

SESSION VIII

***GENERAL EQUILIBRIUM MODELING OF TRADE
LIBERALIZATION A***

STRATEGIC INTERESTS OF ASEAN IN REGIONAL TRADING ARRANGEMENTS IN THE ASIA-PACIFIC REGION

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STRATEGIC INTERESTS OF ASEAN IN REGIONAL TRADING ARRANGEMENTS IN THE ASIA-PACIFIC REGION

I. INTRODUCTION

The past decade has witnessed deepening economic integration among neighbouring nations through formal regional trading arrangements. Spearheaded by the United States and the European Union, regionalism spread rapidly in the Americas and Europe but was slower to take hold in the Asia Pacific region. Since the early 1990's, however, there has been added momentum in this region to fully embrace the idea of regionalism in order to leverage on the growing interdependence among member economies.

Currently, regional institutions within Asia Pacific can be conceived as concentric rings of regional groupings. The oldest of these is the grouping of ASEAN countries, originally comprising Brunei, Indonesia, Malaysia, Philippines, Singapore and Thailand with later inclusion of Vietnam, Laos and Myanmar. At the next level within East Asia is the proposed East Asian Economic Caucus including largely ASEAN and North East Asian countries like Japan, Korea and China but excluding the western industrialised economies in North America and Australasia. At the widest level is the established institution of APEC, encompassing the 18 countries in North America, East Asia, Australasia as well as Chile and Mexico.

This paper examines the strategic interests of ASEAN countries within APEC when forming regional alliances in the pursuit of trade liberalisation. Employing a Computable General Equilibrium (CGE) model, the effects of the various Free Trade Area arrangements on ASEAN as a whole as well as on each individual ASEAN country are analysed. A strong case is made for ASEAN to extend the boundaries of its trade liberalisation strategy to a larger regional framework.

Overview of Regional Institutions in the Asia Pacific Region

(a) ASEAN

Formed in 1967, the Association of South-East Asian Nations (ASEAN) is the oldest of the established regional grouping in the Pacific Basin. Originally conceived as a political grouping, early efforts in economic cooperation were inward-looking and were largely unsuccessful in fostering growth and intra-regional trade expansion.

The revival of regionalism in the mid and late 80's, especially the then impending formation of NAFTA led to the idea of an ASEAN FTA (AFTA) being tabled in early 1991. The proposal gained official endorsement in January 1992 in the Singapore Summit which set a timetable of 15 years or attainment by 2008.

Spurred on by external forces, ASEAN has made substantial progress in accelerating its liberalisation process. Subsequent ASEAN ministerial meetings have deepened and broadened the scope of the AFTA agreement in addition to accelerating the timetable for attainment to 2003. However, unlike the European Union, ASEAN countries are more competitive than complementary in their economic structure.

ASEAN countries are heavily dependent on foreign direct investments (FDI) from outside the region to drive the industrialisation process. Similarly, the level of intra-regional trade dependence is fairly low. Trade links are limited in most cases with the exception of Singapore which has extensive trading relationships with all ASEAN nations, reflecting the island state's role as an entrepot port. All ASEAN countries trade heavily with USA, Japan, EU and other NIEs, with intra-ASEAN trade accounting for only 10-25% of total global trade. Consequently extra-ASEAN investment inflows and trade are far more important in integrating ASEAN economies than intra-ASEAN linkages.

(b) East Asian Economic Caucus

The idea of the East Asian Economic Grouping (EAEG) came from the Malaysian Prime Minister, Dr. Mahathir Mohammad when he suggests in late 1990 that Malaysia would take the lead to set up an East Asian trade group to counter the single market concept of the European Community and NAFTA. The EAEG concept was to embrace countries in South East and North East Asia although no firm list of countries was made out. The United States, Canada, Australia and New Zealand were to be excluded. The rationale was that cooperation and speaking in one voice was necessary among the Asia-Pacific countries in the face of the then failure of the GATT talks. Malaysia may particularly wish to anchor Japan to East Asia rather than have Japan uproot its industries away to Europe or North America.

In October 1991, ASEAN trade ministers met and supported the EAEG concept as an ASEAN initiative after the name was changed to East Asian Economic Caucus (EAEC). North America and Australia have voiced opposition to the concept which has resulted in the cautious attitude and Japan and some ASEAN countries to the idea. Moreover, the significant dependence of East Asian countries on the US market makes it costly for an East Asian grouping to exclude the US.

(c) APEC

The Asia Pacific Economic Cooperation (APEC) was formed in 1989 at a meeting of foreign and trade ministers in Canberra, Australia. The original members of the APEC forum included Australia, Brunei, Canada, Indonesia Japan, South Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand and the United States. Membership of this broadest of Asia Pacific regional groupings has since expanded to 18 member economies.

The APEC forum set out to coordinate economics and trade among member economies, partly in response to growing concern over the lack of progress in the GATT Uruguay Round negotiations. Subsequent APEC ministerial meetings have resulted in greater commitment from member nations to further the cause of trade liberalisation in the region, culminated in the Bogor Declaration of free and open trade and investment by 2010/2020. A number of trade liberalisation objectives and agendas have been arrived at, the latest being the Manila Action Plan, under which each member country spells out its individual liberalisation programme above and beyond Uruguay Round commitments.

II. REGIONAL ECONOMIC INTEGRATION AMONG THE ASEAN NATIONS

ASEAN Free Trade Area (AFTA)

The Association of Southeast Asian Nations (ASEAN) is a regional bloc representing the Southeast Asian countries, recognized as a separate geographical area in the modern world since World War II. In order to strengthen political cohesiveness, enhance the cooperation among member nations and to increase the volume of intra-regional trade as well as accelerate the economic growth of each member nation, ASEAN was established in 1967 by the five founding member nations—Indonesia, Malaysia, the Philippines, Singapore, and Thailand. The ASEAN membership has been extended to Brunei Darussalam in 1984, Vietnam in 1995, and Lao PDR and Myanmar in 1997. If Cambodia succeeds to join ASEAN, ASEAN will cover all the ten Southeast Asian countries.

Since the 1980s, the economic performance of most of the ASEAN member nations has been impressively successful. However, its regional economic cooperation has not been very successful in helping each member nation to advance up the ladder of economic development. To continue to grow faster and to respond to the recent trend of regionalism around the world, such as, the European Union (EU) and the North American Free Trade Area (NAFTA), each ASEAN member nation has been forced to enhance economic cooperation to strengthen collective market size and attractiveness to direct foreign investment. That is, in order to move up the ladder of economic development in this highly competitive world economy, each ASEAN member nation has to attempt to enhance the regional economic cooperation. Another important challenge on ASEAN was the return of Hong Kong to China in 1997. China's rapidly expanding economy itself has already been recognized in ASEAN as a challenging factor in attracting direct foreign investment as well as exporting to third market. In addition to the challenge by China itself, Hong Kong as a state of China in 1997 and China's possible reunification with Taiwan in the future will be a big challenge to ASEAN at the world market.

The ASEAN Free Trade Area (AFTA) can be interpreted as ASEAN's collective strategic response to China's competitive pressure as well as to the worldwide movement towards regional trading arrangements, particularly in the Americas. On January 1, 1993, ASEAN launched the free trade area with an agreement of reducing or eliminating tariffs on nonagricultural products within 15 years under a Common Effective Preferential Tariff (CEPT) scheme. Each ASEAN member nation would cut import tariffs for all goods traded within the region to below 5%. Two different tracks—a "fast track" and a "normal track" will accomplish the import tariffs cut under the CEPT scheme. Under the "fast track," the import tariffs for products with tariffs below 20% will be reduced to below 5% by January 1, 2000, and for other products by January 1, 2003. Under the "normal track," the import tariffs for products with tariffs above 20% will be reduced to 20% within five to eight years in the first stage and reduced to below 5% in the following seven years.

Since ASEAN declared its strategic response to the worldwide trend of economic integration to sustain its rapid economic growth by stimulating intra-regional trade and by attracting more foreign direct investment, quite a number of researchers have attempted to evaluate the possible gains or losses from AFTA.¹ Some of them strongly support AFTA, insisting that the trade creation effect of free trade area

¹ See Imada, Montes, and Naya (1991), Imada and Naya (1992), Moellers and Mahmood (1993), Nadal De Simone (1995), Park (1995), Ramasamy (1995), and Ariff et. al. (1996).

will overwhelm the trade diversion effect. Besides the net positive trade creation effect, the free trade agreement will be beneficial to each ASEAN member nation because it will improve the economic efficiency resulting from the stronger competition and provide a large prospective market, which has over 400 million consumers. In addition to the static gains, they expect big dynamic gains from the strengthened international competitiveness, enhanced inflow of foreign direct investment from other regions, and learning-by-doing effects via trade and foreign direct investment.

On the other hand, some have raised skepticism about the success of AFTA based on the slow progress of past ASEAN economic cooperation. They note the small volume of intra-ASEAN trade, relatively similar production and trade structures in each ASEAN country, and competition among the members for the same export markets.² They conclude that ASEAN member nation's economic structure are more competitive than complementary. Therefore AFTA, by reducing tariff barriers among the nations will be "trade-diverting" rather than "trade-creating." Researchers pessimistic about AFTA also insist that cooperation within a free trade area among the members of ASEAN, which have very different tariff structures and are located at different stages of economic development, will not be feasible. These differences will yield extremely different gains or losses from regional integration to each participating country and will hinder the movement toward a common market.

ASEAN's Regional Grouping in a Global Context

This paper attempts to evaluate the possible gains or losses from AFTA as well as other AFTA plus free trade arrangements on ASEAN as a whole and on each ASEAN member nation. We attempt to analyze whether it is better for ASEAN to maintain the pure regionalisation within a bloc or to widen the option toward other blocs in a wider regional context. For example, ASEAN may push APEC to go toward a free trade area, it may try to integrate with greater China—China, Hong Kong, and Taiwan, initiate discussion on AFTA-US free trade area, or it may start dialogue with Japan and Korea to strengthen the East Asian Economic Caucus (EAEC).

III. CGE MODEL STRUCTURE

In this paper, we focus on finding ASEAN's strategies in regional trading arrangements in the Asia-Pacific. To find ASEAN's strategic policy alternatives through extending the AFTA agreement, we use computable general equilibrium (CGE) analysis as the modeling framework. CGE modeling has been well recognized as a useful methodology to measure the impact of regional economic integration. As the impact of regional economic integration depends on complex microeconomic relations, intersectoral and intercountry linkages, CGE analysis is preferable to traditional econometric models and partial equilibrium analysis, which have difficulty capturing the variety of microeconomic relations and complicated feedback effects. However, contrary to the large volume of literature on computable general equilibrium analysis

² Intra-ASEAN trade has expanded from 16.3% in 1990 to 17.9% in 1993 and 19.6% in 1996. Every ASEAN member's export-led growth has been in several limited items of exportables, such as, light manufactured products, natural resources, and agricultural products. About 30% to 40% of each ASEAN member's exportables are sold to the United States and Japan.

dealing with the effects of NAFTA or APEC free trade area,³ the gains or losses of AFTA have rarely been studied in a general equilibrium framework.⁴

The CGE model used in this paper is a modification of multi-regional CGE models in Lewis, Robinson and Wang (1995) and Global Trade Analysis Project (GTAP) at Purdue University.⁵ The CGE model for this research is highly disaggregated in region and commodity. The highly disaggregated CGE model allows us to analyse both overall macroeconomic impacts of the possible regional groupings on each ASEAN economy as well as the impacts on each industry level in each country. In this preliminary effort to compare the possible strategic regional groupings in the Asia-Pacific region, we have aggregated the number of independent countries/region into nine, and the number of sectors into ten (see Tables 1 and 2). In particular, each of the ASEAN five countries is treated as an independent country in the region to facilitate the analysis of the effect of different scenario on each ASEAN member's economy.

TABLE 1. Regional Aggregation

Aggregation	Economies/Regions
Indonesia	Indonesia
Malaysia	Malaysia
Philippines	The Philippines
Singapore	Singapore
Thailand	Thailand
Greater China	China, Hong Kong, and Taiwan
North East Asia	Japan and Korea
United States of America	USA
Rest of the World	Other countries

TABLE 2. Commodity Aggregation

Aggregation	Industries
Agriculture, Forestry and Fishery	Paddy rice, wheat, grains, non grain crops, wool, other livestock, forestry, fishery
Mining	Coal, oil gas, other minerals
Food and Beverages	Processed rice, meat products, milk products, other food products, beverages and tobacco
Textiles	Textiles and wearing apparels
Chemicals	Petroleum & coal products, chemical rubbers & plastics, nonmetallic mineral products
Metals	Primary ferrous metals, non ferrous metals, fabricated metal products
Transport Equipment	Transport equipment
Machinery Equipment	Machinery and other equipment
Other Manufacturing	Leather, lumber & wood, pulp paper, other manufacturing
Services	Electricity, gas and water, construction services, trade and transport services, other private services, other government services, ownership of dwellings

³ See Tan and Toh (1997).

⁴ See Park (1995) and Park and Lee (1997).

⁵ See Hertel et. al. (1996).

The general features of the static multi-region CGE model can be summarized by the following assumptions.

- A. Similar to traditional multi-regional CGE model of trade liberalization, the CGE model assumes perfect competition markets and that all the markets are cleared.
- B. Production process is represented by a Constant Elasticity of Substitution (CES) production function of primary sectors—labour, land, and capital with fixed proportions of intermediate input demands. Producers maximize profits at perfectly competitive goods and services market. Therefore zero profit condition at each market holds.
- C. The primary input factors are fully utilized and capital is freely mobile across sectors within a region but labour and land are sector-specific within a region. Sectoral employment is allowed to vary but aggregate employment is fixed.
- D. Export supplies and domestic supplies of domestically produced goods and services are allocated by Constant Elasticity of Transformation (CET) aggregation function.
- E. A representative household has a Cobb-Douglas expenditure function equivalent to the Cobb-Douglas utility function optimization process.
- F. Real investment and government spendings are fixed as policy variables.
- G. Regional CGE models in the model are linked through regional trade flows.
- H. Armington assumption is applied to trade between regions.
- I. For model closure, exchange rates are endogenously determined to maintain the given value of trade balance in each economy.

The import demand function specification and the inclusion of positive externality are special features of the CGE model adopted in this paper. Following Deaton (1980) and Lewis, Robinson, and Wang (1995), we have adopted the Almost Ideal Demand System (AIDS) specification for imports. This specification allows import expenditure elasticities to be different from unity as well as the more realistic situation of allowing cross-country substitution elasticities to vary for different pairs of countries.⁶ In general, this specification generates more realistic trade-volume and terms-of-trade effects when analyzing the economic impact of regional trade liberalization.

There is a substantial theoretical and empirical literature indicating that potential dynamic effects of trade liberalization are significantly larger than the traditional static gains. There are, however, fewer consensus on the different channels as well as the quantitative magnitude of the positive externalities of such trade-productivity links.⁷ Instead of tackling the substantial theoretical and empirical problems of

⁶See for example, Hanson, Robinson and Tokarick (1990) for AIDS function in CGE model of the US economy. See Brown (1987), Alston (1989) and Devarajan, Lewis and Robinson (1990).

⁷See for example Barro (1991), Levine and Renelt (1992), Baldwin and Seghezza (1996), Baldwin (1992).

introducing economies of scale and imperfect competition in CGE models, we have adopted the introduction of potential dynamic effects of trade liberalization by incorporating equations for generating positive externalities through both export expansion and the importation of new capital goods.

Following Lewis, Robinson, and Wang (1995), we have adapted the three different channels of trade-productivity links. The first channel links sectoral productivity to sectoral imports of intermediate and capital goods so that the extent of productivity increase depends on the share of intermediates in production. The second channel for trade-productivity links is the externality associated with sectoral export performance i.e. higher export growth translates into increased domestic productivity. Thirdly, the externality associated with aggregate exports whereby increased exports make physical capital more productive, an effect embodied in the capital stock input in the production process.

The first two channels of imported intermediate input (ρ^k) and sectoral export performance (ρ^e) impact productivity through the sectoral production functions.

The externality associated with aggregate exports (ρ^k) is directly embodied as an increase in the initial capital stock ($FS_{k,o}$) and hence enters the production function indirectly as an increase in the capital input.

$$FS_{k,t} = FS_{k,o} \rho^k$$

Each of the three externality relationships (ρ^m , ρ^e , ρ^k) operates through simple elasticity equation. For example, an export productivity elasticity of 0.15 for industrial sector export means that a 10 percent rise in real exports would result in a 1.5 percent increase in total factor productivity in that sector. Empirically, with little good estimates to draw on, the choice of externality parameters to use in the model is largely based on guesstimates. For these preliminary simulations, we have used the Lewis, Robinson and Wang (1995) guesstimates, which are partly based on De Melo and Robinson (1992) in their analysis of the Korean growth performance.

Finally, the model has been calibrated based on the Global Trade Analysis Project (GTAP) data set version 3.0.⁸

IV. LIBERALIZATION OF TRADE BEYOND AFTA

The economic benefits/costs of AFTA to ASEAN members have been studied by several researchers⁹. In general, the effects are favourable though not exceptionally large. This could be due to the high degree of complementarity in economic structure and low volume of intra-regional trade among ASEAN members. However, it is noted that there will be substantial scope for expanding intra-regional trade when AFTA is fully implemented to complement the economic reform and deregulation undertaken in each member economy to pursue export-oriented development strategy and attract foreign capital and technology inflow.

⁸See Hertel et. al. (1996).

⁹See for instance, Imada, Montes and Naya (1991), Park (1995), Toh and Low (1993).

In the discussion that follows, we consider a few options which can possibly be pursued by ASEAN as whole in enlarging its trade linkages with other trading region/countries in the Asia Pacific. With the help of the CGE model, we attempt to evaluate the benefits and costs from the perspective of the five major ASEAN countries in each of the options. We treat the benefits of implementing AFTA as the basis to compare the gain obtainable in the other options. For each case, a 50% reduction of existing (i.e. base year 1992) protection rate (tariff and non-tariff barriers) within the regional grouping is used as the basis of the shock. A total of five options are considered. They are:

- A. AFTA and FTA with US
- B. AFTA and FTA with Japan and Korea
- C. AFTA and FTA with China, Hong Kong and Taiwan (Greater China)
- D. AFTA and FTA with Japan, Korea, China, Hong Kong and Taiwan (EAEC)
- E. AFTA and FTA in APEC

A schematic representation of the possible sub-regional groupings that ASEAN may seek to enlarge its AFTA is shown in Figure 1.

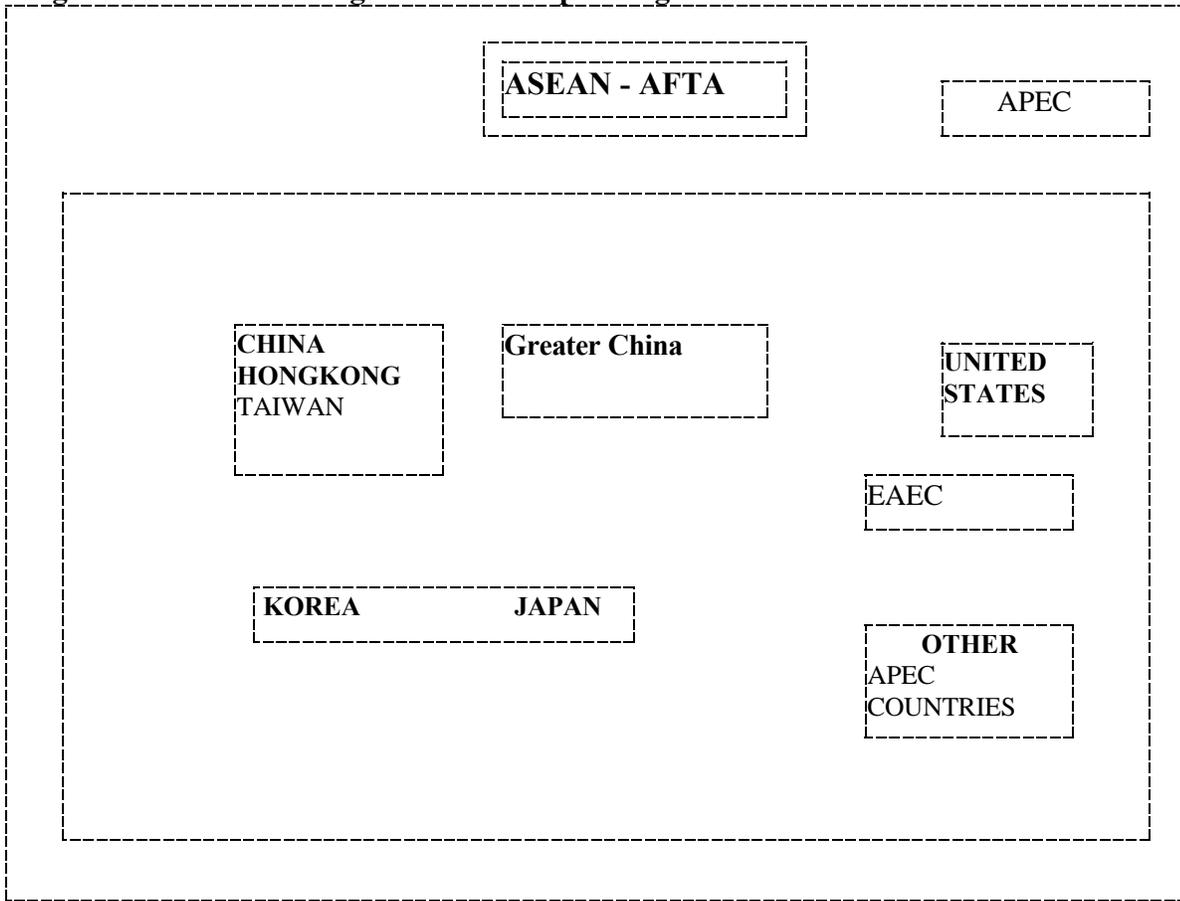
The impact of a 50% reduction of protection rates in the AFTA on the real GDP of the five ASEAN members is shown in Table 3¹⁰. Measured by the percentage deviation from the base year (1992), Thailand, Malaysia and the Philippines are expected to record the highest increase while Singapore appears to benefit least from the ASEAN free trade area. However, this is not surprising as Singapore already has very low tariff barriers, while the other ASEAN members still have considerable room for reduction in tariff and non-tariff barriers to enjoy the gain in international trade. Nevertheless, ASEAN members are aware of the non-zero sum gain in trade liberalisation as often the positive externalities from international competition and exchange will more than compensate for the necessary costs of adjustment.

Table 3 : Macroeconomic Effects of AFTA
(percentage deviation from base)

	RealGDP	Export	Import	Rental	Wage
ASEAN 5	0.34	1.05	0.89	1.01	0.66
Indonesia	0.10	0.39	0.37	0.20	0.19
Malaysia	0.58	1.89	1.75	1.81	2.05
Philippines	0.43	1.94	1.41	0.79	0.77
Thailand	0.60	1.93	1.44	1.34	1.36
Singapore	0.02	0.22	0.24	1.20	1.28

¹⁰ The insignificant impacts of the AFTA on other countries in the model are summarized in Appendix Table 1.

Figure 1: Possible Configuration for Expanding AFTA within APEC



The exports and imports for ASEAN5 as a whole will increase by about one per cent. This small effect is reflective of the current low level of trade interdependence as well as the heavy reliance on markets beyond the ASEAN region. In a way, it also provides a rationale for ASEAN to seek greater trade cooperation with countries and trading groups beyond Southeast Asia to enhance economic gains.

Trade Liberalization Between ASEAN (AFTA) and Other Regions

The idea of a free trade area between ASEAN and the United States is not new. As early as 1988, a joint effort by U.S. and ASEAN researchers submitted a report to the Joint Steering Committee of the ASEAN and US Government proposing the two parties enter into an economic cooperation agreement¹¹. Within the scope of such an agreement, the United States and ASEAN would be able to negotiate a wide range of formal agreements, ranging from formal comprehensive treaties to sector- and issue-specific arrangements. The researchers of the report believe that “an ASEAN-U.S. FTA should be the ultimate goal of the Framework Agreement”.

The delayed completion of the Uruguay Rounds has stimulated and spawned several imaginative proposals for bilateral and sub-regional economic cooperation, especially in the Asia Pacific region. The remarkable economic success of the Asian NIEs and the rapid expansion of the Chinese economy quite naturally point researchers and analysts to consider the continuance of trade-led development in the formation of free trade area. One natural grouping, already driven substantially by market forces despite political reservations, is the economic grouping comprising Taiwan, Hong Kong and China to form Greater China. A *Greater China FTA* is reckoned to be a formidable trading bloc equipped with up-to-date technologies, capital, marketing network, adaptable labour force and very large domestic market. This Greater China grouping poses a strong competitive challenge to ASEAN. One strategy is for ASEAN to seek a regional grouping with Greater China. Another possible development is the FTA with Japan and Korea to counter the influence of the Greater China FTA.

While intra-regional economic cooperation is the main focus of ASEAN, it has increasingly recognized the leverage it possessed as an economic bloc in regional and multilateral negotiations. As an economic entity, ASEAN through its own FTA can increase its linkage with other FTAs to bring about greater welfare for its members. Thus the impacts of trade liberalization beyond AFTA in five possible directions are of interest to policy makers in ASEAN countries.

¹¹Naya S. et. al.(1989) *ASEAN-US Initiative*, East West Centre, Honolulu and Institute of Southeast Asian Studies, Singapore.

Table 4 : Effect on Real GDP

(Impact of AFTA plus relative to AFTA)

	<i>AFTA</i>	<i>AFTA+</i>	<i>AFTA+</i>	<i>EAEC</i>	<i>APEC</i>
ASEAN 5	2.1	2.0	3.3	4.3	5.4
Indonesia	2.8	2.8	6.1	8.0	10.0
Malaysia	1.3	1.6	2.2	2.9	3.3
Philippines	3.7	2.2	4.1	5.3	8.1
Thailand	1.7	1.9	2.9	3.8	4.5
Singapore	1.2	1.3	1.7	2.1	2.5

Table 4 compares the real GDP gains for the various AFTA plus regional trading arrangements relative to the present AFTA arrangement. Starting with the ASEAN-US FTA, the improvement in real GDP for ASEAN is about twice that of AFTA. The improvement is not significantly different if ASEAN will to form a FTA with China, Taiwan and Hong Kong. However, when the latter is expanded to include Japan and Korea to form the EAEC, the improvement in real GDP increases to 4.3 times that of AFTA. Enlarging the FTA membership to cover the whole of APEC will increase the improvement to 5.4 times that of AFTA alone. Interestingly, a FTA involving ASEAN, Korea and Japan produces real GDP improvement larger than that of the ASEAN - US FTA or the ASEAN-Greater China FTA, indicating the substantial complementarities between the economic structure of Japan and Korea with that of ASEAN. Appendix Table 2 shows the real GDP gains or losses for the various policy alternatives to all the regions/countries in the model. From the Appendix Table 2, we find that the regional trading arrangements are mutually beneficial to the participating economies in terms of the real GDP.

At the individual country level, the macroeconomic impact on real GDP is not uniform among the five ASEAN members. While the other four ASEAN members may be relatively indifference between ASEAN - US FTA or the ASEAN-Greater China FTA, Philippines would prefer an ASEAN-US FTA by virtue of the greater gain in real GDP. In fact, Philippines' benefits will be more pronounced whenever a FTA does include the US as a member. On the other hand, an ASEAN-US FTA is of lesser significance to Malaysia and Singapore. It is noteworthy that Indonesia's gain in real GDP will be substantially improved whenever Japan is included as a member of the FTA. These are not peculiar phenomena but are reflective of the heavy reliance of the Philippines and Indonesia on the United States and Japan in trade and investment respectively. Nonetheless, it will be an important factor in the crafting and implementing of policies relating to unified ASEAN initiatives in trade and investment liberalization vis-a-vis other trading blocs.

Trade volumes will expand in tandem with the expansion of real GDP in the economies of ASEAN. Mirroring the impact on real GDP, Table 5 presents the impact on the exports of the ASEAN 5 in the different FTA schemes. FTA with East Asian economies will generate greater export volumes under a ASEAN-US FTA. In fact, it is expected in the coming years, intra Asian trade will continue to expand faster than ASEAN-US trade when the economies in Asia are further integrated by the rapidly expanding intra-regional expansion in trade and investment among regional economies.

Table 5 : Effect on Exports
(Impact of AFTA Plus Relative to AFTA)

	<i>AFTA</i>	<i>AFTA</i>	<i>AFTA</i>	<i>EAEC</i>	<i>APEC</i>
ASEAN5	1.8	2.0	2.9	3.9	4.8
Indonesia	2.7	3.0	6.0	8.1	10.0
Malaysia	1.3	1.7	2.1	2.8	3.2
Philippines	3.5	2.5	4.0	5.7	8.5
Thailand	1.7	2.0	2.9	4.0	4.6
Singapore	1.2	1.2	1.7	2.0	2.4

Note: Appendix Table 3 shows the effects on all the regions/countries in the model.

At a more disaggregated level, Table 6 presents the sectoral impact in the ASEAN5 economies under different FTA schemes. By virtue of the fact that the ASEAN economies have quite different industrial structures, natural resources endowment, it is not surprising that sectoral trade dependency is not uniform throughout ASEAN. While Singapore is very much dependent on the export of manufactured goods, the other members still have substantial portion of their trade in natural resources like oil, gas, rubber, tin and timber. However, the accelerated pace of industrialisation with the help of foreign investments have led all ASEAN economies onto a convergent path of increased dependency on trade in manufactured goods, extending from labour intensive textile and apparel production to more sophisticated products in the microelectronic and information technology areas.

For AFTA, the primary sector for ASEAN as a whole is estimated to contract marginally, particularly for Malaysia, Thailand and Singapore. When linked to US or Northeast Asia, ASEAN collectively will expand the primary sector, especially for Malaysia and the Philippines.

All the ASEAN 5 member will increase their industrial output in the secondary sector as a result of various FTA schemes. For ASEAN5 as a whole the impact were about doubled in the case of an ASEAN-US FTA or ASEAN-Greater China FTA, to more than five times in the case of a FTA in APEC. Again, the importance of US to the Philippines and Indonesia, as well as the importance of Japan to Indonesia and the Philippines stand out, for both the secondary and tertiary sector. Concurrent growth in the ASEAN tertiary sector is also expected, though Singapore stands out as an exception where tertiary output is projected to decline in all the FTA schemes.

The impact of the FTA on three different industries are shown in Tables 7, 8 and 9. Table 7 presents the impact on the output in the textile industry. As in most developing economies, textile production and exports are important economic activities in ASEAN. Tariff reduction and the dismantling of international quantitative restraints such as the Multi Fibre Arrangement, will undoubtedly boost the export performance of many developing countries including ASEAN members.

