Measuring and modelling barriers to services trade: Australia's experience

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1 Why worry?

Why should trade theorists and trade policy practitioners worry about services?

First, 60 per cent of the world's GDP is earned there (World Bank 2001). This is not just a rich economy phenomenon — 119 of the 132 economies listed in the World Development Report have a services share of GDP that exceeds their industry share. And 81 have a services share of GDP that exceeds 50 per cent — from Bangladesh and Botswana to Zambia and Zimbabwe.

Second, close to a third of world trade is generated there (Karsenty 2000). It is no longer tenable, if it ever was, to regard services as non-traded. Nor is it correct to say that most services trade is via commercial presence and hence not comparable to merchandise trade. Karsenty shows that on the basis of available statistics, 'traditional' trade in services — defined to measure cross-border transactions — is today larger in absolute size than establishment-related trade in services. And some of the economies most dependent (in relative terms) on services trade are also some of the poorest (eg Armenia, Lesotho and Kiribati).

Third, barriers to services trade are significant. Because they are primarily regulatory, and differ substantially from traditional tariffs or quotas, there is no simple 'tariff equivalent' with which to compare to merchandise trade barriers. But the effects of removing them can be substantial. As will be shown, Dee and Hanslow (2001) suggest that the global gains from eliminating barriers to trade in services, based on preliminary estimates of those barriers, could be about the same as those from eliminating all remaining barriers to trade in agriculture and industrials. And significant gains would accrue to developing economies.

Fourth, services trade barriers are currently subject to negotiation in both multilateral and regional forums. Under the Doha Development Agenda, the first rounds of services requests and offers have been made. And of the 18 extant preferential trading agreements (PTAs) examined by Adams et al. (2003), 12 had significant coverage of services and foreign direct investment — issues that extend beyond the boundaries of merchandise trade. Further, the coverage of non-merchandise trade issues increases, the more recent the agreement.

So it is incumbent on both trade theorists and trade policy practitioners to understand the nature of services, trade in services and services trade barriers. The aim should not just be to identify theoretical possibilities. It should also be to identify negotiating priorities, so as to maximise net benefits and reduce unintended consequences in a policy area that is still, sadly, largely unchartered territory empirically. With services sectors being large in most economies, the downside risk

from getting it wrong is significant, and the risk is certainly there (eg Dee, Hardin and Holmes 2000, Francois and Wooten 2001).

The purpose of this paper is to describe relevant industrial organisation features of services industries, and to outline their implications for the way that services trade barriers need to be measured and modelled.

2 What's special about services?

Services are often delivered face to face. This means that trade in services often takes place via the movement of primary factors of production — people or capital.

Firstly, the consumer may move to the producer's economy. This happens most clearly with tourism services, but it also happens with services such as education and health, when the student or patient moves to another economy for education or treatment. In the language of the General Agreement on Trade in Services (GATS) under the WTO, this mode of services trade is called 'consumption abroad'.

Alternatively, the producer may move to the consumer's economy. This also happens in education, where teachers move to another economy to teach short courses. It is also very common for professionals to travel temporarily to the economy into which they are delivering professional services. In the language of the GATS, this mode of service delivery is called the 'movement of natural persons' (to distinguish it from the movement of corporate or other legal entities).

Many other services are delivered to other economies via 'commercial presence'. In banking and telecommunications, for example, it is common for companies to set up a permanent corporate presence in another economy and to make their sales from their foreign affiliate. The GATS also recognises commercial presence as a mode of services delivery. This has policy significance, because it means that the GATS is a vehicle for negotiating foreign direct investment issues in the services area.

Another characteristic of services is that they are intangible. This means that where services are traded in the traditional 'cross-border' fashion, e-commerce is an important vehicle for that cross-border trade.

With services traded via the movement of people or capital, the transaction typically occurs behind the border. Even when cross-border trade takes place via e-commerce, it is not easily observed by customs officials.

So services transactions are not amenable to tariff protection. Instead, services trade barriers are typically behind-the-border, non-price regulatory measures.

Services are also an area where market failures can occur. Natural monopoly characterises a range of network services such as telecommunications and air transport. Almost by definition, asymmetric information chararcterises professional services, as well as health and education.

Thus trade in services may also be affected by domestic regulatory regimes that are designed to deal with the market failure. While they are not intended to be protective, they may not be the 'least burdensome' necessary to achieve their objectives. An example would be a requirement for foreign health professionals to retrain in a new economy. Here the legitimate domestic objective of ensuring quality could be achieved by the less burdensome requirement to resit a qualifying examination.

3 How to measure services trade barriers?

If services trade barriers are typically non-tariff measures, does this mean that the same techniques can be used to measure them as are used to measure non-tariff measures affecting merchandise trade? Or is there something special about services trade that means that different measurement techniques need to be used.

It is argued here that services trade barriers cannot be measured by the 'price comparison' techniques that are prevalent in the literature on merchandise trade (as surveyed by Deardorff and Stern 1997, for example), because services are highly differentiated products.

Services are commonly differentiated by economy. A domestic telephone call in the United States is not the same as a domestic telephone call in Australia, because the former is between Washington and Los Angeles whereas the latter is between Sydney and Melbourne. Similarly, the practice of law differs in the two economies, because the legal systems and legal traditions differ. What is more, some of the relevant trade restrictions in legal services are precisely to do with whether foreign legal professionals are able to practice host-economy law, home-economy law or international law in the host economy.

Services are also commonly differentiated by firm. This is because the production of services often involves firm-specific human capital. Microsoft is not the same as any other software firm because Bill Gates is not the same as any other software proprietor. And the development and maintenance of Microsoft required considerable fixed and sunk expenditure in R&D and other 'headquarters services'. Thus the relevant industrial organisation model for services is the same model of firm-level product differentiation and economies of scale that has been used to characterise the multinational manufacturing enterprise (eg Markusen 1995).

Not only are services differentiated by economy and firm, they are also differentiated to the needs of individual customers. The legal services that my solicitor provides to me are not precisely the same as the services she provides to any of her other clients, because I have a unique individual situation. This characteristic was noted by Ethier and Horn (1991), and is one level of product differentiation below that now included in most trade models. I am not aware of any subsequent analysis that has included this characteristic explicitly, but it seems to be implicit in the choice of nesting structure of demand for varieties in some more recent models of services trade. This issue is discussed in more detail in Dee (2003a).

So if services are highly differentiated, it is not appropriate to measure services trade barriers using domestic-foreign price comparison techniques or their derivatives (such as the producer and consumer subsidy equivalent measures developed by the OECD for agriculture, or the various non-tariff extensions of the concept of the effective rate of protection). All such price comparison measures assume that the foreign price is a good 'benchmark' measure of what the domestic price would be in the absence of the trade distortion. But this presupposes that the domestic and foreign goods are perfect substitutes. For services, this is not the case.

Instead, for services it is necessary to construct the counterfactual — what the domestic price would be in the absence of the distortion — from an econometric model of what determines domestic prices. While most of the studies to date have used datasets (either cross-sectional or panel) that have a cross-country dimension, this is not because they are measuring domestic-foreign price wedges. Instead, they are exploiting cross-country (or panel) variation in the extent of barriers to trade, and cross-country variation in the domestic price (or some other measure of domestic performance), to quantify a 'cross-country average' relationship between barriers and performance, controlling for all other factors that affect that performance.

These studies tend to be of two types (see tables 1 and 2 for examples).

Sectoral studies quantify the *direct* impact of services trade barriers on *sector-specific* measures of performance. These effects on performance can be levels effects (if the performance measures are in levels) or could be growth effects (if the performance measures are in growth rates — though in practice, no sectoral studies have identified growth effects). But the key to these studies is that they are sectoral, and do not add up the effects of services trade barriers for the economy as a whole, as CGE studies do.

