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Quantifying Barriers to Trade in Services

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I. Introduction

Given the fact that international trade in services has been increasing significantly in recent decades and now is equal to about 20 percent of global merchandise trade, it is obviously important to consider the barriers that affect services trade and issues of measurement of these barriers. There has been similarly an increasing amount of foreign direct investment (FDI) in both goods and services sectors in and between advanced and developing countries. FDI is subject to a variety of barriers as well and thus merits attention in its own right.

Characteristics and Modes of International Transactions in Services

The most distinguishing characteristic of services transactions is that their production and consumption occur simultaneously, thus often requiring direct contact between producers and consumers. While some services are traded internationally across borders (e.g., "separated" services such as telecommunications) in a manner similar to cross-border trade in goods, other services may require the consumer to move to the location of the producer, as in the case of tourism. Further, because of the necessary proximity of consumers and producers, factors of production may have to move across national boundaries to the place of consumption. Thus FDI may be necessary in order to establish a foreign commercial presence, and there may also be temporary cross-border movement of labor that is required to serve foreign consumers. An indication of the magnitudes of the four modes of services transactions is provided in Table 1.

Types of Barriers to Trade and FDI in Services

As noted by Hoekman and Primo Braga (1997, p. 288), because of the simultaneity of the production and consumption of services, border measures such as tariffs will generally be difficult to

apply because customs agents cannot readily observe the service as it crosses the border. Typically therefore the restrictive policies followed will be designed to limit the access of foreign services and the suppliers of services to domestic markets. Hoekman and Primo Braga distinguish the following types of barriers: (1) quotas, local content, and prohibitions; (2) price-based instruments; (3) standards, licensing, and procurement; and (4) discriminatory access to distribution networks. To explain further:

(1) Quantitative-restriction (QR) type policies are commonly applied to service providers. Two prominent examples are the bilateral agreements regulating international air transportation services, which are usually reciprocal and company specific, and ocean-cargo-sharing arrangements, which also often rely on reciprocity in providing shipping services in mutual trade. In many countries, there are outright prohibitions directed against foreign providers of such services as domestic transportation, basic telecommunications, and legal, insurance, education, surveying, and investment advising services. Restrictions on transborder data flows are also prevalent and may impede market access by foreign providers.

(2) Price-based instruments may take the form of visa fees and entry or exit taxes, discriminatory airline landing fees, and port taxes. Tariffs can be significant barriers to trade in goods that embody services (e.g., films, television programs, computer software) or goods that are used in producing services (e.g., computers, telecommunications equipment, advertising material). Further, many service sectors are subject to government-sanctioned or monitored price controls, examples including air transportation, financial services, and telecommunications. Government subsidies are commonly used in such service sectors as construction, communications, and road and rail transport.

(3) Licensing or certification requirements may be imposed on foreign providers of professional and business services. Environmental standards may also impact on service providers, particularly in transportation and tourism. Government procurement policies are often designed to favor domestic over foreign providers of services as well as goods by means of preference margins and outright prohibitions.

(4) Discriminatory access to distribution and communications systems exists in many countries in such sectors as telecommunications, air transport, advertising, insurance, and dealer networks.

Hardin and Holmes (1997) have focused specifically on barriers to FDI. They define (p. 24) an FDI barrier as "…any government policy measure which distorts decisions about where to invest and in what form. …policy measures such as limits on the level of foreign investment, or the need to go through costly and time-consuming screening processes to convince authorities that FDI in a project will be in the national interest, are considered barriers."

In considering ways of classifying FDI barriers, Hardin and Holmes note (pp. 33-34):

> "The appropriate classification system may vary, depending on the purpose of the exercise. For example, if the purpose is to check and monitor compliance with some policy commitment, then the categories should reflect the key element of the commitment…. If the primary interest is instead the resource allocation implications of the barriers, some additional or different information may be useful.
>
> Barriers to FDI may distort international patterns and modes of…trade. They may also distort allocation of capital between different economies, between foreign and domestic investment, between different sectors, and between portfolio and direct investment. …the classification system…should highlight the key characteristics of the barriers that will determine their size and impact. Market access and national treatment are…relevant categories from a resource allocation perspective. …national treatment is generally taken to refer to measures affecting firms after establishment. A…way to classify barriers is therefore…according to what aspect of the investment they most affect: establishment, ownership and control; or operations. In addition…, some further information may be useful…on distinctions…between direct versus indirect restrictions on foreign controlled firms; and rules versus case-by-case decisions."[1]

The main types of FDI barriers that have been identified by UNCTAD (1996) are noted in Table 2. Further information on the barriers most commonly used to restrict FDI especially in the APEC economies is provided in Hardin and Holmes (1997, esp. pp. 37-40 and 45-55). As they note (p. 40), some common characteristics appear to be:[2]

> "application of some form of screening or registration process involving various degrees of burden for the foreign investor; restrictions on the level or share of foreign ownership, particularly in some service sectors, and often in the context of privatisations; widespread use of case-by-case judgments, often based on national interest criteria; widespread use of restrictions on ownership and control (e.g., restrictions on board membership), particularly in sectors such as telecommunications, broadcasting, banking; and relatively limited use of performance requirements on input controls in services sectors."

II. Measurement of Barriers to Trade and FDI in Services

The measurement of services barriers parallels to an extent the measurement of nontariff barriers (NTBs) that limit trade in goods. However, services barriers involve greater complexities when account is taken of the different modes of supply of services that include not only cross-border trade but also the

[1] Direct restrictions include limitations on the total size or share of investment in a sector and requirements on inputs used (e.g., local content). Indirect restrictions include net benefit or national interest criteria and limitations on membership of company boards. The distinction between rules and case-by-case decisions relates to issues of clarity in specification and transparency as compared to the exercise of administrative discretion.