Table 6 : Impact of AFTA and other FTA Scheme on Sectoral Output

	<i>AFTA</i>	AFTA + USA	AFTA + Greater	AFTA + JAPAN +	EAEC	APEC
Primary Sector						
	<i>-0.04</i>	<i>0.09</i>	<i>0.04</i>	<i>0.10</i>	<i>0.09</i>	<i>0.12</i>
	<i>0.04</i>	<i>-0.49</i>	<i>-0.99</i>	<i>-0.78</i>	<i>-1.40</i>	<i>-1.55</i>
Malaysia	<i>-0.38</i>	<i>0.23</i>	<i>0.20</i>	<i>0.80</i>	<i>0.77</i>	<i>0.75</i>
Philippines	<i>0.19</i>	<i>-0.03</i>	<i>0.03</i>	<i>0.19</i>	<i>0.25</i>	<i>0.21</i>
Thailand	<i>-0.06</i>	<i>-0.15</i>	<i>-0.19</i>	<i>-0.31</i>	<i>-0.42</i>	<i>-0.50</i>
Singapore	<i>-0.08</i>	<i>-0.03</i>	<i>-0.12</i>	<i>0.07</i>	<i>-0.04</i>	<i>-0.07</i>
Secondary						
	<i>0.85</i>	2.07	2.16	2.95	4.16	5.31
	<i>0.24</i>	3.10	3.38	6.76	9.25	11.60
Malaysia	<i>1.92</i>	1.35	2.05	2.09	3.16	3.55
Philippines	<i>1.22</i>	4.25	2.67	4.15	5.95	9.56
Thailand	<i>1.17</i>	1.77	1.94	2.66	3.60	4.32
Singapore	<i>0.21</i>	1.32	1.23	2.13	2.52	3.10
Tertiary Sector						
	<i>0.27</i>	1.82	1.87	3.28	4.17	5.03
	<i>0.08</i>	2.43	2.61	6.51	8.32	10.07
Malaysia	<i>0.45</i>	1.33	1.86	2.26	3.14	3.54
Philippines	<i>0.30</i>	3.23	1.69	4.18	4.86	7.12
Thailand	<i>0.52</i>	1.54	1.78	2.87	3.65	4.17
Singapore	<i>-0.06</i>	1.29	1.32	1.67	2.10	2.48

Note:*Figures in italics represent the percentage deviation from 1992 base case*

Other bold figures represent the multiples using the AFTA percentage deviations as base

Appendix Table 4 shows the effects on all the regions/countries in the model

Table 7: FTA Schemes and Textile Output

	<i>AFTA</i>	AFTA + USA	AFTA + Greater	AFTA + JAPAN +	EAEC	APEC
ASEAN	1.8	1.9	3.1	3.5	5.8	6.9
Indonesia	<i>1.0</i>	2.1	3.7	7.9	10.8	12.3
Malaysia	<i>6.3</i>	1.1	2.8	1.6	3.6	3.7
Philippines	<i>4.2</i>	2.7	5.8	3.7	9.0	11.4
Thailand	<i>1.4</i>	1.8	1.5	2.5	2.9	3.6
Singapore	<i>0.5</i>	1.1	4.4	3.1	7.3	8.0

Note:*Figures in italics represent the percentage deviation from 1992 base case*

Other figures represent the multiples using the AFTA percentage deviations as base

Appendix Table 5 shows the effects on all the regions/countries in the model

The figures in Table 7 indicate that for AFTA, textile output will increase the most in Malaysia and the Philippines. Linkage with the other regional economies, particularly Japan, Korea and the US, will boost the production of textile output in Indonesia and the Philippines substantially.

As the ASEAN economies industrialised, the trade pattern will likely to alter in tandem with the changing industrial structure. Hence, exports of manufactured products and more capital intensive commodities like machineries and equipment will increase. In Tables 8 and 9, the impact of different FTAs on the output of machineries and equipment, other manufactured goods are compared.

Table 8 : FTA Schemes and Machineries & Equipments

	<i>AFTA</i>	<i>AFTA + USA</i>	<i>AFTA + Greater</i>	<i>AFTA + JAPAN +</i>	<i>EAEC</i>	<i>APEC</i>
ASEAN	1.6	1.9	1.3	3.7	4.1	5.1
Indonesia	<i>1.2</i>	<i>3.7</i>	<i>2.1</i>	<i>7.8</i>	<i>9.2</i>	<i>12.5</i>
Malaysia	<i>3.3</i>	<i>1.4</i>	<i>0.9</i>	<i>2.6</i>	<i>2.6</i>	<i>3.0</i>
Philippines	<i>4.4</i>	<i>3.3</i>	<i>1.4</i>	<i>5.0</i>	<i>5.4</i>	<i>8.0</i>
Thailand	<i>3.8</i>	<i>1.7</i>	<i>1.7</i>	<i>3.7</i>	<i>4.4</i>	<i>5.2</i>
Singapore	<i>-0.1</i>	<i>0.1</i>	<i>-0.1</i>	<i>0.5</i>	<i>0.5</i>	<i>0.7</i>

Note:

Figures in italics represent the percentage deviation from 1992 base case
Other figures represent the multiples using the AFTA percentage deviations as base
Appendix Table 6 shows the effects on all the regions/countries in the model

Table 9 : FTA Schemes and Other Manufactured Goods

	<i>AFTA</i>	<i>AFTA + USA</i>	<i>AFTA + Greater</i>	<i>AFTA + JAPAN +</i>	<i>EAEC</i>	<i>APEC</i>
ASEAN	0.6	2.2	2.3	1.4	2.6	3.6
Indonesia	<i>0.3</i>	<i>3.6</i>	<i>1.6</i>	<i>1.3</i>	<i>1.6</i>	<i>3.8</i>
Malaysia	<i>1.5</i>	<i>1.3</i>	<i>2.4</i>	<i>1.4</i>	<i>2.8</i>	<i>3.2</i>
Philippines	<i>0.7</i>	<i>5.6</i>	<i>0.4</i>	<i>1.1</i>	<i>0.1</i>	<i>4.2</i>
Thailand	<i>1.0</i>	<i>1.5</i>	<i>2.3</i>	<i>1.6</i>	<i>2.8</i>	<i>3.1</i>
Singapore	<i>-0.7</i>	<i>1.0</i>	<i>0.9</i>	<i>1.4</i>	<i>1.3</i>	<i>1.3</i>

Note:

Figures in italics represent the percentage deviation from 1992 base case
Other figures represent the multiples using the AFTA percentage deviations as base
Appendix Table 7 shows the effects on all the regions/countries in the model

As in the case of textile output, output for machineries and equipment will expand under AFTA, particularly for Malaysia, Philippines and Thailand. The importance of the US and Japan for Philippines and Indonesia stand out again. For output of other manufactured products, Table 9 indicates that the US

market is extremely important for output expansion, compared to the Northeast Asian market. This is the sector where Northeast and Southeast Asia are competitive and highly dependent on the vast US market.

V. CONCLUSIONS

The regional grouping of ASEAN has increasingly emerged as a significant player in regional and global political and economic discussions in the post cold war era. As a grouping of small to medium sized powers located in the dynamic Asia Pacific region where the interests of major powers like the US, Japan, China intersect, ASEAN has been able to play a disproportionately important role. ASEAN's support was instrumental in the formation of APEC in 1989. ASEAN also played a major role in the establishment of the multilateral security grouping, the ASEAN Regional Forum (ARF). The Asia-Europe Summit (ASEM) was also a major initiative undertaken by ASEAN in enhancing the economic linkages between Asia and Europe to dilute the dominance of the US in global affairs.

While the ASEAN Free Trade Area has been somewhat successful in enhancing greater economic cooperation in ASEAN, there has been increasing concern on how ASEAN as a grouping should progress to enhance its international competitiveness in an increasingly globalized economy. Existing expansion in AFTA included the discussion on the elimination of non-tariff barriers, trade facilitation measures like the harmonization of tariff nomenclature, mutual recognition of product standards and the revision of these standards to enhance transparency. In addition, the establishment of an ASEAN Investment Area was designed to maintain ASEAN's competitive position in attracting direct foreign investment.

For Liberalization in services, ASEAN adopted the Framework Agreement on Trade in Services at the ASEAN Summit in December 1995. The agreement committed ASEAN to eliminate substantially all existing discriminatory measures and market access limitations amongst member states and prohibited new or more discriminatory measures and market access limitations. The priority services sector for negotiations were financial services, telecommunications and tourism. ASEAN countries have committed to reaching an agreement for these sectors beyond their WTO obligations within 18 months from the start of the negotiations in January 1996.

However, recent difficulties in the Southeast Asian economies indicate that ASEAN would face enormous challenges in the next decade. Compared to the past decade of rapid growth, the next decade is likely to pose major fundamental challenges, even after the present turmoil in the equity and foreign exchange markets stabilized.

Firstly, particularly since 1992, China has emerged as a major competitor in attracting foreign direct investment as well as selling to third market, especially the US market. The bulk of foreign direct investment from Taiwan, Hong Kong that flowed to Southeast Asia between 1987-91 has been diverted to China. Increasing amount of investment from Korea, Japan, US and Europe have also been attracted by the expanding China market. ASEAN has responded by broadening, deepening and further liberalizing the ASEAN Free Trade Area (AFTA) to create a potential market of 500 million consumer as a collective strategic response to the external competition.

Secondly, there are indications that NAFTA and the regional trading arrangements in the Americas could increasingly pose a competitive challenge to Southeast Asia. This is particularly so for sectors like textile, garment and automobile where the rules of origin have been rather restrictive. For example, Asia's

market share in US apparel imports had declined from 68% in 1990 to 40% in 1996, while that of Mexico, Canada and the Caribbean have increased from 16% to 37% in the corresponding period. In the first six months of 1997, growth of apparel exports from Mexico and the Caribbean to US have risen by 30-50%, that of China by 50% while that of Southeast Asian countries by only -3 to 16%.

Thirdly, the Southeast Asian countries are increasingly being squeezed in the middle of the industrial ladder. They do not yet have the skill and technological base to compete with the NIEs. On the other hand, the other cheap labour countries like China, South Asia and some Latin American countries are rapidly catching up from behind. Judging from the present poor educational and skill profile as well as weak technological base of countries like Thailand and Indonesia, the continuous upward climbing is likely to be an arduous one. Hence, the present difficulty might not be purely cyclical but could rather be more structural and longer term.

With growth in the next decade to be much more arduous, ASEAN's 2020 vision of a peaceful and prosperous grouping might not be achievable based largely on the effort in AFTA alone. ASEAN might need to actively explore closer economic relationship with other complementary regions to ensure sustained momentum in growth. While political and security considerations would be significant in such exploration, the economic benefits and gains as examined in this paper would also be of substantial consequence.

At the present stage of development, dependence pattern in trade and investment, it is most advantageous for ASEAN to focus extra-ASEAN regional grouping at the APEC level rather than truncate it at the EAEC level. This is because two key countries in ASEAN, namely the Philippines and Indonesia will suffer substantially from any exclusionary trading groups that exclude the US.

While the trade and investment pattern could change substantially over the next two decades, particularly with China emerging as an increasingly important trading partner, the importance of Japan and the US to ASEAN is likely to remain. While the rapid industrialization of the coastal region of China could increasingly create a big market for ASEAN products, the gradual migration of labour intensive and medium technology products from coastal to inland China would likely to prolong China as a serious competitor to ASEAN in attracting direct foreign investment and exporting to third market for quite a sustained period.

From the US perspective, any scheme that is likely to exclude itself in East Asia will probably continue to come from Malaysia, while the Philippines and Indonesia can be counted on to oppose such exclusionary scheme. On the other hand, China which has the ambition to play a more significant economic and political role in East Asia, can be counted on to strongly cultivate Malaysia and Thailand to reduce the dominant role of the US in the region. From this perspective, US might need to increasingly depend on Japan, the Philippines and Indonesia to ensure continued dominant economic and political presence in East Asia in the next century.

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APPENDICES

Appendix Table 1. Macroeconomic Effects of
(% Deviation from Base)

	Real GDP	Exports	Imports	Rental Rate	Wage Rate
Hong Kong	0.000	0.002	0.005	0.005	0.005
China	-0.001	0.004	-0.005	0.000	0.001
Taiwan	0.000	0.012	0.003	-0.003	-0.003
Korea	0.001	0.011	-0.005	-0.002	-0.003
Japan	-0.001	-0.013	-0.017	0.000	0.000
USA	0.000	0.005	0.103	0.003	0.007
EU	-0.001	-0.010	-0.004	0.000	0.001

Appendix Table 2. Effect on Real GDP (% Deviation from Base)

	AFTA	AFTA + USA	AFTA + Greater China	AFTA + JAPAN + KOREA	EAEC	APEC
Hong Kong	0.000	0.000	0.000	-0.001	-0.002	-0.004
China	-0.001	-0.001	0.852	0.002	1.640	1.871
Taiwan	0.000	0.000	0.038	0.000	0.080	0.259
Korea	0.001	0.001	0.001	0.112	0.246	0.442
Japan	-0.001	-0.001	-0.001	0.023	0.056	0.155
USA	0.000	0.006	-0.001	-0.001	-0.001	0.038
EU	-0.001	-0.001	-0.001	-0.001	-0.001	0.000
Indonesia	0.102	0.281	0.284	0.612	0.802	0.995
Malaysia	0.579	0.779	0.950	1.296	1.677	1.898
Philippines	0.431	1.578	0.934	1.763	2.287	3.504
Thailand	0.604	1.024	1.177	1.746	2.314	2.697
Singapore	0.017	0.021	0.023	0.029	0.036	0.042

Appendix Table 3. Effect on exports (% Deviation from Base)

	AFTA	AFTA + USA	AFTA + Greater China	AFTA + JAPAN + KOREA	EAEC	APEC
Hong Kong	0.002	-0.001	-0.024	-0.009	-0.066	-0.090
China	0.004	0.004	4.313	0.005	7.970	8.856
Taiwan	0.012	0.011	0.539	0.008	1.331	2.489
Korea	0.011	0.010	0.023	1.657	2.642	4.472
Japan	-0.013	-0.013	-0.017	0.350	0.848	2.023
USA	0.005	0.119	-0.001	-0.004	-0.010	0.700
EU	-0.010	-0.010	-0.013	-0.013	-0.014	0.001
Indonesia	0.392	1.069	1.184	2.367	3.190	3.919
Malaysia	1.888	2.497	3.212	3.959	5.315	5.978
Philippines	1.942	6.761	4.929	7.813	11.045	16.484
Thailand	1.927	3.261	3.895	5.634	7.622	8.888
Singapore	0.215	0.262	0.264	0.367	0.435	0.511

Appendix Table 4. Effect on Sectoral

	AFTA	AFTA + USA	AFTA + Greater China	AFTA + JAPAN + KOREA	EAEC	APEC
PRIMARY SECTOR						
Hong Kong	-0.031	-0.031	-0.094	-0.031	-0.219	-0.250
China	-0.002	-0.001	0.348	0.002	0.690	0.820
Taiwan	0.003	0.000	-0.128	0.000	-0.231	-0.790
Korea	0.000	0.000	0.002	-0.129	-0.499	-0.972
Japan	-0.001	-0.003	0.000	-0.084	-0.253	-1.207
USA	-0.077	-0.110	-0.080	-0.077	-0.078	0.081
EU	-0.004	-0.004	-0.004	-0.003	-0.002	0.003
Indonesia	0.040	0.088	0.038	0.105	0.092	0.115
Malaysia	-0.379	-0.495	-0.990	-0.778	-1.399	-1.551
Philippines	0.192	0.227	0.198	0.797	0.774	0.750
Thailand	-0.060	-0.034	0.026	0.194	0.250	0.205
Singapore	-0.077	-0.153	-0.192	-0.307	-0.422	-0.499
SECONDARY SECTOR						
Hong Kong	0.002	0.002	0.041	0.003	0.068	0.070
China	0.000	0.000	1.802	-0.001	3.440	3.854
Taiwan	0.004	0.003	0.267	-0.004	0.551	1.695
Korea	0.005	0.004	-0.001	0.358	0.982	1.934
Japan	-0.001	-0.001	-0.003	0.066	0.161	0.561
USA	0.000	0.034	-0.003	-0.008	-0.017	0.072
EU	0.006	0.005	0.005	0.003	-0.002	-0.009
Indonesia	0.245	0.758	0.826	1.654	2.264	2.839
Malaysia	1.922	2.588	3.947	4.021	6.084	6.823
Philippines	1.216	5.166	3.247	5.049	7.240	11.630
Thailand	1.170	2.065	2.273	3.109	4.213	5.051
Singapore	0.211	0.280	0.261	0.450	0.534	0.655
TERTIARY SECTOR						
Hong Kong	-0.002	-0.002	-0.008	-0.002	-0.013	-0.011
China	-0.002	0.000	0.635	0.004	1.236	1.429
Taiwan	-0.001	0.000	-0.061	0.004	-0.116	-0.333
Korea	-0.002	-0.002	0.000	0.023	0.014	-0.034
Japan	-0.001	-0.001	-0.001	0.007	0.018	0.043
USA	-0.002	-0.003	-0.001	0.000	0.003	0.023
EU	-0.003	-0.002	-0.003	-0.002	-0.001	0.003
Indonesia	0.080	0.195	0.209	0.523	0.668	0.808
Malaysia	0.453	0.603	0.842	1.025	1.423	1.604
Philippines	0.298	0.963	0.504	1.247	1.448	2.122
Thailand	0.523	0.803	0.929	1.498	1.908	2.180
Singapore	-0.063	-0.081	-0.083	-0.105	-0.132	-0.156

Appendix Table 5. FTA and Textile output (% Deviation from Base)

	AFTA	AFTA + USA	AFTA + Greater China	AFTA + JAPAN + KOREA	EAEC	APEC
Hong Kong	-0.004	-0.010	0.264	-0.004	0.482	0.559
China	0.001	0.000	5.782	-0.008	11.775	12.888
Taiwan	-0.065	-0.076	0.490	-0.128	0.610	3.536
Korea	-0.036	-0.038	-0.085	1.875	3.598	7.033
Japan	-0.003	-0.001	0.011	0.078	0.232	0.538
USA	-0.067	0.030	-0.039	-0.052	-0.007	0.416
EU	-0.014	-0.012	0.004	-0.005	0.027	0.045
Indonesia	1.009	2.149	3.774	7.926	10.882	12.392
Malaysia	6.338	6.788	17.796	10.433	22.589	23.639
Philippines	4.156	11.195	24.103	15.286	37.332	47.530
Thailand	1.387	2.497	2.051	3.489	4.032	4.952
Singapore	0.534	0.608	2.328	1.644	3.881	4.263

Appendix Table 6. FTA and Machineries and Equipment Output (% Deviation from Base)

	AFTA	AFTA + USA	AFTA + Greater China	AFTA + JAPAN + KOREA	EAEC	APEC
Hong Kong	0.036	0.049	-0.144	0.074	-0.235	-0.290
China	0.001	0.002	1.326	0.005	2.556	3.080
Taiwan	0.047	0.051	0.447	0.074	1.708	1.421
Korea	0.044	0.042	0.047	0.657	0.622	0.845
Japan	0.010	0.007	0.007	0.125	0.287	0.639
USA	0.217	0.261	0.210	0.189	0.165	0.243
EU	0.057	0.053	0.054	0.044	0.030	-0.002
Indonesia	1.193	4.433	2.547	9.311	10.992	14.927
Malaysia	3.276	4.502	3.046	8.539	8.361	9.730
Philippines	4.397	14.557	6.072	21.946	23.719	35.328
Thailand	3.797	6.391	6.380	13.905	16.880	19.743
Singapore	-0.059	0.061	-0.122	0.451	0.464	0.712

Appendix Table 7. FTA and Other Manufactured Goods Output (% Deviation from Base)

	AFTA	AFTA + USA	AFTA + Greater China	AFTA + JAPAN + KOREA	EAEC	APEC
Hong Kong	-0.006	-0.007	-0.078	-0.012	-0.143	-0.163
China	0.002	0.000	3.096	-0.004	5.381	6.114
Taiwan	-0.025	-0.032	0.336	-0.058	0.286	1.745
Korea	-0.011	-0.014	-0.008	0.497	1.655	3.276
Japan	-0.006	-0.008	-0.015	-0.022	0.017	0.361
USA	-0.080	-0.099	-0.101	-0.084	-0.118	-0.184
EU	-0.014	-0.015	-0.022	-0.015	-0.028	-0.031
Indonesia	0.267	0.961	0.426	0.337	0.425	1.014
Malaysia	1.472	1.969	3.590	2.093	4.193	4.643
Philippines	0.728	4.077	0.283	0.817	0.060	3.035
Thailand	0.985	1.518	2.274	1.581	2.731	3.010
Singapore	-0.667	-0.690	-0.578	-0.954	-0.865	-0.867

The **COMPREHENSIVENESS OF APEC's** **FREE TRADE COMMITMENT**

Philippa Dee

Industry Commission

Canberra

Symposium on Evaluating APEC Trade Liberalisation: Tariff and Nontariff Barriers

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ABSTRACT

Comprehensiveness is an important feature of APEC's goal of free and open trade and investment. Both services trade liberalization and trade facilitation measures add significantly to the benefits from liberalization of merchandise trade. But were agriculture to be excluded, the APEC region would forgo benefits amounting to fully 60 per cent of the gains from liberalization of merchandise trade. Not only would the efficient agricultural exporters in the region stand to lose in an economy-wide sense, but so too would the economies that currently maintain relatively high protection of agriculture and rob themselves of gains from improved efficiency and greater specialization.

Comprehensiveness is also important as a principle guiding progress. The efficiency costs of trade restrictions are a function of disparities in assistance, as much as of levels. Liberalization efforts that focus on lowly or moderately assisted sectors, leaving untouched the high levels of assistance in sensitive sectors, risk increasing the disparities in assistance. The potential costs of this approach are illustrated by examining the impact of some of the likely nominations for 'early voluntary liberalization' initiatives.

THE COMPREHENSIVENESS OF APEC'S FREE TRADE COMMITMENT

1 Introduction

In the Bogor Declaration of November 1994, APEC members committed themselves to the long-term goal of free and open trade and investment in the Asia Pacific, at the latest by 2010 for industrialized countries and 2020 for developing countries.

This goal will be pursued promptly by further reducing barriers to trade and investment and by promoting the free flow of goods, services and capital among our economies. We will achieve this goal in a GATT-consistent manner and believe our actions will be a powerful impetus for further liberalization at the multilateral level to which we remain fully committed. (APEC Economic Leaders 1994)

The goal was clearly ambitious, with the commitment covering not just goods trade but also services trade and capital flows. The Bogor Declaration also gave considerable weight to APEC's trade and investment facilitation programs, which were to complement and support the process of liberalization.

Twelve months later the key issue leading up to the Osaka meeting of APEC leaders was whether the APEC commitment could be comprehensive in its sectoral coverage. Four major APEC economies — Japan, Korea, China and Taiwan — indicated concerns about including their agricultural sectors in the commitment to free trade. The issue of comprehensiveness was one of the most difficult faced during the year. But at the Osaka meeting, the principle of comprehensiveness was firmly endorsed. Agriculture remains on the APEC agenda.

In addition to comprehensiveness, the Osaka Action Agenda laid down other principles to govern progress towards free and open trade and investment. Implementation was taken further with the Manila Action Plan for APEC in November 1996. This incorporated Individual Action Plans, Collective Action Plans and other joint activities in various APEC forums. On one assessment, the Individual Action Plans of some economies fall short of Bogor targets, while for other economies the plans appear sufficient to

reach the target (Yamazawa 1997). The 1996 Leaders' meeting also called for nominations for 'early voluntary liberalization' initiatives, which are in the process of being prepared. It remains to be seen how comprehensive is the final package of these initiatives.

The first purpose of this paper is to establish the importance of having a comprehensive end-point or goal, by examining the possible long-term impact of the various components of the free trade commitment made at Bogor. The paper is one of a growing body of literature that examines empirically the impact of liberalization in APEC (eg. World Bank 1994, Murtough et al. 1995, McKibbin 1996, Young and Huff 1997, and work currently being undertaken by the Trade Liberalization Task Force of the APEC Economic Committee). In addition to looking at the liberalization of merchandise trade in agricultural and non-agricultural products, the paper also includes the possible impact of services trade liberalization, as well as of trade and investment facilitation measures.¹

The analysis suggests that both services trade liberalization and trade facilitation measures can add significantly to the benefits from liberalization of merchandise trade. It also suggests that were agriculture to be excluded, the APEC region would forgo benefits amounting to fully 60 per cent of the gains from liberalization of merchandise trade. Not only would the efficient agricultural exporters in the region stand to lose in an economy-wide sense, but so too would the economies that currently maintain relatively high protection of agriculture and rob themselves of gains from improved efficiency and greater specialization.

The second purpose of the paper is to highlight the importance of comprehensiveness as a principle guiding progress. The efficiency costs of trade restrictions are a function of disparities in assistance, as much as of levels. Liberalization efforts that focus on lowly or moderately assisted sectors, leaving untouched the high levels of assistance in sensitive sectors, risk increasing the disparities in assistance. The potential costs of this approach can be illustrated by examining the impact of some of the likely nominations for early voluntary liberalization initiatives. In a few instances, economies are projected to lose from individual initiatives, for classic second-best reasons.

The paper is structured as follows. Section 2 briefly discusses the economic tools with which APEC liberalization is examined, while some of the key assumptions underlying the analysis are outlined further in Appendix A. The analysis makes use of IC95, a model of international trade featuring economies of scale in production and gains from intra-industry specialization.

Readers wanting to avoid technical detail can skip this material, but should be aware that the results of an exercise such as this can sometimes be very sensitive to some of the assumptions used. A systematic sensitivity analysis is provided in Appendix B. The discussion of results in the main body of the paper endeavours to draw on conclusions that are robust to the sensitivity tests chosen.

Section 3 then discusses the scope of the APEC commitment to free trade. It covers the likely scope of facilitation initiatives as well as trade liberalization. One important consideration is to net out of the analysis the impact of trade liberalization initiatives already agreed to in other fora. The key agreements netted out of the current consideration are the NAFTA and Uruguay Round agreements. The results show that despite the Uruguay Round's achievements in liberalizing world trade in agricultural and processed food products, the agricultural and food sectors in some APEC economies would remain relatively highly protected, and therefore subject to significant structural adjustment as a result of APEC's commitment to free trade.

¹ The paper draws heavily on an earlier paper by Dee, Geisler and Watts (1996).

Section 4 then examines the projected impacts of APEC liberalization for each of the key economic groupings in the region, focusing on the contributions from liberalization of merchandise trade, services trade, and from trade facilitation measures. It also discusses the economy-wide implications had agriculture been excluded from the liberalization package.

Section 5 examines more closely the importance of comprehensiveness during the implementation of APEC's commitment.

Section 6 gives suggestions for further research.

2 The framework for analysis

The analysis makes use of a multiregion, multisector model called IC95, a hybrid model incorporating features from Jomini et al. (1994), Hertel (1997), Francois, McDonald and Nordstrom (1995) and Brown et al. (1995). Its key features are:

- a database with a 1992 reference year from the GTAP model (Hertel 1997), but updated to incorporate more recent information on various forms of protection from GATT/WTO sources, and then adjusted to exclude the trade liberalisation already scheduled under the Uruguay Round and NAFTA agreements;
- an imperfectly competitive, monopolistic competition treatment of resources, food processing and other manufacturing industries along the lines of Francois, McDonald and Nordstrom (1995) and Brown et al. (1995); and
- a treatment of capital accumulation and international capital mobility midway between those of the Salter (Jomini et al. 1994) and GTAP models.

Each of these features is discussed in more detail in Appendix A of this paper.

The analysis uses the model to provide a long-run snapshot view of the full impact of APEC's free trade commitment. Information on post-Uruguay, post-NAFTA levels of assistance gives an indication of how much further each APEC economy would need to go to achieve free trade. Several past studies are available that can give a likely indication of the scope for resources savings from trade and investment facilitation measures. These assistance changes and direct resource savings are fed into the model framework, to give an indication of the flow-on effects on wages, prices, and levels of economic activity.

The liberalization and facilitation measures will be phased in over time, and it will also take time for each APEC economy to adjust to the changes. During this phasing and adjustment period, a myriad of other changes will also affect each APEC economy. These other changes are not taken into account in the current analysis. For this reason, the results from the model should not be interpreted as indicating the likely changes over time that will occur in each APEC economy — such results would require *all* changes, not just changes in assistance, to be taken into account. The model results should instead be seen as providing an indication, at some future point in time after all the phasing and adjustment has taken place, of how different each economy would be, compared with the alternative situation at the same point in time, had the liberalization not taken place.

The distinction is important to keep in mind. Sometimes to aid fluency, the results are couched as if key economy indicators ‘rise’ or ‘fall’. This should not be interpreted to mean that the indicators would be higher or lower than they are now. It means that they would, at some future time, be higher or lower than they otherwise would have been had the liberalization not occurred. In both cases, in a growing economy, these indicators could be higher than they are now.

3 The scope of APEC’s free trade commitment

Liberalization

Any assessment of APEC’s free trade commitment needs to net out the impact of other trade liberalization initiatives agreed to in other fora. As noted above, the current assessment nets out the impact of the NAFTA and Uruguay Round agreements. It does not net out the impact of the AFTA agreement, since both the degree of liberalization under AFTA, and its relation to APEC liberalization, are unclear for at least some countries.

The levels of protection remaining in APEC economies, once the NAFTA and Uruguay Round agreements are netted out, are shown in Table 1. For comparison purposes, it also shows the equivalent protection levels in non-APEC regions. For each region, the table shows average protection levels for three broad sectors, being weighted averages of protection levels for the 37 industry groups included in the IC95 model for which post-Uruguay data were obtained from the World Bank. The sectoral breakdown of the IC95 model is shown in appendix Table A1.

For most industries, including those in the services sector, post-NAFTA, post-Uruguay protection is measured by a single tariff rate or tariff equivalent of non-tariff protection against imports. For agriculture and food processing, protection is currently granted by a range of non-tariff barriers and domestic support measures, as well as by explicit tariffs and export subsidies. Under the Uruguay Round agreement, non-tariff barriers on agriculture are to be converted to explicit tariffs. The average tariff rate for agriculture and food in Table 1 therefore shows the average tariff protection level that will apply once tariffication and associated tariff bindings are in place. Similarly, the average export subsidy and production subsidy rates show post-Uruguay levels of export subsidy and domestic support.²

² The summary information in Table 1 first aggregates distinct bilateral tariff rates for each region across the range of other regions supplying the imports. This averaging across source regions has been done at the 37 industry level using import weights. Thus for example, the average tariff levels for the NAFTA region take into account that for a range of goods, tariffs will be zero for NAFTA’s trade with itself. It then aggregates protection levels across industries. For each broad sector and for each type of protection, the sector average protection level has been obtained as a production weighted average of rates across the relevant industries. The sectoral averages for services differ slightly from those reported in Brown et al. (1995) because of a slightly different method of aggregation.

