for U.S. producers to enter their markets by replacing high tariffs with non-tariff barriers, including the use of restrictive technical standards and by tolerating anti-competitive practices by local industries. Until these nontariff barriers are effectively addressed, the U.S. industry will continue to reap far less advantage from trade agreements than intended.

NAFTA has given rise to the "circumvention of antidumping orders." Structural steel beams from Japan and Korea are being transshipped through Canada to circumvent antidumping orders in the United States.[178] Although

---

[176] The U.S. Government limited the tariff reduction to no more than 25 percent of the original tariff during the Tokyo Round. Ten-year staged reductions were also provided under NAFTA, and more recently the U.S.-Jordan Free Trade Agreement. Also, the U.S. Government refused to review petitions to include commercial chinaware to the Generalized System of Preference during the 1984, 1986, 1987, 1990, 1991 and 1992 review exercises.

[177] Alan H. Price and John R. Shane, Wiley Rein and Fielding LLP, on behalf of Nucor Corporation and TXI Chaparral Steel written submission to the Commission, Mar. 31, 2003.

[178] The antidumping orders specifically cover merchandise that has been drilled, punched, notched, painted, coated, or clad and include products classified under the Harmonized Tariff Schedule numbers 7216.32, 7216.33, 7216.50-7216.99, 7228.70.3040, and 7228.70.6000.

there is no production of beams in Canada, U.S. imports of product from Canada were valued at $2.3 million and $2.1 million in 2001 and 2002, respectively. This is a two-fold problem that provides the means and incentive for foreign producers and exporters to circumvent such U.S. duty orders by transshipping subject merchandise through Canada and Mexico. First, NAFTA does not provide for common enforcement of antidumping and countervailing duty orders. Second, there are NAFTA rules for establishing NAFTA origin for merchandise, but there is no mechanism "for ensuring that the country of origin merchandise imported into one NAFTA country is not altered before the merchandise is re-exported to another NAFTA country." Nucor and Chaparral recommend amending NAFTA to correct these problems without relinquishing the current practice of allowing NAFTA members to impose antidumping/countervailing duties on imports from other NAFTA members.

Specialty Steel Industry of North America[179]

Specialty Steel Industry of North America (SSINA) is an association representing virtually all North American specialty steel producers. Specialty steels are high technology, high value stainless and other specialty alloy products.

The objectives of the subject trade agreements–opening markets and adopting trade laws that ensure free and fair trade between these markets, including the zero for zero gradual phase-out of tariffs on steel products under the Uruguay Round Agreements–have not been met for U.S. manufacturing industries, including SSINA.

Tokyo Round

The Tokyo Round Agreements were a major step in determining international dumping and subsidy rules, and U.S. implementation of this agreement afforded domestic specialty steel producers the opportunity to seek effective redress against unfair trade practices.

Uruguay Round

The Tokyo Round trade laws governing dumping and subsidization have been significantly modified and weakened to the detriment of U.S. manufacturing industries by subsequent Uruguay Round Agreements and by the World Trade Organization (WTO) Dispute Settlement Body's interpretation of the agreements. URA modifications have resulted in a noticeable reduction

---

[179] David A. Hartquist and Kathleen W. Cannon, Collier Shannon Scott, PLLC, on behalf of the Specialty Steel Industry of North America (SSINA), written submission to the Commission, Mar. 31, 2003.

in dumping margins, permissible subsidy practices formerly prohibited, and early termination of certain orders under sunset review. Further, the WTO Dispute Settlement Body has used the settlement process to legislate and make decisions on issues not agreed to by GATT Contracting Parties during the Uruguay Round negotiations, which overturn U.S. laws as well as many long-established practices and methodologies. The U.S. Congress and Administration should not permit further weakening of the laws addressing unfair trade practices as proposed in the current Doha Round of Negotiations by a group of countries calling themselves by the misleading name of Friends of Antidumping.

Tile Council of America, Inc.[180]

The Tile Council of America, Inc. (TCA) is an association comprising over 40 manufacturers of ceramic tiles and related products that manufacture over 50 percent of the ceramic tile produced in the United States.

Despite a tripling in U.S. demand for ceramic tile since the Tokyo Round, the cumulative impact of the five trade agreements under study in this investigation have contributed to the precarious condition of the U.S. ceramic tile industry. The tariff reduction provisions of these agreements, particularly the Uruguay Round Agreement and NAFTA have encouraged large quantities of low-priced imports and are a major factor in the severe erosion of the U.S. industry's market share. Between 1979, the year before the Tokyo Round agreements entered into force, and the third quarter of 2002, import penetration for ceramic tile increased by 31 percentage points in terms of quantity to a record high of 77 percent. Since 1995, following the enactment of the Uruguay Round Agreement and NAFTA, U.S. consumption of ceramic tile increased by 46 percent and increased imports have captured 100 percent of this growth. The growth in import penetration is largely due to price-cutting by both traditional and newer import sources, as demonstrated by an 18-percent decrease in the average unit value of glazed ceramic tile imports.

Longer term staged reductions for tariffs on ceramic tile were negotiated under the Uruguay Round Agreement and NAFTA, in part, to provide U.S. manufacturers a period of time to make significant competitive investments in an effort to differentiate their products and minimize competition with low-priced commodity grade imports. The TCA now questions the viability and likely payback of these investments in light of ever increasing low-priced imports that have suppressed prices to the point of driving many U.S. producers out of business. They report that during 2001-2002, four U.S. producers have gone out of business and two additional plants have closed. The U.S. ceramic tile council would be seriously prejudiced by further tariff reductions or concessions and should, therefore, be excluded from such future trade negotiations.

---

[180] Juliana M. Cofrancesco and John F. Bruce, Howrey, Simon, Arnold, and White on behalf of the Tile Council of America, Inc. (TCA) written submission to the Commission, Feb. 14, 2003.

Western Economic Analysis Center[181]

Lower U.S. tariffs across the board have "adversely affected" the U.S. "basic copper industry by lowering the price to domestic users of imported copper," but they also helped to reduce U.S. production costs by "lowering the costs of imported supplies and equipment used by domestic copper mining firms." Other government policies, both foreign and domestic, have had a greater negative impact on the industry than lower tariffs. For example, financial inducements to overseas investment and measures that have made cheaper capital available to competing foreign copper producers had a much more significant and harmful impact on domestic producers than any relaxing of trade barriers because they provided no advantageous offset for the domestic industry. The compliance deadlines imposed by regulatory agencies required a number of producers to take on large amounts of debt financing, which forced certain economically viable operations out of business.

The competitiveness of the domestic copper industry has been further eroded by Federal regulatory policies that create wilderness areas, which precluded the commercial use of economically viable copper deposits, and pollution controls that require large capital investments. Further, the lack of an effective antitrust policy to enforce existing legislation has resulted in a rash of mergers and acquisitions of copper producers by non-copper producers after 1976 that seriously weakened the domestic industry. More recently, foreign corporate and financial interests in U.S. production facilities have been allowed to make U.S. production decisions that do not necessarily benefit U.S. capital, labor, or consumer interests.

Transportation Equipment[182]

Overview

The United States is the world's leading single-country producer and consumer of transportation equipment. In particular, the United States is a global leader in the production of motor vehicles and related equipment, commercial and military aircraft, and guided missiles and space vehicles. Motor vehicles and related equipment accounted for between 56.1 and 71.0 percent of the value of U.S. transportation equipment shipments during 1978-2001, and aircraft and parts accounted for between 15.9 and 28.1 percent

[181] George F. Leaming, Director, Western Economic Analysis Center, written submission to the Commission, Mar. 31, 2003.

[182] For the purposes of this investigation, transportation equipment comprises SIC 37, which includes motor vehicles and motor vehicle equipment; aircraft and parts; ship and boat building and repairing; railroad equipment; motorcycles, bicycles, and parts; guided missiles and space vehicles and parts; and other miscellaneous transportation equipment.

(table 5-20).[183] Throughout the period, the guided missiles and space vehicles subsector vied with the ship and boat building and repair subsector for third place. The United States is not a global leader in the shipbuilding or railroad subsectors. The U.S. shipbuilding sector accounted for less than 1 percent of global shipments in 2001,[184] and no passenger railcars were produced in the United States. Freight cars are largely traded among the U.S. and Canadian subsidiaries of U.S. companies. The motorcycle and bicycle subsectors are very small parts of the U.S. transportation equipment sector.[185] The United States is a leading world producer of heavyweight motorcycles, with the U.S. motorcycle industry enjoying worldwide brand recognition. However, the industry is currently facing capacity constraints. Most mass merchandise bicycle production has moved overseas.[186]

The U.S. transportation equipment industry is composed of thousands of manufacturers. Typically, in subsectors such as motor vehicles and aircraft, the U.S. industry is quite concentrated, while the industries supplying parts to these sectors comprise thousands of firms of varying sizes. Many of the large companies in the transportation equipment sector are multinationals that produce and source globally. Most of the transportation equipment sectors have grown since the implementation of the Tokyo Round, while changing significantly in response to trends in globalization, restructuring, legislation, and intense international competition.

The competitiveness of the U.S. transportation equipment industry is supported by significant investment in research and development, sophisticated manufacturing capabilities, and an educated and technically skilled workforce. Strong domestic demand for transportation equipment products, coupled with intense foreign competition in the U.S. market, has also contributed to the competitiveness of the U.S. industry. Some transportation equipment sectors, most notably the automotive industry, have engaged in production-sharing arrangements involving lower wage countries such as Mexico. Further, the outsourcing of major components to suppliers who offer modules with completely installed systems has become prevalent in the automotive and aircraft sectors.

Overall, shipments for the transportation equipment sector fluctuated during 1978-2001, with sustained periods of growth during 1982-89, 1991-95, and 1996-99. Sector shipments increased at an average annual rate of just 1 percent during the period and were 25.3 percent higher in 2001 than in 1978. Labor

---

[183] Because of the dominance of these two subsectors, much of the subsequent discussion will focus on these industries, as noted.

[184] Maritime Business Strategies LLC, "Shipbuilding Statistics," found at *http://www.coltoncompany.com/shipbldg/statistics/world.htm*, retrieved Aug. 15, 2002.

[185] The United States is an important producer of pleasure boats; however, this is a very small part of the transportation equipment sector.

[186] U.S. Department of Commerce, ITA, *U.S. Industry and Trade Outlook* (New York: The McGraw-Hill Companies, 2000), pp. 39-15 to 39-19.

Table 5-20

Transportation equipment:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
	Billions of constant (1996) dollars											
Shipments	391.4	385.8	327.0	329.0	303.9	375.6	399.7	418.9	428.8	429.1	442.4	444.0
Imports	53.2	52.4	52.3	52.9	53.8	63.1	76.0	89.5	106.1	108.7	107.7	105.4
Exports	47.0	49.8	51.4	53.8	45.7	47.3	45.1	51.6	50.4	54.6	63.3	67.5
Apparent consumption	397.6	388.4	328.0	328.1	312.0	391.4	430.6	456.8	484.4	483.2	486.8	481.8
Trade balance	-6.1	-2.6	-1.0	1.0	-8.1	-15.8	-30.9	-37.9	-55.6	-54.1	-44.4	-37.9
	Percentage											
Imports/apparent consumption	13.4	13.5	16.0	16.1	17.3	16.1	17.6	19.6	21.9	22.5	22.1	21.9
Exports/shipments	12.0	12.9	15.7	16.4	15.1	12.6	11.3	12.3	11.8	12.7	14.3	15.2
	1,000 workers											
Total employment	1,987	2,059	1,881	1,879	1,718	1,730	1,883	1,960	2,003	2,028	2,036	2,052
Production workers	1,370	1,409	1,220	1,207	1,068	1,085	1,203	1,244	1,258	1,278	1,273	1,278
	Constant (1996) dollars											
Hourly earnings	16.40	16.33	16.39	16.66	16.77	16.94	17.08	17.25	17.01	16.68	16.57	16.42
	$1,000 per worker											
Labor productivity	286	274	268	273	285	331	332	337	341	336	348	347

See footnote at end of table.

Table 5-20—*Continued*

Transportation equipment:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Billions of constant (1996) dollars											
Shipments	428.1	409.6	435.4	440.9	469.5	470.8	465.2	504.1	533.7	581.0	559.3	490.9
Imports	104.2	98.8	101.0	108.7	120.8	124.7	129.2	138.0	150.9	175.9	189.3	183.7
Exports	78.0	84.2	89.9	85.3	88.6	83.9	92.9	106.4	116.3	114.4	108.0	106.5
Apparent consumption	454.3	424.2	446.5	464.4	501.8	511.6	501.5	535.7	568.3	642.5	640.6	568.0
Trade balance	-26.2	-14.6	-11.1	-23.5	-32.2	-40.9	-36.4	-31.6	-34.7	-61.5	-81.3	-77.1
	Percentage											
Imports/apparent consumption	22.9	23.3	22.6	23.4	24.1	24.4	25.8	25.8	26.6	27.4	29.6	32.3
Exports/shipments	18.2	20.6	20.6	19.3	18.9	17.8	20.0	21.1	21.8	19.7	19.3	21.7
	1,000 workers											
Total employment	1,989	1,890	1,830	1,756	1,761	1,790	1,785	1,845	1,893	1,888	1,852	1,760
Production workers	1,224	1,169	1,147	1,120	1,154	1,200	1,210	1,256	1,264	1,251	1,222	1,145
	Constant (1996) dollars											
Hourly earnings	16.28	16.45	16.55	16.80	17.20	17.06	17.19	17.21	16.97	16.99	17.27	17.44
	$1,000 per worker											
Labor productivity	350	350	380	394	407	392	385	401	422	465	458	429

[1] Includes SIC 37 (transportation equipment).

Note.—Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of Economic Analysis and Bureau of the Census; and U.S. Department of Labor, Bureau of Labor Statistics.

productivity for the sector followed a similar trend, with sustained growth during 1980-86, 1989-94, and 1996-99. The average annual increase for productivity during the period was 1.8 percent. Employment fluctuated during 1978-2001; total employment hit a period low in 1982 at 1,718,000, and peaked in 1989 at 2,052,000 workers. Most of the industries in the transportation equipment sector are largely unionized. Overall, employment decreased by 11.4 percent during 1978-2001, which corresponds to the 25.4-percent increase in the value of shipments and the resulting 50.0-percent improvement in productivity. Hourly wage rates fluctuated during 1978-2001, with protracted periods of growth during 1979-85 and 1990-94. For the period, hourly wage rates rose by $1.04 (6.3 percent) to $17.44 in 2001.

The automotive industry, the lead transportation equipment subsector in terms of shipments and trade, is global. U.S.-headquartered and foreign-headquartered automakers and partsmakers produce vehicles and components all over the world. Owing to its strong international presence, the U.S. motor vehicle sector is not heavily reliant on exports. Local production strategies have developed for a variety of reasons, including trade barriers in foreign markets, wage rates, and enhanced ability to respond to local consumer preferences.[187] In addition, U.S. automakers in recent years have endeavored to improve their competitiveness in certain markets and round out their product offerings through joint ventures and equity tie-ups.

The U.S. auto industry has consolidated somewhat during the period. Chrysler's acquisition of American Motors Corp. in 1987 reduced the number of U.S.-based automakers to three–General Motors Corp. (GM), Ford Motor Co., and Chrysler Corp. Subsequently, Chrysler itself became a subsidiary of DaimlerChrysler of Germany in 1998. The supplier segment of the industry has also consolidated considerably. Efforts to increase efficiency led to a reduction in the degree of vertical integration in the U.S. motor vehicle industry, evidenced by the divestiture by GM and Ford of their in-house parts operations in May 1999 and June 2000, respectively. Traditionally, major motor vehicle producers have used vertical integration to coordinate the complicated process of designing and building motor vehicles. Today, most major motor vehicle producers worldwide, particularly those in the car and light truck segments, still produce most of their own engines, transmissions, and body stampings. For other components, motor vehicle producers rely on anywhere from several hundred to several thousand suppliers.

The U.S. industry has made extensive use of production-sharing operations, and the entire North American industry has become highly integrated. The close integration of the U.S. and Canadian auto industries was greatly furthered

---

[187] For more information on nontariff barriers, see Office of Automotive Affairs, U.S. Department of Commerce, "World Motor Vehicle Import Requirements," Aug. 2001, found at *http://www.ita.doc.gov/td/auto/impreq.html*.

by the 1965 U.S.-Canada Automotive Products Trade Agreement (APTA).[188] The APTA established a "conditional free-trade zone" between the United States and Canada for motor vehicles and original equipment parts, with specified local content and other requirements. This integration has resulted in significant production rationalization, intra-industry trade, and trade in intermediate goods. Also in 1965, the Mexican Congress approved the Border Industrialization Program, or Maquiladora Program, allowing duty-free entry of components and materials used to assemble vehicles and parts for export markets. Subsequently, NAFTA liberalized trade and investment rules, thereby encouraging the rationalization of production and contributing to the competitiveness of the North American automotive industry.

A number of U.S. Government regulations in the automotive sector shaped the industry during 1978-2001. The most prominent of these include regulations on fuel economy stemming from the 1973-74 oil embargo and energy supply crisis, and the Clean Air Act of 1970,[189] which gave the Environmental Protection Agency (EPA) broad authority to regulate motor vehicle emissions. Vehicle emissions are being further reduced by provisions of the 1990 Clean Air Act Amendments,[190] and several States have mandated emissions standards more stringent than those enforced by the EPA. Regulations regarding safety and labeling also played a role in the development of the industry during the period. Safety and fuel economy regulations have driven U.S. motor vehicle industry research and development,[191] enhancing the U.S. auto industry's ability to compete with imported vehicles, particularly with respect to fuel economy. Regulations requiring passenger motor vehicles manufacturers to label their vehicles with domestic and foreign content information enable consumers to take country-of-origin information into account in deciding which vehicle to purchase. To the extent to which automakers believe that country of origin is important to U.S. consumers, labeling regulations may encourage the use of U.S. and Canadian inputs.

During 1978-2001, the U.S.-based auto industry lost domestic market share to foreign–most notably Japanese–brands. In 1978, traditional U.S. automakers GM, Ford, Chrysler, and American Motors accounted for approximately 84 percent of retail sales of passenger cars and light trucks;[192] in 2001, GM, Ford, and Chrysler vehicles accounted for approximately 65 percent of retail sales.[193]

---

[188] 17 UST 1372, TIAS No. 6093. For more information, see Dennis DesRosiers, "Auto Pact II," *DesRosiers Automotive Reports*, vol. 15, Issue 3, Feb. 28, 2001, found at *http://www.desrosiers.ca*, retrieved Mar. 28, 2002.

[189] P.L. 91-604, Dec. 31, 1970, 84 Stat. 1676.

[190] P.L. 101-549, Nov. 15, 1990, 104 Stat. 2399.

[191] For more information, see the Alliance of Automobile Manufacturers' website, at *http://www.autoalliance.org/*.

[192] Ward's Communications, e-mail communication to USITC staff, Oct. 28, 2002.

[193] Ibid.

The oil crisis in the 1970s had a major effect on import penetration in the U.S. passenger vehicle market. Small, fuel-efficient Japanese vehicles more than doubled their share of the U.S. market; from 12 percent in 1975 to 27 percent in 1980. U.S. automakers lost billions of dollars during this period, and layoffs were in the hundreds of thousands. On April 30, 1981, the U.S. and Japanese Governments announced a voluntary restraint agreement (VRA) on Japanese exports of passenger vehicles to the United States. While the U.S. Government did not request an extension of the agreement in 1985, the Japanese Government voluntarily continued the program, with limit adjustments, until 1994. The VRA provided an impetus for Japanese automakers to establish a manufacturing presence in the United States, because Japanese vehicles manufactured in the United States were exempt from the VRA.[194] The first Japanese plant–Honda's facility in Marysville, OH–was established in 1982; by 2001, there were 9 plants (two are joint ventures with U.S. automakers) producing 2.4 million vehicles in the United States, with an additional 6 Japanese plants producing 2.2 million engines in the United States. Total Japanese automotive employment in the United States in 2001 reached 48,000.[195] According to the Japanese Automobile Manufacturers Association, 64 percent of the vehicles sold in the United States by Japanese automakers in 2001 were produced in North America, up from 12 percent in 1986.[196] Twelve years after Japanese automakers began assembling vehicles in the United States, European automaker BMW opened a U.S. plant in South Carolina, followed by Mercedes-Benz in Alabama in 1997.

In 1995, the United States and Japan signed the U.S.-Japan Agreement on Autos and Auto Parts.[197] As part of the agreement, the Government of Japan made commitments in three important areas: improving market access for foreign motor vehicles; eliminating regulations that limit U.S. auto parts sales in Japan; and enhancing sales opportunities for U.S. original equipment parts producers with Japanese automakers in the United States and Japan. Subsequent bilateral consultations yielded commitments in other areas by Japan. Although acknowledging some progress over the life of the Agreement, the United States expressed concern that the overall market access objectives of the Agreement were not met, noting decreases in U.S. exports of vehicles and

---

[194] Localized production allows Japanese automakers to remain responsive to U.S. market developments, alleviate potential trade friction, and dramatically reduce transportation costs. For more information, see Political Economy Research Center, "Voluntary export restraints on automobiles," PERC Reports--*Tangents*, Sept. 1999, found at *http://www.perc.org/publications/percreports/tang_sept1999.html*.

[195] Japan Automobile Manufacturers Association, "Japan's Automobile Manufacturers: Global Companies Meeting New Challenges with Advanced Technologies," found at *http://www.jama.org*, retrieved Oct. 29, 2002.

[196] Ibid.

[197] *International Legal Materials,* Nov. 1995*;* 34 ILM 1372.

parts to Japan.[198] The United States stated that, the weak Japanese economy notwithstanding, more could be done to improve access and competition in the Japanese market.[199] The Agreement expired without a continuance or replacement at the end of 2000.[200]

The other important subsector in the transportation equipment sector encompasses aircraft and parts. The competitive position of the U.S. civil aerospace sector declined during 1978-2001. While general aviation aircraft shipments increased during the 1990s, U.S. market share for large civil aircraft (LCA) and helicopter shipments has declined. Military aircraft have also been shipped in fewer numbers, while shipments of space vehicles have increased. While there were three U.S. manufacturers producing LCA at the beginning of the period, Boeing, McDonnell Douglas, and Lockheed, there was only one in 2001; Boeing merged with McDonnell Douglas in 1997, and Lockheed stopped manufacturing LCA in 1985. Likewise, five U.S. companies manufacturing fighter aircraft in 1978 were reduced to two by 2001. There has been a considerable rise in foreign competition in the helicopter and LCA sectors during the period.

The U.S. aircraft parts industry has also changed, as its principal customers (airframe manufacturers) seek new methods of cost reduction. New business practices have been adopted in reaction to customer demand; most notably, risk sharing has been more widely adopted in contract negotiations. The rise of risk sharing among aircraft manufacturers and their suppliers has led to consolidation of the supplier base, which has helped suppliers acquire the critical financial mass necessary to meet new contract demands while retaining the ability to stay in business over the long haul. Similar to the auto industry, aircraft suppliers are increasingly taking on supply chain management responsibilities, including systems integration and the coordination of module assembly.[201]

There have been a number of important regulatory changes during the period that have affected the aerospace sector. In 1978, the U.S. Congress passed the Airline Deregulation Act,[202] which incrementally eliminated the Civil Aeronautics Board's control over the allocation of air routes among airlines and the regulation of airfares. The effect of this deregulation was

---

[198] Office of the United States Trade Representative press release, "U.S. and Japan Complete Annual Review of Automotive Framework Agreement, U.S. Emphasizes Need for Improved Market Access and Competition in Japan," Nov. 29, 2000.

[199] Ibid.

[200] On Oct. 18, 2001, the Governments of Japan and the United States announced that they would form a bilateral Automotive Consultative Group that would meet annually.

[201] For more information, please see USITC, *Competitive Assessment of the U.S. Large Civil Aircraft Aerostructures Industry*, inv. No. 332-414, USITC Pub. 3433, June 2001.

[202] P.L. 95-504, Oct. 24, 1978, 49 U.S. Code Sec. 1301, 1301 nt., 1302 et. seq.

manifold; for airlines, competition from existing and new companies became fierce, passenger traffic boomed, and fares decreased. For airframe manufacturers, demand for aircraft increased steadily. The General Aviation Revitalization Act (GARA),[203] enacted in August 1994, provided tort reform[204] and, in the view of many industry observers, much needed relief to the industry.[205] By the early 1990s, the general aviation sector of the aircraft industry reportedly had lost over 100,000 jobs and production had declined by 95 percent, and the lack of legal liability limits were a major contributing factor to the industry's decline.[206] Since the enactment of GARA, general aviation aircraft production in the United States has increased every year.

The 1992 U.S.-EU Agreement on Trade in Large Civil Aircraft[207] limits direct and indirect government assistance to industry. This Agreement aimed to level the playing field for competition between the United States and Europe in the sale of LCA[208] by limiting the support that governments can provide for the development, production, and sale of such aircraft[209]– support that can give companies a competitive advantage in domestic and international markets. The Agreement entered into force on July 17, 1992 and has no expiration date.

Effect of Trade Agreements on the Sector

Considering the dominance of motor vehicles and related equipment in this sector, NAFTA had the most obvious direct effect on the U.S. transportation equipment industry. However, much of the growth in production and trade that has taken place in the U.S. transportation equipment industry since 1980 can be attributed to factors other than the five trade agreements that are the subject of this investigation. These factors include strong growth in demand, changes in

---

[203] P.L. 103-298, Aug. 17, 1994, U.S. Code Sec. 40101 nt., P.L. 105-102, Nov. 20, 1997, 49 U.S. Code Sec 40101 nt.

[204] Liability Reform Coalition, *Liability Reform Coalition Newsletter*, Mar. 2000, found at *http://www.walrc.org/Newsletters/newsletter03.html*, retrieved Dec. 12, 2002.

[205] For example, see National Business Aircraft Association press release, "NBAA Expresses Optimism For Enactment Of General Aviation Revitalization Act - Glickman, Hansen And Kassebaum Commended For Tireless Efforts/Leadership," June 24, 1994, found at *http://web.nbaa.org/public/news/pr/1994/19940624-023.php* and Civil Justice Association of California press release,"Legal Reform Brings Remarkable Recovery to Fresno-area General Aviation," Feb. 15, 1996, found at *http://www.cjac.org/news/021596a.html,* both accessed on July 30, 2003.

[206] Ibid.

[207] EU Council Decision 92/496/EEC, *OJ L* 301, Oct. 17, 1992, p. 31.

[208] These aircraft are defined as having 100 or more passenger seats or weighing more than 15,000 kg.

[209] For more information on this agreement, see USITC, *Global Competitiveness of U.S. Advanced-Technology Manufacturing Industries: Large Civil Aircraft*, inv. No. 332-332, USITC Pub. 2667, Aug. 1993, app. F.

industry structure and production strategies, and production-sharing arrangements. The Auto Pact has also had a major carry-through impact on the transportation equipment industry during the period.

Although the subject trade agreements are not the primary factors driving the expansion of the motor vehicle sector, they have contributed to that expansion. Further, they have contributed substantially to the expansion of transportation equipment industries other than motor vehicles and related equipment (i.e., aircraft and parts; ship and boat building and repair; railroad equipment; motorcycles, bicycles, and parts; guided missiles and space vehicles and parts; and other miscellaneous transportation equipment). Of the five agreements, the Tokyo and Uruguay Rounds had the most profound effect on these industries as a group, particularly with respect to U.S. exports. Table 5-21 presents trade issues addressed by the subject trade agreements that were relevant to the sector. Without the Tokyo and Uruguay Rounds, U.S. exports of non-automotive transportation equipment likely would have been measurably lower, while the additional removal of NAFTA, CFTA, and U.S.-Israel FTA would yield little additional change in U.S. exports. Over the period under consideration, the most significant increase in U.S. non-automotive transportation equipment exports, by value and by percentage change, was in aerospace equipment (civil and military aircraft, spacecraft, and parts); such exports increased by over $40 billion, or by well over 1,000 percent.

Tokyo Round

Between 1980 (the year of the first stage of the Tokyo Round tariff reductions) and 2001, total U.S. trade in transportation equipment increased at an average annual rate of 5.1 percent, reaching $290.2 billion. Total trade increased in every year except for 1982, 1995, and 2001. With the exception of 1981, the United States has consistently run a trade deficit in transportation equipment. The $1-billion deficit in 1980 grew to $77.1 billion by 2001.

U.S. imports of transportation equipment increased from $52.3 billion to $183.7 billion during 1980-2001, an average annual increase of 6.2 percent. Sector imports slightly more than doubled during 1980-87, decreased during 1988-91, and then increased 81.9 percent during 1992-2001. U.S. exports of transportation equipment also rose during the period, albeit at a slower rate. U.S. exports of transportation equipment increased from $51.4 billion to $106.5 billion during 1980-2001, an average annual increase of 3.8 percent. However, the trend in U.S. exports of transportation equipment was erratic, with exports declining in 1982, 1984, 1986, 1993, 1995, and 1999-2001.

International trade became increasingly important during the 1980-2001 period as the sector became more globalized. Moreover, production sharing operations in the automotive sector, particularly in Mexico, expanded, and the integration of the North American automotive industry, accelerated by NAFTA, also increased sector trade. Imports as a share of U.S. apparent consumption increased from 16.0 percent to 32.7 percent, while exports as a share of shipments increased from 15.7 percent to 22.9 percent.

Table 5-21
Transportation equipment: Trade issues addressed in trade agreements and U.S. tariffs

Trade issues and U.S. tariffs	Tokyo Round	U.S.-Israel	U.S.-Canada	Uruguay Round	NAFTA[1]
Tariffs[2]	(1979) 2.5% (1987) 1.7%	(1984) <0.1% (1995) <0.1%	(1987) 0.1% (1998) <0.1%	(1994) 1.6% (1999) 1.2%	(1993) 0.4% (2001) <0.1%
Technical barriers	X		X	X	X
Import licensing	X	X		X	X
Customs valuation	X				X
Government procurement	X	X	X	X	X
Rules of origin		X	X	X	X
TRIMs[3]		X	X	X	X
TRIPs[4]		X		X	X
Agreement on Trade in Civil Aircraft	X			X	
Trade in automobile goods			X		
Trade and investment in the automotive sector (annex to chapter 3)					X

[1] The NAFTA provides that tariffs be eliminated by Jan. 1, 2003 for all industrial goods and by Jan. 1, 2003 for all other goods.
[2] Average trade-weighted ad valorem or ad valorem equivalent tariff. Trade weights for the Tokyo Round and Uruguay Round are based on U.S. imports from the world during the years indicated. Trade weights for the bilateral treaties and NAFTA are based on U.S. imports from the relevant countries. Unless otherwise noted, dates in parentheses represent the year immediately prior to the entry into force of the agreement and the year of the final tariff reduction for most products and markets.
[3] Trade-related investment measures.
[4] Trade-related aspects of intellectual property rights.

Source: U.S. Trade Representative, *Annual Report of the President of the United States on the Trade Agreements Program*, various issues; U.S. Trade Representative, *Trade Policy Agenda and Annual report,* various issues; and *U.S. International Trade Commission, Operation of the Trade Agreements Program,* various issues.

The effect of the Tokyo Round on the U.S. motor vehicle and parts industry was modest, while the effect on other transportation equipment was more significant. U.S. tariffs on sector products were generally already relatively low prior to the agreement (table 5-37),[210] and tariffs on these products in many major foreign markets were generally also low.[211] The increases in total transportation equipment trade during this period can be attributed to market factors[212] as well as to Tokyo Round trade liberalization.

The plurilateral Agreement on Trade in Civil Aircraft (ATCA) was one of the most important components of the Tokyo Round for the sector. The ATCA provided for the elimination of customs duties on civil aircraft and most parts and equipment of such aircraft, and also provided for the reduction or elimination of a number of nontariff measures, such as governmental subsidies, government-directed procurement, technical barriers, and import and export licensing requirements. However, certain ATCA provisions were either ambiguous or lacking in sufficient specificity to ensure full international compliance.[213]

For military aircraft, the Tokyo Round did reduce U.S. and major trading partner tariffs, but these were generally waived anyway. Moreover, government procurement was identified as one of the greatest restrictions on trade in military aircraft. However, the Tokyo Round agreement on government procurement had little impact on this subsector for a number of reasons. First, the agreement was only binding between countries that chose to sign; second, the agreement allowed signatories to determine the products and services covered; third, the agreement only covered purchases over a certain monetary

---

[210] One notable exception is the 25-percent U.S. tariff on most trucks, which remains in effect.

[211] U.S. motor vehicle exports to Canada, the leading market, were already largely free of duty as a result of the APTA, and Japan eliminated its tariffs on most motor vehicles unilaterally in 1978. The EEC did not make Tokyo Round tariff concessions on most motor vehicles. Some market access gains were likely made as a result of tariff reductions in the motor vehicle parts sector. With respect to aircraft and parts, the other leading transportation equipment subsector, import tariffs on commercial and military aircraft in major markets, which could be sizeable in some markets, were generally waived because the importance of these aircraft in terms of economic health and national security.

[212] For example, in the aircraft industry, factors such as quality, financing, offsets, and delivery date are overwhelmingly more important to production and trade patterns than multilateral trade agreements.

[213] U.S. International Trade Commission, *Agreements Being Negotiated at the Multilateral Trade Negotiations on Geneva*, MTN Studies 6, Part 4, inv. No. 332-101 (Washington, DC: U.S. GPO, 1979); and U.S. industry officials, interviews by USITC staff, Dec. 18, 1992 and Feb. 18, 1993, in connection with USITC, *Global Competitiveness of U.S. Advanced-Technology Manufacturing Industries: Large Civil Aircraft*, inv. No. 332-332, USITC Pub. 2667, Aug. 1993, p. F-2.

value; fourth, developing signatory countries were permitted to negotiate offsets; and fifth, the agreement did not cover actions taken in the interest of national security.[214] As a result, signatories generally have not applied the agreement on government procurement to a large percentage of their defense purchases.[215] In the motor vehicles sector, significant foreign policy measures such as taxes based on engine size and complicated distribution systems were not addressed; however, foreign tariff reduction commitments made by certain major markets were beneficial to the U.S. motor vehicle parts industry.[216] For "railroad equipment and miscellaneous transportation equipment" (transportation equipment other than automotive and aerospace), the EC's tariff concession on U.S. exports amounted to a 2.5 percentage point reduction on the applied rate, Canada's reduction was 3.6 percentage points on the applied rate, and Japan's reduction was 2.1 percentage points on the applied rate.[217]

U.S.-Israel FTA[218]

Total U.S. trade with Israel in transportation equipment increased at an average annual rate of 6.0 percent during 1985-2001, reaching $1.7 billion. Trade with Israel changed very little, increasing from 0.5 percent of total U.S. trade in transportation equipment to 0.6 percent during the same period. U.S. exports of sector products to Israel increased by 137.3 percent to $1.2 billion during 1985-2001, while U.S. imports from Israel increased by 184.4 percent to $499 million (table 5-22).

When the U.S.-Israel FTA was negotiated, the trade-weighted U.S. tariff rate on transportation equipment imports from Israel was less than one percent ad valorem. The aircraft and parts subsector accounts for the largest share of U.S. transportation equipment imports from and exports to Israel; most of this trade is in civil products as opposed to military ones. U.S. exports of motor vehicles and parts to Israel increased substantially during the 1990s.

---

[214] U.S. House of Representatives, Committee on Government Reform and Oversight, "Foreign Offset Demands in Defense and Civil Aerospace Transactions," Minority Staff Report, Oct. 23, 1998, p. 20.

[215] Ibid.

[216] USITC, *Agreements Being Negotiated at the Multilateral Trade Negotiations on Geneva*, MTN Studies 6, Part 5, Industry/Agriculture Sector Analysis, inv. No. 332-101 (Washington, DC: U.S. GPO, 1979).

[217] Office of the United States Trade Representative, *Twenty-Fourth Annual Report Of the President Of the United states On the Trade Agreements Program*, 1979, p. 59.

[218] The U.S.-Israel FTA was signed in 1985 and was fully implemented on Jan. 1, 1995.

Table 5-22
Transportation equipment: U.S. trade with Israel, 1984-2001

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992
	Millions of constant (1996) dollars								
U.S. import value									
Israel	196.0	175.4	244.5	202.8	186.1	263.2	302.5	359.8	258.5
All other	75,749.2	89,312.4	105,826.0	108,514.0	107,528.7	105,112.8	103,867.1	98,453.9	100,726.4
Total	75,945.2	89,487.8	106,070.5	108,716.8	107,714.7	105,376.0	104,169.6	98,813.7	100,984.9
	Percent								
Israel/Total	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.3
U.S. import growth									
Israel	—	-10.5	39.4	-17.1	-8.3	41.5	14.9	19.0	-28.2
All other	—	17.9	18.5	2.5	-0.9	-2.3	-1.2	-5.2	2.3
Total	—	17.8	18.5	2.5	-0.9	-2.2	-1.1	-5.1	2.2
	Millions of constant (1996) dollars								
U.S. export value									
Israel	653.3	499.6	421.5	666.9	636.9	656.1	722.2	1,046.2	1,293.9
All other	44,399.4	51,101.1	50,005.8	53,949.0	62,645.8	66,848.9	77,272.5	83,159.0	88,586.2
Total	45,052.7	51,600.6	50,427.3	54,615.9	63,282.7	67,504.9	77,994.7	84,205.2	89,880.1
	Percent								
Israel/Total	1.5	1.0	0.8	1.2	1.0	1.0	0.9	1.2	1.4
U.S. export growth									
Israel	—	-23.5	-15.6	58.2	-4.5	3.0	10.1	44.9	23.7
All other	—	15.1	-2.1	7.9	16.1	6.7	15.6	7.6	6.5
Total	—	14.5	-2.3	8.3	15.9	6.7	15.5	8.0	6.7

See note at end of table.

Table 5-22—*Continued*
Transportation equipment: U.S. trade with Israel, 1984-2001

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of constant (1996) dollars								
U.S. import value									
Israel	218.7	251.4	352.8	477.9	440.5	490.3	426.4	458.8	498.8
All other	108,509.8	120,567.2	124,360.5	128,757.3	137,552.5	150,432.7	175,422.6	188,827.8	183,154.4
Total	108,728.5	120,818.6	124,713.3	129,235.2	137,993.0	150,993.0	175,849.1	189,286.6	183,653.2
	Percent								
Israel/Total	0.2	0.2	0.3	0.4	0.3	0.3	0.2	0.2	0.3
U.S. import growth									
Israel	-15.4	15.0	40.3	35.5	-7.8	11.3	-13.0	7.6	8.7
All other	7.7	11.1	3.2	3.5	6.8	9.4	16.6	7.6	-3.0
Total	7.7	11.1	3.2	3.6	6.8	9.4	16.5	7.6	-3.0
	Millions of constant (1996) dollars								
U.S. export value									
Israel	1,249.5	1,462.2	1,080.3	789.1	804.2	1,577.9	1,809.2	955.6	1,185.7
All other	84,020.3	87,141.5	82,768.0	92,097.7	105,586.6	114,682.8	112,566.7	107,011.7	105,327.8
Total	85,269.9	88,603.8	83,484.3	92,886.8	106,390.8	116,260.8	114,375.8	107,967.2	106,513.5
	Percent								
Israel/Total	1.5	1.7	1.3	0.9	0.8	1.4	1.6	0.9	1.1
U.S. export growth									
Israel	-3.4	17.0	-26.1	-27.0	1.9	96.2	14.7	-47.2	24.1
All other	-5.2	3.7	-5.0	11.3	14.7	8.6	-1.9	-4.9	-1.6
Total	-5.1	3.9	-5.4	10.8	14.5	9.3	-1.6	-5.6	-1.4

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

U.S.-Canada FTA

U.S. trade with Canada in transportation equipment increased at an average annual rate of 3.5 percent during 1988-2001, reaching $89.8 billion (table 5-23). Total U.S. trade with Canada in transportation equipment increased at approximately the same average annual rate as total U.S. sector trade with the rest of the world. U.S. exports of transportation equipment to Canada increased 51 percent to $33.4 billion during 1988-2001, while U.S. imports of sector products from Canada increased 59.2 percent to $56.4 billion. Canada replaced Japan as the leading source of U.S. sector imports in 1992 and remained the largest supplier through 2001.

As the overwhelming portion of total transportation equipment imports from Canada and Japan is accounted for by motor vehicles and motor vehicle parts, the shift to Canada as the leading import source can be explained by the increased integration of the U.S. and Canadian automotive industries that began in 1965 with the APTA,[219] as well as a stabilization of U.S. imports from Japan during the late 1980s and early 1990s as Japanese automakers increased their production in the United States. Therefore, it is likely that the U.S.-Canada FTA had a minor effect on U.S. transportation equipment sector trade and production.

NAFTA

U.S. sector trade with NAFTA partners rose steadily after NAFTA entered into force in 1994, before declining slightly in 2000 and 2001 for Canada, and in 2001 for Mexico. These declines were a result of market factors such as changes in automotive demand and production strategies. Total trade with Canada increased at an average annual rate of 2.8 percent during 1994-2001, below the average rate for the rest of the world (5.8 percent), while total trade with Mexico increased at an average annual rate of 13.8 percent during the period.

The impact of NAFTA on U.S. trade in transportation equipment has been significant largely because of the importance of Canada and Mexico as U.S. trading partners. Much of the increase in sector trade between the three countries can be attributed to increased integration of the automotive industries and markets throughout the continent and to production sharing operations of U.S. automotive firms in Mexico. On implementation of NAFTA, Mexico immediately eliminated or reduced significant trade restrictions; for example, Mexico eliminated its trade balancing requirement, lowered its local content requirement, and eliminated import quotas on new cars and light trucks (quotas for heavy trucks and buses were eliminated in January 1998). These actions, along with the elimination of Mexican tariffs of up to 20 percent, increased U.S.-Mexican total trade in the automotive sector.[220]

---

[219] The APTA was made largely redundant by the U.S.-Canada FTA, which was in turn superseded by the NAFTA in 1994.

[220] Office of the United States Trade Representative, *Study on the Operation and Effects of the North American FTA* (Washington, DC: 1997), pp. 45-51.

Table 5-23
Transportation equipment: U.S. trade with Canada and Mexico, 1987-2001

Year	1987	1988	1989	1990	1991	1992	1993	1994
	Millions of constant (1996) dollars							
U.S. import value								
Canada	30,607.9	35,426.8	35,687.0	35,035.3	32,936.0	34,562.2	38,994.3	44,426.0
Mexico	3,627.6	4,078.8	3,716.8	4,858.7	5,284.6	6,054.3	6,969.7	8,606.9
All other	74,481.3	68,209.2	65,972.3	64,275.7	60,593.2	60,368.5	62,764.5	67,785.7
Total	108,716.8	107,714.7	105,376.0	104,169.6	98,813.7	100,984.9	108,728.5	120,818.6
	Percent							
Canada/Total	28.2	32.9	33.9	33.6	33.3	34.2	35.9	36.8
Mexico/Total	3.3	3.8	3.5	4.7	5.4	6.0	6.4	7.1
U.S. import growth								
Canada	—	15.7	0.7	-1.8	-6.0	5.0	12.8	13.9
Mexico	—	12.4	-8.9	30.7	8.8	14.6	15.1	23.5
All other	—	-8.4	-3.3	-2.6	-5.7	-0.4	4.0	8.0
Total	—	-0.9	-2.2	-1.1	-5.1	2.2	7.7	11.1
	Millions of constant (1996) dollars							
U.S. export value								
Canada	20,108.8	22,112.1	21,047.5	23,327.0	23,062.8	23,287.3	25,533.8	29,510.0
Mexico	2,025.4	2,529.8	3,042.2	4,224.9	4,565.2	5,694.3	5,190.0	6,299.5
All other	32,481.7	38,640.9	43,415.3	50,442.8	56,577.2	60,898.5	54,546.1	52,794.4
Total	54,615.9	63,282.7	67,504.9	77,994.7	84,205.2	89,880.1	85,269.9	88,603.8
	Percent							
Canada/Total	36.8	34.9	31.2	29.9	27.4	25.9	29.9	33.3
Mexico/Total	3.7	4.0	4.5	5.4	5.4	6.3	6.1	7.1
U.S. export growth								
Canada	—	10.0	-4.8	10.8	-1.1	1.0	9.7	15.6
Mexico	—	24.9	20.3	38.9	8.1	24.7	-8.9	21.4
All other	—	19.0	12.4	16.2	12.2	7.6	-10.4	-3.2
Total	—	15.9	6.7	15.5	8.0	6.7	-5.1	3.9

See note at end of table.

Table 5-23—*Continued*
Transportation equipment: U.S. trade with Canada and Mexico, 1987-2001

Year	1995	1996	1997	1998	1999	2000	2001
	Millions of constant (1996) dollars						
U.S. import value							
Canada	46,298.4	48,004.4	50,501.9	53,223.1	63,027.6	62,226.9	56,398.8
Mexico	12,071.2	15,535.5	16,488.9	17,981.9	21,376.0	26,659.0	25,981.0
All other	66,343.7	65,695.3	71,002.2	79,718.0	91,445.5	100,400.7	101,273.5
Total	124,713.3	129,235.2	137,993.0	150,923.0	175,849.1	189,286.6	183,653.2
	Percent						
Canada/Total	37.1	37.1	36.6	35.3	35.8	32.9	30.7
Mexico/Total	9.7	12.0	12.0	11.9	12.2	14.1	14.2
U.S. import growth							
Canada	4.2	3.7	5.2	5.4	18.4	-1.3	-9.4
Mexico	40.3	28.7	6.1	9.1	18.9	24.7	-2.5
All other	-2.1	-1.0	8.1	12.3	14.7	9.8	0.9
Total	3.2	3.6	6.8	9.4	16.5	7.6	-3.0
	Millions of constant (1996) dollars						
U.S. export value							
Canada	30,860.0	31,699.9	35,377.3	34,486.2	37,569.9	37,210.6	33,388.6
Mexico	4,236.6	5,237.1	7,786.6	8,639.6	8,688.4	11,033.2	10,836.5
All other	48,751.7	55,949.8	63,227.0	73,134.8	68,117.5	59,723.4	62,288.4
Total	83,484.3	92,886.8	105,390.8	116,260.8	114,375.8	107,967.2	106,513.5
	Percent						
Canada/Total	36.8	34.1	33.3	29.7	32.9	34.5	31.4
Mexico/Total	5.1	5.6	7.3	7.4	7.6	10.2	10.2
U.S. export growth							
Canada	4.6	2.7	11.6	-2.5	8.9	-1.0	-10.3
Mexico	-32.8	23.6	48.7	11.0	0.6	27.0	-1.8
All other	-7.7	14.8	13.0	15.7	-6.9	-12.3	4.3
Total	-5.4	10.8	14.5	9.3	-1.6	-5.6	-1.4

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

Uruguay Round

During 1995-2001, U.S. trade in transportation equipment increased at an average annual rate of 5.7 percent, reaching $290.2 billion. Imports of transportation equipment increased by 47.3 percent during this period to $184 billion, while exports of such goods increased by 27.6 percent to $107 billion. U.S. shipments also grew throughout 1995-2001, increasing by 4.3 percent to $491 billion.

While Canada and Japan have consistently been the leading two sources of U.S. transportation equipment imports, Mexico made significant strides during this period, becoming the third-leading import source in 1995. Other countries that have been among the leading suppliers of U.S. transportation equipment imports are Germany, France, and the United Kingdom. Sector imports are overwhelmingly (at least 80 percent) accounted for by motor vehicles and motor vehicle parts. On the other hand, motor vehicles and parts and aircraft and parts vie for first and second place each year as the leading sector export. The leading export market for transportation equipment has consistently been Canada, accounting for approximately one-third of total U.S. exports of these products. Mexico rose to replace Japan as the second-leading market in 1998. Subsequently, Japan was surpassed by the United Kingdom and Germany to finish 2001 as the fifth-leading market for U.S. transportation equipment exports.

The overall worldwide Uruguay Round percentage point reduction for U.S. "Transport Equipment" exports was 3.5.[221] However, much of the increase in U.S. trade following implementation of the Uruguay Round can be attributed to factors such as expanding markets in the United States and overseas, as well as further globalization of the automotive industry–specifically, increased integration of the North American automotive industry. Tariff reductions negotiated under the Uruguay Round were largely inconsequential in the motor vehicle subsector, as most trade with Canada and Japan was already duty free, and the EU did not make significant duty reduction commitments.[222]

With respect to motor vehicle parts, the majority of subsector trade was with Canada and Mexico, and already free of duty or subject to reduced duties.

---

[221] This calculation excludes countries participating in free trade agreements with the United States at that time, and also excludes certain products such as automotive engines. Based on J. Michael Finger, Merlinda D. Ingco, and Ulrich Reincke, *The Uruguay Round: Statistics on Tariff Concessions Given and Received* (Washington, DC: The World Bank, 1996).

[222] USITC, *Potential Impact on the U.S. Economy and Industries of the GATT Uruguay Round Agreements*, inv. No. 332-353, USITC Pub. 2790, June 1994, pp. VI-5 to VI-7.

The URA negotiations attempted to harmonize developed-country tariffs at 2 percent ad valorem; this goal was largely met in the EU, but was less successfully negotiated in Latin America and Asia. Japan, however, did agree to bind its tariffs at zero, and Australia, Korea, and Singapore agreed to reduce tariffs to 2 percent. Besides tariff concessions, which seem to have had a limited effect on U.S. production and trade, the agreements on TRIMs, TRIPs, rules of origin, and to a lesser extent, safeguards, were positive outcomes for the U.S. motor vehicle parts industry.[223]

In the civil aircraft and parts subsector, trade was already largely free of duty; duty reductions negotiated under the URA were minimal. The agreement on subsidy and countervailing measures theoretically allowed the U.S. civil aerospace industry to accept, without risk of international action, direct U.S. Government support of research and development. In effect, however, the result of this URA provision was minimal.[224]

Forest and Fishery Products[225]

Overview

The United States is the world's largest producer of forest products and the fifth-largest producer of fishery products. The forest products subsector consists of two industries; wood products, and paper and allied products. U.S. production of wood products in 2001 reached 632 million cubic meters, or about 17 percent of the world's total, more than twice the output of the next largest producer, China.[226] U.S. production of paper and allied products in 2001 reached 177 million metric tons, or about 29 percent of the world's total, more than twice the output of the next largest producer, also China. U.S. production of fishery products in 2001 reached 4.31 million metric tons, or about 4 percent of the world's total, behind China, India, Japan, and Peru (table 5-24).[227] Canada produces a similar mix of both forest and fishery products, and is a major competitor in the U.S. market, as well as in major foreign markets such as Japan and the EU. The U.S. forest and fishery products

[223] Motor and Equipment Manufacturers Association, official submission to USITC in connection with USITC, *Potential Impact on the U.S. Economy and Industries of the GATT Uruguay Round Agreements*, Vol. I, inv. No. 332-353, USITC Pub. 2790, June 1994, p.VI-11.

[224] Ibid, pp. VI-13 to VI-15.

[225] For the purposes of this investigation, forest and fishery products comprise SIC groups 08, 09, 24, 26, and 27. Processed seafood products are not included here; they are included in the discussion of agriculture elsewhere in this report.

[226] Food and Agriculture Organization of the United Nations.

[227] Food and Agriculture Organization of the United Nations, and the U.S. Department of Commerce.

Table 5-24

Forest and fishery products:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
	Billions of constant (1996) dollars											
Shipments	341.3	351.1	343.0	337.5	324.3	360.2	369.9	370.6	387.0	415.6	433.8	439.9
Imports	23.5	25.2	22.1	21.3	18.9	22.7	24.7	24.6	26.3	29.5	30.6	30.5
Exports	13.4	16.4	17.9	16.0	14.1	13.7	12.8	11.8	13.3	16.4	20.4	22.9
Apparent consumption	351.3	360.0	347.2	342.8	329.2	369.1	381.8	383.3	400.0	428.8	444.0	447.5
Trade balance	-10.0	-8.9	-4.3	-5.3	-4.9	-8.9	-11.9	-12.8	-13.0	-13.2	-10.2	-7.6
	Percentage											
Imports/apparent consumption	6.7	7.0	6.4	6.2	5.8	6.1	6.5	6.4	6.6	6.9	6.9	6.8
Exports/shipments	3.9	4.7	5.2	4.8	4.3	3.8	3.5	3.2	3.4	3.9	4.7	5.2
	1,000 workers											
Total employment:												
Forest and fishery products[2]	2,651	2,714	2,641	2,627	2,538	2,623	2,767	2,808	2,847	2,931	2,999	3,008
Production workers:												
Forest and fishery products[2]	1,850	1,893	1,805	1,777	1,687	1,758	1,864	1,889	1,928	1,980	2,019	2,009
	Constant (1996) dollars											
Hourly earnings:												
Forest and fishery products[3]	12.87	12.83	12.83	12.75	12.90	13.58	12.96	12.99	13.03	12.90	12.75	12.66

See footnotes at end of table.