[2] Hardin and Holmes (pp. 40-43) also provide information on investment incentives, which are widely used and for the most part are not subject to multilateral disciplines.

movement of consumers to the location of providers as well as FDI and temporary international movement of labor.

Frequency Measures

Frequency measures of services barriers have been constructed by PECC (1995) and Hoekman (1996). These are based on the information contained in the country schedules of the General Agreement on Trade in Services (GATS) and refer to all four modes of the supply of services. Frequency ratios are constructed based on the number of commitments scheduled in the GATS by individual countries that designate sectors or sub-sectors unrestricted or partially restricted in relation to the maximum possible number of unrestricted commitments. As noted in Hoekman (1996, p. 101), there are 155 sectors and sub-sectors and four modes of supply, which yields 620×2=1,440 total commitments on market access and national treatment for each of 97 countries.[3]

Hoekman (1995) has used frequency ratios to approximate the relative degree of restrictiveness of market-access barriers to services trade across countries and sectors. He established a judgmental set of benchmark tariff equivalents for individual sectors to reflect the degree to which market access to these sectors was restricted. The benchmark tariff equivalents chosen ranged from a high of 200 percent for sectors (e.g., maritime cabotage, air transport, postal services, voice telecommunications, and life insurance) in which market access was essentially prohibited in most countries to 20-50 percent for sectors in which market access was less constrained. He then assigned a value to each country and sector using the benchmarks multiplied by the calculated frequency ratio. Thus, for example, assuming a benchmark tariff equivalent of 200, say, for postal services and a frequency ratio of 50 percent to reflect the scheduled market access commitments, the tariff equivalent for that sector is set at 100 percent. Using the value of output by sector for a representative industrialized country, it is then possible to construct

[3] As noted in Hardin and Holmes (1997, p. 70) the GATS commitments are based on a "positive list" approach and therefore do not take into account sectors and restrictions which are unscheduled. In PECC (1995), it is assumed that all unscheduled sectors and commitments are unrestricted, which will then significantly lower the

weighted average measures by sector and country. The weighted average tariff equivalents for 1-digit ISIC sectors for selected countries are indicated in Table 3.

It should be emphasized that Hoekman's measures are designed to indicate the *relative* degree of restriction and are not to be taken literally as indicators of absolute ad valorem tariff equivalents. But even granting this, there are some important limitations worth mentioning. Thus, as Hardin and Holmes (1997, p. 72) note, Hoekman's method may be misleading or biased because it assumes that the absence of positive country commitments in the GATS schedules can be interpreted as indicating the presence of restrictions, which may in fact not be the case. Also, the different types of restrictions are given equal weight and are not distinguished according to their economic impact. Finally, market access restrictions are the only ones taken into account.

Hardin and Holmes (1997) have attempted to build on and improve Hoekman's methodology for constructing guesstimates of tariff equivalents for services. In particular, they use information on actual FDI restrictions and incorporate information on the types of barriers and their economic impact. Their objective is to construct an index of FDI restrictions that can be translated into a tariff equivalent or tax equivalent. The components of their proposed index and the weights assigned to the different sub-categories are given in Table 4. They set the weights to reflect the relative degree of restriction of different barriers. Foreign equity limits are given greater weights than the other barriers noted. Hardin and Holmes confine their calculations of the indexes of FDI restrictions to the services sectors in the APEC countries.[4] Their results are summarized in Table 5. It is evident that communications and financial services are most subject to FDI restrictions, while business, distribution, environmental, and recreational services are the least restricted.

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calculated frequency ratios. It would be useful accordingly to determine how accurate the PECC assumption may be.

[4] Details on the construction of the indexes and their sensitivity to variations in the restrictive weights are discussed in Hardin and Holmes (1997, esp. 103-11).

Warren and Findlay (2000) have reviewed a number of studies of services sectors based on the use of frequency-type indices of services impediments:[5]

1. Mattoo (1998) analyzed market access commitments in financial services, covering direct insurance and banking. His results indicate that Latin America is the most restricted in direct insurance and Asia the most restricted in banking services.
2. McGuire (1998) showed that Australia's impediments in financial services, including banking, securities, and insurance, were much lower as compared to other economies in Asia.
3. McGuire and Schuele (1999) constructed indices of impediments to trade in banking services for 23 countries plus the European Union that distinguished impediments on commercial presence and operations and impediments affecting foreign banks and all banks. Weighting the various indices by the degree of restrictiveness, they showed that there was a negative relation between GNP per capita and financial market restrictions.
4. The OECD (1997) developed a pilot study of barriers affecting accounting services for Australia, France, the United Kingdom, and the United States. The United Kingdom was found to be the most liberal, the United States the least liberal.
5. Marko (1998) found that 58% of the basic telecommunications services market for the 69 signatories of the February 1997 Agreement on Basic Telecommunications was covered by partial or full GATS commitments.
6. Warren (1999b) constructed a set of indices to measure the restrictiveness of telecommunications policies for 136 countries. There was a high degree of variation in the indices, indicating that many countries are resistant to liberalizing their telecommunications markets.
7. McGuire, Schuele, and Smith (1999) developed indices for restrictions on foreign maritime services suppliers and all maritime service suppliers covering 35 economies. The degree of restrictiveness varied considerably. Chile, the Philippines, Thailand, Turkey, and the United States treated foreign maritime service suppliers less favorably than domestic suppliers.

