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REFORM IN THE APEC REGION:
TRADE AND WELFARE
IMPLICATIONS BY 2005**

Kym Anderson, Betina Dimaranan, Tom
Hertel and Will Martin

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Centre for Economic Policy Research

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ABSTRACT

Economic Growth and Policy Reform in the APEC Region: Trade and Welfare Implications by 2005*

This paper examines the impacts of key trade reforms likely to affect the APEC region over the next decade. It does so by taking an economy-wide perspective using projections to the year 2005, based on the global CGE model known as GTAP. The paper begins by showing that the empirical impact of implementing the Uruguay Round depends significantly on how China and Taiwan are treated. It then explores the market implications of increased economic growth in China, as well as several policy shocks. It is shown that increased industrial growth in China – due to China integrating more into the global economy – would be beneficial to the world, since it would boost industrialization in other Asian countries. Failure to honour Uruguay Round obligations to open textile and clothing markets in OECD countries, on the other hand, is shown to reduce East Asia's industrialization and thereby slow the growth in this region's net imports. Further MFN trade liberalization by APEC members, however, could add substantially to the growth and structural changes expected in the region and beyond over the next decade. The latter benefits are shown, though, to depend heavily on the inclusion of agriculture in the APEC reform, something that Northeast Asian countries have been reluctant to do.

JEL Classification: F13, F17, O53, Q17, R13

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NON-TECHNICAL SUMMARY

Numerous unilateral, regional, and multilateral economic reforms in the Asia-Pacific and elsewhere are under way at present or are scheduled over the next decade or so. This paper examines the likely impacts of key trade reforms affecting the APEC region, and does so by taking an economy-wide perspective using projections to 2005, based on the global computable general equilibrium (CGE) model known as GTAP.

The paper begins by showing that the empirical impact of implementing the Uruguay Round depends significantly on how China and Taiwan are treated. The global economic welfare benefits from the Uruguay Round are 28% greater if China and Taiwan are included in the agreement. The paper then explores the market implications of increased total factor productivity growth in China's non-farm sectors. If that were to be the consequence of China's accession to the WTO and from greater export opportunities arising from multifibre arrangement (MFA) reform, the modelling results suggest this would be not only beneficial to China, but also a considerable gain to its East Asian neighbours with which it trades intensely.

Several policy shocks are examined as well. They include the failure to fully abolish the bilateral quotas on textiles and clothing trade as promised under the Uruguay Round, and further most favoured nation (MFN) trade liberalization by APEC countries. Failure to honour Uruguay Round obligations to open textile and clothing markets in OECD countries is shown also to reduce East Asia's industrialization and thereby slow its net imports of primary and other products. On the other hand, the trade reform that is likely to accompany China's WTO membership would greatly benefit the economies of China and the world. It would boost exports of manufactures and strengthen primary import demand by not only China, but also its densely populated neighbours with whom its intra- and inter-industry trade in manufactures would intensify.

Further MFN trade liberalization by APEC members, as promised in the declaration following the APEC Leaders' Summit in Bogor in November 1994 and confirmed in subsequent summits in 1995 and 1996 in Osaka and Subic Bay, would add even more to the growth and structural changes expected in the region over the next decade and beyond. In our analysis of that scenario, we assume that China joins the WTO and that the Uruguay Round is fully implemented by 2005, and examine the effect of all APEC economies liberalizing trade beyond their Uruguay Round commitments to the extent of a further 50% reduction in import tariffs or tariff equivalents by 2005. A key finding

is that the results depend very heavily on whether agriculture is included in the reform (as demanded by the APEC food-exporting countries but contrary to what APEC's Northeast Asian members want). Specifically, the welfare gains from this regional liberalization are 65% greater when all goods markets are liberalized relative to the welfare gains when agriculture is excluded. (Services trade liberalization is ignored, for want of reliable estimates of services protection rates.) Provided agriculture *is* included, this further reform by APEC economies would add one-third to the global welfare gains from the reforms under the Uruguay Round. It would also boost world trade in all products by an additional 6% (over and above the 10% boost due to the Uruguay Round plus the additional 4% boost due to China and Taiwan's WTO accession). Agricultural trade would be only 2% greater by 2005 if farm products are excluded from the APEC reform, but would be 18% greater if included. Because distortions to agricultural trade in the APEC region would still be very large even after implementing the Uruguay Round, a further reform in the region that excludes farm products would be missing a large part of the gains that remain to be reaped from trade liberalization.

**ECONOMIC GROWTH AND POLICY REFORM IN THE APEC REGION:
TRADE AND WELFARE IMPLICATIONS BY 2005**

Kym Anderson, Betina Dimaranan, Tom Hertel, and Will Martin

The past decade will go down in history as one in which regional and global economic integration took some sizable steps forward. Between 1985 and 1994 the ratio of world trade to GDP rose three times faster than in the preceding ten years and nearly twice as fast as in the 1960s, and since 1985 the flow of foreign direct investment as a share of global GDP has doubled (World Bank 1996). This internationalization is due to a considerable extent to unilateral trade and macroeconomic reforms. But those reforms themselves were also stimulated by regional integration initiatives in Europe, North America and a number of smaller regions. Moreover, the most comprehensive of multilateral initiatives, the Uruguay Round, promises to contribute to this process of globalization during its implementation over the next decade. Arguably the APEC process is now beginning to contribute too. While the nature and extent of the contributions to integration have varied considerably across regions, all these developments have made the national economies of the world -- and especially the Asia-Pacific -- more interdependent.