Table 1 **Sectoral studies of the effects of services trade (and other regulatory) barriers**

Sector in which barriers occur	*Study*	*Sectoral performance measure*	*Growth or level effects*	*Cross-country or panel*
Air passenger transport	Gonenc and Nicoletti (2000)	Airfares Load factors Airline efficiency	Level	Cross-country
	Doove et al. (2001)	Airfares	Level	Cross-country
Banking	Kalirajan et al. (2000)	Net interest margin	Level	Cross-country
	Claessens, Demirgüç-Kunt and Huizinga (2001)	Net interest margin Non-interest income Overhead expenses	Level	Panel
	Barth, Caprio and Levine (2002)	Bank development[a] Net interest margin Overhead cost Non-performing loans Prob. of bank crisis	Level	Cross-country
	Dee (2003b)	Net interest margin	Level	Cross-country
Distribution	Kalirajan (2000)	Cost	Level	Cross-country
Electricity generation	Steiner (2000)	Price Utilisation rates Reserve plant margins	Level	Panel
	Doove et al. (2001)	Price	Level	Panel
Maritime	Kang (2000)	Price	Level	Cross-country
	Fink, Mattoo and Neagu (2001)	Price	Level	Cross-country
	Clark, Dollar and Micco (2001)	Costs	Level	Panel

(Continued on next page)

Table 1 (Continued)

Sector in which barriers occur	*Study*	*Sectoral performance measure*	*Growth or level effects*	*Cross-country or panel*
Professions – engineering	Nguyen-Hong (2000)	Price Cost	Level	Cross-country
Telecommunications	Warren (2000b)	Quantity Price	Level	Cross-country
	Trewin (2000)	Cost	Level	Panel
	Boylaud and Nicoletti (2000)	Price Labour productivity Quantity	Level	Panel
	Doove et al. (2001)	Price	Level	Panel
	Dee (2003b)	Quantity Price	Level	Cross-country
	Fink, Mattoo and Rathindran (2002)	Quantity Productivity	Level	Panel

a Bank credit to the private sector as a share of GDP.

Source: See table for references.

Instead, the first round impacts from sectoral econometric studies provide the key inputs into CGE studies, which then trace through the effects of services trade barriers on other sectors of the economy and, where a disaggregated approach is taken, can also add up the effects of services trade barriers across different services sectors. In doing so, the output of CGE models will be in levels terms if the inputs are in levels terms, but could equally be in growth terms if the inputs are in growth terms. There is nothing inherent in CGE models that restricts them to levels effects. Nor is there anything inherent in CGE models that restricts them to looking at a single aggregate services sector, although most CGE studies to date have been of that form. One of the highest priority areas for research is to build models with disaggregated services sectors, to allow for special features of different services and to examine sectoral priorities for liberalisation.

Table 2 **Economy-wide studies of the effects of services trade (and other regulatory) barriers**

Sector in which barriers occur	*Study*	*Economy-wide performance measure*	*Growth or level effect*	*Cross-country or panel*
Construction	Hoekman and Francois (1999)?	Aggregate services exports?	Level	??
Finance	Francois and Schuknecht (2000)	????	Growth	Cross-country
	Eschenbach and Francois (2002)	Per capita GDP	Growth	Panel
	Mattoo, Rathindran and Subramanian (2001)	Per capita GNP	Growth	Panel
Telecommunications	Hoekman and Francois (1999)	Aggregate services exports	Level	??
	Mattoo, Rathindran and Subramanian (2001)	Per capita GNP	Growth	Panel

Source: See table for references.

Economy-wide studies quantify the *overall* effects of services trade barriers on some *economy-wide* measure of performance. Again, these effects can be levels effects (if the performance measures are in levels) or growth effects (if the performance measures are in growth rates).

These studies are aiming to do the same 'adding up' job as CGE studies. But whereas CGE studies take a structural approach to spelling out how barriers in one sector flow through to other sectors and the economy as a whole, the econometric studies typically (but not always — Eschenbach and Francois (2002) is an exception) take a reduced form approach.

And so the comparison of these economy-wide econometric approaches with CGE models hinges on the differences between structural and reduced form approaches. CGE approaches have a higher information content, and are less testable. But econometric studies need to control for all other factors affecting performance, and to deal (where necessary) with simultaneity issues. This is easier in a panel than in a pure cross-country context. In addition, economy-wide econometric studies are subject to the Lucas (1976) critique — their estimates of flow-on costs or benefits are appropriate so long as the economy stays with the same structure, but could be highly misleading in the face of structural change. And one of the main effects of reducing or removing barriers to services trade is to induce structural change.

The remainder of this paper discusses *sectoral* methods for estimating the direct effects of services trade barriers, and the ways in which they can be used as inputs into CGE models to estimate the economy-wide effects of services trade liberalisation.

4 Services trade barriers — some examples

Before proceeding, it is useful to list some concrete examples of barriers to trade in services. Table 3 gives a broad outline of the main barriers affecting trade in two different services — banking, and legal services.

Table 3 **Description of barriers to trade in banking and legal services**

Banking	*Legal services*
Restrictions on:	Restrictions on:
- number of bank licences	- form of establishment (eg partnership)
- equity participation	- equity participation
- joint ventures	- nationality or citizenship
- raising funds	- licensing and accreditation
- lending funds	- quotas or needs tests
- other lines of business	- advertising and fee setting
- number of branches	- multidisciplinary practices
- temporary or permanent movement of executives	- activities reserved by law to the profession

Source: McGuire and Schuele (2000), Nguyen-Hong (2000).

The key thing to note about the measures in table 1 is that they do not always discriminate against foreigners.

In banking, the measures that affect only foreign participants are those that restrict equity participation, require it to take the form of a joint venture with a local partner, or restrict the temporary or permanent movement of executives. All other measures can be equally applied to domestic new entrants. These include restrictions on the number of banking licences or number of branches, restrictions on where and how banks can raise funds or lend, and on whether banks can undertake other lines of business (eg insurance or securities).

Similarly, for legal services, a few measures affect only foreign practitioners — requirements for nationality or citizenship, and whether quotas or needs tests are applied in order to practice. Other measures can affect domestic practitioners as well. These include restrictions on equity participation, since some economies place restrictions on whether non-lawyers can have an equity stake in a law practice. They also include restrictions on the form of establishment (eg whether corporate

structures are allowed), licensing and accreditation requirements, restrictions on advertising or fee setting, restrictions on whether other disciplines (eg accountancy) can be practiced out of a law firm, and the reservation of certain activities (eg conveyancing) to the legal profession.

The GATS agreement similarly recognises that services trade barriers need not be discriminatory against foreigners. It recognises a specific list of (mostly quantitative) restrictions on 'market access' that are not discriminatory. Many analysts have extended the definition of 'market access' to cover all measures that are non-discriminatory. The GATS also recognises 'derogations from national treatment', which is GATS-speak for discriminatory restrictions.

Thus a key feature of services trade barriers is that they often protect incumbent service suppliers from any competition, be it from domestic or foreign new entrants. This is the single most important feature distinguishing services trade barriers. It has implications both for the economic effects of services trade liberalisation, and for the political economy of services trade reform. These implications are draw out later in the paper.

5 A measurement methodology

The methodology used in Australia to quantify the direct effects of services trade barriers is outlined in Findlay and Warren (2000). It is the result of a collaborative research project between the Australian Productivity Commission and Australian National University. There are two key steps.

The *first step* is to quantify the extent of current barriers to services trade. Because the relevant trade barriers are primarily regulatory, this is by no means straightforward. The general approach in Findlay and Warren is to convert qualitative information about regulatory restrictions into a quantitative index, using a priori judgements about the relative restrictiveness of different barriers. This is generally less contentious within a given category of barrier than between. For example, it makes sense to score a regime that restricts foreign ownership to 25 per cent or less as being twice as restrictive as one that restricts foreign ownership to 50 per cent or less. What is less obvious is how to weight the scores on foreign ownership restrictions together with those on licensing requirements, or those on restrictions on lines of business. Nevertheless, some of the inherent arbitrariness of the weighting procedures can be tested empirically at the next stage.