The various frequency-type measures that have been constructed are especially useful in identifying the types of barriers and the relative degree of protection afforded to particular sectors across countries. But, as is well known, frequency-type measures have only limited economic content with regard to assessing the size of service barriers and the consequences of maintaining or eliminating these barriers. The question then is whether it is possible to construct price-based or quantity-based measures of services barriers that can be used in quantitative assessment of the costs and benefits from the

[5] More recent information on studies completed and in progress in association with the Australian Government Productivity Commission can be accessed at: http://www.pc.gov.au/research/staffres/index/html.

reduction or removal of the barriers. I turn next then to discuss a number of such recent measurement efforts.

Price-Based Measures of Services Barriers

Warren and Findlay (2000) have discussed ongoing efforts to construct price-based measures of services impediments, using estimates of price-cost margins. As they note, Kalirajan et al. (1999) have used a two-stage econometric technique to calculate the "net interest margins" for 694 national and state commercial banks in selected economies. Their results, which distinguish barriers to establishment and to ongoing operations for foreign and domestic firms, are summarized in Table 6. The price impacts of restrictions on foreign banks (F) are the highest for Indonesia, the Philippines, Malaysia, Chile, Singapore, South Korea, and Thailand. Argentina, Australia, Canada, the EU, Hong Kong, Switzerland, and the United States appear to have relatively low non-prudential restrictions in foreign banks. The second set of domestic (D) measures noted apply equally to domestic and foreign banks and range from 0 to 24 percent.

Warren and Findlay also discuss (p. 73) work in progress on price-based measures of policy variables for maritime services:

> "An estimate of shipping expenses (derived from comparisons of values at the point of export and the variables at the point of import) in bilateral trades in each direction is the proxy for price variables. Statistical methods are used to test for the significance of the policy measures for variations in prices, after allowing for the impact of other variables that will affect those charges, including the distance between them, the scale of the trade, indicators of the composition of the bilateral trade, the extent of imbalances in the trade flows, and the degree to which the routes are isolated from substitutes. The data set includes 506 observations. Under the method used, policy must be included in both partner economies. The results will help researchers determine whether a high degree of restrictiveness is necessary in both economies in order to drive up shipping charges or whether a high degree in one partner alone is sufficient."

Quantity-Based Measures of Services Barriers

Warren (1999a) has assessed the quantitative impact of barriers in telecommunications services, chiefly mobile telephony and fixed network services, for 136 countries. Combining the quantitative estimates of the effects of removing existing barriers with an estimate of the price elasticity of demand for

the telecommunications services involved, tariff equivalents in the form of price wedges can be calculated. The tariff equivalents for domestic and for foreign providers of telecommunication services in the major nations are shown in Table 7. The estimates for the advanced industrialized countries are relatively low in comparison to the much higher estimates for the newly industrializing countries shown. There are cases of developing countries (not shown) that in some cases have very large price wedges, including some with several hundred percent, e.g., China (804 and 1,000 percent), Colombia (11 percent and 24 percent), India (861 and 1,000 percent), Indonesia (71 and 128 percent), South Africa (14 and 21 percent), and Venezuela (10 and 15 percent).

Francois (1999) has fit a gravity model to bilateral services trade for the United States and its major trading partners, taking Hong Kong and Singapore to be free trade benchmarks. The independent variables include per capita income, gross domestic product (GDP), and a Western Hemisphere dummy variable. The differences between actual and predicted imports are taken to be indicative of NTBs and then normalized relative to the free trade benchmarks for Hong Kong and Singapore. Combining this with an assumed elasticity demand of •4, tariff equivalents can be estimated. The results for business/financial services and for construction are indicated in Table 8. Brazil has the highest estimated tariff equivalent for business/financial services (35.7 percent), followed by Japan, China, Other South Asia, and Turkey at about 20 percent. The estimated tariff equivalents are considerably higher for construction services, in the 40-60 percent range for China, South Asia, Brazil, Turkey, Central Europe, Russia, and South Africa, and in the 10-30 percent range for the industrialized countries.

As noted in Deardorff and Stern (1998, p. 24), measures of this kind are useful mainly in identifying *relative* levels of protection across sectors and countries. But they have some important drawbacks. That is, by attributing to NTBs all departures of trade from what the included variables can explain, there is a great burden on the model being used. Thus, the worse the model, the more likely it is that NTB estimates will have an upward bias. Moreover, since trade cannot be predicted accurately for particular industries and countries, it is not clear how the deviations should be interpreted and the extent to which existing trading patterns depart from free trade.

Financial-Based Measures of Services Barriers

Hoekman (2000) has suggested that financial data on gross operating margins calculated by sector and country may provide information about the effects of government policies on firm entry and conditions of competition. As he notes (p. 36):

> "In general, a large number of factors will determine the ability of firms to generate high margins, including market size (number of firms), the business cycle, the state of competition policy enforcement, the substitutability of products, fixed costs, etc. Notwithstanding the impossibility of inferring that high margins are due to high barriers, there should be a correlation between the two across countries for any given sector. Data on operating margins provide some sense of the relative profitability of activities, and therefore, the relative magnitude (restrictiveness) of barriers to entry/exit that may exist."