Table 5-24—*Continued*

Forest and fishery products:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Billions of constant (1996) dollars											
Shipments	433.5	411.6	426.0	436.4	453.0	486.9	472.5	476.7	483.9	495.0	494.4	452.6
Imports	28.1	25.8	27.0	29.6	32.8	38.3	37.3	38.9	40.1	43.6	46.3	43.2
Exports	24.5	25.1	26.1	25.3	26.3	30.5	26.8	28.7	25.9	26.3	27.8	24.9
Apparent consumption	437.1	412.3	426.9	440.8	459.4	494.7	481.0	486.9	498.3	512.6	513.2	471.3
Trade balance	-3.6	-0.7	-0.9	-4.4	-6.4	-7.8	-8.5	-10.2	-14.4	-17.6	-18.8	-18.8
	Percentage											
Imports/apparent consumption	6.4	6.3	6.3	6.7	7.1	7.8	7.8	8.0	8.1	8.6	9.1	9.3
Exports/shipments	5.7	6.1	6.1	5.8	5.8	6.3	6.1	6.0	5.4	5.3	5.6	5.5
	1,000 workers											
Total employment:												
Forest and fishery products[2]	2,999	2,899	2,877	2,918	2,984	3,008	3,002	3,032	3,055	3,055	3,034	2,911
Production workers:												
Forest and fishery products[2]	1,997	1,917	1,911	1,944	1,993	2,005	2,000	2,023	2,029	2,017	1,993	1,898
	Constant (1996) dollars											
Hourly earnings:												
Forest and fishery products[3]	12.58	12.48	12.47	12.39	12.36	12.38	12.49	12.60	12.81	13.02	13.14	13.20

[1] Includes SIC 08 (forestry), 09 (fishing, hunting, and trapping), 24 (lumber and wood products, except furniture), 26 (paper and allied products), and 27 (printing, publishing, and allied industries).

[2] Includes employment for SIC 24 (lumber and wood products, except furniture), 26 (paper and allied products), and 27 (printing, publishing, and allied industries).

[3] Hourly earnings for production workers employed in SIC 24, SIC 26, and SIC 27.

Note.—Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of Economic Analysis and Bureau of the Census; and U.S. Department of Labor, Bureau of Labor Statistics.

industries both have access to significant quantities of natural resources, state-of-the-art technology, and a large domestic market for high-value goods. The U.S. forest and fishery products subsectors focus mainly on the domestic market. U.S. exports of high-value products are small but growing.

The forest products subsector produces an array of goods, including lightly processed products such as firewood; industrial products such as plywood, containerboard, and paper; and high-value consumer products such as stationery and scented tissue. The wide range of products reflects the great variety of hardwood and softwood trees available to the industry from various U.S. regions. The subsector consists primarily of large, vertically integrated firms that produce both paper and wood products. Many paper products, for example, are made by paper mills that process their own raw material from pulpwood and residual chips from the wood products subsector. Production of wood products is typically integrated from the harvest of trees, to the distribution of lumber products to retailers. Although a number of firms produce and distribute nationwide, they generally do not invest internationally, with the exception of significant cross-border investment with Canada.

In recent decades, recycling of paper products has become an important part of the industry in the United States: 25 percent or more of all paper products are recycled.[228] This has enabled the industry to supply growing demand for paper without requiring proportionate amounts of new forest resources. Most technological development in the past two decades in this sector has been in the production of paper and allied products.

The fishery products subsector produces a wide range of seafoods and other products. Important products include shrimp, tuna, and salmon, as well as industrial products such as fish meal (used in animal feeds) and fish oil (used in paints and other industrial uses). The U.S. industry has a distinct advantage over its foreign rivals in its proximity to the domestic market, which is an important consideration for a perishable product such as seafood. However, the U.S. industry may be disadvantaged by labor costs and environmental controls limiting the industrial development of some coastal areas.[229]

The fishery products subsector as defined in this investigation is composed of two broad industries, harvesting and aquaculture (fish farming). Commercial fish harvesting takes place along all U.S. coasts, on the high seas, and in freshwater bodies such as the Great Lakes. This subsector is highly disaggregated, consisting of thousands of firms most of which operate a single vessel. However, the size of these enterprises varies widely, from small inshore craft costing a few hundred dollars, to huge ocean-going vessels requiring an investment in excess of $20 million. The appropriate scale and technology for the enterprise generally depends on the type of fish targeted. The principal

---

[228] USITC, *Industry & Trade Summary: Wood Pulp and Waste Paper*, USITC Pub. 3490 Feb. 2002, pp. 22–25.

[229] USITC staff interview with fishery industry officials, June 2003.

equipment needed to harvest certain species of clams are tongs and waterproof boots, while most species of tuna require vessels capable of carrying a helicopter and sufficient fuel to traverse entire oceans.

U.S. shipments of forest and fishery products increased from $341 billion in 1978 to $453 billion in 2001 (33 percent), fluctuating during this period from a low of $324 billion in 1982 to a high of $495 billion in 1999. Peaks and troughs during this period were generally attributable to overall conditions in the U.S. economy; the wood products sector, in particular, mirrors the highly volatile housing and construction industries. U.S. sector exports approximately doubled between 1978 and 2001, reaching $25 billion, although as a share of production they have remained relatively steady, at 5 to 6 percent of production value. Imports grew during the period both in absolute terms and as a share of apparent consumption, from 6.4 percent, or $28 billion, in 1990, to more than 9 percent, or $46 billion, by 2000. Apparent consumption has outpaced production, especially in recent years, rising by 17 percent to $513 billion during 1990-2000.

Trade is an important component of the market for many forest products. Trade in certain products has been the subject of disputes – perhaps most notably the softwood lumber issue with Canada. In 1996, Canada and the United States negotiated the Softwood Lumber Agreement (SLA) that provided for a quota agreement between the two countries. However, the SLA expired in 2001, and shortly thereafter the U.S. softwood products industry filed petitions under U.S. antidumping and countervailing duty statutes.[230]

Employment in the wood and paper products industries (fishing employment is not currently available) grew from 1.6 million workers in 1978 to a peak of 2.0 million workers in 1998, before declining to 1.9 million workers in 2001. The decline from the peak levels of the late 1990s has been especially pronounced in the paper and printing subsectors, where recent recessionary impacts have combined with a longer-run trend toward industry consolidation and overseas migration. The wood products industry is particularly vulnerable to recessions; employment in mobile home construction and the production of home furnishings (such as kitchen cabinets), wood pallets, and shipping containers are especially volatile.

Hourly earnings, however, have been sustained throughout the period by high rates of labor productivity growth. Output per worker grew from less than

---

[230] See, e.g., *Softwood Lumber from Canada*, inv. No. 701-TA-312, USITC Pub. 2469, Dec. 1991, pp. A-3 to A-6. The MOU was signed on Dec. 30, 1986, prior to Commerce's final determination in the countervailing-duty investigation that year. Under this agreement, Canada agreed to charge an export tax to offset benefits accruing to its lumber producers and exporters. However, on Sept. 9, 1991, Canada ended the export tax, leading to the above-cited investigation (which was self-initiated by the Department of Commerce). At the same time, USTR initiated a section 301 investigation. Both actions were terminated following bilateral discussions.

$190,000 in the 1970s to nearly $220,000 by 1990, and almost $250,000 by 2000. As a result, inflation-adjusted earnings per worker grew from $12.64 to $13.18 per hour during 1990-2000.

Both the forest and fishery products industries have access to state-of-the-art technology, which helps sustain U.S. industry competitiveness in the face of rivals with lower labor costs, such as in Asia and Latin America. In addition, proximity to the domestic market is important in subsectors such as printing and publishing, especially for periodicals such as newspapers. However, efficiency has been hampered by government regulations covering such areas as pollution control. By one estimate, pollution abatement costs for the pulp and paper industry are nearly five times the U.S. manufacturing average.[231] According to the same source, every one-percent increase in spending on pollution abatement decreases productivity by five percent.

Globalization has led to expansion by U.S. firms mainly in the printing and publishing industries, where satellite communication enables the transmission of text and data to multiple production locations virtually simultaneously. In addition to the significant U.S.-Canada cross-border investment noted above, there has been increased U.S. industry investment in various Asian economies to take advantage of expanding markets there for newspapers and other publications.[232]

Effect of Trade Agreements on the Sector

The five trade agreements that are the subject of this investigation have had little direct effect on U.S. production and trade in the forestry and fisheries sector. This is because the principal area of sector concern addressed by such agreements has been tariffs, and U.S. tariffs in this sector have historically been very low (below 2 percent ad valorem) (table 5-25). During the period covered by this investigation, production grew by an average of 1.8 percent annually, a pace maintained fairly steadily throughout the period. The average annual growth rate for both imports and exports showed no clear trend during the period despite modest declines in tariffs. U.S. import trends depend mainly on macroeconomic activity that affects housing starts and other variables. Export performance is affected less by foreign trade barriers than by macroeconomic conditions abroad (such as the Asian financial crisis) and the value of the U.S. dollar.

---

[231] U.S. Department of Commerce, Bureau of the Census, “Measuring the Productivity Impact of Pollution Abatement,” SB93-13, Nov. 1993; cited in USITC, *Industry & Trade Summary: Wood Pulp and Waste Paper*, USITC Pub. 3490, Feb. 2002, p. 11.

[232] USITC, *Industry & Trade Summary: Newsprint*, USITC Pub. 3355 (Sept. 2002), p. 8.

Table 5-25

Forest and fishery products: Trade issues addressed in trade agreements and U.S. tariffs

Trade issues and U.S. tariffs	Tokyo Round	U.S.-Israel	U.S.-Canada	Uruguay Round	NAFTA[1]
Tariffs[2]	(1979) 1.4% (1987) 0.7%	(1984) 0.2% (1995) 0.1%	(1987) 0.3% (1998) <0.1%	(1994) 0.5% (1999) 0.3%	(1993) 0.1% (2001) <0.1%
Technical barriers			X	X	X
Customs valuation			X	X	X

[1] The NAFTA provides that tariffs be eliminated by Jan. 1, 2003 for all industrial goods and by Jan. 1, 2008 for all other goods.

[2] Average trade-weighted ad valorem or ad valorem equivalent tariff. Trade weights for the Tokyo Round and Uruguay Round are based on U.S. imports from the world during the years indicated. Trade weights for the bilateral treaties and NAFTA are based on U.S. imports from the relevant countries. Unless otherwise noted, dates in parentheses represent the year immediately prior to the entry into force of the agreement and the year of the final tariff reduction for most products and markets.

Source: U.S. Trade Representative, *Annual Report of the President of the United States on the Trade Agreements Program*, various issues; U.S. Trade Representative, *Trade Policy Agenda and Annual report,* various issues; and U.S. International Trade Commission*, Operation of the Trade Agreements Program,* various issues.

Tokyo Round

Between 1980, when the Tokyo Round Agreements entered into effect, and 2000, U.S. industry shipments in this sector grew by 1.8 percent annually to $494 billion, and then decreased by 8.5 percent in 2001. U.S. imports in this sector grew by 3 percent annually, from $22.1 billion in 1980 to $43.6 billion in 2001. The low long-run average, however, hides some large annual increases (more than ten percent in 1984, 1987, 1994, and 1995) and decreases (more than ten percent in 1980 and 1982). U.S. sector exports during this period grew by 2.7 percent annually, from $17.9 billion in 1980 to $25.8 billion in 2001. Large annual increases (in excess of ten percent) occurred in 1986-89 and 1995. Large decreases occurred in 1981-82 and 2001. In general, trends in this sector closely follow general macroeconomic conditions, because the sector is closely tied to major industries such as housing and other construction, which are strongly affected by the overall level of economic activity.

The Tokyo Round had the effect of lowering U.S. tariffs in this sector from an average 1.4 percent ad valorem in 1979, to 0.7 percent in 1989, when the U.S.-Canada trade agreement took effect. During this period, sector shipments rose by 2.2 percent annually, imports by 2.5 percent annually, and exports by 0.7 percent annually. This period was marked by a sharp recession in 1981-82, which dramatically slowed both imports and exports, as well as general industry production. As forest product tariffs have been reduced over the last 30 years, nontariff barriers have become more prevalent. Types of nontariff barriers include regulatory restrictions (building codes and standards), certification programs (nongovernment product standards), government intervention (forestland ownership and industry assistance), and export restrictions (taxes, quotas, and bans). Although the Tokyo Round addressed many nontariff issues, the softwood lumber dispute[233] has a much greater impact on U.S.-Canada trade in sector products.

U.S.-Israel FTA

Sector trade with Israel grew significantly between 1985, the initial year of the agreement, and 2001. Total exports grew by nearly $50 million, or 84 percent, from $57.1 million in 1985 to $104.9 million in 2001. Total imports grew by $35 million, or 200 percent, from $17.6 million in 1985 to $52.7 million in 2001 (table 5-26).

However, it is unlikely that the trade agreement contributed significantly to this growth. The average U.S. tariff on sector imports from Israel was only 0.2 percent ad valorem prior to the agreement, and 0.1 percent after its implementation. Israel's tariff treatment for sector exports declined by a similarly small amount. As a share of total U.S. exports in this sector, exports

---

[233] See, e.g., USITC, *Softwood Lumber from Canada*, inv. No. 701-TA-197 (Prelim.), USITC Pub. 1320, Nov. 1982; *Softwood Lumber from Canada*, inv. No. 701-TA-274 (Prelim.), USITC Pub. 1874, July 1986.

Table 5-26
Forest and fishery products: U.S. trade with Israel, 1984-2001

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992
	Millions of constant (1996) dollars								
U.S. import value									
Israel	16.5	17.6	22.7	21.1	21.9	26.2	31.8	28.0	37.7
All other	24,719.8	24,585.6	26,240.1	29,499.0	30,562.6	30,461.0	28,100.1	25,765.3	26,954.6
Total	24,736.3	24,603.1	26,262.8	29,520.1	30,584.5	30,487.2	28,132.0	25,793.3	26,992.3
	Percent								
Israel/Total	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
U.S. import growth									
Israel	—	6.3	29.3	-7.0	3.9	19.7	21.3	-12.1	34.5
All other	—	-0.5	6.7	12.4	3.6	-0.3	-7.8	-8.3	4.6
Total	—	-0.5	6.8	12.4	3.6	-0.3	-7.7	-8.3	4.7
	Millions of constant (1996) dollars								
U.S. export value									
Israel	61.4	57.1	70.8	94.4	94.5	112.1	130.8	232.5	127.3
All other	12,771.5	11,785.5	13,179.5	16,253.1	20,281.1	22,820.1	24,399.2	24,832.4	25,990.0
Total	12,832.9	11,842.6	13,250.3	16,347.5	20,375.6	22,932.2	24,530.0	25,064.9	26,117.3
	Percent								
Israel/Total	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.9	0.5
U.S. export growth									
Israel	—	-7.0	24.0	33.3	0.2	19.0	16.7	77.7	-45.3
All other	—	-7.7	11.8	23.3	24.8	12.5	6.9	1.8	4.7
Total	—	-7.7	11.9	23.4	24.6	12.6	7.0	2.2	4.2

See footnote at end of table.

Table 5-26—*Continued*
Forest and fishery products: U.S. trade with Israel, 1984-2001

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of constant (1996) dollars								
U.S. import value									
Israel	32.5	33.9	35.6	29.9	35.5	35.5	44.8	46.2	52.7
All other	29,600.0	32,717.3	38,304.9	37,279.3	38,888.5	40,244.6	43,839.7	46,546.0	43,546.7
Total	29,632.5	32,751.2	38,340.5	37,309.2	38,924.1	40,280.2	43,844.5	46,592.3	43,599.4
	Percent								
Israel/Total	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
U.S. import growth									
Israel	-13.7	4.3	5.0	-16.1	18.9	([1])	26.0	3.2	14.0
All other	9.8	10.5	17.1	-2.7	4.3	3.5	8.9	6.2	-6.4
Total	9.8	10.5	17.1	-2.7	4.3	3.5	9.0	6.2	-6.4
	Millions of constant (1996) dollars								
U.S. export value									
Israel	109.5	122.5	172.3	141.0	147.0	134.1	121.4	128.7	103.0
All other	25,139.8	26,190.6	30,351.7	28,660.0	28,539.1	25,733.2	26,144.2	27,685.7	24,745.6
Total	25,249.3	26,312.2	30,524.0	28,801.0	28,686.1	25,867.3	26,265.6	27,814.4	24,848.6
	Percent								
Israel/Total	0.4	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.4
U.S. export growth									
Israel	-14.0	11.0	41.8	-18.2	4.3	-8.8	-9.4	6.0	-20.0
All other	-3.3	4.2	15.9	-5.6	-0.4	-9.8	1.6	5.9	-10.6
Total	-3.3	4.2	16.0	-5.6	-0.4	-9.8	1.5	5.9	-10.7

[1] Less than 0.5 percent.

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

to Israel remained small, rising from less than 0.1 percent in 1985 to 0.1 percent in 2001 As a share of total U.S. imports in this sector, imports from Israel also remained small, and in fact fell from 0.5 percent in 1985 to 0.4 percent in 2001.

U.S.-Canada FTA

Between 1989 and 2001, U.S.-Canada trade in the forestry and fisheries sector grew by almost $25 billion, or 213 percent, from $11.7 billion in 1989 to $36.6 million in 2001 (table 5-27). Sector exports to Canada more than doubled, from $3.2 billion to $7.4 billion, while imports almost tripled, from $8.4 billion to $28.8 billion during the same period. As a share of total U.S. sector exports, Canada grew from 14 percent in 1989 to 30 percent in 2001. Of total U.S. sector imports, Canada's share grew from 28 percent in 1989 to 66 percent in 2001. In both cases, much of the growth took place prior to 1995, the first year of NAFTA (see below).

This agreement, like the others examined herein, has had a minimal impact on this sector. U.S. tariffs on imports from Canada were already low (0.3 percent) prior to the agreement and are less than 0.1 percent today. The largest non-demand-related factor affecting U.S.-Canada trade in this sector probably was the Softwood Lumber Agreement, which, along with an earlier Memorandum of Understanding negotiated by the two countries, was intended to resolve a series of unfair trade complaints by the U.S. industry.[234]

NAFTA

From 1994 to 2001, U.S. sector trade with its NAFTA partners nearly doubled, from $25.9 billion in the former year to $48.5 billion in the latter. U.S. imports from NAFTA partners grew by $20.0 billion, to $37.2 billion by 2001, while exports to NAFTA partners rose by $2.6 billion, to $11.3 billion, leaving a trade deficit of nearly $26 billion in 2001. As a share of total U.S. sector imports, NAFTA partners supplied 85 percent in 2001, up from 53 percent in 1994. As a share of total U.S. sector exports, NAFTA partners' markets accounted for 44 percent in 2001, up from 32 percent in 1994.

NAFTA's provisions affecting this sector fall mainly in the categories of tariffs, technical barriers, and customs valuation. However, none of these had

[234] See, e.g., *Softwood Lumber from Canada*, inv. No. 701-TA-312, USITC Pub. 2469, Dec. 1991, pp. A-3 to A-6. The MOU was signed on Dec. 30, 1986, prior to Commerce's final determination in the countervailing-duty investigation that year. Under this agreement, Canada agreed to charge an export tax to offset benefits accruing to its lumber producers and exporters. However, on Sept. 9, 1991, Canada ended the export tax, leading to the above-cited investigation (which was self-initiated by the Department of Commerce). At the same time, USTR initiated a section 301 investigation. Both actions were terminated following bilateral discussions.

Table 5-27
Forest and fishery products: U.S. trade with Canada and Mexico, 1987-2001

Year	1987	1988	1989	1990	1991	1992	1993	1994
	Millions of constant (1996) dollars							
U.S. import value								
Canada	7,885.1	7,646.9	8,444.5	10,802.4	10,848.2	10,847.0	11,538.2	12,003.1
Mexico	4,786.0	3,813.1	5,041.0	6,005.3	5,165.9	5,001.4	5,052.8	5,210.8
All other	16,848.9	19,124.5	17,001.7	11,324.3	9,779.2	11,143.9	13,041.5	15,537.2
Total	29,520.1	30,584.5	30,487.2	28,132.0	25,793.3	26,992.3	29,632.5	32,751.2
	Percent							
Canada/Total	26.7	25.0	27.7	38.4	42.1	40.2	38.9	36.7
Mexico/Total	16.2	12.5	16.5	21.4	20.0	18.5	17.1	15.9
U.S. import growth								
Canada	—	-3.0	10.4	27.9	0.4	([1])	6.4	4.0
Mexico	—	-20.3	32.2	19.1	-14.0	-3.2	1.0	3.1
All other	—	13.5	-11.1	-33.4	-13.6	14.0	17.0	19.1
Total	—	3.6	-0.3	-7.7	-8.3	4.7	9.8	10.5
	Millions of constant (1996) dollars							
U.S. export value								
Canada	2,669.3	3,054.3	3,185.2	4,957.6	5,137.1	5,310.4	5,420.7	5,775.6
Mexico	939.4	1,253.4	1,471.4	1,495.2	1,786.7	2,233.1	2,289.2	2,634.1
All other	12,738.8	16,067.9	18,275.6	18,077.3	18,141.1	18,573.8	17,539.4	17,902.4
Total	16,347.5	20,375.6	22,932.2	24,530.0	25,064.9	26,117.3	25,249.3	26,312.2
	Percent							
Canada/Total	16.3	15.0	13.9	20.2	20.5	20.3	21.5	22.0
Mexico/Total	5.8	6.2	6.4	6.1	7.1	8.6	9.1	10.0
U.S. export growth								
Canada	—	14.4	4.3	55.7	3.6	3.4	2.1	6.6
Mexico	—	33.4	17.4	1.6	19.5	25.0	2.5	15.1
All other	—	26.1	13.7	-1.1	0.4	2.4	-5.6	2.1
Total	—	24.6	12.6	7.0	2.2	4.2	-3.3	4.2

See footnote at end of table.

Table 5-27—*Continued*
Forest and fishery products: U.S. trade with Canada and Mexico, 1987-2001

Year	1995	1996	1997	1998	1999	2000	2001
	Millions of constant (1996) dollars						
U.S. import value							
Canada	13,049.8	15,970.2	16,665.6	13,245.3	15,259.7	26,981.8	28,769.9
Mexico	6,158.7	8,178.0	7,829.4	4,869.6	6,099.4	10,828.9	8,452.8
All other	19,132.0	13,160.9	14,429.0	22,165.3	22,525.4	8,781.6	6,376.7
Total	38,340.5	37,309.2	38,924.1	40,280.2	43,884.5	46,592.3	43,599.4
	Percent						
Canada/Total	34.0	42.8	42.8	32.9	34.8	57.9	66.0
Mexico/Total	16.1	21.9	20.1	12.1	13.9	23.2	19.4
U.S. import growth							
Canada	8.7	22.4	4.4	-20.5	15.2	76.8	6.6
Mexico	18.2	32.8	-4.3	-37.8	25.3	77.5	-21.9
All other	23.1	-31.2	9.6	53.6	1.6	-61.0	-27.4
Total	17.1	-2.7	4.3	3.5	9.0	6.2	-6.4
	Millions of constant (1996) dollars						
U.S. export value							
Canada	6,552.8	6,506.8	7,079.1	7,064.2	7,511.7	7,890.1	7,419.1
Mexico	2,372.6	2,437.5	2,672.8	2,983.1	3,261.8	3,649.4	3,260.3
All other	21,598.6	19,856.8	18,934.3	15,820.0	15,492.2	16,275.0	14,169.2
Total	30,524.0	28,801.0	28,686.1	25,867.3	26,265.6	27,814.4	24,848.6
	Percent						
Canada/Total	21.5	22.6	24.7	27.3	28.6	28.4	29.9
Mexico/Total	7.8	8.5	9.3	11.5	12.4	13.1	13.1
U.S. export growth							
Canada	13.5	-0.7	8.8	-0.2	6.3	5.0	-6.0
Mexico	-9.9	2.7	9.7	11.6	9.3	11.9	-10.7
All other	20.7	-8.1	-4.7	-16.5	-2.1	5.1	-12.9
Total	16.0	-5.6	-0.4	-9.8	1.5	5.9	-10.7

[1] Less than 0.5 percent.

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

much real effect on U.S. trade with NAFTA partners. U.S. tariffs on NAFTA imports in this sector averaged 0.1 percent ad valorem before the agreement and less than 0.1 percent after. About 75 percent of NAFTA trade in this sector is between the United States and Canada, where, as noted above, trade disputes have been addressed in other fora besides NAFTA.

Uruguay Round

U.S. trade in the forestry and fishery products sector increased from $69.3 billion in 1995, the year the Uruguay Round Agreements were implemented, to $75 billion in 2000, before returning to its 1995 level in 2001. Sector imports during this period grew from $38.3 billion in 1995 to a record $46.6 billion in 2000, before falling to $43.6 billion in 2001. Sector exports during the same period fell from $31.0 billion in 1995 to $28.8 billion in 2000, and further to $25.8 billion in 2001. Industry shipments rose from $486.9 billion in 1995 to $494.4 billion in 2000, an increase of $7.5 billion, or 2 percent. They then dropped to $452.6 billion in 2001.

The Uruguay Round Agreements addressed a variety of issues, including tariffs, which as noted above were already quite low. The average U.S. tariff in this sector was 0.5 percent ad valorem prior to the Agreements and 0.3 percent by 1999. Other issues addressed in the round included antidumping and subsidies rules, technical barriers, and customs valuation, among other topics. However, none of these appear to have had any appreciable effects on this sector. Rather, the greatest impacts on U.S. production and trade come about from macroeconomic events such as recessions and currency fluctuations. The Asian financial crisis, for example, or the 1981 and 2001 U.S. recessions, along with the recent strong U.S. dollar (especially vis-à-vis currencies of major competing sector exporters) most likely have had much greater influence on U.S. trade in this sector than the Uruguay Round Agreements.[235]

Views of Interested Parties

American Forest & Paper Association[236]

American Forest and Paper Association (AF&PA) is the national trade association of the forest, pulp, paper, paperboard, and wood products industry. In its view, tariffs are the principal factor impairing the competitiveness of the

---

[235] This is also because the Agreements had no connection to the Softwood Lumber Agreement or any other bilateral negotiations on that issue.

[236] Jacob Handelsman, Senior Director, International Trade, and Elizabeth Ward, Executive Director, Wood Products International, American Forest & Paper Association, written submission to the Commission, Mar. 31, 2003.

U.S. forest products industry, and it believes that "no progress has been made on multilateral tariff elimination in the wood products sector and only partial progress has been achieved in the paper sector." Regional FTAs to which the United States is not a party have only exacerbated the competitiveness problem by shutting out the U.S. industry from those markets. Besides tariffs, foreign sanitary and phytosanitary (SPS) measures and producer subsides also create significant U.S. competitive disadvantages for this sector. In general, U.S. exports have fallen in recent years, according to the AF&PA, because of the downturn in the Japanese housing market, the strong U.S. dollar, and other macroeconomic factors.

Tokyo and Uruguay Rounds

These Rounds led to declines or elimination of U.S. tariffs in this sector without corresponding cuts by trading partners, "locking in" a U.S. competitive disadvantage. In particular, the failure to achieve "zero-for-zero" cuts in wood products tariffs with Japan has put the U.S. industry at a disadvantage. Developing countries also have not liberalized their markets or industries, to the detriment of the U.S. industry. Subsidies in both developing and developed economies abroad continue to create competition for U.S. exports. SPS disciplines negotiated in the Uruguay Round are important to the industry and AF&PA opposes any attempt to evade such disciplines, such as attempts by the EU to block U.S. trade with SPS measures based on other than scientific grounds.

NAFTA

Mexico is an important market for U.S. wood products, because there is limited domestic production in Mexico. However, the lengthy staging-in period for Mexican tariff reduction has limited U.S. exports below what they might otherwise have been. The strong dollar vis-a-vis competing exporters in low-cost countries has also hurt U.S. export potential in Mexico. On the other hand, U.S. paper product exports to Mexico have been "thriving."

United States Tuna Foundation[237]

The United States Tuna Foundation (USTF) is a trade association representing all U.S. canned tuna processors and tuna boat owners. USTF has consistently opposed inclusion of canned tuna in the trade agreements examined in this report. USTF notes that several ITC reports have described the "import sensitive" nature of the product, as well as the decline of the U.S. industry due to imports.

---

[237] Randi Parks Thomas, United States Tuna Foundation, written submission to the Commission, Mar. 31, 2003.

During the period under review, the canning sector has shrunk from 14 establishments to four, and employment has declined from more than 26,000 to slightly more than 6,000 in 2002. All but one mainland-based establishment have closed, and only three remain in American Samoa and Puerto Rico. In the harvesting sector, the number of boats and employment thereon have similarly declined. During the last ten years, imports of canned tuna have risen by 10 percent and imports of frozen tuna (which, along with frozen tuna delivered by harvesting vessels, is used by canners to make canned tuna) have risen by 67 percent.

USTF notes that tariffs on canned tuna imports in other large markets remain high, for example, the tariff is 24 percent ad valorem in the EU. Most imports into both the United States and the EU come from low-wage countries that, in many cases, already have duty preferences (e.g., GSP, ATPA), and further declines in U.S. tariff protection for the industry would further weaken the economic health of the canners and boats.

Energy and Fuels[238]

The United States is a major world producer and consumer of energy and fuels as well as a large net importer. The United States accounts for only 9 percent of the world's production but 26 percent of the world's consumption of crude petroleum; 24 percent of production and 26 percent of consumption of refined petroleum products; 22 percent of production and 26 percent of consumption of natural gas; and 21 percent of both production and consumption of coal (table 5-28).[239]

The major economic, technological, and regulatory forces affecting this sector are highly interdependent. As demand for petroleum and the availability of low-cost supplies fluctuated during the past two decades, investment in exploration and drilling services also fluctuated widely. The world crude petroleum industry essentially recovers and distributes a finite, non-renewable resource. Exploration and drilling is directly tied to the per-barrel price of crude petroleum. As the price of crude petroleum increases, so does exploration and drilling. Conversely, if the price is low, drilling in certain areas ceases.

The U.S. industries producing energy and fuels are the world's leaders in research and development of the sophisticated, high-tech processes and equipment used to explore for and produce the products in this sector. Technological innovations in the sector tend to concentrate on improving the recovery of material from already discovered resources. Many of the U.S. petroleum companies have developed expertise in this area and have applied it in the development of reserves in other areas of the world. Specific

[238] For the purposes of this investigation, the energy and fuels sector is composed of SICs 12, 13, and 29, which include the production of coal, crude petroleum, natural gas, and refined petroleum products.

[239] Based on official statistics of the U.S. Department of Energy.

Table 5-28
Energy and fuel products:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
	Billions of constant (1996) dollars											
Shipments	362.5	465.3	590.6	648.5	582.8	521.7	508.2	464.0	308.5	309.4	290.5	307.1
Imports	85.7	112.2	135.4	126.0	95.1	83.3	79.9	68.4	45.6	53.2	47.4	61.1
Exports	8.2	11.1	14.2	16.3	18.7	13.6	12.5	12.9	10.3	9.6	9.8	11.7
Apparent consumption	440.0	566.4	711.9	758.2	659.2	615.1	575.5	519.5	343.7	353.0	328.0	356.5
Trade balance	-77.5	-101.1	-121.2	-109.7	-76.4	-69.7	-67.4	-55.5	-35.3	-43.6	-37.5	-49.4
	Percentage											
Imports/apparent consumption	19.5	19.8	19.0	16.6	14.4	13.5	13.9	13.2	13.3	15.1	14.4	17.1
Exports/shipments	2.3	2.4	2.4	2.5	3.2	2.5	2.5	2.8	3.3	3.1	3.4	3.8
	1,000 workers											
Total employment	847	684	758	906	909	793	795	762	619	565	560	537
Production workers	607	680	717	806	805	671	675	649	537	500	492	466
	Constant (1996) dollars											
Hourly earnings	16.76	16.96	16.65	16.62	16.85	17.19	16.98	17.03	17.44	17.14	16.91	16.90
	$1,000 per worker											
Labor productivity	597	684	824	805	724	777	753	715	574	619	590	659

See footnote at end of table.

Table 5-28—*Continued*

Energy and fuel products:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Billions of constant (1996) dollars											
Shipments	344.8	304.2	285.2	271.4	259.9	261.6	307.0	302.4	231.7	271.4	388.3	366.4
Imports	73.3	59.7	58.0	57.4	57.0	58.8	73.5	71.1	52.6	64.3	112.7	101.6
Exports	13.8	13.8	12.4	10.5	9.3	10.5	12.1	12.1	9.7	9.4	12.3	10.6
Apparent consumption	404.5	350.3	330.8	318.3	307.5	309.9	368.4	361.4	274.7	326.2	488.8	457.4
Trade balance	-59.6	-46.1	-45.6	-47.0	-47.6	-48.3	-61.4	-59.0	-43.0	-54.8	-100.4	-91.0
	Percentage											
Imports/apparent consumption	18.1	17.1	17.5	18.0	18.5	19.0	19.9	19.7	19.2	19.7	23.1	22.2
Exports/shipments	4.0	4.5	4.3	3.9	3.6	4.0	3.9	4.0	4.2	3.5	3.2	2.9
	1,000 workers											
Total employment	552	553	510	501	486	465	464	480	478	430	439	464
Production workers	483	471	434	413	407	397	399	420	418	375	388	417
	Constant (1996) dollars											
Hourly earnings	16.84	16.87	17.07	16.85	16.78	16.82	16.67	16.95	17.57	17.64	17.43	17.24
	$1,000 per worker											
Labor productivity	715	646	657	657	639	660	769	720	554	723	1,001	878

[1] Includes SIC 12(coal mining), 13 (oil and gas extraction), and 29 (petroleum refining and related industries).

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of Economic Analysis and Bureau of the Census; and U.S. Department of Labor, Bureau of Labor Statistics.

developments, such as horizontal drilling and the injection of certain chemicals into wells, have increased considerably the amount of material that can be recovered from wells that were at one time considered to be dry. In addition, the United States maintains a sophisticated transportation system consisting of pipelines, barges, railroads, and trucks to move product from points of production to consuming areas.

There are about 19,000 to 20,000 companies involved in the production of energy and fuels in the United States. Many are small companies that individually and collectively account for relatively small shares of total U.S. production of crude petroleum, refined petroleum products, natural gas, and coal. There are also many large, multinational companies in the United States that are involved in both foreign production and importing into the United States. Most of these companies are also involved in refining and petrochemical production. Approximately 50 of the largest companies account for about 80 percent of total U.S. sector production. Employment in the U.S. energy and fuels sector, which fluctuated during 1978-2001, decreased from 847,000 workers in 1978 to 464,000 in 2001, mainly due to the declines in world prices for crude petroleum, technological advances, and the closure of stripper wells.[240]

The value of U.S. shipments of energy and fuels fluctuated erratically from $362.5 billion in 1978 to $366.4 billion in 2001, peaking at $648.5 billion in 1981 and reaching a low of $231.7 billion in 1998. Crude petroleum accounts for an average of 13 percent of the value of shipments for the sector; refined petroleum products accounts for 38 percent; natural gas accounts for 39 percent; and coal accounts for 10 percent. However, the price of crude petroleum, which influences the quantity of production and shipments of these products, fluctuated during 1978-2001 from a low of $9.00 per barrel in 1978 to a high of $28.26 per barrel in 2000 (in constant 1996 dollars).[241]

U.S. production of crude petroleum declined from 8.7 million barrels per day (b/d) in 1978 to 5.8 b/d in 2001 as a result of many factors, most notably declining world crude petroleum prices in the mid-1980s that resulted in the reduced profitability of certain high cost U.S. stripper wells, many of which were shut down. U.S. production declined each year during the period, reaching its lowest point in 2000 and 2001. Natural gas production during the period remained relatively stable at about 19.1 trillion cubic feet. Prices for natural gas generally mirror crude petroleum prices—over 90 percent of U.S. natural gas production is associated[242] with the production of crude petroleum.

---

[240] A stripper well is one which produces such small volumes of crude petroleum that the gross income provides only a small margin of profit or, in some cases, does not even cover the actual cost of production.

[241] Based on official statistics of the U.S. Department of Energy.

[242] Associated natural gas occurs in the form of a gas cap in a crude petroleum well. The natural gas is separated from the crude petroleum at the wellhead and shipped via pipelines to natural gas processing plants.

Natural gas prices (per thousand cubic feet), fluctuated from a low of $0.91 in 1978 to a high of $4.12 in 2001. Wellhead prices of natural gas increased significantly in 2001, primarily because the supply in California was inadequate to meet the demand of industrial users.[243] U.S. production of refined petroleum products, which accounts for an average of about 85 to 90 percent of domestic consumption, increased from 18.8 million barrels per day (b/d) in 1978 to 19.6 million b/d in 2001. U.S. petroleum refineries, which are designed to operate at 85 percent capacity utilization, are currently operating at more than 95 percent, a level that cannot be sustained indefinitely. U.S. production of coal increased from 670 million short tons in 1978 to 1.1 billion short tons in 2001, based on increased demand.[244]

The United States is a major world importer of energy and fuels. In terms of quantity, the United States accounts for an average of 24 percent of the total world's imports of crude petroleum, which have accounted for more than 50 percent of domestic consumption since the mid 1990s. U.S. imports of crude petroleum increased from 6.4 million b/d in 1978 to 9.8 million b/d in 2001. Also, since the mid 1990s, the United States has accounted for an average of 17 percent of total world imports of natural gas,[245] 13 percent for refined petroleum products, and 2 percent for coal. U.S. imports of natural gas increased from 966 billion cubic feet in 1978 to 4.0 trillion cubic feet in 2001 and imports of refined petroleum products fluctuated but remained relatively stable, increasing overall from 2.0 million b/d in 1978 to 2.5 million b/d in 2001. The United States is not a net importer of coal; however, U.S. imports increased from 2.9 million short tons in 1978 to 19.8 million short tons in 2001, most of which were imports of coke from China.

Except for coal, the United States is not a major exporter of energy and fuels, accounting for a minimal share of total world exports. The United States has abundant coal reserves and is the world's third largest supplier of coal behind Australia and South Africa. The United States accounts for an average of 11 percent of the world's total coal exports. U.S. exports of crude petroleum account for less than 0.5 percent of total world exports, natural gas accounts for 0.8 percent, and refined petroleum products account for less than 5 percent. U.S. exports of crude petroleum are prohibited, except as approved by the

[243] On Mar. 26, 2003, the Federal Energy Regulatory Commission (FERC) announced that its investigation into the California energy crisis found widespread manipulation of natural gas and electricity prices and supplies in California.

[244] Based on official statistics of the U.S. Department of Energy.

[245] Natural gas is most efficiently and least expensively transported in its gaseous state via pipeline, thus limiting import sources and export markets to those connected to the intricate and sophisticated U.S. pipeline system, primarily Canada and, to a lesser extent, Mexico. While the United States has the capability to liquify and transport liquified natural gas (LNG) via tanker from ports on both the East and West Coast, many foreign markets do not have LNG receiving terminals, which are highly sophisticated and extremely expensive to build and maintain.

Government.[246] Canada has been the only consistent market for U.S. exports of crude petroleum as part of a commercial exchange agreement. U.S. exports of crude petroleum ranged from a high of 287,000 b/d in 1980 to a low of 20,000 b/d in 2001. The U.S. market consumes an average of 98 percent of the total U.S. production of refined petroleum products. U.S. exports of refined petroleum products increased from 204,000 b/d in 1978 to 951,000 b/d in 2001. Approximately 99 percent of U.S. exports of natural gas are shipped via pipeline in a gaseous state; exports of natural gas ranged from a low of 49 billion cubic feet in 1980 to a high of 364 billion cubic feet in 2001. U.S. exports of coal ranged from a low of 40.7 million short tons in 1978 to a high of 112.5 million short tons in 1981.

Effect of Trade Agreements on the Sector

The five trade agreements that are the subject of this investigation have had little, if any, direct effect on U.S. production and trade in this sector. Of the products covered in this sector, both natural gas and coal were already duty free, and duty rates for crude petroleum and refined petroleum products were already very low, averaging less than 1 percent ad valorem prior to the Tokyo Round. In addition, the duty rates for refined petroleum products are bound in the GATT. Table 5-29 presents trade issues addressed by the subject trade agreements that were relevant to the sector.

The primary driving force in the supply and demand of energy and fuels is the per barrel price of crude petroleum. The crude petroleum market is global with prices that are closely linked. U.S. crude petroleum prices are almost identical to those in other producing and consuming nations, indicating that prices are determined by world demand and supply. During 1978-2001, crude petroleum price fluctuations were not generally affected by trade agreements but were largely driven by market events.

The many unrelated events occurred that shocked prices during 1998 illustrate how market forces affect the sector. During the first quarter of 1998, Asia entered into a period of economic crisis and, after two years of fairly steady growth in demand for crude petroleum, world demand fell by 500,000 b/d, causing price drops of $3 to $5 per barrel. Compounding the Asian economic crisis was the abnormally warm winter in the United States, Europe, and Asia. As a result, by May, supply outpaced demand, stocks began to build,

---

[246] U.S. exports are restricted to: (1) crude petroleum derived from fields under the State waters of Alaska's Cook Inlet; (2) Alaskan North Slope (ANS) crude; (3) certain domestically produced crude destined to Canada as part of a commercial exchange agreement; (4) production shipped from U.S. territories; and (5) small shipments of California crude to Pacific Rim countries. U.S. exports of crude petroleum account for less than 0.5 percent of total U.S. production and less than 2 percent of Cook Inlet and ANS crude petroleum production.

Table 5-29
Energy and fuel products: Trade issues addressed in trade agreements and U.S. tariffs

Trade issues and U.S. tariffs	Tokyo Round	U.S.-Israel	U.S.-Canada	Uruguay Round	NAFTA[1]
Tariffs[2]	(1979) 0.1% (1987) 0.6%	(1984) NA (1995) NA	(1987) 0.5% (1998) <0.1%	(1994) 0.6% (1999) 0.4%	(1993) 0.2% (2001) <0.1%
Technical barriers	X				
Import licensing	X				
Customs valuation	X			X	
Government procurement	X	X	X	X	X
Offsets		X			
Rules of origin		X	X	X	X

[1] The NAFTA provides that tariffs be eliminated by Jan. 1, 2003 for all industrial goods and by Jan. 1, 2008 for all other goods.

[2] Average trade-weighted ad valorem or ad valorem equivalent tariff. Trade weights for the Tokyo Round and Uruguay Round are based on U.S. imports from the world during the years indicated. Trade weights for the bilateral treaties and NAFTA are based on U.S. imports from the relevant countries. Unless otherwise noted, dates in parentheses represent the year immediately prior to the entry into force of the agreement and the year of the final tariff reduction for most products and markets.

Source: U.S. Trade Representative, *Annual Report of the President of the United States on the Trade Agreements Program*, various issues; U.S. Trade Representative, *Trade Policy Agenda and Annual report,* various issues; and *U.S. International Trade Commission, Operation of the Trade Agreements Program,* various issues.

and prices declined by approximately $6 per barrel.[247] Prices had returned to an average of $15 per barrel by August when Russia increased crude petroleum exports to the world market in an effort to earn dollars and offset losses from the depreciating ruble. At the same time, the Chinese government, in an effort to preserve hard currency and encourage economic growth, drastically reduced fourth quarter imports.[248] These events in Russia and China had the effect of increasing supply by 600,000 to 800,000 b/d. In addition, the United Nations allowed Iraq to export $2 billion of crude petroleum every six months for humanitarian reasons, which resulted in additional price declines.[249] All trade agreements enacted during 1978-2001 were overshadowed by events such as those occurring during 1998, which determined price and demand for energy and fuels. There was little or no direct impact on petroleum trade as a result of the Tokyo Round and the U.S.-Israel FTA. Rates of duty for crude petroleum and refined petroleum products were already very low prior to the entry into force of these agreements. In addition, Israel accounted for a very small share of total sector trade (table 5-30).

U.S.-Canada FTA

There was little or no direct impact on petroleum trade as a result of the United States-Canada FTA. Under the United States-Canada FTA, Canada remained the only market for U.S. exports of crude petroleum under a commercial exchange agreement approved by the U.S. Government, whereby U.S. exports of crude are exchanged for imports of refined petroleum products. In addition, a sophisticated pipeline system connects the United States and Canada. Many of the large multinational petroleum companies in the United States also maintain operations in Canada, frequently shipping feedstocks and products between their plants in the two countries.

NAFTA

Table 5-31 provides data on U.S. sector trade with Canada and Mexico. There was little or no direct impact on petroleum trade as a result of the NAFTA, which reduced duty rates to free in 2003. The NAFTA reaffirmed the provisions of the U.S.-Canada FTA in terms of petroleum (crude petroleum and refined petroleum products). The United States is Mexico's major trading partner, accounting for 60 percent of Mexico's exports of crude petroleum. The United States is the major source of Mexico's imports of refined petroleum products; Mexico's nine operating refineries cannot meet domestic demand for refined petroleum products. Mexican trade with Canada in petroleum is

[247] Based on official statistics of the U.S. Department of Energy.

[248] Industry representative, interview with USITC staff, Nov. 20, 2002.

[249] Industry representative, interview with USITC staff, Nov. 20, 2002.

Table 5-30
Energy and fuel products: U.S. trade with Israel, 1984-2001

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992
				Millions of constant (1996) dollars					
U.S. import value									
Israel	(1)	28.4	39.2	34.0	37.6	16.6	34.6	29.9	21.6
All other	79,908.0	68,317.7	45,511.2	53,204.1	47,333.0	61,070.4	73,278.3	59,696.2	57,968.1
Total	79,908.0	68,346.1	45,550.4	43,238.2	47,370.6	61,087.0	73,313.0	59,726.0	57,989.7
				Percent					
Israel/Total	(2)	(2)	0.1	0.1	0.1	(2)	0.1	0.1	(2)
U.S. import growth									
Israel	—	(1)	38.1	-13.3	10.4	-55.8	108.7	-13.8	-27.7
All other	—	-14.5	-33.4	16.9	-11.0	29.0	20.0	-18.5	-2.9
Total	—	-14.5	-33.4	16.9	-11.0	29.0	20.0	-18.5	-2.9
				Millions of constant (1996) dollars					
U.S. export value									
Israel	20.2	29.1	23.0	14.1	29.7	61.4	87.9	74.0	56.4
All other	12,518.8	12,822.3	10,250.8	9,611.0	9,809.7	11,599.4	13,603.8	13,605.1	12,292.3
Total	12,539.0	12,851.4	10,273.8	9,625.0	9,839.4	11,660.8	13,691.7	13,679.1	12,348.7
				Percent					
Israel/Total	0.2	0.2	0.2	0.2	0.3	0.5	0.6	0.5	0.5
U.S. export growth									
Israel	—	43.7	-21.0	-38.8	111.0	107.1	43.2	-15.9	-23.8
All other	—	2.4	-20.1	-6.2	2.1	18.2	17.3	(1)	-9.7
Total	—	2.5	-20.1	-6.3	2.2	18.5	17.4	0.1	-9.7

See footnotes at end of table.

Table 5-30—*Continued*
Energy and fuel products: U.S. trade with Israel, 1984-2001

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001
				Millions of constant (1996) dollars					
U.S. import value									
Israel	35.5	22.5	0.4	2.8	6.3	6.8	3.1	44.6	13.4
All other	57,376.3	56,931.6	58,831.3	73,466.1	71,044.6	52,602.7	64,259.8	112,669.4	101,572.4
Total	57,411.8	56,954.1	58,831.8	73,468.9	71,050.9	52,609.4	64,262.8	112,714.0	101,585.6
				Percent					
Israel/Total	0.1	(2)	(2)	(2)	(2)	(2)	(2)	(2)	(2)
U.S. import growth									
Israel	64.5	-36.7	-98.2	580.3	120.5	8.0	-54.7	135.7	-69.9
All other	-1.0	-0.8	3.3	24.9	-3.3	-26.0	22.2	75.3	-9.9
Total	-1.0	-0.8	3.3	24.9	-3.3	-26.0	22.2	75.3	-9.9
				Millions of constant (1996) dollars					
U.S. export value									
Israel	76.7	85.8	105.8	115.6	78.2	85.3	96.5	76.0	91.9
All other	10,387.3	9,229.9	10,408.8	11,933.0	11,989.5	9,560.3	9,346.8	12,199.3	10,489.9
Total	10,464.0	9,315.7	10,514.7	12,048.7	12,067.6	9,645.5	9,443.3	12,275.2	10,581.8
				Percent					
Israel/Total	0.7	0.9	1.0	1.0	0.7	0.9	1.0	0.6	0.9
U.S. export growth									
Israel	35.9	11.8	23.4	9.2	-32.4	9.0	13.2	-21.3	21.0
All other	-15.5	-11.1	12.8	14.6	0.5	-20.3	-2.2	30.5	-14.0
Total	-15.3	-11.0	12.9	14.6	0.2	-20.7	-2.1	30.0	-13.8

[1] Not available
[2] Less than 0.5 percent.

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

Table 5-31
Energy and fuel products: U.S. trade with Canada and Mexico, 1987-2001

Year	1987	1988	1989	1990	1991	1992	1993	1994
	Millions of constant (1996) dollars							
U.S. import value								
Canada	7,885.1	7,906.1	9,063.9	12,045.8	12,537.4	12,840.8	13,987.7	14,854.6
Mexico	4,786.0	3,942.4	5,410.7	6,696.6	5,970.3	5,920.7	6,125.5	6,448.7
All other	40,567.0	35,522.1	46,612.4	54,570.6	41,218.4	39,228.2	37,298.6	35,650.7
Total	53,238.2	47,370.6	61,087.0	73,313.0	59,726.0	57,989.7	57,411.8	56,954.1
	Percent							
Canada/Total	14.8	16.7	14.8	16.4	21.0	22.1	24.4	26.1
Mexico/Total	9.0	8.3	8.9	9.1	10.0	10.2	10.7	11.3
U.S. import growth								
Canada	—	0.3	14.6	32.9	4.1	2.4	8.9	6.2
Mexico	—	-17.6	37.2	23.8	-10.9	-0.8	3.5	5.3
All other	—	-12.4	31.2	17.1	-24.5	-4.8	-4.9	-4.4
Total	—	-11.0	29.0	20.0	-18.5	-2.9	-1.0	-0.8
	Millions of constant (1996) dollars							
U.S. export value								
Canada	1,590.5	1,552.8	1,801.9	2,021.1	1,389.9	1,434.7	1,239.5	1,276.3
Mexico	505.7	416.4	806.4	910.0	945.0	1,356.6	1,103.8	1,036.3
All other	7,528.8	7,870.2	9,052.4	10,760.5	11,344.2	9,557.4	8,120.8	7,003.0
Total	9,625.0	9,839.4	11,660.8	13,691.7	13,679.1	12,348.7	10,464.0	9,315.7
	Percent							
Canada/Total	16.5	15.8	15.5	14.8	10.2	11.6	11.9	13.7
Mexico/Total	5.3	4.2	6.9	6.7	6.9	11.0	10.6	11.1
U.S. export growth								
Canada	—	-2.4	16.1	12.2	-31.2	3.2	-13.6	3.0
Mexico	—	-17.7	93.7	12.9	3.8	43.6	-18.6	-6.1
All other	—	4.5	15.0	18.9	5.4	-15.8	-15.0	-13.8
Total	—	2.2	-6.3	2.2	18.5	17.4	0.1	-9.7

See note at end of table.