The first step produces an index score for each economy of the form

$$R = R_1 + R_2$$

where R_1 and R_2 are scaled so that their maximum possible values reflect their relative economic significance, and typically sum to unity.

The *second step* is to develop an econometric model and use it to estimate the effect of the services trade restrictiveness index R on some sectoral measure of economic performance Y (typically price, cost, price-cost margin, quantity or productivity), while controlling for all the other factors X that might affect performance in that industry.

$$Y = \alpha + \beta R + \gamma X + \varepsilon$$

The appropriate control variables will obviously vary from one sector to the next.

It is also possible to use the econometric stage to test the weighs that were assigned a priori to different categories of restrictions in the first stage, essentially by reestimating them. This is done by entering the index scores for the different categories of restrictions separately into the estimating equation.

$$Y = \alpha + \beta_1 R_1 + \beta_2 R_2 + \gamma X + \varepsilon$$

Often this approach is precluded by one of two econometric problems — multicollinearity, or lack of in-sample variation in one or more of the restrictiveness index components. However, the regulatory work by the OECD (Gonenc and Nicoletti 2000, Boylaud and Nicoletti 2000, Steiner 2000) is suggestive of how factor analysis (of which principal components is an application) could be used to overcome these problems. Prior to any econometric estimation, they used factor analysis to identify a set of orthogonal 'factors' that explained most of the variation in their original data on regulatory restrictions. But as Doove et al. (2001) point out, high cross-country variation in restrictions may have little or no relationship with the relative economic importance of particular restriction categories:

> … the use of factor analysis could lead to paradoxical results — in the sense that the more important restrictions, if they were applied widely and consistently across countries, could also have low cross-country variation and thus low factor analysis weights. (p. 17)

If, instead, principal components were used as the method of econometric estimation, then problems of multicollinearity would be overcome and orthogonal linear combinations of individual restrictions could be identified that explained most of the variation in economic outcomes — a truer measure of economic significance.

Once the econometric estimation is completed, the 'on-average, per unit' effects of services trade restrictions are given by the estimated coefficients β. If total liberalisation would yield a restrictiveness index score of zero, then βR itself gives

an estimate of the 'total, country-specific' effects of current restrictions on economic performance, relative to a free-trade benchmark (equivalent to vertical shifts in supply or demand curves). Mathematical manipulation can convert this into a percentage 'tax equivalent' (the appropriate manipulation depending on the particular measure of performance and the particular functional form for the estimating equation). The base for the tax would be the price, cost or other performance measure chosen.

However, a 'free trade' benchmark need not always coincide with zero regulation. The method is flexible enough to allow that in a free trade situation, it would still be appropriate to have prudential regulation of financial services, safety regulation of air passenger transport services, and so on. Thus, free trade could be associated with an alternative value R' of the restrictiveness index, and the value of $\beta(R - R')$ would then be converted into a regulatory tax equivalent.

The first thing to note about the methodology is that it can be generalised fairly easily to include additional economies or additional time periods. Once a coefficient estimate for β has been obtained from a particular sample, all that is required for additional economies or time periods is to produce an index score R to characterise the services trade restrictions at that point in time, and the new 'tax equivalents' can be calculated from the existing coefficient and the new index score without redoing the econometrics. Obviously, the original sample needs to be fairly representative for such 'out-of-sample forecasting' to be appropriate. Many of the studies on Table 1 include, at minimum, the APEC economies, the members of the European Union, and often key economies from the rest of the world (eg Switzerland, Turkey, India, South Africa).

A second advantage of the methodology is that it produces estimates of the effects of trade barriers that are explicitly linked to characterisations of the restrictions themselves, rather than being generated as an 'unexplained residual'.

While it would be desirable to use information about every conceivable barrier affecting trade in a particular service in these exercises, this is not always possible. Where the index measures of services trade barriers are to be used in an econometric model, issues of comparability also arise. It would be inappropriate to use a dataset that showed a particular economy to be very liberal (or very illiberal), simply because information on some barriers to services trade was unavailable for that economy. Hence, the trade restrictiveness indexes used in econometric exercises may not be fully comprehensive, but they generally measure a broad range of barriers for which comparable data are available for all the economies in the sample.

In this respect, it is important that the information on restrictions be more comprehensive than that provided in the GATS schedules of WTO Members. Other sources have proved fruitful, including material produced by the Asia Pacific Economic Cooperation (APEC) forum, the OECD, the WTO and the United States Trade Representative.

A final issue is how to interpret the 'tax equivalent' measures. There are two related issues:

- what is the appropriate measure of performance Y; and
- what does each measure tell us about whether the restrictions are rent-creating or cost-escalating.

Take the second issue first. Restrictions could either create pure rents for incumbent firms, and should therefore be modelled as tax or tariff equivalents, in the same way as the MultiFibre Arrangement. Liberalisation would therefore be modelled as the elimination of those tax or tariff equivalents, yielding 'triangle gains' associated with improvements in allocative efficiency, along with redistributive effects associated with the elimination of rents to incumbents. As Dee and Hanslow (2001) demonstrate, the former effects would not be trivial, but the latter effects could also be significant. Alternatively, restrictions could increase the real resource cost of doing business. Liberalisation should therefore be modelled as a productivity improvement (saving in real resources), and yield 'rectangle gains' in terms of freeing resources for use elsewhere.

The distinction is critical, for two reasons. First, in a unilateral or multilateral setting, rectangle gains are likely to exceed triangle gains by a significant margin, especially given the importance of the services sectors in most economies. Secondly, in the context of preferential trade agreements, the danger of net welfare losses from net trade diversion arises only if the relevant barriers are rent-creating. If the barriers are cost-escalating, then preferential liberalisation will always increase welfare, even if the preferential partner does not have the world's lowest costs. This second argument is elaborated in Adams et al. (2003).

To date, most modellers have made an a priori judgement about which treatment is appropriate (eg Hertel 1999, Brown, Deardorff and Stern 2000, Dee and Hanslow 2001), but the truth is likely to lie in between, and to differ from sector to sector. Pure rents are relatively rare in practice, but it is easy to imagine them being a component of the returns to international finance and telecommunications companies, for example, given the artificial barriers to new entry in those sectors in many economies. On the other hand, it is easy to imagine how the trade restrictions built into the international system of bilateral air service agreements frustrate the

ability of airlines to reap network economies, and thus increase their real costs of doing business.

Ideally, the empirical work involved in estimating the economic effects of the barriers should give insights as to whether they are rent-creating or cost-escalating. For example, if the restrictions are believed to create rents, then the relevant measure of performance to use in the econometric analysis would be price/cost margins. If the restrictions were believed to raise costs, then the relevant performance measure would be a measure of costs or productivity. Even more ideally, each study should use a range of performance measures to identify what type of effects are being created. In practice, only one or two measures of performance are used, and not always the most appropriate ones in hindsight.

Where restrictions are believed or shown to raise real resource costs, there is a subsidiary set of questions to answer. Do the restrictions raise fixed costs, sunk costs, or ongoing operating costs? And what is the commodity or primary factor composition of the real resource costs so created? In practice, little information is likely to be provided on these subsidiary questions in the process of estimating the barriers. But this will be a fruitful area for different modellers to take different theoretical approaches in their applications, and to test the implications accordingly.

Thus additional work on estimating barriers to services trade is warranted, not only to increase the sectoral and economy coverage of the estimates, but also to give additional insights into the types of economic effects that are being created.