The country-region results averaged over firms and sectors for 1994-96 are indicated for agriculture, manufacturing, and services in Table 9. Sectoral results for services only are given in Table 10. Services margins are generally higher than manufacturing margins by 10-15 percentage points, and the services margins vary considerably across countries. Australia, Hong Kong, and Singapore have the lowest services margins in the 20 percentage range, while Chile, China, Indonesia, Philippines, Taiwan, Thailand, and the United States have services margins in excess of 40 percent. The sectoral results indicate that the margin for hotels and financial services are relatively high, and the margins for wholesale and retail trade are lower. The margins for several developing countries appear to be relatively high in a number of sectors. Overall, as Hoekman suggests (p. 39):

> "…business services, consultancy, and distribution do not appear to be among the most protected sectors. …barriers to competition are higher in transportation, finance, and telecommunications. These are also basic 'backbone' imports that are crucial for the ability of enterprises to compete internationally."

III. Modeling the Economic Effects of Services Barriers

While the various measures of services barriers noted are of interest, they need to be incorporated into an explicit economic modeling framework in order to determine how the existence or removal of the barriers will affect conditions of competition and costs of production, economic welfare, and the intersectoral movement of capital and labor.

Most research to date on the modeling of barriers has been focused on international trade in goods rather than trade in services and FDI. The reasons for this stem in large part from the lack of comprehensive data on cross-border services trade and FDI and the associated barriers together with the difficult conceptual problems of modeling that are encountered. Some indication of pertinent modeling work is provided in Table 11. Following Hardin and Holmes (1996, p. 85), the approaches to modeling can be divided as follows: (1) analysis of services trade liberalization in response to reductions in services barriers – Brown et al. (1996a,b), Robinson et al. (1999), Francois et al. (1996), Tamms (1999), and Hertel (2000); (2) FDI assumed to respond to trade liberalization or other exogenous changes that generate international capital flows in response to changes in rates of return – Martin and Yagashima (1993); Donovan and Mai (1996); McKibbin and Wilcoxen (1996); Bora and Guisinger (1997); Adams (1998), and Dee et al. (1996, 1998);[6] and (3) modeling of links between parents and affiliates and distinctions between foreign and domestic firms in a given country/region – Markusen et al. (1995, 1999); Benjamin and Diao (1997); Petri (1997); Dee and Hanslow (2000); and Brown and Stern (2000).

The third group of studies noted in Table 11 comes closest to capturing the important role played especially by multinational corporations (MNCs) and their foreign affiliates in providing services. Thus, for example, in the Brown and Stern (2000) modeling study, each MNC is assumed to produce a differentiated product and to allocate production to its various host-country locations. Firms employ capital, labor, and intermediate inputs in their production, and they set prices as an optimal mark-up of price over marginal cost. Consumers are assumed to allocate their expenditure between goods and services that are produced by firms domestically and varieties that are imported from each national source. Labor is taken to be freely mobile between domestic sectors but not across borders. Capital, however, is mobile internationally, although not perfectly so because there is a risk premium that will vary depending on the size of a country's capital stock. Barriers to foreign direct investment (FDI) are

[6] For more recent CGE modeling studies that focus on issues of international capital mobility, see Ianchovichina et al. (1999), Verikos and Hanley (1999), and Walmsley (1999), as well as selected papers presented at the Third Annual Conference on Global Economic Analysis, Sydney, Australia, June 2000.

assumed to take the form of an increased fixed cost of locating investment in a host country. For this purpose, Brown and Stern use the cost-price margins estimated by Hoekman (2000), which are listed in Tables 9 and 10 as indicative of barriers to FDI. Since the cost-price gap is smallest in most sectors in Hong Kong, a country thought to be freely open to foreign firms, the excess in any other country in the Brown and Stern model above the Hong Kong figure is taken to be due to barriers to the establishment of foreign firms.

Using the aforementioned modeling structure with three sectors (agriculture, manufactures, and services) and 18 countries/regions, Brown and Stern use their model to calculate the economic effects of an assumed 33 percent reduction in the tariff barriers on agriculture and manufactures and the barriers to establishment of foreign firms providing services.[7] When barriers are lowered, international capital in the form of FDI will then be attracted to countries with the relatively highest rates of return and away from other countries.

The welfare effects of the assumed 33 percent reduction in barriers are indicated in Table 12. For agricultural liberalization in Scenario A, global welfare rises by $20.9 billion, with the biggest gainers being the United States, Australia, and Canada as resources are shifted into their agricultural sectors. Japan especially and the European Union (EU) show welfare declines as their resources are shifted out of agriculture with protection being reduced. The reduction in barriers on mining and manufactured goods in Scenario B provides the greatest source of welfare gain of $141.2 billion, with Japan and the EU especially benefiting. There are also sizable welfare gains for the Asian developing countries, particularly Taiwan, Korea, and China. For services liberalization in Scenario C, global welfare increases by $42.4 billion. Except for Japan, all the industrialized countries show welfare increases, as do most of the Asian developing countries. The welfare declines noted for services liberalization are associated primarily with whether or not a country attracts or loses capital as a result of liberalization.

[7] See also Dee and Hanslow (2000) for computational results based on a related modeling framework and with estimates services barriers taken from Kalirajan et al. (1999) and Warren (2000).