Table 1: Estimated post-NAFTA, post-Uruguay levels of protection
(per cent)

	<i>Aus</i>	<i>NZ</i>	<i>NAFTA</i>	<i>Jpn</i>	<i>Kor</i>	<i>Ind</i>	<i>Mal</i>	<i>Phl</i>	<i>Sng</i>	<i>Tha</i>	<i>Chn</i>	<i>Tw</i>	<i>EU</i>	<i>ROW</i>
Import tariffs														
Agric & food ^a	1.4	1.9	7.6	61.8	36.2	15.4	32.8	37.0	7.8	39.2	6.1	37.9	33.1	9.8
Res & manuf ^a	6.2	5.8	1.5	1.2	9.0	18.3	9.9	22.0	2.3	27.4	11.3	6.5	3.2	11.7
Services ^b	109.0	107.6	63.1	68.2	54.5	49.1	52.2	51.3	50.8	47.7	47.2	52.6	98.9	110.5
Export subsidies														
Agric & food ^a	0.9	..	1.6	..	..	..	..	..	..	..	..	..	8.1	0.1
Production subsidies														
Agric & food ^a	0.8	0.6	3.2	3.4	7.2	1.4	..	..	..	0.4	..	..	..	..

^a Estimates from World Bank (as also reported in Hertel et al. 1995), Incgo (1995) and Francois, McDonald and Nordstrom (1995). See Appendix A for further details.

^b Estimates from Hoekman (1995), reported in Brown et al. (1995). The cross-regional pattern of these estimates relative to Australia and New Zealand lacks plausibility, but the estimates provide the only comprehensive attempt to date to quantify barriers to services trade. See Appendix A for further comments and qualifications.

The average levels of protection in Table 1 give a broad indication of the scope of APEC's free trade commitment. In what follows, it is assumed that a move to free trade involves the complete elimination of the protection summarized in Table 1. There has been debate by some APEC members on whether free trade would mean absolutely zero tariffs on merchandise trade. If not, the current treatment might be slightly overstated. In the services area, where some barriers tend to be of an all-or-nothing nature, the current treatment is more likely to be appropriate.

The Bogor declaration also committed APEC members to achieving their free trade goal in a GATT-consistent manner. In itself, this did not necessarily commit members to liberalize on a non-discriminatory or most-favoured-nation basis. For example, Article XXIV of the GATT allows discriminatory action so long as it liberalizes 'substantially all trade' and so long as barriers to non-members are not raised. The enabling clause of the Tokyo Round Agreement effectively removes this constraint with respect to the imports and exports of developing countries. Snape (1995) nevertheless argued that it would be extremely difficult for a preferential APEC agreement to meet all the requirements of GATT consistency. The current assessment of APEC liberalization assumes that the liberalization occurs in a non-discriminatory manner, consistent with the notions of open regionalism and concerted unilateralism. Indeed, the principle of non-discrimination was endorsed at the Osaka summit in November 1995.

According to Table 1, the areas of highest average assistance are in the service sectors of most APEC economies. As noted above, the assistance 'guesstimates' are obtained indirectly. Where a region failed to make an offer during the GATS negotiations, this was interpreted as indicating the existence of a range of barriers prohibiting market access. Since no economy scheduled more than about 65 per cent of the total number of possible sectors (Hoekman 1995), and since the tariff equivalent of a prohibitive trade

restriction was assumed to be 200 per cent, it is not surprising that the guesstimated tariff equivalents of all services trade restrictions averaged between 50 and 100 per cent. It is nevertheless difficult to fully understand the cross-regional pattern of estimates. In any event, were an alternative interpretation put on the failure to make an offer, the tariff equivalents would be smaller (Warren 1996, PECC 1995).

Since very little services trade liberalization has been achieved so far under the GATS agreement, there is considerable scope for liberalization under APEC's free trade commitment. Any assessment of the impact of such liberalization needs to be qualified, however, not just by cautions about the quality or interpretation of the trade restriction guesstimates, but also by qualifications on the quality and extent of data on initial levels of services trade, and on the way that services are modelled.³

The database for a model such as IC95 can, at best, draw on data for the total levels of services trade by service category obtained originally for balance of payments purposes and subsequently incorporated into regional input-output frameworks. The data therefore tend to be better for the service categories such as 'trade and transport' that are relatively well-measured for balance of payments purposes, but less reliable for some of the other service categories, particularly private services (including business services such as technical consultancy, software development) that are often measured as a pure residual. Even where trade totals are measured with reasonable reliability, it needs to be remembered that the bilateral patterns of such trade are obtained by pure estimation (typically from bilateral patterns of goods trade or by using some form of gravity model), since no bilateral services trade data are collected directly in any systematic fashion.

Services trade can perform a number of functions. Services can be required in their own right, such as when an engineering firm wins a contract to provide consultancy services on a foreign construction project. Alternatively, services can be traded internationally to facilitate trade in merchandise. Trade and transport services (wholesaling, retailing, air, sea, road and rail transport services) are the most obvious example, but it appears that many financial services are also 'traded', via the permanent presence of a banking or insurance facility in another country, to facilitate goods trade between the two countries. The benefits of trade liberalization are likely to be greater, and more evenly spread, when services play a dual role, because the linkages to other parts of the economy are more pervasive.

Like Salter and GTAP, IC95 captures the dual role of trade and transport services as being traded in their own right as well as facilitating goods trade. It does not capture a dual role for any other service category, despite this probably being an important feature of why they are traded. To the extent that the data are reliable, the dual role has been captured for the most important category, since trade and transport services are more heavily traded than other service categories in most economies. To the extent that a dual role for other services has not been recognized, the benefits from services trade liberalization may be understated.

³ It is nevertheless easy to overestimate the extent to which services require a modelling treatment different from that for goods. Brown, Deardorff and Stern (1995) have considered this in some detail, and conclude that the key difference requiring a different treatment is the characteristic identified by Ethier and Horn (1991), that producers of services typically specialise their products to the particular needs of customers. This is a level of product differentiation below the firm-level differentiation captured in IC95 (see Appendix A), and is also an argument for possible diseconomies of scope.

Table 1 shows that next to service sectors, the agricultural and food sectors in Japan, Korea and Taiwan have among the highest levels of protection within the APEC region, even taking into account the liberalization already agreed to under the Uruguay Round agreement. However, the agriculture and food sectors in Thailand, the Philippines and Malaysia are also relatively highly protected. China does not appear to be heavily protected, although this may be an artifice of the way that the agricultural estimates in China have been constructed.

The estimates of agricultural protection in Table 1 do not include the impact of quarantine restrictions. If APEC's free trade commitment removes other restrictions on agricultural trade but if quarantine restrictions remain, even for the best of reasons, then the effective liberalization of agricultural trade could be considerably less than the estimates in Table 1 would suggest. This is an important qualification to the impacts of agricultural liberalization estimated in the next section.

Outside of agriculture and services, post-NAFTA, post-Uruguay assistance levels are generally more moderate, although low sectoral averages for resources and non-food manufacturing in some economies disguise a relatively wide dispersion of assistance at the industry level around the sectoral average. In particular, tariffs on textiles and clothing are still relatively high in Australia and New Zealand, importing economies not otherwise affected by the Uruguay Round commitment to dismantle the Multifibre Arrangement. Assistance to motor vehicles is also high in these economies. Assistance to textiles, clothing and lumber products tends to be high in Indonesia and Malaysia. Within non-food manufacturing, assistance tends to be high across the board in the Philippines and Thailand.

Facilitation

According to UNCTAD, a comprehensive US assessment of the costs involved in document preparation and handling in connection with the movement of goods in international trade concluded that the total cost of paperwork and procedures could amount to 10 to 15 per cent of the value of goods traded. This was recognised as a conservative estimate by UN experts.

The estimate was made in 1971, and did not take account of indirect costs

which can be quite substantial, although they are not easy to quantify, like those caused by delays in transport resulting from cumbersome procedures, delays in payment caused by errors in documentary credits, losses due to deterioration or pilferage while cargo is waiting for clearance or onward transportation, etc. Neither did it refer to lost opportunities, nor the strong disincentive for potential exporters caused by the complication of international trade procedures. (UNCTAD 1992, p. 99)

UNCTAD noted that while there have been substantial cost improvements since 1971, the range of 10 to 15 per cent of the value of goods traded is 'still generally accepted in trade facilitation circles as an order of magnitude for the direct and indirect costs of procedures'. For economies such as South Korea where trade is 40 per cent of GDP, the estimated costs of doing trade could therefore account for as much as 4 to 6 per cent of GDP.

A more recent study of the potential cost savings from market integration in Europe estimated the direct and indirect costs of border controls and customs red tape to be smaller than the UNCTAD study, although other types of savings from market integration were also considered.

The Cecchini studies, (Cecchini 1988) looked at a range of barriers that could be targeted in a single European market:

- border controls and customs red tape;
- divergent standards and technical regulations;
- conflicting business laws and tax regulations; and
- protectionist procurement practices.

The study used survey techniques to examine the direct and indirect costs of border controls and customs red tape, including administration costs, consignment delays and turnover foregone. It also gave estimates of the government spending on the resources required to operate the customs controls. Direct administration costs were estimated at around 1.5 per cent of the value of trans-border trade, while delays added a further 0.5 per cent. The cost of business foregone was between 1 and 3 per cent of the value of trade, while the cost of government expenditure added only 0.1 to 0.2 per cent. In total, therefore, the direct and indirect costs of border controls and customs red tape were up to 5 per cent of the value of trade.

In the European context, the border controls were needed for a variety of reasons: because of differences in VAT and excise rates, because of the need to adjust farm product prices in accordance with Europe's Common Agricultural Policy, for veterinary checks, transport controls, statistical formalities or to enforce bilateral trade quotas and other quantity restrictions with non-EC countries to certain goods. The costs of border controls and customs red tape were highest for small businesses.

As noted above, the Cecchini studies also looked at a range of other measures affecting either goods trade or cross-border investment. These measures could, on a broad interpretation, be taken as potential areas of action for the facilitation of trade or investment flows.

Divergent technical regulations and standards, along with duplication of testing and certification procedures, were found to affect a range of manufacturing goods (particularly food, pharmaceuticals, motor vehicles, telecommunications equipment and building materials).

The cost of regulatory diversity hit hardest in sectors combining high levels of both technology and regulation (pharmaceuticals and telecommunications equipment), while mature industries like motor vehicles and consumer electronics were also severely penalized. Regulations were also identified as imposing barriers to market entry in the service sector, particularly in finance, insurance and securities, telecommunications services, and other business services, eg. advertising, engineering, computing and legal services.

Energy, transport, telecommunications and water supply were characterized as having nationalistic procurement practices for strategic reasons. Specific cost savings from open competition were identified in

pharmaceuticals, office machinery and instrumentation, telephone switching, telephones. electrical equipment, motor vehicles and coal.

The Cecchini studies measured the total gains from market integration in several different ways. One method added together the gains from the following sources:

- the gains from removing barriers that directly affect intra-EC trade, essentially customs formalities and related delays;
- the gains from removing barriers to production, ie. barriers which hinder foreign market entrants and thus the free play of competition;
- the cost reductions achieved by business through exploiting more fully potential economies of scale; and
- other gains in efficiency due to intensified pressures of competition.

The total gains from all these sources were in the range from 4.3 to 6.4 per cent of the EC's GDP. Estimates derived by alternative means were in the same ballpark.

Thus the Cecchini studies identified potential gains from narrowly-defined trade facilitation measures that were smaller than those in the UNCTAD study, but gave estimates of a similar order to the UNCTAD study when potential savings on a broader front from economic integration were included.

One purpose of this study is to examine the flow-on impact of savings from facilitation measures. The indirect savings incorporated in the above estimates give one indication. Another approach is to take the direct cost savings from the above analysis, and to use the IC95 model framework to estimate the associated indirect flow-on effects. This has the advantage of providing an estimated impact on a basis consistent with the method used to examine the impact of liberalisation.

The approach has been to adopt two alternative estimates of the potential direct cost savings from facilitation measures — 5 per cent and 10 per cent of the value of goods traded. The lower figure is larger than the upper bound of 2 per cent direct cost savings from administration and delays associated with customs controls and red tape, but allows for some limited action on facilitation of investment flows.

The upper figure is a possible estimate of the direct cost savings from a more extensive set of facilitation measures. The Osaka Agenda lists a range of objectives that hold out the prospect of more significant gains. The APEC economies have pledged not only to simplify and harmonise customs procedures and to enhance the mobility of business people, but also to:

- ensure the transparency of standards and conformity assessment, align both mandatory and voluntary standards with international ones, achieve mutual recognition of conformity assessment, and promote cooperation for technical infrastructure development to facilitate broad participation in mutual recognition arrangements;
- introduce or maintain effective and adequate competition policy and/or laws associated with enforcement policies, ensure the transparency of the above, and promote cooperation among APEC economies;

- develop a common understanding on government procurement policies and systems, and achieve liberalization of government procurement markets throughout the Asia-Pacific region in accordance with the principles and objectives of the Bogor Declaration; and
- promote the transparency of their respective regulatory regimes, and eliminate trade and investment distortions arising from domestic regulations which not only impede free and open trade and investment but are also more trade and/or investment restricting than necessary to fulfil a legitimate objective.

These objectives hold out the prospect of more significant gains from facilitation measures.

To model the flow-on effects and indirect cost savings associated with facilitation measures, an indication is needed of where the direct resource savings will occur. Trade and investment facilitation measures presumably lower the resource cost of moving goods and capital between regions. As noted above, the IC95 model recognizes the role that trade and transport services play moving goods and other services internationally. This broad sector includes the activities of freight forwarders and others directly involved in trade facilitation. The approach has therefore been to calculate the dollar savings equivalent to 5 or 10 per cent of the value of total trade (as measured by imports), and to assume that trade facilitation measures will produce direct resource savings in the trade and transport service sector (technically, via a productivity improvement) equivalent to this dollar amount.

Thus the benefits of facilitation are assumed to accrue by being able to economize directly on existing resources in a given use, which is analogous to having more resources. This is in contrast to the benefits of trade liberalization, which are expected to accrue primarily through efficiency gains associated with reallocating existing resources to better uses. The returns from trade facilitation measures are therefore likely to be substantial by comparison with the returns from liberalization. However, it needs to be remembered that trade liberalization, particularly if it is non-discriminatory, could well be a necessary precondition for significant direct resource savings on the facilitation front.

4 The economy-wide impacts of APEC's free trade commitment

Liberalization

The economy-wide and broad sectoral impacts of APEC trade liberalization, covering all sectors including services and implemented on a non-discriminatory basis, are shown in Table 2.

As noted above, a key benefit of non-discriminatory trade liberalization is the opportunity to make use of the cheapest imports from the best sources, allowing some existing resources in import-competing industries to be reallocated to better uses domestically. In addition to these traditional static allocative efficiency gains, the current model allows for additional gains from increased international specialization. As explained in Appendix A, the gains from specialization tend to magnify the overall effects of trade liberalization.

Table 2: **Welfare and sectoral implications of APEC liberalization^a**

	<i>Aus</i>	<i>NZ</i>	<i>NAFTA</i>	<i>Jpn</i>	<i>Kor</i>	<i>Ind</i>	<i>Mal</i>	<i>Phl</i>	<i>Sng</i>	<i>Tha</i>	<i>Chn^b</i>	<i>Twn</i>	<i>EU</i>	<i>ROW</i>
Welfare effects														
Real income	4.4	9.6	0.7	1.5	2.1	2.9	3.8	2.4	17.2	4.1	1.8	1.7	0.3	0.3
Real GDP	3.4	5.6	0.7	1.5	3.9	5.1	4.9	4.2	6.9	4.5	3.1	1.4	..	..
Terms of trade	1.3	4.8	0.2	-1.9	-3.7	-5.2	-2.4	-4.2	2.9	-0.3	-2.5	-0.4	1.7	0.9
Trade effects														
Exports	48.5	36.6	18.4	29.1	40.8	66.0	25.0	56.8	8.5	45.1	54.1	28.2	5.3	2.4
Imports	52.4	51.1	18.1	35.2	36.0	63.8	27.0	49.8	10.1	34.8	45.5	40.1	6.8	3.1
Balance of trade	0.2	-0.2	..	-0.2	-0.2	1.0	0.4	0.3	4.2	3.0	0.7	-0.3	..	..
Output volume														
Agriculture	12.3	13.2	-6.4	-42.3	-37.3	0.2	-0.2	-5.5	-6.1	8.1	-0.3	19.6	2.5	4.1
Resources	36.0	36.9	6.8	6.5	-12.3	-13.3	-18.3	-10.7	70.2	-33.6	-15.0	-10.1	-4.2	-4.4
Manufacturing	-2.8	-2.6	-0.9	1.6	7.8	27.0	9.3	11.0	-6.7	2.9	2.4	1.9	-1.6	-2.3
Services	-2.2	-1.1	..	-0.7	1.2	0.4	4.1	1.4	11.8	2.0	2.5	0.2	0.6	0.7

^a IC95 model projections. All results represent deviations from control. Most variables are measured in percentage changes, except for the balance of trade as a proportion of GDP, which is an absolute change measured in percentage points.

^b Includes Hong Kong.

The combined effect of gains in static efficiency and from specialization could be measured by the change in an index of real final output (say, real GDP), minus a change in the index of real primary factor usage. Such a measure is not reported directly in Table 2, however, because it gives only half the story.

An important additional, dynamic benefit of trade liberalization is when gains in allocative efficiency and from increasing international specialization provide incentives for an economy to increase its underlying resource base. This source of dynamic gain has been highlighted recently in the United States, particularly by Baldwin (1992), and is captured in models such as IC95 or Salter that allow for more capital to be accumulated than otherwise on the face of beneficial policy initiatives. As noted in Appendix A, IC95 also makes provision for induced employment gains in economies with a high proportion of the workforce in non-wage agriculture initially. These induced increases in resource base also tend to magnify the overall effects of trade policy initiatives.

By definition, the combined gains from allocative efficiency, increased specialization, and the dynamic gains from induced increases in resource base can be measured by the change in an index of real final output, ie. real GDP. Table 2 confirms that APEC liberalization on a non-discriminatory basis would lead to real GDP being higher than otherwise in all APEC economies.

The real GDP gains tend to be bigger in the smaller and more open economies. They are greatest in Singapore, largely because of Singapore's entrepôt role as a conduit for cheaper imports from outside the APEC region (recall that liberalization is on a non-discriminatory basis). Indeed, if APEC liberalization were instead on a preferential basis (assuming the same rules of origin as for AFTA, namely 40 per cent of content), Singapore's gain in real GDP would fall to be about the same order as Indonesia's, and less than

New Zealand's (with these real GDP gains in turn being smaller than in Table 2 because of the preferential nature of the liberalization).

Nevertheless, welfare in each region is affected not just by increases in economic activity, but also by changes in the prices of the goods and services a region produces to derive income, relative to the prices of the goods and services that consumers (public and private) purchase to yield utility. One important element of this is changes in a region's terms of trade.

Trade liberalization would tend to raise the average world prices of agricultural and food products, since liberalization will have the effect of reducing the export and production subsidies afforded these products in many countries. Conversely, liberalization would have the effect of lowering the average world prices of resources, non-food manufacturing and services, areas currently protected primarily via tariffs or tariff equivalents (in the case of services, essentially by assumption).

Table 2 confirms that terms of trade would tend to improve for agricultural exporting regions such as New Zealand, Australia, and to a lesser extent the NAFTA region, while falling either in agricultural importing regions such as Japan and Korea, or in regions with significant levels of tariff protection in resources and/or non-food manufacturing such as Indonesia, Malaysia, the Philippines, Thailand and China. Singapore's terms of trade improve as some of its traditional entrepôt trade (eg. machinery and equipment) contracts to make way for entrepôt trade in areas where its neighbours are newly competitive, such as agricultural and food products, textiles and clothing.

In some regions, therefore, terms of trade improvements magnify the real GDP gains from trade liberalization, while in other regions, terms of trade declines moderate the real GDP gains. Nevertheless, all regions are projected to gain in terms of real income, a measure that takes both factors into account and is therefore a better measure of the impact on overall welfare of each region.⁴

Table 2 also confirms that trade liberalization is projected to be accompanied by a major expansion in regional trade levels, above what they would otherwise have been. The projected changes in sectoral output also suggest the need for significant structural adjustment in some economies, although it needs to be recognized that in some cases, the measured percentage changes in sectoral output disguise the real scope of the adjustment. For example, the very high percentage expansion in Singapore's resource sector (which includes forestry and fishing) is from a very low base. At the other extreme, the relatively modest percentage changes in service sector output may represent significant adjustments, given the large sizes of the service sectors in some economies.

⁴ In IC95, real income is measured as net national product, deflated by a price index for net national expenditure (private and public consumption and net investment). This is essentially the same as the equivalent variation measure of welfare in the GTAP model, but differs from the measure of real income in the Salter model by including the price of investment goods in the overall price deflator. IC95's measure therefore recognizes that if trade liberalisation allows cheaper net additions to capital stocks, this will improve future productive capacity and hence future consumption prospects. Irrespective of which measure is used, one potential influence on welfare is minimised in the current analysis. In the absence of additional foreign borrowing or lending, real income is not affected by major changes in debt service obligations to foreigners, other than those arising from induced changes in interest rates.

Economy-wide effects of excluding agriculture

Table 3 is designed to give an indication of the economy-wide implications of excluding agriculture from the liberalisation package. A comparison with Table 2 shows a number of interesting features.

Table 3: Welfare and sectoral implications of APEC liberalisation that excludes agriculture^a

	<i>Aus</i>	<i>NZ</i>	<i>NAFTA</i>	<i>Jpn</i>	<i>Kor</i>	<i>Ind</i>	<i>Mal</i>	<i>Phl</i>	<i>Sng</i>	<i>Tha</i>	<i>Chn^b</i>	<i>Twn</i>	<i>EU</i>	<i>ROW</i>
Welfare effects														
Real income	3.2	5.4	0.5	0.7	1.5	2.4	2.4	2.0	16.4	1.0	1.8	1.0	0.4	0.1
Real GDP	3.1	5.1	0.5	0.7	1.6	4.4	3.0	3.6	6.6	4.0	3.2	0.5	0.1	0.1
Terms of trade	-1.8	-2.1	-0.2	-0.7	-0.4	-4.8	-1.6	-3.7	2.8	4.1	-2.5	-0.1	1.7	0.7
Trade effects														
Exports	48.0	36.9	16.5	24.0	25.6	56.1	19.1	51.4	8.0	44.6	52.3	24.9	4.8	1.5
Imports	47.6	41.8	16.1	29.1	24.4	55.2	21.2	45.0	9.6	30.8	43.9	35.5	6.3	2.3
Balance of trade	0.2	-0.3	-0.1	-0.1	0.3	0.6	0.3	0.4	4.1	2.2	0.7	-0.1	..	..
Output volume														
Agriculture	1.7	-0.7	1.3	1.1	-1.5	-0.8	0.1	-4.4	-6.6	-1.1	-0.4	0.7	-0.3	-0.2
Resources	44.5	58.9	4.7	3.1	-9.8	-8.2	-13.1	-10.8	69.2	-25.7	-16.9	-9.3	-4.0	-2.9
Manufacturing	-3.0	-4.9	-0.4	2.4	1.1	20.5	4.3	12.8	-7.1	4.9	3.8	0.4	-1.4	-1.6
Services	-2.4	-0.4	-0.1	-1.2	0.6	0.4	3.5	1.0	12.0	2.3	2.4	..	0.7	1.0

^a IC95 model projections. All results represent deviations from control. Most variables are measured in percentage changes, except for the balance of trade as a proportion of GDP, which is an absolute change measured in percentage points.

^b Includes Hong Kong.

In all but one case (the exception being China), the real income gains to APEC members are lower when agriculture is excluded from the liberalization package. This drop off in projected gains is most noticeable for two quite different categories of region — the relatively efficient agricultural exporters, and the regions with very highly assisted agricultural sectors. The best examples in the former category are Thailand, an efficient exporter of processed rice, and New Zealand, and efficient exporter of dairy products. When agriculture is excluded from the liberalization package, the real income gains to these regions fall by three-quarters and one-half, respectively. The best example in the latter category is Japan, with only one half the real income gain when agriculture is excluded.

For both Japan and Korea, the exclusion of agriculture essentially eliminates the significant pressure for structural adjustment in both the agricultural sector and in processed food. However, it also leads to significantly smaller gains arising from better allocative efficiency and international specialization (with their reinforcing dynamic effects), as indicated by the significantly smaller projected gains in real GDP. This effect more than outweighs the easing in terms of trade that comes about from less upward pressure on the average world prices of agricultural products. For Japan and Korea, therefore, excluding agriculture

may allow these economies to avoid significant sectoral adjustment, but at a significant economy-wide cost.⁵

The picture in Taiwan is more mixed. The real income gains in Taiwan are smaller when agriculture is excluded, but somewhat surprisingly, the projected change in agricultural output is not nearly as favourable as when agricultural liberalization is included. The reason is that Taiwan's agricultural sector is projected to gain more from agricultural liberalization elsewhere in the region than it is projected to lose from agricultural liberalization at home. The assistance estimates built into the IC95 database (sourced originally from the GTAP model) suggest that while Taiwan heavily assists grain and dairy production, its production of meat products and other food products is relatively lightly assisted. These latter sectors have significant export sales to Japan, and are projected to expand strongly when Japan liberalizes its agriculture as part of the full APEC liberalization scenario. The inability to pursue this source of comparative advantage explains the lower overall real income gains for Taiwan when agriculture is excluded from the liberalization package.

Finally, China is projected to be just as well off whether agriculture is excluded as when it is included, although in terms of real GDP, China is projected to do slightly better when agriculture is excluded. This may well be an artifice of the way assistance in China has been measured. As noted in the previous section, Chinese agriculture appears to be relatively lightly assisted in the IC95 model, possibly the net result of having combined relatively high explicit tariffs with a range of domestic pricing arrangements that implicitly tax agriculture. It is a moot point whether both will be up for negotiation or action in an APEC context. The down payment that China offered at Osaka seemed to be limited to explicit tariffs and import control measures. Were that trend to continue, the pattern of adjustment could well be more like that of an economy with relatively high formal border measures, but some existing agricultural trade with other economies in the region. In that case, the projected results for Taiwan may offer a rough indication of the likely implications for China.

Contribution of services trade liberalization

One of the motivations of the current study is to examine the implications of services trade liberalization in an APEC context. The contribution of services trade liberalization can be measured in one of several ways — either by looking at the implications of services trade liberalization alone, or by comparing the effects of a full liberalization package with a package that excludes services. In principle, if there are significant non-linear interaction effects between merchandise trade and services trade liberalization, the two approaches need not give the same answer. As it happens, both approaches have been tried, and they give very much the same answer, at least for a key aggregate like real income.⁶ Table 4 shows the broad welfare and sectoral implications of service trade liberalization on its own.

⁵ This conclusion does not depend on the assumption, implicit in Table 3, that agriculture is excluded from the liberalization package in every APEC region. In a scenario in which only Japan, Korea, Taiwan and China excluded agriculture, the projected real income gains in Japan and Korea were even smaller. Their real GDP gains were smaller as resources were actually attracted into agriculture, while the terms of trade movements were more adverse because of agricultural liberalisation elsewhere.

⁶ For all regions except Singapore, they give the same answer for real income to within a decimal point. For Singapore, they give the same answer to within half a percent.

Table 4: **Welfare and sectoral implications of APEC liberalization for services only^a**

	<i>Aus</i>	<i>NZ</i>	<i>NAFTA</i>	<i>Jpn</i>	<i>Kor</i>	<i>Ind</i>	<i>Mal</i>	<i>Phl</i>	<i>Sng</i>	<i>Tha</i>	<i>Chn^b</i>	<i>Twn</i>	<i>EU</i>	<i>ROW</i>
Welfare effects														
Real income	2.8	5.0	0.5	0.6	0.5	0.4	0.8	1.0	7.3	0.8	0.5	1.3	0.1	0.2
Real GDP	2.6	4.5	0.4	0.7	0.4	0.3	0.6	0.5	3.6	0.3	0.4	0.9	..	0.1
Terms of trade	-1.6	-1.7	..	-1.7	0.1	0.1	..	1.0	1.1	1.0	0.1	0.3	0.4	0.5
Trade effects														
Exports	30.0	29.4	11.2	15.6	4.4	3.9	4.0	4.3	0.7	0.6	4.2	8.6	1.4	1.2
Imports	29.4	33.5	10.6	17.3	4.7	5.4	4.8	5.4	1.4	1.2	3.9	12.6	1.7	1.6
Balance of trade	0.1	-0.3	..	..	-0.1	-0.2	0.1	..	1.8	0.2	0.1	..	..	..
Output volume														
Agriculture	1.2	-1.4	0.2	1.4	-0.3	0.3	0.2	-0.6	-2.1	-1.2	-0.2	-0.2	..	-0.2
Resources	18.2	45.2	1.5	5.2	-2.1	2.5	-5.7	-4.1	76.8	-7.3	-1.3	-3.0	-1.5	-2.5
Manufacturing	6.1	-0.5	0.7	2.6	-1.6	0.6	-0.8	-2.7	-15.3	-3.5	-1.3	-0.6	-0.9	-1.3
Services	-2.6	-1.4	-0.3	-1.3	0.6	-1.2	2.7	1.8	16.0	3.0	1.6	0.3	0.4	0.9

^a IC95 model projections. All results represent deviations from control. Most variables are measured in percentage changes, except for the balance of trade as a proportion of GDP, which is an absolute change measured in percentage points.

^b Includes Hong Kong.

Comparing Tables 2 and 4 suggests that services trade liberalization can provide a significant proportion of the total gains from trade liberalization, although this conclusion is subject to a number of provisos discussed in the previous section. Services trade liberalization is projected to provide between 13 and 30 per cent of the total gains for Korea, Indonesia, Malaysia, Thailand and China, 40 per cent of the total gains for Japan and between 50 and 75 per cent of the total gains for Australia, New Zealand, the NAFTA region and Taiwan. Services trade liberalization contributes a greater share of the total gains in economies where the services sector accounts for a relatively large share of GDP initially, and/or where services trade barriers have been assessed as relatively high.