Table 5-31—*Continued*

Energy and fuel products: U.S. trade with Canada and Mexico, 1987-2001

Year	1995	1996	1997	1998	1999	2000	2001
	Millions of constant (1996) dollars						
U.S. import value							
Canada	16,501.5	20,585.5	21,900.7	17,619.4	20,592.1	37,175.7	40,751.7
Mexico	7,787.7	10,541.4	10,288.9	6,477.8	8,230.8	14,920.1	11,973.2
All other	34,542.5	42,342.0	38,861.3	28,512.2	35,439.9	60,618.3	48,860.6
Total	58,831.8	73,468.9	71,050.9	52,609.4	64,262.8	112,714.0	101,585.6
	Percent						
Canada/Total	28.1	28.0	30.8	33.5	32.0	33.0	40.1
Mexico/Total	13.2	14.4	14.5	12.3	12.8	13.2	11.8
U.S. import growth							
Canada	11.1	24.8	6.4	-19.6	16.9	80.5	9.6
Mexico	20.8	35.4	-2.4	-37.0	27.1	81.3	-19.8
All other	-3.1	22.6	-8.2	-26.6	24.3	71.1	-19.4
Total	3.3	24.9	-3.3	-26.0	22.2	75.4	-9.9
	Millions of constant (1996) dollars						
U.S. export value							
Canada	1,331.4	1,733.4	2,076.9	2,112.3	1,920.4	2,201.2	2,197.8
Mexico	1,261.6	1,493.8	1,924.0	1,692.0	2,153.8	3,974.1	2,933.3
All other	7,921.7	8,821.4	8,066.7	5,841.3	5,369.1	6,099.9	5,450.6
Total	10,514.7	12,048.7	12,067.6	9,645.5	9,443.3	12,275.2	10,581.8
	Percent						
Canada/Total	12.7	14.4	17.2	21.9	20.3	17.9	20.8
Mexico/Total	12.0	12.4	15.9	17.5	22.8	32.4	27.7
U.S. export growth							
Canada	4.3	30.2	19.8	1.7	-9.1	14.6	-0.2
Mexico	21.7	18.4	28.8	-12.1	27.3	84.5	-26.2
All other	13.1	11.4	-8.6	-27.6	-8.1	13.6	-10.6
Total	-15.3	-11.0	12.9	14.6	0.2	-20.7	-2.1

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

negligible because of the lack of pipeline infrastructure between the two nations; Mexico does export small quantities of crude petroleum to Canada via tanker. Both countries are net petroleum exporters.

All segments of Mexico's petroleum industry including the operations of tankers and pipelines, and trade of crude petroleum, natural gas, and refined petroleum products as well as oilfield services) remained under the sole purview of the Mexican state-owned Petroleos Mexicanos (PEMEX). The NAFTA includes provisions that ensure the ability of a nation to protect its natural resources for reasons of national security. Crude petroleum is a national security item, in accordance with the GATT.

Under the provisions of NAFTA, duty rates in the United States and Canada for crude petroleum and refined petroleum products, which averaged about 0.5 percent ad valorem for crude petroleum and about 1 percent for refined petroleum products, were reduced to free over a 10-year period. Mexico's tariffs, which averaged about 5 percent ad valorem on crude petroleum and 8.6 percent ad valorem on refined petroleum products, were reduced to free over the same 10-year period. Canada and the United States have historically maintained a trade relationship exchanging crude for products. In Mexico, only PEMEX can import crude petroleum and refined petroleum products; PEMEX has historically imported these products as they deem necessary, regardless of tariff rates.

Uruguay Round

There was little or no direct impact on energy and fuels trade as a result of the Uruguay Round Agreements. Crude petroleum and refined petroleum products were are not subject to further scheduled Normal Tariff Relations staged tariff reductions. The rates of duty for crude petroleum and refined petroleum products were already very low.

Miscellaneous Products[250]

Overview

The miscellaneous products sector contains diverse industries that produce a wide variety of products, ranging from high-technology medical equipment to relatively low-technology products such as footwear. The sector encompasses dynamic high-technology industries that have become global leaders, industries that have maintained a relatively stable U.S. market share by successfully

[250] For the purposes of this investigation, miscellaneous products are composed of SIC groups 25, 31, 38, and 39. This sector includes search, detection, navigation, guidance, aeronautical, and nautical systems and instruments for the entire period (1978–2001).

adapting to import competition, and labor-intensive industries that have lost most of the U.S. market to lower-priced imports. The miscellaneous products sector is primarily composed of the following subsectors: medical goods, which accounted for 23 percent of the total value of sector shipments in 2001; furniture, 22 percent; optical, measuring, and controlling instruments, 18 percent; and search, detection, navigation, guidance, and aeronautical instruments, 10 percent.

Most U.S.-produced medical goods, measuring instruments, and navigation/aeronautical instruments subsectors are high technology goods sold primarily to medical and research institutions, manufacturing equipment/process control firms, defense-related contractors, security firms, and ship and aircraft producers. Although price is an important factor in world competition, quality considerations are paramount. U.S. producers, noted for their rigid quality standards, have a strong position in global markets. Manufacturers in Europe and Japan are the chief competitors for U.S. producers. Leading producers, based in the United States and Japan, are seeking ways to reduce prices, including shifting assembly to countries with lower labor costs. Many, if not most, of the U.S. industries in this sector are globally competitive. The United States had trade surpluses in navigation instruments and remote control apparatus; medical goods; drawing, drafting, and calculating instruments; and measuring testing, and controlling instruments in 2001.[251]

U.S. producers' shipments in the sector grew by 49 percent during 1978-2001 to $279 billion (table 5-32).[252] During the same period, sector employment fell by 16 percent to 1.8 million workers, productivity grew 32 percent to $248,000 per worker, and hourly earnings increased by 8 percent to $11.91. The most dynamic segment of the miscellaneous products sector is the medical goods industry. U.S. producers' shipments more than quadrupled during 1978-2001 to $63.6 billion. Two factors have been key to the industry's growth: breakthroughs in science and technology, which have led to the development of equipment such as magnetic resonance imaging (MRI) machines and the increased need for medical equipment to service the aging U.S. population.

U.S. producers' shipments of furniture grew by 48 percent during 1978-2001 to $60 billion. The market is highly sensitive to changes in interest rates, which affect home purchases, and therefore, furniture sales. U.S.-made furniture, for the most part, is not competitive outside North America. U.S. furniture producers have responded to import competition by using imported

---

[251] U.S. trade in the industry/commodity group "Optical goods, including ophthalmic instruments" is dominated by imports of eyeglass frames, which are not classified in SIC 38. Therefore, the trade deficit and high import penetration ratio in this category is not indicative of the competitiveness of U.S. producers of ophthalmic instruments.

[252] In constant (1996) dollars.

Table 5-32
Miscellaneous products:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
	Billions of constant (1996) dollars											
Shipments	187.8	192.7	199.4	199.5	197.4	210.0	212.7	214.8	219.3	227.8	249.4	251.1
Imports	26.1	26.6	26.8	29.0	29.0	32.9	39.4	44.3	51.5	56.8	60.9	59.4
Exports	18.5	21.3	23.1	23.3	21.2	20.7	19.7	19.0	19.9	22.3	26.6	29.4
Apparent consumption	195.4	198.1	203.1	205.2	205.2	222.2	232.4	240.1	250.9	262.3	283.7	281.2
Trade balance	-7.6	-5.4	-3.6	-5.7	-7.9	-12.2	-19.7	-25.3	-31.6	-34.5	-34.3	-30.1
	Percentage											
Imports/apparent consumption	13.4	13.4	13.2	14.2	14.1	14.8	16.9	18.4	20.5	21.7	21.5	21.1
Exports/shipments	9.9	11.0	11.6	11.7	10.7	9.9	9.3	8.9	9.1	9.8	10.7	11.7
	1,000 workers											
Total employment	2,154	2,195	2,139	2,152	2,046	2,013	2,098	2,069	2,026	2,039	2,083	2,069
Production workers	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	1,326	1,319
	Constant (1996) dollars											
Hourly earnings	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	11.01	10.94
	$1,000 per worker											
Productivity	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	([2])	188	190

See footnotes at end of table.

Table 5-32—*Continued*

Miscellaneous products:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Billions of constant (1996) dollars											
Shipments	251.4	245.5	248.1	251.5	252.4	259.1	264.6	273.0	278.2	281.3	285.6	279.0
Imports	60.6	60.0	64.7	69.4	74.7	79.6	83.3	91.8	98.1	104.5	116.0	110.0
Exports	31.5	33.9	35.9	36.5	38.5	41.3	44.4	48.9	48.2	49.6	57.3	54.2
Apparent consumption	280.5	271.6	276.9	284.4	288.7	297.4	303.5	315.9	328.0	336.2	344.3	334.8
Trade balance	-29.1	-26.1	-28.8	-32.8	-36.2	-38.3	-38.9	-43.0	-49.8	-54.9	-58.6	-55.9
	Percentage											
Imports/ apparent consumption	21.6	22.1	23.4	24.4	25.9	26.8	27.5	29.1	29.9	31.1	33.7	32.9
Exports/shipments	12.5	13.8	14.5	14.5	15.2	15.9	16.8	17.9	17.3	17.6	20.1	19.4
	1,000 workers											
Total employment	2,020	1,938	1,894	1,878	1,868	1,848	1,843	1,860	1,885	1,872	1,864	1,799
Production workers	1,280	1,215	1,195	1,188	1,188	1,178	1,169	1,177	1,198	1,195	1,190	1,125
	Constant (1996) dollars											
Hourly earnings	10.96	10.91	10.90	10.91	10.93	10.99	11.17	11.33	11.50	11.66	11.78	11.91
	$1,000 per worker											
Productivity	196	202	208	212	212	220	226	232	232	235	240	248

[1] Includes SIC 25 (furniture and fixtures), 31 (leather and leather products), 38 (measuring, analyzing, and controlling instruments; photographic, medical and optical goods; watches and clocks), and 39 (miscellaneous manufacturing industries).
[2] Not available.

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of Economic Analysis and Bureau of the Census; and U.S. Department of Labor, Bureau of Labor Statistics.

furniture to supplement their product lines and by importing labor-intensive parts and hardware from China. Import penetration in the U.S. furniture industry depends on the materials from which a given type of furniture is made and its end-use. Office furniture tends to be manufactured from metals, plastics, and man-made fibers and is characterized by greater standardization, automation, and longer production runs than for wood household or upholstered furniture. The weight and bulk of metal, upholstered furniture and fully-assembled wood furniture result in shipping costs that discouraged imports of these products from sources other than Canada. China, however, is highly competitive in U.S. markets for stackable furniture, knock-down furniture, and parts of furniture that require labor intensive processing, such as lathe-work on legs for tables and chairs.[253] Although the U.S. trade deficit in the furniture industry amounted to $12.2 billion in 2001, imports accounted for only 19 percent of U.S. apparent consumption.

The subsector producing optical, measuring, analyzing, and controlling instruments has also expanded steadily throughout the period with U.S. producers' shipments more than doubling during 1978-2001 to $49.3 billion. Almost every modern assembly line uses such equipment. This equipment is also used for quality control in manufacturing, for testing in scientific and medical laboratories, for checkout counters in retail stores, and in power plants and other utilities to measure and control the flow of electricity, water, natural gas, and petroleum. Although U.S. production has increased, less technologically advanced products in this segment such as thermostats, speedometers, and gas meters face intense import competition. This situation has led U.S. producers to use assembly plants in Mexico to lower their production costs for these products.

Cameras and watches are primarily labor and technology-intensive consumer products. Companies based in Japan (with assembly plants in many Asian countries) are the leading world producers of cameras and watches, while manufacturers in Switzerland also remain significant global suppliers of watches. U.S. producers have become niche suppliers of these products and the U.S. market relies on foreign suppliers to meet a significant share of domestic demand. The U.S. trade deficit for photographic cameras and equipment and watches and clocks combined was more that $4.5 billion in 2001, and the ratio of U.S. imports to apparent U.S. consumption for watches and clocks was 80 percent.

Most U.S. producers of the remaining sector products are globally competitive only in the high-end niches. Production processes for most other goods in this segment tend to be labor-intensive and production technology is

---

[253] Taiwan was the leading supplier of such products to the U.S. market until the mid-1980s. As labor costs rose in Taiwan, furniture manufacturers there shifted much of their production to China. See USITC, *Industry and Trade Summary: Furniture and Motor Vehicle Seats*, USITC Pub. 3382, Jan. 2001.

readily transferable to developing or newly industrialized countries. Numerous sector imports are produced in Asia under license from U.S. companies, and tend to be concentrated in consumer goods for which there is no remaining U.S. production (e.g., home video games and certain Christmas decorations). Such products typically require semi-skilled assembly (e.g., jewelry and musical instruments) or sewing (e.g., baseballs, sports gloves, leather footwear, and luggage) or low-technology injection molding (e.g., toys and dolls). Less import-sensitive articles are characterized by high transportation costs; low raw-material costs in the United States relative to those of foreign producers; or superior U.S. design and production technology or copyright protection.

Effect of Trade Agreements on the Sector

The five trade agreements that are the subject of this investigation likely have had little direct effect on overall production and trade in the U.S. miscellaneous products sector. However, some subsectors were impacted by tariff reductions as imports increased significantly.[254] The growth in shipments and trade that has taken place in the miscellaneous products sector since 1978 can be attributed principally to innovations in science and technology that have aided the aggressive, high-tech industries making up the bulk of this sector.[255] For example, the medical goods industry, which accounted for nearly one-fourth of U.S. producers' shipments in this sector in 2001, has consistently retained competitiveness over the last decade due to its research and development pipeline of new product introductions and adaptations.[256] Other factors contributing to sector expansion include very strong growth in demand; adapting to import competition with increased production sharing;[257] reputation for high standards; and ability to provide customized products. Further, U.S. companies increasingly took advantage of lower wage rates in Mexico and the Dominican Republic by moving assembly of high volume but low margin commodities to these countries.

---

[254] Segments in the miscellaneous products industry that have been impacted by increased U.S. imports in part attributed to relatively large tariff reductions include certain furniture, leather and leather products. Tariff reductions were also relatively large in other industries (SIC group 39), including specific costume jewelry, toys, and athletic goods.

[255] Measuring, analyzing, and controlling instruments; photographic, medical, and optical instruments; and watches and clocks accounted for almost 60 percent of the total value of U.S. producers' shipments in this sector in 2001.

[256] Products introduced or adapted during the past decade include advanced medical imaging equipment, cardiac pacemakers and defibrillators, coronary stents, arthroscopic and other endoscopic surgical apparatus and tools, orthopedic reconstructive implants, medical lasers, and insulin imaging systems.

[257] For additional detail see "Production-Sharing Update: Developments in 2001," *Industry Trade and Technology Review*, USITC Pub. 3534, July 2002, pp. 27-42 (posted on USITC Internet site at *www.usitc.gov/webpubs.htm*).

Other sector products, such as footwear, luggage, and watches, have been exempted from preferential tariff programs such as GSP, CBERA, and ATPA, and tariffs have been reduced gradually. Despite tariff protection, the U.S. industries manufacturing these products have, for the most part, disappeared. Low labor costs in China have more than offset U.S. tariffs for these labor-intensive products. China's eligibility for MFN treatment, effected January 30, 1980, was another factor influencing trade in this sector. China, the principal beneficiary of tariff reductions on many categories of sector products (i.e., furniture), has become an increasingly important supplier of certain miscellaneous products. Table 5-33 presents trade issues addressed by the subject trade agreements that were relevant to the sector.

Tokyo Round

Between 1980 and 2000, total U.S. trade in miscellaneous products increased by 246 percent, reaching $173 billion before declining by 5 percent in 2001. Imports of miscellaneous products increased almost yearly during 1980-2001, quadrupling to $110 billion, while exports of sector items more than doubled during the same period to $54 billion causing the sector trade deficit to increase from $3.7 billion to $56 billion. As the sector responded to a globalized economy and production sharing became a major force in trading, imports as a share of U.S. apparent consumption increased from 13 percent to 34 percent while exports as a share of shipments increased from 12 percent to 19 percent.

The effect of the Tokyo Round on the miscellaneous products industry was limited. U.S. tariffs on sector products were relatively low prior to the agreements and tariffs in major foreign markets on the majority of sector products were also low.[258] Tariffs[259] were reduced by 3.1 percentage points to 4.7 percent during the period. The growth in international trade is primarily attributable to technological advances and improvements in production methods.

U.S.-Israel FTA[260]

Total U.S. trade in miscellaneous products with Israel more than quadrupled during 1985-2001, from $1.7 billion to $6.7 billion. Trade with Israel increased from 3 percent of total U.S. sector trade to 4 percent during the same period. U.S. imports of sector products from Israel increased from $1.5 billion in 1985 to $5.7 billion in 2001, while U.S. exports increased from $358 million to nearly $1 billion (table 5-34).

---

[258] There were important exceptions to this general observation. Relatively high tariffs were maintained on luggage, leather footwear, watches, and toys through the Tokyo Round.

[259] Average trade-weighted ad valorem or ad valorem equivalent tariff.

[260] The U.S.-Israel FTA was signed in 1985 and was fully implemented on Jan. 1, 1995.

Table 5-33
Miscellaneous products: Trade issues addressed in trade agreements and U.S. tariffs

Trade issues and U.S. tariffs	Tokyo Round	U.S.-Israel	U.S.-Canada	Uruguay Round	NAFTA[1]
Tariffs[2]	(1979) 7.8% (1987) 4.7%	(1984) <0.1% (1995) <0.1%	(1987) 3.0% (1998) <0.1%	(1994) 4.8% (1999) 2.5%	(1993) 1.2% (2001) <0.1%
Technical barriers	X		X	X	X
Rules of origin		X	X	X	X

[1] The NAFTA provides that tariffs be eliminated by Jan. 1, 2003 for all industrial goods and by Jan. 1, 2008 for all other goods.

[2] Average trade-weighted ad valorem or ad valorem equivalent tariff. Trade weights for the Tokyo Round and Uruguay Round are based on U.S. imports from the world during the years indicated. Trade weights for the bilateral treaties and NAFTA are based on U.S. imports from the relevant countries. Unless otherwise noted, dates in parentheses represent the year immediately prior to the entry into force of the agreement and the year of the final tariff reduction for most products and markets.

Source: U.S. Trade Representative, *Annual Report of the President of the United States on the Trade Agreements Program*, various issues; U.S. Trade Representative, *Trade Policy Agenda and Annual report,* various issues; and *U.S. International Trade Commission, Operation of the Trade Agreements Program,* various issues.

Table 5-34
Miscellaneous products: U.S. trade with Israel, 1984-2001

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992
	Millions of constant (1996) dollars								
U.S. import value									
Israel	1,318.2	1,488.5	1,699.0	1,792.4	1,990.7	2,047.9	1,853.3	1,861.6	1,980.7
All other	38,053.2	42,791.5	49,767.5	54,994.3	58,951.7	57,384.0	58,728.1	58,112.4	62,736.3
Total	39,371.3	44,280.0	51,466.5	56,786.8	60,942.4	59,432.0	60,581.3	59,973.9	64,717.0
	Percent								
Israel/Total	3.4	3.4	3.3	3.2	3.3	3.5	3.1	3.1	3.1
U.S. import growth									
Israel	—	12.9	14.1	5.5	11.1	2.9	-9.5	0.5	6.4
All other	—	12.5	16.3	10.5	7.2	-2.7	2.3	-1.1	8.0
Total	—	12.5	16.2	10.3	7.3	-2.5	1.9	-1.0	7.9
	Millions of constant (1996) dollars								
U.S. export value									
Israel	353.7	357.6	379.4	418.3	535.9	489.7	314.9	306.3	392.5
All other	19,318.7	18,647.5	19,520.2	21,906.4	26,092.3	28,871.4	31,145.1	33,568.1	35,519.1
Total	19,672.3	19,005.1	19,899.6	22,324.6	26,628.3	29,361.1	31,460.0	33,874.4	35,911.6
	Percent								
Israel/Total	1.8	1.9	1.9	1.9	2.0	1.7	1.0	0.9	1.1
U.S. export growth									
Israel	—	1.1	6.1	10.2	28.1	-8.6	-35.7	-2.7	28.1
All other	—	-3.5	4.7	12.2	19.1	10.7	7.9	7.8	5.8
Total	—	-3.4	4.7	12.2	19.3	10.3	7.2	7.7	6.0

See note at end of table.

Table 5-34—*Continued*
Miscellaneous products: U.S. trade with Israel, 1984-2001

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of constant (1996) dollars								
U.S. import value									
Israel	2,292.6	2,597.0	2,824.7	3,194.6	3,749.7	4,460.4	5,121.6	6,138.8	5,680.7
All other	67,059.9	72,117.4	76,785.2	80,147.6	88,050.7	93,597.0	99,370.3	109,828.4	104,354.0
Total	69,352.5	74,714.3	79,609.8	83,342.2	91,800.4	98,057.4	104,492.0	115,967.2	110,034.7
	Percent								
Israel/Total	3.3	3.5	3.6	3.8	4.1	4.6	4.9	5.3	5.2
U.S. import growth									
Israel	15.8	13.3	8.8	13.1	17.4	19.0	14.8	19.9	-7.5
All other	6.7	7.5	6.5	4.4	9.9	6.3	6.2	10.5	-5.0
Total	7.2	7.7	6.6	4.7	10.2	6.8	6.6	11.0	-5.1
	Millions of constant (1996) dollars								
U.S. export value									
Israel	413.8	360.6	358.8	361.6	374.0	452.5	518.7	810.7	936.8
All other	36,098.8	38,116.2	40,950.7	44,069.2	48,480.7	47,764.9	49,103.3	56,511.8	53,209.4
Total	36,512.5	38,476.8	41,309.6	44,430.8	48,854.7	48,217.4	49,621.9	57,322.5	54,146.1
	Percent								
Israel/Total	1.1	0.9	0.9	0.8	0.8	0.9	1.1	1.4	1.7
U.S. export growth									
Israel	5.4	-12.9	-0.5	0.8	3.4	21.0	14.6	56.3	15.6
All other	1.6	5.6	7.4	7.6	10.0	-1.5	2.8	15.1	-5.8
Total	1.7	5.4	7.4	7.6	10.0	-1.3	2.9	15.5	-5.5

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

It is unlikely that the tariff reductions in theU.S-Israel FTA had any measurable impact on the U.S. miscellaneous products industry because Israel accounted for only a negligible share of U.S. trade in this sector. Moreover, a large portion of these imported products already entered the United States duty-free prior to 1985.

U.S.-Canada FTA

During 1988-2000, U.S. trade with Canada in miscellaneous products nearly tripled, reaching $17.6 billion, before falling to $15.6 billion in 2001. U.S. imports of these items from Canada increased irregularly during the period to $7.1 billion in 2001, representing an increase of 135 percent over 1988; U.S. exports of sector products to Canada increased by 226 percent to $8.6 billion (table 5-35). During the period under consideration, imports from Canada accounted for 5 percent of total U.S. imports of miscellaneous products in 1988, increasing to 6 percent in 2001; exports to Canada accounted for 12 percent of total U.S. exports in 1988, increasing to 16 percent in 2001. Because Canada accounts for a relatively small share of U.S. trade in this sector,[261] it is unlikely that a tariff reduction of 2.9 percentage points to 0.1 percent[262] had any measurable impact on the overall U.S. miscellaneous products industry.

NAFTA

U.S. sector trade with NAFTA partners Mexico and Canada has increased almost every year since the agreement entered into force in 1994 (table 5-35). Between 1994 and 2001, U.S. imports from Canada increased 63 percent to $7.1 billion (6 percent of total U.S. imports) and exports to Canada rose by 32 percent to $9.4 billion in 2000, before declining to $8.6 billion in 2001 (16 percent of total U.S. exports). Following a similar trend, U.S. imports from Mexico more than doubled to $9.4 billion (9 percent of total U.S. imports); exports to Mexico increased by 19 percent to $4.7 billion (9 percent of total U.S. exports). Although much of the increase in sector trade with Mexico and Canada can be attributed to factors discussed earlier,[263] the elimination of tariffs and nontariff barriers through this agreement–principally between the United States and Mexico–has contributed to increased trade in certain

---

[261] The most important exception to this general assessment was in the furniture industry. U.S. furniture exports to Canada quadrupled during 1988-2000 as tariffs which ranged between 2.5 percent and 9.6 percent ad valorem were reduced to free. Canada is the leading market for U.S. exports of furniture.

[262] Average trade-weighted ad valorem or ad valorem equivalent tariff.

[263] The 50 percent devaluation of the Mexican peso in January 1995 was the leading cause of the sharp rise in U.S. investment in assembly plants in Mexico in 1995 and 1996 and the subsequent increase in U.S. trade with Mexico.

Table 5-35
Miscellaneous products: U.S. trade with Canada and Mexico, 1987-2001

Year	1987	1988	1989	1990	1991	1992	1993	1994
	Millions of constant (1996) dollars							
U.S. import value								
Canada	2,864.3	2,999.5	2,862.0	2,855.2	2,782.3	3,147.2	3,498.9	4,325.4
Mexico	1,537.0	1,941.9	2,218.3	2,376.8	2,563.0	2,972.5	3,473.4	4,407.4
All other	52,385.4	56,001.1	54,351.7	55,349.4	54,628.7	58,597.4	62,380.2	65,981.5
Total	56,786.8	60,942.4	59,432.0	60,581.3	59,973.9	64,717.0	69,352.5	74,714.3
	Percent							
Canada/Total	5.0	4.9	4.8	4.7	4.6	4.9	5.1	5.8
Mexico/Total	2.7	3.2	3.7	3.9	4.3	4.6	5.0	5.9
U.S. import growth								
Canada	—	4.7	-4.6	-0.2	-2.6	13.1	11.2	23.6
Mexico	—	26.3	14.2	7.1	7.8	16.0	16.9	26.9
All other	—	6.9	-3.0	1.8	-1.3	7.3	6.5	5.6
Total	—	7.3	-2.5	1.9	7.3	7.9	7.2	7.7
	Millions of constant (1996) dollars							
U.S. export value								
Canada	2,933.3	3,189.3	3,395.8	5,361.5	5,570.2	5,922.6	6,421.6	7,177.6
Mexico	1,074.4	1,474.9	1,952.2	2,258.9	2,842.5	3,381.1	3,450.5	3,565.9
All other	18,316.9	21,964.1	24,013.1	23,839.6	25,461.7	26,607.9	26,640.5	27,733.3
Total	22,324.6	26,628.3	29,361.1	31,460.0	33,874.4	35,911.6	36,512.5	38,476.8
	Percent							
Canada/Total	13.1	12.0	11.6	17.0	16.4	16.5	17.6	18.7
Mexico/Total	4.8	5.5	6.7	7.2	8.4	9.4	9.5	9.3
U.S. export growth								
Canada	—	8.7	6.5	57.9	3.9	6.3	8.4	11.8
Mexico	—	37.3	32.4	15.7	25.8	19.0	2.1	3.4
All other	–	19.9	9.3	-0.7	6.8	4.5	0.1	4.1
Total	–	19.3	10.3	7.2	7.7	6.0	1.7	5.4

See note at end of table.

Table 5-35—*Continued*
Miscellaneous products: U.S. trade with Canada and Mexico, 1987-2001

Year	1995	1996	1997	1998	1999	2000	2001
	Millions of constant (1996) dollars						
U.S. import value							
Canada	3,857.1	5,454.2	6,064.8	6,577.6	7,116.8	8,172.0	7,052.7
Mexico	5,111.4	5,726.6	6,621.1	7,657.9	8,372.0	9,313.7	9,405.9
All other	69,641.4	72,161.4	79,114.6	83,821.9	89,003.1	98,481.6	93,576.2
Total	79,609.8	83,342.2	91,800.4	98,057.4	104,492.0	115,967.2	110,034.7
	Percent						
Canada/Total	6.1	6.5	6.6	6.7	6.8	7.1	6.4
Mexico/Total	6.4	6.9	7.2	7.8	8.0	8.0	8.6
U.S. import growth							
Canada	12.3	12.3	11.2	8.5	8.2	14.8	-13.7
Mexico	16.0	12.0	15.6	15.7	9.3	11.3	1.0
All other	5.6	3.6	9.6	6.0	6.2	10.7	-5.0
Total	6.6	4.7	10.2	6.8	6.6	11.0	-5.1
	Millions of constant (1996) dollars						
U.S. export value							
Canada	7,201.6	7,265.9	8,044.1	8,455.1	9,065.3	9,449.9	8,581.6
Mexico	2,765.3	3,006.6	3,952.4	4,234.0	4,172.7	5,152.3	4,738.1
All other	31,342.7	34,158.4	36,858.2	35,528.2	36,384.0	42,720.3	40,826.4
Total	41,309.6	44,430.8	48,854.7	48,217.4	49,621.9	57,322.5	54,146.1
	Percent						
Canada/Total	17.4	16.4	16.5	17.5	18.3	16.5	15.9
Mexico/Total	6.7	6.8	8.1	8.8	8.4	9.0	8.8
U.S. export growth							
Canada	0.3	0.9	10.7	5.1	7.2	4.2	-9.2
Mexico	-22.5	8.7	31.5	7.1	-1.5	23.5	-8.0
All other	13.0	9.0	7.9	-3.6	2.4	17.4	-4.4
Total	7.4	7.6	10.0	-1.3	2.9	15.5	-5.5

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

industries.[264] For example, although certain U.S. firms in this sector were first attracted to Mexico as a manufacturing site due to its relatively lower wage costs and proximity to the United States, they also benefitted from Mexican investment incentives under its Maquiladora Program, preferential U.S. production sharing duties, and eventually the reduction and elimination of duties under NAFTA.

Uruguay Round

During 1995-2000, U.S. trade in miscellaneous products increased annually to $173 billion, or by 43 percent, before declining by 5 percent in 2001 to $164 billion (table 5-35). Imports of miscellaneous products grew each year from 1995 to 2000, reaching $116 billion before declining to $110 billion in 2001. Exports of such goods increased annually from $41 billion in 1995 to $57 billion in 2000, or by 39 percent, before decreasing to $54 billion in 2001. During this period, U.S. shipments continued to grow, increasing from $250 billion in 1995 to $279 billion in 2000.

Although much of the increase in U.S. trade following the implementation of the Uruguay Round can be attributed to the principal factors affecting the sector's expansion, the Uruguay Round nonetheless had a modest effect on certain sectors of the industry. Tariffs were reduced by 2.3 percentage points to 2.5 percent.[265] Under the Uruguay Round, the United States and several important trading partners agreed to eliminate tariffs immediately for certain sector products–medical goods, furniture, and dolls, toys, and games. The U.S. medical instrument industry, a major world exporter, was in a strong position to benefit from the removal of foreign tariffs. Many leading U.S. producers of furniture import a portion of their product lines and/or labor-intensive parts so the reduction in tariffs reduced their costs, making tariff elimination a mixed blessing for some of the industry. Further, tariffs on imports of stackable and knock-down furniture from China were already low, so reducing the tariffs did not significantly impact the level of imports. The two largest marketers of toys, dolls, and games own the most significant U.S. producers, although they supply most of the U.S. market with products from wholly owned or contract manufacturers in China. For certain products, both companies use assembly facilities in Mexico and for others, it is more economical to supply the U.S. market from domestic operations.

---

[264] See *Broom Corn Brooms*, Inv. No. NAFTA 302-1 (Provisional Relief Phase), USITC Pub. 2963 (May 1996); *Broom Corn Brooms,* Inv. Nos. TA-201-65 and NAFTA 302-1, USITC Pub. 2983 (Aug. 1996).

[265] The average trade-weighted ad valorem or ad valorem equivalent tariffs.

Views of Interested Parties

American Brush Manufacturers Association[266]

The American Brush Manufacturers Association (ABMA) is a diverse group of businesses made up of 162 member manufacturers and affiliated supplier companies that has represented broom, brush and mop manufacturers since 1917.

A significant amount of U.S. corn broom production was lost to Mexico after NAFTA took effect due to high labor content of the product. Three of the four largest U.S. companies have either moved all, or a significant amount, of their production to Mexico and most of the smaller U.S. manufacturers (or former U.S. manufacturers) now import part or all of their finished products from Mexico. In each instance NAFTA has caused "vanishing profits and dwindling workforces" in the U.S. corn broom industry.

Textiles and Apparel

Overview

The U.S. textile and apparel sector[267] is one of the world's largest and most efficient producers of high-volume goods such as denim and sheeting fabrics. In the past two decades, however, the textile and apparel sector has declined in relative worldwide importance primarily because of increased global competition.[268] Notwithstanding quotas and high tariffs, U.S. imports have accounted for a growing share of domestic consumption. With the existing quota system scheduled for elimination on January 1, 2005, U.S. textile and apparel producers have been pursuing business strategies for survival in a heightened competitive climate.

Labor costs are a critical competitive factor in both textile and apparel manufacturing that often put U.S. manufacturers at a disadvantage vis-a-vis countries such as China and India where wages are substantially lower. The hourly wage in the U.S. textile industry was $14.24 in 2000, compared with those in China and India which were $0.69 and $0.58, respectively, in the same

---

[266] David C. Parr, Executive Director, American Brush Manufacturers Association, written submission to the Commission, Feb. 14, 2003.

[267] For the purpose of this investigation, the textile and apparel sector comprises SIC groups 22 and 23, including textile mill products such as yarns, fabrics, carpets, and other made-up articles, and apparel.

[268] Because of high shipping costs, carpet production is less sensitive to import penetration than other textile products. Subsequently, carpet manufacturers have not experienced as many competitive challenges as producers in other segments of the textile industry.

year (table 5-36).[269] Average wages in the U.S. textile and apparel industries increased 11 percent during 1978-2001.[270] This is likely a reflection of the demand for higher-skilled workers as domestic textile firms have adopted more sophisticated production technology and apparel firms have retained cutting jobs while sending lower-skilled sewing jobs offshore. Many U.S. apparel manufacturers are concentrating domestic production for niche markets that include high-fashion and high-quality tailored garments where labor costs are less of a factor in determining competitiveness.

U.S. textile and apparel firms have restructured and consolidated operations extensively during the past decade. The number of establishments in the U.S. textile and apparel industries in 2000 totaled 11,300 and 16,500, respectively, following a succession of plant closures that have occurred primarily since the early 1990s. U.S. textile and apparel sector shipments fluctuated during 1978-2001, but declined overall from $176 billion in 1978 to $132 billion in 2001, the lowest level during the period. Textile industry employment decreased by 50 percent to 400,000 employees during 1978-2001, while that of the apparel industry declined by 62 percent to 436,000 employees. The apparel industry incurred a greater reduction in employment due in part to the shift in production and sourcing of finished goods offshore. The decline in textile employment is partly attributable to erosion of the domestic production base for apparel, a primary market for U.S. textile products, as well as to increased automation, which has improved efficiency.

The U.S. textile industry faces shrinking domestic markets for its yarn and fabric output largely because of growing imports of these goods as well as end-use items such as apparel and home textiles, which often contain foreign inputs. However, the growth in imports of apparel assembled from U.S. fabric has boosted U.S. fabric exports and has helped offset weakness in domestic demand for U.S. apparel fabrics.[271] U.S. textile manufacturers are moving away from markets that traditionally feed domestic apparel production (e.g., broadwoven fabrics), and into less vulnerable niche markets such as performance wear, technical, and industrial fabrics.

In an effort to remain competitive, U.S. textile mills have invested heavily in technology to increase productivity and capacity, while reducing employment. The industry has achieved high levels of productivity in the production of high-volume commodity goods such as denim and sheeting

[269] The year 2000 is the last year for which data were available. Wages are for spinning and weaving jobs within the textile industry only, comparable apparel sector wage data for the same year were not available. Werner International, *International Wage Survey, Year 2000.*

[270] Based on data from the U.S. Department of Labor, Bureau of Labor Statistics.

[271] Mexico and Caribbean countries receive trade preferences for apparel imported into the United States that has been assembled from U.S.-made fabrics. See trade agreements portion of this section for more information on trade preferences under NAFTA and the Caribbean Basin Trade Partnership Act (CBTPA).

Table 5-36

Textiles and apparel products:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
	Billions of constant (1996) dollars											
Shipments	176.3	168.6	162.9	160.2	152.4	166.9	161.8	154.6	157.0	163.5	162.6	158.7
Imports	15.7	14.8	15.1	16.4	16.1	19.0	24.5	26.2	29.6	33.8	33.2	36.4
Exports	5.3	6.8	7.2	6.4	4.6	4.0	3.7	3.4	3.8	4.4	5.4	6.2
Apparent consumption	186.7	176.6	170.8	170.3	164.0	181.8	182.6	177.5	182.8	192.8	190.4	188.9
Trade balance	-10.4	-8.0	-7.9	-10.0	-11.5	-14.9	-20.8	-22.9	-25.8	-29.4	-27.8	-30.1
	Percentage											
Imports/apparent consumption	8.4	8.4	8.8	9.6	9.8	10.4	13.4	14.8	16.2	17.5	17.4	19.3
Exports/shipments	3.0	4.0	4.4	4.0	3.0	2.4	2.3	2.2	2.4	2.7	3.3	3.9
	1,000 workers											
Total employment	2,231	2,189	2,111	2,067	1,911	1,905	1,931	1,823	1,803	1,822	1,813	1,796
Production workers	1,928	1,888	1,816	1,772	1,623	1,623	1,648	1,550	1,534	1,551	1,544	1,529
	Constant (1996) dollars											
Hourly earnings	8.47	8.43	8.36	8.32	8.23	8.27	8.27	8.29	8.33	8.30	8.27	8.27
	$1,000 per worker											
Labor productivity	91	89	90	90	94	98	98	100	102	105	105	104

See footnote at end of table.

Table 5-36—*Continued*

Textiles and apparel products:[1] U.S. shipments, imports, exports, apparent consumption, ratios of imports to consumption and exports to shipments, total employment, production workers, hourly wages, and productivity, 1978-2001

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Billions of constant (1996) dollars											
Shipments	152.8	149.2	154.7	157.3	161.5	161.0	157.9	160.4	154.4	150.3	148.0	131.6
Imports	36.6	36.5	41.9	44.3	47.0	49.1	50.2	57.4	62.6	65.1	72.5	69.5
Exports	7.5	8.8	9.9	10.8	11.8	13.1	14.3	16.1	16.1	15.6	16.5	14.6
Apparent consumption	181.8	177.0	186.7	190.8	196.7	197.0	193.8	201.8	200.8	199.8	204.0	186.4
Trade balance	-29.0	-27.8	-32.0	-33.5	-35.2	-36.0	-36.0	-41.4	-46.5	-49.5	-55.9	-54.9
	Percentage											
Imports/apparent consumption	20.1	20.6	22.5	23.2	23.9	24.9	25.9	28.5	31.2	32.6	35.5	37.3
Exports/shipments	4.9	5.9	6.4	6.8	7.3	8.2	9.1	10.0	10.5	10.4	11.2	11.1
	1,000 workers											
Total employment	1,728	1,676	1,681	1,664	1,650	1,599	1,494	1,440	1,363	1,249	1,164	1,044
Production workers	1,461	1,415	1,421	1,403	1,389	1,336	1,241	1,195	1,122	1,020	940	836
	Constant (1996) dollars											
Hourly earnings	8.27	8.24	8.30	8.32	8.42	8.54	8.70	8.86	9.07	9.36	9.52	9.47
	$1,000 per worker											
Labor productivity	105	105	109	112	116	121	127	134	138	147	157	157

[1] Includes SIC 22 (textile mill products) and 23 (apparel and other finished products made from fabrics and similar materials).

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of Economic Analysis and Bureau of the Census; and U.S. Department of Labor, Bureau of Labor Statistics.

fabrics, and in printing, dyeing, and finishing operations. Textile mills have also invested in technology to improve manufacturing flexibility in an effort to coordinate production and marketing with the needs of their downstream apparel customers. Domestic investment in U.S. textile machinery during 1978-2001 averaged $2.1 billion per year and $2.7 billion per year during the 1990s.[272] The adoption of new manufacturing technologies enabled U.S. broadwoven fabric mills to increase fabric output per loom hour from 16 to 35 square meters during 1989-99.[273] Largely as a result of this investment, labor productivity in textile manufacturing increased 73 percent from 1978-2001.

The U.S. apparel industry is a competitive and fragmented sector that mostly comprises small establishments. The industry has undergone major restructuring during the past decade in response to rising import competition, changing consumer preferences, and increasing share of sales to a few large retailers. The strong bargaining power of these retailers tends to reduce the flexibility of producers in negotiating prices and delivery dates, and enables retailers to minimize inventory levels and push inventory costs back up the supply chain.[274] In response, U.S. apparel producers are increasing their focus on core products, reducing vertical integration to shed overhead costs, outsourcing more processes in the production chain domestically and offshore, and merging with other apparel companies to consolidate resources and capture greater market share. Many smaller firms that are labor intensive and lack the financial resources, brand names, or operating efficiencies to compete have gone out of business.

The competitive pressures from retailers and foreign suppliers have prompted many U.S. apparel firms to invest in new technology and improve production and marketing processes in an effort to maximize their inherent advantage of market proximity. These firms now operate quick response (QR) systems to speed the flow of goods, services, and information between segments of the industry, linking them electronically with textile suppliers and retailers. Quick response programs provide apparel firms with timely access to point-of-sale retail data, enabling them to focus production on apparel items with strong consumer appeal and maintain enough production flexibility to adapt to changing market demands. Although upgrades in technology have revolutionized the apparel industry's supply chain management, production of most garments remains labor intensive, largely because of the difficulty in automating most sewing functions.

---

[272] Capital expenditures for the 13-year period from 1978-2001 in the textile and apparel industries totaled $50 billion and $19 billion, respectively (to include equipment and software purchases). U.S. Department of Commerce, Bureau of Economic Analysis, *Historical-Cost Investment in private Equipment and Software by Industry* (Table 3.7E), found at *http://www.bea.gov,* retrieved Sept. 25, 2002.

[273] U.S. Department of Commerce, Census Bureau, *CIR: Broadwoven Fabrics (Gray) Summary - 1999* (MQ313T(99)-5), issued June 2000, and selected back issues.

[274] Industry official, interview by USITC staff, New York, NY, May 13, 2002.

The decline in domestic demand for U.S.-made textiles has been offset, in part, by the implementation of special access programs under heading 9802.00.80 of the Harmonized Tariff Schedule (formerly TSUS item 807.00) that provide for the establishment of preferential quotas for apparel products assembled in eligible countries from U.S.-origin fabrics. Such arrangements allow domestic apparel companies to reduce costs on highly labor intensive sewing and detailing processes, while maintaining a market for U.S. textile products. A significant but declining part of the apparel imports under this tariff provision come from Caribbean Basin Economic Recovery Act (CBERA) countries and Mexico, which mainly compete with one another for assembly work from U.S. firms.[275] In addition to competitively priced labor, the proximity of these countries to the United States provides U.S. firms with greater management control over production, quicker turnaround, and lower shipping costs than would Asian operations. The value of garment parts cut to shape in the United States and sent offshore for assembly totaled $6 billion in 2001.

Effects of Trade Agreements on the Sector

The substantial rise in U.S. textile and apparel trade since 1982, and the subsequent effects on the domestic industry can be attributed in part to the five trade agreements considered in this investigation. While tariff reductions in certain agreements (e.g., Tokyo Round) directly impacted trade flows, most sector trade is still restricted by quotas originally set by the Multifiber Arrangement and continuing until January 1, 2005 under the Agreement on Textiles and Clothing (see Uruguay Round section later in this chapter for additional details). Furthermore, other factors such as the Caribbean Basin Economic Recovery Act, currency devaluations in Mexico and certain Asian countries, and the continuous emergence of low-cost producers world-wide have also been influential. Each of the five subject agreements has impacted the U.S. sector to varying degrees. Table 5-37 presents trade issues addressed by the subject trade agreements that were relevant to the sector.

Tokyo Round

Between 1982 (the first year in which Tokyo Round tariff reductions were applied to sector products) and 2001, total U.S. trade in textile and apparel products increased more than 300 percent to $84 billion.[276] While exports grew

[275] U.S. imports of apparel from Mexico under 9802.00.80 have been declining since the implementation of the NAFTA, as the Agreement provides duty-free entry of such goods under HTS heading 9802.00.90.

[276] While tariff reductions for most products came into force on Jan. 1, 1980, those pertaining to textile and apparel products were deferred to Jan. 1, 1982 due to a special snapback provision pertaining to the Multifiber Arrangement (MFA). The provision

Table 5-37
Textiles and apparel products: Trade issues addressed in trade agreements and U.S. tariffs

Trade issues and U.S. tariffs	Tokyo Round	U.S.-Israel	U.S.-Canada	Uruguay Round	NAFTA[1]
Tariffs[2]	(1979) 21.8% (1987) 16.8%	(1984) 16.1% (1995) 0.3%	(1987) 9.8% (1998) 0.5%	(1994) 13.1% (1999) 10.9%	(1993) 4.9% (2001) 0.4%
Technical barriers	X			X	X
Import licensing	X	X		X	
Customs valuation	X			X	X
Government procurement	X	X	X		X
Rules of origin		X	X	X	X
Safeguard measures				X	X
TRIMs[3]					X
TRIPs[4]				X	X

[1] The NAFTA provides that tariffs be eliminated by Jan. 1, 2003 for all industrial goods and by Jan. 1, 2008 for all other goods.
[2] Average trade-weighted ad valorem or ad valorem equivalent tariff. Trade weights for the Tokyo Round and Uruguay Round are based on U.S. imports from the world during the years indicated. Trade weights for the bilateral treaties and NAFTA are based on U.S. imports from the relevant countries. Unless otherwise noted, dates in parentheses represent the year immediately prior to the entry into force of the agreement and the year of the final tariff reduction for most products and markets.
[3] Trade-related investment measures.
[4] Trade-related aspects of intellectual property rights.

Source: U.S. Trade Representative, *Annual Report of the President of the United States on the Trade Agreements Program*, various issues; U.S. Trade Representative, *Trade Policy Agenda and Annual report,* various issues; and *U.S. International Trade Commission, Operation of the Trade Agreements Program,* various issues.

at an average annual rate of 5 percent to $15 billion in 2001, imports increased by 8 percent annually to $69 billion. Consequently, the United States recorded a trade deficit of $55 billion in 2001. International trade, already firmly established within the sector prior to the Tokyo Round, increased substantially during the period as globalization of the industry, and a succession of new low-cost suppliers, led manufacturers and retailers to alter production and sourcing patterns to reduce costs and maintain competitiveness. Imports as a share of domestic consumption nearly quadrupled from 10 to 37 percent during 1982-2001, while exports as a share of shipments increased almost four-fold to 11 percent. Apparel products accounted for a much larger share of sector imports in 2001 (88 percent) than did textiles, while the two sub-sectors shared a nearly equal portion of exports. Imports account for a much greater share of the consumption of apparel than for textiles. For many significant apparel items such as shirts and trousers, imports have captured more than 95 percent of the U.S. market.

It is likely that the effects of the Tokyo Round on the U.S. textile and apparel industry were modest. The element of the agreement that most affected the sector was the reduction in U.S. tariffs by an average of 21 percent over six years. However, most of the pre-existing rules governing textile and apparel trade were unaffected by the Tokyo Round as much sector trade continued to be regulated by the Multifiber Arrangement (MFA), which was in force from 1974-1994.

U.S.-Israel FTA

Aggregate U.S. trade in textile and apparel products with Israel increased at an average annual rate of 15 percent during 1984-2001, reaching $622 million, of which apparel constituted $497 million (80 percent) (table 5-38). U.S. exports of textiles and apparel to Israel increased by 106 percent to $41 million while imports from Israel increased more than ten times to $582 million. The most significant concentration of imports in 2001 occurred in women's knit and woven apparel, and home textiles, while exports of synthetic filament fibers and yarns, and floor coverings dominated shipments to Israel. The sector trade deficit with Israel broadened from $30 million to $540 million during 1984-2001, with apparel accounting for 85 percent of the imbalance. Despite the widening gap, however, trade with Israel in textile and apparel products accounted for less than one percent of total U.S. trade in the sector in 2001. In that year, Israel was the 36th largest market for U.S. sector exports and the 24th largest supplier to the U.S. market.

---

[276]—*Continued*

stated that multilateral tariff reductions phased in over multiple years would return to pre-negotiation levels in the absence of the MFA or a similar agreement. Because the MFA was set to expire on Jan. 1, 1982, tariff reductions were postponed until that date in order to avoid nullification if the MFA was not renewed.

Table 5-38
Textile and apparel products: U.S. trade with Israel, 1984-2001

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992
	Millions of constant (1996) dollars								
U.S. import value									
Israel	49.9	92.1	111.8	141.5	131.3	176.4	217.7	226.7	285.3
All other	24,404.7	26,134.1	29,508.1	33,630.2	33,065.6	36,205.7	36,349.9	36,301.8	41,621.3
Total	24,454.7	26,226.1	29,619.9	33,771.7	33,196.9	36,382.1	36,567.6	36,528.6	41,906.6
	Percent								
Israel/Total	0.2	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.7
U.S. import growth									
Israel	—	84.4	21.4	26.6	-7.2	34.4	23.4	4.1	25.8
All other	—	7.1	12.9	14.0	-1.7	9.5	0.4	-0.1	14.7
Total	—	7.2	12.9	14.0	-1.7	9.6	0.5	-0.1	14.7
	Millions of constant (1996) dollars								
U.S. export value									
Israel	19.9	17.1	28.0	34.9	32.7	48.3	65.6	66.9	71.0
All other	3,627.5	3,348.7	3,777.3	4,358.5	5,367.0	6,175.9	7,474.1	8,685.2	9,865.6
Total	3,647.4	3,365.8	3,805.3	4,393.4	5,399.6	6,224.1	7,539.7	8,752.1	9,936.6
	Percent								
Israel/Total	0.5	0.5	0.7	0.8	0.6	0.8	0.9	0.8	0.7
U.S. export growth									
Israel	—	-13.8	63.4	24.6	-6.7	47.7	35.9	2.1	6.1
All other	—	-7.7	12.8	15.4	23.1	15.1	21.0	16.2	13.6
Total	—	-7.7	13.1	15.5	22.9	15.3	21.1	16.1	13.5

See note at end of table.

Table 5-38—*Continued*
Textile and apparel products: U.S. trade with Israel, 1984-2001

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Millions of constant (1996) dollars								
U.S. import value									
Israel	317.9	381.9	426.6	399.4	399.1	490.6	549.0	608.5	581.5
All other	43,952.3	46,586.8	48,679.2	49,844.1	57,040.7	62,123.1	64,542.0	71,875.4	68,919.1
Total	44,270.3	46,968.8	49,105.8	50,243.4	57,439.9	62,613.6	65,091.0	72,483.9	69,500.6
	Percent								
Israel/Total	0.7	0.8	0.9	0.8	0.7	0.8	0.8	0.8	0.8
U.S. import growth									
Israel	11.5	20.1	11.7	-6.4	-0.6	22.9	11.9	10.8	-4.5
All other	5.6	6.0	4.5	2.4	14.4	8.9	3.9	11.4	-4.1
Total	5.6	6.1	4.6	2.3	14.3	9.0	4.0	11.4	-4.1
	Millions of constant (1996) dollars								
U.S. export value									
Israel	84.9	80.3	97.7	87.6	85.6	71.5	64.5	51.5	41.0
All other	10,674.9	11,684.7	13,036.7	14,193.6	15,961.4	16,065.3	15,565.1	16,490.9	14,593.8
Total	10,759.8	11,765.0	13,134.4	14,281.3	16,047.0	16,136.8	15,629.6	16,542.4	14,634.9
	Percent								
Israel/Total	0.8	0.7	0.7	0.6	0.5	0.4	0.4	0.3	0.3
U.S. export growth									
Israel	19.5	-5.4	21.7	-10.3	-2.3	-16.5	-9.8	-20.1	-20.5
All other	8.2	9.5	11.6	8.9	12.5	0.7	-3.1	6.0	-11.5
Total	8.3	9.3	11.6	8.7	12.4	0.6	-3.1	5.8	-11.5

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

It is not likely that the U.S.-Israel FTA had a measurable impact on the domestic textile and apparel industry. While removal of quotas and most tariffs on sector products under the agreement resulted in greater import levels from Israel during 1984-2001, the country remains a relatively small supplier to the U.S. market.