6 Trade restrictiveness indexes — some results

In its initial phase, the Australian research focused on barriers to market access and derogations from national treatment, and quantified restrictions affecting trade in the following services sectors:

- *banking* services in 38 economies (McGuire 1998, McGuire and Schuele 2000, Kalirajan et al. 2000);
- *telecommunications* services in 136 economies (Warren 2000a, 2000b);
- *maritime* services in 35 economies (Kang 2000, McGuire, Schuele and Smith 2000);
- *wholesale and retail distribution* in 38 economies (Kalirajan 2000);
- *education* services in 29 economies (Kemp 2000);
- *professional* services (accounting, architecture, engineering, legal) for up to 34 economies (Nguyen-Hong 2000); and

- *foreign direct investment* in a variety of services sectors in 15 APEC member economies (Hardin and Holmes 1997).

More recently, the work has extended 'beyond the border' into the effects of regulatory regimes in three important service industries — air passenger transport, telecommunications and electricity supply. Doove et al. (2001) drew on the OECD's rigorous assessment of regulatory regimes in these three sectors (Gonenc and Nicoletti 2000, Boylaud and Nicoletti 2000, Steiner 2000) and extended it to range of non-OECD economies.

Index scores were calculated separately for domestic and foreign service suppliers. A *foreign index* measures all the restrictions that hinder foreign firms from entering and operating in an economy. It covers both discriminatory and non-discriminatory restrictions. A *domestic index* represents restrictions that are applied to domestic firms and it generally only covers non-discriminatory restrictions (for most services, restrictions do not discriminate against domestic firms). The *difference* between the foreign and domestic index scores is a measure of discrimination against foreigners. Figure 1 provides a stylised illustration of a typical trade restrictiveness index.

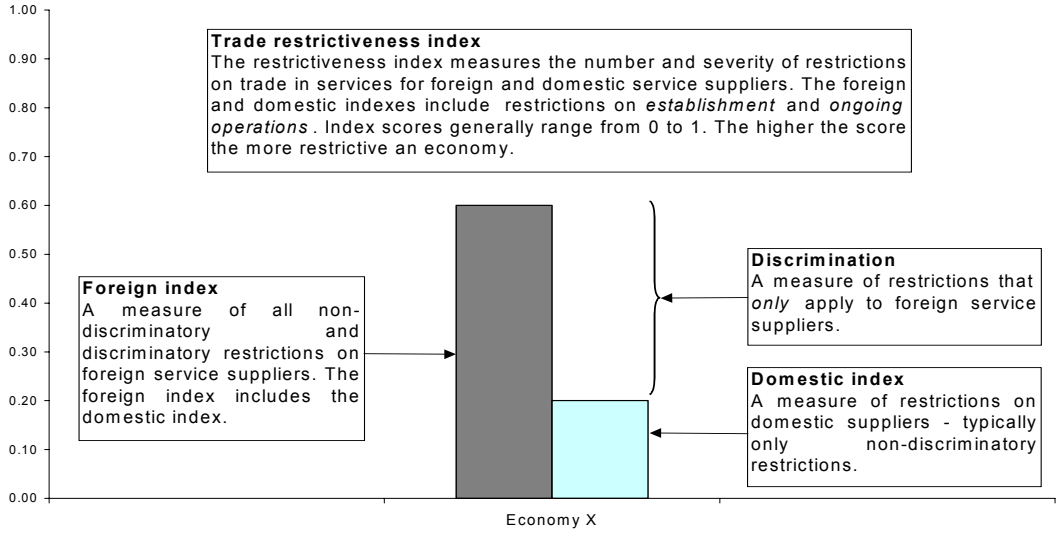
The index methodology also distinguished whether a restriction applied to:

- *establishment* — the ability of service suppliers to establish a physical outlet in a territory and supply services through those outlets; or
- *ongoing operations* — the operations of a service supplier after it has entered the market.

Restrictions on establishment often included licensing requirements for new firms, restrictions on direct investment in existing firms and restrictions on the permanent movement of people. Restrictions on ongoing operations often included restrictions on firms conducting their core business, the pricing of services and the temporary movement of people.

Generally, the results from the restrictiveness indexes showed that Asian and South American economies had medium to high index scores. These economies were also found to be the most discriminatory against foreign service suppliers. European and North American economies tended to have low to medium index scores. Nevertheless, there were some important exceptions to these general trends, as some of the following examples illustrate.

Figure 1 **A typical trade restrictiveness index**



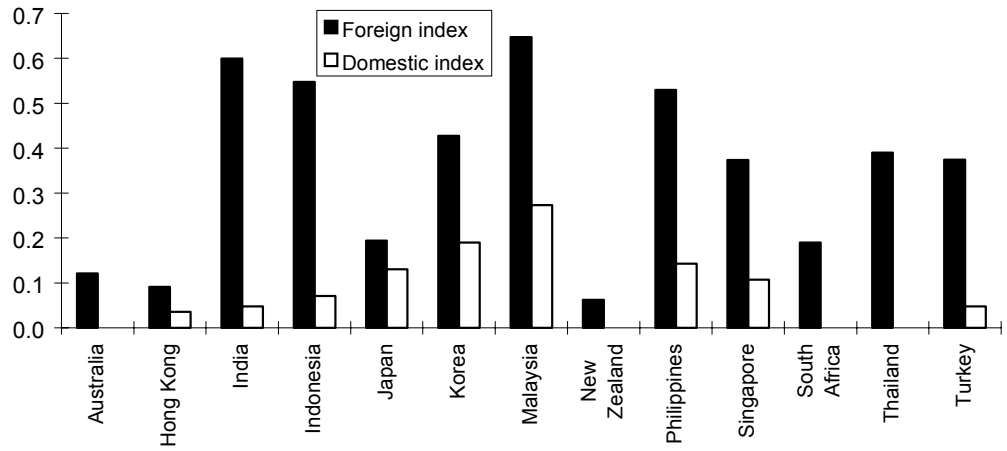
Banking

Figure 2 gives a summary of the index scores for banking services in selected economies. In computing the banking index, it was recognised that prudential regulation plays a vital role in ensuring the systemic stability of a banking system. Even though it may raise the operating costs of banks, it is not designed to restrict trade. The index was therefore compiled over non-prudential regulation (as listed in table 3), consistent with the 'prudential carve-out' of the GATS.

One important qualification is that the information on non-prudential restrictions covering trade in banking services was as at 31 December 1997, prior to significant banking reforms in many economies (including in Australia).

Figure 2 shows that at the time the information was collected, the Asian economies with the most restricted trade in banking services — India, Indonesia, Malaysia and the Philippines — also tended to be those that discriminated most against foreign entrants. Australia's index incorporates its restrictions on foreign equity participation in Australian banks. Australia's foreign banking index score, although relatively low, exceeds that for the United States, Canada and members of the European Union (not shown), primarily for this reason.

Figure 2 **Banking restrictiveness indexes for selected Asia Pacific economies, South Africa and Turkey[a]**

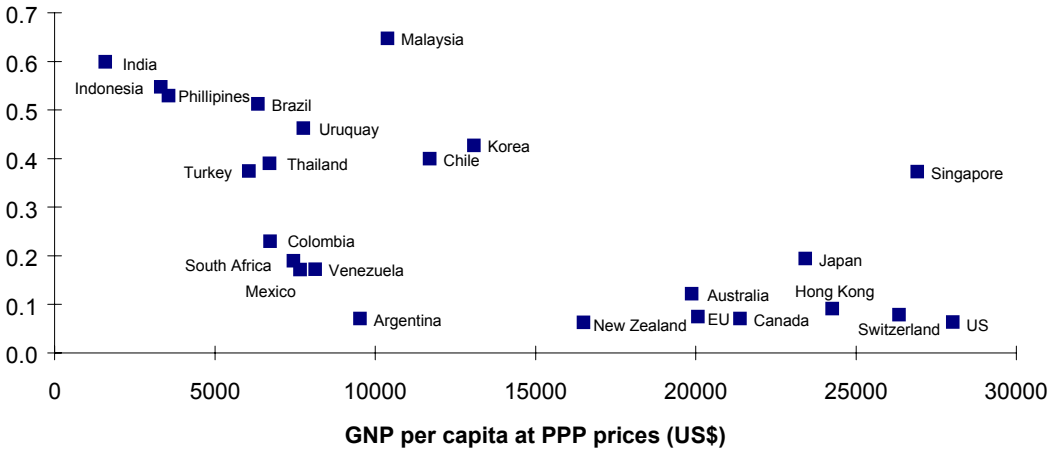


a The higher the score the more restrictive an economy. Scores range from 0 to 1.