Whether services trade liberalization leads to a contraction or expansion of services sector output in an economy also depends primarily on whether barriers to services trade have been assessed as being high by international standards. The projected flow-on effects to other sectors in each region reflect the combination of several factors. The first is a reaction to the resource flows into or out of the services sector — resource movements into services, for example, that cannot be met by additional resource accumulation will need to be transferred from other sectors.

However, some other sectors will themselves gain significantly from more competitive service provision. In particular, recall that the IC95 model recognizes explicitly that the trade and transport service industry plays a direct role in transporting other traded goods and services internationally. Other sectors that will tend to benefit significantly from services trade liberalization are those, such as the resource

sectors in Australia and New Zealand, for which transport costs to foreign markets are an important determinant of international competitiveness.⁷

Facilitation

The Bogor declaration identifies trade and investment facilitation measures as being just as important a component of the free trade commitment as liberalization initiatives. And liberalization on a non-discriminatory basis is likely to be an important precondition for the harmonization and/or streamlining of trade procedures.

As discussed in the previous section, a direct cost saving equivalent to 5 per cent of the value of trade seems an upper limit to the potential gains from a relatively narrow set of trade and investment facilitation measures. With the broader objectives regarding standards, competition policy, procurement and regulation endorsed at Osaka, then the direct cost savings could rise to as much as 10 per cent of the value of trade.

The flow-on effects of facilitation measures by APEC members with direct resource savings equivalent to 5 per cent of the value of imports are shown in Table 5. Although the IC95 model is not linear by design, its projected impacts of facilitation measures that save 10 per cent of the value of imports is very close to twice the impact shown in Table 5.

The direct resource savings have been assumed to accrue in the trade and transport service industry. This industry has a particularly critical role to play in facilitating the international movement of goods and other services, although it has other functions as well. Table 5 suggests that some of the resources freed by streamlining of trade procedures could stay on in the sector to facilitate a greater flow of traded goods and services. But some of the resources could also be redeployed, particularly elsewhere in the service sector, to perform other functions.

Almost by definition, the size of the overall real income gains is greater for regions with a high trade share in GDP. Since a resource saving of this sort is akin to having more resources in total in a region, overall income gains can be achieved without the need for significant structural adjustment. Thus trade facilitation measures equivalent to 5 per cent of the value of imports are projected to yield real income gains that can be as great or greater than those achieved through trade liberalization, but with significantly less relative movement in the sectoral composition of output.

⁷The theoretical structure of IC95 does not allow for tariffs on those trade and transport services imported indirectly as the transport 'margin' on imports of other goods and services. But to the extent that lowering tariffs on direct 'non-margin' imports of trade and transport services reduces the domestic costs of producing those services, this flows on to the cost of international transport margins supplied by the domestic industry. Thus the model captures, albeit in an indirect way, the way in which lowering barriers to service trade can lower the cost of international service margins.

Table 5: **Welfare and sectoral implications of APEC facilitation measures equivalent to 5 per cent of the value of imports^a**

	<i>Aus</i>	<i>NZ</i>	<i>NAFTA</i>	<i>Jpn</i>	<i>Kor</i>	<i>Ind</i>	<i>Mal</i>	<i>Phl</i>	<i>Sng</i>	<i>Tha</i>	<i>Chn^b</i>	<i>Twn</i>	<i>EU</i>	<i>ROW</i>
Welfare effects														
Real income	1.2	2.2	0.8	0.7	2.3	1.9	3.7	2.1	5.3	2.9	2.8	1.7	0.1	0.2
Real GDP	1.1	2.0	0.7	0.6	2.3	1.8	4.2	2.1	4.9	3.0	2.8	1.7	..	0.1
Terms of trade	..	..	..	0.4	-0.3	..	-1.1	-0.7	-0.2	-0.5	-0.7	-0.2	0.1	0.3
Trade effects														
Exports	1.0	1.4	0.7	0.6	1.5	1.2	3.9	1.7	0.8	2.5	3.4	1.4	..	0.2
Imports	0.8	1.4	1.0	0.7	0.4	1.0	2.3	0.9	0.4	0.9	1.8	1.0	0.4	0.7
Balance of trade	..	..	..	..	0.3	0.1	0.3	0.1	1.4	0.5	0.4	..	..	-0.1
Output volume														
Agriculture	..	-0.4	0.2	0.2	0.4	0.4	-0.1	0.1	-0.3	0.2	0.4	0.4	0.1	0.1
Resources	0.7	2.1	-0.1	0.1	0.2	-0.5	-4.6	1.0	3.1	1.0	-2.8	-1.6	0.4	0.8
Manufacturing	0.3	-0.4	0.3	0.4	-0.3	1.5	1.8	0.3	-2.1	1.3	1.2	..	0.2	..
Services	0.9	1.5	0.5	0.3	2.5	1.9	6.6	2.4	6.1	2.9	3.7	2.2	-0.1	-0.2

^a IC95 model projections. All results represent deviations from control. Most variables are measured in percentage changes, except for the balance of trade as a proportion of GDP, which is an absolute change measured in percentage points.

^b Includes Hong Kong.

Summing up

The overall dollar impact of liberalisation and facilitation initiatives on the real income of each region is shown in Table 6. It also shows the total impact for the APEC region as a whole.

The key findings are as follows:

- elimination of all trade barriers, including in services, could eventually involve real income gains of US\$303 billion per annum for APEC members, over and above what real incomes otherwise would have been;
- relatively narrow trade facilitation measures could add up to US\$216 billion, while more extensive measures covering standards, competition policy, procurement and regulation could add up to US\$442 billion, giving a maximum total of US\$745 billion;
- but excluding sensitive sectors, especially in agriculture, would dramatically reduce the economic benefits. Failure to advance agricultural liberalization beyond the Uruguay Round commitments would mean forgoing US\$106 billion of real income gains — that is 61 per cent of the total benefits of US\$175 billion from liberalization in traded goods, or 35 per cent of total trade liberalization benefits of US\$303 billion after inclusion of services. Moreover, if agriculture is excluded, US\$10 billion of annual free rider gains would flow to the EU.

Table 6: Real income gains from APEC trade liberalisation and facilitation

Change in Region	Facilitation						Liberalisation						Total gains from liberalisation and facilitation (at 5%)	
	At 5% of imports		At 10% of imports		Non-agriculture		Agriculture		Services		Total liberalisation		Real Y%	Real Y\$
	Real Y%	Real Y\$	Real Y%	Real Y\$	Real Y%	Real Y\$	Real Y%	Real Y\$	Real Y%	Real Y\$	Real Y%	Real Y\$	Real Y%	Real Y\$
Australia	1.2	5	2.5	11	0.4	2	1.2	5	2.8	12	4.4	18	5.6	23
New Zealand	2.2	1	4.5	3	0.5	..	4.1	3	5.0	3	9.6	6	11.8	8
NAFTA	0.8	70	1.5	140	..	4	0.3	23	0.5	43	0.7	70	1.5	140
Japan	0.7	39	1.4	80	0.2	8	0.8	44	0.6	34	1.5	86	2.2	125
Republic of Korea	2.3	17	4.8	35	1.0	7	0.7	5	0.5	4	2.1	16	4.4	33
Indonesia	1.9	7	4.0	15	2.0	8	0.5	2	0.4	2	2.9	11	4.8	18
Malaysia	3.7	7	7.7	14	1.6	3	1.4	2	0.8	1	3.8	7	7.5	13
Philippines	2.1	3	4.3	6	1.1	1	0.4	..	1.0	1	2.4	3	4.5	6
Singapore	5.3	9	11.2	19	9.1	16	0.8	1	7.3	12	17.2	30	22.4	39
Thailand	2.9	9	6.0	18	0.2	1	3.1	9	0.8	2	4.1	12	7.0	20
China	2.8	41	5.7	85	1.4	20	0.6	9	0.5	7	2.4	36	5.2	78
Taiwan	1.7	8	3.5	17	-0.3	-2	0.7	3	1.3	6	1.7	8	3.4	16
EU	0.1	4	0.1	9	0.3	27	-0.1	-10	0.1	8	0.3	25	0.3	29
Rest of the world	0.2	5	0.3	12	-0.2	-7	0.2	7	0.2	8	0.3	9	0.4	14
Total APEC		216		442		69		106		128		303		519

Assumptions: Trade facilitation induces a productivity improvement in the trade and transport services sector equal to 5 or 10 percent of imports.

Measured benefits do not include liberalisation under the Uruguay Round or NAFTA.

IC95 model projections. As noted in the text, IC95 probably understimates pure border protection in China post-Uruguay Round. For this table, the projected benefits from agricultural reform in China have been modified. These results are based on the assumption that agricultural liberalisation would have a similar impact on the economies of Taiwan and China (in percentage term). So freeing agricultural trade was assumed to increase real income in China by 0.6 percent compared with 0.7 percent for Taiwan.

Real income (Real Y) gains expressed in \$US are based on the estimated size of the world economy in 2010.

5 Implementation

The Bogor Declaration in November 1994 defined the end point of the APEC process — free and open trade and investment in the Asia-Pacific region. The Osaka Action Agenda in November 1995 confirmed that commitments would be comprehensive. It also began the specification of tasks by which the end point would be reached. The implementation process was taken further with the Manila Action Plan for APEC in November 1996. This incorporated Individual Action Plans, Collective Action Plans and other joint activities in various APEC forums.

The Osaka Action Agenda specified principles defining how progress should be made towards the end point. In addition to comprehensiveness, WTO-consistency, transparency and non-discrimination, the following additional principles were to be applied to ‘the entire APEC liberalization and facilitation process’:

- comparability — economies should undertake comparable liberalization and facilitation, taking into account liberalization and facilitation already achieved;
- standstill — impediments should not rise above initial levels;
- simultaneous start — impediments should begin to fall in all economies at the start of the APEC implementation process;
- continuous process — impediments should decline each year;
- significant contributions — impediments should decline substantially each year;
- differentiated timetables — economies can reduce different types of impediments in the order and at the rate they find desirable, provided that the path conforms to other guidelines; and
- flexibility — available in dealing with issues arising from the different levels of development and diverse circumstances in each economy during the liberalization and facilitation process.

Many of these principles can be seen as defining a requirement for ‘steady’ or ‘linear’ progress. The Individual Action Plans have already been evaluated in those terms (eg. Yamazawa 1997).

Yet despite the endorsement of comprehensiveness, other of the principles appear to leave the way open for economies to ‘back-load’ their liberalization efforts in sensitive areas. Petri (1997a) goes so far as to say the criteria fall short of defining a minimum acceptable *breadth* of progress.

The potential implications of this can be seen by examining the impacts of possible ‘early voluntary liberalization’ initiatives currently being developed in response to APEC leaders’ 1996 request. In discussing how to implement the Leaders’ decision, the Senior Officials Meeting early in 1997 noted that ‘any sectoral liberalization process would need to seek a balance in the broad interests of members, be subject to wide business/private sector support, and support the principle of comprehensiveness and mutual benefit’. It remains to be seen the extent to which the combined package of agreed sectors and measures from all members meets the principle of comprehensiveness. Nevertheless, the measures expected to be put

up by individual member countries tend to involve sectors in which the level of assistance in the sponsor country is relatively low.

The IC95 model has been used to examine the likely impact of liberalizing some of these sectors in isolation. Examples include non-ferrous metals (which Australia is expected to nominate), chemicals (which has been nominated by the United States and Singapore), fish (which New Zealand, Thailand and several other countries have nominated) and wood and wood products (which Canada and others have nominated).

Without presenting the results in any detail, one broad lesson from the exercise was that the larger the number of sectors to be liberalized, the larger and more uniform would be the real income gain across APEC. In total, there were projected to be widespread, but modest, gains among APEC economies.

When some sectors were considered in isolation, a few economies were projected to lose, for classic second-best reasons. The losers retained much higher tariffs elsewhere. Liberalization of lowly or moderately protected sectors caused resources to flow into other less efficient sectors, thus causing allocative efficiency losses.

These latter results highlight that the welfare losses of tariff protection are related to the dispersion in tariff levels, as much as to their levels. Taking a 'tops down' approach to liberalization can reduce the dispersion of assistance, and likely avoid second-best welfare losses. Taking a 'bottoms down' approach can increase dispersion, and create such losses.

This is not to deny that a 'bottoms down' approach may not be an important confidence building measure in the early stages of the liberalization process. As the Australian Industry Assistance Commission noted in its report on methods of achieving general reductions in protection:

The choice of a particular option depends on the relative weight placed on different government objectives. Options which emphasize the objective of encouraging the development of competitive industries tend to involve larger reductions in high rates of protection and have wider coverage whereas options which focus on the community's capacity to absorb changes have smaller reductions over a longer time period. (Industries Assistance Commission 1982, p. 1)

Nevertheless, the end point of the APEC liberalization agenda is fixed in time. In a few economies, it may be politically feasible slowly to build a consensus for a 'big bang' liberalization of sensitive sectors late in the day. In many economies, the community impact is more likely to be minimized by taking advantage of the full time frame, starting now, and making gradual 'linear' reductions in assistance, even in sensitive sectors. Not only would this likely minimize the burden of adjustment, it could also be preferable from an efficiency perspective.

6 Areas for further research

One of the conclusions of this paper is that the impacts of trade liberalization and facilitation initiatives are shown to be positive throughout the APEC region. This conclusion is shown (in Appendix B) to be relatively robust, at least in direction if not in magnitude, to variations in key parameters. Significantly, it is also shown to be robust to certain changes in model specification. Nevertheless, there is scope for further research into the reasons for the changes that are observed. There is also scope for relaxing the model's relatively constrained treatment of capital mobility. A more realistic treatment, in line with recent theories of direct foreign investment, would allow for less mobility than in the case of perfect arbitrage, but would require empirical research into how capital flows would change in response to changes in rate of return differentials. With a less severely constrained treatment of capital flows than currently, the projections shown here would tend to be amplified.

Another conclusion of this paper is that both services trade liberalization and trade facilitation measures could add significantly to the benefits from liberalization of merchandise trade. However, the analysis of the benefits of services trade is based on a set of stylized guesstimates of the current impacts of services trade restrictions. A key area for further research would be to get a more direct understanding of the nature and size of the barriers to services trade, as well as a more up-to-date estimates of the direct benefits of trade facilitation measures. The recent PECC (1995) publication is an important step in improving the information base on trade barriers within the APEC region.

APPENDIX A: KEY FEATURES OF THE IC95 MODEL

Database

The starting point for the database is the GTAP multiregion database from 1992. The World Bank subsequently released data on pre- and post-Uruguay Round tariff rates for the sectors incorporated in the GTAP and Salter models, (see, for example, Hertel et al. 1995), obtained in turn from the WTO. There has also been a first attempt at estimating the tariff equivalents of restrictions applying to services trade (reported in Brown et al. 1995, and based in turn on pioneering work by Hoekman 1995).

The World Bank pre-Uruguay tariff rates differ from those built into the original GTAP database. This raises the question of which set of starting estimates to adopt. In many cases the World Bank estimates are more dated, being centered around 1988 with some from as early as 1986. However, the World Bank estimates appear to provide more comprehensive country coverage, particularly for some of the economies in the ASEAN region. The World Bank's post-Uruguay data are obviously valuable for summarizing the offers made during the Uruguay negotiating process.

The approach here has been to replace the GTAP tariff estimates with the World Bank's pre-Uruguay estimates, except in the following cases. In agriculture, fishing, and food processing, the GTAP estimate was retained when it was higher than the World Bank's estimate. This is the approach of Hertel et al. (1995), who argue that the World Bank rates for agriculture and food may not adequately capture the tariffification of some agricultural assistance. The GTAP tariff rates were also retained in toto for the three Chinas, (the People's Republic, Hong Kong and Taiwan), regions for which the World Bank provided no data.

The tariff equivalents of restrictions to services trade reported in Brown et al. (1995) were also built into the database. As noted, these were taken in turn from work by Hoekman, who used the presence or absence of offers made during the GATS agreement as an kind of 'revealed preference' indicator of the assistance likely to be afforded currently by particular measures in each region. The procedure was then to assign tariff equivalents to individual measures (200 per cent for measures judged to be prohibitive, and rates of between 20 and 50 per cent for other measures), so as to provide a weighted average assistance estimate for each sector. The resulting estimates are high, and their cross-regional variation lacks plausibility in many instances.

These measures of assistance to services sectors suffer from at least two additional weaknesses. The scope of services trade as defined in the GATS agreement extended well beyond trade as conventionally defined. It also covered services delivered by way of permanent presence in the host country, ie. via direct foreign investment rather than via trade more narrowly defined. Particularly in a model that makes explicit provision for capital accumulation and its possible mobility, it may be preferable to model those interventions affecting capital mobility directly, rather than converting them to tariff equivalents on services trade.⁸ Hardin and Holmes (forthcoming) have made progress on quantifying separately the impediments to direct foreign investment.

In addition, the estimates assume that an absence of offers implies a prohibitive trade restriction. This is clearly arguable — a country may equally fail to make offers for a lowly assisted service sector with a strong competitive advantage. Alternative tariff equivalents are becoming available based on alternative assumptions (Warren 1996, PECC 1995).

For other forms of assistance, specifically the export subsidies and production subsidies applying to agriculture and food and the export tax equivalents of the Multifibre Arrangement, the GTAP estimates have been retained.

The resulting database incorporates the measures of assistance that predate the reductions agreed to under the Uruguay Round and NAFTA agreements. In order to exclude the influence of these agreements on the current assessment of the APEC free trade commitment, NAFTA and Uruguay Round liberalization experiments were conducted on the database to produce a database incorporating post-Uruguay and post-NAFTA levels of assistance, while taking account of the structural adjustments that these agreements will cause.

Specifically, NAFTA liberalization was modelled as the elimination of tariffs and export subsidies on trade in agriculture and food, resources and manufacturing within the NAFTA region (United States, Canada and Mexico).⁹ Starting with a post-NAFTA database, Uruguay Round liberalization was then modelled as follows. Tariffs for all sectors except services were reduced to their post-Uruguay Round

⁸ Petri (1997b) notes that about half of services trade is carried out via direct foreign investment, and uses this as a basis for applying the Hoekman estimates entirely to capital flows rather than to trade flows.

⁹ This approach does not adequately recognize the special arrangements that have been made for some sensitive products: automobiles, clothing and textiles, electronics, sugar, meat, eggs, poultry and dairy products. It is unclear the extent to which NAFTA will result in liberalisation of services trade. The agreement takes a negative list approach so that all services trade is liberalised unless explicitly excluded, but then allows a grandfathering of all existing restrictions. Snape (1995) discusses the possible interactions between APEC and other regional agreements, covering NAFTA, the Americas, AFTA and CER.

levels, using the World Bank's data on post-Uruguay tariff rates. In agriculture and food processing, export subsidies were reduced by 34 per cent in industrial countries and 24 per cent in developing countries (Inco 1995) while production subsidies were reduced by 20 per cent in industrial countries and 13 per cent in developing countries (Francois, McDonald and Nordstrom 1995). Finally, the export taxes used to model the impact of the Multifibre Arrangement were eliminated. No liberalization of barriers to services trade was included. This is based on the assessments of Hoekman (1995) and others that little or no liberalization in services was achieved in the Uruguay Round. However, the GATS agreement has served the very useful purpose of establishing a framework for future negotiation and of binding the status quo.¹⁰

These procedures produce a database with post-NAFTA, post-Uruguay levels of assistance, with which to assess the impact of the APEC commitment to free trade within the APEC region. Young and Huff (1997) have noted the importance of assessing APEC in a post-NAFTA environment. The procedures do not net out the impact of other existing trade agreements of importance in the APEC region, in particular, the ASEAN Free Trade Agreement (AFTA). However, Snape (1995, p. 9) notes that (unlike NAFTA), AFTA may be providing an alternative to APEC for some APEC members, 'and in this regard may be regarded as a "fallback" or a competitor, depending on one's perspective'.

Imperfect Competition

Many conventional models of trade incorporating the assumption of perfectly competitive industries are not perfectly competitive models at all. In particular, those that incorporate the Armington assumption allow a commodity or service from one region to be an imperfect substitute for the same commodity or service from other regions. This assumption of imperfect substitution is usually invoked in order to explain the observed phenomenon of two-way trade in a given commodity or service. However, it gives a particular region, even if it is small, a degree of market power. This manifests itself in a terms of trade decline when the region expands exports of a commodity or service, even if the region is sufficiently small that the average world price remains essentially unchanged. Examples of models incorporating the Armington assumption are Salter and GTAP.

By contrast, models that incorporate global monopolistic competition recognize that product differentiation is likely to occur at the firm, rather than the regional level. It is not so much that cars from Japan are imperfect substitutes for cars from the United States or Europe, but that Hondas are imperfect substitutes for Fords or BMWs. A model of firms producing differentiated products and competing globally therefore has some intuitive appeal.

Francois and Shiells (1994) have shown that analytically, the two approaches are very similar. They differ in only two respects. Firstly, the elasticities of substitution appropriate to firm level product differentiation tend to be larger than those used in models of regional product differentiation. This can be justified in several ways. One is simply the intuitive appeal of product differentiation at the firm level, together with the observation that firms are typically smaller than regions. Another is the observation that

¹⁰ Francois and Martin (1995) have argued that the binding process per se has a liberalizing effect, by reducing both the mean and the variance of future protection measures.

large elasticities of substitution are required before multi-country trade models can successfully reproduce historical changes in trade patterns.¹¹

Secondly, models of firm level product differentiation typically incorporate a love of variety for its own sake, so that consumers and users are better off when there are more varieties (or firms) globally than when there are fewer. Since most trade is in intermediate goods, an appealing interpretation of this love of variety in a trade context is that with more variety, a firm can buy an intermediate input that is better tailored to its own particular use. This love of variety can be modelled as a productivity improvement that occurs when the number of varieties expands, or a productivity decline that occurs when the number of varieties contracts. This can affect the productivity of the commodity in both intermediate and final use. With this love of variety, models of monopolistic competition can capture gains from trade arising from specialization in production, as well as those arising from comparative advantage. The productivity improvements associated with a love of variety tend to amplify the sectoral output adjustments that occur in conventional Armington models of trade.

Francois, McDonald and Nordstrom (1995) and IC (1995) provide examples of both these key differences. Francois, McDonald and Nordstrom also show how global imperfect competition can be built into a multiregion trade model in a particularly parsimonious fashion. With monopolistic competition, firms face increasing returns to scale but entry ensures no super-normal profits for any firm. With monopolistic competition, therefore, market power can be exploited to recover fixed costs, but no further. Under these conditions, there is a direct relationship between the extent of product differentiation and market power (as measured by elasticities of substitution between varieties) and the markup of price over marginal cost (which with free entry will be just sufficient to cover fixed costs). Francois, McDonald and Nordstrom therefore use estimates of scale elasticities obtained from engineering studies to measure markups of price over marginal cost, and hence the elasticities of substitution between varieties. These elasticity taste parameters also parameterise the extent of the productivity improvement when the number of varieties expands.¹²

Their approach, and their parameterisation, is adopted for the resources, food processing and other manufacturing sectors in the current model. In the absence of scale elasticity estimates for the remaining sectors, the 'perfect' competition, Armington treatment of Salter and GTAP is used, also as in Francois, McDonald and Nordstrom. The key parameters for the current exercise are shown in Table A1.¹³

¹¹ See Gehlhar (1997). Also required is an explicit treatment of human capital as a factor of production. There is no skill differentiation of labour in the current version of IC95.

¹² Under the assumptions they adopt, output per firm is fixed, so that industry output can be used as an indicator of the number of firms, and hence the number of varieties. Richer treatments of monopolistic competition (eg. Brown et al. 1995) allow output per firm and hence average production costs to adjust, leading to the possibility of additional procompetitive effects associated with trade liberalization.

¹³ In common with Brown et al. (1995), however, it was found that the productivity improvements associated with love of variety introduced model instability when parameterised strictly according to a Dixit-Stiglitz (1977) aggregator function. In this exercise, productivity is assumed to increase when industry output (the indicator of number of varieties) increases, but only at a tenth the rate suggested by a Dixit-Stiglitz aggregator. Brown et al. (1995) used a dampening factor of one half. Note that Brown et al. also extend their treatment of imperfect competition to the services sector (see Brown, Deardorff and Stern 1995).

Table A1: Key elasticities in the IC92 model

	<i>Inverse Scale^a</i>	<i>Domestic/Import^b Armington</i>	<i>Import/Import^b Armington</i>	<i>Primary Factor Substitution^c</i>
Paddy rice		2.2	4.4	0.56
Wheat		2.2	4.4	0.56
Other grains		2.2	4.4	0.56
Non-grain crops		2.2	4.4	0.56
Wool		2.2	4.4	0.56
Livestock products		2.8	5.6	0.56
Forestry		2.8	5.6	0.56
Fishing		2.8	5.6	0.56
Coal	0.95	20.0	20.0	1.12
Oil	0.95	20.0	20.0	1.12
Gas	0.95	20.0	20.0	1.12
Other minerals	0.95	20.0	20.0	1.12
Processed rice	0.85	6.7	6.7	1.12
Meat products	0.85	6.7	6.7	1.12
Milk products	0.85	6.7	6.7	1.12
Other food products	0.85	6.7	6.7	1.12
Beverages & Tobacco	0.85	6.7	6.7	1.12
Textiles	0.86	7.1	7.1	1.26
Wearing apparel	0.87	7.7	7.7	1.26
Leather & fur	0.88	8.3	8.3	1.26
Lumber & wood products	0.86	7.1	7.1	1.26
Pulp, paper & printing	0.86	7.1	7.1	1.12
Petroleum & coal products	0.92	12.5	12.5	1.26
Chemicals, rubber & plastics	0.85	6.7	6.7	1.26
Non-metallic minerals	0.88	8.3	8.3	1.26
Iron & steel	0.87	7.7	7.7	1.26
Non-ferrous metals	0.86	7.1	7.1	1.12
Fabricated metal products	0.88	8.3	8.3	1.12
Transport equip	0.85	6.7	6.7	1.26
Other machinery & equipment	0.85	6.7	6.7	1.26
Other manufacturing	0.88	8.3	8.3	1.26
Electricity, gas & water		2.8	5.6	1.26
Construction		1.9	3.8	1.40
Trade & transport		1.9	3.8	1.68
Private services		1.9	3.8	1.26
Govt services		1.9	3.8	1.26
Ownership of dwellings		1.9	3.8	1.26

^a Under the assumptions in the model, inverse scale elasticities measure the ratio of marginal cost to average cost. For data sources on scale elasticities, see Francois, McDonald and Nordstrom (1995).

^b For industries where inverse scale elasticities (s) are available, the Armington elasticities are given by $1/(1-s)$. For other industries, the Armington elasticities take the values normally used in the Salter and GTAP models.

^c Taken from the GTAP model.

Capital accumulation

The model used for the current exercise makes provision both for capital to accumulate in a given region, and for foreign borrowing to further facilitate the mobility of capital between regions, using the approach in the Salter model (McDougall 1993). In the current exercise, regions are permitted to accumulate capital, but only in a way that keeps their debt to income ratios fixed. Essentially, this means they must fund domestically any additional capital accumulation that would not have taken place otherwise.¹⁴

There are two possible justifications for this. One is the empirical observation, originating with Feldstein and Horioka (1980), that capital appears to be far from perfectly mobile internationally. The other is that imposing a fixed debt-to-income ratio is akin to imposing a terminal condition, given the long-term snapshot view of the current exercise, that regions cannot accumulate debt ‘forever’.

A preferable approach, and an area for further research, would be to implement a treatment of partial capital mobility that is consistent with more recent theories of foreign direct investment (see Markusen 1995 for a useful summary). Petri (1997b) has made a very promising start in that direction.

Other key assumptions

In most regions, both labour supplies and employment rates are held fixed (more precisely, are held at the values they otherwise would have had without the trade liberalization in question). This means that the beneficial labour market impact of trade liberalization is absorbed in the form of higher wages rather than higher employment levels.

There has been some debate in the literature as to whether this is the appropriate treatment for economies with a significant share of the labour force in subsistence agriculture. Dee, Jomini and McDougall (1996) have shown that one alternative treatment, in which employment varies enough to hold real wages fixed, can have a strong impact on the projected results from trade liberalization scenarios. However, there is ample evidence of strong real wages growth historically in economies with large agricultural sectors (World Bank 1995), so that the assumption of fixed real wages in a trade policy context is probably too extreme. On the other hand, evidence on unemployment and underemployment is still too patchy or untrustworthy to provide a reliable alternative means of gauging the potential employment gains from trade liberalization.

The current treatment is based on studies that have shown a reasonable degree of wage responsiveness of labour supply among households in subsistence agriculture. The distinguishing feature of these households is that consumption and production decisions are consolidated into a single decision-making unit. One study has shown wage elasticities of labour supply in the range 0.1 to 0.3 (Singh, Squire and Strauss 1986). For economies where more than 20 per cent of the workforce is in non-wage employment in agriculture (World Bank 1995, the economies being Malaysia, Indonesia, Philippines, Thailand and China), the elasticity of labour supply with respect to (post-tax) wages has been set at 0.2.

¹⁴This treatment is very much like the ‘endogenous capital, fixed savings rate’ treatment in Francois, McDonald and Nordstrom (1995).

This treatment raises a second, related issue. The current model contains a treatment of government finances along the lines of the Salter model. This allows IC95 to quantify the lost tariff revenue associated with trade liberalization. In most regions, income tax rates on labour and non-labour income are assumed to increase equiproportionately so as to maintain government savings rates constant in the face of reduced tariff revenues, and the other changes precipitated by trade reform. In a few economies, tariff revenue constitutes a significant share of government revenue initially, so that the required changes in income tax rates can be substantial. In one case, Thailand, the induced increase in income tax rates on labour income was enough to ensure a reduction in post-tax wages, despite upward movement in pre-tax wages. This in turn induced a negative labour supply response, a result judged to be implausible. For Thailand and the Philippines, economies where income tax revenue is a relatively small share of total revenue *and* where implied labour income tax rates are very much higher than non-labour income tax rates initially, the burden of adjusting to lower tariff revenue was assumed to fall on non-labour income taxes alone.

APPENDIX B: SENSITIVITY ANALYSIS

The projected results from economic models can be sensitive to the values chosen for their demand and supply parameters, all of which are subject to some uncertainty. But economic models can also be sensitive to changes in their theoretical structure (see also Francois, McDonald and Nordstrom 1995).

This appendix tests the sensitivity of the key results of this paper to variations in both parameter values and theoretical structure. The sensitivity analysis is conducted on the projected implications of APEC trade liberalisation (the base case reported in Table 2), with the results reported for the model's welfare measure, real income, and its key components, real GDP and the terms of trade.

The base values for the key parameters of IC95 that determine the responsiveness of supply and demand were shown in Table A1 of Appendix A.