The combined welfare effects for Scenarios A, B, and C are shown for Scenario D and indicate an increase in global welfare by $193.2 billion. In this overall scenario, there is an increase in the return to capital. Therefore, it is likely that, over time, there will be an increase in the world's capital stock. To take this into account, Brown and Stern allow for an increase of 2 percent in the world capital stock, which is the amount necessary to hold the real return to capital equal to its level in the base period. The results are shown in Scenario E in Table 12, and they indicate that the welfare effects are now positive for all countries in the model. For the world as a whole, welfare rises by $612.4 billion. The welfare increases are substantial in both absolute terms and as a percentage of GNP in both the industrialized and developing countries. It appears therefore that capital formation can play a far more important and substantive role than the removal of the more traditional efficiency distortions of trade barriers in determining the welfare effects of trade liberalization.

IV. Implications for Research and Policy

It should be evident from the preceding discussion that the existing measures of services barriers are subject to some uncertainty. The reason is that they are indirect measures of the price-quantity dimensions involved because services barriers do not readily lend themselves to direct measurement in the same ways that tariffs do. The most promising measures of services barriers are those based on detailed and careful analysis especially at the sectoral level, with the work being done at the Australian Productivity Commission being the case in point. Further refinement of measures of the cost-price margins also is deserving of continued attention. Because research on services barriers is so time intensive, international organizations and government agencies are in the best position to undertake and underwrite the costs involved. The private sector can also be of help in providing specialized information and knowledge about different barriers.

Despite their measurement being imprecise, it appears that services barriers have significant costs. This is attested by the potential gains in economic welfare that modeling studies suggest would be realized if the barriers were to be reduced or removed. Continuing modeling research by members of the

academic community as well as international and governmental organizations should certainly be encouraged. From what we know to date, services liberalization should therefore remain a central objective in the ongoing WTO services negotiation and as part of a broader WTO negotiating round.

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Table 1
Trade in Services by Modes of Supply, 1997

Mode of Supply[a]	Category	Value ($bn)	Cumulative share (%)
Mode 1	Commercial services (excl. travel)	890	41.0
Mode 2	Travel	430	19.8
Mode 3	Gross output of foreign affiliates	820	37.8
Mode 4	Compensation of Employees	30	1.4
Total		2,170	100.0

[a]Modes 1, 2, and 4 are derived from balance-of-payments data.

Source: Karsenty (2000).

Table 2
Barriers to FDI

Restrictions on market entry	Bans on foreign investment in certain sectors
	Quantitative restrictions (e.g., limit of 25 per cent foreign ownership in a sector)
	Screening and approval (sometimes involving national interest or net economic benefits tests)
	Restrictions on the legal form of the foreign entity
	Minimum capital requirements
	Conditions on subsequent investment
	Conditions on location
	Admission taxes
Ownership and control restrictions	Compulsory joint ventures with domestic investors
	Limits on the number of foreign board members
	Government appointed board members
	Government approval required for certain decisions
	Restrictions on foreign shareholders' rights
	Mandatory transfer of some ownership to locals within a specified time (e.g., 15 years)
Operational restrictions	Performance requirements (e.g., export requirements)
	Local content restrictions
	Restrictions on imports of labor, capital and raw materials
	Operational permits or licences
	Ceilings on royalties
	Restrictions on repatriation of capital and profits

Source: UNCTAD (1996).

Table 3
Constructed Ad Valorem Tariff Equivalent "Guesstimates" by 1-Digit ISIC Services Sectors for Selected Countries (Percentage)

Country	ISIC 5 Con-struction	ISIC 6 Wholesale & Retail Distr.	ISIC 7 Transp., Storage & Communic.	ISIC 8 Business & Fin. Services	ISIC 9 Social & Personal Services
Australia	12.0	7.4	183.4	24.8	25.4
Austria	5.0	4.6	98.7	20.1	13.9
Canada	6.0	9.0	117.7	25.9	40.2
Chile	40.0	34.4	182.2	45.2	42.9
European Union	10.0	10.0	182.0	27.2	23.6
Finland	19.0	14.6	181.0	23.8	31.7
Hong Kong	32.0	31.5	149.8	39.0	42.9
Japan	5.0	4.6	142.0	28.9	32.3
Korea	16.0	21.4	164.9	36.3	40.7
Mexico	24.0	21.3	152.3	40.9	29.8
New Zealand	5.0	13.4	181.5	30.5	36.1
Norway	5.0	13.4	122.2	25.7	24.0
Singapore	12.0	34.4	138.8	35.9	33.7
Sweden	12.0	13.4	184.2	22.5	26.9
Switzerland	5.0	8.0	178.1	27.7	32.3
Turkey	5.0	34.4	31.6	35.4	35.9
United States	5.0	4.6	111.4	21.7	31.7

Source: Hoekman (1995, pp. 355-56).

Table 4
Components of an Index of FDI Restrictions

Type of restriction	Weight
Foreign equity limits on all firms	
No foreign equity permitted	0.5
Less than 50 per cent foreign equity permitted	0.5
More than 50 per cent and less than 100 per cent foreign equity permitted	0.25
Foreign equity limits on existing firms, none on greenfield	
No foreign equity permitted	0.5
Less than 50 per cent foreign equity permitted	0.25
More than 50 per cent and less than 100 per cent foreign equity permitted	0.125
Screening and approval	
Investor required to demonstrate net economic benefits	0.1
Approval unless contrary to national interest	0.075
Notification (pre or post)	0.05
Control and management restrictions	
All firms	0.2
Existing firms, none for greenfield	0.1
Input and operational restrictions	
All firms	0.2
Existing firms, none for greenfield	0.1

Source: Hardin and Holmes (1997, p. 76).