Source: McGuire and Schuele (2000).

The potential significance of discrimination against foreign entrants in banking is illustrated in figure 3. This shows that economies with fewer restrictions against foreign entrants tend to have higher GNP per capita.

Figure 3 **Banking foreign restrictiveness indexes and GNP per capita at PPP prices (1996)[a]**



a Purchasing power parity (PPP) prices based on World Bank surveys undertaken since 1993. GNP per capita at PPP prices are used. GNP per capita using official exchange rates tends to undervalue low and middle income economies with relatively low prices (World Bank 1998).

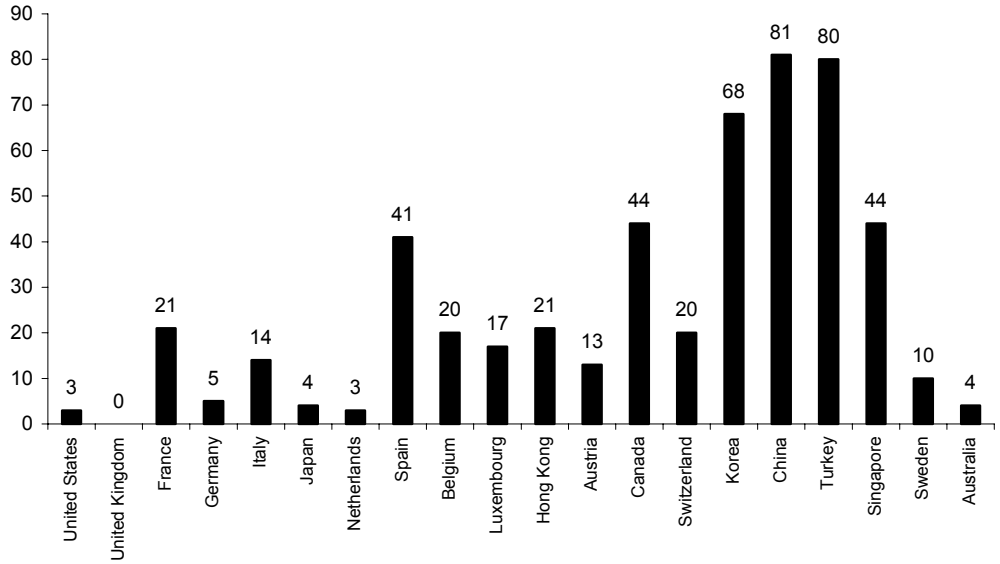
Source: McGuire and Schuele (2000).

Other studies find a similar relationship between the openness of trade and income. Levine (1996) found that economies with financial systems that are better at performing key financial services functions tend to be economically developed, have higher income per capita and grow at a faster pace than those with less developed financial systems. PECC (1995) found a positive relationship between wealth and openness, in that APEC economies with a higher number of GATS commitments also tend to have higher GDP per capita.

Telecommunications

Figure 4 gives a measure of the total trade restrictiveness index scores for telecommunications in the top twenty services trading nations in 1997. The figure shows a high degree of variation, 'reflecting the continuing resistance among many economies to the liberalisation of their telecommunications markets' (Warren 2000a, p. 79).

Figure 4 **Telecommunications trade restrictiveness index for the top-20 services trading nations, 1997[a]**



a The higher the score, the greater the degree to which an industry is restricted. The maximum score is 100 per cent. The index is a simple unweighted average of scores for five components measuring restrictions on market access and national treatment in commercial presence and cross-border trade in fixed line and mobile telephony markets.

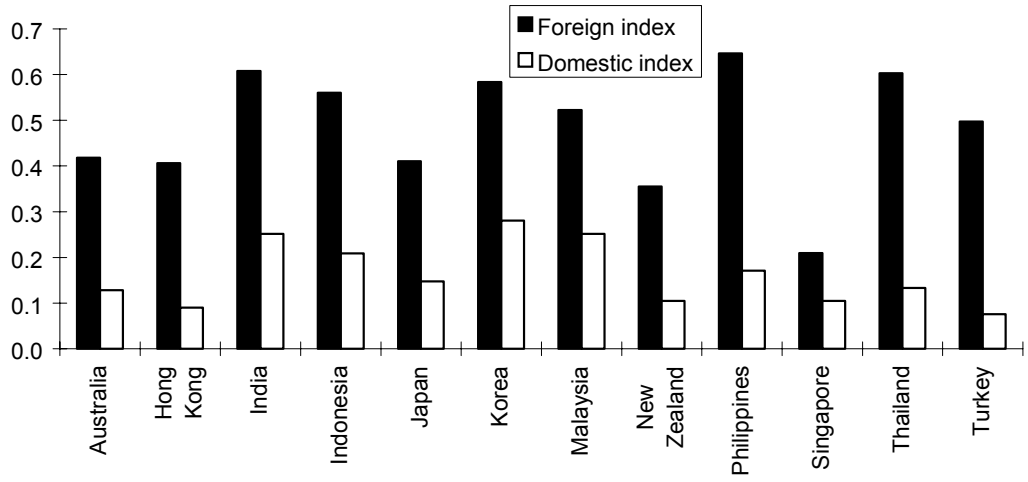
Source: Warren (2000a).

As with banking, there is a relatively strong correlation between the extent of trade restrictiveness and the level of per capita income. The high restrictiveness score for China, for example, is typical of that for a number of low and medium income economies. It also contributes to some of the modelling results highlighted later in the paper.

Maritime

In maritime, there tends to be less difference than in banking or telecommunications in the extent of trade restrictiveness between developed and developing economies. All of the 35 economies studied were found to maintain significant restrictions on new entrants, particularly foreign ones, in their maritime services markets (figures 5, 6 and 7). This was based on information on restrictions ranging from 1994 to the end of 1998, in areas such as cabotage, cargo sharing, government treatment of liner shipping conferences, and port services.

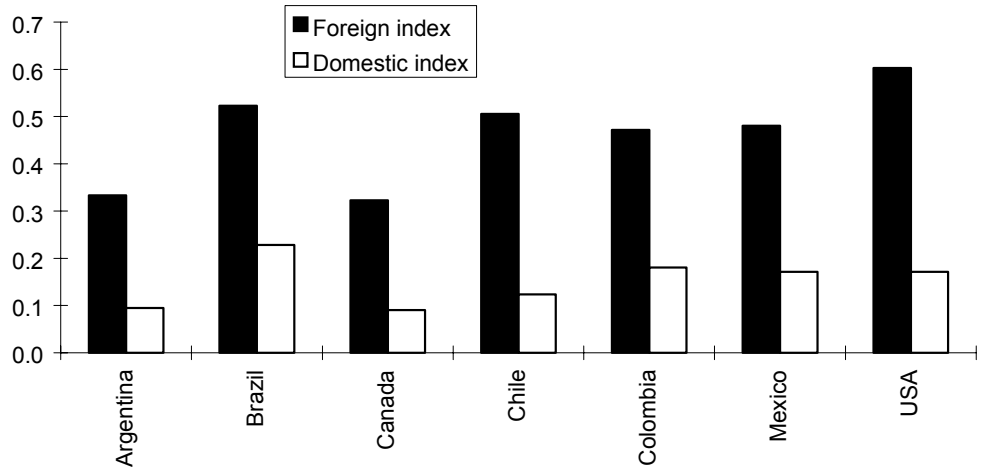
Figure 5 **Maritime restrictiveness indexes for selected Asia Pacific economies and Turkey[a]**



a The higher the score the more restrictive an economy. Scores range from 0 to 1.

Source: McGuire, Schuele and Smith (2000).