Because of the restrictions on international capital mobility assumed in IC95, the model does not project major changes in capital/labour ratios in any region. The model results therefore prove to be relatively insensitive to variations in the primary factor substitution elasticities, since these supply side parameters are not required to play a major role. Thus this appendix only reports sensitivity to the key demand parameters, these being the elasticities of substitution between imports from different sources and the elasticities of substitution between imported and domestic goods.

The first set of results, reported in Tables B1 to B3, show the effect on the welfare variables of varying these Armington elasticities uniformly by plus and minus 25 per cent, and by plus and minus 50 per cent. Real GDP and real income both prove to be approximately linear in the parameters, with both increasing for higher values of the trade parameters. The only sign reversals occur for real income in China when the elasticities are reduced by 50 per cent, and in real GDP in the Rest of the World when they are increased by 50 per cent.

While the terms of trade also appear to be approximately linear in the parameters, the direction of the response depends on each region's trade balance (the value of exports at fob prices less the value of imports at cif prices). The terms of trade effects are positively related to movements in the trade elasticities for net importing regions (eg. NAFTA, Singapore) and negatively related for net exporting regions (eg. Australia, New Zealand). The increased competition created by greater substitutability between imports from different sources and between imports and domestic goods forces domestic firms to improve their efficiency more in the face of a given tariff cut. The larger cost reductions from import-competing firms mean that the average world prices of all commodities are reduced below what they were with lower trade elasticities. For net exporting regions this reduction in world prices has an unfavourable terms of trade effect, while the opposite is true for net importing regions. Again the only case of a sign reversal in the terms of trade effect occurs with a 50 per cent reduction in parameters, this time for Taiwan.

The results of this paper may also be sensitive to the model's theoretical structure, and so sensitivity analysis is conducted on the implementation of imperfect monopolistic competition.

The second set of results in Tables B4 to B6 show the effects of implementing an imperfect monopolistic competition treatment for the resources, food processing and other manufacturing industries, industries for which estimates of the necessary scale elasticities were available. As described in Appendix A, this treatment involved two key changes to the Armington-style perfectly competitive model. Firstly, the

import substitution elasticities of the relevant industries were increased, and secondly, variety scaling of output was introduced. The tables show results for an Armington-style competitive model (using the standard Armington elasticity values from the Salter or GTAP models), the individual effects of the two additions, and then their combined effects.

The results in Table B4 show that for most regions, increasing the trade elasticities for the relevant subset of industries increases real GDP, while adding variety scaling causes only marginal changes compared with the standard Armington-style perfect competition model. Appendix A notes, however, that variety scaling has been introduced at only a tenth the rate suggested by the theory. Overall, the combined effects produce larger real GDP gains for most APEC regions, reinforcing the view that the modelled gains from specialisation tend to reinforce the gains from allocative efficiency.

The results for the terms of trade in Table B5 prove to be much more sensitive to variations in model specification. Part of the reason appears to be that the changes have been instituted primarily in manufacturing industries, and models such as this appear to be very sensitive to what happens in the manufacturing sector. The variations in model specification are significant enough to cause sign reversals in projected terms of trade changes in four of the regions — Australia, NAFTA, Thailand and Taiwan. The combined effects on terms of trade are dominated by the trade elasticity increase.

Despite this, the results for real income are less sensitive to variations in model specification. In most regions, the modelled gains from greater specialisation are projected to reinforce those from allocative efficiency, and in no case is there a sign reversal.

As stated in the paper, the results of this sensitivity analysis offer comfort in the robustness of the qualitative results presented.

Table B1: Implications of APEC trade liberalisation for real GDP — sensitivity to variations in Armington elasticities

	<i>minus</i> 50%	<i>minus</i> 25%	<i>base</i> <i>case</i>	<i>plus</i> 25%	<i>plus</i> 50%
Australia	1.47	2.36	3.41	4.68	6.20
New Zealand	2.50	3.91	5.63	7.66	10.00
NAFTA	0.28	0.44	0.65	0.89	1.16
Japan	0.78	1.18	1.53	1.88	2.23
Korea	2.26	3.05	3.86	4.68	5.51
Indonesia	2.29	3.60	5.12	6.83	8.72
Malaysia	1.98	3.33	4.89	6.68	8.75
Philippines	2.57	3.34	4.17	5.06	6.00
Singapore	3.81	5.33	6.86	8.41	10.02
Thailand	2.42	3.42	4.47	5.65	7.05
China	1.32	2.17	3.12	4.16	5.30
Taiwan	0.56	0.96	1.40	1.90	2.45
EU	0.02	0.03	0.03	0.03	0.03
ROW	-0.08	-0.06	-0.04	-0.02	0.01

Table B2: Implications of APEC trade liberalisation for terms of trade — sensitivity to variations in Armington elasticities

	<i>minus</i> 50%	<i>minus</i> 25%	<i>base</i> <i>case</i>	<i>plus</i> 25%	<i>plus</i> 50%
Australia	2.37	1.91	1.35	0.90	0.54
New Zealand	6.76	5.54	4.80	4.36	3.92
NAFTA	0.13	0.17	0.24	0.32	0.43
Japan	-2.35	-2.14	-1.95	-1.81	-1.69
Korea	-4.15	-3.82	-3.67	-3.57	-3.50
Indonesia	-4.98	-5.03	-5.24	-5.48	-5.72
Malaysia	-2.30	-2.36	-2.39	-2.40	-2.41
Philippines	-5.16	-4.48	-4.19	-4.01	-3.87
Singapore	2.85	2.87	2.92	2.94	2.93
Thailand	-1.24	-0.53	-0.28	-0.17	-0.07
China	-2.70	-2.59	-2.54	-2.54	-2.56
Taiwan	0.21	-0.16	-0.41	-0.59	-0.73
EU	1.67	1.67	1.72	1.80	1.87
ROW	0.77	0.81	0.91	1.01	1.10

Table B3: Implications of APEC trade liberalisation for real income — sensitivity to variations in Armington elasticities

	<i>minus 50%</i>	<i>minus 25%</i>	<i>base case</i>	<i>plus 25%</i>	<i>plus 50%</i>
Australia	2.33	3.29	4.38	5.72	7.36
New Zealand	6.39	7.75	9.57	11.86	14.42
NAFTA	0.36	0.53	0.74	1.00	1.29
Japan	0.62	1.09	1.51	1.92	2.33
Korea	0.29	1.23	2.11	2.97	3.84
Indonesia	0.35	1.56	2.88	4.34	5.95
Malaysia	0.85	2.23	3.84	5.71	7.87
Philippines	0.37	1.44	2.40	3.37	4.38
Singapore	13.05	15.06	17.16	19.21	21.23
Thailand	1.28	2.79	4.08	5.43	7.03
China	-0.15	0.77	1.75	2.80	3.95
Taiwan	1.01	1.29	1.65	2.10	2.62
EU	0.26	0.27	0.29	0.30	0.31
ROW	0.16	0.20	0.25	0.31	0.38

Table B4: Implications of APEC trade liberalisation for real GDP — sensitivity to variations in model specification

	<i>Armington-style</i>	<i>Higher trade elasticities</i>	<i>Variety scaling</i>	<i>Base case (both)</i>
Australia	2.75	3.38	2.78	3.41
New Zealand	5.51	5.66	5.52	5.63
NAFTA	0.53	0.64	0.53	0.65
Japan	1.05	1.48	1.09	1.53
Korea	2.43	3.63	2.55	3.86
Indonesia	3.63	4.50	4.19	5.12
Malaysia	3.01	4.57	3.13	4.89
Philippines	3.10	3.96	3.30	4.17
Singapore	5.37	7.02	5.12	6.86
Thailand	3.53	4.35	3.66	4.47
China	2.00	3.08	2.04	3.12
Taiwan	1.43	1.38	1.43	1.40
EU	0.04	0.04	0.03	0.03
ROW	-0.02	-0.01	-0.05	-0.04

Table B5: Implications of APEC trade liberalisation for terms of trade — sensitivity to variations in model specification

Armington-style perfect Higher trade elasticities Variety scaling Base case (both)

Australia	-0.65	1.30	-0.64	1.35
New Zealand	2.98	4.80	2.97	4.80
NAFTA	-0.13	0.19	-0.10	0.24
Japan	-2.82	-1.97	-2.81	-1.95
Korea	-2.87	-3.55	-2.96	-3.67
Indonesia	-1.37	-4.69	-1.61	-5.24
Malaysia	-1.38	-2.25	-1.44	-2.39
Philippines	-1.58	-3.89	-1.68	-4.19
Singapore	3.19	2.89	3.24	2.92
Thailand	0.08	-0.23	0.03	-0.28
China	-1.17	-2.45	-1.21	-2.54
Taiwan	0.22	-0.38	0.19	-0.41
EU	1.37	1.67	1.40	1.72
ROW	1.14	0.91	1.12	0.91

Table B6: Implications of APEC trade liberalisation for real income — sensitivity to variations in model specification

Armington-style perfect Higher trade elasticities Variety scaling Base case (both)

Australia	3.16	4.33	3.20	4.38
New Zealand	8.40	9.59	8.41	9.57
NAFTA	0.55	0.73	0.56	0.74
Japan	0.86	1.46	0.90	1.51
Korea	1.10	1.94	1.19	2.11
Indonesia	3.14	2.55	3.58	2.88
Malaysia	2.72	3.66	2.79	3.84
Philippines	2.73	2.34	2.90	2.40
Singapore	15.85	17.23	15.69	17.16
Thailand	3.18	3.97	3.29	4.08
China	1.42	1.76	1.44	1.75
Taiwan	1.98	1.66	1.97	1.65
EU	0.24	0.29	0.23	0.29
ROW	0.31	0.29	0.27	0.25

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Comments by Jeffrey Lewis on
Strategic Interests of ASEAN in Regional Trading Arrangement in the
Asia-Pacific Region
by Innwon Park, Kong-Yam Tan, and Mun Heng Toh

and

The Comprehensiveness of APEC's Free Trade Commitment
by Philippa Dee

I am going to exercise the power of the Chair to add a few remarks of my own, some of which have been anticipated. First of all, I felt more comfortable because of the long footnote at the bottom of Philipps Dee's paper with the organizational changes. I work for the World Bank, where we have been having changing acronyms and changing organizations forever. Second, is this the same Department of Foreign Affairs that worried so much about numbers they left the documents outside the Pacific Forum Conference on the table? Okay. I feel comforted too.

I have decided to start by trying to list the stylized facts of these kinds of multicountry models. We now have hundreds of examples and variants. One no longer needs to explain every tiny component, but can instead start from a common view of the broad, stylized facts and conclusions.

The first fact or conclusion is that all participants in a regional liberalization exercise or free trade agreement benefit, particularly, as Philippa just pointed out, when the liberalization is comprehensive and includes all sectors. Most cases that reach alternative results involve only selected and pathological sectors that usually have very specific explanations.

The second conclusion or stylized fact addresses the early concern about spreading free-trade regional agreements, that they could have a detrimental effect on those left out, as if trade created within a free-trade agreement would come at the expense of trade outside the region, or that trade diversion would exceed trade creation. This has not been the case, not even in apparel 5 years or so after NAFTA, nor anywhere in this broad class of models. Trade creation almost always exceeds trade diversion, usually by a factor of 4 or 5 or 8.

The third stylized fact, which Philippa highlighted, is that the size of the country gain is more or less proportional to the size of the liberalization that the country is undertaking. This is her Epsilon T squared: the more you offer, the more you gain. Some exceptions occur, as Innwon Park's paper suggested. In some cases, the regional pattern and choice of partners matters: who is included and who is not. But, the more you offer, the more you gain. Now, what does all this mean? If we think of the plain vanilla kind of multicountry CGE model, we get positive gains that are proportional to the size of what is offered up. But the numbers are not big: really just small percentages of GDP. They are quarter-percentages or less for the large countries, for example, the United States or NAFTA agglomerations, and a little bit bigger perhaps for Japan. Numbers get bigger for smaller economies.

This leads to the next line of inquiry; "the search for large numbers." When we look for numbers larger than one-quarter percent of GDP, we implicitly believe other things are going on. These models tend to get extended to create larger gains, or to capture some of the effects that we think produce larger gains. We build in larger gains by building in some kind of productivity gain. This is the

approach taken in Park's paper that began from our model, where direct links occur between trade expansion as a result of liberalization and the productivity with which existing resources are used. As another example, Philippa's model took in gains from trade facilitation. Another approach is to build in bigger distortions. We benchmark models with bigger distortions because when we eliminate these distortions, we get bigger gains. This time-honored approach goes back to the early single-country work. In such work, the gains that would accrue from trade liberalization were much bigger when one built in big rents to begin with, not just official tariffs. In fact, Shujiro Urata, who is here today, and I tried to produce large estimated numbers for Turkey. If you build in big distortions and remove them, you then get bigger gains. A third approach is imperfect competition which, as Philippa argued, is no longer really a bell and whistle but a prominent feature in a whole series of models, linked to the underlying Armington story and not all that different. My point here is that countries gain: the more you offer the more you gain. After recognizing that, we should confirm validity and model parameterization as the next set of issues, which is how big the numbers are and how well designed and developed the stories are that motivate them. For example, the big gains from service sector liberalization in the story very much derive from the tariff equivalent of 100 percent, which was built in from the start, whereas the tariff equivalents for the manufacturing sector in many of these economies, including the developing economies is 10-20 percent. Thus, one gets large gains from service sector liberalization.

I think another area of importance is trade facilitation and "reality checking" the numbers. I found the estimates of the size of these effects to be low, particularly for many of the developing countries. If one were to look at the potential impact of import-clearing procedures and harmonization and elimination of such procedures in an economy such as Indonesia (where I worked for many years), you can get far larger estimates of the gains that might occur based on micro surveys of importers. For example, the famous experiment in Indonesia occurred when management of the customs clearance process was taken away from the customs authorities and replaced it with the international surveyor SGS. Clearing times for imported shipments of goods dropped by 85 percent, from somewhere like 23 days down to 2 or 3 days average. And the importers swore that it was saving them on the order of 10 to 20 percent of the cost of the shipment to clear their goods that fast. So these potential gains could be enormous, particularly for economies where institutional structures do not necessarily work well.

We have not talked much about service sector liberalization in the past, largely for two reasons: first, none of the earlier global liberalizations had service sector liberalization on the table, so that was a good reason not to consider it. And second, even when we considered it, we did not treat it because it poses difficulties to the way we think about liberalization, particularly to our whole approach towards tradability and choices of import versus domestic. And so I think one question that has to be asked is whether our paradigm--whether an Armington paradigm or an imperfect monopolistic competition paradigm of substitutability based on price--is the right way to approach service sector liberalization.

If you walk into a bank in Jakarta--whether a domestically owned bank or a domestic branch of a foreign bank--you know that nearly all of the inputs and nearly all of the labor and nearly all of the capital are Indonesian, and not Australian or American or anything else. So it is not clear that your choice is between a "domestically produced" Indonesian good with domestic inputs or a "foreign produced" good made with U.S. or Australian inputs. Nor is it clear that price sensitivity matters. Those who pursue liberalization must think more about the way that these choices can be modeled.

Comments by Mary E. Burfisher on

“Strategic Interests of ASEAN in Regional Trading Arrangements in the Asia-Pacific Region,” by Park, Innwon; Tan, Kohn-Yam; and Toh, Mun-Heng,

REVIEW

Park, Tan and Toh provide a very capable analysis of the impacts of alternative regional trading arrangements in the Asia-Pacific region on the five members of ASEAN. Their analysis draws mainly from the results of a global computable equilibrium model, and is enriched with a broader discussion of the political and economic motivations for ASEAN members' trade policies. Their main conclusion is that the larger the free trade area, the greater the gains for each of the ASEAN countries in terms of GDP growth, exports, and output. The largest free trade area that they consider is among the 18 members of APEC. The smallest is among the five ASEAN countries.

This is an outcome that we might expect based on economic theory. The more member countries, the more likely it is that a free trade area includes complementary economies with potential for trade creation, and the smaller the scope for trade diversion. The authors provide a good background discussion of the underlying trade and production data in their model. They note that ASEAN countries have competitive production structures, and relatively larger trade flows with non-ASEAN APEC members compared to intra-ASEAN trade. This discussion provides some intuition into their model results and policy conclusions.

An important feature of their analysis is their incorporation of trade and productivity links. In this way, they attempt to capture the mechanisms behind the tremendous, apparently trade-related, economic growth that has been observed in these countries over the past two decades. They model a relationship between export growth and increased productivity of labor, capital, and land. They also incorporate the relationship between increased imports of intermediates and capital goods, and factor productivity. Even so, the projected impacts of free trade agreements on ASEAN countries are found to be extremely small. ASEAN GDP increases only 0.34% under an ASEAN free trade area, and only 2% under an APEC free trade area.

While their model results are certainly credible, it would be useful if the authors had provided more insight into what drives them. For example, what share of the expected GDP growth under the alternative free trade scenarios is accounted for by productivity growth, and does this vary by country? Likewise, base data on the sectoral trade barriers would help to give a sense of the significance of trade liberalization for these economies. Assumptions about countries' export supply and import demand elasticities would help to explain both the magnitude of the impacts of alternative free trade arrangements, and the differences in effects among ASEAN members. The text is not clear about the authors' factor mobility assumptions. If, in fact, both land and labor are sector specific within each region, as they state, this would help account for small impacts. Although why this very restrictive assumption, or any factor mobility assumption, is made ought to be explained. The authors might consider including their welfare results. While they provide real GDP impacts, these are not necessarily of the same sign as welfare changes. These are simply suggestions for elaborating on what is already a strong paper.

One of the main contributions of this paper is its insight into strategic issues. In particular, the authors develop some important conclusions regarding the divergent interests of the ASEAN members

regarding expansion options. All ASEAN members gain from each successive expansion of ASEAN (in terms of GDP growth) and have the largest GDP gains under the largest free trade arrangement, APEC. However, some members gain more from expansion toward China than from expansion toward the U.S. This is the type of outcome that has raised concerns about the relationship between regionalism and multilateralism, and in particular, whether regional trade agreements are likely to lead, through membership expansion, to global free trade. On one hand, the authors' results suggest the possibility that some countries, if able to dominate the ASEAN trade policy agenda, would derive much of their gains from expanding ASEAN only within Asia, and may not derive sufficient additional gains to make pursuit of a full APEC worthwhile. On the other hand, the authors find positive, if unequal, incentives for all ASEAN members to expand to the largest possible union.

While the authors already provide a thorough analysis of ASEAN's free trade options, their discussion has also stimulated some ideas about some additional areas to consider. One is the possible disparities in trade-productivity links among APEC countries, particularly the possibility of relatively rapid productivity growth in China. A second is the expansion of ASEAN under open regionalism, the MFN-based approach to regional trade liberalization that has been proposed for APEC. These model extensions might generate some very different and useful insights into ASEAN members' incentives to expand their regional trade agreement beyond AFTA and beyond Asia.

Comments by Wang Zhi¹ on

“The Comprehensiveness of APEC’s Free Trade Commitment”

by Philippa Dee

In this paper, Philippa Dee presents a comprehensive assessment of the impact of APEC trade liberalization, including liberalization in both merchandise and services trade, as well as savings from trade and investment facilitation measures. Starting from the GTAP database, the author has amassed and synthesized an enormous amount of additional data and evidence from other sources in the process of constructing and calibrating the IC95 multi-regional CGE model. Having struggled myself with these same data, and been frustrated by the inconsistencies that exist, her capable efforts in reconciling the base year data with post-NAFTA, post-Uruguay protection levels alone should be highly praised.

Turning to the policy implications, her results highlight the importance of all sectors being included in APEC’s goal of free and open trade. She found that both services trade liberalization and trade facilitation measures can add significantly to the benefits from liberalization of merchandise trade. However, if sensitive sectors such as agriculture were excluded, the economic benefits would be dramatically reduced for most APEC countries. This result is not surprising given the structure of the IC95 model and its base year data which net out the impact of the Uruguay Round and NAFTA agreements. Agriculture is a major sector of unfinished business from the Uruguay Round. There are high protection rates for food and agriculture products, for example, remaining in East and South East Asia. With the freer play of comparative advantage after APEC trade liberalization which includes agriculture, more efficient resource allocation across the region will lead to significant efficiency gains across APEC economies and increases in import demand for food and agriculture products, particularly in East Asia. Therefore, the welfare gain both for major exporting and importing economies would be substantial.

However, because of the static nature of the IC95 model and the comparative statics counterfactual experiments design used by the author, it is not possible to show that the contribution from agriculture to total welfare gains will decrease during the course of APEC trade liberalization as agreed to in the Bogor Declaration. There are two major reasons. First, the time table for liberalization is 2010 for industrial countries and 2020 for developing countries. East Asia’s newly industrialized economies such as Singapore and Taiwan have declared their intention to participate in the same time table as industrial countries. Since agriculture resources in APEC’s developing economies such as ASEAN are more abundant than economies like Japan, Korea and Taiwan, which are planning to fully liberalize in 2010, the contribution from agricultural reform will be relatively less after 2010. Second, demand for agricultural products is less elastic than other commodities. As the share in total demand for agriculture and food products decreases along with economic growth, its contribution to total welfare gains from APEC trade liberalization will also decline over time.

Another valuable contribution from Dee’s study is the attempt to examine the cost savings from trade facilitation measures in addition to trade liberalization. This effort broadens the policy coverage normally covered in exercises conducted by CGE models. However, it is not very clear from her paper how

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this is implemented in the IC95 model. It may be more convincing if she were to interpret these facilitation measures as a means to reduce transaction costs for all commodity trade. Because there are delivery costs associated with each bilateral trade flow in the GTAP data base, it will be very easy to assume a uniform reduction across all sectors and regions in the model as a proxy for immediate results from trade facilitation offers. The indirect impact of these reductions on other parts of the global economy then can be evaluated similar to other trade impediment reductions. Since these transaction demands are supplied by the trade and transportation service sector in each region, a reduction in trade delivery costs would also induce direct resource savings to the sector (use less resources but deliver more goods to consumers), a consequence that Dee was trying to analysis.

Most trade liberalization exercises based on CGE models are concentrated on merchandise trade, with the notable exception of Brown et al (1995), due to the lack of systematic information on services trade barriers. The only available source of service trade barriers is the work by Hoekman(1995). In order to cover the impact of trade liberalization in the services sector, the tariff equivalents of restrictions to services trade that “guesstimated” by Hoekman were built into the base year data of Dee’s study. It is the first attempt that I am aware of to cover services in an assessment of APEC trade liberalization. Although the results provide some sense of the relative importance of barriers to services trade and the interactions between the goods and services sectors when those barriers are removed, they should, at best, be considered only as indicative, given the weakness and arbitrariness of Hoekman’s guesstimates.

Besides the problems underlying the protection data used in this study, simulation results from CGE models are also conditional on estimates of various elasticities and other parameters used in the model, and are often criticized by econometricians because the uncertainty surrounding those estimates may dwarf the quantitative results predicted by the model. In addition to parameter sensitivity, the results are also sensitive to changes in model specifications (Francois, et al., 1995).

In response to these concerns, Philippa Dee reported the results from conditional sensitivity analyses of import substitution elasticities by varying those parameters uniformly in her study and found that key simulation results such as the real GDP and the real income are approximately linear with respect to those parameters. However, as Harrison, et al. (1993) have pointed out, such procedures often overstate the robustness of model results in a multi-variate context. Unconditional Systematic Sensitivity Analysis (USSA) is recommended as an alternative. In such a procedure, a distribution is assumed for each uncertain parameter (assuming the parameters are independently distributed), and a certain number of parameter values are randomly selected based on discrete approximations of their distribution. The model is then solved for all possible combinations of the selected point values of the parameters, and estimates of the mean and standard deviation for the model's major endogenous variables are generated. Such an approach is obviously superior than what used in this study. In order to overcome the tremendous computational requirements caused by dimension explosion in USSA procedure,² Orthogonal Design, an experiment design method widely used in natural sciences, may be introduced to reduce the computation difficulties may involved in the analysis(Wang, 1997).

² As noted by Harrison, et al. (1993), in a model with M uncertain parameters and a sample size of N for each required model solution under USSA would be N^M times.

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SESSION IX

***GENERAL EQUILIBRIUM MODELING OF TRADE
LIBERALIZATION B***

The Cost of Regulation in the Japanese Service Industry

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This is a substantial revision of Kawai and Urata (1997).

The Cost of Regulation in the Japanese Service Industry

Hiroki Kawai and Shujiro Urata

The Japanese service industry has expanded rapidly, accounting for more than three-quarters of its GDP or employment in the 1990s. However, the Japanese service industry suffers from inefficiency and the prices of services are high. These unfavorable characteristics of the Japanese service industry, which are largely due to extensive regulations, result in substantial costs to the Japanese economy. The simulation results, using a CGE model, indicate that the cost of regulations in the service industry is as large as nine percent of GDP. The cost to an average Japanese consumer would be approximately 270,000 yen or US\$2,300.

I. Introduction

As is the case in other developed countries, the service sector has become increasingly important in the Japanese economy. Its share in total value added and employment rose respectively from 67 and 62 percent in 1980 to 76 and 73 percent in 1993. Despite a rapid expansion of the service sector, a number of service markets are regulated through a variety of forms. For example, entry into most service markets such as transportation and communications needs an approval of the government, and most service prices have to be approved by the government or reported to it. This is a quite a contrast to the manufacturing sector, where regulations have been largely liberalized.

A regulated service market limits competition and results in high prices and low productivity. Consumers lose on both counts, while producers lose when they are forced to pay high prices for intermediate services such as transportation or communications. Since the service sector accounts for a large part of the Japanese economy, inefficiency of the service sector influences Japan's economic activities at sectoral as well as overall levels.

This paper examines quantitatively the cost of Japan's regulated service market by undertaking counterfactual simulations with the use of a computable general equilibrium (CGE) model.¹ Through provision of a virtually realistic "economy", CGE models enable one to examine effectively the impact of policies such as regulations on the economy.

The paper begins with a brief description of the service sector in Japan, setting the stage for the following analyses, then turns to an analysis of the cost of regulation in the service sector. The final section offers concluding comments.

II. The Service Sector in the Japanese Economy

While the service sector in Japan expanded rapidly over time, there are wide variations between sub-sectors of services (Table 1). In terms of output (value added), construction, distribution, and real estate account respectively for 10.3 (9.4), 9.9 (13.8), and 6.5 (11.1) percent of all industries.² As for employment, the distribution sector has by far the largest share, accounting for 20 percent of total employment, followed by construction at 10 percent. Being labor intensive, distribution's share in total employment is significantly greater than its corresponding share in output or value added.

To investigate further the importance of the service sector, we computed the impact of the price change of a particular service on the overall prices by taking inter-industry linkages into consideration.³ The computed values are shown in the last column of Table 1. For example, a 1 percent decline in the price of construction leads to 0.05 percent decline in overall price level. Among the service sub-sectors, the

¹ A number of studies have been undertaken by using CGE models. Most of them examined issues related to foreign trade and fiscal measures. See Robinson (1988) for a survey of CGE models. For a more recent survey, see Garbaccio and Plummer (1997).

² "Other services", including government services, restaurants, and medical services, account for a large part of the service sector, as shown in Table 1.

³ We used a 162x162 input-output table for 1993, and produced a 162x162 matrix consisting of the magnitude of the impact of price changes in sector *i* on sector *j*, where *i* and *j* range from 1 to 162.

Table 1: The Service Sector in the Japanese Economy: 1993

Sector	Output		Value Added		Employment		Labor Productivity Total=1.0	Impact of price changes on overall price
	Trillion yen	share (%)	Trillion yen	share (%)	1,000	share (%)		
I Agriculture, Forestry and Fishery	17441	2.0	9198	2.2	4455	6.9	0.318	0.0307
II Mining	2027	0.2	978	0.2	94	0.1	1.609	0.0033
III Manufacturing	317183	36.7	105256	24.9	12912	19.9	1.255	0.2981
IV Services	521648	60.4	322411	76.4	47526	73.1	1.044	0.7427
Construction	88779	10.3	39706	9.4	6511	10.0	0.939	0.0522
Public Utilities	21873	2.5	12155	2.9	505	0.8	3.707	0.0373
Distribution	85357	9.9	58240	13.8	13609	20.9	0.659	0.1351
Financial/Insurance Services	28888	3.3	19405	4.6	2056	3.2	1.453	0.0579
Real Estate	56199	6.5	46675	11.1	762	1.2	9.430	0.0778
Transportation	34783	4.0	19720	4.7	2891	4.4	1.050	0.0522
Communications	13317	1.5	9605	2.3	752	1.2	1.967	0.0295
Other Services	192450	22.3	116905	27.7	20440	31.4	0.880	0.3007
Total	864122	100	422221	100	64994	100	1.000	1.0747

Source: Computed from the *Input-Output Table 1993*, Management and Coordination Agency.

impact of price changes in the distribution sector is particularly large: a 1 percent decline in the price of distribution would result in 0.13 percent decline in the overall price level. Because distribution services are used extensively as inputs in the production of other sectors, a decline in their price would benefit other Japanese producers greatly.

Because regulations are likely to affect prices and technical efficiency, we compare the Japanese service sector to that of the U.S. with respect to their prices and TFP (total factor productivity) levels. Table 2 shows these differences for 162 sectors in 1990. The figures are constructed in such a way that the U.S. value is unity. They reveal that the prices of services in Japan are significantly higher and TFPs are lower than those in the U.S.

The prices of construction, financial, transportation, and other services in Japan are more than double their U.S. counterparts.⁴ In particular, the prices of road freight transport and storage, building maintenance, legal and accounting services, and other business services are very high. There are only four service sub-sectors where the prices in Japan are lower than those in the U.S.: air transport and related services, education and research, non-profit organization, and medical and health services. For twelve service sub-sectors out of forty-eight sub-sectors, the TFP level in Japan is higher than that in the U.S. Some of these sub-sectors include medical and health services, education and research, and air transport and related services.

In general, those sectors where prices are high exhibit low TFP levels, reflecting a relationship that inefficient use of resources leads to high production cost, which in turn results in high prices. However, there are sub-sectors where both high prices and high TFP exist in Japan. These are water supply, real estate, communications, railroads, other transport services, motor vehicle repair, amusement and recreation services, and information and computer services. This "anomaly" may be explained by the absence of competition in these sectors caused by government regulations. Without competition, efficient producers capable of producing at low cost can charge high prices, enabling the producers to earn excess profits.

III. The Impact of Deregulation in Services: A Simulation Using a CGE Model

What is the impact of high prices and low productivity on the Japanese economy? In this section we use a CGE model to simulate a counterfactual case under which the level of TFP of the Japanese service sectors were to increase to the U.S. level as a result of deregulation.⁵ We then compare the counterfactual with the actual case to estimate the impact of low productivity and high prices on the Japanese economy.