Table 5

FDI Restrictiveness Indices for Selected APEC Economies and Selected Sectors (Percentage)

	Business	Communications	Distribution	Education	Financial	Transport
Australia	18	44	18	18	45	20
Canada	23	51	20	20	38	24
China	36	82	28	53	45	46
Hong Kong	2	35	5	0	23	9
Indonesia	56	64	53	53	55	53
Japan	6	35	5	20	36	11
Korea	57	69	63	55	88	57
Malaysia	32	42	8	8	61	12
Mexico	29	74	33	45	55	28
New Zealand	9	43	8	8	20	13
Papua New Guinea	30	48	30	30	30	30
Philippines	48	76	48	48	95	98
Singapore	26	52	25	25	38	25
Thailand	78	84	78	78	88	78
United States	1	35	0	0	20	3

Note: The higher the score, the greater the degree to which an industry is restricted. The maximum score is 100%.
Source: Adapted from Hardin and Holmes (1997, pp. 112-137).

Table 6
Price Wedge Data for Banking Services in Selected Economies
(Percentage)

Economy	Foreign or Domestic	Barriers to Establishment	Barriers to Ongoing Operations	Total
Argentina	F	2.53	2.81	5.34
	D	0.00	0.00	0.00
Australia	F	7.08	2.22	9.31
	D	0.00	0.00	0.00
Brazil	F	35.06	10.50	45.56
	D	0.00	0.87	0.87
Canada	F	2.53	2.81	5.34
	D	0.00	0.00	0.00
Chile	F	22.74	11.26	34.00
	D	15.47	7.73	23.20
Colombia	F	6.47	11.88	18.35
	D	3.54	0.00	3.54
Hong Kong	F	1.97	4.94	6.91
	D	0.00	2.65	2.65
India	F	28.58	26.50	55.08
	D	3.54	0.00	3.54
Indonesia	F	32.91	16.42	49.33
	D	0.00	5.35	5.35
Japan	F	2.05	13.22	15.26
	D	0.00	10.03	10.03
Korea	F	18.15	18.58	36.73
	D	0.00	14.93	14.93
Malaysia	F	35.92	24.69	60.61
	D	15.38	6.73	22.11
Mexico	F	10.48	2.92	13.40
	D	0.00	0.00	0.00
New Zealand	F	2.52	2.18	4.69
	D	0.00	0.00	0.00
Philippines	F	33.28	14.08	47.36
	D	7.32	3.66	10.99
Singapore	F	10.69	20.76	32.45
	D	0.00	8.15	8.15
South Africa	F	2.64	12.27	14.90
	D	0.00	0.00	0.00
Switzerland	F	2.24	3.71	5.95
	D	0.00	0.00	0.00
Thailand	F	20.56	12.50	33.06
	D	0.00	0.00	0.00
Turkey	F	23.12	8.43	31.54
	D	3.54	0.00	3.54
USA	F	1.95	2.80	4.75
	D	0.00	0.00	0.00

Uruguay	F	15.35	24.99	40.34
	D	11.00	0.00	11.00
Venezuela	F	5.35	8.09	13.44
	D	0.00	0.00	0.00
EU12*	F	2.52	2.80	5.32
	D	0.00	0.00	0.00

*Covers 12 EU economies. Finland, Ireland, and Luxembourg are not covered.
Source: Warren and Findlay (2000) and Philippa Dee (Australian Productivity Commission).

Table 7
Tariff Equivalents of Barriers to Telecommunication Services in Major Nations
(Percentage)

	Domestic	Foreign
Australia	0.31	0.31
Austria	0.85	0.85
Belgium	0.65	1.31
Brazil	3.81	5.68
Canada	1.07	3.37
Chile	1.68	1.68
Hong Kong	1.26	1.26
Colombia	10.55	24.27
Denmark	0.20	0.20
Finland	0.00	0.00
France	0.34	1.43
Germany	0.32	0.32
Ireland	1.46	2.67
Italy	1.00	1.00
Japan	0.26	0.26
Korea	4.30	8.43
Mexico	6.24	14.43
Netherlands	0.20	0.20
New Zealand	0.27	0.27
Singapore	2.10	2.72
Spain	2.03	3.93
Sweden	0.65	0.65
Switzerland	1.23	1.23
Turkey	19.59	33.53
United Kingdom	0.00	0.00
United States	0.20	0.20

Source: Adapted from Warren (1999a).

Table 8

Estimated Tariff Equivalents in Traded Services:
Gravity-Model Based Regression Method
(Percentage)

Countries/regions	Business/financial services	Construction
North America[+]	8.2	9.8
Western Europe	8.5	18.3
Australia and New Zealand	6.9	24.4
Japan	19.7	29.7
China	18.8	40.9
Taiwan	2.6	5.3
Other Newly Industrialized Countries	2.1	10.3
Indonesia1	6.8	9.6
Other South East Asia	5.0	17.7
India	13.1	61.6
Other South Asia[*]	20.4	46.3
Brazil	35.7	57.2
Other Latin America	4.7	26.0
Turkey*	20.4	46.3
Other Middle East and North Africa	4.0	9.5
CEECs & Russia	18.4	51.9
South Africa	15.7	42.1
Other Sub-Saharan Africa	0.3	11.1
Rest of World (ROW)	20.4	46.3

[*]Turkey and Other South Asia are not available, separately, in the U.S. data, and have been assigned estimated ROW values.
[+]North America values involve assigning Canada/Mexico numbers to the United States.
Source: Francois (1999).