U.S.-Canada FTA

During 1987-2001, total U.S. trade in textile and apparel products with Canada increased at an average annual rate of 12 percent, reaching $5.6 billion (table 5-39). Textiles and apparel represented 53 percent and 47 percent of the trade value, respectively. Canada's share of total U.S. textile trade increased from 8 percent to 18 percent in the period, while its share of total U.S. apparel trade doubled from 2 percent to 4 percent. U.S. exports of textiles to Canada increased by 256 percent to $1.7 billion in 2001, while exports of apparel rose by 372 percent to $816 million. Within the same period, textile imports from Canada increased by 511 percent to $1.3 billion and apparel by 339 percent to $1.8 billion. Canada was the second largest market for U.S. textile and apparel products in 1989 and the 11th largest supplier to the U.S. market. In 2001, Canada remained the second largest market for U.S. sector products, but had become the fourth largest supplier to the United States.

It is likely that the U.S.-Canada FTA had a significant effect on U.S. sector trade and production, particularly during 1988-1993 prior to implementation of the NAFTA, the trade provisions of which superseded those contained in this agreement. During that period, elimination of tariffs and quotas led to a near tripling of sector exports to Canada reaching $1.9 billion, while imports followed a similar trend by more than doubling to $1.2 billion. The trade surplus with Canada in sector products increased from $25 million to $766 million between 1988-1993, most of which is attributable to higher exports of intermediate textile goods, industrial textiles, and floor coverings.

NAFTA

During 1994-2001, total U.S. trade in textiles and apparel with NAFTA countries Canada and Mexico increased at an average annual rate of 12 percent to $19 billion, compared with a 4-percent average annual increase in sector trade with the rest of the world. Imports from Mexico increased by 184 percent to $9 billion, while those from Canada rose by 109 percent to $3.1 billion. Most of the increase occurred in apparel and manmade fibers. Exports to Mexico, largely concentrated in broadwoven fabrics and garment parts for assembly, increased to $4.8 billion (111 percent). U.S. exports to Canada climbed to $2.4 billion (18 percent) during the 1994-2001 period, which reflected increases in shipments of floor coverings and synthetic woven fabrics. In 1994, Mexico and Canada were the fifth and seventh largest sector suppliers to the United States, respectively, climbing to first and fourth place in 2001. Despite a quadrupling of the textile trade surplus with Mexico to $1.8 billion

Table 5-39
Textile and apparel products: U.S. trade with Canada and Mexico, 1987-2001

Year	1987	1988	1989	1990	1991	1992	1993	1994
	Millions of constant (1996) dollars							
U.S. import value								
Canada	618.2	687.5	727.8	707.7	780.8	983.7	1,174.6	1,476.7
Mexico	740.5	797.9	1,287.2	1,505.9	1,793.3	2,250.8	2,730.7	3,148.9
All other	32,413.1	31,711.5	34,367.1	34,354.1	33,954.5	38,672.1	40,365.0	42,343.1
Total	33,771.7	33,196.9	36,382.1	36,567.6	36,528.6	41,906.6	44,270.3	46,968.8
	Percent							
Canada/Total	1.8	2.1	2.0	1.9	2.1	2.4	2.7	3.1
Mexico/Total	2.2	2.4	3.5	4.1	4.9	5.4	6.2	6.7
U.S. import growth								
Canada	—	11.2	5.9	-2.8	10.3	26.0	19.4	25.7
Mexico	—	7.8	61.3	17.0	19.1	25.5	21.3	15.3
All other	—	-2.2	8.4	([1])	-1.2	13.9	4.4	4.9
Total	—	-1.7	9.6	-0.5	-0.1	14.7	5.6	6.1
	Millions of constant (1996) dollars							
U.S. export value								
Canada	642.9	711.2	810.0	1,465.6	1,620.6	1,730.3	1,940.9	2,119.0
Mexico	542.9	718.7	957.7	1,081.9	1,273.2	1,656.9	1,888.5	2,295.0
All other	3,207.6	3,969.7	4,456.5	4,992.2	5,858.3	6,549.5	6,930.5	7,350.9
Total	4,393.4	5,399.6	6,224.1	7,539.7	8,752.1	9,936.6	10,759.8	11,765.0
	Percent							
Canada/Total	14.6	13.2	13.0	19.4	18.5	17.4	18.0	18.0
Mexico/Total	12.4	13.3	15.4	14.4	14.6	16.7	17.6	19.5
U.S. export growth								
Canada	—	10.6	13.9	80.9	10.6	6.8	12.2	9.2
Mexico	—	32.4	33.3	13.0	17.7	30.1	14.0	21.5
All other	—	23.8	12.3	12.0	17.4	11.8	5.8	6.1
Total	—	22.9	15.3	21.1	16.1	13.5	8.3	9.3

See footnote at end of table.

Table 5-39—*Continued*
Textile and apparel products: U.S. trade with Canada and Mexico, 1987-2001

Year	1995	1996	1997	1998	1999	2000	2001
	Millions of constant (1996) dollars						
U.S. import value							
Canada	1,775.8	2,104.3	2,473.6	2,823.1	3,063.4	3,290.5	3,080.1
Mexico	4,039.6	5,149.9	6,833.5	8,146.7	9,165.5	9,974.2	8,951.4
All other	43,290.3	42,989.2	48,132.8	51,643.8	52,862.1	59,219.2	57,469.1
Total	49,105.8	50,243.4	57,439.9	62,613.6	65,091.0	72,483.9	69,500.6
	Percent						
Canada/Total	3.6	4.2	4.3	4.5	4.7	4.5	4.4
Mexico/Total	8.2	10.3	11.9	13.0	14.1	13.8	12.9
U.S. import growth							
Canada	20.3	18.5	17.6	14.1	8.5	7.4	-6.4
Mexico	28.3	27.5	32.7	19.2	12.5	8.8	-10.3
All other	2.2	-0.7	12.0	7.3	2.4	12.0	-3.0
Total	4.6	2.3	14.3	9.0	4.0	11.4	-4.1
	Millions of constant (1996) dollars						
U.S. export value							
Canada	2,444.0	2,549.3	2,912.0	2,981.5	2,848.4	2,772.8	2,490.7
Mexico	2,400.8	2,998.8	3,680.7	4,445.7	5,168.1	5,604.6	4,840.3
All other	8,289.6	8,733.2	9,454.3	8,709.6	7,613.1	8,165.0	7,303.8
Total	13,134.4	14,281.3	16,047.0	16,136.8	15,629.6	16,542.4	14,634.9
	Percent						
Canada/Total	18.6	17.9	18.2	18.5	18.2	16.8	17.0
Mexico/Total	18.3	21.0	22.9	27.6	33.1	33.9	33.1
U.S. export growth							
Canada	15.3	4.3	14.2	2.4	-4.5	-2.7	-10.2
Mexico	4.6	24.9	22.7	20.8	16.3	8.5	-13.6
All other	12.8	5.4	8.3	-7.9	-12.6	7.3	-10.6
Total	11.6	8.7	12.4	0.6	-3.1	5.8	-11.5

[1] Less than 0.5 percent.

Note.–Figures may not sum to total because of rounding.

Source: Compiled by the U.S. International Trade Commission from official statistics of the U.S. Department of Commerce, Bureau of the Census.

between 1994-2001, the $6 billion deficit in apparel trade resulted in a trade deficit for the entire textile and apparel sector.

It is likely the agreement had a significant effect on U.S. sector trade and production. The U.S. textile industry, especially fabric producers, has benefitted from the increased use of U.S. fabric in apparel and other made-up textile goods assembled in production-sharing operations in Mexico. Further, the Agreement's strict rules of origin virtually guaranteed high demand for U.S. and Canadian fabrics and yarns given the abundance of low-cost apparel manufacturing and lack of high-quality textiles available in Mexico. However, as domestic textile mills have faced intense international competition in recent years, many firms have reduced or discontinued operations despite demand in Canada and Mexico. The agreement has had a more negative effect on the domestic apparel industry as competition from garments produced in Mexico using low-cost labor have caused many U.S. manufacturers to close down or move assembly operations offshore.[277] Furthermore, devaluation of the Mexican peso in December 1994-January 1995 greatly enhanced Mexico's competitive position in the U.S. market.

Uruguay Round

Total U.S. trade in textiles and apparel increased at an average annual rate of 5 percent during 1995-2001, reaching $84 billion at the end of the period. Imports of textiles increased by 23 percent to $8 billion while exports rose by 44 percent to $8 billion. During the same period, apparel imports climbed by 52 percent to $61 billion while exports increased by 8 percent to $7 billion. The strong growth of apparel imports relative to that of exports increased the sector trade deficit by 56 percent to $55 billion.

The Uruguay Round established the Agreement on Textiles and Clothing (ATC), which replaced the MFA as the comprehensive agreement governing global trade in this sector. The ATC established a ten-year schedule for acceleration of quota growth rates and gradual phase-out of all MFA quotas in four stages by January 1, 2005, with remaining quotas phased out at a faster rate than previously.[278] During the first three stages of integration, completed on July 1, 2002, quotas on at least 51 percent of eligible products were phased out.[279] Because importing countries had considerable flexibility in selecting

---

[277] Industry official, telephone interview by USITC staff, June 21, 2001.

[278] MFA quotas were applied on a country-specific basis. This was a departure from the GATT nondiscrimination principle that all GATT-member countries be treated equally when quotas or other trade restrictions are applied.

[279] The quota phase-out schedule required 16 percent integration on July 1, 1995, an additional 17 percent on July 1, 1998, and another 18 percent on July 1, 2002. Individual countries were allowed to determine which products from each of four categories (tops and yarns, fabrics, made-up textile products, and apparel) that they would included in each tranche.

products for inclusion in each phase, the United States delayed removing quotas on the most import-sensitive products until the final stage. It is possible that considerable disruption, including major switching among import suppliers, will occur to the domestic industry when quotas on the remaining 49 percent of goods are eliminated, as products under those categories accounted for 85 percent of textile and apparel imports in 2001. Certain products that were fully integrated on January 1, 2002 have experienced increases in import levels by quantity though the value of those imports may have declined. For example, overall shipments of infants' apparel into the United States in 2002, no longer subject to quotas, rose 10 percent by volume but decreased 3 percent in value, most likely resulting from a large increase in low-price imports from China which replaced higher-priced imports from other sources.[280] The ATC also required members to reduce or eliminate nontariff barriers and facilitate customs, administrative, and licensing procedures. According to U.S. industry representatives, however, many such barriers remain in foreign markets or have been created by countries seeking to offset WTO market concessions using measures such as onerous labeling requirements or lengthy pre-import inspections.[281] U.S. consumers have likely benefitted to some degree already from lower prices and greater product diversity.

Views of Interested Parties

Association of the Nonwoven Fabrics Industry[282]

The Association of the Nonwoven Fabrics Industry (INDA) is the trade association of the nonwovens industry, a multi-billion-dollar business in the United States and abroad. INDA members are involved in the manufacture of nonwoven roll goods and production of primary materials and machinery used to create nonwovens. INDA members also include companies that convert nonwoven roll goods into finished products such as disposable baby diapers, surgical drapes and gowns, filtration materials, wiping products, construction materials, geotextiles, and numerous other end-use applications.

---

[280] Based on category 239 Major Shippers Report data from the Department of Commerce. China's category imports increased 826 percent by quantity in 2002, while just 298 percent by value.

[281] American Textile Manufacturers Institute, "Promises Unkept: A Report on Market Access for U.S. Textile and Apparel Products Five Years into the World Trade Organization," Mar. 17, 2000.

[282] Jessica Franken, Government Affairs Associate, Association of the Nonwoven Fabrics Industry, written submission to the Commission, March 31, 2003.

The unilateral phaseout of U.S. tariffs on nonwoven roll goods during the Uruguay Round, which went from a high of 16 percent in 1994 to zero as of January 1, 1999, has been at least partially responsible for a dramatic narrowing in the gap between U.S. imports and U.S. exports of nonwoven roll goods (as measured in kilograms) over the past six years. Imports of nonwoven roll goods to the United States increased more than 140 percent during 1996-2001, while U.S. exports have risen by a more modest rate of 59 percent over the same period. The United States exported 162 percent more nonwoven roll goods than it imported during 1996, although by 2001 that gap had narrowed such that the U.S. exported 72 percent more nonwoven roll goods than it imported. Given these trends, INDA is concerned that imports of nonwoven roll goods to the U.S. will match, and perhaps exceed, U.S. exports within the next few years.

"The nonwovens industry has often been regarded as one of the few bright points within the struggling textiles sector of the U.S. economy, but these duty imbalances threaten to reverse that trend." INDA requests that the USITC reflect in its investigation the difficulties its industry has experienced as a result of the elimination of tariffs of nonwoven roll goods during the Uruguay Round.

CHAPTER 6: The Impact of NAFTA Preferences on U.S.-Mexican Trade: A Sectoral Approach

Introduction

NAFTA came into effect on Jan. 1, 1994. The Agreement capped nearly a decade of improved and expanded trade ties between the United States and Mexico, and widened the scope of the U.S.-Canada Free Trade Agreement (CFTA), which was signed in 1989. A large number of studies have examined NAFTA and its effect on trade. However, due to the lack of historical data, the majority of these studies used computable general equilibrium (CGE) models to address this question.[1] The general consensus of these ex ante studies is that NAFTA would provide large positive benefits to the Mexican economy, have small but positive effects on the U.S. economy, and have minimal effects on the Canadian economy.

[1] A notable exception is USITC, *The Impact of the North American Free Trade Agreement on the U.S. Economy and Industries: A Three-Year Review*, USITC Publication No. 3045, June 1997. As discussed in chapter 4, this study uses import and export demand functions to examine the effects of NAFTA on North American trade at the aggregate level, between 1989 and 1996. The study reports the volume of U.S. imports from Mexico increased by 10 percent in 1994, by 5.7 percent in 1995, and 6.4 percent in 1996, as a result of NAFTA. The volume of U.S. exports to Mexico rose by 1.3 percent in 1994, was 3.8 percent higher in 1995, and 3.2 percent higher in 1996. However, there were no significant effects of NAFTA on U.S. aggregate trade with Canada. Using a similar methodology, the study analyzed almost 200 industries, accounting for more than 85 percent of trade between the United States and its NAFTA partners. For most of the industries analyzed, the USITC found no discernible impact of NAFTA on changes in the volume of bilateral trade between member countries. However, U.S. exports to Mexico increased significantly in 13 industries, and fell in none. U.S. imports from Mexico increased in 16 industries, and decreased in seven industries. U.S. exports to Canada increased in 10 industries, and fell in eight industries, while U.S. imports from Canada increased in 13 industries, but declined in eight industries.

In ex post studies, it is difficult to isolate the effect of NAFTA on trade, partly because other domestic and trade-related events occurred close to or during the NAFTA phase-in period. These events include political instability in Mexico, the devaluation of the peso in December 1994, and the establishment of the World Trade Organization in 1995. Furthermore, not all tariffs on traded commodities were eliminated between the United States, Canada, and Mexico in 1994. For most commodities, tariffs are being phased out over a 10-to-15-year period, depending on the commodity category. Therefore, North American trade flows since 1994 are not entirely free of duty. Moreover, in addition to tariff reductions, NAFTA contains other provisions relating to nontariff barriers, border measures, and dispute resolution mechanisms that can be expected to generate changes that are difficult to quantify. These factors complicate the analysis and make it more difficult for researchers to adequately capture the effects of NAFTA on trade among member countries.

Nevertheless, sufficient time has now elapsed since the implementation of NAFTA to make statistical testing feasible. The objective of this chapter is to estimate statistically the impact of NAFTA tariff reductions and tariff preferences on U.S. and Mexican trade in goods across industries.[2] Three specific questions are examined. First, did reductions in U.S. and Mexican tariffs under NAFTA increase import shares significantly across industries? Second, did import shares increase more in industries with relatively larger NAFTA tariff preferences? Third, does the response to NAFTA tariff liberalization differ significantly across industries?

This chapter examines the changes in Mexican shares of U.S. imports of manufactured goods from 1989-2001, and changes in U.S. shares of Mexican imports of manufactured goods from 1991-1999.[3] In order to include the pre-existing GSP preferences, and the gradual phase-in of NAFTA, the applied tariff preferences are used for each product over the time period. The impact of both tariff reductions and tariff preferences on import shares are examined across industries. Tests for differences in response to tariff reductions and tariff preferences before and after NAFTA are conducted. For the U.S. market, tests for differences in response across industries are conducted.

Results suggest that U.S. tariff reductions and tariff preferences under NAFTA did have a significant impact on Mexican shares of U.S. imports. About one-third of the growth in Mexico's import shares could be attributed to U.S. tariff reductions and tariff preferences under NAFTA. The impact of both

[2] As stated above, the Commission analysis examines tariff reductions on goods only. It does not examine changes in non-tariff barriers, nor trade in services.

[3] Clearly, additional U.S. tariff reductions after 2001 and Mexican tariff reductions after 1999 are not included. Since much of the phase-in took place by 2001, this is not likely to bias the results.

U.S. tariff reductions and U.S. tariff preferences was larger after NAFTA relative to the period as a whole. Estimates for the textile and apparel industry showed an even stronger response to U.S. trade liberalization and U.S. tariff preferences under NAFTA, suggesting that responses to NAFTA are likely to differ across sectors. Results also suggest that Mexican tariff reductions and tariff preferences under NAFTA had a significant impact on U.S. shares of Mexican imports. Mexican trade liberalization toward the United States under NAFTA implied an expansion of about 13 percent in the average U.S. share of Mexico's manufactured goods imports. However, this expansion was almost completely offset by the depreciation of the peso against the dollar.

Previous Studies[4]

There is much debate as to whether the NAFTA has had any significant impact on trade flows. Recent ex post statistical studies show conflicting results, while leaving some questions unanswered. Agama and McDaniel[5] study the impact of U.S. NAFTA tariff preference toward Mexico on aggregate U.S. imports from Mexico between 1989 and 2001. They explicitly capture the gradual phase-in of these preferences. The authors find that U.S. tariff preferences did significantly increase U.S. imports from Mexico, and that the impact of NAFTA tariff preferences on U.S.-Mexican trade was significantly larger than the impact of U.S. preferences extended to Mexico prior to NAFTA. Agama and McDaniel also find that Mexican tariff preferences under NAFTA significantly increased Mexican aggregate imports from the United States. These results are in sharp contrast to those of Krueger.[6] Examining U.S. aggregate imports from Mexico between 1991 and 1997, Krueger finds little evidence that membership in NAFTA had significant effects on North American trade. However, she does argue that trade in some individual sectors may have increased due to NAFTA.

Romalis[7] examines the impact of the U.S. NAFTA preferences on Canadian and Mexican shares of U.S. imports across industries. In general, he finds a positive, significant effect of NAFTA trade preferences on Mexican and Canadian shares of U.S. imports. However, his analysis does not directly capture the year-by-year phase-in of the NAFTA tariff preferences. Fukao,

[4] See appendix B for a more detailed discussion of the papers cited in this section.

[5] Laurie-Ann Agama and Christine A. McDaniel, "The NAFTA Preference and U.S.-Mexico Trade: Aggregate Level Analysis," *The World Economy*, forthcoming 2003.

[6] Ann O. Krueger, "Trade Creation and Trade Diversion Under NAFTA," National Bureau of Economic Research (NBER) Working Paper, December 1999.

[7] John Romalis, "NAFTA's Impact on North American Trade," University of Chicago Graduate School of Business Working Paper, 2001.

et al.,[8] also examine U.S. imports from Mexico and Canada across manufactured goods, from 1992-1998. They find that U.S. tariff reductions under NAFTA implied increases in Mexican and Canadian shares of U.S. imports for a significant number of industries. However, Fukao, et al. do not explicitly test the effect of U.S. tariff preferences under NAFTA.

NAFTA and North American Trade

United States[9]

Figure 6-1 shows a comparison across sectors of U.S. applied tariffs against U.S. imports from Mexico for the pre- and post-NAFTA implementation period.[10] The figure shows substantial variation in the initial level of protection as well as differences in the degree of tariff liberalization across sectors.[11] In 1993, the U.S. applied tariffs on imports from Mexico ranged, on average, from a low of only 0.7 percent on wood products to a high of 9.4 percent on textiles and apparel products. Between 1993 and 2001, applied tariffs on Mexican goods fell across all sectors as tariff reductions under NAFTA were phased in. By 2001, U.S. applied tariffs on goods imported from Mexico ranged from nearly free trade in wood products to about 1 percent on footwear products. The textile and apparel sector experienced the largest decline, as the average tariff fell from over 9 percent in 1993 to less than 1 percent in 2001. Figure 6-2 shows that U.S. applied tariffs on goods imported from non-NAFTA countries followed a similar pattern, declining across all sectors between 1993 and 2001, largely due to the Uruguay Round. However, U.S. tariffs against the non-NAFTA partners fell at a much slower rate than those against Canada and Mexico.

Figure 6-3 shows the variation in tariff preference that the United States extended to Mexico between 1993 and 2001 across sectors. With the exception of the agriculture sector, Mexico received a tariff preference in all sectors prior to the implementation of NAFTA, under the GSP program, the production-sharing provisions of the United States Harmonized Tariff System (HTS), and under duty suspension in HTS chapter 99. After NAFTA came into effect, Mexico was no longer eligible for GSP program benefits. The tariff

---

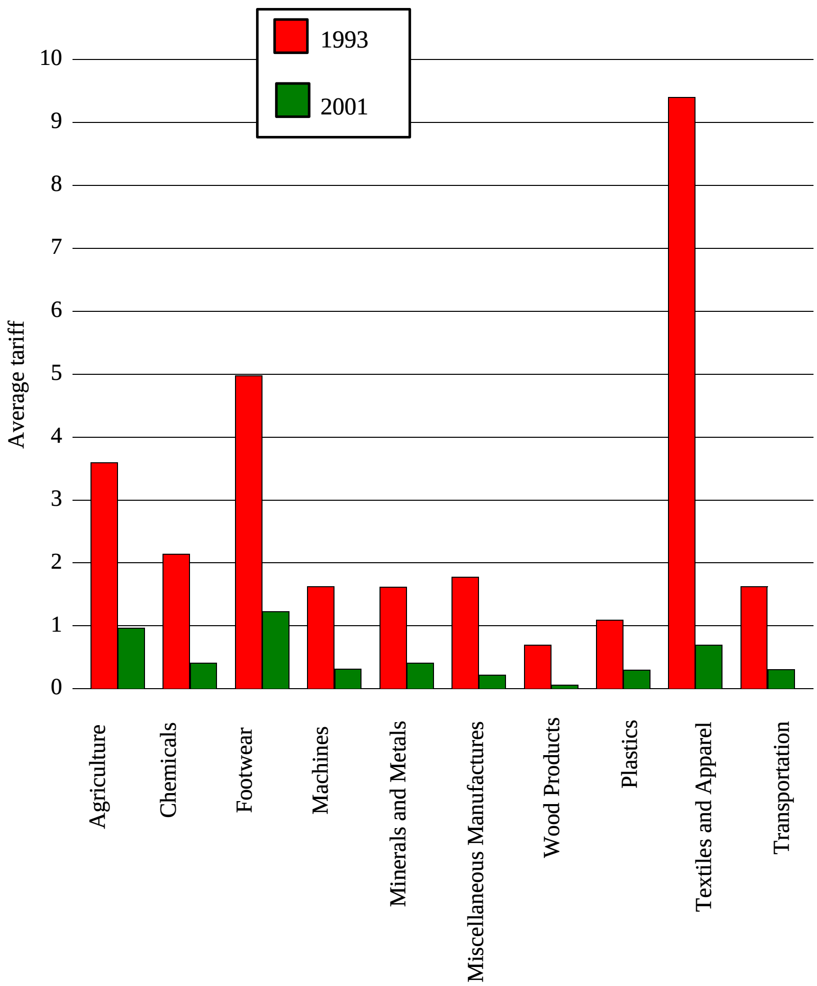
[8] Kyoji Fukao, Toshihiro Okubo, and Robert Stern, "An Econometric Analysis of Trade Diversion," *The North American Journal of Economics and Finance*, vol. 14, No. 1, March 2003, pp. 3-24.

[9] All data on U.S. trade and tariffs are taken from the U.S. Department of Commerce.

[10] Applied tariffs are calculated as the ratio of collected import duties to customs value of total imports from Mexico.

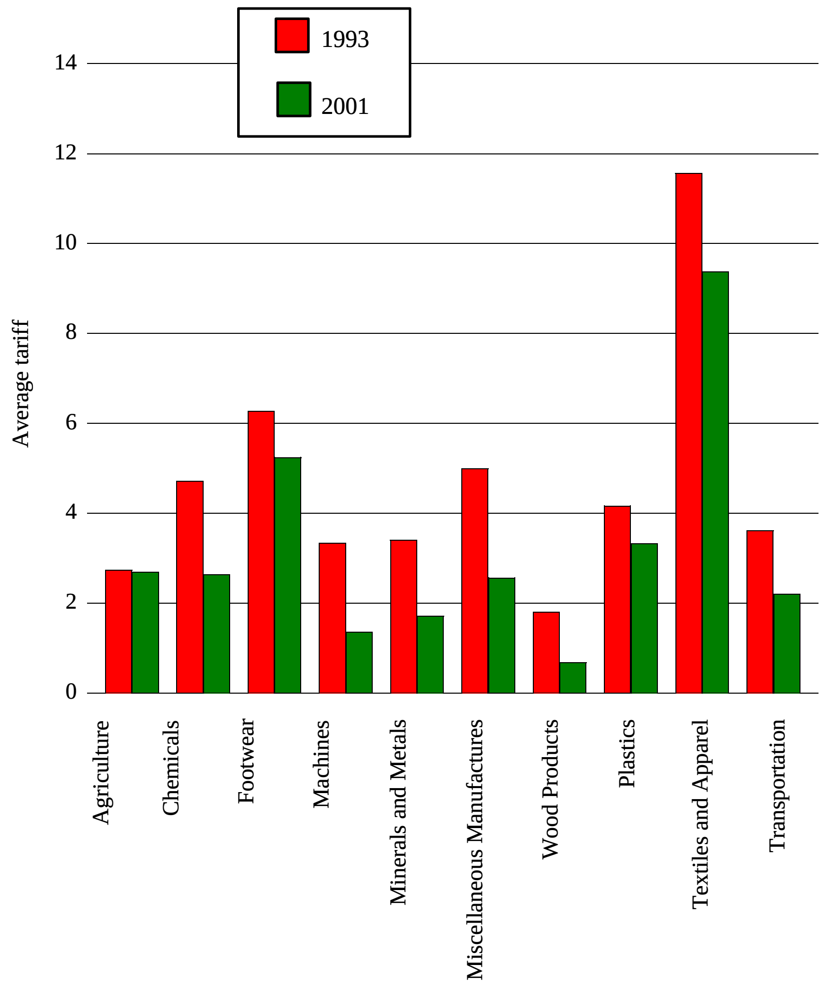
[11] Sectors are defined according to the section classifications in the HTS. See table B-1 in appendix B.

Figure 6-1
Simple average U.S. tariff on imports from Mexico, 1993 and 2001



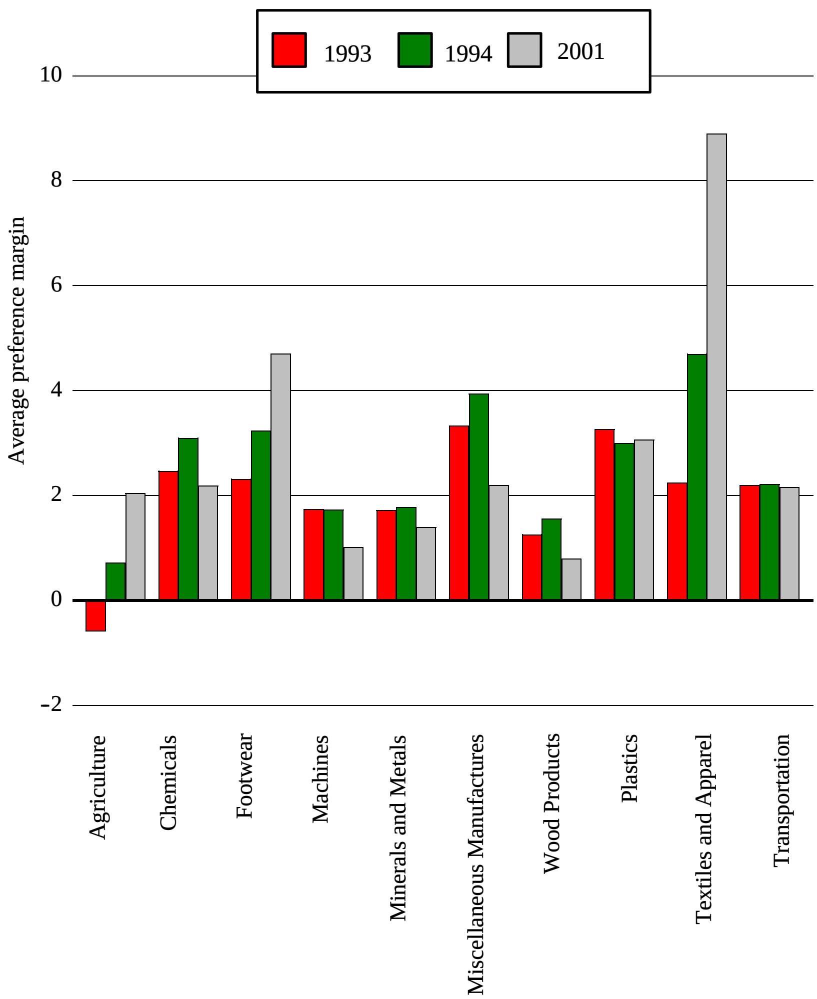
Source: Commission calculations and U.S. Department of Commerce data.

Figure 6-2
Simple average U.S. tariff on Non-NAFTA imports, 1993 and 2001



Source: Commission calculations and US Department of Commerce data.

Figure 6-3
Average U.S. tariff preference toward Mexico: Pre and post NAFTA



Source: Commission calculations and U.S. Department of Commerce data.

preference increased for all sectors (except plastics), and remained positive in 2001, although it declined slightly in some sectors, most likely due to multilateral tariff cuts under the Uruguay Round.

Mexico's share of U.S. imports for 1993, 1994, and 2001, grouped by U.S. 2001 tariff preference, are shown in figure 6-4. Although Mexico increased its import share in both the pre- and post-NAFTA period, the growth in Mexico's share of U.S. imports accelerated across all preference ranges during the NAFTA years. It is clear that products that received positive preferences in 2001 did experience significant growth between 1989 and 1993. However, after the implementation of NAFTA, growth rates for these products accelerated, particularly for products with preferences exceeding 5 percentage points.[12]

Mexico[13]

Figure 6-5 shows the distribution of Mexico's tariffs against imports from the United States.[14] It is evident that between 1991 and 1999, Mexican tariffs fell dramatically across all product categories.[15] Mexico's average tariff fell from an initial level of 13.8 percent in 1991, to an average level of only 3.9 percent in 1999. Mexico's initial tariffs against U.S. products varied across sectors, ranging from about 11.0 percent for chemical products to 18.0 percent for miscellaneous manufactures products. The largest reduction in average tariff, 13.5 percentage points, took place in the miscellaneous manufactures sector. The textiles and apparel and footwear sectors experienced declines of almost 12 percentage points, closely followed by the machinery and transportation sectors with reductions in tariffs of more than 11 percentage points.

Mexico's average tariffs against non-NAFTA partners were the same as those against the United States prior to NAFTA (figure 6-6). However, Mexican tariffs against non-NAFTA countries actually rose between 1991 and 1999, most likely reflecting a decision made in response to the peso crisis.[16] The largest increases are seen in textiles, apparel, and footwear items. As a result of continued tariff cuts on products imported from the United States, coupled with increased barriers against non-NAFTA partners, Mexican tariff preferences toward the United States grew considerably, as shown in figure 6-7.

---

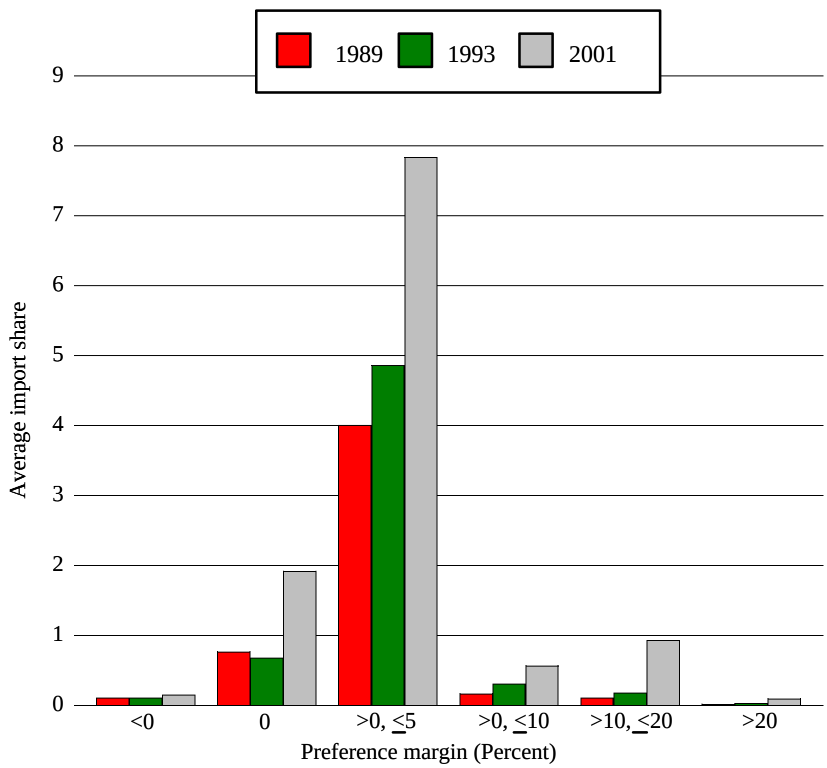
[12] This includes more than 700 items at the HTS 6-digit level.

[13] All Mexican trade and tariff data are taken from the United Nations Conference on Trade and Development's Trade Analysis and Information System.

[14] Applied tariffs are calculated as the ratio of import duties to customs value of total imports from the United States.

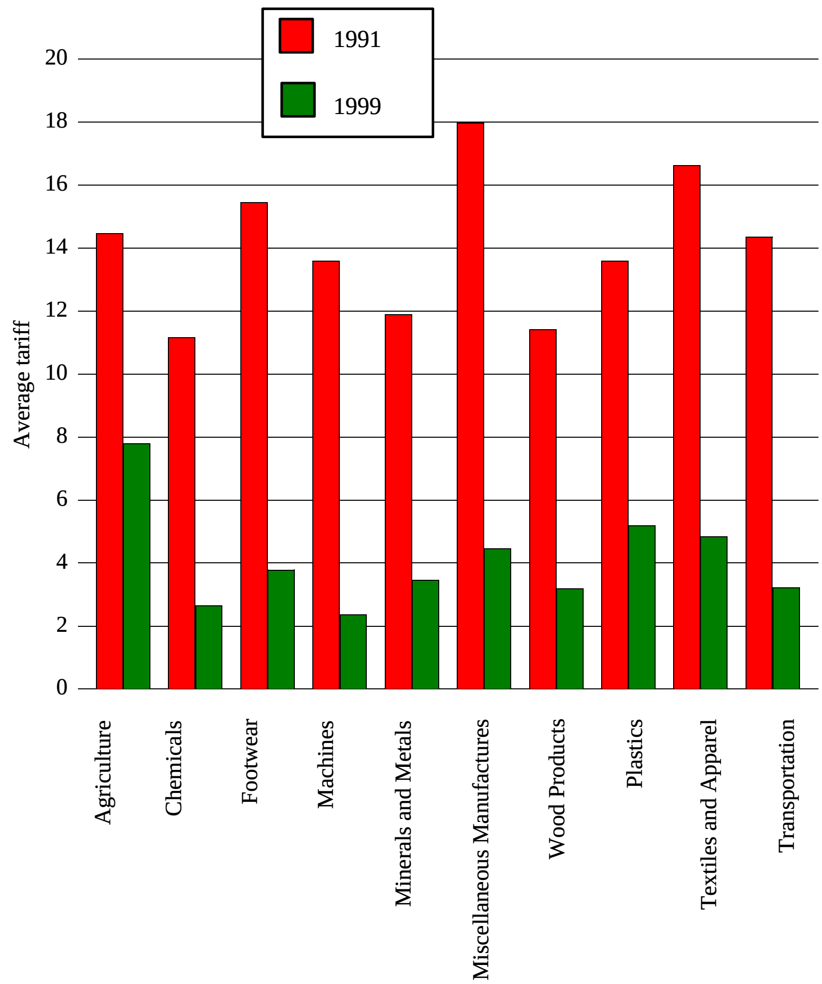
[15] Sectors are defined according to the section classifications in the HTS. See table B-1 in appendix B.

Figure 6-4
Mexican share of U.S. imports by tariff preference: 1989, 1993, and 2001



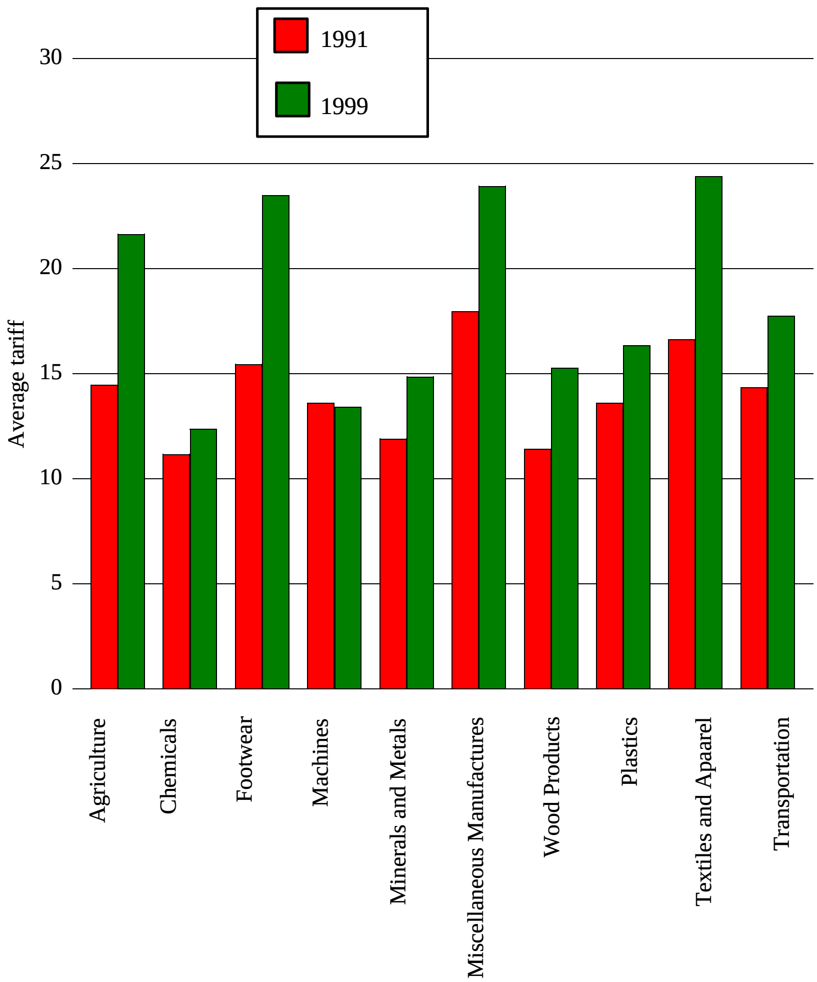
Source: Commission calculations and U.S. Department of Commerce data.

Figure 6-5
Mexico’s simple average tariff on imports from the United States: 1991, 1999



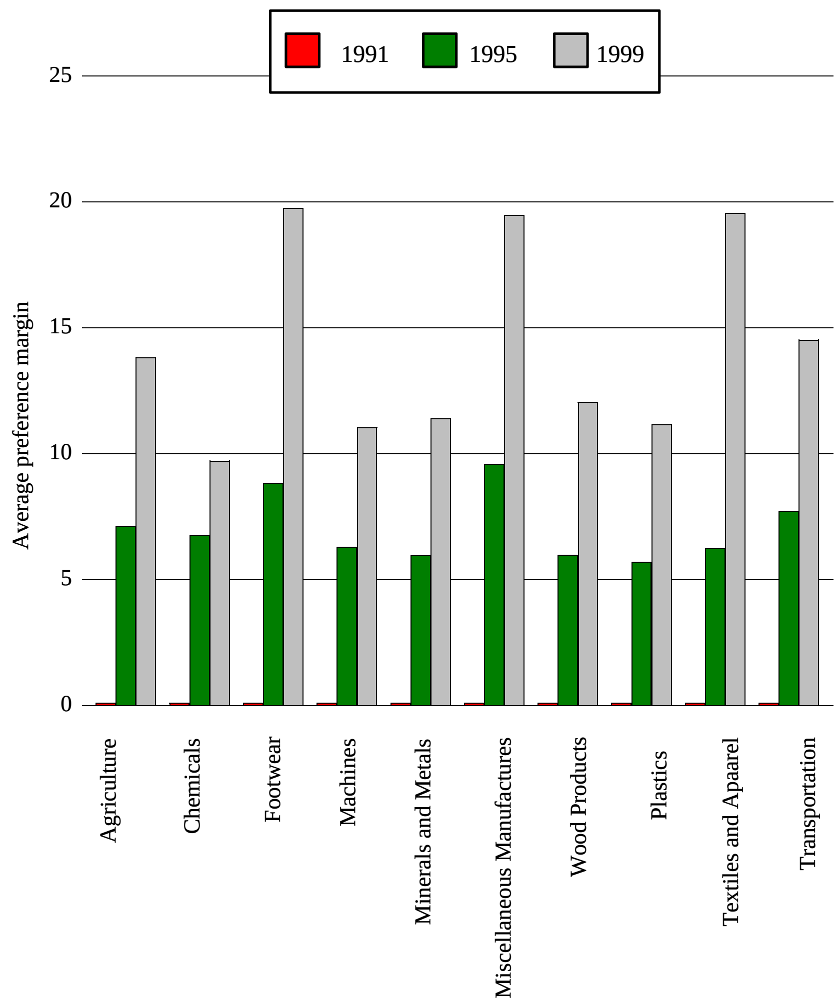
Source: Commission calculations and UNCTAD TRAINS data.

Figure 6-6
Mexico's simple average tariff on Non-NAFTA imports: 1991, 1999



Source: Commission calculations and UNCTAD TRAINS data.

Figure 6-7
Mexican tariff preference margin toward United States: Pre and post NAFTA



Source: Commission calculations and UNCTAD TRAINS data.

Figure 6-8 shows the average U.S. share of Mexico's imports during the pre- and post-NAFTA periods grouped according to the NAFTA preference in 1999. U.S. shares rose in those categories with the larger preferences as Mexico shifted its sourcing to its NAFTA neighbor. However, in categories where the preference margins were small, U.S. import shares declined slightly. The data show that initial U.S. shares varied across the categories of tariff protection, ranging from 60.8 percent for goods afforded a preference greater than 20 percent, to 69.3 percent for good with a preference between 5 and 10 percent. With the exception of the goods afforded a preference up to and including 5 percent, U.S. shares grew across all preference categories immediately after NAFTA came into effect, before declining slightly. By 1999, again with the exception of goods with a preference below and including 5 percent, U.S. import shares had fallen below their 1995 levels, but remained at or above their initial levels. U.S. import shares ranged from 58.1 percent for items with a preference up to and including 5 percent, to 69.2 percent for items afforded a preference between 5 percent and 20 percent.

Analytical Framework[17]

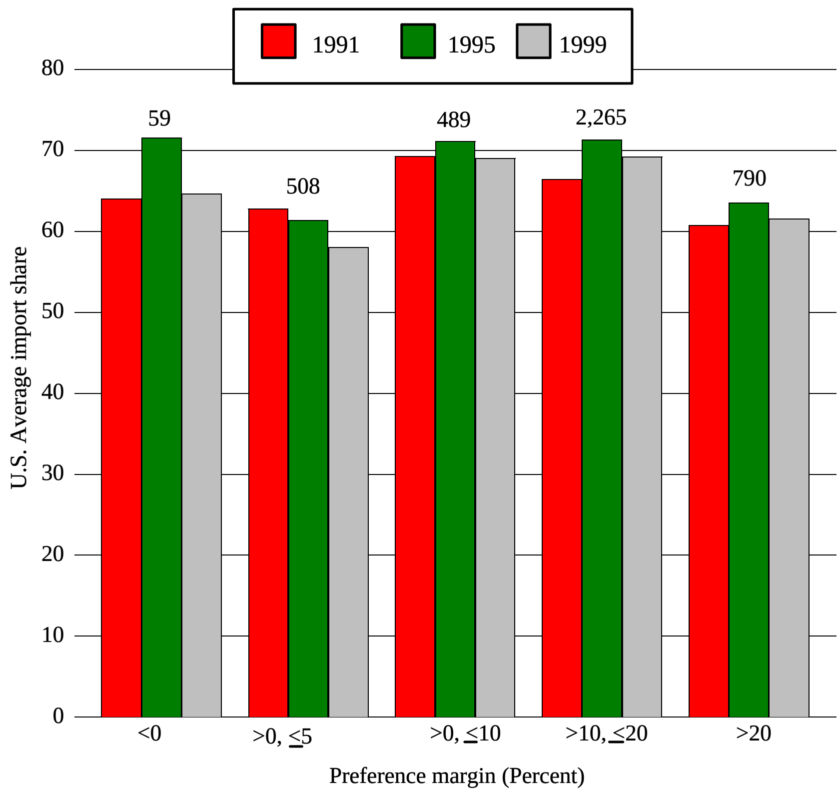
The Commission undertook a statistical analysis of the impact of NAFTA tariff reductions and tariff preferences on U.S. and Mexican trade across industries. Economic theory suggests that preferential trade liberalization, such as NAFTA, should expand trade between the countries that are part of the agreement. At the sectoral level, preferential liberalization might be expected to significantly increase the import shares of partner countries. This study uses conventional statistical techniques to test the impact of NAFTA on import shares across sectors. Three questions are investigated. First, did reductions in U.S. and Mexican tariffs under NAFTA increase import shares significantly across industries? Second, did import shares increase more in industries with relatively larger NAFTA tariff preferences? Third, does the response to NAFTA tariff liberalization differ significantly across industries?

A country's share of its partner's imports in any industry is expected to be predominantly a function of the price of that country's imports relative to the price of imports from other countries. Thus, Mexico's share of US imports will depend upon the price of Mexican imports relative to imports from other countries. The same would be true for the United States' share of Mexico's imports. The prices of imports from any country are made up of four key components: the actual export price of the product, the additional markup due to transport costs, the tariff applied to that imported good,[18] and the exchange rate, which translates the foreign currency price into the partner's currency. Changes in any of these four components will change relative prices, and thus

[16] USITC (1997).

[17] A detailed technical discussion may be found in Appendix B.

Figure 6-8
U.S. share of Mexican imports by tariff preference, 1991 and 1999[1]



[1] Number above bars indicates the number of HTS 6-digit tariff lines in that preference margin group in 2001

Source: Commission calculations and UNCTAD TRAINS data.

influence a country's share of its partner's imports. In order to isolate the role of NAFTA trade preferences on import shares, changes in these other key components are incorporated directly into the analysis.

The Commission analysis uses actual data on applied tariff rates throughout the period 1989-2001, to capture both the differences in tariff preferences across goods and the gradual phase-in of preferences over time under NAFTA. Proxies for export prices from the United States, Mexico and other countries are included, as well as measures of changes in the peso-dollar exchange rate, and in U.S. and Mexican purchasing power over imports from other sources. Lagged import shares are included to help capture the fact that markets do not always adjust to policy changes immediately, and that Mexican or U.S. import shares may be historically high or low in some products. The tariff level itself is also included, since in any given year, regardless of the tariff preference, Mexico or the United States would likely have relatively smaller import shares in products where they face relatively highly barriers.

Several conclusions from previous studies are also examined. Agama and McDaniel suggested that U.S. preferences toward Mexico did significantly raise Mexico's share of U.S. imports at the aggregate level, and that these preferences mattered more after NAFTA than before. In the present study, an explicit test is conducted to see if the impact of U.S. preferences differs before and after NAFTA. Krueger suggested that any significant change in Mexico's share of U.S. imports was likely due to the major peso devaluation in late 1994, rather than NAFTA. The present study allows a direct comparison of the influence of the trade preferences relative to exchange rate changes during this time period. Krueger also suggests that specific sectors, such as textiles and apparel, may have been significantly impacted by the NAFTA preferences, even if aggregate effects were negligible. The present study estimates the effects of preferences specifically on Mexican shares of U.S. imports of textiles and apparel, and compares the results to the impact on manufacturing as a whole. A detailed discussion of data sources, definitions, and estimation procedures can be found in Appendix B.

Results

United States

Tables 6-1 and 6-2 summarize the effect of United States NAFTA tariff preferences on Mexico's share of U.S. manufactured imports.[19] Table 6-1 shows the impact of changes in NAFTA tariff preferences and other key

---

[18] If other non-tariff barriers, such as quotas, also exist on a particular imported product, the tariff -equivalent of such barriers must be taken into account to get an accurate estimate of the increase in price due to all trade barriers.

[19] Complete results for the United States are reported in tables B-2 and B-3 in appendix B.

Table 6-1
The impact of U.S. NAFTA preferences: Manufacturing sector

	Percent Change in Mexican Share of U.S. imports		
	All Manufacturing		Textiles and Apparel
Due to a 1 percent increase in:	(1)	(2)	(3)
Tariff preference	3.89	2.09	[1]0.31
Tariff preference post NAFTA	-	4.46	5.29
Transport costs	-6.69	-6.67	-9.51
Tariff level	-3.08	-2.47	-2.99
Tariff level post NAFTA	-	-4.44	-2.99
Lagged import share	0.21	0.21	0.15
Exchange rate (peso/dollar)	0.12	0.11	[1] -0.02
Price of imports from Mexico	-0.14	-0.14	-0.36
Exchange rate (NEER)	-0.02	-0.02	-0.01
Price of imports from world	-0.03	-0.03	0.25

[1] Result not statistically different from zero at conventional levels. See table B-2 in appendix B for details.

NOTE: Column (1) shows the impact of U.S. tariff preferences on Mexican import share, controlling for changes in transport costs, exchange rates, export prices, tariff levels, and lagged import share. Column (2) shows the results when the impact of tariff preferences and tariff levels are allowed to differ post-NAFTA. Column (3) contrasts the results for manufacturing as a whole with those for the textile and apparel sector.

Source: USITC calculations. Data on U.S. tariffs and import values from the U.S. Dept. of Commerce. Data on exchange rates from the IMF *International Financial Statistics.*

economic factors on Mexico's share of U.S. imports. Table 6-2 then shows the relative importance of each of these factors in explaining the change in Mexico's import share between 1990 and 2001.

Impact of U.S. NAFTA tariff preferences on Mexican import share

Table 6-1 reports results for three different statistical tests. Column (1) in table 6-1 shows the impact of U.S. tariff preferences on Mexican import share, controlling for changes in transport costs, exchange rates, export prices, tariff levels, and lagged import share. Column (2) shows the results when the impact of tariff preferences and tariff levels are allowed to differ post-NAFTA. In both columns, the tariff preference has a strong positive impact on Mexico's share of U.S. imports. In column (2) between 1989 and 2001, a 1 percent increase in

Table 6-2
Explaining the growth of Mexico's share of U.S. manufactured imports, 1990-2001

	Actual Increase in Average Share: 63 percent		
	Actual Change[1]	**Elasticity[2]**	**Implied Change in Import Share[3]**
			Percent
Tariff preference *(percentage pt.)*	0.8	2.1	1.7
Tariff preference post NAFTA *(percentage pt.)*	1.2	4.5	5.4
Tariff level *(percentage pt.)*	-1.0	-2.5	2.5
Tariff level post NAFTA *(percentage pt.)*	-2.6	-4.4	11.4
Transport cost *(percentage pt.)*	-0.7	-6.7	4.7
Peso/dollar exchange rate *(percent)*	230.0	0.1	23.0
Mexican export price *(percent)*	14	-0.1	-1.4

[1] Actual historical change.

[2] Sensitivity of Mexican import share to a 1-percent change in the policy, cost or price listed on the left. Values taken from table 6-1, column (2).

[3] The values in column (1) multiplied by the corresponding values in column (2).