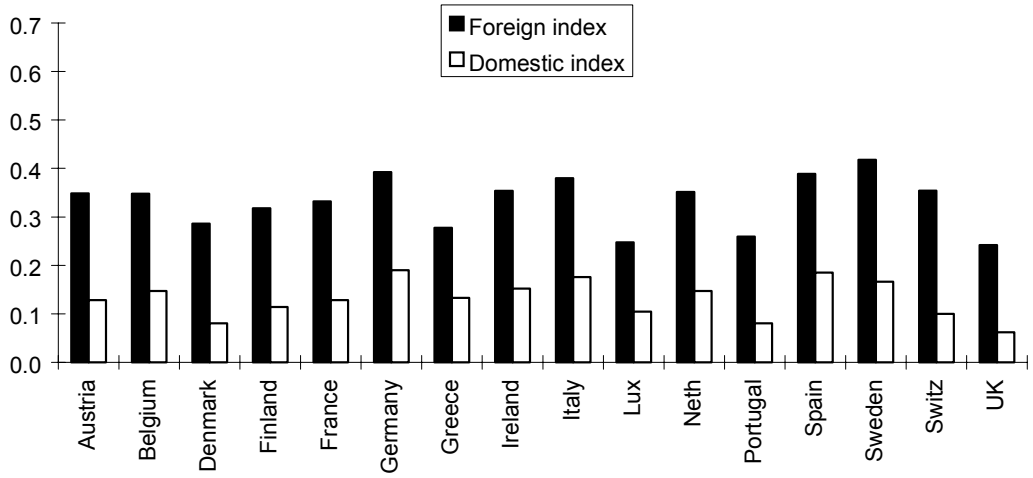
Figure 6 **Maritime restrictiveness indexes for selected American economies[a]**



a The higher the score the more restrictive an economy. Scores range from 0 to 1.

Source: McGuire, Schuele and Smith (2000).

Figure 7 **Maritime restrictiveness indexes for European economies[ab]**



a The higher the score the more restrictive an economy. Scores range from 0 to 1. **b** Inland waterways are covered by this study.

Source: McGuire, Schuele and Smith (2000).

Among the developed economies, the United States stood out as having a particularly restrictive trade regime. The *Merchant Marine Act 1920* (the Jones Act) requires that all goods transported by water between US ports be carried in US owned, operated, built and crewed ships. The United States reserves the right to

impose retaliatory measures on routes served by US ships as well as routes served by foreign ships but carrying US cargo.

The European economies tended to have lower restrictions on maritime services than the United States, although some of them, such as Luxembourg, are land-locked so the only meaningful restrictions were those applying to inland waterways.

7 Price and quantity impacts — some results

Australian research has estimated the effects of market access and national treatment restrictions on:

- the price-cost margins of *banking* services for 27 economies (Kalirajan et al. 2000);
- the price-cost margins for *distribution* services for 18 economies (Kalirajan 2000);
- the price-cost margins for *engineering* services for 20 economies (Nguyen-Hong 2000);
- the cost and price-cost margins for *international air services* (Johnson et al. 2000);
- the trade margins for *maritime* services (Kang 2000); and
- the cost and quantity for *telecommunications* services for up to 136 economies (Trewin 2000 and Warren 2000b).

The following examples show the limited extent to which the weights attributed to the components of the trade restrictiveness index have been able to be reestimated during the econometric stage.

It has typically not been possible to estimate the effects of trade restrictions on the performance of domestically owned and foreign owned firms separately. Since it has been argued that these firms are producing differentiated products, there should be no presumption that the prices of their services are equal in a given economy. Unfortunately, the information on ownership in the datasets used is either non-existent, or patchy at best. Thus the exercises have typically only identified impacts on a sample average of domestic and foreign firms. This constitutes an unfortunate theoretical inconsistency in the empirical work to date.

Banking

In Kalirajan et al. (2000), the effects of trade barriers on banking performance were examined in a two-stage process:

- first, the price performance of banks was 'corrected' for the influence of two key elements of prudential supervision — capital and liquidity requirements;
- then the influence of trade restrictions and other factors was examined on this 'corrected' price measure.

While the activities of banks have diversified enormously over recent years, a key banking function is still financial intermediation between depositors and borrowers. The raw price measure chosen was the net interest margin on this intermediation activity. The model, based on Saunders and Schumacher (1997a, 1997b), examined the main influences on financial intermediation activity.

The first stage was a firm-level estimation across a range of economies:

Net interest margin = f [capital, liquidity, non-interest operating expenses (net of other operating income), economy dummy variables]

where all variables were measured as ratios and in natural log form. The net interest margin (including account service fees) was expressed as a ratio of interest earning assets. Capital (common stock, preferred stock and retained earnings), liquidity (cash and due from banks) and net non-interest operating expenses were expressed as ratios to total assets.

The capital and liquidity measures were the actual holdings of individual banks, on the assumption that these largely reflect prudential requirements. It was felt that using actual capital and liquidity ratios was the best that could be done, in the absence of data to compute each bank's actual reserve and liquidity requirements based on risk-weighted (rather than simple total) assets.

The inclusion of net non-interest expenses corrected for differences in the cost structures of different banks.

The second stage was a pure cross-country estimation:

'Corrected' interest margin = f [interest rate volatility, market structure, measures of trade policy]

where the 'corrected' interest margin was an average measure across all the banks in that economy. It was calculated from the results of the first stage estimation as

the sum of the constant term and the coefficient on the relevant economy dummy in that equation.

Interest rate volatility was included because it increases interest rate risk for banks and reduces bank profit. It was measured as the variance of annualised quarterly deposit interest rates over the last 3 years. Market structure was included because greater bank concentration was expected to increase bank profits. It was measured as a four firm concentration ratio in lending assets.

The results in Kalirajan et al. (2000) suggested that higher capital or liquidity requirements would both raise the 'price' of intermediation services — the net interest margins of banks — although the result for liquidity requirements is highly insignificant. However, these estimates were only a partial measure of the effects of prudential regulations, which are not aimed at reducing the price of banking services, but at ensuring systemic stability. The results in Kalirajan et al. (2000) showed the incidental cost of such regulations, in terms of reducing bank profits, but they did not show the corresponding benefits.

Some insight into the benefits of prudential regulation is provided by Barth, Caprio and Levine (2002). They examined the effects of their regulatory variables on several measures of bank performance, including bank development (bank credit to the private sector as a share of GDP) and the probability of experiencing a banking crisis. They concluded that the stringency of capital regulations was not very closely linked with bank performance or stability, neither generally nor in particular institutional or regulatory environments. Instead, they found that regulations that encourage and facilitate private monitoring of banks tended to boost bank performance, while those that encourage diversification reduced the probability of suffering a systemic crisis. Their measure of capital stringency included such things as whether risks were properly accounted for, and whether capital requirements were officially verified, rather than the size of the capital requirements per se (as used in Kalirajan et al. 2000). Their finding on capital stringency raises questions about the conventional wisdom that such measures are beneficial.

Dee (2003b) extended the framework of Kalirajan et al. (2000) to also include the index measures of prudential supervision compiled by Barth, Caprio and Levine (2002) in the second stage of the estimation. Of the potential trade barrier and prudential variables, two were estimated to be significant — the policy variable measuring the extent of trade barriers to foreign entrants, and the measure of the extent to which foreign operators have actually entered the market. Trade barriers were estimated to increase prices, and actual foreign entry to reduce them. The results differed somewhat from those of Barth, Caprio and Levine (2002), who found that only contestability, and not actual foreign entry, affected banking performance.

None of the bank supervisory variables were significant. As noted, these policies are designed to ensure system stability and integrity, not to reduce prices. The results were reassuring in that these supervisory practices did not appear to raise costs significantly as a secondary consequence. As in Barth, Caprio and Levine (2002), measures that encouraged private monitoring (*7b* and *7d*) were instead estimated to reduce net interest margins, although the effect in Dee (2003b) was not significant. Barth, Caprio and Levine (2002) provide further evidence of how these policies contribute to banking system development and stability.