⁴ It should be noted that one of the reasons behind high price differentials in services between Japan and the U.S. is that services are nontradable.

⁵ Our CGE model deals with 162 sectors. We adopted a savings-driven closure rule and the fixed exchange rate regime. For more detailed information on our model, see Kawai and Urata (1997).

Table 2 Price and TFP Differences Between Japan and the U.S. (U.S.=1)

Sector	Price	TFP	Sector	Price	TFP
Agriculture	2.261	0.880	Metal products for construction	2.091	0.672
Cereals	6.000	0.207	Other metal products	1.742	0.740
Forestry	3.120	0.385	Electric wires	1.230	1.084
Tobacco	2.250	0.538	Steel and steel products	1.271	1.243
Vegetables	1.784	0.649	Aluminum products	1.140	1.354
Poultry	1.855	0.686	Other non-ferrous metals	1.180	1.403
Dairy farming	2.173	0.698	Copper products	1.109	1.497
Fruits	1.524	0.806	Machinery	1.288	1.253
Other non-edible foods	1.420	0.905	Other general machinery	2.374	0.627
Agri services	1.358	0.968	Office machinery	2.252	0.644
Other edible foods	1.249	1.005	Machine tools	2.056	0.707
Other livestock	1.412	1.165	Medical instruments	1.891	0.710
Crops for sugar	1.000	1.217	Other electric machinery	1.843	0.799
Fishery	0.986	1.326	Optical instruments	1.479	0.852
Logging	1.089	2.031	Engines and boilers	1.573	0.880
Mining	1.039	1.613	Rotating electric machinery	1.500	1.015
Metal ore	3.000	0.391	Watches and clocks	1.445	1.023
Other non-metal ores	3.322	0.406	Conveyors	1.392	1.104
Coal mining	0.844	1.354	Batteries	1.337	1.123
Gravel, quarry and crushed stones	0.709	1.806	Electronic computing equipments	1.245	1.125
Crude petroleum and natural gas	0.843	1.956	Elec equip for internal comb engines	1.257	1.152
Food	2.069	0.944	Electric bulbs	1.342	1.163
Sugar	1.770	0.431	Aircraft	1.045	1.164
Animal oil and fat	2.657	0.545	Two wheel vehicles	1.079	1.209
Vegetable oil	2.230	0.652	Radio and TV	1.085	1.222
Soft drinks	2.147	0.666	Electron tubes	1.057	1.253
Meat and meat products	2.308	0.666	Textile machinery	1.263	1.256
Other food stuffs	2.186	0.712	Semi-conductors	1.057	1.268
Bread	1.847	0.747	Analytical instruments	1.056	1.277
Sea foods	1.571	0.757	Electric and electronic parts	1.166	1.297
Liquor	2.722	0.757	Railroad cars	1.037	1.304
			Paper containers	1.381	1.262
			Other wooden products	1.016	1.497
			Pulp	0.940	1.613
			Newspapers	1.042	1.861
			Construction	2.505	0.562
			Railroad construction	2.672	0.500
			Electric utility facilities	2.672	0.507
			Public utility	2.648	0.520
			New residential construction	2.711	0.530
			New non-residential construction	2.354	0.588
			Telecommunication facilities	1.913	0.625
			Other construction	2.183	0.639
			Building repairs	2.183	0.644
			Electricity, gas, water	1.753	0.922
			Gas	2.524	0.521
			Thermal energy supply	1.425	0.852
			Electricity	1.814	0.922
			Water	1.302	1.149
			Distribution	1.578	0.830
			Wholesale	1.572	0.830
			Retail trade	1.586	0.830
			Financial services	2.404	0.803
			Banking	2.532	0.803
			Insurance	2.107	0.803
			Real estate	1.290	1.349
			Real estate	1.290	1.349
			Transportations/communications	2.943	0.817
			Road freight transport and storage	6.908	0.159
			Postal services	1.390	0.788
			Water transport services	1.662	0.792
			Broadcasting	1.365	0.971

Noodles	1.938	0.780	Other household electric appliances	1.248	1.330	Road passenger transport	1.123	0.976
Confectionery	1.847	0.809	Ship building	1.045	1.405	Communications	1.232	1.136
Other processed agricultural foods	1.712	0.884	Cars	0.755	1.712	Railroads	1.142	1.209
Dairy products	1.930	0.927	Other telecommunication machinery	0.743	1.878	Other transport services	1.102	1.464
Grain mill and flour	2.286	1.357	Wired communication machinery	0.743	1.880	Air transport and related services	0.854	1.606
Tobacco	1.847	1.682	Other manufacturing	1.766	0.933	Other Services	2.008	0.943
Feeds for animals	0.896	2.227	Plywood	6.900	0.197	Legal and accounting services	4.804	0.272
Textiles	1.224	1.153	Foreign and Japanese paper	2.297	0.583	Other business services	4.804	0.305
Weaving apparel	1.546	0.722	Stationary	2.390	0.607	Building maintenance services	4.804	0.379
Reeling and spinning	1.495	0.843	Other manufacturing	2.148	0.668	Waste and scraps	2.577	0.388
Carpets	1.261	1.000	Coated and converted paper	2.159	0.749	Public services	2.088	0.508
Fabrics, yarn	0.885	1.551	Other paper products	1.972	0.785	Motor vehicles leasing	2.495	0.512
Other textiles	0.547	2.152	Miscellaneous ceramic products	1.726	0.800	Hotel and lodging	2.077	0.646
Chemical products	1.517	1.196	Wood chips	1.436	0.817	Extra household expenditure	2.077	0.659
Basic chemicals	2.341	0.705	Toys and sporting goods	1.681	0.818	Advertisement	1.960	0.707
Petroleum and coal products	1.987	0.712	Publishing and printing	1.646	0.867	Restaurants	2.077	0.755
Tires	1.657	0.871	Concrete	1.573	0.868	Unclassified	2.077	0.772
Paints and ink	1.920	0.904	Other leather products	1.588	0.907	Other repair	1.719	0.796
Agricultural chemicals	1.607	1.036	Furniture	1.664	0.908	Other personal services	2.071	0.859
Other chemicals	1.379	1.245	Records	1.478	0.928	Barber and beauty shops	1.938	0.895
Plastics and rubber products	1.171	1.248	Cement	1.482	0.931	Motion pictures	1.384	0.991
Footwear	1.146	1.323	Cement products	1.460	0.989	Motor vehicle repair	1.220	1.019
Synthetic resin	1.382	1.330	Musical instruments	1.478	1.026	Amusement and recreation services	1.391	1.020
Synthetic fibers	1.091	1.584	Small personal adornments	1.404	1.026	Information and computer services	1.190	1.054
Fertilizers	1.072	1.714	Ceramic wares	1.415	1.027	Non-profit organization	0.920	1.299
Medicaments	0.736	2.152	Ordnance	1.000	1.135	Education and research	0.785	1.998
Cosmetics, toiletries	0.705	2.352	Glass and glass products	1.229	1.139	Medical and health services	0.588	2.278
Soap and detergents	0.609	2.504	Leather and fur products	1.497	1.167	Government	2.088	0.477
Metals	1.476	1.062	Carbon and graphite products	1.234	1.203	Government	2.088	0.477

Source: Kawai(1996)

In the simulations, the level of TFP is increased exogenously. Since the prices are determined endogenously in the CGE models, they cannot be so changed.⁶ But the prices would change as a result of the changes made in TFP.

Before conducting counterfactual simulations, we first examine the impact of a 10 percent increase in the level of TFP for the service sectors, one sector at a time, to discern the magnitude of the impact of deregulation by individual sectors. We call this exercise a "sensitivity" analysis.

III.1 Sensitivity Analysis

The results of increasing the TFP level of eight service sectors by 10 percent are shown in Table 3. As expected, this leads to lower prices and higher levels of real wages, income, consumption, and GDP. Specifically, a 10 percent increase in TFP in all the service sectors would reduce consumer and investment prices by 4.72 and 4.67 percent, while increasing real wages, disposable income, consumption, and GDP by 5.23, 5.04, 4.54, and 5.46 percent, respectively.

There are wide variations in the magnitude of the impact of these changes, depending on the service sectors where the increase in TFP occurs. The largest increase in GDP (0.93%) occurs when an increase in TFP takes place in construction services, because this encourages fixed investment by lowering the price of construction.⁷ The increase in fixed investment in turn results in higher GDP. Indeed, a 10 percent increase in the level of TFP in construction services leads to a decline in the price of investment goods by 2.3 percent, which in turn results in the increase in private fixed investment by 2.4 percent.

An increase in the level of TFP in the distribution sector also leads to a significant increase in GDP. Specifically, a 10 percent hike in TFP would cause a 0.83 percent expansion in GDP. In this case, private consumption as well as fixed investment are promoted by lower prices of consumption and investment goods, which are caused by the increase in productivity in the distribution sector. Consumers benefit from the improved productivity in the distribution sector, as a 10 percent increase in the level of TFP in this sector increases the real wages and real disposable income by 0.85 and 0.91 percent, respectively.

Improved productivity in other service sectors has a smaller effect. A 10 percent increase in the level of TFP in real estate, transportation, finance and insurance, public utilities, and communications results in the increase of GDP by 0.51, 0.41, 0.31, 0.20, and 0.11 percent, respectively.

⁶ To be more exact, in our CGE model, foreign prices are exogenously given, and domestic prices are endogenously determined. Furthermore, we treat services as non-tradables, that is, there are no trade or no foreign prices in our model. As such, we adjust TFP in the deregulation simulation. In contrast, primary and manufactured products are traded, and therefore, in our "free trade" simulation, both foreign prices and TFP are adjusted.

⁷ The increase in TFP level in "other services" contributes most to GDP. However, as "other services" is a heterogeneous group, we do not discuss them explicitly.

Table 3: Sensitivity Analysis: 10 percent increase in TFP in Different Sectors

Base	Service Sectors							Non-services				
	Total	construc- tion	public utilities	distribu- tion	finance & insurance	real estate	transportation		others			
Macroeconomic Indicators (index, billion yen)				percent change from the base								
Real wage	1,000	5.23	0.08	0.28	0.85	0.43	0.92	0.37	0.14	1.93	2.63	
Consumers price	1,000	-4.72	-0.06	-0.17	-0.99	-0.31	-0.69	-0.44	-0.12	-1.91	-2.43	
Investment price	1,000	-4.67	-2.29	-0.05	-0.81	-0.12	0.04	-0.34	-0.05	-1.02	-4.07	
Real investment	115,184	8.23	2.44	0.31	1.24	0.55	0.47	0.51	0.17	2.19	6.64	
Real disposable income	291,834	5.04	0.07	0.24	0.91	0.39	0.83	0.39	0.13	1.92	2.56	
Real consumption	243,628	4.54	0.04	0.21	0.83	0.35	0.75	0.36	0.12	1.75	2.29	
GDP	424,537	5.46	0.93	0.20	0.83	0.31	0.51	0.41	0.11	2.07	3.56	
Increase in Consumers' Surplus per family per capita				equivalent variation in yen								
		815,995	7,489	38,575	144,995	51,590	263,039	74,728	23,512	377,790	465,094	
		263,224	2,416	12,443	46,772	16,642	84,851	24,106	7,585	121,868	150,030	

Source: Authors' calculation

When productivity improves in construction services, the producers' prices decline only in construction services, public utilities, and real estate.⁸ In contrast, for the case where productivity improves in other service sectors, the producers' prices in all the sectors decline, albeit by small magnitude. These contrasting impacts can be explained by differential inter-industry relationships. Construction services are mainly used in construction, while other services are used in many sectors. In particular, an improvement in the level of TFP in distribution and in transportation leads to a significant reduction in the prices of other products.

III.2 The Impact of Deregulation in Services

Next we perform the following simulations:

Simulation 1 Deregulation Scenario: Since services are not considered tradable, free trade in services cannot be applied.⁹ But deregulation of the services sectors is expected to reduce prices and improve productivity. We undertake the deregulation exercise by increasing the level of TFP of the Japanese service sectors to a point where the TFP gap between Japan and the U.S. is reduced by 50 percent. Prices of non-tradable services are determined endogenously in the model.

Simulation 2 Free Trade Scenario: Price differentials between the prices of Japanese imports and U.S. prices of tradable products are eliminated, and the TFP gaps between U.S. and Japanese tradable primary and manufacturing sectors are halved.

Simulation 3 (combination of simulations 1 and 2): price differentials between Japanese imports and U.S. tradable products are eliminated, and TFP gaps in the tradable and service sectors between Japan and the U.S. are reduced by 50 percent. Simulation 3 may be considered as a regulation-free and free trade regime.

The reason that the TFP gaps in the tradable and service sectors between Japan and the U.S. are reduced by 50 percent rather than completely eliminated in the free trade and deregulation simulations is that only a part of these gaps may be attributable to trade restrictions and regulations. Other factors such as industrial organization also play an important role in determining TFP and price levels.

Results of the simulations are shown in Table 4. Under the deregulation case, where the TFP gap between the Japanese service sectors and the U.S. counterparts were halved, Japan's GDP would rise by 9.3 percent. A major factor behind the substantial increase in GDP is an expansion of fixed investment, which increases by 13.3 percent. Consumption increases by 4.2 percent. The average consumer would gain 269,864 yen from deregulation of the service sectors. The expansion of investment and consumption occurs because of the decline in the prices of investment and consumption goods. Among the service sub-sectors, deregulation of construction services contributes notably to the increase in GDP, as it reduces the price of construction services greatly by improving productivity of that sector. Recall that the impact of the increase in productivity in construction services was found large in the sensitivity analysis.

⁸ Because of the limitation of space, the effects on producers prices discussed in the main text are not reported in Table 3. For those interested, please contact the authors for detailed results.

⁹ Some services are traded, but they are treated as non-tradable in this paper, because of a lack of sufficient information on the mechanism and statistics of service trade.

Table 4 Deregulation in Services and Free Trade in Tradable Sectors

Economic Indicators	Base	Deregulation	Free trade in	Deregulation
		in services	tradable sectors	and free trade
percent change from the base				
Macroeconomic Indicators (index, billion yen)				
Real wages	1.0	4.1	2.7	7.5
Consumers price	1.0	-5.5	-3.7	-9.3
Investment price	1.0	-11.5	-4.6	-16.6
Real investment	115,184	13.3	3.2	18.2
Real disposable income	291,834	4.6	3.0	8.2
Real consumption	243,628	4.2	2.8	7.5
Real GDP	424,537	9.3	2.2	12.2
Consumers' surplus (equivalent variations, yen)				
Per family		863,564	628,507	1,798,979
Per capita		269,864	196,408	562,181
Prices of consumption goods (index)				
Food and beverage	1.0	-5.6	-8.2	-14.1
Clothing	1.0	-5.4	-6.2	-11.5
Rent and c.g.w	1.0	-2.8	-1.0	-3.9
Furniture, etc	1.0	-6.0	-3.4	-9.5
Medical, insurance	1.0	-6.0	-2.0	-8.1
Transportation	1.0	-4.5	-2.4	-7.0
Education, amusement	1.0	-3.9	-2.3	-6.3
Others	1.0	-9.7	-2.9	-12.9
Prices of production goods (index)				
Agriculture	1.0	-3.3	-10.9	-14.8
Mining	1.0	-12.8	-3.8	-18.0
Food	1.0	-4.0	-12.6	-17.5
Textiles	1.0	-3.8	-7.1	-11.2
Chemicals	1.0	-3.1	-7.1	-10.6
Metals	1.0	-3.6	-5.4	-9.4
Machinery	1.0	-3.8	-4.8	-9.0
Other manufacturing	1.0	-4.2	-8.5	-13.2
Construction	1.0	-17.4	-3.2	-21.2
Utilities	1.0	-5.8	-1.5	-7.6
Distribution	1.0	-7.4	-1.3	-8.4
Finance & insurance	1.0	-9.1	-1.2	-10.3
Real estate	1.0	-2.1	-0.5	-2.7
Transport, communication	1.0	-13.3	-1.9	-15.1
Services	1.0	-11.2	-2.3	-13.9
Government	1.0	-19.9	-1.5	-21.4
Domestic production (billion yen)				
Agriculture	19,522	5.0	6.1	12.8
Mining	2,156	11.8	1.3	15.4
Food	36,953	3.9	9.6	15.0
Textiles	14,334	4.9	6.2	12.2
Chemicals	49,707	6.6	2.2	10.3
Metals	52,246	8.8	2.9	13.5
Machinery	132,234	4.8	3.2	9.3
Other manufacturing	50,583	7.7	3.6	12.9
Construction	89,199	18.4	2.4	22.1
Utilities	20,454	7.9	2.8	12.0
Distribution	82,414	6.8	1.9	9.4
Finance & insurance	31,252	8.4	2.9	12.5
Real estate	50,116	2.4	0.6	3.7
Transport, communication	53,382	9.7	3.0	13.7
Other services	184,798	8.5	3.0	12.6
Government	20,409	19.6	1.6	21.2

Employment (1,000)				
Agriculture	5,343	2.8	-8.4	-4.7
Mining	100	-69.7	-8.0	-92.0
Food	1,745	2.0	-0.7	1.3
Textiles	1,474	2.6	0.2	3.3
Chemicals	1,252	6.2	0.6	8.0
Metals	1,838	6.8	-3.2	4.7
Machinery	4,741	0.2	-3.0	-3.3
Other manufacturing	2,876	5.4	-2.8	3.4
Construction	6,502	0.6	-1.1	-0.8
Elec, gas, water	477	-3.7	0.1	-4.8
Distribution	13,508	2.9	1.8	5.2
Financing	2,216	-0.3	2.3	2.3
Real estate	679	2.8	1.0	4.2
Transport, communication	3,547	-7.7	1.6	-5.9
Other services	17,464	-4.0	0.5	-4.1
Government	1,955	-0.3	0.6	-0.5

Source: Authors' calculation

Deregulation in the service sector leads to an increase in production in all the sectors in the economy. In particular, the increase in production is very large in government services (19.6%), construction services (18.4%), mining (11.8%), and transportation and communications (9.7%). Deregulation affects employment. Mining sector employment is particularly hard hit, as it would be reduced by 70%. This is attributable to the small size of the mining sector in the pre-deregulation period. Because of the small base, the changes expressed in percentage would show up large.

Under the second scenario of trade liberalization, free trade would raise GDP by 2.2 percent.¹⁰ Unlike the case of deregulation, both investment and consumption contribute equally to GDP growth, as they rise by around 3 percent. The increase in consumption follows from the increase in real wages and real disposable income. In turn these increases are attributable to the reduction in product prices, resulting from free trade.

Various sectors would be affected differently by free trade. As the domestic to foreign price ratios of primary products is significantly higher than that of manufactured products in the pre-free trade situation, the prices of primary products decline compared to those of manufactured products when free trade is introduced. Despite the decline in producers prices, production of all the products increases. Three reasons may be given for this seemingly anomalous result. One is the real income effect, which results in the increase of the consumption of all the products, thereby inducing demand for domestically- produced products. The second reason may be an improvement in productivity (assumed to follow from trade liberalization), which increases the competitiveness of domestic producers, enabling them to expand production. The third factor is the assumption of low substitutability between imported and domestically produced products. This assumption derives from the estimates which were made by using the data observed under the trade-restricted regime. Because of low substitutability, reduction in import prices would have a limited effect in expanding imports at the cost of domestic production.

Despite the increase in production, free trade would reduce employment in the primary sector because of the increase in TFP. Employment in agriculture declines by 8.4 percent and in mining by 8.0 percent. Since the primary sector in Japan is characterized by high prices and low productivity, free trade would greatly affect the primary sector.

The results of simulation 3, which considers both deregulation in the non-tradable service sector and free trade in the tradable sector are more or less the summation of those obtained from simulations 1 and 2. GDP would increase by 12.2 percent; consumption and investment would increase by 7.5 and 18.2 percent respectively, as the prices of consumption and investment goods decline by 9.3 and 16.6 percent. The benefits from increased consumption can be translated into a rise in the consumer surplus of 562,181 yen per person. Prices of all the products and services decline with the rate of the decline being particularly large for primary products, construction services, transportation, and government services (around 15-20% each). Production in all sectors increases, although there are wide variations in the rate of increase, with production of services expanding the most. The rate of increase in the production of construction services, and government services exceeds 20 percent. In contrast, the rate of increase in the production in real estate is only around 3 percent.

¹⁰ Using a partial equilibrium approach, Sazanami, Urata, and Kawai (1995) estimates the cost of high prices in Japan to be 0.5 percent of GDP in 1989. Besides the differences in the models, it should be noted that an improvement in productivity, which was assumed in our study, was not assumed in their study.

Although production would increase in all the sectors, employment in eight sectors (agriculture, mining, machinery, construction services, utilities, transportation and communications, other services, and government services) declines and that in the remaining eight sectors increases. Employment in mining declines sharply, while that in chemicals expands significantly. These observations indicate that deregulation and trade liberalization would necessitate substantial structural changes, incurring a large cost of adjustment.

IV. Conclusions

The service sector has increased its importance in the Japanese economy, currently accounting for more than 70 percent of total value added and employment. Despite its importance, it is plagued by high prices and low productivity, the cost of which is estimated by a CGE model at 9 percent of GDP, and 270,000 yen in terms of per capita consumption. The cost is greater, amounting to 12 percent of GDP and 560,000 yen worth of per capita consumption, when high prices of tradable goods are also taken into account.

Our estimates indicate that policies such as deregulation in the service industry and trade liberalization in the tradable sector are warranted. But such policies result in the redistribution of workers among different sectors. Indeed, as much as 70 percent of workers in the mining sector are likely to lose employment. It is therefore important to introduce assistance programs such as income transfer and retraining, in order to reduce the cost of adjustment.

There are some areas that were not adequately dealt with in this CGE model, and are left as agenda for future research. First, some services such as transportation and communications, are traded internationally, but because of lack of information on service trade our CGE model treated all services as non-tradable. Second, foreign direct investment (FDI) is not incorporated in our model. FDI is increasing rapidly, and it has an important impact not only on commodity trade but also on service trade. Its exclusion from our model is likely to lead to some biases in the results.

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Liberalizing Services Trade in APEC: A General Equilibrium Analysis with Imperfect Competition*

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Abstract

This paper presents a general equilibrium investigation of services trade liberalization in APEC using a global multi-country, multi-sector applied general equilibrium model with an imperfectly competitive service sector. Reducing the service sector's nontariff barriers is modeled by eliminating the possibility for oligopolistic firms to price-discriminate between client countries within APEC and lowering the fixed costs of the firms doing service exporting business. The results suggest that services trade liberalization almost systematically reinforces existing trade balances. The increase in demand for intermediate services tends to reinforce rather than counteract the role of primary factors in determining sectoral comparative advantage. Tariff liberalization in the region has a contrasting effect on trade and welfare compared to services liberalization. The Western APEC members received the greatest welfare gains from services trade liberalization, while the developing economies which start out with the highest levels of tariff protection gained more if only tariffs were eliminated.

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I. Introduction

I-1. Services trade

Services are an important sector in every economy, comprising 50 to 80 percent of GDP in most of them. Since they are collectively the largest segment of almost all economies, it is not surprising that they also constitute a major intermediate input to production in other sectors. Services are also playing an increasingly important role in international trade. While services were once considered nontradable, international trade in services is one of the fastest growing components of world trade and now comprises some 25 percent of the total. With its dominant and integral role in national economies and rapidly growing role in the world economy, we can expect that reducing the barriers to trade in services will have a notable impact on other sectors, and that the protection environment in other sectors will affect trade in services.

This study explores some potential effects of liberalizing trade in services among APEC members by using Computable General Equilibrium (CGE) simulations of liberalization in an imperfectly competitive services sector. Imperfect competition is a useful framework for considering barriers to trade in services. These barriers include the costs of documentation for meeting foreign regulations, certification, and government procurement requirements, obtaining foreign market information, and maintaining distribution networks. Such barriers reduce the options for consumers to seek different sources of supply and increase opportunities for monopolistic pricing. In this study, services barriers are portrayed as fixed costs of exporting. When the need for spending on these fixed costs is reduced by trade liberalization, economic welfare is bound to improve. However, the results also reveal an important structural story about the impact on other sectors. The rest of this section gives a general description of the basic framework, the next section describes the CGE model in more detail, and the final two sections present a description of simulations and results.

I-2. Approach

It should be noted at the outset that data on trade in services suffers from many weaknesses. The compilation of national balance of payments accounts reveals that a fair amount of services trade may go unrecorded, and that countries categorize the components of services trade in different ways. Indeed, some of the apparent acceleration in services trade may derive from recently improved statistical coverage. Similarly, barriers to trade in services are also difficult to measure. While affected by local taxes and subsidies applied to goods, market access for services is especially influenced by regulations, quotas, technical standards, certification requirements, distribution networks, and government procurement rules. In the wake of the Uruguay Round, Hoekman (1996) made an initial attempt to benchmark the relative degrees of protection of services markets in a number of countries, using the extent of commitments under the General Agreement on Trade in Services (GATS) agreement. Using these measures to develop tariff equivalents, Brown, Deardorff, Fox, and Stern (1996) implemented a pioneering exercise in the global simulation of services trade liberalization. Their model also includes imperfect competition in all sectors except agriculture.

One important feature of international trade in many services is the difficulty in selling in foreign markets without a local presence in those markets, such as with banking and insurance. This gives rise to the strong association between services trade and foreign direct investment (FDI). Investment in services is now estimated to constitute one half to two thirds of the inward FDI for many countries (Hoekman,

1996; OAS, 1997). Therefore, services trade is quite sensitive to barriers to FDI. Petri (1997) explores the impact of this type of trade barrier in APEC using a global model with foreign ownership of subsidiaries in the home economy. The foreign subsidiaries have production technologies distinct from their domestic competitors, but they also face a specific tax that reduces the profitability of FDI.

In the current study, the various nontariff barriers (NTBs) affecting services are assumed to give the service suppliers from a given country a different degree of monopoly power in each national market, including their own. Thus NTBs allow the imperfectly competitive service sector to price discriminate across country markets. As is traditional in CGE models with imperfect competition, this sector is modeled with fixed costs which cause average costs to be above marginal costs and allow for increasing returns to scale. Barriers to trade in services are also modeled as fixed costs. Thus to be able to export, firms must make fixed expenditures on capital and labor in order to gather market information and meet regulations and other requirements.

There is some evidence, though mostly indirect, to support the view that there are fixed costs involved in exporting services. Campa (1993) examines the case of wholesale trade industries in the U.S. between 1981 and 1987 and tries to explain the pattern of entry by foreign firms. He assumes that foreign firms must meet (though not exceed) the proportions of U.S. sectors' holding of fixed assets and expenditures on media promotion. He finds a significant negative relationship between these sunk costs and foreign entry as well as a significant negative impact from exchange rate volatility. He further infers an influence from sunk costs given that this would explain the negative impact on entry from exchange rate uncertainty, and he finds a significant negative effect from a term interacting sunk costs and exchange rate volatility. Notably, he does not find any significant effect of variable costs in the firm's home country on entry in the U.S. market.

A study by Glejser, Jacquemin, and Petit (1980) uses Belgian data, mostly of manufactures, but they did include the industrial design sector. They report on a survey of 1446 exporters where one question asked firms whether they were handicapped by a lack of information about foreign outlets. Analysis of the data vindicates the survey opinions, showing that an affirmative answer is indeed negatively correlated with export rates. The data further show that exporters concentrate their exports on a small number of countries, supporting the view that sunk exporting costs are specific by country of destination.

Roberts and Tybout (1995), in their study of Colombian plant-level decisions to export, consider only manufacturing firms. Nevertheless, their econometric results reject the hypothesis that sunk costs for entry into the export market are zero. They infer from their results that reductions in fixed costs could make exporting profitable for more firms and that export promotion efforts should distinguish measures aimed at existing exporters from those aimed at easing the entry of new exporters. Gallaway (1994) cites the widespread existence of national export promotion agencies designed to reduce the information gap on foreign markets as evidence that such fixed costs of exporting are important.

Of course we do not know what the level of fixed costs are in services. But in the spirit of counterfactual simulation, we make various assumptions and test the impact of trade liberalization under different possible scenarios.

II. The model

II-1. Overview of the model

The world economy consists of 10 regions, each with 11 production sectors. All the APEC members in the model are either an individual country or an aggregated region. The 10 regions are: (1) United States, (2) Canada, (3) Japan, (4) China, (5) Mexico/Chile, (6) Australia/New Zealand, (7) Korean, Singapore, Hong Kong and Taiwan as a region, (8) Southeast Asia, (9) European Union, and (10) the Rest of World which includes all countries not elsewhere classified. The 11 production sectors are: (1) agriculture, (2) energy, (3) textile and paper, (4) petroleum chemical products, (5) metals, (6) transport industries, (7) other manufacturing, (8) non traded services, including construction and utility, (9) trade and transportation, (10) other government service and (11) other private service, including financial and insurance services and commerce². Except for the other private service sector, all other sectors of production are perfectly competitive. In these sectors, countries are linked by the Armington system so that commodities are differentiated in demand by their geographical origin.

The focus of this study is non tariff barriers (NTBs) and its effects on trade among the APEC members. In most cases, NTBs raise the cost of doing export business for foreign firms and prevent domestic consumers from cross-border arbitraging. To capture these, the service sector is modeled as a noncompetitive sector in which firms have price-discrimination opportunities across national markets. This model structure was first developed by Mercenier (1995) in a study of European Union's move to a single market. Based on Mercenier (1995), major features of the model are presented as follows.

II-2. The households and final demand

Final demand decisions in each country are assumed to be made by a single representative household³. Besides the consumption decision, the representative household also makes a saving/investment decision. However, the static property of the model prevents savings to be endogenously determined and hence the saving rate is fixed in the model.

The households value products of competitive industries from different countries as imperfect substitutes (Armington, 1969), while they treat as specific each good produced by individual firms operating in the private service sector -- the non competitive sector, i.e., the preferences exhibit love for variety in the private service sector (the Dixit-Stiglitz specification, 1977). Thus, preferences can be represented by a two-level utility function:

$$U_r = U[u_1(\cdot), u_2(\cdot), u_3(\cdot), \dots, u_J(\cdot)] \quad (1)$$

² The data used are from GTAP version 3, 1992. See McDougall (1997).