Source: USITC calculations. Data on U.S. tariffs and import values from the U.S. Dept. of Commerce. Data on exchange rates from the IMF *International Financial Statistics.*

the tariff preference raised Mexico's import share by about 2 percent. However, this impact more than doubled to 4.5 percent after NAFTA implementation. This suggests that NAFTA preferences had a more significant impact on import shares than the preferences extended to Mexico prior to NAFTA.[20] As might be expected, the level of protection is also a critical factor in explaining Mexican import share. On average, a 1 percent higher tariff on a particular product from Mexico, relative to other products, implied a 2.5 percent smaller Mexican share of U.S. imports. This effect intensified after NAFTA implementation, implying a 4.4 percent smaller Mexican share of U.S. imports.

[20] This may be because NAFTA preferences are exclusive to Mexico, whereas GSP preferences of similar size were also received by other developing country exporters. It may also reflect the perception that NAFTA preferences are deeper or more permanent. Finally, it could reflect a perception that the tariff preferences signal other aspects of the agreement, such as investment reforms.

Exchange rate changes and export prices are also important determinants of the Mexican share of U.S. imports during this time period. A 1-percent depreciation of the peso against the dollar would imply relatively cheaper Mexican imports, and lead to a 0.12-percent increase in Mexico's import share, while a 1-percent depreciation of the dollar against other trading partners would increase Mexico's import share by 0.02 percent. A 1-percent increase in the price of imports from Mexico relative to other countries lowered Mexico's share of imports by 0.14 percent.[21] Finally, the higher the Mexican import share in the previous year, the higher the Mexican import share in the present year.

Because individual industries may respond differently to U.S. tariff preferences under NAFTA, the scenario shown in column (2) was estimated for an individual industry in which sufficient data were available: textiles and apparel (HTS 11). Column (3) reports the results for the textile and apparel sector. A comparison of columns (2) and (3) shows that Mexican shares of U.S. imports in textiles and apparel are less responsive than manufacturing to tariff preferences prior to NAFTA, but much more responsive after NAFTA. This may be due in part to the presence of quantitative restrictions (QRs) on apparel and textile imports which were in place prior to NAFTA, but removed after the agreement was implemented.[22] If binding, QRs would limit any response to a tariff preference.[23] Mexico's textile and apparel import share is strongly affected by the extent of tariff reductions (as is manufacturing), and appears more sensitive to changes in the price of Mexican exports and to transport costs than overall manufacturing. Column (3) thus provides some evidence that individual industries may respond differently to trade liberalization.[24]

---

[21] The impact of changes in competing exporters' prices is likely to be small, given that this is an unweighted average price over all sellers. However, its negative impact is unexpected, and may be due to the fact that Mexico is a small seller of many products, hence Mexican export prices move together with other larger competing exporters' prices. Results for the textile and apparel industries (in aggregate) in column (3) show the expected positive sign on price of imports from the world.

[22] For detailed information on the removal of these QRs under NAFTA, see USITC, *The Economic Effects of Significant U.S. Import Restraints*, Third Update 2002, USITC Publication No. 3519, June 2002.

[23] It would be tempting to test the impact of the NTBs in textiles and apparel by including a measure such as the coverage ratio (the percent of tariff lines restricted by the NTB). However, there are several problems with this approach. First, data are not readily available over time prior to NAFTA, so no time variation can be captured. Second, the coverage ratio does not measure the severity of the restriction, only its scope. Third, since the restrictions are voluntary export restrictions, their severity is likely captured in the premium exporters can charge for their products in the U.S. market. This premium is part of the Mexican export price, and as presently calculated, it cannot be separated out of the price variable.

[24] Complete results for textiles and apparel are reported in table B-3, appendix B.

Importance of U.S. NAFTA tariff preferences for Mexico's import share

The results in table 6-1 show the responsiveness of Mexican shares of U.S. imports to U.S. NAFTA tariff preferences and to changes in other key economic factors. To see the relative importance of NAFTA trade liberalization, compared to other economic factors, in explaining actual changes in Mexican shares of U.S. manufactured imports, the results from table 6-1 must be combined with actual historical changes in tariffs, exchange rates, transport costs, and Mexican export price. This is done in table 6-2.

The average Mexican share of U.S. manufactured imports was 4.5 percent in 1991. This share grew by about 63 percent between 1990 and 2001. The relative influence of NAFTA trade preferences and peso devaluation can be approximated by using the values in table 6-2, column (1) and (2). Column (1) shows the actual percentage change in tariff preferences, tariffs levels, transport costs, Mexican export prices and the peso-dollar exchange rate between 1990 and 2001. The largest change during this period was the depreciation of the peso against the dollar by about 230 percent. Column (2) shows the sensitivity of the Mexican import share to a 1 percent change in each economic factor (from table 6-1, column (2)). Multiplying the value in column (2) by 230.0 percent suggests that the actual depreciation of the peso raised Mexico's average share of U.S. imports by about 23.0 percent. This is recorded in column (3). Peso depreciation thus accounts for about one-third of the growth in Mexico's average import share.

Table 6-2 also shows that the impact of U.S. tariff preferences and tariff reductions had a large impact on Mexico's share of U.S. imports. The average U.S. tariff preference toward Mexico grew by 0.8 percentage points (prior to NAFTA), and by 1.2 percentage points after NAFTA. Again, column (2) shows the sensitivity of the Mexican import share to a 1-percent change in these policy variables. Multiplying the values in column (1) by those in column (2) suggests that larger U.S. tariff preference raised Mexico's import share by 1.7 percent prior to NAFTA, and by 5.4 percent after NAFTA (column (3)). The average U.S. tariff on Mexican manufactured goods fell by 1 percentage point prior to NAFTA, and by 2.6 percentage points after NAFTA took effect. Again, multiplying the values in column (1) by those in column (2), the drop in U.S. average tariffs against Mexico raised Mexico's import share by 2.5 percent prior to NAFTA, and by 11.4 percent after NAFTA (column (3)). Adding the first four numbers in column (3) suggests that overall trade liberalization toward Mexico between 1990 and 2001 led to a 21 percent increase in Mexico's average share of U.S. imports. Thus, overall trade liberalization toward Mexico accounted for about one-third of the growth in Mexico's average import share.

Mexico

Tables 6-3 and 6-4 summarize the impact of Mexican NAFTA tariff preferences on the U.S. share of Mexican manufactured imports.[25] Table 6-3 shows the impact of changes in NAFTA tariff preferences and other key economic factors on the U.S. import share. Table 6-4 then shows the relative importance of each of these factors in explaining the change in the U.S. import share between 1991 and 1999.[26]

Impact of Mexican NAFTA tariff preferences on U.S. import share

Table 6-3 shows that Mexican NAFTA preferences had a strong positive impact on U.S. shares of Mexican imports. Column (1) shows the impact of Mexican tariff preferences on U.S. import share, controlling for changes in exchange rates. Column (2) shows the results when the 1991 tariff level and 1991 import share are included. In column (1) a 1-percent increase in the tariff preference extended to the United States increased the U.S. share of Mexican imports by 0.37 percent. This result is independent of the changes in the exchange rate, which also had a significant impact. A 1-percent depreciation of the peso against the dollar decreased Mexican imports from the United States by 0.06 percent. At the same time, a 1-percent real depreciation of the peso against all trading partners, currencies would lead to a 0.002-percent increase in the U.S. share of Mexican imports.

Column (2) shows the importance of historical factors in influencing the U.S. share of Mexican imports. If a U.S. product faced a 1-percent higher Mexican tariff in 1991 relative to other U.S. products, the U.S. share of imports of that product would be 0.84 percent lower in the future relative to other U.S. products. Products in which the U.S. share of Mexican imports was high in 1991 had a larger U.S. share after NAFTA. A 1-percent higher U.S. share in 1991 led to a 0.49 percent higher U.S. share post-NAFTA. Column (2) also shows that after controlling for these historical influences, the impact of the Mexican tariff preferences on U.S. import share is larger. Now, a 1-percent higher Mexican tariff preference toward the United States raises the U.S. import share by 0.44 percent.

[25] Complete results for Mexico are reported in tables B-4 in appendix B.

[26] Limitations in the availability of Mexican tariff data, especially prior to NAFTA, meant that only 3 years of data–for 1992, 1995, and 1999–could be used in the statistical tests. The nonconsecutive nature of the data means that lagged effects cannot be included. In addition, all Mexican import data are c.i.f. value, and thus, unit values and transport costs cannot be calculated.

Importance of Mexican NAFTA tariff preferences for U.S. import share

The results in table 6-3 show the responsiveness of U.S. shares of Mexican imports to Mexican NAFTA tariff preferences and to changes in other key economic factors. Again, to see the relative importance of NAFTA trade liberalization, compared to other economic factors, in explaining actual changes in U.S. shares of Mexican manufactured imports, the results from table 6-3 must be combined with actual historical changes in tariff preferences and exchange rates. This is done in table 6-4.

The average U.S. share of Mexican manufactured imports was about 64.6 percent in 1991. By 1999, this average share had grown by about 2.5 percent. The relative influence of NAFTA trade preferences and peso devaluation can be approximated by using the values in table 6-4, columns (1) and (2). Column (1) shows the actual percentage point change in tariff preferences, the tariffs level, and the peso-dollar exchange rate, between 1990 and 2001. The degree of Mexican trade liberalization was large during this period. Tariffs against the United States fell by about 10 percentage points on average, and preferences rose from zero in 1991 to 12.2 percent in 1999. Column (2) shows the sensitivity of U.S. import share to a 1-percent change in these policies. Multiplying the values in column (2) by those in column (1) suggests that larger Mexican tariff reductions increased the U.S. import share by 8.4 percent, while larger tariff preferences increased the U.S. import share by 5.3 percent. These are recorded in column (3). Adding the first two values in column (3) indicates that overall Mexican trade liberalization between 1991 and 1999 raised the average U.S. share of Mexican imports by about 13.7 percent. Clearly the 230 percent depreciation of the peso counteracted this increase. Again multiplying 230 percent by the corresponding value in column (2) suggests that the depreciation of the peso against the dollar led to an 11.5 percent drop in the average U.S. share of Mexican imports. These results suggest that the overall small growth in U.S. share of Mexican imports was not due to insensitivity to trade liberalization, but due to the counteracting forces of trade liberalization and peso devaluation.

Table 6-3
The impact of Mexican NAFTA preferences: Manufacturing sector

	Percent change in U.S. Share of Mexican imports	
Due to a 1 percent increase in:	(1)	(2)
Tariff preference	0.370	0.440
Exchange rate *(peso/dollar)*	-0.060	-0.050
Exchange rate (REER)	-0.002	-0.002
Tariff level in 1991	-	-0.840
Import share in 1991	-	0.490

Column (1) shows the impact of Mexican tariff preferences on U.S. import share, controlling for changes in exchange rates. Column (2) shows the results when the 1991 tariff level and 1991 import share are included.

Source: USITC calculations. Data on Mexican tariffs and import values from UNCTAD TRAINS. Data on exchange rates from the IMF *International Financial Statistics.*

Table 6-4
Explaining the growth of U.S. share of Mexican manufactured imports, 1991-1999

	Actual Increase in Average Share: 2.5 percent		
	Actual change[1]	**Elasticity[2]**	**Implied Change in Import Share[3]**
			Percent
Tariff preference *(percentage pt.)*	12.2	0.44	5.3
Tariff level *(percentage pt.)*	-10.0	-0.84	8.4
Peso/dollar exchange rate *(percent)*	230.0	-0.05	-11.5

[1] Actual historical change.

[2] Sensitivity of U.S. import sare to a 1-percent change in the policy listed on the left. Values taken from table 6-1, column (2).

[3] The values in column (1) multiplied by the corresponding values in column (2).

Source: USITC calculations . Data on Mexican tariffs and import values from UNCTAD TRAINS. Data on exchange rates from IMF *International Financial Statistics.*

Conclusion

The Commission results suggest that tariff reductions and tariff preferences did have a significant impact on Mexican shares of U.S. manufactured goods imports between 1990 and 2001. From an initial average level of about 5 percent, Mexican shares of U.S. imports grew, on average, by about 63 percent. Of this, roughly one-third could be attributed to tariff reductions and tariff preferences. Another third could be attributed to the appreciation of the dollar relative to the peso. Tariff reductions and tariff preferences had a significantly larger effect after NAFTA relative to the period as a whole. Estimates for the textile and apparel industry showed an even stronger response to trade liberalization and tariff preferences, suggesting that there may be differences in responsiveness to NAFTA trade liberalization across individual industries.

The Commission results indicate that both tariff reductions and tariff preferences had a significant impact on U.S. shares of Mexican manufactured goods imports between 1991 and 1999. The average U.S. share of Mexican imports began at about 65 percent and grew by about 2.5 percent. Though this expansion was small on net, Mexican trade liberalization toward the United States would have implied an expansion of about 13 percent. However, this expansion was nearly completely offset by the depreciation of the peso against the dollar.

CHAPTER 7: Comparative Simulations of the Economywide Effects of the Five Trade Agreements Negotiated Under Fast-Track Authority

Overview

This chapter provides a consistent structural analysis of the five trade agreements negotiated under fast-track authority. The analysis uses time appropriate data on trade and overall economic conditions to quantify the difference between the economy as observed under liberalization (the benchmark) and the simulated economy in the absence of liberalization. For transparency, and to highlight the relative impacts of each agreement, the simulation model captures the imposition of those specific, quantifiable distortions[1] that were explicitly eliminated under the agreements.[2] The model captures only those changes that arise as a result of relative price changes.[3] The

[1] A distortion in this context refers to any policy instrument that causes a change to the market-clearing price and quantity. One definition of distortion in this context is "[a]ny departure from the ideal of perfect competition that interferes with economic agents maximizing social welfare when they maximize their own. [It] Includes taxes and subsidies, tariffs and nontariff barriers, externalities, incomplete information, and imperfect competition." (Alan V. Deardorff, *Deardorff's Glossary of International Economics*, found at *http://www-personal.umich.edu/~alandear/glossary/*, downloaded June 8, 2003) This study explicitly considers only ad valorem tariffs and quantity restraints on trade. However, these distortions interact with other distortions implicit in the model, including domestic tax policy.

[2] Some portions of the agreements were not in force at the time of the study (2002-2003), and therefore, were not included as a part of the simulation analysis. Some important examples of scheduled liberalizations that are not considered here include the final phase out of textile and apparel quotas under the Agreement on Textiles and Clothing (a part of the Uruguay Round) on Jan. 1, 2005; and the scheduled elimination under NAFTA of restrictions on imports of sugar and other agricultural products originating from Mexico.

[3] The model only considers the effect on relative prices of the quantifiable trade distortions (that is, tariffs and those non-tariff barriers that have been quantified in publicly available sources) removed by the agreements. Unquantified policy changes,

purpose of the simulations is to provide a consistent and widely acceptable framework for assessing the relative impacts of the direct liberalization embodied in each agreement using verifiable, publicly available data.

The simulations discussed below suggest that of the five agreements analyzed, the two multilateral agreements – the Tokyo Round and the Uruguay Round[4] – had the greatest impact on welfare. The welfare impact of the other agreements rose with the intensity of the pre–existing trading relationship and the magnitude of tariff cuts. NAFTA ranks as the most important, followed by the U.S–Canada FTA and the U.S.–Israel FTA. Had the United States not entered into the five agreements, the model suggests that welfare would have been lower by approximately 0.6 percent of real income in 2001.

The estimated impacts produced in the simulations here are conservative from a quantitative and a theoretical perspective. The trade policy changes considered in the analysis are only those that have been quantified in publicly available sources (i.e. tariff and selected non–tariff barriers). The model only considers the effects of relative price changes attributable to trade policy changes. As has been discussed throughout this report, trade policy might plausibly be linked to increasing scale economies or higher productivity levels. Because the evidence for these effects is somewhat mixed, this exercise does not attribute changes in productivity levels or in firm scale to changes in trade policy. Models that allow for increased scale economies and productivity effects from trade liberalization generally suggest larger welfare gains from liberalization.[5] In chapter 8, we present a model where consumers value product variety and trade policy induces changes in product variety. In this chapter, however, no such changes occur to welfare through this mechanism.

---

[3]—*Continued*
such as agreements on trade in services in the Uruguay Round, are not included. Therefore, the model likely understates the effect of the agreements on relative prices. By limiting its analysis to the effect of relative price changes, the model does not take into account economic impacts that may go beyond relative price change. For example, trade agreements may have increased product variety, an effect discussed in chapter 8.

[4] Data requirements limit the analysis to the years 1978-2001. Two of the agreements, the Uruguay Round and NAFTA, had not been fully implemented by 2001. For example, the Agreement on Textiles and Clothing, a part of the Uruguay Round, was not fully implemented in 2001. The modeled effects of these agreements would have been are relatively larger had these agreements been fully implemented by 2001.

[5] Thomas F. Rutherford and David G. Tarr (“Trade Liberalization, Product Variety and Growth in a Small Open Economy: A Quantitative Assessment,” *Journal of International Economics*, vol. 56, pp. 247-272, 2002) contrast the welfare effects of trade liberalization obtained in standard (constant-returns-to-scale) models and their model, which includes scale economies. Rutherford and Tarr find welfare impacts many multiples higher than those obtained in standard models.

Approach

The tool used to analyze the economy in the absence of liberalization is a numeric or computable general equilibrium model calibrated to the observed trade flows, and macro– and microeconomic conditions of the U.S. economy over the historical period from 1978 to 2001.[6] The numeric model is a mathematical representation of the economy, simulating the interaction of producers and consumers where each agent maximizes its own welfare subject to resource endowments and market prices. Resource and technological constraints interact with trade barriers to determine overall welfare. For this exercise resource endowments and technologies are held constant across the policy simulations. Doing so allows for an experiment that completely controls for shocks that are contemporaneously correlated with policy changes. Only those impacts that are specifically (structurally) attributed to policy appear in the simulation. Thus, the technique employed here is more akin to the ex ante studies reviewed in chapter 4, but it is applied in an ex post analysis of the agreements.

The motivation for using an ex ante technique for assessing past agreements is to isolate the economywide impact of the policy of interest. Other sources of U.S. economic change, apart from the agreements and including those identified in chapter 4, make it difficult to isolate the effects of trade policy changes in an economy–wide context. Ex post analysis typically explores statistical relationships between trade policy changes and economic outcomes. While it is often possible to isolate effects on individual sectors facing liberalization, indirect effects are usually too difficult to isolate from other changes occurring in the economy. It is especially difficult to trace the effects of trade policy changes on one sector, such as apparel and other textile products, onto other sectors, such as retail trade. The simulations presented here rely on a particular theoretical structure of economic behavior to provide a framework for passing the effects of trade policy changes onto the broader economy.[7] Employing such a framework is important, because sectors most directly affected by liberalization (goods sectors) account for a relatively small share of national output, and the much larger service sectors are often affected indirectly.

In the simulation model, each year in the past represents a static equilibrium in which all resource and technological relationships are calibrated to a best estimate of the historical baseline. Yearly calibration directly accommodates changes in population, productivity and tastes over time, as well

[6] Appendix C of this report includes a technical description of the model used for the simulations that appear in this chapter. Details of the data and construction of the social accounts can be found in Edward J. Balistreri and Alan K. Fox, "TSCAPE: A Time Series of Consistent Accounts for Policy Evaluation," USITC Working Paper 2003-5-A, 2003.

[7] For more details on model structure, see appendix C.

as macroeconomic phenomena related to business cycles. The realized tariff reductions and phase-in periods embodied in each agreement are also directly accommodated in the baseline calibration. The baseline equilibrium for the U.S. economy replicates the historical series on real 1996 dollar merchandise trade flows with specific trade partners covered by the agreements and the world as a whole. The baseline also replicates aggregate income and other specific series from the National Income and Products Accounts (NIPA) published in the annual Economic Report of the President. Production technologies are determined by using the detailed benchmark input-output accounts published every five years by the Bureau of Economic Analysis of the U.S. Department of Commerce (USDOC).

The model depends on a set of response parameters as well as on the calibrated baseline data. These parameters establish the model's behavioral responses to price changes. A key response parameter governing model results is the elasticity of substitution between domestic and foreign varieties of a given commodity. Estimates of these parameters are taken from econometric literature on international trade.[8] A back-of-the-envelope calculation indicates that an average trade elasticity of about 5, combined with the trade-weighted average tariff reduction for all agreements of 3 percentage points (calculated in chapter 3 of this report) might be expected to yield about a 15 percent increase in trade flows. In comparison, the simulation results below showed about a 12 percent change in trade flows.[9] Other important response relationships are dictated by other elasticities. For example, consumers in the model are assumed to make decisions based on Cobb-Douglas[10] preferences. Firms substitute between capital and labor according to a Cobb-Douglas technology, but use intermediate inputs in fixed proportions to the value-added composite.

With the benchmark and response parameters established, the model can simulate a counterfactual equilibrium in which tariff and other concessions

---

[8] David Hummels, Purdue University, uses U.S. data on trade and trade costs to estimate the degree to which trade flows change with changes in trade costs. The simulation model uses Hummels' estimates, at the 1-digit level, to map trade-policy changes into trade-flow changes. The 1-digit estimates were obtained through personal correspondence with David Hummels. The estimation methodology can be found in David Hummels' paper, "Toward a Geography of Trade Costs" (mimeo, Purdue University, 2000).

[9] The difference between the back-of-the-envelope calculation and the structural model simulation might generally be attributed to the complexity of the modeled economy and more realistic characterization of the actual policies. For example, the back-of-the-envelope calculation does not track the imports diverted from rest-of-world imports to imports from a free-trade agreement partner. This and other complexities may act to mitigate the overall trade response. Model-based calculations are more reliable because they can explicitly account for such complexities.

[10] In a Cobb-Douglas formulation, the budget shares devoted to each good remain constant.

embodied in the trade agreements are not eliminated. The general methodology for implementing counterfactual U.S. import policy is to adopt the rate of protection (using calculated duties) in the year prior to the enforcement of the agreement. The removal of partner-country concessions is also incorporated to reflect the overall impact of the agreement on trade prices.[11] The counterfactual simulations should be interpreted as “but for” the agreement. In the but-for economy, U.S. trade barriers increase and prices received by U.S. exporters fall. The net result of not entering the trade agreements is restricted trade. Unlike traditional ex post analyses, this is more an assumption than an empirical result. Essentially, the simulation model aids in the quantification of this assumption and permits the ranking of the relative importance of the different agreements.

Simulation scenarios were designed to take advantage of data on collected duties and minimize qualitative assessments of what the world would have looked like under a set of hypothetical circumstances. With only data on duties, for example, it is not possible to establish what concessions the United States' free-trade agreement partners might have made under the Uruguay Round but in the absence of the U.S. trade agreement. The liberalizations were thus cumulatively removed from the point of view of the year prior to enforcement. This approach allowed for an analysis of the marginal effect of each agreement, as well as the aggregate effect of all agreements that follow a particular agreement. The central scenarios are:

1. But-for: Uruguay Round
2. But-for: Uruguay Round and NAFTA[12]
3. But-for: Uruguay Round, NAFTA, and U.S.-Canada FTA

---

[11] A number of different sources were used to establish the changes in export prices that might be attributed to each agreement. J. Michael Finger, Merlinda D. Ingco, and Ulrich Reincke, *The Uruguay Round: Statistics on Tariff Concessions Given and Received*, (World Bank: Washington D.C., 1996) was used to establish the concessions received by the United States under the Uruguay Round. For NAFTA and the U.S.-Canada FTA direct duty data was obtained from the TRAINS database published by the United Nations Conference on Trade and Development. Bernard D. Reams Jr., *The Trade Agreements Program of the United States: Annual Reports of the President 1957-1985: Volume 3*, (Buffalo, New York: William S. Hein and Co., Inc., 1989), was used to establish the concessions received by the United States under the Tokyo Round. Although there was a lack of data on concessions received by U.S. exporters to Israel, an assumption was made that export prices to Israel increased by 3 percent under the U.S.-Israel FTA.

[12] The policy changes linked to NAFTA in the exercise are only changes in Mexican policy and changes in U.S. policy toward Mexico. Canadian policy changes and U.S. policy changes toward Canada are attributed to the U.S.-Canada FTA.

4. But–for: Uruguay Round, NAFTA, U.S.–Canada FTA, and U.S.–Israel FTA

5. But–for: Uruguay Round, NAFTA, U.S.–Canada FTA, U.S.–Israel FTA, and Tokyo Round.

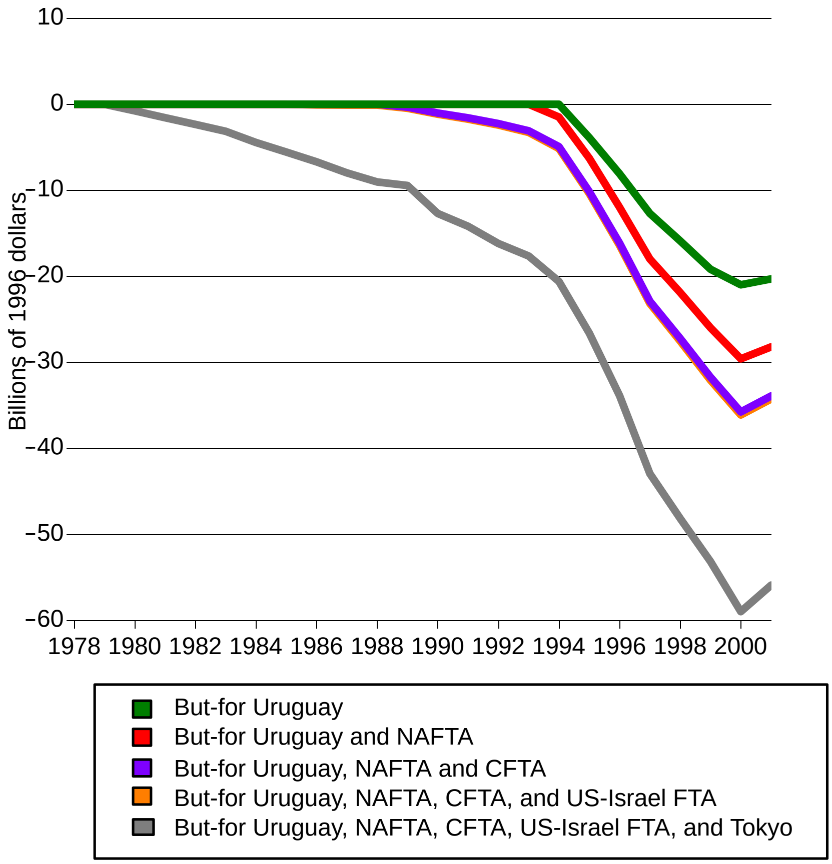
In the first scenario, trade barriers were set for all future years beyond 1994 at a level consistent with the tariffs and nontariff barriers measured in 1994, the year prior to enforcement of the Uruguay Round. Trade barriers for U.S. free–trade agreement partners remained at their baseline values; U.S.–Mexico tariffs are implicitly unaffected by the removal of the Uruguay Round. This scenario simulated the but–for Uruguay Agreement equilibrium. The second scenario included the but–for Uruguay Round changes in barriers and added the changes to the set of trade barriers between the United States and Mexico removed in response to NAFTA. Trade barriers between the United States and Mexico were set for all future years beyond 1993 at a level consistent with the barriers between the United States and Mexico measured in 1993, the year before NAFTA came into force. The second scenario simulated the but–for NAFTA and Uruguay equilibrium.

Similarly, subsequent scenarios compounded the impacts of suppressing the liberalization of the next previous agreement. For example, the third scenario included all the changes in barriers from scenario 2 and added the changes to the set of trade barriers between the United States and Canada removed in response to the U.S.–Canada FTA. Trade barriers between the United States and Canada were set, for all subsequent years beyond 1988, at a level consistent with the observed barriers between the United States and Canada in 1988, the year before the Canadian agreement went into force. This step–by–step unwinding of trade agreements facilitates analysis of the aggregate and marginal impacts of the agreements. This approach avoids making arbitrary assumptions about what concessions the United States might have received during later negotiations had prior agreements not occurred. That is, no judgment is made about the form the Uruguay Round might have taken had NAFTA never been implemented.

Principal Finding

Within the simulation model the most relevant summary measure of the economywide effects of the trade agreements is the simulated change in welfare, as measured by the money–metric equivalent variation. Change in welfare measures the income loss in 1996 dollars equivalent to eliminating the liberalizations embodied in the agreements. Figure 7–1 shows the welfare changes attributed to each scenario. In 2001, for example, the annual welfare loss attributed to the but–for–Uruguay scenario (the removal of the Uruguay Round tariff cuts) was approximately $20 billion in 1996 dollars. In the but–for–all–agreements scenario the loss was more than $56 billion in 1996 dollars, approximately 0.6 percent of real income in 2001. The annual welfare

Figure 7-1
Change in welfare relative to baseline that includes trade agreements



Source: Commission calculations.

losses attributed to each agreement generally rise over time for two primary reasons. First, liberalization is gradual due to phase–in schedules embodied in the observed duties; and second, trade accounted for a growing share of U.S. output over the period.[13]

[13] Note that aggregate trade in 2001 was below trade in 2000 (see Figure 7-4) in part due to a recession. As a result, welfare losses from removal of the trade agreements are lower in 2001 than in 2000.

Applying a 5 percent discount rate to the historical welfare losses associated with not entering any of the five trade agreements produces the calculated result that the 2001 present value of aggregate welfare loss totals $595 billion in 1996 dollars. This aggregate welfare loss represents 0.2 percent of the 2001 present value of the corresponding aggregate income from 1980 through 2001.[14]

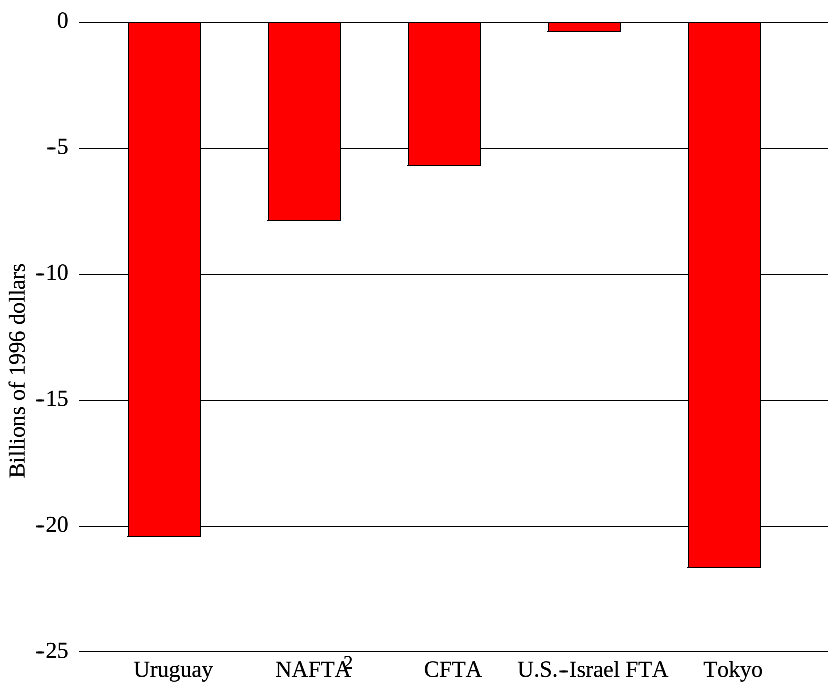
Figure 7–2 shows a decomposition of the welfare impacts in 2001 into the portions attributable to each agreement. The marginal effect of each agreement was analyzed by subtracting the next most inclusive scenario. For example, the marginal impact of the Tokyo Round Agreement in 2001 was computed by subtracting the welfare loss under scenario 4 from scenario 5 (–$56b less –$34b = –$22b). The welfare losses attributed to the removal of the multilateral Uruguay and Tokyo Rounds were the largest. The losses associated with removing NAFTA, which only includes the marginal impact of adding Mexico to the U.S.–Canada FTA, are slightly larger than those associated with removing the Canadian agreement. To look at North American trade as a whole, including both Canada and Mexico, the impacts of the U.S.–Canada FTA and NAFTA should be added together. The simulated welfare loss associated with removing both NAFTA and the U.S.–Canada FTA in 2001 was approximately $14 billion. The U.S.–Israel FTA had a very small relative impact (–$0.3 billion) due to the relatively small trade flows between the United States and Israel.

These simulation results are consistent with standard theories of international trade. Multilateral agreements–such as the Tokyo and Uruguay Rounds–tend to have a larger impact for two reasons. First, more trade is covered by multilateral liberalizations, since most of the world's goods are traded among GATT signatory countries. Second, there are no offsetting losses from trade diversion, again thanks to the multilateral framework of these agreements. Turning to the bilateral agreements, the impact of NAFTA was relatively larger than the impact of the U.S.–Canada FTA because Mexico's tariff cuts were so large. At the time of the establishment of the U.S.–Canada FTA, Canada's tariffs against U.S. exports were already relatively low. And lastly, the impact of the U.S.–Israel FTA was the smallest both because tariffs were already low before the agreement and Israel's share of the U.S. market was small.

---

[14] The year 1980 was used as the first year of the present-value calculation because this was the first year in which the scenario was different from the baseline (the first year of the Tokyo Round phase-in).

Figure 7-2
Marginal welfare impact of removing agreements in 2001[1]



[1] Displays the incremental impact of reimposing the quantifiable trade restrictions eliminated by each of the agreements. The policies are imposed on a numeric model of the U.S. economy

[2] Considers only the effect of Mexican policy changes and U.S. policy changes with respect to Mexico

Source: USITC.

Baseline

To establish a baseline for comparing the simulated removal of trade agreements, the model was calibrated to historical data from 1978 to 2001.[15] Calibration involves establishing a complete dataset for the model that is internally consistent with the accounting rules of the model. This process

[15] Details of the data and construction of the social accounts can be found in Edward J. Balistreri and Alan K. Fox, "TSCAPE: A Time Series of Consistent Accounts for Policy Evaluation," USITC Working Paper 2003-5-A, 2003.

imposes a set of consistency conditions that will generally fail when combining unadjusted data from different sources. Priority was therefore given to maintaining the integrity of data from certain sources. For example, the aggregate NIPA series on real GDP, published in the annual Economic Report of the President, is reproduced in the baseline model run. Figure 7–3 presents these data in a chart. The baseline data are useful for putting the scenario results in the context of the overall size of the U.S. economy. Figure 7–3 also decomposes GDP into its labor and other–value–added components. Labor's value share of GDP over the series averages about 58 percent. Other–value–added includes payments to property type income, and indirect business taxes and non–tax liabilities.

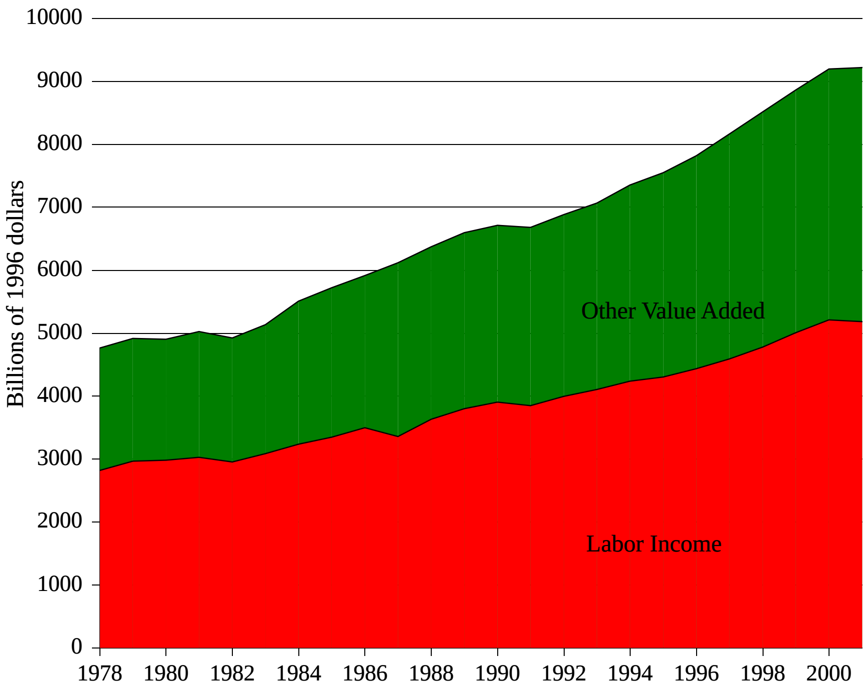
The integrity of the merchandise trade flows and duty payments is also maintained in the calibration process because of the focus of analysis on detailed changes to international trade policy. These current–dollar customs–level series are aggregated and converted into real 1996 dollars. Combining the information from the NIPA totals and the detailed benchmark input–output tables determined the nonmerchandise trade flows. Figure 7–4 presents aggregate real imports and real exports that are generated in the baseline equilibrium.

Trade has become a much larger component of the U.S. economy over the baseline period. In 1978, imports were 7 percent of GDP, growing to 16 percent of GDP in 2001. In 1978, exports were 6 percent of GDP; by 2001 they had risen to 12 percent. The dramatic relative growth in baseline trade is important as a point of context for the scenario results. Clearly, some of the trade growth is directly attributable to the trade agreements under analysis here, but much of it cannot be directly linked to the measured changes in barriers. If the growth is not attributed to the changes in tariff and nontariff barriers embodied in the agreements, the baseline indicates significant structural change. Figure 7–5 illustrates the relative trade growth by converting real–baseline GDP, imports and exports into quantity indices normalized on their respective 1978 levels.

Detailed Results

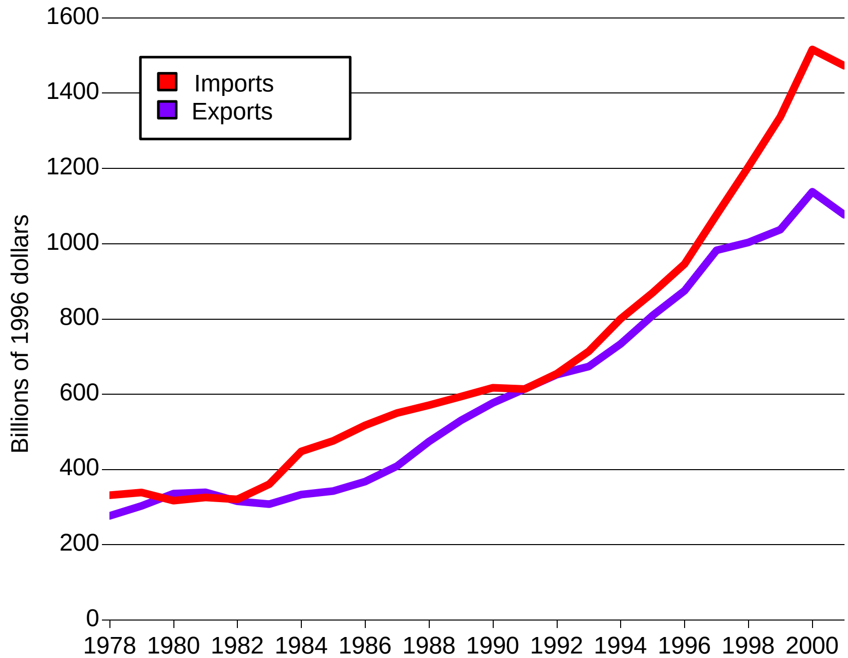
Figure 7–6 shows changes in imports and illustrates the aggregate impacts that the agreements had on trade volumes. The aggregate change in exports will be the same, evaluated at world prices, because of the trade balance constraint (no change in baseline balance–of–payments position). The agreements signed under trade promotion authority had a substantial impact on trade volumes. Under scenario 5, in which all agreements are removed, 2001 imports (and exports) are $178 billion less than the levels that were observed in 2001. As with the welfare results, the greatest trade impacts were attributed to the multilateral Tokyo and Uruguay Agreements. The North American agreements also had significant impacts on trade volumes, whereas the U.S.–Israel FTA had very little impact on aggregate trade.

Figure 7-3
Baseline real gross domestic product



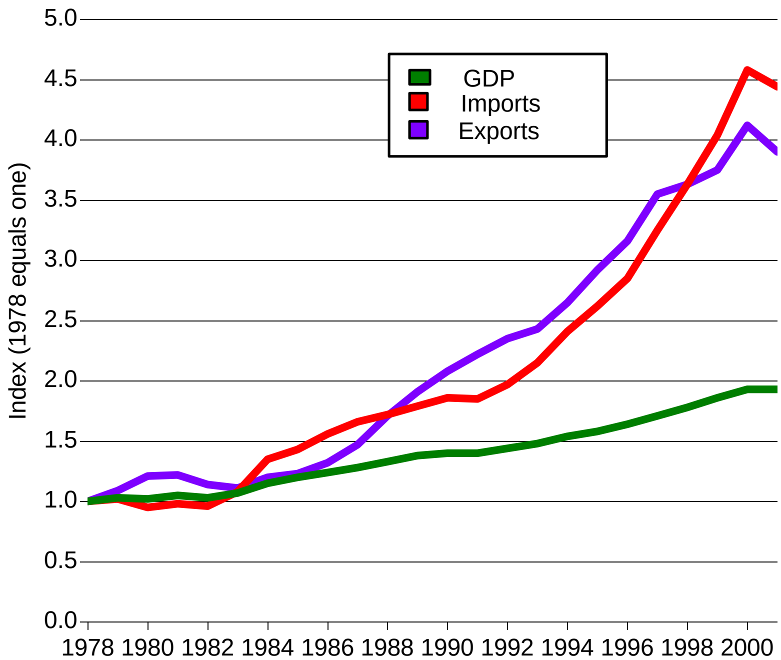
Source: Edward J. Balistreri and Alan K. Fox, 2003, "TSCAPE: A Time Series of Consistent Accounts for Policy Evaluation," USITC Working Paper 2003-05-A (May).

Figure 7-4
Baseline real imports and exports



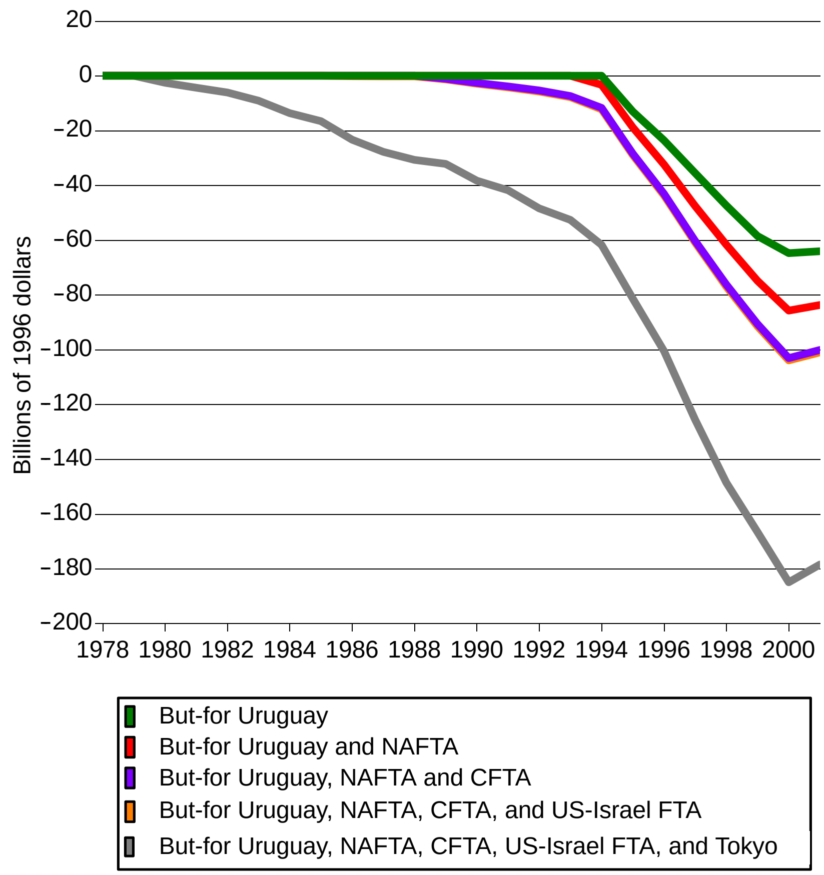
Source: Edward J. Balistreri and Alan K. Fox, 2003, “TSCAPE: A Time Series of Consistent Accounts for Policy Evaluation,” USITC Working Paper, 2003-05-A (May)

Figure 7-5
Benchmark quantity indices for real income and trade



Source: Edward J. Balistreri and Alan K. Fox, 2003, "TSCAPE: A Time Series of Consistent Accounts for Policy Evaluation," USITC Working Paper, 2003-05-A (May)

Figure 7-6
Change in aggregate imports relative to baseline



Source: Commission calculations

Although the magnitudes of trade reductions were sizeable when all of the agreements are removed, the impacts were small relative to overall trade growth during the same period. Referring back to Figure 7–4, imports grew a total of $1.1 trillion from 1978 to 2001. Of this total, the model attributed 15 percent of the growth to the agreements. The other 85 percent of import and export growth were implicitly attributed to other factors that contributed to trade growth. Other factors may include U.S. and foreign income growth, unilateral economic reforms in developing countries, and innovation in transportation and communication technologies. These effects cannot be quantified in the model without specific data or assumptions on their change over time.

The aggregate results might also be summarized in terms of changes in income. This income change can be decomposed into labor, capital, and tariff revenue components. The simulation model has a stylized representation of the labor market. Only one type of labor is assumed, and the market always clears with full employment at the baseline levels. Total compensation to workers changes, however, due to changes in the market clearing wage (relative to the true-cost-of-living index, the numeraire). Overall, in 2001 under scenario 5, labor income fell by 0.8 percent ($40 billion). This reduction indicated that removal of the trade agreements reduced net demand for labor. Similarly, the removal of agreements decreased the net return to capital, reducing other-value-added payments by 0.7 percent ($30 billion). Offsetting these income decreases was a gain in tariff revenues (when the agreements are removed) totaling $50 billion in 2001 under scenario 5.

CHAPTER 8:
Growth in Product Variety

There are a number of ways in which economies benefit from increased international trade. In the simulation model used in chapter 7, trade agreements increase U.S. welfare because they lower the price of U.S. imports and raise the price of U.S. exports.[1] While relative price changes are likely the primary benefit of trade agreements, theoretical models of international trade suggest another important benefit–U.S. tariff reductions allow a wider variety of products to be sold in the U.S. market. Added variety can benefit consumers if they value having choices among multiple products. Firms buying imported intermediate goods can also benefit from access to a wider variety of products. Because standard models do not relate tariff reductions to greater product variety, they may understate the benefits of trade liberalization.

This chapter documents a notable feature of recent U.S. trade growth–growth in the number of import sources per imported commodity. In 1978, the U.S. imported from an average of 39 countries per SIC 4-digit commodity. By 2001, the number of import sources per commodity had risen to 58. Calculations in this chapter indicate that 2.5 percent of U.S. import growth since 1978 can be attributed to the increased number of trading partners per product.

There are a number of possible explanations for the growth in the number of product-country pairs in U.S. imports.[2] During the time period considered in this report, many countries undertook significant political and economic reforms that facilitated their wider participation in world markets.[3] As mentioned in chapter 4, technological innovations in transportation and communication technologies have also facilitated trade growth. The analysis in

[1] Such changes raise the average standard of living because increased export prices raise average income, while decreased import prices reduce the cost of living.

[2] In what follows, "product-country pair" is used to indicate imports of a specific product originating in a specific country. For example, "computer equipment from China" identifies a product-country pair. The chapter investigates growth in the number of product-country pairs per product in which U.S. imports are recorded, and measures the share of total trade growth attributable to new product-country pairs.

[3] Several reforming countries are significant U.S. trading partners, including Mexico, China, India, and Indonesia. The trade agreements considered in this study may have had some role in helping to make reform efforts more credible. However, it is quite likely that such reforms would have occurred, even in the absence of the trade agreements.

this chapter employs an econometric model to estimate the role of tariff reductions in increased import variety. While the statistical relationship between tariff cuts and new import sources is weak, model estimates suggest that between 1.3 and 3.5 new varieties, or approximately 5 to 20 percent of growth in U.S. import variety since 1978, can be attributed to U.S. tariff reductions.

Theoretical models of international trade developed over the last two decades suggest that the economic benefits associated with new import sources may be large. If buyers of imports consider goods from new import sources to be qualitatively different than goods from existing sources, standard models will understate the value of trade liberalization to the U.S. economy. If, on the other hand, the goods from new sources cannot be distinguished from the goods from existing sources, there is no benefit from the increased number of import sources.[4] In that case, the standard gains from trade, like those measured in chapter 7, would be a more appropriate measure of welfare changes.

This chapter employs a calibrated theoretical model to demonstrate the possible magnitude of the gains from new varieties induced by tariff reduction. Estimates from that exercise suggest that increased product variety may account for as much as three-quarters of the welfare gain from U.S. tariff reductions. Thus, standard models, which measure only the effects of relative price change, may substantially understate the welfare gains from trade agreements.

Theoretical Discussion

Theoretical discussions of the role of product variety in international trade began with models by Krugman and Ethier.[5] In both these models, individual firms produce different varieties of the same product. In the Krugman model, trade occurs because consumers wish to consume a variety of products. Consumers' taste for variety leads them to demand foreign varieties. In Ethier's

---

[4] For example, consumers might view a woman's blouse from Mexico and a woman's blouse from China as the same product, or the new Chinese variety might have been produced in Mexico at one time. In these cases, importing blouses from Mexico and China would be no different, in a welfare sense, than importing from Mexico or China alone. This chapter considers the possibility that new sources represent new varieties. The exercise is intended to suggest a possible gain from trade missing in standard models like that used in chapter 7.

[5] Paul R. Krugman, "Increasing Returns, Monopolistic Competition and International Trade," *Journal of International Economics* ,vol. 9, No.4, November 1979, pp. 469–79; and Wilfred J. Ethier, "National and International Returns to Scale in the Modern Theory of International Trade," American Economic Review, June 1982, vol. 72, No. 3, pp. 389–405.

model, having access to a greater variety of intermediate goods raises a firm's productivity. In both models, the economic gains from increased variety are the reason for international trade. Romer argues that economic models without a role for increased product variety may substantially understate the value of international trade.[6]

Most theoretical models that include a role for product variety attach varietal differences to the output of individual firms. Unfortunately, trade data are infrequently available at the firm level, so empirical research typically attaches varietal differences to a product's country of origin. By assumption, buyers of imports (consumers, firms, or both) treat electronic equipment from Canada as an imperfect substitute for electronic equipment from Germany, and buyers are assumed to desire imports from each source.[7] This chapter follows this convention, treating the output of each country as a distinct variety of the good in question. This chapter focuses on product-country pairs that are new to the U.S. market since 1978.

Several empirical applications, some of which are reviewed in chapter 4, are relevant to the work in this chapter. Evenett and Venables decompose growth in developing country exports from 1970 to 1997.[8] This chapter employs Evenett and Venables' method to decompose growth in U.S. imports. Following Schott, the chapter identifies country groupings that are most responsible for U.S. import growth.[9] Subsequent work in this chapter adapts a model and technique proposed by Klenow and Rodgriguez-Clare, who estimate the welfare gains from Costa Rican liberalization in the mid 1980s.[10]

---

[6] Paul M. Romer, "New Goods, Old Theory, and the Welfare Costs of Trade Restrictions," *Journal of Development Economics*, vol. 43, 1995, pp. 5-38.

[7] This is the Armington assumption, that goods are differentiated by their country of origin. This treatment was first proposed in Paul Armington, "A Theory of Demand for Products Distinguished by Place of Production." *International Monetary Fund Staff Papers*, March 1969, vol. 16, No. 1, pp. 159-78. The Armington assumption underlies many applied trade models, including the Global Trade Analysis Project (GTAP) model and the model used in Chapter 7 of this report.

[8] Simon J Evenett and Anthony J. Venables, "Export Growth in Developing Countries: Market Entry and Bilateral Trade Flows," July, 2002. Presented at the National Bureau of Economic Research Summer Research Institute. Downloaded from the internet site *http://www.nber.org/~confer/2002/si2002/venables.pdf* on April 24, 2003.

[9] Schott, Peter K. "Do Rich and Poor Countries Specialize in a Different Mix of Goods? Evidence from Product-Level U.S. Trade Data," National Bureau of Economic Research Working Paper 8492, September 2001.

[10] Peter J. Klenow and Andres Rodriguez-Clare, "Quantifying Variety Gains from Trade Liberalization," September 1997, Graduate School of Business, University of Chicago. Downloaded from web page of Peter Klenow *http://www.klenow.com/QuantifyingVariety.pdf* on Nov 12, 2002.