The econometric results from Dee (2003b) can be used to calculate the 'tax equivalents' of restrictions on banking activities. This is done by comparing the predicted values for net interest margins under current policy settings with the predicted values were policies to be set at their most (or more) liberal. The results give the percentage by which net interest margins are inflated as a result of the restrictions, and are shown in table for selected other economies (based on their 1997 policy settings).

Table 4 **Tax equivalents of market access and national treatment restrictions on banking**

Per cent

	Trade barriers – market access	*Trade barriers – national treatment*	*Low foreign ownership*	*Total*
Chile	15.45	3.16		18.61
Indonesia	3.66	24.30		27.96
Korea	10.05	11.67		21.72
Philippines	7.45	19.93	3.59	30.97
Singapore	5.53	13.28		18.81
Thailand	0.00	17.85		17.85
Australia	0.00	3.53		3.53
France	0.00	0.50		0.50
Japan	6.81	0.12		6.93
Sweden	0.00	0.50		0.50
United States	0.00	0.12		0.12

Source: Dee (2003b).

The first two columns of table 4 show the tax equivalents of services trade restrictions. As noted, the tax equivalents of the non-discriminatory market access restrictions show the tax penalty imposed on domestic entrants. The tax equivalents of the national treatment restrictions show the *additional* penalty imposed on foreign entrants by discriminatory trade measures. Thus the *total* tax equivalent faced by foreign entrants is given by the sum of the first two columns in table 4. Note that the breakdown of the tax equivalents into their discriminatory and non-

discriminatory components is based on the a priori assignment of weights in the restrictiveness index, rather than on econometric estimation. This is because there was insufficient in-sample variation in the non-discriminatory index to identify its effects econometrically.

Also potentially affecting the prices of banking services are factors that fall outside the narrow definition of services trade barriers. The econometric results in Dee (2003b) suggested that it was not just the contestability of the market for banking services that mattered, but also the actual extent of foreign ownership. The third column of table 4 captures the potential effects on banking prices if the actual extent of foreign ownership of banking assets were raised to the sample average of 18 per cent. The currently low foreign ownership in the Philippines is estimated to add about 4 per cent to the prices of banking services. Low foreign ownership was found to be more significant for the South East European economies.

Overall, the restrictions on banking services are estimated to have raised the prices of banking services in some developing economies by up to 30 per cent. Clearly, there are significant potential gains from further reform in this area.

Professions

Nguyen-Hong (2000) estimated a model of the performance of engineering firms, in order to estimate the effects of trade restrictions on firm profitability, correcting for all the other factors that are likely to affect profitability in the sector. Extending models of profitability by Mueller (1986), the potentially relevant control variables were:

- market share of the particular firm;
- extent of overall market concentration;
- R&D spending, as an indicator of product differentiation;
- recent sales growth;
- diversification;
- absolute size;
- cost of capital.

Nguyen-Hong (2000) found that, correcting for other influences, non-discriminatory domestic barriers to establishment had a significant and negative effect on the price-cost margins of engineering firms. Discriminatory barriers to foreign establishment and ongoing operation had a significant and positive effect on price-cost margins.

The negative coefficients were taken as tentative evidence that the nature of the associated trade restrictions was primarily to raise the real costs of doing business. Thus the non-discriminatory restrictions, such as local licensing and accreditation requirements, were likely to raise costs, but the discriminatory nationality, residency and other restrictions placed on foreign professionals were likely to protect incumbent engineering professionals from competition and to create rents. In practice, both sorts of restrictions are likely to have independent effects on both prices and costs. The net impacts found by Nguyen-Hong would therefore understate the total impacts of the restrictions on competitiveness and efficiency.

Nguyen-Hong (2000) showed how the econometric results could be used to estimate the direct 'cost impact' of non-discriminatory restrictions and the 'price impact' of discriminatory restrictions for each economy in the sample.

The relative effects of the discriminatory and non-discriminatory restrictions were able to be identified by entering the foreign and domestic index measures together into the same regression. Therefore, multicollinearity was controlled for and the resulting coefficient estimates are not overstated.

The resulting price and cost impacts of restrictions on engineering services are shown in table 5, for selected economies. The results suggest that non-discriminatory barriers to establishment could raise the costs of engineering services by up to 5 per cent. Discriminatory barriers to foreign entry could create rents for local companies, raising the prices of engineering services relative to costs by up to 10 per cent. While the separate effects on the profits of engineering firms may be offsetting, both effects are likely to have adverse consequences for the economy as a whole.

While the results suggest that liberalising restrictions on engineering services may not be a high priority in many economies, they also hint at the potential gains from loosening regulatory restrictions on the more heavily regulated legal and accounting professions. For these sectors, Nguyen-Hong (2000) showed that the trade restrictiveness indexes tended to be significantly higher than for engineering.

Table 5 **Price- and cost-raising effects of barriers to trade in engineering services**

Per cent

	Price impact			*Cost impact*
	Foreign barriers to establishment	*Foreign barriers to ongoing operation*	*All foreign barriers*	*Domestic barriers to establishment*
Malaysia	11.3	0.7	12.0	5.3
Indonesia	9.9	0.3	10.2	3.2
Singapore	4.9	0.2	5.0	0.8
Australia	2.1	0.7	2.8	2.1
France	0.3	0.6	0.9	0.7
Japan	3.1	3.4	6.6	2.2
Sweden	5.9	0.9	6.8	0.7
United States	5.1	2.2	7.4	3.8

Source: Nguyen-Hong (2000).

Other sectors

As with the restrictiveness index results, Asian and South American economies were generally found to have medium to high price and cost effect measures. European and North American economies tended to have low to medium price and cost effect measures.

A summary of the results from the trade restrictiveness index and econometric work has been included in the Productivity Commission's annual *Trade and Assistance Review* publications. These publications, along with detailed data on the trade restrictiveness indexes and results from the econometric studies, are available without charge on the Productivity Commission's website at www.pc.gov.au/research/memoranda/servicesrestriction/index.html.

8 Modelling services trade liberalisation

Studies to date

Few of the early multi-country studies recognised FDI as a mode of services delivery (table 6). Petri (1997) was a pioneering exception. Of those multi-country studies that did include FDI, few contained more than a single aggregate services sector. This reflects the constraints on model size associated with modelling FDI in a multi-sector, multi-country context. These constraints are still relevant.

Table 6 **Selected CGE studies of services trade liberalisation**

Study	*No of services sectors*	*Modes of services delivery*		*Barriers to modes of delivery*		*Source of estimates of services trade barriers*
		FDI	*Other*	*FDI*	*Other*	
Multicountry studies						
Brown et al. (1996)	5	X	√	X	√	Hoekman (1995)
McKibbin and Wilcoxen (1996)	1	X	√	√ (in-direct)	√	Assumed
Petri (1997)	1	√	√	√	X	Hoekman (1995)
Hertel et al. (1999)	5	X	√	X	√	Hoekman (1995) and Francois (1999)
Robinson et al. (1999)	6	X	√	X	√	Hoekman (1995)
Brown and Stern (2001)	1	√	√	√	√	Hoekman and Francois (1999)
Benjamin and Diao (2000)	1	X	√	X	√	Assumed
Chadha (2001)	8	X	√	X	√	Hoekman (1995)
Dee and Hanslow (2001)	1	√	√	√	√	Kalirajan et al. (2000) and Warren (2000b)
Verikios and Zhang (2001)	6	√	√	√	√	Kalirajan et al. (2000) and Warren (2000b)
Single country studies						
Konan and Maskus (2002)	14	X	√	X	√	Zarrouk (2000), Balhous and Nabli (2000), World Bank (2000), etc.
Jensen, Rutherford and Tarr (2003)	20	√	√	√	√	Zemnitsky (2001) and assumed

Source: See table for references.