Table 9

Average Gross Operating Margins of Firms Listed on National Stock Exchanges, 1994-96 by Country/Region (Percentage)

Country/Region	Agriculture	Manufacturing	Services
Australia	8.4	15.5	16.6
Canada	32.1	22.6	32.9
Chile	39.1	40.8	44.0
China	30.6	28.1	49.5
European Union	22.9	23.8	31.6
Hong Kong	25.9	12.8	18.1
Indonesia	41.8	34.3	41.3
Japan	38.4	26.4	28.7
Republic of Korea	11.2	25.7	25.8
Malaysia	22.6	6.0	21.6
Mexico	38.4	39.3	37.2
New Zealand	33.3	16.6	26.8
Philippines	18.1	28.6	42.3
Singapore	0.0	11.1	22.0
Taiwan	19.6	25.1	41.3
Thailand	38.2	27.3	52.6
United States	36.6	21.2	42.3
Rest of Cairns Group[a]	36.3	31.1	39.0

[a]Includes Argentina, Brazil, and Colombia.

Source: Hoekman (1999). Based on calculations using Worldscope (1998) data.

Table 10

Average Gross Operating Margins of Services Firms Listed on National Stock Exchanges, 1994-96, by Country/Region and by Sector (Percentage)

Country/ Region	Recrea-tion	Business services	Construc-tion	Consult-ing	Finance	Health	Hotels	Retail Trade	Wholesale	Transport/ utilities
Australia	17.9	13.8	15.3	7.0	41.0	b	27.3	7.9	9.1	c
Canada	60.1	51.7	14.4	19.2	44.5	2.3	67.8	12.0	16.0	36.5
Chile	b	b	68.7	b	55.2	b	b	21.3	27.9	46.8
China	b	b	45.9	67.1	34.0	b	77.5	24.4	25.5	46.9
European Union	42.5	32.1	19.3	22.1	51.6	22.3	23.7	23.6	19.9	32.6
Hong Kong	b	6.5	12.9	11.5	25.4	b	31.3	10.1	6.9	31.0
Indonesia	b	81.1	22.9	25.3	53.6	b	68.2	26.4	24.8	45.3
Japan	28.1	31.6	14.2	28.6	40.5	40.1	27.2	32.9	15.6	20.6
Republic of Korea	b	41.2	15.3	b	b	b	b	26.7	14.9	31.2
Malaysia	13.3	c	18.3	14.7	28.3	24.3	38.7	11.2	10.8	30.7
Mexico	19.6	b	25.7	37.3	33.3	b	49.6	28.4	25.0	51.0
New Zealand	b	b	13.8	b	57.6	b	26.9	6.6	19.7	35.6
Philippines	19.9	b	40.2	b	53.9	b	55.8	43.9	40.3	42.3
Singapore	46.7	8.6	10.6	7.7	46.3	29.2	28.2	5.4	7.9	28.0
Taiwan	79.9	36.3	21.6	11.1	64.8	b	74.5	21.5	23.2	38.9
Thailand	85.4	35.8	38.1	c	60.3	40.6	55.5	44.2	25.6	56.7
United States	46.8	56.2	20.2	c	56.3	37.0	48.5	34.6	27.0	43.4
Other Cairns[a]	b	b	28.9	26.2	69.8	29.3	64.6	24.2	22.9	52.4

[a]Includes Argentina, Brazil, and Colombia.
[b]Data not available.
[c]Reflects negative gross operating margin.
Source: Hoekman (2000). Based on calculations using Worldscope (1998) data.

Table 11
Alternative Approaches to Modeling the Impact of Barriers to Trade and Investment

1. Reduction in services barriers.
Brown et al. (1996a, b) Based on 8-region, 29-sector, 1990-reference year version of Michigan CGE model, with all goods and services tradable. Uses Hoekman's (1995) "guesstimates" of tariff equivalents covering all modes of providing services, including FDI. Factors involved in FDI assumed to be part of factor markets in country of origin.
Australian Department of Foreign Affairs and Trade (1999) Based on GTAP model, version 4 (1995) database covering 45 regions and 50 sectors in each region, and on the Asia Pacific G-cubed model with 18 regions and 6 sectors, with inclusion of a financial sector and full (dynamic) macroeconomic closure. Uses modifications of Hoekman's (1995) "guesstimates" of services tariff equivalents.
Francois et al. (1996) CGE analysis using 1989 reference year and calculation of the effects of price wedges that can be attributed to the Jones Act that restricts U.S. trade in domestic water transportation (cabotage) services.
Robinson et al. (1999) Based on 10-region, 11-sector, 1995-reference year CGE model, with all goods and services tradable. Uses Hoekman's (1995) "guesstimates" of services tariff equivalents, with allowance for growth in total factor productivity (TFP) stimulated from imports of services by developing countries.
Tamms (1999) Constructs cost functions using data for 50 airlines from 27 countries for 1982-95 and estimates a frontier function to determine the extent to which an airline lies off its frontier.
Hertel (2000) Based on 19-region, 22-sector CGE model, with GTAP 1995 reference-year data projected to year 2005. Post-Uruguay Round tariff rates are used for agriculture and manufactures. Barriers for business services and construction based on gravity-model estimates in Francois (1999).
2. Flows of FDI respond to changes in rates of return.
Martin and Yagashima (1993) Analysis of trade liberalization in Asia-Pacific region coupled with assumed changes in inward FDI.
Donovan and Mai (1996) Use MEGABARE model to estimate effects of trade liberalization with varying degrees of international capital mobility responding to differential rates of return on investment.
McKibbin and Wilcoxen (1996) Use G-Cubed model with international capital mobility responding to changes in differential sectoral rates of return to capital.
Bora and Guisinger (1997) Analysis of investment liberalization in APEC, with allowance for international capital mobility.
Adams (1998) Based on GTAP model, with 14 regions and 37 perfectly competitive sectors, and post-NAFTA database. Each region contributes a fixed proportion of its income to a global savings pool. Investment allocation

depends upon relative rates of return. Focus is on effects of trade liberalization in APEC. FDI is not modeled explicitly.