³ The government exists as a final demander. The government's function is simplified to collect tax revenues and consume final goods. The government revenue is assumed to be fixed and the difference between the government revenues and government consumption is transferred to the households.

where $u_i(\cdot)$ is the subutility derived from the consumption of product j and $U_r(\cdot)$ is the upper tier utility function that translates all sectoral subutility levels into an overall welfare level. For the consumption of a product produced from the competitive sector, the lower level utility function can be replaced by an Armington composite good which is the composition of consumption aggregates in terms of geographical origin. For the consumption of the noncompetitive sector's products, the lower level utility function is a combination of products of individual firms located in the ten regions. Limited by the data, as well as to simplify the model setup, we assume that each region acts as an aggregate demander and faces an aggregate subutility/Armingtonian function, i.e., classification of final demand as the households, the government, intermediate or investment demand only happens at the upper level, while at the lower level each economy acts as a single agent. Formally, the lower level problem in Eq. (1) can be represented by the following CES functions:

$$\begin{aligned} \text{Max } CD_{jr} + GD_{jr} + IVD_{jr} + ID_{jr} &= [\sum_{s \in W} \alpha_{jsr} M_{jsr}^{-\rho_j} + (1 - \sum_{s \in W} \alpha_{jsr}) D_{jr}^{-\rho_j}]^{-1/\rho_j} \\ \text{s.t. } PC_{jr}(CD_{jr} + GD_{jr} + IVD_{jr} + ID_{jr}) &\geq \sum_{s \in W} P_{jsr} M_{jsr} + P_{jrr} D_{jr}, \quad j \in CS \end{aligned} \quad (2)$$

$$\begin{aligned} \text{Max } CD_{jr} + GD_{jr} + IVD_{jr} + ID_{jr} \\ &= [\sum_{s \in W} \alpha_{jsr} \sum_{f \in F_{js}} M_{fjsr}^{-\rho_j} + (1 - \sum_{s \in W} \alpha_{jsr}) \sum_{f \in F_{jr}} D_{fjr}^{-\rho_j}]^{-1/\rho_j} \\ \text{s.t. } PC_{jr}(CD_{jr} + GD_{jr} + IVD_{jr} + ID_{jr}) \\ &\geq \sum_{s \in W} \sum_{f \in F_{js}} P_{fjsr} M_{fjsr} + \sum_{f \in F_{jr}} P_{fjrr} D_{fjr}, \quad j \in NC \end{aligned} \quad (3)$$

where j is sector/good index with J representing the set for sectors, CS representing the subset for the ten competitive sectors and NC the noncompetitive service sector; and s, r are region indices with W representing the set for the ten regions; f is the firm index with F_{jr} representing the set for firm in sector j and located in region r ; M_{jsr} is imports by region r from region s for competitive sector's product j and M_{fjsr} is region r 's demand for firm f 's product and firm f is located in region s 's noncompetitive sector; D_{jr} is the demand for the product j produced at home region r and D_{fjr} is the demand for firm f 's product and firm f is located in the home country; P_{jsr} is the price of good j faced by region r and imported from region s and P_{fjsr} is the price charged by firm f in region r 's market and firm f is located in region s ; CD_{jr} , GD_{jr} , IVD_{jr} , and ID_{jr} are, respectively, the household, the government, investment, and intermediate demand for the composite good j ; PC_{jr} is the unit price for the composite good j . The consumer final demand for the composite, CD_{jr} , is derived from the upper level utility function of the households, the value of the government final demand for the composite; $PC_{jr} \cdot GD_{jr}$, is a fixed share of the government total revenues; the value of the investment demand, $PC_{jr} \cdot IVD_{jr}$, is a fixed share of total investment; while the intermediate demand, ID_{jr} , is determined by the production technologies of all sectors and will be defined later.

The total consumption of households and government, plus investment demand, spending at current prices are equal to national income, which is the sum of labor earnings and capital revenues

owned by the households and the net tax revenues owned by the government. The capital revenue of each region includes domestic capital rentals and pure profits generated from the non competitive service sector. Labor and capital, which are in fixed supply, are perfectly mobile across sectors in each region but not internationally. Thus, factor rental prices are endogenously determined by factor market clearing. Also, the data reflect an initial imbalance of trade in each region. Given the static property of the model, the aggregate values of the trade balances for each region are fixed at their initial levels (but not the bilateral trade balances). There is no monetary term in the model and hence the real exchange rates are endogenously determined by the Walrasian equilibrium condition in the world market.

II-3. Firms in the noncompetitive sector

The model setup for firms in the competitive sectors is quite standard and hence the discussion focuses on firms in the non competitive service sector. The private service sector is assumed to have increasing returns to scale in production. The existence of economies of scale internal to firms operating in the private service sector makes perfect competition impossible in this sector. Following Mercenier (1995), we assume that firms in the noncompetitive service sector behavior as an oligopolist. There is of course no general model of oligopoly. “The outcome of oligopoly competition depends on numerous details, especially the choice variables of firms (e.g., prices or outputs) and the nature of conjectures about other firms’ responses” (Helpman and Krugman, pp85, 1993). Following a number of researchers, the traditional Cournot’s assumption is adopted, i.e., assuming that oligopolistic firms choose outputs as their strategic variables taking other firms’ outputs as given (the noncooperative behavior).

The existence of NTBs to trade allows firms to charge different f.o.b. prices to different customers in different national markets, i.e., markets are segmented and consumers are prevented from cross-border price arbitraging. In particular, firms have an incentive to offer low prices in markets in which their market shares, and therefore their incentive to restrict sales to support the price, are low (e.g., a foreign market), but to offer a high price in the market in which their market shares are high (e.g., the home market).

Formally, the increasing returns to scale production is modeled by assuming that, in addition to variable costs, individual firms face fixed primary factor costs. The variable costs are associated with the technology which is the same as that for the competitive sectors, i.e.,

$$x_{jr} = l_{jr}^{\beta_{ljr}} k_{jr}^{\beta_{kjr}} (\prod_{i \in J} ifd_{ijr}^{\beta_{ijr}}), \quad \in NC \quad (4)$$

where x_{jr} is the individual firm’s output in sector j of region r , l_{jr} and k_{jr} are demand for labor and capital, respectively, ifd_{ijr} is intermediate demand for good i used in sector j , and $\beta_l + \beta_k + \sum_i \beta_i = 1$.

Assuming symmetry between the oligopoly firms operating within each region’s noncompetitive sector (but different cross regions), the total output of the noncompetitive sector in region r is $X_{jr} = n_{jr} x_{jr}$, where n_{jr} is the number of firm in the noncompetitive sector j . The constant return to scale technology in variable inputs defined in Eq. (3) implies that the unit variable cost, v_{jr} , (and hence the marginal cost) of the production is a function the factor rental prices plus intermediate input prices only, i.e., $v_{jr} = v_{jr}(w_r, r_r, PC_{1r}, \dots, PC_{jr})$, w_r , r_r are wage and capital rental rate, respectively.

The fixed costs are independent of the quantity of the output, so that the average cost is declining in output. The average costs of the production for an individual oligopoly firm can be defined as:

$$V_{js} = v_{js} + \frac{(w_s \bar{L}_{js} + r_s \bar{K}_{js})}{x_{js}}, \quad j \in NC,$$

where L and K are fixed inputs of labor and capital, respectively.

With Cournot's assumption, an oligopoly firm's price-discriminating strategy is to choose sales to each individual markets as its strategic variables to maximize profits, taking other firms' sales and prices to the same markets as given, i.e.:

$$\text{Max}_{\langle z_{jsr} \rangle} \pi_{js} = \sum_{r \in W} P_{jsr} z_{jsr} - v_{js} x_{js} - w_s \bar{L}_{js} - r_s \bar{K}_{js}, \quad j \in NC,$$

where z_{jsr} is the quantity of the output sought to region r 's consumer by region s ' an individual firm, and $\sum_{r \in W} z_{jsr} = x_{js}$ (while region r 's demand for the products produced by region s is $n_{js} z_{js} = n_{js} M_{jsr}$, and demand for the home products is $n_{jr} z_{jr} = n_{jr} D_{jr}$). The country-specific profit maximizing price has the Lerner formula:

$$\frac{P_{jsr} - v_{js}}{P_{jsr}} = - \frac{\partial P_{jsr}}{\partial z_{jsr}} \frac{z_{jsr}}{P_{jsr}}. \quad (5)$$

where the right hand side of Eq. (5) is the inverse firm's perceived elasticity of demand for market r . The computation of these elasticities can be found in Mercenier (1995). These elasticities crucially depend on the market shares of each individual firm (including its domestic market share and market share in each foreign country). When the number of firms in the service sector is fixed, the oligopoly firms may experience nonzero profits. Alternatively, the number of firms is endogenously determined by entry and exit up to the point at which profits are driven down to zero (Chamberlain's large group case, 1933).

As a firm's perceived elasticities of demand depend on its market share, Eq. (5) implies that if a firm's market share is low in a specific national market (and hence its perceived elasticity of demand in that market is low), it has to charge a lower price in that market. In contrast, if the firm's market share is high in a market, the firms' perceived elasticity of demand in that market is high and hence the price the firm charges in that market is higher. It is clear that, at least, for the service sector, firms have a higher market shares in their home market. Thus, Eq. (5) implies that oligopoly firms would charge a higher price in their domestic market and lower prices in the foreign markets. Consequently, for an import country, the domestic price would be higher than the import prices for the private service sector. Different from tariff barriers which usually raise prices for both domestic and imported goods, the non tariff barriers sometimes only raise the prices for domestic goods. However, as the barriers in the domestic market prevent more cheaper foreign goods from coming in, domestic consumers have to consume more expensive domestic good, instead of cheaper foreign goods. If APEC can reduce non tariff barriers among the members, the opportunities for firms to price discriminate among different national markets would become smaller. This is the major task of the next section.

III. Description of the Policy Simulations

Three experiments are conducted by our study. In the first experiment, we remove all tariffs of APEC members imposed on their imports from other countries, including non-APEC countries. In addition, the self-restricted export taxes on textile are removed. The major consideration to conduct this experiment is that the smaller economies of the Asia-Pacific region benefit from a global based system which does not condone selective discrimination. Also, members such as Japan and other emerging economic giants of East Asia benefit from a global economic order, for different reasons. East Asia is not a natural economic unit. Although the share of trade within East Asia has been expanding rapidly, East Asia's exports to and imports from the rest of the world will continue to increase. The economic impact of maintaining open trading links with the rest of world, especially Europe and North America is a source of resistance to any formal trading bloc in this area. For these reasons, the long-term pressures within APEC, especially from its East Asian members, are to work cooperatively for free trade in the global economy. Hence, in the first experiment, we conduct a non-discriminated simulation by eliminating all tariffs APEC members imposed on their imports from the world.

In the second experiment, in addition to tariff elimination of the first experiment, we integrate APEC's service market by assuming that oligopoly firms in the service sector switch from their initial price-discriminating strategy to a single pricing behavior within the APEC. Formally, the firm's perceived elasticity of demand in the integrated market becomes a weighted average of the price elasticities on each individual economy within the APEC:

$$E_{jsAPEC} = \sum_{r \in APEC} [E_{jsr} \frac{n_{js} z_{jsr}}{\sum_{r \in APEC} n_{js} z_{jsr}}], \quad s \in APEC,$$

where E_{jsAPEC} is the firm's perceived elasticity of demand in the integrated APEC market, E_{jsr} is elasticity of demand in each individual member's market and $n_{jsr} / \sum_{r \in APEC} n_{jsr}$ is the share of each economy's demand in the total demand of APEC members.

This experiment can be rationalized as follows: Although tariffs within the service sector of the APEC economies are negligible, various non-tariff barriers exist such as government policies and security regulations. These barriers confer to firms the power to price discriminate between national markets. The integration program is expected to restore cross-border arbitraging by suppressing all forms of NTBs. Firms would then be forced to charge a unique price within APEC. Modeling this is difficult because NTBs are essentially unobservable. The modeling strategy adopted, therefore, consists of treating these NTBs as latent variables, which underlie the existence of price discrimination opportunities for firms in the pre-integration equilibrium. Once this is recognized, it suffices to infer from the data set the price system consistent with the optimal price discrimination strategies of oligopolistic firms and to interpret these as resulting from the implicit structure of NTBs. The experiment then consists of forcing the individual firms to adopt single pricing within APEC market, price being determined from their average regional wide monopoly power and interpreting this behavioral change as the optimal strategic reaction to the disappearance of the never-explicitly modeled NTBs.

Together with integrating service market, in the experiment 2 we also reduce fixed costs by 10 percent for all firms operating in the service sector of the APEC members. Non-tariff barriers increase firm's difficulty to enter other members' market. Such difficulty is usually linked with high fixed costs for firms in the export business. Once market entry barriers are reduced, we should expect that firms operating in the service sector become more efficient and hence can reduce their fixed costs.

In the last experiment, we only simulate service sector market integration plus 10 percent fixed cost reduction. By doing so, we can isolate the effects of market integration in service sector from other sectoral policies. Service sector produces most intermediate inputs for other final production and is the largest sector in the model. This experiment can help us to evaluate the importance of liberalization of service sector on the economy as a whole.

IV. Results

IV-1. Welfare

Reducing tariffs and barriers to trade in services are under discussion by APEC members as integral parts of meeting their overall goals on liberalizing trade and investment among them. In this study, liberalization of services trade is discussed in the context of tariff reduction, while they are simulated separately and jointly. Since a major objective of trade liberalization is improvement in economic efficiency, we begin with discussion of welfare effects. Then, to illuminate issues of structural change, we follow with sectoral results as represented by either changes in trade flows or changes in output. In all experiments, country or regional trade balances remain fixed, but the partner and sectoral composition may change.

It should be noted at the outset that the tariff removal experiment was not intended as a portrait of APEC tariff liberalization since it starts from pre-Uruguay Round tariffs and since APEC members have not committed to eliminating tariffs. Rather, the experiment was intended to provide a comparator and to allow the simulation of services liberalization both with and without the presence of other tariff distortions. So in table 1 we see the regional welfare gains associated with the removal of tariffs in APEC economies, tariff removal combined with services liberalization, and services liberalization alone, with all original tariffs in place. As can be expected, the greatest welfare gains from tariff removal take place in economies starting out with the highest levels of tariff protection, namely the developing and newly industrialized economies of east and southeast Asia.

In contrast, the regional structure of welfare gains practically reverses when services alone are liberalized. As will be seen below, the large western economies have an apparent comparative advantage in services. Therefore, they gain relatively more from reduction in services barriers, and in fact they gain more from services liberalization alone than they do from tariff removal alone. Of course this depends on the size of the experiment, so as a benchmark we note that the sources of gain between tariffs and services are about equal for the U.S. when services fixed costs are reduced by five percent.

While in the case of tariffs, most gains arise from economies reducing their own protection, with services, APEC economies gain extra dividends from liberalization abroad. Services trade barriers are modeled as forcing suppliers to spend more on their own capital and labor in order to obtain essential foreign market information and to comply with foreign restrictions, thus increasing total fixed costs

Table 1. Changes in welfare index in the simulations
(% deviation from the base year)

	EXP1 ¹	EXP2 ²	EXP3 ³
USA	0.908	2.658	1.731
Canada	1.344	2.726	1.364
Mexico/Chile	1.408	1.917	0.555
Australia/New Zealand	2.983	4.111	1.111
Japan	2.845	4.511	1.627
NIC of East Asia ⁴	7.866	8.926	0.971
China	7.392	7.241	-0.077
Southeast Asia	6.789	7.656	0.908
EU	0.186	1.311	1.118
ROW	0.495	1.367	0.864

1. Eliminating all tariffs of APEC countries imposed on their imports from the world;
2. EXP1 plus integrating service market in APEC and reducing fixed costs by 10 percent for firms operating in the service sector of the APEC countries;
3. Only integrating service market in APEC and reducing fixed costs by 10 percent;
4. Including Korea, Taiwan, Hong Kong and Singapore.

regardless of the (positive) amount exported. The reduction of services barriers is simulated by reducing fixed cost and forcing firms within APEC to move to a single-price strategy in the APEC market. In these experiments, firms' profits are fixed at the base level, and the number of firms vary, i.e., firms are allowed free entry.⁴ Then, once price discrimination across foreign partners is eliminated, the reduction in costs from lowered trade barriers leads to a reduction in the price of services for domestic consumers.

IV-2.Sensitivity

The choice of reducing services fixed costs by the same percentage amount across all regions in APEC derives from the base structure of services trade. Using the degree of services protection estimated by Hoekman (1996), the APEC model regions can be classified as relatively more or less open regarding services trade. The base data on the direction of services trade indicate a similar structure across partners for all regions. In the data, firms in each region export services to all other regions, and they export most to the more open economies and less to the economies more closed regarding services. Alternative structures of the services liberalization experiment were tried, such as using substantially smaller fixed cost reductions for the economies with the largest services sectors, but the results were not inconsistent with those presented here.⁵

Another important variation on these experiments involves testing different levels of substitution elasticities. When the substitution elasticity on the imperfectly competitive services sector is reduced, welfare gains from services liberalization are increased, as theory would predict. Lower degrees of substitutability across different suppliers of the noncompetitive good increase the opportunities for monopolistic price discrimination and thus increase the gains from reducing barriers that generate price discrimination.⁶ Also, sectoral trade results are attenuated but structurally similar, and there is little impact on the tariff removal scenario compared to the high elasticity case. The three original experiments were also repeated with double the values on Armington elasticities for the competitive sectors. Again, this increases welfare gains, accentuates structural trade results and does not reverse them. The results shown here represent the conservative cases for the competitive sectors.

IV-3. Structural effects

Considering sectoral adjustments as seen through changes in net exports, the first thing to note in experiment 1 is the strong impact on tradable services of removing tariffs on all other sectors.⁷ In the tariff removal experiment, the U.S. surplus in services expands notably while the deficits in the other western APEC economies are reduced. The biggest decline in net exports is in the EU, which does not participate in the tariff removal. China expands its surplus and southeast Asia reduces its deficits.

⁴ Firms within each region in the model are assumed to be identical. Hence, the firms' market shares within sectors, including export shares, are the same, regardless of whether they are new entrants.

⁵ Another alternative included basing fixed cost reductions on a region's export as compared to total sales of services.

⁶ In the model calibration, reducing the Armington elasticity for services also increases fixed costs in the sector.

⁷ The service sector bears negligible tariffs in most regions.

Table 2. Levels of sectoral net exports by countries, \$1000 million

	BASE	EXP1	EXP2	EXP3
2.1 USA				
Private services	3.7473	18.0814	20.9632	6.4149
Agriculture	22.9362	51.0476	51.4247	23.0591
Energy	-42.3982	-39.2488	-39.5348	-42.7272
Textile and paper	-41.5251	-55.4163	-56.3681	-42.2793
Petrochemicals	12.3747	10.1849	9.8917	12.1278
Metals	-12.3527	-13.8129	-14.0751	-12.5908
Transport industries	-11.8235	-9.4033	-9.8830	-12.3126
Other manufacturing	-15.6546	-47.8873	-49.1360	-16.6287
2.2 Canada				
Private services	-10.3344	-9.1673	-9.2611	-10.4485
Agriculture	5.2372	7.7857	7.8210	5.2529
Energy	8.6312	8.9130	9.0480	8.7636
Textile and paper	10.6252	8.6332	8.7042	10.7258
Petrochemicals	-1.9828	-2.1375	-2.1346	-1.9778
Metals	2.5780	2.4181	2.4263	2.5882
Transport industries	6.3401	5.7526	5.8045	6.3993
Other manufacturing	-19.7889	-21.0098	-21.2330	-20.0071
2.3 Mexico/Chile				
Private services	-2.4678	-1.3283	-1.9997	-2.9368
Agriculture	0.2242	1.9806	2.0777	0.2807
Energy	7.8486	7.9337	8.0571	7.9426
Textile and paper	-1.8570	-1.9814	-1.9099	-1.8116
Petrochemicals	-5.8546	-5.7903	-5.7597	-5.8458
Metals	0.3381	0.0410	0.0965	0.3765
Transport industries	-4.3094	-5.4695	-5.4184	-4.2722
Other manufacturing	-8.0427	-10.2148	-10.1027	-7.9594

Table 2. Levels of sectoral net exports by countries -- continue, \$1000 million

	BASE	EXP1	EXP2	EXP3
2.4 Australia/New Zealand				
Private services	-1.4349	-1.9617	-1.9548	-1.3753
Agriculture	15.8639	26.3621	26.6056	16.0099
Energy	11.1117	10.6739	10.7149	11.1487
Textile and paper	-3.4234	-6.2217	-6.2918	-3.4684
Petrochemicals	-3.2671	-4.4245	-4.4745	-3.3104
Metals	2.4498	1.9506	1.9416	2.4450
Transport industries	-6.3939	-8.4980	-8.5514	-6.4377
Other manufacturing	-13.0008	-15.3985	-15.4987	-13.0944
2.5 Japan				
Private services	-6.6360	-7.4482	-8.3538	-7.7293
Agriculture	-41.6624	-94.0601	-94.9412	-42.0585
Energy	-50.7555	-52.7186	-52.7973	-50.8284
Textile and paper	-14.7299	-14.9176	-15.0735	-14.8578
Petrochemicals	1.7243	5.4755	5.6134	1.8232
Metals	11.6275	14.2971	14.4174	11.7405
Transport industries	75.9006	84.2608	84.8935	76.5056
Other manufacturing	147.7895	187.0193	188.3319	148.8706
2.6 NIC of East Asia				
Private services	-6.2986	-6.8271	-6.7341	-6.3157
Agriculture	-13.9189	-25.1649	-25.4636	-14.0864
Energy	-23.4715	-25.0507	-25.2048	-23.6240
Textile and paper	30.8137	46.0744	46.4059	31.0731
Petrochemicals	-2.9875	-4.1544	-4.2533	-3.0551
Metals	-5.9598	-6.9587	-6.9854	-5.9792
Transport industries	-5.1732	-6.3115	-6.3056	-5.1660
Other manufacturing	13.9959	16.3803	16.4661	14.0883

Table 2. Levels of sectoral net exports by countries -- continue, \$1000 million

	BASE	EXP1	EXP2	EXP3
2.7 China				
Private services	7.2710	13.3554	11.6165	5.9278
Agriculture	5.1735	12.4408	12.7113	5.3502
Energy	1.5083	2.7072	2.7906	1.5786
Textile and paper	20.2462	18.5446	19.1983	20.7268
Petrochemicals	-8.2310	-10.2157	-10.0791	-8.1218
Metals	-3.1386	-4.2358	-4.1584	-3.0771
Transport industries	-5.2875	-9.7644	-9.7399	-5.2695
Other manufacturing	-9.0121	-15.7981	-15.5106	-8.7864
2.8 Southeast Asia				
Private services	-4.8003	-0.4885	-0.7893	-4.8384
Agriculture	15.5061	14.2209	14.3488	15.6270
Energy	12.2100	14.0306	14.0184	12.1506
Textile and paper	19.4452	22.8130	23.0306	19.5996
Petrochemicals	-9.7275	-10.9194	-11.0024	-9.8378
Metals	-8.5116	-10.1272	-10.1552	-8.5509
Transport industries	-8.7996	-12.2005	-12.2348	-8.8411
Other manufacturing	-8.8061	-13.3560	-13.3479	-8.8401
2.9 EU				
Private services	35.0393	13.7423	15.8564	36.8427
Agriculture	-16.5356	-8.2178	-8.5131	-16.8753
Energy	-63.5860	-63.9632	-64.6501	-64.2244
Textile and paper	-25.4473	-25.6343	-26.1110	-25.8498
Petrochemicals	31.5481	35.3690	35.5532	31.7504
Metals	11.7439	14.0552	14.0079	11.7089
Transport industries	16.6733	19.0514	19.0343	16.6952
Other manufacturing	21.0021	29.4311	29.4633	21.0963

However, the industrialized east Asian economies increase their deficits. These changes are best understood in the context of trade shifts in other sectors.

The elimination of all tariffs in the model leads to trade patterns that capitalize more on comparative advantage, absent the consideration of nontariff barriers. In the U.S., a higher surplus in services and agriculture is accompanied by a notable drop in its deficit in transport equipment. These shifts are balanced (under the constraint of fixed trade deficits) by higher trade deficits in the textile and the other manufacturing sectors.⁸ The Asian economies expand net exports in sectors such as textiles, energy (southeast Asia), or other manufactures (newly industrialized economies), while expanding deficits in transport equipment and chemicals. What may be more noteworthy and in greater contrast to services liberalization are the cases where sectoral trade balances move in a countervailing direction, or opposite of that indicated by the base data.

In addition to the large drop in the U.S. transport equipment deficit mentioned above, there are notable declines in trade surpluses for energy and metals in Australia/New Zealand, textile/paper and transport equipment in Canada, and chemicals in the U.S. as well as many other smaller reductions in net balances. Almost none of these countervailing trade shifts is replicated in the case of services liberalization. In experiment 3, trade balance changes are smaller than in the case of tariffs. The surpluses and deficits of the base data are almost always reinforced or left virtually unchanged.

When services alone are liberalized, the main impact on other sectors is through their use of services as an intermediate input. As mentioned earlier, services are the single most important intermediate input in the base input-output data. Also, as table 3 shows, the demand for intermediate services expands dramatically when their trade barriers are reduced. The critical feature here, as pointed out by Burgess (1990), is whether intermediate services counteract or reinforce other sources of comparative advantage. Figure 1 examines this issue from the point of view of primary factor intensities. Drawn from the base data, they indicate that across the APEC economies (except for Canada and Australia/New Zealand), services is a capital intensive sector and is generally used most intensively in other capital intensive industries. This indicates that intermediate services largely reinforce primary factor intensity as a source of comparative advantage. Thus the liberalization of services trade largely reinforces existing sectoral trade balances. Of course there may be many measurement issues regarding the base data, but these results indicate the role that factor intensities may have in services liberalization.

Under tariff removal, all relative prices are directly affected and there is more scope for productive resources to shift across sectors. In experiment 2, services liberalization is combined with tariff removal. However, the role of services liberalization in reinforcing existing trade balances is sustained, with previously noted reductions in trade balances due to tariff removal counteracted partly by services liberalization.

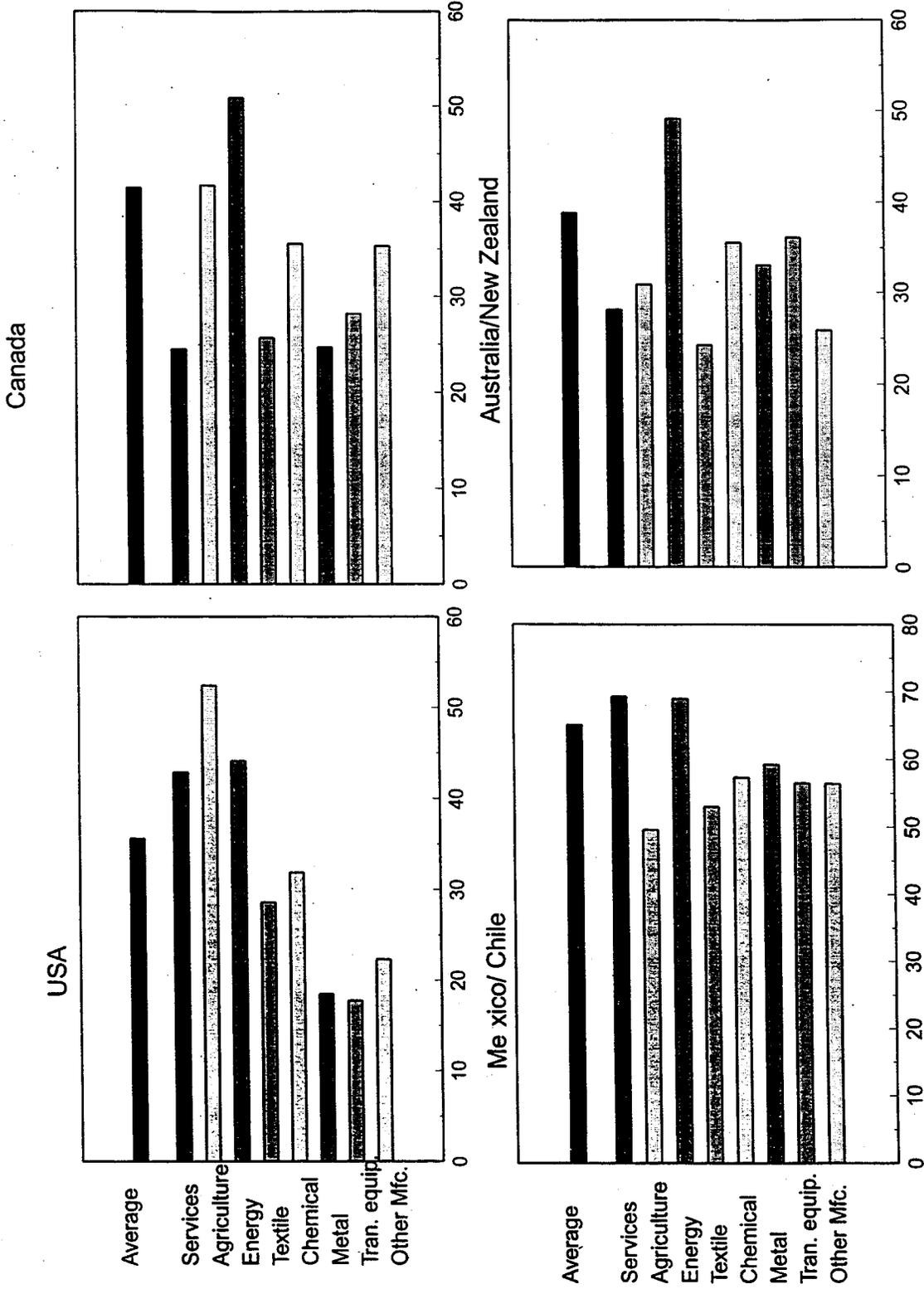
Of course sectoral net trade balances are not independent policy objectives, and structural issues are deeply connected to changes in domestic demand as well. For those interested in sectoral issues, total output is the more relevant bottom line (see table 4). Nevertheless, the changes in net exports are good indicators of the sectors with the greatest increases in output resulting from tariff removal. In the

⁸ Note that changes in trade balances can often be more volatile than changes in single-direction trade flows, which are the more frequently reported outcome.