Data

The primary data source employed in this study is the U.S. import series from the Department of Commerce (DOC).[11] In the construction of this data, product categories from the Trade Statistics of the United States of America (TSUSA) and Harmonized Tariff System (HTS) were concorded to 4-digit Standard Industrial Classification categories.[12] Some part of the phenomenon measured here may include changes in product classification systems over time–what appears as a new product may simply represent a reclassification of an existing product. Considerable efforts were undertaken to reconcile the two data systems, but analysis of product variety is sensitive to the process of reconciliation.

A number of political changes since 1978 also complicate this analysis, including the break-up of political units like the Soviet Union, and the mergers of political units like East and West Germany. In order to ensure a consistent number of possible U.S. trading partners over time, geographic areas that were unified in any time period during our sample are identified as a single trading partner for the purposes of this analysis. Thus, for analytical purposes, the former Soviet Republics are grouped into a single country, as are other groups of countries that were broken apart or merged during the period 1978-2001.[13] Products from political subdivisions that have their own import code in U.S. trade statistics are treated as distinct from products exported from the parent country.[14]

Historical Experience

Figure 8-1 shows annual average number of import sources per SIC 4-digit category. In 1978, the U.S. imported from an average of 39 import sources per SIC 4-digit commodity. By 2001, that figure had risen to 58. While import variety has generally increased over time, Figure 8-1 reveals an interesting aberration in the mid 1980s. Import product variety increased rapidly in the mid-1980s, and then fell back to its long-term growth trend in the late 1980s. The deviation from the trend appears to be connected with changes in the real

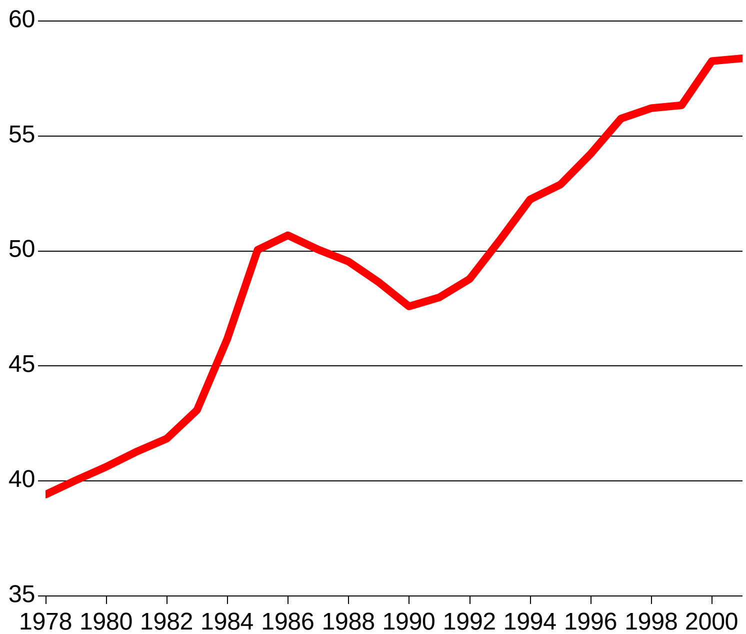
[11] Because DOC collected the data under two different classificiation schemes, the data were concorded to allow a single classification scheme. The concordance procedure is described in Edward J. Balistreri and Alan K. Fox, “TSCAPE: a Time Series of Consistent Accounts for Policy Evaluation,” USITC working paper 2003–5–A, 2003.

[12] The United States collected data under the TSUSA classification system through 1988. Since 1989, trade data has been collected under the HTS system. Combining these data series required an exercise of mapping products into a single classification system.

[13] The former republics of Yugoslavia are treated as a single variety, as are the combination of North and South Yemen, Israel and the West Bank/Gaza, the Czech and Slovak Republics, Eritrea and Ethiopia, and East and West Germany.

[14] So, for example, Aruba’s products are treated as distinct from the products from the Netherlands.

Figure 8-1
U.S. import sources per SIC4 commodity



Source: USITC calculations based on U.S. Department of Commerce data

exchange rate. The Federal Reserve's price-adjusted broad dollar exchange rate index increased by 19 percent between March 1983 and March 1985,[15] increasing the real purchasing power of dollars in world markets. The same index fell from 29 percent between March 1985 and March 1988,[16] reflecting a decline in the purchasing power of dollars. In time periods where U.S. importers have had relatively more purchasing power, they have imported from relatively more sources.

[15] USITC calculations based on the Federal Reserve's "price adjusted broad-dollar index," downloaded from Internet address *http://www.federalreserve.gov/releases/h10/Summary/indexbc_m.txt* on April 23, 2003.

[16] Ibid.

New Varieties in Trade Growth, a Decomposition

To better understand the significance of new country-product pairs in overall trade growth, a decomposition method proposed by Evenett and Venables is applied to U.S. import data over the period 1978-2001. At the 4-digit SIC level, 2.5 percent of import growth can be attributed to imports from new trading partners. Most of the new growth attributed to new country-product pairs occurs in countries the World Bank classifies as "middle income" countries. Countries that joined the GATT/WTO during the years 1978-2001 accounted for a larger share of import growth in new product country pairs than countries that were either members of the GATT in 1978, or countries that were not members of the WTO in 2001. One percent of all import growth between 1978 and 2001 occurred in products that China began exporting to the United States during the period.

Method

Evenett and Venables show that trade growth can be decomposed into three components: new trade in products not traded before, growth in the trade of products already traded, and reduced trade due to the discontinuation of trade in some products. They suggest a further decomposition of the second category - growing trade in products already traded. U.S. imports in already traded products may have grown because the United States imports more from existing sources or because the United States imports the product from new sources. U.S. imports of existing products may also decline because some exporters discontinue exporting to the United States. The category of interest in this chapter is the share of trade growth that can be attributed to new exporters of existing products.[17]

One part of the analysis uses country groupings to establish commonalities among the countries that became exporters of new products to the United States. The first country grouping emphasizes the timing of a country's accession to the General Agreement on Tariffs and Trade or the World Trade Organization. A second grouping emphasizes new exporters' level of average income. The World Bank classifies countries into three levels of development - low income, middle income, and high income.[18] In this analysis, countries are grouped according to the World Bank's characterization of their income status in 1999.

---

[17] For example, in 1978, the U.S. did not import any products in the "electronic computers" category (SIC 3571) from China. By 2001, Chinese exports accounted for 11 percent of total U.S. imports of electronic computers.

[18] World Bank, "Classification of Economies by Income and Region, 2000," *World Development Report 2000/2001: Attacking Poverty*, p. 334, Oxford University Press, New York, 2001.

Because the number of exporters in a given commodity varies from year to year, Evenett and Venables use four-year averages to characterize trade at the beginning and end of the period. In this case the first four years of data are 1978-1981, so the initial level of trade in a given product-country pair is defined as the average annual value of trade in that product-country pair over the years 1978-1981. The final four years of data are 1998-2001, so the end-of-period flows are the average over these four years. Thus, in the decomposition analysis, new product-country pairs only appear if the United States did not import the product from a country in 1978-1981, but did so in the years 1998-2001.

Results

Table 8-1 shows Evenett and Venables' top-level decomposition. Ninety-five percent of United States import growth occurred in products that were traded throughout the period. Some products that the United States imported in 1978-1981 were not imported in 1998-2001, and this accounts for -0.3 percent of trade growth. Product categories that had no trade in 1978-1981 accounted for 5.4 percent of trade growth. Virtually all of this increase can be attributed to trade in computer storage devices.[19]

Table 8-1
Decomposition of trade growth

Category	Share of import growth
	Percent
Continued products	95.0
Discontinued products	-0.3
New products	5.4
Total	[1]100.0

[1] Components do not add to total because of rounding error.

Source: U.S. Department of Commerce data and USITC calculations.

Evenett and Venables' second level decomposition is reported in table 8-2. Trade in existing products is decomposed according to the source countries from which the United States imports these products. Increased trade in existing product-country pairs accounted for 93.2 percent of the increase in

[19] The listing of computer storage devices as a new product is a demonstration of the issues that arise in concording data over time. The concordance process used in building the data set did not identify any products that were traded in 1978 that were most appropriately assigned to the "computer storage devices" category. Thus, for the purposes of this study, SIC 3572 – *computer storage devices* is a new product. Some products that were traded in 1978 were mapped into SIC 3571– *electronic computers*, so SIC 3571 is considered to be an existing product.

overall U.S. imports. Some countries stopped exporting products that they exported in 1978-1981, and this accounted for -0.8 percent of trade growth. Trade growth attributable to new product-country pairs accounted for 2.5 percent of all trade growth.

Table 8-2
Decomposition of import growth in continued products

Category	Share of import growth
	Percent
Same partners	93.2
Discontinued partners	-0.8
New partners	2.5
Total	95.0

Source: U.S. Department of Commerce data and USITC calculations.

Table 8-3 provides summary measures according to the various country groupings outlined above. Most of the U.S. import growth attributed to new product-country pairs is from countries that the World Bank classifies as middle income countries. Trade in new product-country pairs from middle income countries accounts for 1.8 percent of all U.S. trade growth. Likewise,

Table 8-3
SIC share of import growth in continued products with new trade partners

New trading partner category	Share of import growth
	Percent
Income Level	
Low	0.3
Middle	1.8
High	0.4
GATT/WTO Entry	
Before 1978	0.7
1978-2001	1.4
After 2001[1]	0.3
All new trading partners	2.5

[1] Includes countries which had not completed their accession by 2002 and countries that have not acceded.

Source: U.S. Department of Commerce data and USITC calculations.

new entrants to the GATT/WTO account for much of trade growth due to new product country pairs. Of the 2.5 percent trade growth attributable to new product-country pairs, 1.4 percent has come from countries that acceded to the GATT/WTO between 1978 and 2001.

An important source of growth in both the middle income country grouping and the 1978-2001 GATT/WTO accession grouping is China. New products from China account for 1.0 percent of all the growth in U.S. imports between 1978-1981 and 1998-2001. Of this 1.0 percent, half can be attributed to exports of electronic computers (SIC 3571) from China. After China, the most significant sources of new varieties were Indonesia, Thailand, Aruba, Vietnam and the Soviet Union. These results are reported in table 8-4.

Table 8-4
SIC share of import growth in continued products with new trading partners, by new trading partner

New trading partner/products	Share of import growth by product	Total share of import growth
	Percent	
China		1.0
Electronic computers (3571)	0.5	
Telephone and telegraph apparata (3661)	0.2	
Other products	0.3	
Indonesia		0.1
Thailand		0.1
Aruba		0.1
Petroleum refining (2911)	0.1	
Other products	0.0	
Vietnam		0.1
Former Soviet Union		0.1
Other new trading partners		1.0
All new trading partners		2.5

Source: U.S. Department of Commerce data and USITC calculations.

Table 8-5 decomposes U.S. import growth in new product-country pairs by product. Electronic computers account for the largest share of growth due to new product-country pairs. Telephone and telegraph equipment, petroleum refining products and various apparel articles are the products with the next largest shares of trade growth attributable to new product-country pairs.

Table 8-5
SIC share of import growth in continued products with new trade partners by product

Product/New trading partners	Share of import growth by new trading partner	Total share of import growth
	Percent	
Electronic computers (3571)		0.5
China	0.5	
Other countries	0.0	
Telephone and telegraph apparata (3661)		0.2
China	0.2	
Other countries	0.0	
Petroleum refining (2911)		0.1
Aruba	0.1	
Other countries	0.0	
Girls' and children's outerwear (2369)		0.1
Men's and boys' trousers and slacks (2325)		0.1
Fabricated rubber products (3069)		0.1
Other products		1.4
All new trading partners		2.5

Source: U.S. Department of Commerce data and USITC calculations.

Econometrics[20]

There are a number of possible reasons for increased growth in the number of U.S. import sources. Unilateral political and economic reforms in many developing countries predated significant entry into world export markets. Several reforming countries, including China, India, Indonesia, the former Soviet Union, and Mexico, have significantly increased their share of U.S. imports. Changing transportation and communication technologies also allow a greater number of countries to participate in world markets, and to sell a

[20] For a detailed description of the econometric methods and results, see appendix D.

wider variety of products. The purpose of this exercise is to isolate the role of U.S. tariff reductions as a source of increased product variety. Since most U.S. tariff reductions over the period can be linked directly to the five trade agreements considered, this exercise is meant to identify the impact of the trade agreements on product variety over the time period 1978-2001.

The econometric strategy relates changes in U.S. tariff rates and freight charges to changes in the number of import sources per commodity. The econometric question can be summarized as, "Did products that experienced larger U.S. tariff reductions between 1978 and 2001 experience larger increases in the number of import sources?" The evidence presented in appendix D suggests that the answer is yes. Estimates from the econometric model suggest that, on average, a 1 percentage point reduction in the multilateral tariff rate on a SIC 4-digit commodity increases the number of U.S. import sources of that commodity by 0.3 to 0.4. The model also suggests that the net effect of preferential tariff reductions awarded products from Israel, Canada, and Mexico have also contributed to growth in the number of export varieties. Post estimation calculations suggest that between 1.3 and 3.5 new varieties per commodity can be attributed to tariff reductions. These estimates suggest that 5 to 20 percent of the growth in new product varieties can be linked to tariff reductions.

Measuring the Economic Effects of Increased Product Variety

In standard models like the one used in chapter 7, tariff reductions do not induce new product-country pairs in imports. Consumers are modeled as if they would benefit from such entry; the framework simply does not allow entry to occur. More recent theoretic models use a framework that allows a consistent representation of new product entry. Importers pay a fixed cost to purchase a new variety. When tariffs fall, the reduced relative price of imported goods leads consumers to increase their relative demand for imports, and they buy more varieties as a result.

The Commission simulated the effects of tariff changes on a model calibrated to match certain features of the United States economy.[21] A key feature of the calibration is that the model matches the econometric estimates, a 4 percent increase in the tariff reduces the number of import varieties from 58 to 55.[22] Similar to chapter 7, the model is shocked by imposing historical

[21] The model is discussed in detail in technical appendix D.

[22] Three is chosen because it is the largest integer within the range of econometric estimates that suggest 1.3 to 3.5 new import varieties can be attributed to tariff reductions. The purpose of the modeling exercise is to set a reasonable upper bound on additional gains from import variety. Thus, the largest possible integer within the range of econometric estimates was chosen.

tariffs on a representation of the 2001 economy. In this case, the 1978 average tariff is imposed. Welfare is calculated in two circumstances, one in which the model includes benefits from added import variety and one in which consumers do not gain from increased import variety. The ratio of the two estimates offers a suggestive guide to the possible magnitude of variety-type effects.

The estimates suggest that variety effects, if present, could be important contributors to overall welfare. When variety effects are not included in the welfare calculation, raising U.S. tariffs to their 1978 level reduces welfare by 0.04 percent. When variety effects and relative price changes are both included, returning to 1978 tariffs reduces welfare by 0.15 percent. Changes in import product variety account for three-quarters of the total welfare change in the import variety model. These estimates indicate that, if variety type effects are present in the real economy, the estimates in chapter 7 may substantially understate the effects of trade agreements on U.S. economic welfare.

APPENDIX A
Authorizing Legislation and *Federal Register* Notice

SEC. 2111. REPORT ON IMPACT OF TRADE PROMOTION AUTHORITY. 19 USC 3811.

(a) IN GENERAL.—Not later than 1 year after the date of enactment of this Act, the International Trade Commission shall report to the Committee on Finance of the Senate and the Committee on Ways and Means of the House of Representatives regarding the economic impact on the United States of the trade agreements described in subsection (b). Deadline.

(b) AGREEMENTS.—The trade agreements described in this subsection are the following:

(1) The United States-Israel Free Trade Agreement.

(2) The United States-Canada Free Trade Agreement.

(3) The North American Free Trade Agreement.

(4) The Uruguay Round Agreements.

(5) The Tokyo Round of Multilateral Trade Negotiations.

SEC. 2112. INTERESTS OF SMALL BUSINESS. 19 USC 3812.

The Assistant United States Trade Representative for Industry and Telecommunications shall be responsible for ensuring that the interests of small business are considered in all trade negotiations in accordance with the objective described in section 2102(a)(8). It is the sense of the Congress that the small business functions should be reflected in the title of the Assistant United States Trade Representative assigned the responsibility for small business.

SEC. 2113. DEFINITIONS. 19 USC 3813.

In this title:

(1) AGREEMENT ON AGRICULTURE.—The term "Agreement on Agriculture" means the agreement referred to in section 101(d)(2) of the Uruguay Round Agreements Act (19 U.S.C. 3511(d)(2)).

(2) AGREEMENT ON SAFEGUARDS.—The term "Agreement on Safeguards means the agreement referred to in section 101(d)(12) of the Uruguay Round Agreements Act (19 U.S.C. 3511(d)(12)).

(2) AGREEMENT ON SUBSIDIES AND COUNTERVAILING MEASURES.—The term "Agreement on Subsidies and Countervailing Measures" means the agreement referred to in section 101(d)(13) of the Uruguay Round Agreements Act (19 U.S.C. 3511(d)(13)).

(4) ANTIDUMPING AGREEMENT.—The term "Antidumping Agreement" means the Agreement on Implementation of Article VI of the General Agreement on Tariffs and Trade 1994 referred to in section 101(d)(7) of the Uruguay Round Agreements Act (19 U.S.C. 3511(d)(7)).

(5) APPELLATE BODY.—The term "Appellate Body" means the Appellate Body established under Article 17.1 of the Dispute Settlement Understanding.

(6) CORE LABOR STANDARDS.—The term "core labor standards" means—

(A) the right of association;

(B) the right to organize and bargain collectively;

(C) a prohibition on the use of any form of forced or compulsory labor;

(D) a minimum age for the employment of children; and

and all persons who requested the opportunity were permitted to appear in person or by counsel.

The Commission transmitted its determination in this review to the Secretary of Commerce on February 24, 2003. The views of the Commission are contained in USITC Publication 3577 (February 2003), entitled *Steel Concrete Reinforcing Bar from Turkey: Investigation No. 731–TA–745 (Review).*

By order of the Commission.

Issued: February 25, 2003.

Marilyn R. Abbott,

Secretary to the Commission.

[FR Doc. 03–4825 Filed 2–28–03; 8:45 am]

BILLING CODE 7020–02–P

INTERNATIONAL TRADE COMMISSION

[Investigation TA–2111–1]

The Impact of Trade Agreements: Effect of the Tokyo Round, U.S.-Israel FTA, U.S.-Canada FTA, NAFTA, and the Uruguay Round on the U.S. Economy

AGENCY: International Trade Commission.

ACTION: Request for additional written comments.

SUMMARY: The United States International Trade Commission invites additional public input from interested parties (*e.g.*, manufacturers, service providers, labor, other interest groups, etc.) regarding the impact of the following trade agreements: the Tokyo Round of Multilateral Trade Negotiations, the United States-Israel Free Trade Agreement, the United States-Canada Free Trade Agreement, the North American Free Trade Agreement, and the Uruguay Round Agreements. In particular, the Commission is interested in the impact of these five agreements on a sector-specific basis.

DATES: *Effective Date:* February 24, 2003.

To be assured of consideration by the Commission, written comments (a signed original and 14 copies of each set of comments, along with a cover letter) should be submitted no later than March 31, 2003.

FOR FURTHER INFORMATION CONTACT: John Davitt, Industries Coordinator (202–205–3407), Office of Industries, U.S. International Trade Commission, Washington, DC 20436. For information on other aspects of this investigation, contact Kyle Johnson, Project Leader (202–205–3229) or Russell Hillberry, Deputy Project Leader (202–708–5405), Office of Economics. Hearing-impaired persons can obtain information on this matter by contacting the Commission's TDD terminal on 202–205–1810. General information concerning the Commission also may be obtained by accessing its Internet server (*http://www.usitc.gov*). The public record for this study may be viewed on the Commission's electronic docket at *http://edis.usitc.gov.*

SUPPLEMENTARY INFORMATION: The Commission instituted the investigation for the purpose of fulfilling the requirement in section 2111 of the Trade Act of 2002 (Pub. L. 107–210, 116 Stat. 933), that it report to the Committee on Ways and Means of the House of Representatives and the Committee on Finance of the Senate not later than one year after the date of enactment (*i.e.*, by August 6, 2003) regarding the economic impact on the United States of the aforementioned trade agreements. The Commission held a public hearing in connection with the investigation on January 14, 2003. 67 FR 59007 (Sept. 19, 2002).

To further inform the quantitative and qualitative analysis that will be included in the report, the Commission seeks additional input from interested parties (*e.g.*, manufacturers, service providers, labor, other interest groups, etc.) concerning their opinions or experiences with respect to the trade agreements. The Commission invites commentators to address in as much detail as possible the impact of these five agreements, their specific provisions, and their effectiveness. In particular, the Commission is interested in the impact of the five trade agreements on individual sectors relative to any other developments that have affected the sectors since 1980 (*e.g.*, changes in government regulation or trade policy, industry structure, technology, level of globalization, and competitive strength/position relative to foreign producers). The Commission also is interested in any sector-specific differentiation that can be made between the effects of tariff liberalization versus non-tariff measure liberalization. In this regard, the Commission also seeks interested party views on the effectiveness of negotiated commitments in facilitating actual market access.

Written Submissions: Commercial or financial information that a submitter desires the Commission to treat as confidential must be submitted on separate sheets of paper, each clearly marked "Confidential Business Information" at the top. All submissions requesting confidential treatment must conform with the requirements of § 201.6 of the Commission's rules of practice and procedure (19 CFR 201.6). All written submissions, except for confidential business information, will be made available in the Office of the Secretary of the Commission for inspection by interested parties.

The Congressional committees have requested that the Commission prepare a public report (containing no confidential business information). Accordingly, any confidential business information received by the Commission in this investigation and used in preparing the report will not be published in a manner that would reveal the operations of the entity supplying the information. All submissions should be addressed to the Secretary, United States International Trade Commission, 500 E Street SW, Room 112, Washington, DC 20436. Hand-delivered comments must be delivered to the prescribed room during the Commission's official business hours (8:45 a.m. to 5:15 p.m.) in order to be deemed filed on the day they are delivered. The Commission's Rules do not authorize filing of submissions with the Secretary by facsimile or electronic means, except to the extent permitted by section 201.8 of the Commission's Rules, as amended, 67 FR 68036 (Nov. 8, 2002).

List of Subjects

TPA, Trade Act of 2002, Tariffs, Imports.

By Order of the Commission.

Issued: February 25, 2003.

Marilyn R. Abbott,

Secretary to the Commission.

[FR Doc. 03–4824 Filed 2–28–03; 8:45 am]

BILLING CODE 7020–02–P

DEPARTMENT OF JUSTICE

Antitrust Division

Notice Pursuant to the National Cooperative Research and Production Act of 1993—Advanced Technology Institute: National Shipbuilding Research Program ("NSRP")

Notice is hereby given that, on January 13, 2003, pursuant to section 6(a) of the National Cooperative Research and Production Act of 1993, 15 U.S.C. 4301 *et seq.* ("the Act"), Advanced Technology Institute has filed written notifications simultaneously with the Attorney General and the Federal Trade Commission disclosing changes in the membership of the National Shipbuilding Research Program ("NSRP"). The notifications were filed for the purpose of extending

Issued: September 13, 2002.

By order of the Commission.

Marilyn R. Abbott,

Secretary to the Commission.

[FR Doc. 02–23799 Filed 9–18–02; 8:45 am]

BILLING CODE 7020–02–P

INTERNATIONAL TRADE COMMISSION

[Investigation TA–2111–1]

The Impact of Trade Agreements: Effect of the Tokyo Round, U.S.-Israel FTA, U.S.-Canada FTA, NAFTA, and the Uruguay Round on the U.S. Economy

AGENCY: United States International Trade Commission.

ACTION: Institution of investigation and scheduling of public hearing.

EFFECTIVE DATE: September 12, 2002.

SUMMARY: Following the President's signature on August 6, 2002, of the Trade Act of 2002, the Commission instituted investigation No. TA–2111–1, The Impact of Trade Agreements: Effect of the Tokyo Round, U.S.-Israel FTA, U.S.-Canada FTA, NAFTA, and the Uruguay Round on the U.S. Economy.

The Commission instituted the investigation for the purpose of fulfilling the requirement in section 2111 of the Trade Act of 2002 (Pub. L. 107–210, 116 Stat. 933), that it report to the Committee on Ways and Means of the House of Representatives and the Committee on Finance of the Senate not later than 1 year after the date of enactment regarding the economic impact on the United States of the following trade agreements: the Tokyo Round of Multilateral Trade Negotiations, the United States-Israel Free Trade Agreement, the United States-Canada Free Trade Agreement, the North American Free Trade Agreement, and the Uruguay Round Agreements.

FOR FURTHER INFORMATION CONTACT: Further information may be obtained from Kyle Johnson, Project Leader (202–205–3229) or Russell Hillberry, Deputy Project Leader (202–708–5405), Office of Economics, U.S. International Trade Commission, Washington, DC, 20436. For information on the legal aspects of this investigation, contact William Gearhart of the Office of the General Counsel (202–205–3091). Hearing impaired individuals are advised that information on this matter can be obtained by contacting the TDD terminal on (202) 205–1810.

Public Hearing

A public hearing in connection with the investigation will be held at the U.S. International Trade Commission Building, 500 E Street SW., Washington, DC, beginning at 9:30 a.m. on January 14, 2003. All persons shall have the right to appear, by counsel or in person, to present information and to be heard. Requests to appear at the public hearing should be filed with the Secretary, United States International Trade Commission, 500 E Street SW., Washington, DC 20436, no later than 5:15 p.m., December 27, 2002. Any prehearing briefs (original and 14 copies) should be filed not later than 5:15 p.m., January 3, 2003; the deadline for filing post-hearing briefs or statements is 5:15 p.m., February 14, 2003. In the event that, as of the close of business on December 27, 2002, no witnesses are scheduled to appear at the hearing, the hearing will be canceled. Any person interested in attending the hearing as an observer or non-participant may call the Secretary of the Commission (202–205–1806) after December 27, 2002, to determine whether the hearing will be held.

Written Submissions

In lieu of or in addition to participating in the hearing, interested parties are invited to submit written statements (original and 14 copies) concerning the matters to be addressed by the Commission in its report on this investigation. Commercial or financial information that a submitter desires the Commission to treat as confidential must be submitted on separate sheets of paper, each clearly marked "Confidential Business Information" at the top. All submissions requesting confidential treatment must conform with the requirements of section 201.6 of the Commission's Rules of Practice and Procedure (19 CFR 201.6). All written submissions, except for *confidential business information*, will be made available in the Office of the Secretary of the Commission for inspection by interested parties. The Congressional committees have requested that the Commission prepare a public report (containing no confidential business information). Accordingly, any confidential business information received by the Commission in this investigation and used in preparing the report will not be published in a manner that would reveal the operations of the firm supplying the information. To be assured of consideration by the Commission, written statements relating to the Commission's report should be submitted to the Commission at the earliest practical date and should be received no later than the close of business on February 14, 2003. All submissions should be addressed to the Secretary, United States International Trade Commission, 500 E Street SW., Washington, DC 20436. The Commission's rules do not authorize filing submissions with the Secretary by facsimile or electronic means. Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at 202–205–2000. General information concerning the Commission may also be obtained by accessing its Internet server (http://www.usitc.gov).

List of Subjects: TPA, Trade Act of 2002, tariffs, imports.

Issued: September 13, 2002.

By order of the Commission.

Marilyn R. Abbott,

Secretary to the Commission.

[FR Doc. 02–23767 Filed 9–18–02; 8:45 am]

BILLING CODE 7020–02–P

DEPARTMENT OF LABOR

Office of the Secretary

Submission for OMB Review; Comment Request

September 11, 2002.

The Department of Labor (DOL) has submitted the following public information collection request (ICR) to the Office of Management and Budget (OMB) for review and approval in accordance with the Paperwork Reduction Act of 1995 (Pub. L. 104–13, 44 U.S.C. Chapter 35). A copy of this ICR, with applicable supporting documentation, may be obtained by calling the Department of Labor. To obtain documentation, contact Darrin King (202) 693–4129 or E-Mail: *King-Darrin@dol.gov.*

Comments should be sent to Office of Information and Regulatory Affairs, Attn: OMB Desk Officer for OSHA, Office of Management and Budget, Room 10235, Washington, DC 20503 ((202) 395–7316), within 30 days from the date of this publication in the **Federal Register**.

The OMB is particularly interested in comments which:

- Evaluate whether the proposed collection of information is necessary for the proper performance of the functions of the agency, including whether the information will have practical utility;
- Evaluate the accuracy of the agency's estimate of the burden of the

APPENDIX B
Chapter 6 Technical Annex

Previous Studies

This section provides a brief review of recent ex post statistical studies that have attempted to capture the impact of NAFTA on its North American trading partners. At the disaggregated level, the most closely related study is that of Romalis.[1] Romalis examines the impact of the U.S. NAFTA preferences on Canadian and Mexican shares of U.S. imports across about 6,800 commodities traded continually between 1989 and 2000. Since his tariff preference data are limited to the year 2000, Romalis tests whether the 2000 tariff preference had an effect on import shares in 2000 and in previous years. In general he finds a positive, significant effect, which grows between 1994 and 2000. Romalis interprets this as capturing the phase–in of tariff preferences over time, and concludes that NAFTA has had a substantial effect on North American trade.

Agama and McDaniel[2] use an import demand model to exploit the time–varying dimension of the U.S. tariff preference toward Mexico on aggregate imports between 1989 and 2001. The authors note that this is important because the United States extended a tariff preference to Mexico prior to NAFTA under the GSP program, and the NAFTA preference was phased in over time. They use the model to examine the impact of the tariff preference on the U.S. demand for Mexican goods. The authors report a 1 percentage point rise in the preference corresponds to a 5.7 to 8.0 percent rise in U.S. demand for goods produced in Mexico. After NAFTA was implemented, a 1 percentage point rise in the preference resulted in an additional 6.0 to 7.2 percent rise in the U.S. demand for goods from Mexico. This suggests that U.S. import demand was more responsive to changes in the tariff preference following the implementation of NAFTA. Agama and McDaniel also use an export demand model to examine the impact of the Mexican tariff preference toward the United States over the 1993 to 2001 period. They report that a 1 percentage point rise in the NAFTA preference corresponds to a 4.7 to 6.3 percent rise in Mexico's demand for goods produced in the United States.

---

[1] John Romalis, "NAFTA's Impact on North American Trade," University of Chicago Graduate School of Business Working Paper, 2001.

[2] Laurie-Ann Agama and Christine A. McDaniel, "The NAFTA Preference and U.S.-Mexico Trade: Aggregate Level Analysis," *The World Economy*, forthcoming 2003.

Krueger[3] uses a gravity model to analyze the effects of membership in preferential trade agreements on trade flows for 61 countries between 1991 and 1997. She finds little evidence that membership in NAFTA had significant effects on North American trade at the aggregate level. However, using qualitative analysis to examine North American trade at the industry level, Krueger argues that trade in some individual sectors may have increased due to NAFTA. These sectors include, among others, machinery and equipment, and textiles and apparel.

Although Fukao, et al.,[4] try to test for evidence of trade diversion from NAFTA, their study provides additional empirical evidence on the impact of tariff reductions on import flows. Fukao, et al., use a gravity model to examine the impact of tariff reductions on U.S. manufactured commodity import shares at the HS 2–digit level from 1992 to 1998. Selected commodities are also analyzed at the HS 4–digit level over this period. The authors report that the estimated coefficients on tariffs were negative and statistically significant for 15 commodities and conclude that reductions in tariff rates had significant positive effects on U.S. trade for these 15 commodities.[5]

Two studies of the Canada–U.S. Free Trade Agreement (CUSFTA) find evidence that trade liberalization has a significant impact on trade flows. Trefler[6] tests the impact of Canadian tariff cuts under the CUSFTA on Canadian manufacturing imports from the United States as a share of Canadian output. He finds that CUSFTA tariff cuts are a statistically significant determinant of these import shares. Clausing[7] uses an import demand model to

---

[3] Ann O. Krueger, "Trade Creation and Trade Diversion Under NAFTA," National Bureau of Economic Research (NBER) Working Paper, December 1999.

[4] Kyoji Fukao, Toshihiro Okubo, and Robert Stern, "An Econometric Analysis of Trade Diversion," *The North American Journal of Economics and Finance,* vol. 14, No. 1, March 2003, pp. 3-24.

[5] Given that U.S. tariffs against Mexico and Canada fell faster than U.S. tariffs against the rest of the world, the authors infer that NAFTA resulted in significant trade diversion from other competing exporters to the NAFTA partners.

[6] Daniel Trefler, "The Long and Short of the U.S.-Canada Free Trade Agreement," NBER Working Paper No. 8293, May 2001.

[7] Kim A. Clausing, "Trade Creation and Trade Diversion in the Canada-U.S. Free Trade Agreement," *Canadian Journal of Economics,* vol. 34, No. 3, 2001, pp. 676-696.

examine the responsiveness of U.S. imports from Canada to U.S. tariff changes due to the CUSFTA. She reports that U.S.–Canadian trade is highly sensitive to changes in tariffs. Each 1 percent point reduction in tariffs is associated with a 9.6 percent increase in imports from Canada.[8]

Analytical Framework

As in Romalis' study, a country's share of U.S. imports in any industry is expected to be predominantly a function of the price of that country's imports relative to the price of imports from other countries. For each good i, in any year t, Mexico's share of U.S. total imports is, thus, a function of the price of Mexican imports relative to the average price of U.S. imports from all other sources:

$$\left(M_{itMex}^{US} \middle/ M_{itWorld}^{US} \right) = f\left(P_{itMex}^{I} \middle/ P_{itWorld}^{I} \right) \tag{1}$$

The prices of U.S. imports (P^I) from any country j are made up of four key components: the actual export price of the product (P*), the additional markup due to transport costs (TR), the tariff (T) applied to that imported good,[9] and the exchange rate (E), which translates the foreign currency price into U.S. dollars.

$$P_{ijt}^{I} = [P_{ijt}^{*}(1 + T_{ijt} + TR_{ijt})] / E_{jt} \tag{2}$$

Changes in any of these four components will change the relative price of imports from an individual country and influence its share of U.S. imports. Any attempt to isolate the impact of trade preferences on import share, therefore, must control for changes in the other three components.

The Commission analysis extends Romalis' study in several ways. First, actual data on applied tariff rates throughout the period 1989–2001 are used, capturing both the differences in tariff preferences across goods and the gradual

[8] Clausing also tests for trade diversion, but finds no evidence that it occurred.

[9] If other non-tariff barriers, such as quotas, also exist on a particular imported product, the tariff -equivalent of such barriers must be taken into account to get an accurate estimate of the increase in price due to all trade barriers.

phase-in of preferences over time. Second, proxies for export prices from Mexico and other countries are included, as well as measures of changes in the peso-dollar exchange rate, and in U.S. purchasing power over imports from other sources. Third, the import share in the previous year (lagged import share) is included as a determinant of today's import share. This variable helps to control for the fact that markets do not always adjust to policy changes immediately, and that Mexican import shares may be historically high in some products. Fourth, the tariff itself is used as a control variable, since in any given year, regardless of the tariff preference, Mexico would likely have relatively smaller import shares in products where it faces relatively highly barriers. Finally, the growth of U.S. shares of Mexican imports in response to Mexico's NAFTA tariff preferences is examined. Taking the log of equations (2) and (1), and substituting (2) into (1), yields the basic specification to be estimated. Incorporating lagged import shares and tariff levels yields:

$$\begin{aligned}(m_{it}^{kj} - m_{it}^{kw}) = a_0 + a_1(t_{it}^{kw} - t_{it}^{kj}) + a_2 N(t_{it}^{kw} - t_{it}^{kj}) \\ + a_3 t_{it}^{kj} + a_4 N t_{it}^{kj} + a_5 tr_{it}^{kj} + a_6 e_t^{kj} + a_7 p_{it}^{*j} \\ + a_8 tr_t^{kw} + a_9 e_t^{kw} + a_{10} p_{it}^{*w} + a_{11}(m_{it-1}^{kj} - m_{it-1}^{kw})\end{aligned} \tag{3}$$

where: lowercase letters indicate log values; j,k=Mexico, US, j≠k; w=world; N=dummy for post-NAFTA years.

Several conclusions from previous studies are also explored using equation (3). Agama and McDaniel suggested that U.S. preferences toward Mexico did significantly raise Mexico's share of U.S. imports at the aggregate level, and that these preferences mattered more after NAFTA than before. In the present study, an explicit test is conducted to see if the impact of U.S. preferences differs before and after NAFTA. Krueger suggested that any significant change in Mexico's share of U.S. imports was likely due to the major peso devaluation in late 1994, rather than NAFTA. The present study allows a direct comparison of the influence of the trade preferences relative to exchange rate changes during this time period. Krueger also suggests that specific sectors, such as textiles and apparel, may have been significantly impacted by the NAFTA preferences, even if aggregate effects were negligible. The present study estimates the effects of preferences specifically on Mexican shares of U.S. imports of textiles and apparel, and compares the results to the impact on manufacturing as a whole.

Data and Estimation

Equation (3) is estimated for the U.S. manufacturing sector over the period 1990–2001[10] for all HTS 6–digit subheadings that existed throughout the 1989–2001 period.[11] Mexico's share of U.S. imports is calculated as the ratio of U.S. imports from Mexico to U.S. imports from the world, using customs value for the calculations. Applied tariffs on imports from Mexico and the world are calculated as import duties collected, divided by customs value, for each product in each year. Transport costs are approximated by the ratio of the c.i.f. value of imports to the customs value of imports. The U.S. NAFTA preference toward Mexico is then the difference between the applied tariff on world imports, and the applied tariff on Mexican imports. The use of applied tariffs has both benefits and drawbacks. The benefit is a better measure of the extent and magnitude of the tariff preferences phased in by a particular year. The drawback is that applied tariffs are only available for products which the U.S. actually imports from Mexico, which reduces the sample, though the dataset remains quite large at about 37,000 observations.[12] The introduction of lagged import shares eliminates the initial year's data, reducing the sample to about 34,700.

Changes in the value of the Mexican peso to the U.S. dollar are measured by the nominal peso/dollar exchange rate. The nominal effective exchange rate for the U.S. measures changes in the U.S. dollar's purchasing power with respect to a weighted average of its trading partners' currencies. Both exchange rate series are taken from the International Monetary Fund's International Financial Statistics.[13] The export prices of products from Mexico and from all other countries are proxied by unit values. These are calculated as customs value of imports divided by quantity. Due to aggregation problems with

[10] For both the U.S. and Mexican specifications, estimation uses generalized least squares, with fixed effects at the industry level, and a correction for heteroskedasticity.

[11] Over this time period some subheadings are eliminated, while new ones are introduced. Within the manufacturing sector, the sample of subheadings which appears consistently throughout the period is approximately 4,300.

[12] A more serious problem may be the non-random nature of the reduction in the sample. Romalis has a similar problem, and reestimates his model correcting for this potential bias. He finds that the correction produces negligible differences in the results.

[13] The annual values used are simple averages of the monthly data.

quantity measures, it was not possible to construct consistent unit values for imports for all sources other than Mexico. As an alternative, the unit value measures for U.S. imports from the world (all countries including Mexico) are used. Since some HTS 6–digit subheadings lines have multiple quantity measures which cannot be accurately compared over the entire time period, nor easily aggregated, these products were dropped from the sample.[14] Thus, inclusion of price measures reduced the sample to about 28,000 observations.

All Mexican trade data were taken from the United Nations Conference on Trade and Development's Trade Analysis and Information System (TRAINS). Import shares, applied tariffs and preferences were all calculated as in the U.S. analysis. Although Mexican imports from the United States and the world were available for 1991–2000, tariffs against U.S. imports were only available for 1991, 1995, and 1999. Thus, the estimation for Mexico uses pooled data over 3 years and about 4,000 products. Since import data were only available in c.i.f. value, it was not possible to construct a measure of transport costs or proxies for export prices from either the United States or the world. U.S. shares of Mexican imports in 1989 were used to capture historical differences across products, and Mexican tariffs against the United States in 1989 were used to capture differences in the level of historical protection across products.

[14] For example, some products are reported at the 6-digit level in kilograms, number of units, and dozens, for the period 1989-1995, and only in kilograms and dozens for 1996-2001.

Table B-1
Sector classifications and descriptions

Sector	HTS No.	Description
Agriculture	01-24	Live animals; animal products; vegetable products; animal or vegetable fats and oils; prepared foodstuffs; beverages, spirits and vinegar; tobacco and manufactured tobacco substitutes
Chemicals	28-38	Products of the chemical or allied industries
Footwear	41-43, 64-67	Raw hides and skins, leather, furskins, and articles thereof; saddlery and harness; travel goods, handbags; footwear, headgear, umbrellas, sun umbrellas, walking sticks, whips and parts; prepared feathers; artificial flowers; articles of human hair
Machines	84-85	Machinery and mechanical appliances; electrical equipment; parts
Minerals and metals	25-27, 71-83	Mineral products; natural or cultured pearls, precious or semi-precious stones, precious metals; base metals and articles of base metal
Misc. manufactures	94-96	Miscellaneous manufactured articles
Wood products	44–49	Wood and articles of wood; wood charcoal; cork and articles of; pulp of wood or of other fibrous cellullosic material; waste and paperboard
Plastics	39-40	Plastics and plastic articles; rubber and rubber articles
Textiles and apparel	50-63	Textiles and textile articles
Transport	86-89	Vehicles, aircraft, vessels and associated transport equipment
Other	68-70, 90-93, 97-99	Articles of stone, plaster, cement, asbestos, mica or similar material; ceramic products; glass and glassware; optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; clocks and watches; musical instruments and parts; arms and ammunition; parts and accessories thereof; works of art, collectors' pieces and antiques; special classification provisions; temporary legislation

Source: USITC aggregation. Aggregation and descriptions based on the Harmonized Tariff Schedule of the United States Annotated 2003, Revision 1, *http://dataweb.usitc.gov/scripts/tariff/toc.html*, downloaded March 17, 2003.

Table B-2
Explaining Mexican shares of U.S. imports: Manufacturing sector, 1989-2001[1]

	(1)	(2)	(3)	(4)
Tariff preference[2]	7.45**	7.36**	3.89**	2.09**
	(19.45)	(19.33)	(9.24)	(2.80)
Post NAFTA tariff Preference	--	--	--	2.37**
				(2.96)
Tariff level[3]	--	--	-3.08**	-2.47**
			(-6.71)	(-4.89)
Post NAFTA tariff level	--	--	--	-1.97**
				(-2.64)
Transport costs[4]	-9.96**	-10.04**	-6.69**	-6.67**
	(-14.64)	(-14.74)	(-12.37)	(-12.35)
Lagged import share	--	--	0.21**	0.21**
			(76.51)	(76.15)
Peso/dollar exchange rate . . .	--	0.27**	0.12**	0.11**
		(9.88)	(3.68)	(3.00)
Mexican export price[5]	--	--	-0.14**	-0.14**
			(-11.64)	(-11.63)
Nominal effective exchange rate[6]	--	-0.01**	-0.02**	-0.02**
		(-6.04)	(-20.24)	(-19.38)
World export price[5]	--	--	-0.03**	-0.03**
			(-2.78)	(-2.80)
Year dummies	yes	no	no	no
Industry dummies[7]	yes	yes	yes	yes
Number of observations.	37,255	37,255	27,809	27,809
R^2	0.15	0.15	0.41	0.41
F-statistic	62.42**	69.00**	195.35**	191.90**

[1] All variables in logs. Statistical significance levels of 1%, and 5% , shown by ** and *, respectively.

[2] Applied tariff on U.S. imports from world-applied tariff on U.S. imports from Mexico.

[3] Applied tariff on Mexico=import duties/customs value.

[4] The c.i.f. margin in percent. Calculated as c.i.f. import value/customs value.

[5] Unit values=customs value/quantity.

[6] Decrease equals depreciation of peso.

[7] Constructed at the 2-digit HTS level.

Source: USITC.

Table B-3
Explaining Mexican shares of U.S. imports: Apparel and textiles sectors, 1989-2001[1]

	Textiles and Apparel	Apparel	Textiles
Tariff preference[2]	0.31	2.92*	-2.19
	(0.26)	(2.00)	(-0.99)
Post NAFTA tariff Preference	4.98**	5.11**	2.03
	(4.10)	(3.39)	(0.88)
Tariff level[3]	-2.99**	1.83	-8.23**
	(-3.71)	(1.64)	(-6.94)
Post NAFTA tariff level	-0.12	-0.46	1.03
	(-0.14)	(-0.34)	(0.87)
Transport costs[5]	-9.51**	-18.07**	-8.91**
	(-14.79)	(-4.75)	(-14.28)
Lagged import share	0.15**	0.18**	0.13**
	(28.43)	(13.02)	(23.01)
Peso/dollar exchange rate .	-0.03	0.49**	-0.22 †
	(-0.28)	(2.78)	(-1.70)
Mexican export price[6]	-0.36**	-0.01	-0.47**
	(-9.34)	(-0.14)	(-11.13)
Nominal effective exchange rate[7]	-0.01**	-0.01	-0.01*
	(-2.97)	(-1.36)	(-2.54)
World export price[6]	0.25**	-0.28**	0.45**
	(-2.97)	(-3.92)	(10.13)
Industry dummies[8]	yes	yes	yes
Number of observations. . .	6118	2153	3965
R^2	0.37	0.45	0.38
F-statistic	156.03**	158.34**	114.59**

[1] All variables in logs. Textiles and Apparel is defined as section 11 of the U.S. HTS; apparel is HTS 61 and HTS62. Statistical significance levels of 1%, 5% , and 10% shown by **, *, and †, respectively.

[2] Applied tariff on U.S. imports from world-applied tariff on U.S. imports from Mexico.

[3] Applied tariff on Mexico=import duties/customs value. Divergent responses to tariff in apparel and textiles may be due to presence of quantitative restrictions on apparel prior to NAFTA.

[4] The c.i.f. margin in percent. Calculated as c.i.f. import value/customs value.

[5] Unit values=customs value/quantity. Note that in apparel, Mexican unit values are highly correlated with world unit values. If world unit values are omitted, a strong negative response to Mexican unit values appears (with other results unchanged).

[6] Decrease equals depreciation of peso.

[7] Constructed at the 2-digit HTS level.

Source: USITC.

Table B-4
Explaining US shares of Mexican imports: Manufacturing sector, 1991-1999[1]

	(1)	(2)
Tariff preference[2]	0.37*	0.44**
	(2.16)	(2.73)
Tariff level in 1991[3]	--	-0.84**
		(-3.51)
Import share in 1991	--	0.49**
		(25.03)
Peso/dollar exchange rate	-0.06*	-0.05*
	(-2.22)	(-2.39)
Real effective exchange rate[4]	-0.002**	-0.002**
	(-3.98)	(-4.66)
Industry dummies[5]	yes	yes
Number of observations.	12,161	12,049
R^2	0.09	0.29
F-statistic	12.20**	50.41**

[1] All variables in logs. Statistical significance levels of 1% and 5% , shown by ** and *, respectively.

[2] Applied tariff on Mexican imports from world-applied tariff on Mexican imports from US.

[3] Applied tariff on US=import duties/customs value in 1991.

[4] Decrease equals depreciation of peso.

[5] Constructed at the 2-digit HTS level.

Source: USITC.

APPENDIX C
Chapter 7 Technical Annex

TECHNICAL APPENDIX

Simulation Model Used in Chapter 7 for Analysis of the Agreements Signed Under Fast-track Authority

Introduction

The tool used to analyze the economy in the absence of fast-track liberalizations is a numeric general equilibrium model calibrated to the observed trade flows and to macro- and microeconomic conditions of the U.S. economy over the historical period from 1978 to 2001.[1] The numeric model is a mathematical representation of economic scarcity and exchange. Resource and technological constraints interact with policy distortions to limit overall welfare. For this exercise, resource endowments and technologies are held constant across the policy simulations. This generates a clean numeric experiment that controls for shocks that are contemporaneously correlated with policy changes. Only those impacts that are specifically (structurally) attributed to policy appear in the simulation. Thus, the technique employed is more akin to an *ex ante* technique applied to an *ex post* analysis of the agreements.

Model Description

General equilibrium models simulate interactions among producers and consumers within an economy in markets for goods, services, labor, and physical capital. The distinguishing feature of the general equilibrium approach is its economywide coverage and multisectoral nature. The model employed here explicitly accounts for upstream and downstream production linkages, intersectoral competition for labor and capital, and international price changes. Currently the model contains no intertemporal linkages; each year is solved as an independent static equilibrium. The key elements of the model can be divided into four components that define the behavioral relationships: final demand behavior, production technology, factor supplies, and the trade equilibrium.

---

[1] Details of the data and construction of the social accounts can be found in Edward J. Balistreri and Alan K. Fox, "TSCAPE: a Time Series of Consistent Accounts for Policy Evaluation," USITC working paper 2003-5-A, 2003.

Final Demand Behavior

The model considers three separate components of domestic final demand: household consumption, government demand, and investment demand. Household consumption is dictated by Cobb-Douglas utility over each product. The other components of final demand are fixed exogenously at their baseline levels; real government spending and investment are held constant. Household consumption is subject to a budget constraint equal to the sum of factor incomes, net capital flows, and tariff revenues, less investment and government spending.

Holding government spending fixed is consistent with welfare analysis under the assumption of separability of private consumption and publicly provided goods in the household utility function. The separability assumption is necessary in the absence of information about the total net benefit associated with government provision of public goods. The model assumes that changes in government outlays (due to changes in tariff policy) are lump-sum redistributed to households. Using distortionary tax instruments (such as labor tax rates) to redistribute additional tariff revenues might decrease or increase the estimated welfare impacts in the scenarios. This depends on the marginal cost of public funds generated by the tax instruments, and the tariffs, in question.[2]

Holding aggregate investment constant in the specification abstracts from issues of substitution between present and future consumption. This assumption is appropriate for static welfare comparisons, but might seem awkward in an analysis that covers multiple time periods. The analysis here, however, is a series of static equilibria, not a dynamic model that considers capital accumulation. This approach might best be described as a recursive-static exercise. In each time period the capital stock is assumed fixed. Although beyond the scope of analysis here, relaxation of these assumptions might reveal important insights into the adjustment dynamics associated with trade policy.

Production Technology

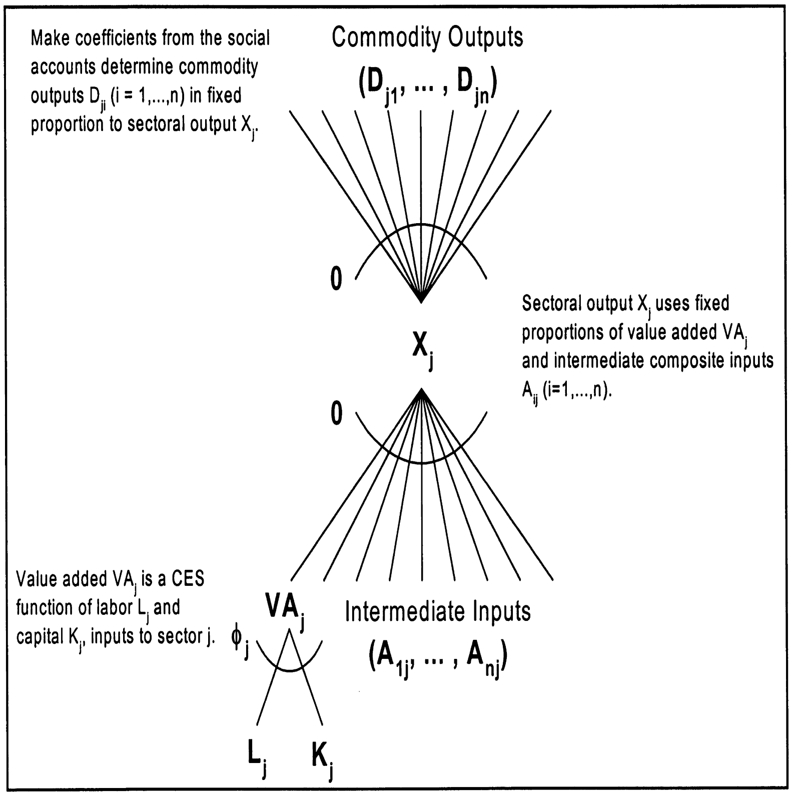
Production technology is modeled using a nested constant elasticity of substitution (CES) value- added function.[3] Figure C-1 illustrates the production technology. At the bottom of the figure, inputs are combined to produce sectoral output X_j. In the value added nest, capital and labor substitute for one another at a rate f_j. Domestic outputs of commodity i produced by sector j, D_{ji},

---

[2] See Charles L. Ballard and Don Fullerton, “Distortionary Taxes and the Provision of Public Goods,” Journal of Economic Perspectives, vol. 6, no. 3, pp. 117-131, 1992.