Dee et al. (1996)

Based on 13-region, 4-sector, 1992-reference year CGE model, with all goods and services tradable, monopolistic competition in the resources, food processing, and manufacturing sectors, and allowance of capital accumulation and international factor mobility. Uses Hoekman's (1995) "guesstimates" of services tariff equivalents.

Dee et al. (1998)

Based on same model and data as Dee et al. (1996), with analysis of APEC sectors selected for "early voluntary sectoral liberalization."

3. Links between parents and foreign affiliates and distinctions between foreign and domestic firms.

Markusen et al. (1995)

Analysis of trade liberalization in the automobile industry in the NAFTA countries, using a model with multinational firms or national firms responding to changes in their market shares.

Markusen et al. (1999)

Conceptual static and dynamic CGE model used to analyze how inward FDI in producer services may complement domestic skilled labor, affect the pattern of trade in goods, and determine the characteristics of the dynamic adjustment path.

Benjamin and Diao (1997)

Based on 10-region, 11-sector CGE model, using data for the early 1990s, with the focus on liberalization of cross-border trade of other private services in APEC. Service providers in the single services sector are imperfectly competitive and have fixed costs, and are able to price discriminate across countries. Liberalization is modeled as both reducing fixed costs and removing the market segmentation that permits price discrimination. FDI is not modeled explicitly, but it could be.

Petri (1997)

Based on 6-region, 3-sector CGE model, using 1992 GTAP dataset, with FDI distinguished between activities of domestic and foreign-owned firms. Products differentiated by both country of ownership and place of production. Capital allocation between sectors and between domestic and foreign investments responds to changes in rates of return and to investor preferences. Barriers to FDI modeled as a tax on FDI profits.

Dee and Hanslow (2000)

Based on 19-region, 3-sector, 1995-reference year CGE model, with modifications of Petri's (1995) framework and updating of data on FDI stocks, output, and rates of return. Used averages of services barriers for banking and telecommunications services contained in Kalirajan et al. (1999) and Warren (2000).

Brown and Stern (2000)

Based on 18-region, 3-sector, 1995-reference year CGE model with features of structure and FDI similar to Dee and Hanslow (2000). Used estimates of price-cost margins from Hoekman (2000) to estimate services barriers.

Table 12
Welfare Effects of Thirty-three Percent Reductions in Barriers to Trade in Agriculture, Manufactures, and Services

Country	Scenario A Agriculture		Scenario B Manufactures		Scenario C Services		Scenario D All Sectors		Scenario E All Sectors, incl. 2% Increase in Capital Stock	
Industrialized Countries	**% GNP**	**$Bill.**	**% GNP**	**$Bill.**	**% GNP**	**$Bill.**	**% GNP**	**$Bill.**	**% GNP**	**$Bill.**
Australia	1.4	4.7	1.8	6.0	0.6	2.2	3.7	12.8	6.1	20.8
Canada	0.6	3.4	0.0	0.1	4.2	23.6	4.7	26.8	5.9	33.8
European Union	-0.0	-1.7	0.4	28.3	0.2	14.1	0.5	41.6	1.9	151.0
Japan	-0.4	-22.2	1.0	53.3	-0.6	-28.5	0.1	3.1	1.6	80.2
New Zealand	0.4	0.2	7.1	4.1	2.6	1.5	10.0	5.7	12.0	6.9
United States	0.4	30.1	0.1	6.1	0.1	9.6	0.6	45.8	2.5	178.4
Developing Countries										
Asia										
China	0.2	1.1	0.8	6.0	1.3	9.0	2.2	15.4	4.0	28.3
Hong Kong	0.1	0.0	3.2	3.2	1.9	1.9	5.0	5.0	10.2	10.3
Indonesia	0.1	0.3	0.8	1.6	4.1	8.0	5.0	9.8	7.3	14.4
Korea	-0.2	-0.8	2.4	10.9	-0.6	-2.9	1.6	7.2	4.2	18.5
Malaysia	0.3	0.3	6.1	5.7	0.7	0.7	7.1	6.6	9.1	8.5
Philippines	0.5	0.3	1.0	0.7	0.7	0.5	2.1	1.4	6.3	4.4
Singapore	0.4	0.2	4.2	2.4	0.7	0.4	5.2	3.0	7.3	4.2
Taiwan	0.1	0.4	7.7	21.2	2.2	6.2	9.8	27.0	10.5	28.8
Thailand	0.3	0.4	0.9	1.4	-0.5	-0.9	0.6	1.0	4.8	7.7
Other										
Chile	-0.0	-0.0	-0.3	-0.2	-0.4	-0.3	-0.7	-0.5	2.2	1.4
Mexico	0.5	1.3	-0.6	-1.7	-1.0	-2.7	-1.0	-2.9	1.2	3.4
Rest of Cairns	0.3	2.9	-0.8	-7.9	-1.1	-11.2	-1.5	-15.7	1.1	11.5
Total		**20.9**		**141.2**		**42.4**		**193.2**		**612.4**

Source: Brown and Stern (2000).