In addition, many of the earlier multi-country studies took their estimates of barriers to services trade from the very early pioneering work of Hoekman (1995). His study combined an index measure of barriers to services trade, derived from GATS schedules, with 'guestimates' of the tax equivalents of those barriers. It therefore suffered from the incomplete coverage of GATS schedules, and lacked an econometric basis for the tax equivalents. More recent work by Brown and Stern (1999), Dee and Hanslow (2001) and Verikios and Zhang (2001) has begun, in a limited way, to make use of the more comprehensive estimates available.

Two recent, single-country studies by Konan and Maskus (2002) and Jensen Rutherford and Tarr (2003) have been able to combine a much more disaggregated treatment of the services sector with much more detailed and country-specific measures of barriers to services trade. In Jensen, Rutherford and Tarr (2003), the estimates of barriers to services trade were based on the methodology of Findlay and Warren (2000). Konan and Maskus (2002) did not include a treatment of FDI, because in Tunisia's highly regulated economy, FDI was prohibited in many key services sectors, and they judged there was no way to predict how responsive sectors that were inactive in the benchmark would be to FDI in the liberalised environment. Jensen, Rutherford and Tarr (2003) judged FDI from new multinational service providers to be possible in 11 of their sectors (all in services), and modelled it accordingly.

Australian research

The FTAP model has been used to examine the impact of multilateral liberalisation of services trade. It was developed by the Productivity Commission and is a 19 region (covering economies in Asia, North and South America and the European Union) by 3 sector (agriculture and food, manufacturing and services) computable general equilibrium model of the world economy. The FTAP model was developed from the Global Trade Analysis Project (GTAP) model (Hertel 1997), with the addition of some structure necessary to support the analysis of services liberalisation. A fuller discussion of the theoretical considerations in modelling services policy issues is contained in Dee (2003a).

The theoretical structure of the model covers both FDI and portfolio investment. The model's database contains estimates of FDI stocks and activities of FDI firms on a bilateral basis. The treatment of FDI allows for the examination of the comprehensive removal of restrictions on all modes of service supply, including restrictions on services delivered via commercial presence. Hanslow, Phamduc and Verikios (1999) fully document the structure of the FTAP model.

The first version of the FTAP model was indicative only in its treatment of barriers to services trade. An average of the estimates of barriers to trade in telecommunications and banking services, taken from Kalirajan et al. (2000) and Warren (2000b), was taken to be typical of barriers for the model's services sector as a whole. An area for further research will be to disaggregate FTAP's single services sector into its separate service industries and to model trade barriers for these industries separately.

Because of evidence that barriers to trade in banking and telecommunications services raised prices above costs in those sectors, services trade barriers were incorporated into FTAP as tax equivalents. Restrictions on establishment were incorporated as taxes on capital. Restrictions on ongoing operations were incorporated as taxes on the output of FDI firms and the exports of firms supplying via the other modes of delivery. Different 'tax' rates applied to domestic and foreign-owned firms, reflecting discriminatory treatment of foreign-owned entities. The model structure ensured that the revenues (or rents) from these 'taxes' were divided appropriately between the government and private agents.

In future, cost-raising restrictions will also be incorporated. But one implication of the current treatment is that the gains from services trade liberalisation are probably understated. As noted, if services trade barriers raise prices above costs and create rents for incumbent firms, liberalisation will yield 'triangle gains' associated with improvements in allocative efficiency, along with redistributive effects associated with the elimination of rents to incumbents. But if trade barriers raise the real resource cost of doing business, liberalisation could lead to 'rectangle gains' associated with a saving of real resources. And rectangle gains are likely to exceed triangle gains by a significant margin.

Dee and Hanslow (2001) used the FTAP model to find that the world as a whole would be projected to be better off by more than US$260 billion annually (in current dollar terms) as a result of eliminating all post-Uruguay Round trade restrictions. About US$130 billion would come from liberalising services trade, of which US$100 billion would accrue in China. US$50 billion would come from agricultural liberalisation, and US$80 billion from liberalisation of manufactures. These were the projected gains in real income about 10 years after the liberalisation had occurred and the associated resource adjustments had taken place.

Dee and Hanslow also projected the benefits of *partially* liberalising services trade. The results showed that the greatest global benefits would come from liberalising market access restrictions rather than national treatment restrictions (refer to table 7).

Table 7 **Effects of partial services liberalisation on world real income[a]**
US$ billion

	Remove restrictions on market access	*Remove restrictions on national treatment*	*Both[b]*
Remove restrictions to establishment	56.8	3.7	64.2
Remove restrictions on ongoing operations	25.6	12.9	39.3
Both[b]	98.8	19.3	133.4

a Projected gains in real income about 10 years after the liberalisation had occurred and the associated resource adjustments had taken place. **b** Because of interaction effects between types of partial liberalisation, the figures for 'Both' are not additive.

Source: Dee and Hanslow (2001).

This is in contrast with the presumption widely found in the goods trade literature that the greatest gains would come from removing discrimination. In services, if restrictions on national treatment are removed while significant barriers to market access remain, the danger is that an economy will simply hand monopoly rents to foreign operators without gaining offsetting benefits in the form of lower prices to domestic users. This is similar to the danger pointed out by Francois and Wooton (2001), and is part of what lies behind the FTAP results shown in table 7.

The results also showed that it would be difficult to find an outcome where at least some economies gained and none lost from partial liberalisation, when it involved only removing one class of restriction (market access, national treatment, establishment or ongoing operations). This suggested that the best strategy for liberalisation may be to negotiate gradual reductions in *all* types of restrictions simultaneously.

Dee, Hanslow and Phamduc (2003) looked at the question of which sectors would gain from multilateral services trade liberalisation. An economy's services sector itself may not lose from liberalisation because there are competing forces at work.

- Not all services trade barriers discriminate against foreign services suppliers, so the service sector could expand because of new domestic entry.
- Some services trade barriers restrict inward FDI, so the service sector could expand because of new foreign entry.
- Some services barriers discriminate against foreign services delivered cross-border, so the services sector could contract in the face of additional import competition.
- Services trade liberalisation could benefit downstream using industries, and the service sector may lose out in the competition for domestic resources (eg labour).

The net effect was likely to be an expansion in the services sectors in economies where domestic services restrictions were high initially. Again, this is in contrast to liberalization of goods trade, and makes the political economy of services trade reform somewhat different.

The benefits to services sectors in economies such as China were projected to be particularly large, because of the focus of the initial work on barriers to banking and telecommunications, and the particularly high barriers to telecommunications trade in China. When trade restrictions in sectors such as maritime are also taken into account, the sectoral and economy breakdown of gains are likely to be more even.

Verikios and Zhang (2001) also used the FTAP model to analyse the sectoral impacts of removing restrictions on trade in financial and communication services separately. They found that the total gain in world income from liberalising both sectors would be US$47 billion (in current dollars), with about US$24 billion of this coming from liberalising communications services and US$23 billion from financial services.

9 Agenda for further research

The modelling of services trade in FTAP will be expanded to include the price and cost estimates for sectors beyond banking and telecommunications. More sectoral detail will also be incorporated in FTAP, so as to be able to model the benefits of liberalising each service sector separately and analyse the benefits of cross-sectoral trade offs.

More work is also required to model the movement of people. Dee and Hanslow (2001) lumped barriers to the permanent movement of people together with other barriers to FDI, and barriers to the temporary movement of people together with barriers to the other three modes of service delivery, but did not model either the temporary or permanent movement of people directly. This approach was adequate when the focus of attention was on barriers to FDI. But barriers to the movement of people per se is an issue of intense interest, especially to developing economies. If it is to be modelled directly, then the underlying flows of people will also need to be modelled. Winters (2002) summarises an important first step in this direction.

Finally, more work is needed to characterise domestic regulatory regimes across economies for selected industries, and to examine the interactions between services trade barriers and domestic regulatory regimes.

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