[3] For an introduction to CES production functions, see ch. 9 of P. R. G. Layard and A. A. Walters, *Microeconomic Theory* (New York: McGraw-Hill, 1978);, and ch. 9 of E. Silberberg, *The Structure of Economics* (New York: McGraw-Hill, 1990);, and ch. 9 of J. W. Chung, *Utility and Production Functions: Theory and Applications* (Cambridge, MA: Blackwell Publishers, 1994).

Figure C-1
Production in the USITC model



are produced in fixed proportions according to the make coefficients in the social accounts. In general, the predominant output for a sector will be in its corresponding commodity, but some sectors will produce other commodities (i.e., the Oil and Gas Extraction industry produces significant amounts of the commodity Electric, Gas, and Sanitary Services, because some natural gas extraction facilities directly produce delivered natural gas to customers). The structure employed here accommodates details on both industries and commodities embedded in the "make" accounts available in the TSCAPE data series.

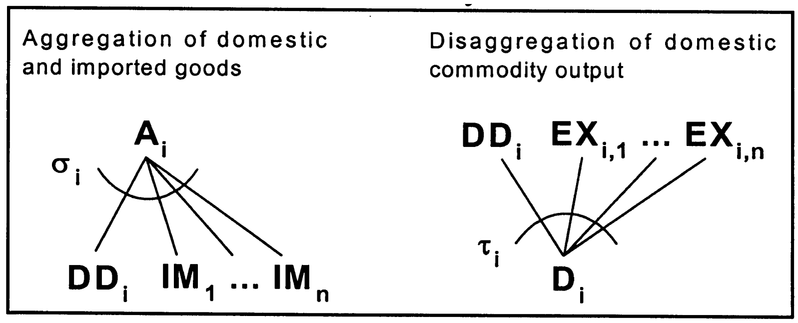
Factor Supplies

Factors of production–labor and capital–are assumed to be in fixed supply. This treatment is appropriate, because the model is not focused on aggregate employment, dynamic adjustment, or domestic tax issues. A single type of generic labor unit is assumed, and the supply of labor is fixed based on the observed value of labor payments for each year in the series. Similarly, capital supply is fixed at its observed value (based on capital payments) for each year in the series. This assumption might be defensible if the policy changes under analysis are expected to have a negligible impact on aggregate capital stocks.

Trade Equilibrium

Consistent with an Armington formulation of trade, region specific varieties of each commodity compete with the domestic variety.[4] For the analysis of trade agreements signed under Fast-track Authority, imports and exports were distinguished by four trade partners: Canada, Mexico, Israel, and ROW (rest of world). Thus the four regional import varieties of a commodity combine with the domestic variety of that commodity at a constant elasticity of substitution. The resulting output is the composite commodity A_i, which is available for domestic absorption.[5] The first panel of Figure C-2 illustrates the Armington aggregation of imports of commodity *i*. The figure is structured such that inputs enter the bottom and outputs are at the top. The parameter s_i controls the elasticity of substitution between domestic and imported goods.[6]

Figure C-2
Product and commodity structure



[4] See Paul S. Armington, “A Theory of Demand for Products Distinguished by Place of Production,” *IMF Staff Papers*, vol. 16, Mar. 1969, pp. 159-76.

[5] Domestic absorption is the measure of both intermediate and final demand for a product.

[6] This σ is often referred to as the “Armington” elasticity, see Paul S. Armington, ”A Theory of Demand for Products Distinguished by Place of Production,” *IMF Staff Papers*, vol. 16, (Mar. 1969), pp. 159-76.

U.S. commodity output is illustrated in the right panel of figure C-2. D_i represents total output of commodity i. Total output D_i is then disaggregated into domestic market supply (DD_i) and international market supply ($EX_{i,r}$) according to a constant elasticity-of-transformation (CET) function. The CET parameter τ_i controls the export supply response.

Response Parameters

In addition to establishing the baseline data (TSCAPE), the model depends on a set of response parameters. These parameters establish behavioral responses to price changes. A key response parameter governing model results is the elasticity of substitution between domestic and foreign varieties of a given commodity. Estimates of these parameters are taken from econometric literature on international trade.[7]

---

[7] David Hummels (Professor of Economics, Purdue University) uses U.S. data on trade and trade costs to estimate the degree to which trade flows change with changes in trade costs. The simulation model uses Hummels' estimates, at the one-digit level, to map trade policy changes into trade flow changes. The one-digit estimates were obtained through personal correspondence with David Hummels. The estimation methodology can be found in David Hummels' paper, "Toward a Geography of Trade Costs" (Mimeo, Purdue University, 2000).

APPENDIX D
Chapter 8 Technical Annex

This technical appendix contains the details of the calculations reported in chapter 8. Two technical exercises were undertaken in chapter 8: an econometric study of the effect of tariff and other trade cost changes on import variety, and a simulation exercise that measures welfare changes in an economic model in which import variety is endogenous to the level of the tariff. The primary purpose of the simulation exercise is to demonstrate the relative magnitude of two sources of welfare gains from trade liberalization, relative price changes and the entry of new product varieties.

The first portion of the technical summary outlines the econometric procedure and characterizes the regression results. Detailed econometric results are reported in tables D3-D6. The second section of the technical appendix describes the model used to measure welfare changes associated with increased product variety.

Econometrics

Methodological Approach

The econometric model is straightforward. It relates changes in the number of import sources in a given commodity with changes in tariff levels and in freight costs facing that commodity. Estimated coefficients on changes in tariff rates provide an estimate of how tariff changes are linked to changes in the number of import sources per commodity. A regression constant measures the number of new sources per commodity that are not linked to changes in tariffs or freight charges.

The econometric specification is as follows:

D1) $$\Delta Count_k = a + \beta_1 \Delta tariff_k + \beta_2 \Delta freight_k + \varepsilon_k$$

where $\Delta Count_k$ is the change in the number of U.S. import sources in commodity k between 1978 and 2001, α is a regression constant, $\Delta tariff_k$ and are $\Delta freight_k$ changes in the measured ad valorem tariff and freight rates for commodity k, and ε_k is a randomly distributed error term.[1] The regression coefficients, β_1 and β_2, are estimates of the degree to which changes in tariffs and freight rates explain changes in the number of import sources per commodity.

Implicit in the estimating strategy defined in equation 1 is the hypothesis that no variables correlated with tariffs and freight charges are excluded from the regression. If reductions in non-tariff barriers have increased product variety, and non-tariff barriers are positively correlated with tariffs, the

[1] The error is assumed to be heteroskedastic. The regression procedures use the White estimation technique to account for heteroskedasticity.

econometric specification in equation 1 will overstate the significance of tariff changes in explaining changes in product-country pairs. Since comprehensive measures of non-tariff barriers are not readily available, equation 1 is estimated over subsets of the products. Estimates for agricultural and textile and apparel sectors are suspect, as these sectors were likely to have been affected by quantitative restrictions. Since mining products are less likely to be differentiated in a manner consistent with the theories of product variety,[2] estimates of increased import variety in mining sectors are estimated separately as well. Most of the analysis is done on the subsample of products that include manufactured goods other than textiles and apparel. Import variety growth was slightly faster in this subsector, which saw an average increase of 20.5 new product-country pairs per commodity group. The average increase over all sectors was 19.1.

The initial econometric specification treats entry decisions by all exporters as equivalent. It is possible that particular groups of countries are more or less responsive to changes in tariff and freight costs. In order to investigate these hypotheses, we group countries as above, using income per capita and dates of GATT/WTO accession. Equation 1 is then estimated over the sub-samples of the data defined by the country-groupings.

Results

Table D-1 shows the relationship between tariff cuts and growth in product-country pairs for two samples of the data. The table reports the effect of a one percent increase in assorted trade costs on the estimated number of new varieties. For example, column two shows that a one percent increase in the multilateral tariff rate on a commodity reduces the number of imported product-country pairs in that commodity by 0.41. Because tariffs were reduced in most commodities, this estimate suggests that tariff reductions increased the number of product-country pairs in U.S. imports.

Similar estimates across subsamples of countries indicates that growth in new product-country pairs was most sensitive to tariff reductions among countries that became members of the GATT/WTO during the period 1978-2001.[3] Similarly, growth in the number of product-country pairs imported from countries the World Bank classifies as middle income countries were most significant. However, the statistical relationships between trade cost reductions and growth in the number of product-country pairs remained weak across multiple estimating equations.

---

[2] See James E. Rauch 1999, “Networks Versus Markets in International Trade” *Journal of International Economics*, 48(1) pp 7-35.

[3] See tables D-5 and D-6 for details.

Table D-1
Trade cost changes and growth in imported SIC 4-digit product-country pairs, 1978-2001

	Change in number of imported product-country pairs	
	All products	Manufacturing other than textiles and apparel
Due to 1 percent increase in:		
Multilateral tariff level	-0.41	-0.34
Freight costs	[1]-0.17	[1]-0.11
Tariff on imports from Israel	0.44	0.32
Tariff on imports from Canada	[1]0.04	[1]0.21
Tariff on imports from Mexico	-0.73	-0.55

[1] Not statistically different from zero at conventional levels. See table D-3 .

Source: U.S. Department of Commerce data and USITC calculations.

A straightforward post-estimation calculation translates the estimated statistical relationships into estimates of induced growth in the number of product-country pairs. The first column of table D-2 shows the estimated response of the number of product-country pairs in imports to a 1 percent increase in each trade cost measure. The second column of table D-2 shows the average change in each of the trade cost changes over the period 1978-2001. The final column reports the product of the numbers in the first two columns, this is the estimate of the number of new product-country pairs attributable to each of the trade cost changes. In manufacturing sectors other than textiles and apparel, the average increase in the number of product-country pairs was 20.54. On average, reductions in the multilateral rate appear to have been responsible for 1.32 (about 6 percent) of the new product-country pairs. Preferential tariff reductions given to Mexico, Israel, and Canada had offsetting effects that produced virtually no net impact.

Similar calculations across a range of specifications indicate that tariff reductions were responsible for 3.5 new varieties, at most. The range of estimates suggests that approximately 5 to 20 percent of the growth in the number of new product country pairs can be attributed to tariff reductions. Factors other than measured trade cost reductions appear to have been quite important. Developing country economic reforms may well have been a more significant cause of growth in U.S. import product variety.

Table D-2
Explaining the growth of new product-country pairs in U.S. imports, 1978-2001[1]

	Average change in number of import sources: 20.54		
	Estimated response to trade cost changes	**Average change in trade costs 1978-2001**	**New product-country pairs attribute to trade cost changes**
Multilateral tariff	-0.34	-3.89	1.32
Freight costs	[2]-0.11	-1.97	0.23
Tariff on imports from Israel	0.32	-2.95	-0.93
Tariff on imports from Canada	[2]0.21	-5.85	-1.23
Tariff on imports from Mexico	-0.55	-3.97	2.18

[1] For subsample of industries that excludes agricultural products, mining products and textiles and apparel.

[2] Not statistically different from zero at conventional levels. See table D-3.

Source: U.S. Department of Commerce data and USITC calculations.

Detailed Econometric Tables

Table D-3
Regression of import variety changes on trade cost changes for all sectors and for industry subsectors[1]

Commodities included in sample	all SIC 4 sectors	agricultural goods[2]	mining products[3]	textiles and apparel[4]	manufacturing other than textiles and apparel[5]
Constant	15.20**	2.19	-8.15	26.60	18.97**
	(1.22)	(3.13)	(5.38)	(5.75)	(1.14)
Change in					
multilateral tariff[6]	-0.41**	1.56	43.14**	0.77	-0.34*
	(0.15)	(1.06)	(13.97)	(0.70)	(0.16)
freight costs[7] .	-0.17	0.06	-0.79†	0.61	-0.11
	(0.17)	(0.23)	(0.41)	(1.07)	(0.23)
Israel tariff	0.44**	0.77	-40.90*	0.83†	0.32**
	(0.11)	(0.53)	(13.47)	(0.43)	(0.10)
Canada tariff . .	0.04	-0.90	-0.49	0.54	0.21
	(0.20)	(0.46)	(1.03)	(0.54)	(0.21)
Mexico tariff . .	-0.73**	-1.03	-5.22	-1.64**	-0.55**
	(0.15)	(1.01	(4.87)	(0.46)	(0.18)
Number of observations. . . .	388	29	19	39	301
R^2	0.10	0.12	0.57	0.29	0.04
F-statistic	12.97**	1.51	7.4**	3.21*	5.73**

1 Statistical significance levels of 1%, 5%, and 10% shown by **, *, and †, respectively.
2 Products with SIC4 classification numbers less than 1000.
3 Products with SIC4 classification numbers 1000-1499.
4 Products with SIC4 classification numbers 2200-2399.
5 Products with SIC4 classification numbers above 2000, except for textiles and apparel sectors.
6 Calculated as (Collected duties - duties collected on imports from Israel, Canada and Mexico)/(Value of imports - Value of imports from Israel, Canada and Mexico).
7 Calculated as (CIF value - customs value)/ CIF value.

Table D-4
Regression of import variety changes on trade cost changes for subsamples of regressors[1]

Constant	19.90**	19.66**	18.97**
	(1.06)	(1.01)	(1.14)
Change in			
multilateral tariff[2]	-0.16	-0.17	-0.34*
	(0.16)	(0.16)	(0.16)
freight costs[3]		-0.11	-0.11
		(0.23)	(0.23)
Israel tariff			0.32**
			(0.10)
Canada tariff			0.21
			(0.21)
Mexico tariff			-0.55**
			(0.18)
Number of observations.	301	301	301
R^2	0.003	0.004	0.04
F-statistic	1.06	0.68	5.73**

[1] Sample includes only manufactured goods other than textiles and apparel. Statistical significance levels of 1%, 5%, and 10% shown by **, *, and †, respectively.
[2] Calculated as (Collected duties - duties collected on imports from Israel, Canada and Mexico)/(Value of imports - Value of imports from Israel, Canada and Mexico).
[3] Calculated as (CIF value - customs value)/ CIF value.

Table D-5
Regression of import variety changes on trade cost changes for subsamples of countries defined by date of GATT/WTO accession[1]

Dates of GATT/WTO accession	pre-1978	1978-2001	post-2001	all countries
Constant	9.87**	6.47**	2.62**	18.97**
	(0.67)	(0.40)	(0.24)	(1.14)
Change in				
multilateral tariff[2]	-0.13	-0.20**	-0.02	-0.34*
	(0.10)	(0.05)	(0.03)	(0.16)
freight costs[3]	-0.07	-0.01	-0.04	-0.11
	(0.12)	(0.08)	(0.04)	(0.23)
Israel tariff	0.12†	0.17**	0.03	0.32**
	(0.07)	(0.03)	(0.02)	(0.10)
Canada tariff	0.14	0.05	0.03	0.21
	(0.12)	(0.06)	(0.04)	(0.21)
Mexico tariff	-0.33**	-0.15*	-0.07*	-0.55**
	(0.11)	(0.06)	(0.03)	(0.18)
Number of observations	301	301	301	301
R^2	0.04	0.05	0.02	0.04
F-statistic	3.17**	6.20**	2.20†	5.73**

[1] Sample includes only manufactured goods other than textiles and apparel. Statistical significance levels of 1%, 5%, and 10% shown by **, *, and †, respectively.

[2] Calculated as (Collected duties - duties collected on imports from Israel, Canada and Mexico)/(Value of imports - Value of imports from Israel, Canada and Mexico).

[3] Calculated as (CIF value - customs value)/ CIF value.

Table D-6
Regression of import variety changes on trade cost changes for subsamples of countries defined by levels of development[1]

Income grouping, 2001	Low Income	Middle Income	High Income	All countries
Constant	3.45**	11.94**	3.58**	18.97**
	(0.32)	(0.66)	(0.40)	(1.14)
Change in				
multilateral tariff[2] . .	-0.02	-0.29**	-0.03	-0.34*
	(0.05)	(0.09)	(0.05)	(0.16)
freight costs[3]	-0.02	-0.06	-0.03	-0.11
	(0.06)	(0.14)	(0.06)	(0.23)
Israel tariff	0.01	0.24**	0.06	0.32**
	(0.03)	(0.06)	(0.04)	(0.10)
Canada tariff	0.06	0.12	0.04	0.21
	(0.06)	(0.12)	(0.05)	(0.21)
Mexico tariff	-0.13*	-0.25*	-0.18**	-0.55**
	(0.05)	(0.10)	(0.05)	(0.18)
Number of observations.	301	301	301	301
R^2	0.02	0.04	0.04	0.04
F-statistic	1.43	5.77**	3.56**	5.73**

[1] Sample includes only manufactured goods other than textiles and apparel. Statistical significance levels of 1%, 5%, and 10% shown by **, *, and †, respectively.

[2] Calculated as (Collected duties - duties collected on imports from Israel, Canada and Mexico)/(Value of imports - Value of imports from Israel, Canada and Mexico).

[3] Calculated as (CIF value - customs value)/ CIF value.

Description of simulation model

The model is a simplified version of the model proposed by Klenow and Rodriguez-Clare (KRC).[4] There is fixed cost of importing a new variety, and the fixed cost varies over varieties. Those varieties with the lowest fixed costs are imported, while others are not. When tariffs are raised to their 1978 average level, the number of imported varieties available in the United States falls. Because consumers value product variety, removing the agreements (returning to 1978 tariffs) has a more negative impact than it would if the model did not allow tariffs to affect the level of product variety.

[4] Peter J. Klenow and Andres Rodriguez-Clare, "Quantifying Variety Gains from Trade Liberalization," September 1997, Graduate School of Business, University of Chicago. Downloaded from web page of Peter Klenow *http://www.klenow.com/QuantifyingVariety.pdf* on Nov 12, 2002.

The model used here differs from the KRC model in one regard - the treatment of intermediate goods. In KRC, increased variety in intermediate products raised domestic productivity; there are no such spillovers in this model. KRC apply their model to a substantial liberalization of Costa Rican imports. Given Costa Rica's size and level of development, a model that attributed productivity gains to increased import variety in intermediates is appropriate. Such stories are less appropriate for the United States. In this model, only consumer gains from import variety are considered. The model used here also assumes only a single factor of production, labor, whereas KRC model includes a (relatively unimportant) role for capital.

Like the standard model explained in chapter 7 and appendix C, the economic model considered here is calibrated to match certain features of the U.S. economy. A model experiment considers how the economy might respond to a reimposition of the U.S. tariffs that were in place in 1978. The model outlined here matches only broad outlines of the U.S. economy, such as the share of imports in expenditure, the level of tariffs imposed, and the changes in the tariffs. The model described in appendix C captures extensive detail about the U.S. economy, including input-output relationships and partner country trade relationships. The model used in this section is only intended to make a demonstrative point, and leaves the construction of a more detailed model for subsequent research.

The demonstrative point made below is that models with a role for product variety suggest larger welfare gains from tariff reductions, and larger welfare losses from tariff increases. The point has been made in the theoretical literature by KRC and by Romer.[5] This exercise is intended as a demonstration of the theoretic point, using an illustrative example based on U.S. data. The simulation indicates that, if consumers value access to an increased variety of imported goods, increased product variety may account for as much as 3/4 of the total welfare increase associated with tariff liberalization.

Model Details

The reader is referred to Klenow and Rodriguez-Clare for a detailed description of the model. This model simplifies from the KRC model by assuming the share of intermediates and capital in production (a) is equal to zero. The economy contains two kinds of goods, a nontradeable good and a tradeable good. Consumers in the model have CES preferences over varieties of the tradeable good. There is a single domestic variety of the tradeable good. Importers of the tradeable good must employ a fixed amount of labor to undertake the activity of importing. World prices are taken as given, so changes in U.S. tariffs affect the prices paid by U.S. consumers, but not the prices that foreign producers receive. Tariff revenues are refunded to consumers lump sum, and they treat this revenue as income.

---

[5] Romer, Paul M. (1994). "New Goods, Old Theory, and the Welfare Costs of Trade Restrictions," *Journal of Development Economics*, vol. 43, pp. 5–38.

Given these assumptions and those outlined in KRC, the model can be summarized as a system of equations. Given the models assumptions about firm and consumer behavior, the price consumers pay for variety j (h_j) is determined by

$$\text{D2)}\quad h_j = \tau \big/ (1 - 1/\sigma)$$

where τ is the tariff applied to imports and σ is the elasticity of substitution between varieties of the tradeable good. The price index of the tradeable good takes the form:

$$\text{D3)}\quad P = \left(1 + \sum_{j=1}^{N} h_j^{(1-\sigma)}\right)^{1/(1-\sigma)}$$

Real U.S. income (I) can be written as:

$$\text{D4)}\quad I = L \Big/ \left(1 - \beta\left(\frac{\tau - 1}{\tau}\right) P^{(\sigma-1)} \sum_{j=1}^{N} h_j^{(1-\sigma)}\right)$$

where L is the supply of labor, β the share of the tradeable good in consumption, and N the number of traded varieties.

Product j is imported if revenues cover the fixed cost (F_j) of importing product j:

$$\text{D5)}\quad \frac{1}{\tau\sigma} P^{(\sigma-1)} \beta I h_j^{(1-\sigma)} > F_j$$

and F_j varies over imported products j in the following manner

$$\text{D6)}\quad F_j = F_0 \exp(\mu j)$$

where F_0 and μ are values to be determined in calibration.

Equilibrium utility (U) is conditional on equilibrium income (I), prices (P), and the share of tradeables in utility(β). Equilibrium P is a function of the equilibrium number of import varieties (N) and the tariff (τ). Utility is the welfare measure of interest, and is calculated as follows.

D7) $$U = \frac{I}{\beta^{-\beta}(1-\beta)^{1-\beta} P(N,\tau)^{\beta}}$$

The Simulation Experiment

As in the simulation experiment in chapter 7, the model is used to measure the effect of imposing 1978 tariffs on a representation of the 2001 economy. Under the assumption that the model of economic behavior is correct, this type of experiment produces a simulated environment that represents the world as it would have existed had the U.S. not reduced its tariffs. The (simple) average tariff on 4 digit commodities in 2001 was 2.7 percent. In 1978, that value was 7.1 percent. Econometric evidence outlined in chapter 8 suggests that these tariff cuts induced import growth of between 1 and 3.5 new varieties. The model is calibrated so that the simulated tariff increase from 2.7 to 7.1 percent eliminates 3 varieties from the import bundle.[6]

Calibration Details

The model is calibrated through the choice of parameter values that reflect specific features of the U.S. economy, and then free parameters are chosen such that 3 fewer varieties are imported at the 7.1 percent tariff than at the 2.7 percent tariff. The parametric inputs are reported in table D-7.

[6] This reflects the upper range of the 1-3.5 range. Because the experiment is aimed at identifying possible upper bounds on variety type effects, the largest discrete number in this range is chosen as a calibration input.

Table D-7
Parameter inputs into model calibration

Parameter	Description	Value
L	Economy-wide labor supply	1000
β	Share of tradeable good in consumption[1]	0.15
σ	Elasticity of substitution[2]	8.26
t_0	1+simple average tariff in 2001[3]	1.027
t_1	1+simple average tariff in 1978[3]	1.071
F_0	Common component of fixed labor charge[4]	0.2741
μ	Variety-specific component of fixed labor charge[4]	0.001

[1] Ratio of imports to GDP; USITC calculations and Bureau of Economic Analysis.

[2] Average elasticity of substitution at comparable level of aggregation, David Hummels, “Toward a Geography of Trade Costs,” Purdue University monograph, 1999.

[3] USITC calculations based on Department of Commerce data.

[4] Calibrated fitted values.

Results

Once calibrated, the simulation model is shocked by changing the tariff from its 2001 value of 1.027 to its 1978 value of 1.078. The model has been calibrated so that this tariff change causes the number of U.S. import varieties to fall from 58 to 55. Utility is calculated for three outcomes: the initial equilibrium, $(U_0 = U|_{N=58,\tau=1.027})$ the counterfactual equilibrium $(U_1 = U|_{N=55,\tau=1.071})$, and for the counterfactual outcome with variety held constant $(U_1' = U|_{N=58,\tau=1.071})$

The experiment most similar to that considered in chapter is 7 is a comparison of the initial equilibrium and the counterfactual equilibrium with variety held constant. A comparison of U_1 and U_0 indicates that when the relative price effects of tariff changes are considered alone, returning tariffs to 1978 levels would reduce U.S. welfare by 0.04 percent. Comparing U'_1 and U_0 allows an estimate of the total welfare gains (relative price and variety effects). In this scenario, returning to 1978 tariffs would reduce U.S. welfare by 0.15 percent. Variety effects account for approximately 3/4 of the total welfare change induced by the tariff change.

APPENDIX E
Bibliography

Bibliography

Adams, Richard, Philippa Dee, Jyothi Gali, and Greg McGuire (2003). "The Trade and Investment Effects of Preferential Trading Arrangements - Old and New Evidence," *Productivity Commission Staff Working Paper* (May 2003), Canberra, Australia: Productivity Commission.

Agama, Laurie-Ann C. and Christine A. McDaniel (2003). "The NAFTA Preference and U.S.-Mexico Trade: Aggregate-Level Analysis," *The World Economy (forthcoming)*.

Aitken, Brian and Ann Harrison (1999). "Do Domestic Firms Benefit from Foreign Direct Investment? Evidence from Venezuela," *American Economic Review*, vol. 89, pp. 605-618.

Aw, Bee Yan, Sukkyun Chung, and Mark Roberts (2000). "Productivity and Turnover in the Export Market: Micro-Level Evidence from the Republic of Korea and Taiwan (China)," *World Bank Economic Review,* vol. 14, pp. 65-90.

Aw, Bee Yan and Amy Huang (1995). "Productivity and the Export Market: a Firm-Level Analysis," *Journal of Development Economics*, vol. 47, pp. 313-32.

Baier, Scott L. and Jeffrey H. Bergstrand (2001). "The Growth of World Trade: Tariffs, Transport Costs and Income Similarity," *Journal of International Economics*, vol. 53, pp.1-27.

Balasubramanyam, V.N., Mohammed Salisu, and David Sapsford (1996). "Foreign Direct Investment and Growth in Export Promoting and Import Substituting Countries," *Economic Journal* vol. 106, No. 434 (January), pp. 92-105.

Baldwin, Robert and Tracy Murray (1997). "MFN Tariff Reductions and Developing Country Trade Benefits under the GSP" *Economic Journal*, vol. 87, No. 345, pp.30-46, March.

Baldwin, Richard and Elena Seghezza (1996a). "Trade-Induced Investment-Led Growth," National Bureau of Economic Research Working Paper 5582.

Baldwin, Richard and Elena Seghezza (1996b). "Testing for Trade-Induced Investment-Led Growth," National Bureau of Economic Research Working Paper 5416.

Baldwin, Richard and Elena Seghezza (1997). "Growth and European Integration: Towards an Empirical Assessment," Centre for Economic Policy Research, Discussion Paper No. 1393.

Baldwin, Richard and Elena Seghezza (1998). "Regional Integration and Growth in Developing Nations," *Journal of Economic Integration*, vol. 13, pp. 367-399.

Bartelsman, Eric and Mark Doms (2000). "Understanding Productivity: Lessons from Longitudinal Microdata," Journal of Economic Literature, vol.38, pp. 569-594.

Benjamin, Nancy and Michael Ferrantino (2001). "Trade Policy and Productivity Growth in OECD Manufacturing," *International Economic Journal*, vol. 15, pp. 95-115.

Berman, Eli, John Bound, and Zvi Griliches (1994). "Changes in the Demand for Skilled Labor within U.S. Manufacturing: Evidence from Annual Survey of Manufactures," *Quarterly Journal of Economics*, vol. 109, No. 2, pp. 367-397.

Bernard, Andrew and J. Bradford Jensen (1995). "Exporters, Jobs, and Wages in U.S. Manufacturing: 1976-1987," *Brookings Papers on Economic Activity*, pp. 67-112.

Bernard, Andrew and J. Bradford Jensen (1999). "Exceptional Exporter Performance: Cause, Effects, or Both?" *Journal of International Economics*, vol. 47, pp. 1-25.

Bernard, Andrew, J. Bradford Jensen and Peter K. Schott (2002). "Falling Trade Costs, Heterogeneous Firms, and Industry Dynamics," Yale University School of Management (September), working paper available at *http://www.som.yale.edu/Faculty/pks4/files/research/papers/expdyn26_020916.pdf*.

Bernard, Andrew, J. Bradford Jensen and Peter K. Schott (2002). "Survival of the Best Fit: Low Wage Competition and the (Uneven) Growth of US Manufacturing Plants," Yale University School of Management working paper, available at *http://www.som.yale.edu/Faculty/pks4/files/research/papers/bestfit_020816.pdf*.

Bernard, Andrew, J. Bradford Jensen, and Peter K. Schott, (2003) "Survival of the Best Fit: Exposure to Low-Wage Countries and the (Uneven) Growth of U.S. Manufacturing Plants," April, Yale University manuscript.

Bhagwati, Jagdish, Arvind Panagariya, and T.N. Srinivasan (1998). *Lectures on International Trade*, 2nd Edition (Cambridge, MA: MIT Press).

Borensztein, Eduardo, Jose DeGregorio, and Jong-Wha Lee (1998). "How Does Foreign Direct Investment Affect Economic Growth?" *Journal of International Economics*, vol. 45, pp. 115-35.

Borjas, George J., Richard B. Freeman, and Lawrence F. Katz (1997). "How Much Do Immigration and Trade Affect Labor Market Outcomes?" *Brookings Papers on Economic Activity*, vol. 1, pp. 1-67.

Borjas, George J. and Valerie A. Ramey (1993). "Foreign Competition, Market Power, and Wage Inequality: Theory and Evidence," National Bureau of Economic Research Working Paper No. 4556 (December).

Bound, John and George Johnson (1992). "Changes in the Structure of Wages in the 1980s: An Evaluation of Alternative Explanations," *American Economic Review*, vol. 82, No. 3, pp. 371-392.

Brander, James A. and Barbara J. Spencer (1984). "Tariff Protection and Imperfect Competition," in H. Kierzkowski, ed., *Monopolistic Competition and International Trade* (Oxford, UK: Oxford University Press) pp. 194-206.

Brown, Drusilla K. (1994). "Properties of Applied General Equilibrium Trade Models with Monopolistic Competition and Foreign Direct Investment," in J.F. Francois and C.R. Shiells, eds., *Modeling Trade Policy: Applied General Equilibrium Assessments of North American Free Trade* (Cambridge, UK: Cambridge University Press) pp. 124-148.

Brown, Drusilla K., Alan V. Deardorff and Alan K. Fox, and Robert M.Stern (1995). "Computational Analysis of Goods and Services Liberalization in the Uruguay Round," in W. Martin and L.A. Winters, eds., *The Uruguay Round and the Developing Economies,* World Bank Discussion Paper 307 (Washington, DC: The World Bank) pp. 365-380.

Brown, Drusilla K., Alan V. Deardorff and Robert M. Stern (1992). "The North American Free Trade Agreement: Analytical Issues and a Computational Assessment," *The World Economy,* vol. 15, No. 1, pp. 15-29.

Brown, Drusilla K., Alan V. Deardorff and Robert M. Stern (1992). "North American Integration," *The Economic Journal,* vol. 102 (November), pp. 1507-1518.

Brown, Drusilla K and Robert M. Stern (1989), "Computable General Equilibrium Estimates of the Gains from U.S.-Canadian Trade Liberalisation," in David Greenaway, Thomas Hyclak, and Robert J. Thornton, eds., *Economic Aspects of Regional Trading Arrangements*, Hertfordshire, England, Harvester Wheatsheaf, pp. 69-108.

Brown, Fred and John Whalley (1980). "General Equilibrium Evaluations of Tariff-Cutting Proposals in the Tokyo Round and Comparisons With More Extensive Liberalisation of World Trade," *The Economic Journal,* vol. 90 (December), pp. 836-866.

Burfisher, Mary E., Sherman Robinson and Karen Theirfelder (1994). "Wage Changes in a U.S.-Mexico Free Trade Area: Migration Versus

Stolper-Samuelson Effects," in J.F. Francois and C.R. Shiells, eds., *Modeling Trade Policy: Applied General Equilibrium Assessments of North American Free Trade* (Cambridge, UK: Cambridge University Press) pp. 195-222.

Burfisher, Mary E., Sherman Robinson and Karen Theirfelder (2001). "The Impact of NAFTA on the United States," *Journal of Economic Perspectives,* vol. 15, No. 1 (Winter), pp. 125-144.

Burtless, Gary (1997). "Widening U.S. Income Inequality and the Growth in World Trade," Brookings Institution, unpublished manuscript, as cited in William R. Cline, *Trade and Income Distribution* (Washington, DC: Institute for International Economics), p. 19.

Caves, Richard E. and David Barton (1990). *Efficiency in U.S. Marketing Industries* (Cambridge, MA: MIT Press).

Caves, Richard E, Jeffrey A. Frankel, and Ronald W. Jones (2002). *World Trade and Payments: An Introduction,* 9th edition (Boston: Addison-Wesley).

Clausing, Kimberly A. (2001). "Trade Creation and Trade Diversion in the Canada-United States Free Trade Agreement," *Canadian Journal of Economics,* vol. 34, No. 3, pp. 676-696.

Cline, William R. (1997). *Trade and Income Distribution* (Washington, DC: Institute for International Economics).

Cox, David and Richard G. Harris (1985), "Trade Liberalization and Industrial Organization: Some Estimates for Canada," *Journal of Political Economy*, vol. 93, No. 1, February 1985, pp 115-145.

Cox, David and Richard G. Harris (1986), "A Quantitative Assessment of the Economic Impact on Canada of Sectoral Free Trade with the United States," *Canadian Journal of Economics,* vol. 19, No. 3, August 1986, pp. 377-94.

Coughlin, Cletus C. and Howard J. Wall (2000). *NAFTA and the Changing Pattern of State Exports*, Working Paper 2000-029, Research Division, Federal Reserve Bank of St. Louis, October.

Deardorff, Alan V. and Robert M. Stern (1981). "A Disaggregated Model of World Production and Trade: An Estimate of the Impact of the Tokyo Round," *Journal of Policy Modeling,* vol. 3, pp. 127-152.

Deardorff, Alan V. and Robert M. Stern (1983), "Economic Effects of the Tokyo Round," *Southern Economic Journal*, January 1983, vol. 49, No. 3, pp. 605-624.

Deardorff, Alan V. and Robert M. Stern (1986). *The Michigan Model of World Production and Trade* (Cambridge, MA: MIT Press).

Delgado, Miguel, Jose Farinas, and Sonia Ruano (2002). "Firm Productivity and Export Markets: a Non-Parametric Approach," *Journal of International Economics*, vol. 57, pp. 397-422.

Devarajan, Shantayanan, Delfin S. Go, Jeffrey D. Lewis, Sherman Robinson, and Pekka Sinko (1997), "Chapter 6: Simple General Equilibrium Modeling," in *Applied Methods for Trade Policy Analysis*, Joseph F. Francois and Kenneth A. Reinert, eds. (Cambridge, UK: Cambridge University Press).

DeRosa, Dean A. (1998). *Regional Integration Arrangements: Static Economic Theory, Quantitative Findings, and Policy Guidelines*, World Bank Policy Research Report 2007.

Dollar, David (1992). "Outward-Oriented Developing Economies Really Do Grow More Rapidly: Evidence from 95 LDCs, l976-l985," *Economic Development and Cultural Change,* vol. 41, pp. 523-544.

Doms, Mark and J. Bradford Jensen (1998). "Comparing Wages, Skills, and Productivity Between Domestic and Foreign Owned Manufacturing Establishments in the United States," in *Geography and Ownership as Bases for Economic Accounting.* R. Baldwin, R. Lipsey, and J.D. Richardson, eds. (Chicago: University of Chicago Press).

Edwards, Sebastian (1992). "Trade Orientation, Distortions, and Growth in Developing Countries,"*Journal of Development Economics,* vol. 39, pp. 31-57.

Edwards, Sebastian (1993). "Openness, Trade Liberalization, and Growth in Developing Countries, *Journal of Economic Literature,* vol. 31, pp. 1358-1393.

Edwards, Sebastian (1998). "Openness, Productivity, and Growth: What Do We Really Know?" *Economic Journal*, vol. 108, pp. 383-398

Feenstra, Robert C. (1994). "New Product Varieties and the Measurement of International Prices," *American Economic Review*, vol. 84 (March), pp. 157-177.

Feenstra, Robert C. (1998). "Integration of Trade and Disintegration of Production in the Global Economy," *Journal of Economic Perspectives*, vol. 12, No. 4, pp. 31-50.

Feenstra, Robert C., ed. (2000). *The Impact of International Trade on Wages* (Chicago, IL: The University of Chicago Press).

Feenstra, Robert C. (2003), "Increasing Returns and the Gravity Equation," chapter 5 in Feenstra, *Advanced International Trade: Theory and Evidence* (Princeton, NJ: Princeton University Press, 2003 forthcoming).

Feenstra, Robert C. and Gordon Hanson (1999). "Productivity Measurement and the Impact of Trade and Technology on Wages: Estimates for the U.S., 1972-1990," *Quarterly Journal of Economics*, vol. 114, No. 3, August 1999, pp. 907-940.

Feenstra, Robert C. and Gordon H. Hanson (2001). "Global Production Sharing and Rising Inequality: A Survey of Trade and Wages," University of California, San Diego, and National Bureau of Economic Research, Revised June 2001.

Feenstra, Robert C., Gordon H. Hanson and Deborah L. Swenson, (2000) "Offshore Assembly from the United States: Production Characteristics of the 9802 Program," in Robert E. Feenstra, ed. (2000), *The Impact of International Trade on Wages* (Chicago: University of Chicago Press, pp. 85-122).

Feenstra, Robert C., James R. Markusen, and Andrew K. Rose (2001). "Using the Gravity Model Equation to Differentiate Among Alternative Theories of Trade," *Canadian Journal of Economics*, vol. 34, No. 2, pp. 430-447.

Feenstra, Robert C. and Clinton R. Shiells (1997). "Bias in U.S. Import Prices and Demand," in Timothy F. Bresnahan and Robert J. Gordon, eds.(1997), *The Economics of New Goods*, 249-76. (Chicago: University of Chicago Press).

Ferrantino, Michael (2001). "Evidence of Trade, Income, and Employment Effects of NAFTA," *Industry Trade and Technology Review*, U.S. International Trade Commission Publication 3483 (December).

Field, Alfred J. and Edward M. Graham (1997) "Is there a Special Case for Import Protection for the Textile and Apparel Sectors Based on Labour Adjustment?" *The World Economy*, vol. 20, No. 2 (March) pp. 137-157.

Fox, Alan K. (2000) "Evaluating the Success of a CGE Model of the U.S.-Canada Free Trade Agreement," in Alan K. Fox, *Three Essays on International Trade Policy*, Ph.D. dissertation, University of Michigan. *http://www-personal.umich.edu/~alanfox/dissert.pdf* (accessed August 1, 2003).

Francois, Joseph F., Bradley McDonald, and Hakan Nordstrom (1995). "Assessing the Uruguay Round," in W. Martin and L.A. Winters, eds., *The Uruguay Round and the Developing Economies,* World Bank Discussion Paper 307, (Washington, DC: The World Bank) pp. 117-214.

Francois, Joseph F., and Clinton R. Shiells (1994). "AGE Models of North American Free Trade," in J.F. Francois and C.R. Shiells, eds., *Modeling Trade Policy: Applied General Equilibrium Assessments of North American Free Trade,* (Cambridge, UK: Cambridge University Press) p. 3-44.

Frankel, Jeffrey A. (1997). *Regional Trading Blocs in the World Economic System* (Washington, D.C.: Institute for International Economics).

Frankel, Jeffrey A. and David Romer (1999). "Does Trade Cause Growth?" *American Economic Review*, vol. 89, pp. 379-99.

Frankel, Jeffrey A. and Andrew K. Rose (2002). "An Estimate of the Effect of Common Currencies on Trade and Income," *The Quarterly Journal of Economics*, vol. 117, No. 2, pp. 437-466.

Frankel, Jeffrey A. and Shang-Jin Wei (1995). "Open Regionalism in a World of Continental Trading Blocks," National Bureau of Economic Research Working Paper No. 5272.

Frankel, Jeffrey A. and Shang-Jin Wei (1996). "ASEAN in a Regional Perspective," Pacific Basin Working Paper No. PB96-02, Federal Reserve Bank of San Francisco.

Freeman, Richard (1995). "Are Your Wages Set in Beijing?" *Journal of Economic Perspectives*, vol. 9, No. 3 (Summer), pp. 15-32.

Fukao, Kyoji, Toshihiro Okubo and Robert M. Stern (2003). "An Econometric Analysis of Trade Diversion under NAFTA," *The North American Journal of Economics and Finance*, vol.14, No.1 (March), pp. 3-24.

GAO (2000a), "Trade Adjustment Assistance: Trends, Outcomes, and Management Issues in Dislocated Worker Programs," GAO-01-59, October.

GAO (2000b) "Trade Adjustment Assistance: Impact of Federal Assistance to Firms is Unclear," GAO-01-12, December.

GAO (2001), "Trade Adjustment Assistance: Experiences of Six Trade-Impacted Communities," GAO-01-838, August.

Ghosh, Sucharita and Steven Yamarik (2003). "Are Regional Trading Arrangements Trade Creating? An Application of Extreme Bounds Analysis," *Journal of International Economics (forthcoming).*

Girma, Sourafel, David Greenaway, and Richard Kneller (2002). "Does Exporting Lead to Better Performance? A Microeconomic Analysis of Matched Firms," manuscript.

Goldberg, Pinelopi and Frank Verboven (2001). "Market Integration and Convergence to the Law of One Price: Evidence from the European Car Market," Centre for Economic Policy Research Discussion Paper No. 2926 (August).

Goldin, Ian, and Dominque van der Mensbrugghe(1995). "The Uruguay Round: An Assessment of Economywide and Agricultural Reforms," in

Will Martin and L. Alan Winters, eds., *The Uruguay Round and the Developing Economies*, World Bank Discussion Paper 307 (Washington, DC: The World Bank, 1995) pp. 25-52.

Gould, David M. (1998). "Has NAFTA Changed North American Trade?" *Federal Reserve Bank of Dallas Economic Review* (First Quarter) pp. 12-23.

Greenaway, David, Wyn Morgan, and Peter Wright (1998). "Trade Reform, Adjustment and Growth: What Does the Evidence Tell Us?" *Economic Journal*, vol. 108, pp. 1547-1561.

Haaland, Jan and Truls C. Tollefsen (1994). "The Uruguay Round and Trade in Manufactures and Services: General Equilibrium Simulations of Production, Trade, and Welfare Effects of Liberalization," Centre for Economic Policy Research Discussion Paper No. 1008 (July).

Haddad, Mona and Ann E. Harrison (1993). "Are There Positive Spillovers from Foreign Direct Investment? Evidence from Panel Data for Morocco," *Journal of Development Economics*, vol. 42, pp. 51-74.

Harrigan, James (2000). "International Trade and American Wages in General Equilibrium," in Robert C. Feenstra, ed, *The Impact of International Trade on Wages* (Chicago, IL: The University of Chicago Press), 2000, pp. 171-196.

Harris, Richard (1984). "Applied General Equilibrium Analysis of Small Open Economies with Scale Economies and Imperfect Competition," *American Economic Review* 74:5, December 1984, pp. 1016-32

Harrison, Ann E. (1994). "Productivity, Imperfect Competition, and Trade Reform: Theory and Evidence," *Journal of International Economics*, vol. 36, pp. 53-73.

Harrison, Ann E. (1996). "Openness and Growth: a Time-Series, Cross-Country Analysis for Developing Countries," *Journal of Development Economics*, vol. 48, pp. 419-447.

Harrison, Ann E. and Ana Revenga (1995). "The Effects of Trade Policy Reform: What Do We Really Know?" National Bureau of Economic Research Working Paper 5225.

Harrison, Glen W., Thomas F. Rutherford, and David G. Tarr (1995). "Quantifying the Uruguay Round," in W. Martin and L.A. Winters, eds., *The Uruguay Round and the Developing Economies*, World Bank Discussion Paper 307 (Washington, DC: The World Bank) pp. 215-284.

Haskel, Jonathan E. and Matthew J. Slaughter (2000). "Have Falling Tariffs and Transportation Costs Raised U.S. Wage Inequality?" National Bureau of Economic Research Working Paper No. 7539 (February).

Haskel, Jonathan E. (1999). “The Trade and Labour Approaches to Wage Inequality,” Centre for Economic Policy Research Working Paper, Queen Mary and Westfield College, University of London (July).

Hassink, Wolter H.J. and Ronald Schettkat (2001). “On Price-Setting for Identical Products in Markets Without Formal Trade Barriers,” Utrecht University Discussion Paper No. 315 (June).

Head, Keith and John Ries (1999). “Rationalization Effects of Tariff Reductions, *Journal of International Economics*, vol. 47, pp. 295-320.

Hertel, Tom, Will Martin, Koji Yanagishima, and Betina Dimaranan (1995). “Liberalizing Manufactures Trade in a Changing World Economy,” in W. Martin and L.A. Winters, eds., *The Uruguay Round and the Developing Economies*, World Bank Discussion Paper 307 (Washington, DC: The World Bank) pp. 73-96.

Hillberry, Russell and Christine McDaniel (2002). “A Decomposition of Trade Growth Since NAFTA,” U.S. International Trade Commission Office of Economics Working Paper No. 2002-12-A (December).

Hummels, David (1999). “Have International Transport Costs Declined?” Purdue University, November 1999, available at *http://www.mgmt.purdue.edu/faculty/hummelsd/research/decline/declined.pdf*, downloaded March 17, 2003.

Hummels, David (2001). “Time as a Trade Barrier” July 2001, Purdue University manuscript, downloaded from *http://www.mgmt.purdue.edu/faculty/hummelsd/research/time3b.pdf*_on March 17, 2003.

Hummels, David, Jun Ishii, and Kei-Mu Yi (2001). “The Nature and Growth of Vertical Specialization in World Trade,”*Journal of International Economics*, vol. 54.

Hummels, David and Peter J. Klenow (2002). “The Variety and Quality of a Nation’s Trade,” National Bureau of Economic Research Working Paper 8712 (January).

Hummels, David and Volodymyr Lugovskyy (2002). “Usable Data? Matched Partner Trade Statistics as Measures of International Transport Costs,” Purdue University manuscript.

Hummels, David and Alexandre Skiba (2003). “A Virtuous Circle? Regional Tariff Liberalization and Scale Economies in Transport,” forthcoming 2003 in *FTAA and Beyond: Prospects for Integration in the Americas.*

Karemara, David and Kalu Ojah (1998). “An Industrial Analysis of Trade Creation and Diversion Effects of NAFTA,” *Journal of Economic Integration*, vol. 13, pp. 400-25.

Katayama, Hajime, Shihua Lu, and James Tybout (2002). "Inferring Plant-Level Performance Measures from Revenues and Costs," manuscript.

Katz, Lawrence F. and David Autor (1999) "Changes in the Wage Structure and Earnings Inequality," in Orley Ashenfelter and David Card, eds., *Handbook of Labor Economics, Vol. 3A* (Amsterdam: Elsevier, 1999) pp. 1463-1555.

Katz, Lawrence F. and Kevin M. Murphy (1992). "Changes in Relative Wages 1963-1987: Supply and Demand Factors," *Quarterly Journal of Economics*, vol 107, No. 428 (February), pp. 35-78.

Kehoe, Timothy J. (2002). "An Evaluation of the Performance of Applied General Equilibrium Models of the Impact of NAFTA," *Federal Reserve Bank of Minneapolis Research Department Staff Report*, revised December 2002.

Kehoe, Patrick J. and Timothy J. Kehoe (1994). "Capturing NAFTA's Impact With Applied General Equilibrium Models." *Federal Reserve Bank of Minneapolis Quarterly Review* (Spring) vol. 18, No. 1.

Kim, Euysung (2000). "Trade Liberalization and Productivity Growth in Korean Manufacturing Industries: Price Protection, Market Power, and Scale Efficiency," *Journal of Development Economics*, vol. 62, 55-83.

Klenow, Peter J. and Andres Rodriguez-Clare (1997). "Quantifying Variety Gains from Trade Liberalization," manuscript (September), downloaded from Peter Klenow's web page at *http://www.klenow.com/QuantifyingVariety.pdf* on November 12, 2002.

Kletzer, Lori G. (2001). *Job Loss from Imports: Measuring the Costs* (Washington, DC: Institute for International Economics).

Krueger, Anne O. (1999). *Trade Creation and Trade Diversion Under NAFTA*, National Bureau of Economic Research Working Paper No. 7429 (December).

Krueger, Anne O. (2000). "NAFTA's Effects: A Preliminary Assessment", *The World Economy*, vol. 23, No. 6 (June).

Krugman, Paul (1995). "Growing World Trade, Causes and Consequences," Brookings Papers on Economic Activity, No. 1, pp. 327-377.

Krugman, Paul R. and Maurice Obstfeld (2000). *International Economics: Theory and Policy*, 5th Edition (Reading, MA: Addison-Wesley).

Krishna, Pravin and Devashish Mitra (1998). "Trade Liberalization, Market Discipline, and Productivity Growth: New Evidence from India," *Journal of Development Economics*, vol. 56, pp. 447-62.

Kucera, David and William Millberg (2002). “Trade and the Loss of Manufacturing Jobs in the OECD: New Factor Content Calculations for 1978-1995,” International Institute for Labor Studies Paper: DP/135/2002.

Lawrence, Robert Z. and Matthew J. Slaughter (1993). “Trade and U.S. Wages: Great Sucking Sound or Small Hiccup?” *Brookings Papers on Economic Activity*, vol. 2, pp. 161-226.

Leamer, Edward E. (1982). “Sets of Posterior Means with Bounded Variance Priors,” *Econometrica*, vol. 50, pp. 725-736.

Leamer, Edward E. (1999), “Effort, Wages, and the International Division of Labor,” *Journal of Political Economy* vol. 107, No. 6, part 1 (December), pp. 1127-63.

Leamer, Edward E., Alfonso Guerra, Martin Kaufman, and Boris Segura (1995). “How Does the North American Free Trade Agreement Affect Central America?” World Bank Policy Research Working Paper 1464.

Leamer, Edward E. and Herman Leonard (1983). “Reporting the Fragility of Regression Estimates,” *The Review of Economics and Statistics,* vol. 65, No. 2, pp. 306-317.

Leamer, Edward E. and Christopher F. Thornburg (2000), “Effort and Wages: A New Look at the Interindustry Wage Differentials,” in Robert E. Feenstra, ed. (2000), *The Impact of International Trade on Wages* (Chicago: University of Chicago Press), pp. 37-80.

Lee, Jong-Wha and Phillip Swagel (1997). “Trade Barriers and Trade Flows Across Countries and Industries,” *Review of Economics and Statistics*, vol. 74, pp. 372-382.

Levine, Ross and David Renelt (1992) “A Sensitivity Analysis of Cross-Country Growth Regressions,” *American Economic Review*, vol. 82, pp. 942-963.

Levinsohn, James (1993). “Testing the Imports-as-Market-Discipline Hypothesis,” *Journal of International Economics*, vol 35, pp. 1-22.

MacDonald, James M. (1994). “Does Import Competition Force Efficient Production?” *Review of Economics and Statistics*, vol. 76, pp. 721-27.

Markusen, James R., James R. Melvin, William H. Kaempfer, and Keith E. Maskus (1995). *International Trade: Theory and Evidence,* International Edition, (Boston: McGraw-Hill).

Martin, Will and Alan L. Winters (1995). *The Uruguay Round–Widening and Deepening the World Trading System* (Washington, DC: The World Bank).

Meade, James E. (1955). *The Theory of Customs Union* (Amsterdam: North Holland).