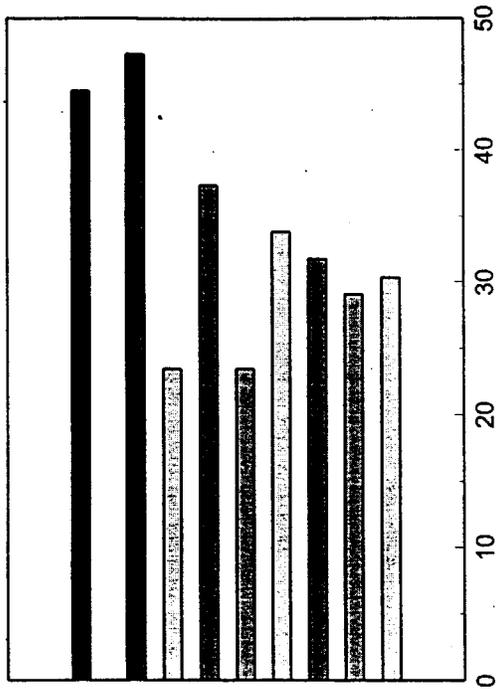
Table 3. Changes in demand for services as intermediate inputs
 (% change from base year)

	EXP1	EXP2	EXP3
USA	1.73	3.23	3.28
Canada	3.46	5.71	3.55
Mexico/Chile	0.34	2.15	3.38
Australia/New Zealand	3.75	5.80	3.22
Japan	1.61	4.83	4.90
NIC of East Asia	4.59	6.34	2.81
China	8.96	10.71	3.27
Southeast Asia	11.25	16.41	4.44
EU	-0.29	0.22	1.48
ROW	-0.09	0.48	1.57

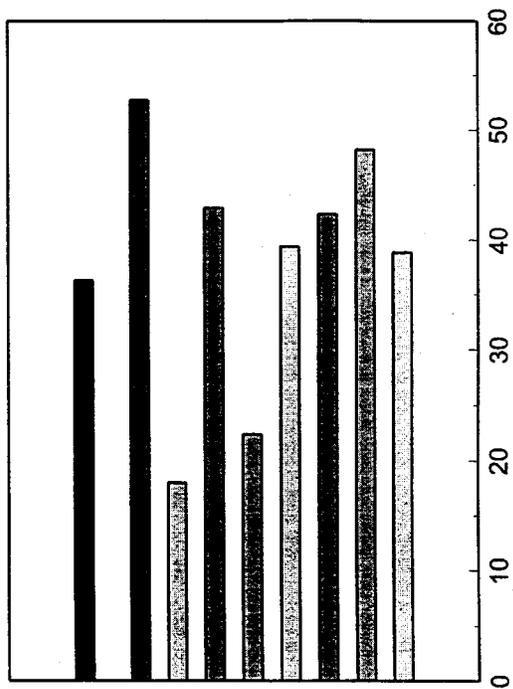
Figure 1: Shares of Capital in Value Added



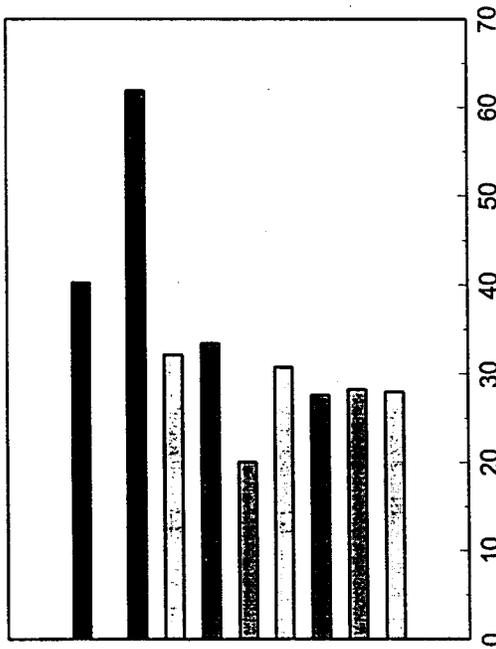
NIC of East Asia



Southeast Asia



Japan



China

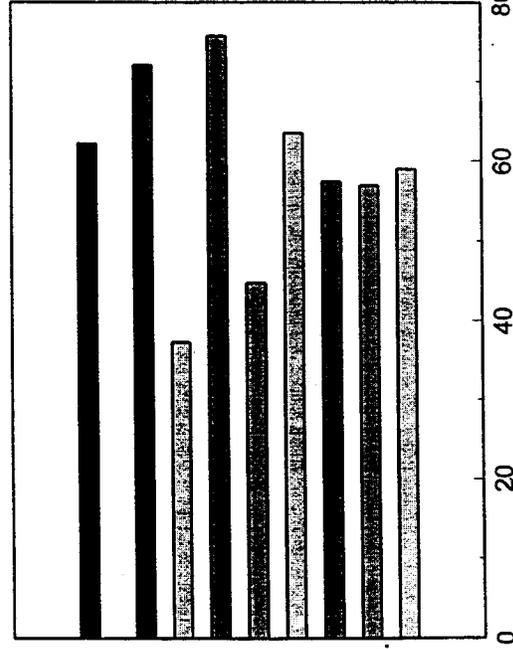
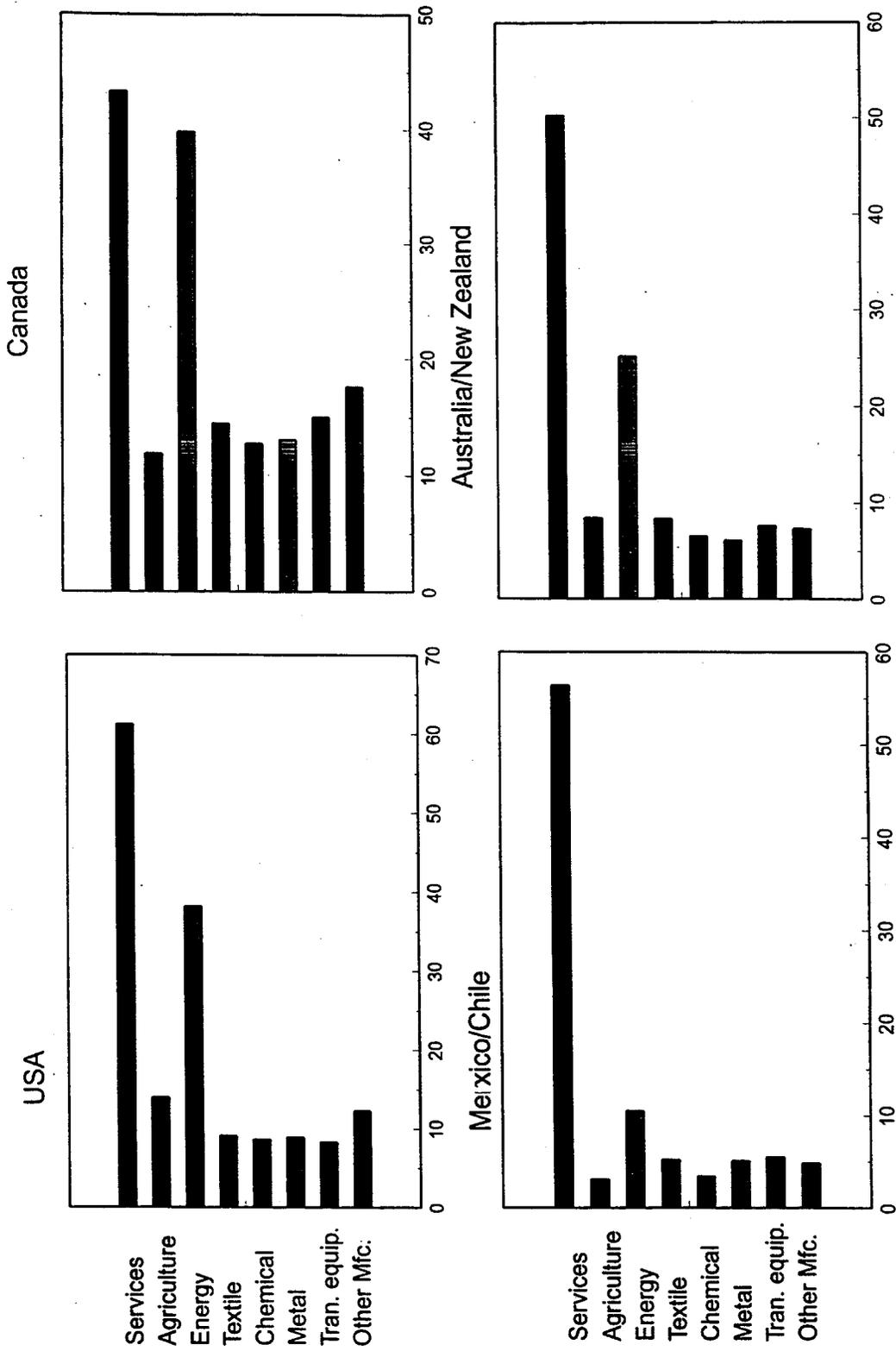
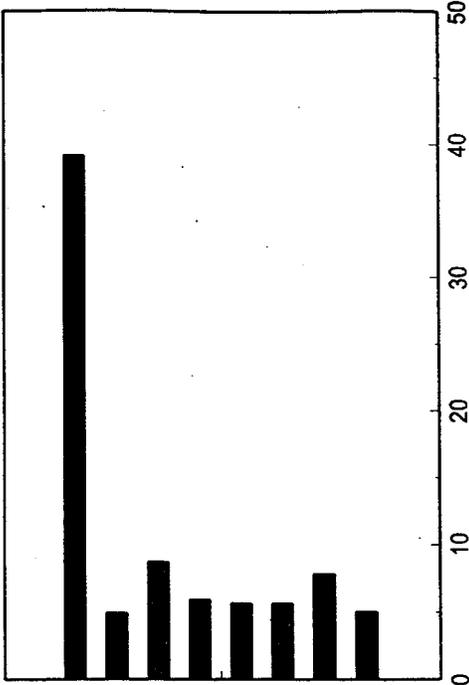


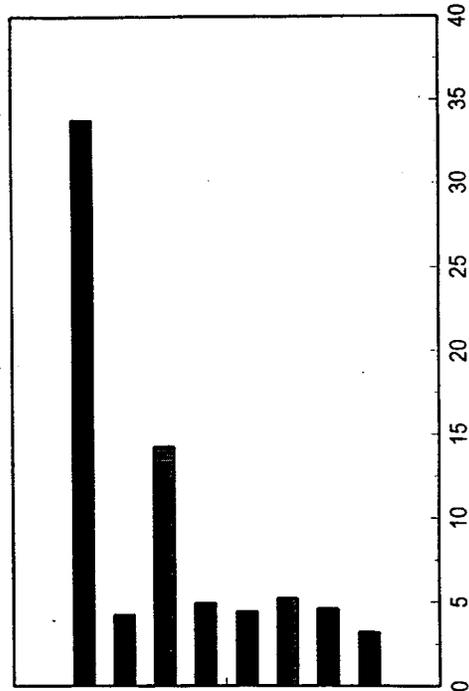
Figure 2: Shares of Services in Total Intermediate Inputs for Each Sector



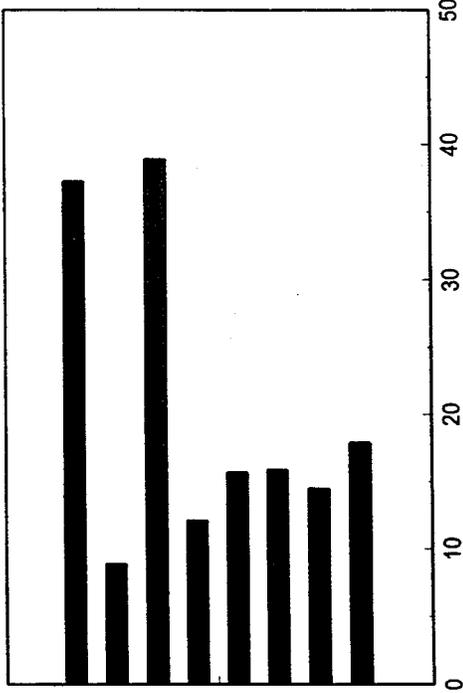
NIC of East Asia



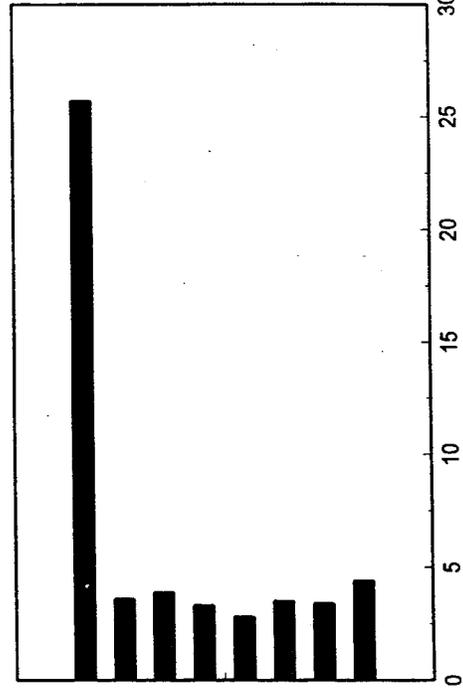
Southeast Asia



Japan



China



Services
Agriculture
Energy
Textile
Chemical
Metal
Tran. equip.
Other Mfc.

Services
Agriculture
Energy
Textile
Chemical
Metal
Tran. equip.
Other Mfc.

Table 4. Change in outputs from the base year (% change from base year)

	EXP1	EXP2	EXP3	EXP1	EXP2	EXP3
4.1 USA				4.5 Japan		
Private services	0.31	2.94	2.61	-0.98	1.48	2.45
Agriculture	6.78	8.25	1.39	-1.05	-0.04	1.02
Energy	2.14	3.17	1.01	0.18	1.95	1.78
Textile and paper	-1.20	-0.38	0.83	1.68	2.78	1.10
Petrochemicals	0.23	1.10	0.87	2.27	3.42	1.13
Metals	1.82	2.34	0.51	3.96	4.69	0.70
Transport industries	2.66	3.21	0.54	5.25	6.11	0.82
Other manufacturing	1.99	2.13	0.14	7.56	8.28	0.64
4.2 Canada				4.6 NIC of East Asia		
Private services	1.64	4.26	2.57	0.02	2.12	1.99
Agriculture	5.87	7.17	1.24	6.33	7.15	0.78
Energy	2.07	3.46	1.36	-0.33	0.01	0.38
Textile and paper	-0.51	0.63	1.14	23.91	24.93	0.86
Petrochemicals	0.46	1.76	1.29	6.10	6.77	0.66
Metals	1.79	2.56	0.75	5.03	5.54	0.50
Transport industries	1.04	2.06	1.01	2.58	3.18	0.57
Other manufacturing	1.77	2.15	0.38	9.41	9.90	0.45
4.3 Mexico/Chile				4.7 China		
Private services	-1.03	-0.82	0.78	18.97	17.41	-0.51
Agriculture	-0.74	-0.20	0.54	-5.00	-5.07	-0.07
Energy	5.23	6.37	0.83	10.61	11.46	0.62
Textile and paper	0.91	1.64	0.67	27.04	28.50	0.89
Petrochemicals	0.94	1.64	0.65	4.02	4.60	0.44
Metals	5.74	6.47	0.58	9.60	10.22	0.47
Transport industries	4.82	5.62	0.66	12.52	13.38	0.65
Other manufacturing	8.86	9.80	0.73	11.84	12.67	0.63
4.4 Austria/New Zealand				4.8 Southeast Asia		
Private services	0.09	2.45	2.46	1.22	2.20	1.80
Agriculture	20.37	21.46	0.93	-1.73	-1.20	0.51
Energy	-1.83	-1.37	0.42	10.38	10.37	-0.24
Textile and paper	-2.40	-1.56	0.88	25.70	26.61	0.60
Petrochemicals	1.65	2.52	0.86	1.87	2.35	0.45
Metals	0.65	1.07	0.41	6.12	6.37	0.15
Transport industries	-3.36	-2.92	0.45	0.98	1.19	0.20
Other manufacturing	-1.44	-1.09	0.33	19.81	20.23	0.25

case of services liberalization, the figures showing which sectors use the most services as intermediates is the best indicator of sectors growing more than average. Since both experiments involve removal of trade barriers, rationalization of resources, and welfare increases, the vast majority of sectors experience some growth in output. In the instances of declines, they are negligible.

In two respects these results differ from those of Brown *et al* (1996) mentioned above. While the structure of the experiments differ in the two cases, it is worth noting that under non-services tariff liberalization they find a widespread drift of labor resources out of services, whereas we find the services sector thriving in some countries while contracting in others. Under services trade liberalization they report an increase in services exports from Japan, though a drop in net exports, whereas we find both gross and net exports of Japan's services to decline. These differences are probably due to the specification in Brown *et al* of imperfect competition in all sectors except agriculture. This feature allows more scale economies to be achieved under trade expansion and forces fewer trade-offs as more output can be produced with fewer workers.

V. Conclusions

This paper describes a framework for modeling barriers to services trade as fixed costs and uses this framework to simulate the impact of trade liberalization. The removal of tariffs on all other sectors was found to have a notable impact on the structure of production and trade in the services sector. The APEC members showing the largest increase in net exports of services under this experiment were also the ones experiencing the greatest welfare gains and growth in services net exports under services trade liberalization. As tariff removal led to trade patterns more in line with comparative advantage, a number of the initial net trade balances were substantially reduced, indicating a movement countervailing to that producing the base trade balances. In contrast, services trade liberalization almost systematically reinforced existing trade balances, and maintained this role when simulated jointly with tariff removal. The relative use of capital and labor in services was found to be similar to that in sectors making the most use of services as an intermediate input. Therefore, the increase in demand for intermediate services under services liberalization tended to reinforce rather than counteract the role of primary factors in determining sectoral comparative advantage.

The Western APEC members were among those receiving the greatest welfare gains from services trade liberalization. For the U.S., the welfare gains from reducing trade barriers in services has the potential to equal or exceed that from even complete APEC tariff removal.

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Comments by Ellen E. Meade on

**The Cost of Regulation in the Japanese Service Industry
by Hiroki Kawai and Shujiro Urata**

and

**Liberalizing APEC Trade in Service
by Nancy Benjamin and Xinshen Diao**

I have not really looked much at this literature since the NAFTA debate about 5 years ago, and I have been involved more in European monetary issues. But being an outside observer allows me to pose questions rather than to answer them. The most interesting aspect of these two papers, I think, is the attempt to model barriers that restrict trade and/or production of services and which compute the gains associated with the liberalization of those barriers. We have seen models in the NAFTA context and subsequently of elimination of the traditional type barriers to trade.

The first paper by Kawai and Urata on Japan is a single-country model, and it makes the assumption that all services are nontraded, differing from the Benjamin and Xinshen world regional model that asserts that all services are traded. What differentiates private services from their remaining service sectors is that private sector services are characterized by imperfect rather than perfect competition. The Kawai and Urata paper notes the size of the TFP gap between the United States and Japan. They compute that gap and narrow it by 50 percent as an estimated productivity shock in effect: An estimate of liberalization of the restrictions on services in the domestic sector. As we would expect with the positive productivity shock, there are the associated improvements in income, consumption, and welfare.

The Benjamin/Xinshen paper is interesting because of its treatment of the imperfectly competitive private services sector. Fixed costs are used in this sector to represent the domestic barriers to entry. An implication of the model structure and assumptions is that the country's specific profit-maximizing price in this private services sector implies a positive relationship between the firm's market share and the price it charges. Thus domestic producers have a high market share in their national markets, and the price that domestic producers charge is high at home, higher than foreign producers in the domestic market, which have a small market share. Their model of liberalization of barriers and private services involves two changes: (1) a move to single pricing where producers, both domestic and foreign charge some weighed average price and (2) a reduction in the fixed cost by 10 percent, which is already noted, with an ad hoc 10 percent adjustment.

I agree with both papers, that these types of services, say banking and financial services or distribution, have domestic regulations that effectively provide some market power to domestic producers and limit the access of foreign producers to the domestic market. But to model such restrictions is difficult, and I am not convinced that either paper has addressed this problem.

For instance, can it be that the fixed cost to entry are simply differential fixed costs with higher fixed cost to foreign producers for access to the domestic market than the domestic producers themselves. The model structure in the Benjamin/Xinshen paper may not be fully necessary or the differential fixed costs may not be any more ad hoc than the assumptions made. I would feel more comfortable if the high market share for domestic producers in their model were more a direct result of the domestic regulations in place. It would be nice to see some explicit linkage because the debate over restrictions on services

emphasizes domestic regulations in giving the upper hand to the domestic producers. Both authors mentioned the key role of foreign direct investment, but they do not really treat it. We need a dynamic framework for treating foreign direct investment. The NAFTA debate made this need clear when liberalization of investment became crucial in many dynamic CGE models. When we talk about services and the importance of services, to leave out foreign direct investment is quite a problem.

Unlike the Benjamin/Xinshen paper, the Kawai/Urata paper is concerned with Japanese trade, but not the implications of trade worldwide for countries having different trading partners. Given their conclusions about the welfare loss to Japanese consumers because of the current restrictions, this paper should appeal to the Clinton administration. It is a clear signal about the implications of these regulations for consumers in Japan. And that brings me to a final comment: many models make an assumption about unchanged trade balance at a macro-economic level, looking at the sectorial differences across sectors. But the services debate makes it seem that both dynamics--allowing for an overall current account type movement and a current account type balance--are important, at least here in the United States.

Comments by Christopher Melly¹ on

**“The Cost of Regulation in the Japanese Service Industry,”
by Hiroki Kawai and Shujiro Urata**

Kawai and Urata estimate the cost of regulation in service industries in Japan using a computable general equilibrium (CGE) model. The model determines regulatory cost by estimating how improvements in total factor productivity in service industries affect prices, production, and employment throughout the economy. On the basis of this simulation, the authors find that the cost of regulation, which is presumed to be a partial cause of high prices and low productivity, is 9 percent of GDP and 270,000 yen (\$2,232) in per capita consumption. Such high values may be plausible given the ubiquitous nature of services, which comprise more than 70 percent of GDP and employment in Japan.

This paper reveals a number of interesting aspects about services in the Japanese economy. It is surprising to see just how much higher prices for services are in Japan than in the United States. According to Kawai and Urata, Japan’s prices for construction, financial services, transportation, and “other services” are twice the prices recorded in the United States. Even more striking, price levels are seven times higher in Japan for road freight transport and storage, and five times higher for legal, accounting, and other business services.

The paper also shows how service prices and productivity influence the rest of the economy. For example, out of all service sectors, prices for distribution services were found to have the single greatest effect on total prices, and increases in productivity in the construction and distribution sectors registered the largest positive effects on GDP. It may be obvious that these services have a major economic impact, but the paper also shows that productivity improvements in each service sector, except for construction, resulted in producer price declines *in all industry sectors*. While these price declines are characterized as of small magnitude, this demonstrates the wide reach of most service sectors throughout the economy.

So Kawai and Urata make the valuable contribution of showing that services play an important role in the economy and that improvements in services productivity would significantly improve overall welfare. But perhaps the most important concept to take away from the paper is how much work remains to be done. First, more effort needs to be expended to improve available data so that services may be analyzed at a more detailed level. According to Kawai and Urata, the sector that had the greatest effect on GDP is not a sector at all, but rather an amalgamation called “other services.” This is not very helpful. Second, the paper really provides only a rough sketch of what would happen in the event of a broad productivity shock. It does not explore how such a productivity change might occur and what would be the real world results. For instance, how might productivity actually be improved in the distribution sector? What regulations or market conditions are impeding productivity improvements? If these barriers were removed, who would benefit and how? These questions should be examined for each of the service sectors in future research.

A third major area of work is to determine the economic effects of international trade and investment in services. While the model assumes otherwise, services are indeed tradable on both a cross-border basis and through foreign affiliates – to the extent that cross-border services trade accounts for 21 percent of total U.S. trade and sales of services through foreign affiliates of U.S. firms exceed \$300 billion. The rights to invest and thereby establish a commercial presence in a foreign country and to

¹The author is with Office of Industries of the U.S. International Trade Commission. These comments are solely meant to represent the opinions of individual authors. They are not meant to represent in any way the views of the U.S. International Trade Commission or any of its individual Commissioners, or the U.S. government.

operate on an equal footing with local competitors are arguably the most important issues for international service firms. Presently, negotiations to liberalize trade and investment in telecommunications, financial services, and “other services” take place under vague assumptions that open trade and investment is a good thing, but just how good or who benefits remains unknown. Intuitively, the introduction of foreign competition, capital, technology, and know-how in the service sectors should result in lower prices and improved productivity. As Kawai and Urata show, such productivity improvements should yield significant gains in GDP and consumption. But clearly more research is needed to develop an understanding of the effects of trade and investment in service industries so that appropriate policies may be developed.

Comments by Alan V. Deardorff on

**Liberalizing Services Trade in APEC:
A General Equilibrium Analysis with Imperfect Competition**

by Nancy Benjamin and Xinshen Diao

This is a valuable paper addressing an issue of considerable importance. As is becoming well known, trade in services has been growing more rapidly than trade in goods, at the same time that trade in goods has itself been expanding as a share of overall economic activity. Only since the advent of the Uruguay Round of Multilateral Trade Liberalization has it even been recognized that trade in services exists. A that international transactions in services do occur and have many of the features of trade in goods, except of course that they do not pass through customs. This last fact has meant that data on trade in services cannot be collected as easily as for trade in goods, and indeed for some types of services it is not obvious even what data to collect. For all of these reasons, efforts to model international trade in services have only recently begun. This is one of the first studies to attempt that, and it is therefore not surprising that it pioneers new ground. I will devote most of my attention to the innovations in the paper.

But first, let me say a few words about the paper's more conventional aspects. It reports on three policy experiments involving liberalization of trade in goods and services among the APEC countries. These experiments are performed using a computable general equilibrium (CGE) model that was apparently constructed for that purpose. The model has ten countries/regions and eleven sectors, all but one of which (the traded service sector that is the focus of attention) are modeled as perfectly competitive with goods differentiated by country of origin. This makes it a very conventional model, as it should be to avoid generating results from unusual modeling choices that are not meant to be the focus of attention.

The model itself is not reported in any detail, which is fine, given the purpose of the current paper. It would be helpful, however, to direct us to where we can find the details of the model (its equations, and more about the data being used) if we want to see them. There are also some questions that should be answered here about modeling choices, since we need to know these if we are to interpret the results. How is the model closed: that is, is final demand linked directly to factor income, or is some other mechanism used? How are factor markets handled: are some factors sector-specific, or are all of them immobile across industries; do all factor markets clear; are factor supplies fixed or do they respond to prices? Are there any international capital flows in the model, and if so, how are they determined? Is this entirely a real model, or do nominal exchange rates play a role? If so, how are they determined?

We also need to know a little more about the data used in the model, even outside of services. From what year do the data on trade, output, and factor uses come, and what are the sources? Are there separate input-output tables for each country/region, and how especially do you handle I-O tables for the regions that aggregate countries? We do not need to know much here, but a footnote or two could help to put the results in context.

We do need more, however, about your data on services. First, we need to know what you cover in the focus industry, "other private services." Clearly, from the definitions of sectors (9) and (10), you exclude trade, transportation, and government. (Does that mean that you allow no trade, nor trade liberalization, in trade and transportation services? That seems a major omission.) But we do not know what you also exclude in sector (8), "nontraded services," since not long ago all services might have been included in that category. Given the importance of sector (11) for your analysis, you really should list its

main components. We also need to know about your data on services trade, including not only its year and source, but also some indicators of the size of the gross and net flows, both absolutely and in relation to GDP.

Let me turn now to the main innovation in the paper: the modeling of services markets and especially of services trade liberalization. Past work has relied on embarrassingly crude estimates of barriers to trade in services. The barriers themselves were inferred by Hoekman (1996) from positions taken by countries in the Uruguay Round negotiations. This was a very clever technique, and a useful one in the absence of any other information, but the confidence one could place in these numbers was incredibly small. Brown et al. (1996) then used these numbers as though they were tariffs, removing them to reflect services trade liberalization. Yet if there is one thing that we do know about trade in services, it is that there are no tariffs on these transactions. Indeed, I have argued in Deardorff (1994) that there should be tariffs on services trade, and that the first step in the GATS should have been to replace all current discriminatory policies and regulations affecting services with tariffs. Such "tariffication" is being used successfully, we hope, as the starting point for liberalization of other NTBs in goods markets, and I see no compelling reason why it could not be done also in services.

But be that as it may, the fact remains that it has not been done, and we do not have anything like tariffs on international service transactions. Therefore, to model liberalization as removing these tariffs, as Brown et al. (1996) do, requires at best a large theoretical leap of faith.

Benjamin and Diao try to do better. They work within a model of service trade based on Mercenier (1995) in which service providers are imperfectly competitive and have fixed costs, and are able to price-discriminate across countries. They then model liberalization as both reducing the fixed costs and removing the market segmentation that permits price discrimination. Thus they find a new equilibrium with firms charging a single price in all countries, and they nudge that price in the downward direction by reducing fixed costs.

This is an ingenious method, but it is also sufficiently novel that I would like to know more about how it works before I will trust it as a representation of services trade liberalization.

First, I very much like the idea of modeling liberalization as a reduction in fixed costs. The kinds of impediments that countries place in the way of foreign service providers do strike me as raising fixed costs much more than variable costs. However, if I understand the paper correctly, the fixed costs that are reduced in the model apply to a firm's entire production, not just to its sales in a particular foreign market. This seems wrong to me, and I feel like a great opportunity is being missed. Surely, if the model could incorporate destination-specific fixed costs, this would provide an ideal tool for examining the effects of reducing all sorts of regulatory barriers to services trade.

Ideally, such an analysis should allow for the possibility not only of expansion of sales by existing providers, but also of entry, including by firms that currently exist but do not serve a particular foreign market because of these costs. The model would then capture the benefits not just of lower costs and lower prices due to that, but also (depending on the type of competition) additional benefits from greater competition.

The other dimension of liberalization as modeled here is the removal of market segmentation that permits price discrimination. This I have doubts about. My specialty is not industrial organization, and I

do not know much about how the possibility of market segmentation is usually thought to be determined. The most obvious obstacle to market segmentation would be arbitrage by buyers, who could buy in one place and sell in another if a firm charged two different prices. In fact that is usually an implausible scenario even for goods, and it seems downright impossible for services. There may well be other aspects of the problem that I am not thinking about, but it strikes me that market segmentation in services is likely to remain, regardless of any liberalization in services.

I am not sure that this is a problem for the paper, though. With market segmentation and price discrimination, the most likely direction of that segmentation is to charge a lower price abroad than at home. If somehow price discrimination were to disappear, one would expect home prices to fall and foreign prices to rise, exactly the opposite of what most of us would expect from trade liberalization. Indeed, I wonder if the authors did not find exactly this to be happening, and were motivated by that to add a reduction of fixed costs to their specification of trade liberalization.

So in the end, I have found the paper very stimulating and thought-provoking. I do not regard the numerical results of the paper to be definitive, since I have doubts about the particular ways that they were modeled. But I am intrigued by the approach and motivated to try similar things in the modeling that I do myself together with Drusilla Brown and Bob Stern. This paper points the way, I think, toward modeling removal of barriers to trade in services as a combination of reductions in fixed costs that are specific to foreign service firms selling in a domestic market, and a relaxation of barriers to entry.

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