Nguyen, Trien T., Carlo Perroni, and Randall M. Wigle (1995). "A Uruguay Round Success?" *World Economy,* vol. 18 (January) pp. 25-30.

Pavcnik, Nina (2002). "Trade Liberalization, Exit, and Productivity Improvements: Evidence from Chilean Plants," *Review of Economic Studies*, vol. 69, pp. 245-76

Perroni, Carlo (1996) "The Uruguay Round and Its Impact on Developing Countries: An Overview of Model Results," report prepared for a United Nations Conference on Trade and Development Project on "The Impact of the Uruguay Round on Developing Countries,"(February).

Perroni, Carlo and John Whalley (2000). "The New Regionalism: Trade Liberalization or Insurance?" *Canadian Journal of Economics*, vol. 33, No. 1 (February) pp. 1-24.

Pritchett, Lant (1996). "Measuring Outward Orientation in LDCs: Can it Be Done? *Journal of Development Economics,* vol. 49, pp. 307-335.

Ray, Edward John and Howard P. Marvel (1995). "Countervailing Duties", *Economic Journal*, vol. 105, No. 433, pp.1576-93, November.

Richardson, David J. (1995) "Income Inequality and Trade: How to Think, What to Conclude," *Journal of Economic Perspectives*, vol. 9, No. 3 (Summer) pp. 33-55.

Roberts, Mark J. and James R. Tybout, eds. (1996). *Industrial Evolution in Developing Countries: Micro Patterns of Turnover, Productivity and Market Structure* (New York: Oxford University Press).

Robertson, Raymond (2000). "Wage Shocks and North American Labor-Market Integration," *The American Economic Review*, vol 90, No. 4 (September) pp. 742-764.

Rodriguez, Francisco and Dani Rodrik (1999). "Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence," National Bureau of Economic Research Working Paper No. 7081.

Roland-Holst, David W., Kenneth A. Reinert, and Clinton R. Shiells (1992). "North American Trade Liberalization and the Role of Nontariff Barriers," *Economy-wide Modeling of the Economic Implications of a FTA with Mexico and Canada* (Washington, DC: U.S. International Trade Commission, May), Publication 2508.

Roland-Holst, David W., Kenneth A. Reinert, and Clinton R. Shiells (1994). "A General Equilibrium Analysis of North American Integration," *Modeling Trade Policy: Applied General Equilibrium Assessments of North American Free Trade* (Cambridge, UK: Cambridge University Press), pp. 47-82.

Romalis, John (2001). “NAFTA’s Impact on North American Trade,” University of Chicago Graduate School of Business Working Paper.

Romer, Paul M. (1994). “New Goods, Old Theory, and the Welfare Costs of Trade Restrictions,” *Journal of Development Economics,* vol. 43, pp. 5-38.

Rose, Andrew K. (1991). “Why Has World Trade Grown Faster Than Income?” *Canadian Journal of Economics*, vol. 24, pp. 417-427.

Rose, Andrew K. (2000). “One Money, One Market? The Effects of Common Currencies on International Trade,” *Economic Policy*, vol. 15, No. 30, pp. 7-46.

Rose, Andrew K. (2002). “Do WTO Members Have More Liberal Trade Policy?”, *National Bureau of Economic Research Working Paper* no. 9347 (November).

Rutherford, Thomas F. and David G. Tarr (2002). “Trade Liberalization, Product Variety and Growth in a Small Economy: A Quantitative Assessment,” *Journal of International Economics*, vol. 56, pp. 247-272.

Sachs, Jeffrey D. and Howard J. Shatz (1994). “Trade and Jobs in U.S. Manufactures,” *Brookings Papers on Economic Activity,* vol. 1, pp. 1-84.

Sachs, Jeffrey D. and Andrew Warner (1995). “Economic Reform and the Process of Global Integration,” *Brookings Papers on Economic Activity*, vol. 1-118.

Sawyer, Charles W. and Richard L. Sprinkle (1986). “U.S.-Israel Free Trade Area: Trade Expansion Effects of the Agreement,” *Journal of World Trade Law,* vol. 20, No. 5 (September-October) pp. 529-39.

Schott, Peter K. (2001). “Do Rich and Poor Countries Specialize in a Different Mix of Goods? Evidence from Product-Level U.S. Trade Data,” National Bureau of Economic Research Working Paper 8492, (September).

Slaughter, Matthew J. (1998). “International Trade and Labour-Market Outcomes: Results, Questions, and Policy Options,” *The Economic Journal*, vol. 108 (September) pp. 1452-1462.

Slaughter, Matthew J. and Phillip Swagel (1997). “The Effect of Globalization on Wages in the Advanced Economies,” International Monetary Fund Working Paper WP/97/43 (April).

Slaughter, Matthew J. (2000). “What Are the Results of Product-Price Studies and What Can We Learn from Their Differences?” in Robert C. Feenstra, ed, *The Impact of International Trade on Wages* (Chicago, IL: The University of Chicago Press).

Smarzynska, Beata (2002). “Does Foreign Direct Investment Increase the Productivity of Domestic Firms? In Search of Spillovers through Backward Linkages,” World Bank Policy Research Working Paper 2923.

Soloaga, Isidro and L. Alan Winters (2001). “Regionalism in the Nineties: What Effect on Trade?” *North American Journal of Economics and Finance,* vol. 121, pp.1-29.

Stolper, Wolfgang and Paul Samuelson (1941). “Protection and Real Wages,” *Review of Economic Studies,* vol. 9, pp. 58-73.

Trefler, Daniel (1995). “The Case of the Missing Trade and Other Mysteries,” *American Economic Review,* vol. 85, No. 5 (December), pp. 1029-1046.

Trefler, Daniel (2001). *The Long and Short of the Canada-U.S. Free Trade Agreement*, National Bureau of Economic Research Working Paper No. 8293 (May).

Trella, Irene and John Whalley (1994). “Trade Liberalization in Quota-Restricted Items: The United States and Mexico in Textiles and Steel,” in J.F. Francois and C.R. Shiells, eds., *Modeling Trade Policy: Applied General Equilibrium Assessments of North American Free Trade* (Cambridge, UK: Cambridge University Press), pp. 256-98.

Tybout, James. (2000). “Manufacturing Firms in Developing Countries: How Well Do They Do, and Why?” *Journal of Economic Literature*, vol. 38, pp. 11-44.

U.S. International Trade Commission (1997). *The Impact of the North American Free Trade Agreement on the U.S. Economy and Industries: a Three-Year Review,* Publication No. 3045 (June).

U.S. International Trade Commission (1997). *The Dynamic Effects of Trade Liberalization: an Empirical Analysis*, Publication No. 3069 (October).

U.S. International Trade Commission (2002). *The Economic Effects of Significant U.S. Import Restraints: Third Update 2002*, Publication No. 3519 (June).

Viner, Jacob (1950). *The Customs Union Issue,* (New York: Carnegie Endowment for International Peace).

Wacziarg, Romain (2001). “Measuring the Dynamic Gains from Trade,” *World Bank Economic Review,* vol. 15, pp. 393-429.

Wall, Howard J. (2003). “NAFTA and the Geography of North American Trade,” *Federal Reserve Bank of St.Louis Review,* vol.85, No. 2, March/April.

Whalley, John (1984). *Trade Liberalization Among Major World Trading Areas* (Cambridge, MA: Massachusetts Institute of Technology Press).

Wong, Kar-Yiu (1995). *International Trade in Goods and Factor Mobility* (Cambridge, MA: Massachusetts Institute of Technology Press).

Wood, Adrian (1994). *North-South Trade, Employment, and Inequality: Changing Fortunes in a Skill-Driven World* (New York: Oxford University Press).

Yi, Kei-Mu (2001). "Can Vertical Specialization Explain the Growth in World Trade?"-*Journal of Political Economy*, forthcoming 2003. Draft available at *http://www.newyorkfed.org/rmaghome/economist/yi/pubs.html*, downloaded Mar. 20, 2003.

APPENDIX F
Hearing Witnesses and Views of Interested Parties

CALENDAR OF PUBLIC HEARING

Those listed below will appear as witnesses at the United States International Trade Commission's hearing:

Subject:	The Impact of Trade Agreements: Effect of the Tokyo Round, U.S.-Israel FTA, U.S.-Canada FTA, NAFTA, and the Uruguay Round on the U.S. Economy
Inv. No.:	TA-2111-1
Date and Time:	January 14, 2003 - 9:30 a.m.

Sessions will be held in connection with this investigation in the Main Hearing Room (room 101), 500 E Street, SW, Washington, DC.

ORGANIZATION AND WITNESS:

Sidley Austin Brown & Wood LLP
Washington, DC
on behalf of

Pharmaceutical Research and Manufacturers of America

Andrew W. Shoyer) -- OF COUNSEL

National Milk Producers Federation

Peter Vitaliano, Vice President, Economic Policy and Market Research, National Milk Producers Federation

Institute for International Economics

Benjamin K. Goodrich, Research Assistant, Institute for International Economics

Positions of Interested Parties

This section summarizes the views of interested parties submitted to the Commission in connection with the investigation, either at the hearing or in written statements. The original statements can be viewed at the USITC Electronic Document Information System web site, http://edis.usitc.gov. These summaries do not reflect the views of the U.S. International Trade Commission or any individual Commissioner.

AFL-CIO[1]

The AFL-CIO is a voluntary federation of 65 national and international labor unions that represent 13 million workers.

U.S. trade policies have resulted in "exploding trade deficits and staggering job losses, especially in [the] manufacturing sector; significant impingement on the power of the national government and state and local authorities to regulate in the public interest; and dilution of protections under domestic trade laws." The United States should "go back to square one" and recraft its trade policies "to ensure that they promote and protect workers' rights and the environment in the United States and other nations."

Uruguay Round

The U.S. trade deficit in goods and services nearly quadrupled during 1994-2002 and these deficits have substantially retarded GDP growth. Growing trade deficits have also eliminated a net total of 3 million actual and potential jobs from the U.S. economy. Most (65 percent) job losses were in the manufacturing sector. Displaced workers in import-competing sectors have had difficulty finding jobs in growing sectors. Further, real manufacturing wages have not kept pace with the cost of living.

These factors have affected local businesses and have eroded state and local tax bases. The Uruguay Round Agreements (URA) have negatively affected the power to regulate in the public interest as the WTO dispute resolution procedures have challenged domestic laws and regulations design to protect the environment, health and safety, consumers, or workers. The URA has also weakened the substance of U.S. trade laws and reduced the ability to effectively implement these laws. If global competition remains unchecked, it will make the world increasingly "unstable" by creating greater inequality and "weaker democracies."

---

[1] AFL-CIO, written submission to the Commission, Feb. 14, 2003.

NAFTA

NAFTA has been a “dismal failure” and workers’ wages in all three NAFTA countries have fallen or stagnated. The trade surplus that the United States had with Mexico before NAFTA is now a deficit and the deficit that it had with Canada is now much larger. These deficits eliminate job opportunities. NAFTA also has caused jobs to shift from “relatively high-paying manufacturing jobs with good benefits and higher union density to service sector jobs that pay less and provide fewer benefits.” The effect has been particularly negative on the textile and apparel sector and the automotive goods sector. Wage disparities between manufacturing production workers in Mexico and the United States have increased, encouraging U.S. production to shift to Mexico and undocumented Mexican workers to move to the United States. “NAFTA has also made it less risky and more lucrative to move production to Canada and Mexico” thereby “undermining the bargaining position of U.S. workers.”

Air Transportation Association[2]

The Air Transportation Association (ATA) is the principal trade and service organization of the U.S. scheduled airline industry.

Of the 5 subject trade agreements, only the URA covers commercial air transport although the ATA generally supports all of these and other agreements that liberalize trade with foreign partners. However, some free trade agreements, such as the U.S.-Singapore FTA, cover express delivery services similar to those provided by certain ATA members. Even so, there is not yet industry consensus on this approach to liberalization.

The URA, particularly the General Agreement on Trade in Services (GATS), covers limited aspects of commercial air transportation. The GATS Annex on Air Transport Services covers three sub-sectors, two of which the United States has taken exemptions on. ATA supports the U.S. government position that liberalization of air transportation services can best be achieved under the current, broad exclusion from the GATS of most activities in this sector. ATA believes that the existing venues and mechanisms for air transport liberalization are sufficient.

[2] Edward A. Merlis, Senior Vice President, Legislative and International Affairs, Air Transportation Association written submission to the Commission, Jan. 21, 2003.

American Brush Manufacturers Association[3]

The American Brush Manufacturers Association (ABMA) is a diverse group of businesses made up of 162 member manufacturers and affiliated supplier companies that has represented broom, brush and mop manufacturers since 1917.

A significant amount of U.S. corn broom production was lost to Mexico after NAFTA took effect due to high labor content of the product. Three of the four largest U.S. companies have either moved all, or a significant amount, of their production to Mexico and most of the smaller U.S. manufacturers (or former U.S. manufacturers) now import part or all of their finished products from Mexico. In each instance NAFTA has caused "vanishing profits and dwindling workforces" in the U.S. corn broom industry.

American Forest & Paper Association[4]

American Forest and Paper Association (AF&PA) is the national trade association of the forest, pulp, paper, paperboard, and wood products industry. In its view, tariffs are the principal factor impairing the competitiveness of the U.S. forest products industry, and it believes that "no progress has been made on multilateral tariff elimination in the wood products sector and only partial progress has been achieved in the paper sector." Regional FTAs to which the United States is not a party have only exacerbated the competitiveness problem by shutting out the U.S. industry from those markets. Besides tariffs, foreign sanitary and phytosanitary (SPS) measures and producer subsides also create significant U.S. competitive disadvantages for this sector. In general, U.S. exports have fallen in recent years, according to the AF&PA, because of the downturn in the Japanese housing market, the strong U.S. dollar, and other macroeconomic factors.

Tokyo and Uruguay Rounds

These Rounds led to declines or elimination of U.S. tariffs in this sector without corresponding cuts by trading partners, "locking in" a U.S. competitive

[3] David C. Parr, Executive Director, American Brush Manufacturers Association, written submission to the Commission, Feb. 14, 2003.

[4] Jacob Handelsman, Senior Director, International Trade, and Elizabeth Ward, Executive Director, Wood Products International, American Forest & Paper Association, written submission to the Commission, Mar. 31, 2003.

disadvantage. In particular, the failure to achieve "zero-for-zero" cuts in wood products tariffs with Japan has put the U.S. industry at a disadvantage. Developing countries also have not liberalized their markets or industries, to the detriment of the U.S. industry. Subsidies in both developing and developed economies abroad continue to create competition for U.S. exports. SPS disciplines negotiated in the Uruguay Round are important to the industry and AF&PA opposes any attempt to evade such disciplines, such as attempts by the EU to block U.S. trade with SPS measures based on other than scientific grounds.

NAFTA

Mexico is an important market for U.S. wood products, because there is limited domestic production in Mexico. However, the lengthy staging-in period for Mexican tariff reduction has limited U.S. exports below what they might otherwise have been. The strong dollar vis-a-vis competing exporters in low-cost countries has also hurt U.S. export potential in Mexico. On the other hand, U.S. paper product exports to Mexico have been "thriving."

American Restaurant China Council[5]

The ***American Restaurant China Council*** (ARCC) is a trade association that represents a substantial majority of U.S. Commercial Chinaware production.[6] The ARCC member companies are Buffalo China, Inc., The Hall China Company, and The Homer-Laughlin China Company.

Tokyo and Uruguay Rounds

The Tokyo and Uruguay Round tariff reductions led to large surges of low-priced imports that eroded U.S. market share for commercial chinaware. Following the Tokyo Round tariff reduction on commercial chinaware from 48-percent to 35-percent, product imports increased more than eightfold to nearly five million dozens during 1979-1994. These imports captured a

[5] Susan Esserman and Melanie Schneck, Steptoe & Johnson, LLP on behalf of the American Restaurant China Council, written submission to the Commission, February 14, 2003.

[6] Commercial chinaware (HTS 6911.10.10 and HTS 6912.00.20) is "especially designed for use by hotels, restaurants, and other commercial establishments and institutions that require stronger, thicker, more durable and more sanitary chinaware."

substantial share of the U.S. market, resulting in either the transfer or shut down of a number of U.S. manufacturers operations and the loss of hundreds of American jobs. Imports continued to increase during the Uruguay Round tariff reduction staging to over 6.8 million dozens by year end 2000, dropping to 5.8 million dozens in 2001 due to the U.S. economic slowdown. This flow of U.S. imports is not offset by significant U.S. export opportunities due largely to high tariff rates overseas, onerous testing and certification requirements, and national preferences to buy domestic production, particularly in Europe.

The U.S. Government has historically recognized that commercial chinaware is an import sensitive product by limiting the industry's tariff reduction requirements during the Tokyo Round and by granting a 10-year staged reduction in the Uruguay Round.[7] During this time, the industry made significant capital improvement investments to lower production costs and increase efficiency in an effort to ensure its future competitiveness. However, the commercial chinaware market remains intensely price sensitive and any future tariff elimination or accelerated tariff reduction would threaten the U.S. industry's survival. ARCC also states that maintaining import tariffs for commercial chinaware would have no discernible effect on consumers (restaurants and hotels) because it is generally recognized that the cost of chinaware represents an insignificant part of their (the consumers') operating costs.

Association of the Nonwoven Fabrics Industry[8]

The Association of the Nonwoven Fabrics Industry (INDA) is the trade association of the nonwovens industry, a multi-billion-dollar business in the United States and abroad. INDA members are involved in the manufacture of nonwoven roll goods and production of primary materials and machinery used to create nonwovens. INDA members also include companies that convert nonwoven roll goods into finished products such as disposable baby diapers, surgical drapes and gowns, filtration materials, wiping products, construction materials, geotextiles, and numerous other end-use applications.

---

[7] The U.S. Government limited the tariff reduction to no more than 25 percent of the original tariff during the Tokyo Round. Ten-year staged reductions were also provided under NAFTA, and more recently the U.S.-Jordan Free Trade Agreement. Also, the U.S. Government refused to review petitions to include commercial chinaware to the Generalized System of Preference during the 1984, 1986, 1987, 1990, 1991 and 1992 review exercises.

[8] Jessica Franken, Government Affairs Associate, Association of the Nonwoven Fabrics Industry, written submission to the Commission, March 31, 2003.

The unilateral phaseout of U.S. tariffs on nonwoven roll goods during the Uruguay Round, which went from a high of 16 percent in 1994 to zero as of January 1, 1999, has been at least partially responsible for a dramatic narrowing in the gap between U.S. imports and U.S. exports of nonwoven roll goods (as measured in kilograms) over the past six years. Imports of nonwoven roll goods to the United States increased more than 140 percent during 1996-2001, while U.S. exports have risen by a more modest rate of 59 percent over the same period. The United States exported 162 percent more nonwoven roll goods than it imported during 1996, although by 2001 that gap had narrowed such that the U.S. exported 72 percent more nonwoven roll goods than it imported. Given these trends, INDA is concerned that imports of nonwoven roll goods to the U.S. will match, and perhaps exceed, U.S. exports within the next few years.

"The nonwovens industry has often been regarded as one of the few bright points within the struggling textiles sector of the U.S. economy, but these duty imbalances threaten to reverse that trend." INDA requests that the USITC reflect in its investigation the difficulties its industry has experienced as a result of the elimination of tariffs of nonwoven roll goods during the Uruguay Round.

Benjamin Goodrich[9]

Benjamin Goodrich is employed by the Institute for International Economics. However, the views expressed in his submission are his own and do not necessarily reflect the views of individual colleagues or the members of the Institute's Board or Advisory Committee.

Mr. Goodrich generally holds a favorable view of all the subject trade agreements. His submission emphasizes a number of points for the Commission to keep in mind when evaluating the effects of the subject trade agreements on the U.S. economy. It also discusses the merits and shortcomings of various economic models that can be used to estimate the counterfactual condition expressed as "What would the U.S. economy look like if the United States had not implemented a certain trade agreement?"

Blue Diamond Growers[10]

Blue Diamond Growers is a nonprofit farmer-owned marketing cooperative that markets almonds, hazelnuts, macadamia nuts, and pistachios for its

[9] Benjamin Goodrich, Institute for International Economics, written submission to the Commission, Jan. 3, 2003.

[10] Susan Brauner, Director of Public Affairs, Blue Diamond Growers, written submission to the Commission, Mar. 27, 2003.

members. The almonds are grown exclusively in California and are the largest tree crop in the State. Almonds are the largest valued agricultural export from California. Over 75 percent of the world's supply of almonds is produced in California.

Tokyo Round and Uruguay Round

Blue Diamond Growers (BDG), and almonds in general, benefitted significantly from the Tokyo and Uruguay Rounds. These agreements opened markets for almonds worldwide. As a result of these two agreements, U.S. almond exports increased by 25 percent to Europe, 1,100 percent to Eastern Europe, 300 percent to the Middle East, and 200 percent to Asia during 1996-2002.

U.S.-Israel Free Trade Agreement

BDG, and almonds in general, benefitted from the United States-Israel Free Trade Agreement until the agreement was renegotiated in 1995. U.S. almond exports were adversely affected by the 1995 changes which increased duties on U.S. exports of almonds to Israel by a factor of four thereby closing the market for U.S. exports. In 1997, a TRQ was applied which allowed limited access of almonds to Israel, but was too restrictive to provide meaningful amounts of trade. BDG believes that if all barriers to trade with Israel were removed, almond exports to Israel would grow from about $10 million in 2002 to about $25 million within five years.

U.S.-Canada Free Trade Agreement

BDG, and almonds in general, benefitted significantly from the U.S.-Canada Free Trade Agreement which enhanced and stabilized market access. The value of U.S. almond exports to Canada grew by 90 percent during 1996-2002 reaching $37 million.

NAFTA

BDG, and almonds in general, benefitted significantly from NAFTA because it enhanced and stabilized market access. The value of U.S. almond exports to Mexico grew by about 300 percent during 1996-2002, reaching about $11 million.

Florida Citrus Mutual[11]

Florida Citrus Mutual (FCM) is a voluntary cooperative association whose active membership consists of more than 11,000 Florida growers of citrus for processing and fresh consumption. FCM accounts for as much as 80 percent of all oranges grown in the United States for processing into juice and other citrus products. The 6-year staged reduction of U.S. tariffs on orange juice from WTO-member countries under the URA, and the 15-year staged elimination of the U.S. tariff and tariff rate quota on orange juice from Mexico under NAFTA encouraged under-priced imports, which contributed directly to the erosion of U.S. processing orange prices and grower earnings. FCM believes that this damage occurred without any counterbalancing positive effects on U.S. orange juice exports.

Uruguay Round

The URA has increased the inflow of under-priced Brazilian orange juice into the U.S. market with severe negative consequences for the U.S. citrus industry. Brazil, the world's largest orange juice producer, was the primary beneficiary of the United States' URA commitment to reduce orange juice tariffs by 15 percent. These staged tariff reductions led to the plunging import unit value of Brazilian juice. In 2002, the average value per liter of imports from Brazil was 31 percent less than the average during the 5 years prior to URA implementation (1990-1994).

NAFTA

NAFTA has adversely affected U.S. orange growers by increasing Mexico's exports of orange juice to the United States. The United States has committed to a 15 year phase-out schedule for U.S. tariffs on Mexican orange juice. The United States is Mexico's largest export market for orange juice, and Mexico has the ability to divert fruit from fresh domestic consumption into orange juice processing. U.S. imports from Mexico have not risen as rapidly as expected as a result of NAFTA, primarily owing to droughts and citrus diseases in Mexico as well as the strong Mexican peso and heavy competition from Brazil and CBERA-eligible orange juice. However, U.S. imports of frozen concentrated orange juice from Mexico have exceeded the NAFTA TRQ in every year, except 2001. The primary effect of Mexican imports has been to erode U.S. prices. In 2002, the average price from Mexico was 25 percent less than the average during the 5 years prior to NAFTA implementation (1989-1993).

---

[11] Andrew Lavigne, Executive Vice President and CEO, Florida Citrus Mutual and Matthew T. McGrath, Barnes, Richardson & Colburn, on behalf of Florida Citrus Mutual, written submission to the Commission, Mar. 31, 2003.

Florida Tomato Exchange[12]

The Florida Tomato Exchange (FTE) represents a substantial majority of the fresh tomatoes produced in the state of Florida.

During the winter months Florida produces most of the tomatoes grown commercially in the United States. The FTE supports free trade and open markets, but only provided such trade is fair. The growers represented by FTE are not subsidized, do not receive price supports, or deficiency payments, loan guarantees, or export credit assistance.

NAFTA

Many years prior to passage of NAFTA, FTE presented statements to Congress, USTR, and USITC that tomatoes were an import-sensitive commodity and, without meaningful safeguard provisions regarding tomato imports from Mexico, Florida's tomato growers would be substantially harmed. NTE's recommendations for safeguard provisions were not adopted, but rather other "traditional" safeguard provisions were used. After NAFTA was enacted in 1994, Mexico flooded the U.S. market with fresh tomatoes. When NTE attempted to use the NAFTA safeguard provisions that were intended solely to assist Florida's tomato and pepper growers, they were unsuccessful. Estimates of the harm to NTE's growers totaled approximately $125 million per winter season, and over $1 billion to date. A major tomato packing house in Florida closed its door. The industry estimates that upwards of 10,000 workers in Florida have lost their jobs as a direct result of NAFTA. The NTE filed an antidumping suit, and in 1995 the U.S. Department of Commerce preliminarily found that Mexican producer-exporters dumped tomatoes in the U.S. market. A suspension agreement was negotiated and a second suspension agreement was negotiated by Commerce in December 2002. Although the NAFTA package included transitional assistance for workers displaced by NAFTA, the monetary and work assistance were deficient and many or most workers did not complete this training and others who followed and would have been eligible, did not even try. The only relief that was useful to the industry was the long-standing antidumping statute.

[12] Reginald L. Brown, Executive Vice President, Florida Tomato Exchange, written submission to the Commission, Feb. 11, 2003.

Generic Pharmaceutical Association[13]

The Generic Pharmaceutical Association (GPA) represents more than 140 companies that manufacture and support the generic pharmaceutical industry and whose membership accounts for more than 90 percent of generic drugs dispensed in the United States.

GPA supports the need for both pharmaceutical innovation and the preservation of intellectual property rights, as provided for in the trade negotiations conducted over the last two decades. The association notes, however, that their membership is uniquely impacted by the agreements on intellectual property, and as a consequence, increased oversight is required to insure that its interests are appropriately addressed.

Under the Uruguay Round, the TRIPS agreement established a patent term of 20 years, for products patented after June 7, 1995. This agreement obliged the United States to lengthen patent terms from 17 years to 20 years, thereby, increasing the time during which the consumer is denied access to lower-priced pharmaceuticals. GPA cited a 1995 study that calculated "(t)he annual generic savings lost by American consumers due to delayed generic entry will range from $200 million in some years to $500 million in other years."[14] This study also calculated that the U.S. Government could lose $1.25 billion over the two years following the publication's release, based on purchases for Medicaid, Medicare, the Veteran's Administration, and the Department of Defense.

International Intellectual Property Alliance[15]

The International Intellectual Property Alliance (IIPA) represents the U.S. copyright-based industries in bilateral and multilateral efforts to improve international protection of copyrighted materials. IIPA's six member trade associations represent over 1,100 U.S. companies producing and distributing materials protected by copyright laws throughout the world.

---

[13] Kathleen D. Jaeger, R.Ph., J.D, President & CEO, Generic Pharmaceutical Association, written submission to the Commission, Feb. 14, 2003.

[14] Stephen W. Schondelmeyer, "Economic Impact of GATT Patent on Currently Marketed Drugs," PRIME Institute, College of Pharmacy, University , Mar. 1995.

[15] Maria Strong, Vice President and General Counsel, International Intellectual Property Alliance, written submission to the Commission, Feb. 14, 2003.

Both NAFTA and the Uruguay Round have played an important role in elevating the standards of copyright protection and enforcement around the world although the NAFTA intellectual property provisions, which in several ways, provide better copyright protection than that of the Uruguay Round TRIPS[16] agreement. NAFTA's Intellectual Property Rights chapter still contains problematic issues regarding secondary uses of sound recordings and Canada's extension of its "cultural industries" exclusion to intellectual property. The multilateral reach of TRIPS and the regional reach of NAFTA have provided firm foundations for countries to improve their copyright laws and enforcement mechanisms to protect both domestic and foreign rightsholders. The TRIPS agreement achieved major obligations desired by the copyright industry. The enforcement obligations of the TRIPS agreement provide a comprehensive foundation for the development of the procedures and remedies necessary for effective enforcement against copyright piracy.

National Association of Manufacturers[17]

The National Association of Manufacturers (NAM) represents about 14,000 U.S. manufacturing companies, including approximately 10,000 small and medium-sized firms, and more than 200 sector specific industrial trade associations.

All of the trade agreements under investigation have been "unambiguously" positive for the U.S. economy.

NAFTA

NAFTA has been an important source of U.S. manufacturing export growth. "The U.S. merchandise trade deficit with Mexico is mainly caused by U.S. oil imports and U.S.-Mexico trade in the highly integrated automotive sector." GDP in motor vehicles increased at an average annual rate of 4.8 percent during 1995-99 (while the rest of GDP grew at 3.8 percent.) In addition, "NAFTA has contributed to making U.S. manufacturing firms more globally competitive by permitting easier access to cheaper industrial inputs and allowing bigger companies to reallocate resources in such a way as to facilitate just-in-time manufacturing and outsource low-skill, low-pay activities to Mexico while retaining high-skill, high wage activities in the United States." NAFTA has improved regional competitiveness by "facilitating the

[16] Trade-related aspects of intellectual property rights.

[17] Frank Vargo, Vice President, International Economic Affairs, National Association of Manufacturers, written submission to the Commission, Mar. 31, 2003.

improvement of North America's transport infrastructure." "NAFTA has not shifted U.S. foreign direct investment in manufacturing to Mexico and Canada." "Foreign direct investment from other countries into Mexico and Canada, ... has increased under NAFTA" sustaining stable economies in these countries that "benefit U.S. economic and national security interests."

Uruguay Round

The URA has "benefitted U.S. manufacturing in multiple ways." It has cut industrial tariffs, most importantly in the zero-for-zero or tariff-harmonization agreements that eliminated tariffs for major industrial sectors among a critical mass of participating countries. It has also incorporated intellectual property right protection into the system of global trading rules; improved the GATT subsidies code;

made progress in defining and proscribing the use of certain trade-related investment measures by governments; and established a binding dispute mechanism for resolving government-government commercial disputes. Although the effects of the URA were generally positive, they failed to increase "effective market access for U.S. manufactured exports to the newly industrializing economies of developing nations."

National Electrical Manufacturers Association[18]

The National Electrical Manufacturers Association (NEMA) is the largest trade association representing the interests of U.S. electrical industry manufacturers. NEMA has more than 400 member companies, most of which are small and medium-sized, that manufacture products used in the generation, transmission, distribution, control, and use of electricity.

NEMA supports world-wide elimination of tariffs on electrical, electronic, and medical imaging equipment through WTO zero-for-zero tariff elimination; through regional agreements; and through bilateral trade agreements.

NAFTA

Approximately one-half of U.S. exports of NEMA-type products are destined for Canada and Mexico, and NAFTA has been the motor driving the growth of these exports since 1994.

---

[18] Statement by Timothy Richards, General Electric, on behalf of the National Electrical Manufacturers Association (NEMA), written submission to the Commission, Mar. 28, 2003.

Uruguay Round

"The Uruguay Round (UR) did not go far enough in eliminating tariffs in [NEMA's] industries." Many countries refused to sign the UR agreement to eliminate tariffs on medical equipment, and the medical equipment "zero-for-zero" did not cover some critical components and parts of medical devices. "High tariffs remain a major barrier" to NEMA's member sales "outside the EU, NAFTA, and Japan," "particularly in more advanced developing countries that are rapidly industrializing." Standards and technical barriers remain in the European Union (EU) and Japan which hamper the sales of NEMA members and although tariffs in these countries are still relatively low they still cost NEMA members millions of dollars.

National Milk Producers Federation and U.S. Dairy Export Council[19]

The National Milk Producers Federation (NMPF) is a national farm commodity organization that represents dairy farmers. The U.S. Dairy Export Council (USDEC) is a non-profit organization that represents the export trade interests of U.S. milk producers, dairy cooperatives, proprietary processors, export traders, and industry suppliers.

Tokyo Round

The Tokyo Round had only "marginal impact on global agricultural trade" including dairy products. "Unlike the Uruguay Round, which succeeded it, the Tokyo Round left most non-tariff trade barriers, export subsidies, and domestic support programs virtually untouched." Tariffs and other import barriers were negotiated on the basis of a request/offer approach, which resulted in many of the most sensitive products being subjected to minimal access improvements or being excluded from the negotiations altogether. The Tokyo Round also led to positive agreements, including the International Dairy Agreement and the cheese quota.

The International Dairy Agreement provided for minimum export prices for some key dairy products in an attempt to bolster world prices although within four years of implementation, the EU developed a substantial domestic dairy surplus and began to export butter at below the minimum agreed prices. In reaction, the United States withdrew from the Agreement.

---

[19] Peter Vitaliano, Ph.D., Vice President, Economic Policy and Market Research, National Milk Producers Federation, written submission to the Commission, March 31, 2003.

"The Tokyo Round agreement on U.S. cheese import quotas helped shield the industry from heavily subsidized European dairy imports" but also resulted in higher cheese imports because the United States established quotas above previous import levels. Prior to this agreement, cheeses valued below certain fixed prices were permitted to enter the United States only with an import license, which allowed the government to restrict volumes below levels that would undermine the dairy price-support program. The Tokyo Round institutionalized the large, subsidized dairy trade from the EU and consequently a distorted world dairy trade situation overall.

The U.S.-Canada Free Trade Agreement

Although the U.S.-Canada Free Trade Agreement (CFTA) phased out most import restrictions and agricultural tariffs over a ten-year period, dairy was excluded from these commitments and U.S. dairy exporters have virtually no access to the Canadian market. Canada and the United States agreed to maintain import quotas on dairy and certain other products.

NAFTA

"NAFTA has had a positive qualitative and quantitative impact on U.S. dairy producers and processors." Under NAFTA, all non-tariff barriers to agricultural trade between the United States and Mexico were eliminated, and most tariffs were eliminated over a ten-year period, including those applying to dairy products. Unlike CFTA, NAFTA provides for the phased elimination of all dairy tariffs between the United States and Mexico. Stringent rules of origin were written into NAFTA in order to ensure that the benefits of preferential access would only accrue to those items produced in North America. Tariffs on all dairy products reduce to zero over a ten-year phase out period, except on skim milk powder exported from the United States to Mexico, which will be eliminated over 15 years.

U.S.-Israel Free Trade Agreement

The U.S.-Israel FTA "has not been beneficial to the U.S. dairy industry."

Uruguay Round

The Uruguay Round Agreements (URA) "achieved many of the objectives for improving disciplines for global agricultural trade that could not be achieved in previous GATT negotiations." The URA established international discipline that eased future negotiations although the United States paid a heavy price to accomplish the agreement in the form of tariff disparities among countries. "Perhaps the most significant accomplishment of the UR market access agreement in agriculture was the conversion of all non-tariff measures into tariffs” including U.S. Section 22 dairy import quotas, EU variable import levies, and the Canadian and Japanese import licensing systems.

The URA also required countries to reduce agricultural export subsidies by 21 percent in volume terms and 36 percent in budgetary outlays which primarily affected the EU which, even after the agreement, continues to maintain about 72 percent of world dairy export subsidies. The export subsidies commitment left a huge competitive advantage with the EU and helped them build a market in the United States at the expense of domestically produced cheese, butter, and milk protein powders.

Further, the URA required all countries to establish ceilings for the amount of support afforded producers through internal support mechanisms. The agreement left the EU with a “huge competitive advantage” that has “harmed the U.S. dairy industry.” “On the other hand, expenditures in programs such as the de minimis clause as well as the green box have assisted the [U.S.] dairy industry as well as the U.S. agriculture overall.”

Nucor Corporation and TXI Chaparral Steel[20]

Nucor Corporation (Nucor) and TXI Chaparral Steel (Chaparral) are two of the largest steel producers in the United States. Nucor produces a variety of flat-rolled and long products and Chaparral produces only long products, including beams, hot-rolled bar, and rebar.

NAFTA and the URA have provided foreign exporters and investors greater access to the U.S. market, but reciprocating benefits for U.S. exporters and investors have not reached full potential. Nucor and Chaparral contend that many developing countries maintain high import tariffs on products such as steel even though their producers are in a position to effectively “compete internationally without protection.” These producers have the advantage of a protected home market from which to penetrate other markets, particularly the United States. Further, most developed countries have made it more difficult, if not impossible, for U.S. producers to enter their markets by replacing high tariffs with non-tariff barriers, including the use of restrictive technical standards and by tolerating anti-competitive practices by local industries. Until these nontariff barriers are effectively addressed, the U.S. industry will continue to reap far less advantage from trade agreements than intended.

---

[20] Alan H. Price and John R. Shane, Wiley Rein and Fielding LLP, on behalf of Nucor Corporation and TXI Chaparral Steel written submission to the Commission, Mar. 31, 2003.

NAFTA has given rise to the "circumvention of antidumping orders." Structural steel beams from Japan and Korea are being transshipped through Canada to circumvent antidumping orders in the United States.[21] Although there is no production of beams in Canada, U.S. imports of product from Canada were valued at $2.3 million and $2.1 million in 2001 and 2002, respectively. This is a two-fold problem that provides the means and incentive for foreign producers and exporters to circumvent such U.S. duty orders by transshipping subject merchandise through Canada and Mexico. First, NAFTA does not provide for common enforcement of antidumping and countervailing duty orders. Second, there are NAFTA rules for establishing NAFTA origin for merchandise, but there is no mechanism "for ensuring that the country of origin merchandise imported into one NAFTA country is not altered before the merchandise is re-exported to another NAFTA country." Nucor and Chaparral recommend amending NAFTA to correct these problems without relinquishing the current practice of allowing NAFTA members to impose antidumping/countervailing duties on imports from other NAFTA members.

Pharmaceutical Research and Manufacturers of America[22]

The Pharmaceutical Research and Manufacturers of America (PhRMA) is the national association representing the U.S. research-based pharmaceutical industry.

PhRMA is highly supportive of each of the subject trade agreements and PhRMA members have reaped enormous benefits from these trade agreements which have opened up foreign markets to U.S. exports. The industry benefitted greatly from the improved intellectual property protection, reduced technical barriers to trade, and "the zero for zero" initiative of the United States that eliminated duties on many active ingredients and intermediates.

While the U.S. industry has fared well with these treaties, not all trade agreements were created equal. The most acceptable agreement would be one that provides intellectual property protection comparable to that found in the United States, whereas the TRIPS agreement established only a minimum level

---

[21] The antidumping orders specifically cover merchandise that has been drilled, punched, notched, painted, coated, or clad and include products classified under the Harmonized Tariff Schedule numbers 7216.32, 7216.33, 7216.50-7216.99, 7228.70.3040, and 7228.70.6000.

[22] Andrew W. Shoyer, USITC hearing testimony on behalf of the Pharmaceutical Research and Manufacturers of America, Jan. 14, 2003.

of protection for intellectual property protection. More recent multinational and bilateral agreements have improved the protection for intellectual property rights that was initiated in the TRIPS agreement and extended and clarified in the NAFTA. For example, the U.S.-Jordan FTA provided for improved data protection, allowed biotech products to be patentable, limited compulsory licensing, and extended the patent period to allow for time lost because of regulatory delays.

Other elements of the trade agreements have also been quite beneficial. The WTO Agreement on Technical Barriers to Trade extended the work of the Tokyo Round. The plurilateral Agreement on Government Procurement limited the ability of government procurement practices to create artificial barriers to trade. The Agreement on Government Standards reduced the ability of countries to use regulations, standards, and testing and certification procedures as tools to restrict trade. The association supports measures that such as those embodied in the U.S.-Jordan FTA that protect the pharmaceutical industry from parallel imports, a practice in which products are sold at a lower price in one country (usually a poor country) and then resold at a higher price, by a third party, in another country (usually a richer country).

Specialty Steel Industry of North America[23]

Specialty Steel Industry of North America (SSINA) is an association representing virtually all North American specialty steel producers. Specialty steels are high technology, high value stainless and other specialty alloy products.

The objectives of the subject trade agreements–opening markets and adopting trade laws that ensure free and fair trade between these markets, including the zero for zero gradual phase-out of tariffs on steel products under the Uruguay Round Agreements–have not been met for U.S. manufacturing industries, including SSINA.

Tokyo Round

The Tokyo Round Agreements were a major step in determining international dumping and subsidy rules, and U.S. implementation of this agreement afforded domestic specialty steel producers the opportunity to seek effective redress against unfair trade practices.

---

[23] David A. Hartquist and Kathleen W. Cannon, Collier Shannon Scott, PLLC, on behalf of the Specialty Steel Industry of North America (SSINA), written submission to the Commission, Mar. 31, 2003.

Uruguay Round

The Tokyo Round trade laws governing dumping and subsidization have been significantly modified and weakened to the detriment of U.S. manufacturing industries by subsequent Uruguay Round Agreements and by the World Trade Organization (WTO) Dispute Settlement Body's interpretation of the agreements. URA modifications have resulted in a noticeable reduction in dumping margins, permissible subsidy practices formerly prohibited, and early termination of certain orders under sunset review. Further, the WTO Dispute Settlement Body has used the settlement process to legislate and make decisions on issues not agreed to by GATT Contracting Parties during the Uruguay Round negotiations, which overturn U.S. laws as well as many long-established practices and methodologies. The U.S. Congress and Administration should not permit further weakening of the laws addressing unfair trade practices as proposed in the current Doha Round of Negotiations by a group of countries calling themselves by the misleading name of Friends of Antidumping.

The Ranchers-Cattlemen Action Legal Fund-United Stockgrowers of America[24]

The Ranchers-Cattlemen Action Legal Fund - United Stockgrowers of America (R-CALF USA) is a non-profit association that represents thousands of U.S. cattle producers on issues concerning national and international trade and marketing. R-CALF USA's membership consists primarily of cow-calf operators, cattle backgrounders, and feedlot owners. Its members are located in 42 states, and the organization has over 30 local and state cattle association affiliates.

U.S.-Canada FTA and NAFTA

For live cattle, there was a significant increase in imports from Canada. Prior to the USCFTA, imports of Canadian cattle into the United States remained flat and averaged 368,000 head per year from 1978 to 1988. In 1989, U.S. imports began a generally strong upward trend with imports during the past five years averaging over 1,160,000 head annually. Live cattle imports from Mexico, on the other hand, have not increased. For the five years prior to NAFTA, imports from Mexico averaged 1,089,379 head annually, but for the most recent five year period averaged only about 938,177 annually. U.S. exports of live cattle to Canada are restricted, but a post-NAFTA agreement,

---

[24] Leo R. McDonnell, Jr., President, R-CALF USA, written submission to the Commission, Feb. 14, 2003.

the Northwest Pilot Program, has led to increased exports when certain sanitary conditions are met. U.S. shipments of live cattle to Canada grew from 40,000 head in 1996 to 349,536 head in 2000. U.S. exports of live cattle to Mexico have generally increased since NAFTA, from 62,683 head in 1994, to 363,887 head in 2001.

U.S. imports of beef from Canada increased markedly following the USCFTA, growing from 81,138 metric tons in 1990 to 335,163 metric tons in 2000. During the same time period, U.S. exports of beef to Canada remained flat, slipping from 90,892 in 1991 to 87,480 metric tons in 2000. U.S. beef exports to Mexico have grown significantly following NAFTA. Since 1995, U.S. exports have risen steadily with export volumes some 2.5 times greater than in the years prior to NAFTA, to about 178,749 metric tons, and worth some $531 million. U.S. beef imports from Mexico have increased considerably since NAFTA, growing from 591,340 kilograms in 1994 to 3,412,582 kilograms in 2001, worth about $15 million.

Prior to the USCFTA and NAFTA, U.S. tariffs on imports of Canadian and Mexican beef limited access into the U.S. market. However, the U.S. Meat Import Law, which was replaced by a tariff rate quota during the Uruguay Round, was even more important in controlling the amount of imported beef entering the U.S. market.

Tokyo Round

Prior to the completion of the Tokyo Round, Japan controlled imports of beef through quotas. During the Tokyo Round, the United States sought a larger allotment within Japan's quota for higher quality grain-fed beef. An agreement was reached between the United States and Japan in 1978 and led to increased access for U.S. beef in the Japanese market.

U.S. Israel Free Trade Area Agreement

In 1985, the United States and Israel signed an FTA calling for the phasing out of tariffs by 1995. In 1996, the United States and Israel signed the Agreement on Trade in Agricultural Products (ATAP). The ATAP was set to expire on Dec. 31, 2001. However, it was extended through 2002 with tariffs and tariff rate quotas maintained at 2001 levels. Despite the FTA, exports of U.S. frozen beef to Israel were, as of 2001, subject to a TRQ of 8815 metric tons, and fresh and chilled U.S. beef was subject to a TRQ of 1,217 metric tons. In-quota imports of these products enter duty-free. U.S. beef exports to Israel are small totaling only $203,000 in 2001, mostly frozen product. An important impediment to U.S. beef exports to Israel is the Israeli Kosher Meat Import Law of 1994, which bans the importation of any meat or meat product that is not certified as kosher by Israel's chief rabbinate.

Uruguay Round

The Uruguay Round promoted U.S. exports of beef to Japan and Korea, but not the EU. As part of the Uruguay Round, the United States and Japan signed the Beef-Citrus Agreement which phased out Japan's import quota and 25 percent tariff on beef. These were replaced with a 70 percent tariff in 1991, which was reduced to 60 percent in 1992 and 50 percent in 1993. The phasing out of Japan's quota had a dramatic impact on U.S. exports of beef and offal to Japan, which rose by almost 90 percent by value from 1988 to 1990. During this time, exports by volume rose by 50 percent. The Beef-Citrus Agreement, while not necessarily part of the formal Uruguay Round negotiations, was negotiated after the Uruguay Round began. Concessions made by Japan during Uruguay Round continue to benefit the U.S. beef industry. The United States is the main beef exporter to Japan with 48 percent of Japan's import market.

The Beef-Citrus Agreement between the United States and Japan served as a model for opening the Korean market to imports of U.S. beef. During Uruguay Round negotiations, Korea and the United States reached agreement on global access to the Korean beef market. Under the Uruguay Round Agreement on Agriculture, Korea agreed to increase its minimum imports of beef two-fold to 225,000 metric tons by 2000. Imports of beef by Korea would be unrestricted as of 2001, but a tariff of 41.2 percent would be imposed on such imports, which would decrease to 40 percent in 2004. The U.S. beef industry has benefitted from concessions made by Korea during Uruguay Round negotiations. In 2001, U.S. exports to Korea constituted 57 percent of Korea's beef imports.

In contrast to Japan and Korea, the outcome of Uruguay Round negotiations with regard to cattle and beef with the EU has not been positive for U.S. producers. Despite a finding of the WTO that the EU's ban on the importation of beef treated with growth promoting hormones violates the SPS Agreement, the EU continues to block shipments of most U.S. beef. Furthermore, while the EU made cuts in subsidies for the cattle and beef industry as a result of the Uruguay Round, this sector retains strong government support. The EU's cattle producers remain heavily subsidized, and the 2002 budget for the EU's beef sector was approximately $8.2 billion, or about 17 percent of the EU's agricultural budget. As part of its Uruguay Round commitments, the EU agreed to reduce export subsidies for beef from 1.9 billion ECUs in 1995 to 1.3 billion ECUs in 2000. This amounted to a 26 percent cut in export subsidies for beef. According to the USDA, export refunds provided by the EU in 2000 for beef totaled $750 million. The U.S. live cattle industry, by contrast, receives little government support, and in 2000 provided no beef export subsidies to producers.

Tile Council of America, Inc.[25]

The Tile Council of America, Inc. (TCA) is an association comprising over 40 manufacturers of ceramic tiles and related products that manufacture over 50 percent of the ceramic tile produced in the United States.

Despite a tripling in U.S. demand for ceramic tile since the Tokyo Round, the cumulative impact of the five trade agreements under study in this investigation have contributed to the precarious condition of the U.S. ceramic tile industry. The tariff reduction provisions of these agreements, particularly the Uruguay Round Agreement and NAFTA have encouraged large quantities of low-priced imports and are a major factor in the severe erosion of the U.S. industry's market share. Between 1979, the year before the Tokyo Round agreements entered into force, and the third quarter of 2002, import penetration for ceramic tile increased by 31 percentage points in terms of quantity to a record high of 77 percent. Since 1995, following the enactment of the Uruguay Round Agreement and NAFTA, U.S. consumption of ceramic tile increased by 46 percent and increased imports have captured 100 percent of this growth. The growth in import penetration is largely due to price-cutting by both traditional and newer import sources, as demonstrated by an 18-percent decrease in the average unit value of glazed ceramic tile imports.

Longer term staged reductions for tariffs on ceramic tile were negotiated under the Uruguay Round Agreement and NAFTA, in part, to provide U.S. manufacturers a period of time to make significant competitive investments in an effort to differentiate their products and minimize competition with low-priced commodity grade imports. The TCA now questions the viability and likely payback of these investments in light of ever increasing low-priced imports that have suppressed prices to the point of driving many U.S. producers out of business. They report that during 2001-2002, four U.S. producers have gone out of business and two additional plants have closed. The U.S. ceramic tile council would be seriously prejudiced by further tariff reductions or concessions and should, therefore, be excluded from such future trade negotiations.

[25] Juliana M. Cofrancesco and John F. Bruce, Howrey, Simon, Arnold, and White on behalf of the Tile Council of America, Inc. (TCA) written submission to the Commission, Feb. 14, 2003.

United States Tuna Foundation[26]

The United States Tuna Foundation (USTF) is a trade association representing all U.S. canned tuna processors and tuna boat owners. USTF has consistently opposed inclusion of canned tuna in the trade agreements examined in this report. USTF notes that several ITC reports have described the "import sensitive" nature of the product, as well as the decline of the U.S. industry due to imports.

During the period under review, the canning sector has shrunk from 14 establishments to four, and employment has declined from more than 26,000 to slightly more than 6,000 in 2002. All but one mainland-based establishment have closed, and only three remain in American Samoa and Puerto Rico. In the harvesting sector, the number of boats and employment thereon have similarly declined. During the last ten years, imports of canned tuna have risen by 10 percent and imports of frozen tuna (which, along with frozen tuna delivered by harvesting vessels, is used by canners to make canned tuna) have risen by 67 percent.

USTF notes that tariffs on canned tuna imports in other large markets remain high, for example, the tariff is 24 percent ad valorem in the EU. Most imports into both the United States and the EU come from low-wage countries that, in many cases, already have duty preferences (e.g., GSP, ATPA), and further declines in U.S. tariff protection for the industry would further weaken the economic health of the canners and boats.

Western Economic Analysis Center[27]

Lower U.S. tariffs across the board have "adversely affected" the U.S. "basic copper industry by lowering the price to domestic users of imported copper," but they also helped to reduce U.S. production costs by "lowering the costs of imported supplies and equipment used by domestic copper mining firms." Other government policies, both foreign and domestic, have had a greater negative impact on the industry than lower tariffs. For example, financial inducements to overseas investment and measures that have made cheaper capital available to competing foreign copper producers had a much more significant and harmful impact on domestic producers than any relaxing of trade barriers because they provided no advantageous offset for the domestic

[26] Randi Parks Thomas, United States Tuna Foundation, written submission to the Commission, Mar. 31, 2003.

[27] George F. Leaming, Director, Western Economic Analysis Center, written submission to the Commission, Mar. 31, 2003.

industry. The compliance deadlines imposed by regulatory agencies required a number of producers to take on large amounts of debt financing, which forced certain economically viable operations out of business.

The competitiveness of the domestic copper industry has been further eroded by Federal regulatory policies that create wilderness areas, which precluded the commercial use of economically viable copper deposits, and pollution controls that require large capital investments. Further, the lack of an effective antitrust policy to enforce existing legislation has resulted in a rash of mergers and acquisitions of copper producers by non-copper producers after 1976 that seriously weakened the domestic industry. More recently, foreign corporate and financial interests in U.S. production facilities have been allowed to make U.S. production decisions that do not necessarily benefit U.S. capital, labor, or consumer interests.