Integration possibilities are far from being exhausted, however. The Uruguay Round promises a great deal, but its implementation has only just begun and will take six to ten years to complete, even if implemented on schedule. There is a great deal of scope for slippage along the way, especially with respect to the Agreement on Textiles and Clothing. Secondly, most of the economies in transition from socialism still have a long way to go in reforming their trade and trade-related policies before they can accede to the World Trade Organization (or even to the European Union -- see Winters 1996). In Asia, China has made much progress in this respect, but is yet to be admitted to WTO. Hence Taiwan still cannot join. Thirdly, the pace of integration has been driven in part by the rapid growth and export-oriented industrialization of East Asia's developing economies. What impact would an increase in industrial growth in, say, China have on world trade and welfare? On the other hand, if governments of the Asia-Pacific can begin to deliver on their APEC commitment to reach free trade on an MFN basis by 2010 for rich countries

and 2020 for developing countries, that will lead to further integration both within the APEC region and between it and the rest of the world.

The present paper seeks to examine empirically these various possibilities for furthering the regional and global integration of national economies in the context of on-going economic growth. Their production, trade and welfare consequences are simulated using the latest projections version of the global CGE model known as GTAP, described briefly in Section 1. In Section 2, the estimated effects of implementing the Uruguay Round by 2005 are presented first without, and then with, China and Taiwan participating as WTO members. This is to show just how much difference their accession could make to the world economy. Assuming sanity prevails on that issue and both join the WTO soon, the scenario involving their membership and full implementation of the Round is taken as the modified base case in 2005, and is compared in Section 3 with several scenarios. These examine the effects of: (a) a possible increase in economic growth in China, (b) slower reform of the Multifibre Arrangement than promised under the Uruguay Round, and (c) a 50 per cent MFN liberalization of trade in the APEC region (first without and then with agriculture included in the reform). All are shown to have substantial effects on trade and welfare not only in the Asia-Pacific but also in Western Europe and elsewhere. The final section of the paper concludes by drawing out key policy implications of these empirical findings.

An increase in industrial economic growth in China is shown to be beneficial to the world economy, not least because it would increase industrialization in other Asian countries. Failure to honour Uruguay Round obligations to open textile and clothing markets in OECD countries is shown also to reduce East Asia's industrialization and thereby slow its net imports of primary and other products. On the other hand, the trade reform that is likely to accompany China's WTO membership would greatly benefit the economies of China and the world. It would boost exports of manufactures and strengthen primary import demand, not only by China but also by its densely populated neighbours with whom its intra- and inter-industry trade in manufactures would intensify. Further MFN trade liberalization by APEC members, as promised in the declaration following the APEC Leaders' Summit in Bogor in November 1994, and confirmed in the two subsequent summits in Osaka and Subic Bay, would add even more to the growth and structural changes expected in the region and beyond over the next decade. The latter benefits are shown to depend heavily, however, on the inclusion of agriculture in the APEC reform.

1. The GTAP Model

To provide a picture of how world trade might look in a decade's time, use is made of the latest projections version of the GTAP (Global Trade Analysis Project) applied general equilibrium model based in Purdue University (Hertel 1997). The GTAP model is a standard, multiregion model which is currently in use by over one hundred researchers in 30 countries on five continents. The data base builds on contributions from many of these individuals, as well as the national and international agencies in the GTAP Consortium. Perfect competition and constant returns to scale are assumed for all sectors of each economy in the version used here.

The model utilizes a sophisticated representation of consumer demands which allows for differences in both the price and income responsiveness of demand in different regions depending upon both the level of development of the region and the particular consumption patterns observed in that region. In the simulations presented below, many of the East Asian economies are projected to continue to experience extremely rapid economic growth rates, so that the income elasticities of demand play an important role in the model.

On the supply-side, differences in rates of factor accumulation within and between countries interact with different sectoral factor intensities to drive Rybczynski-type changes in the sectoral composition of output. The GTAP production system distinguishes sectors by their intensities in four primary factors of production: agricultural land, labor time, physical capital, and human capital. Thus in a region where physical capital is accumulating rapidly, relative to other factors, we can expect the capital intensive sectors to expand at the expense of labor-intensive sectors.

The GTAP framework is built on a complete set of economic accounts for 1992 for each of 30 economies/regions spanning the world. It incorporates an exhaustive description of inter-industry linkages at the 37-sector level. In addition to differences in intermediate input intensities, import intensities are also permitted to vary across uses. Since much trade is in intermediate inputs, the distinction between sales to final consumers and sales to other firms can be quite important. Lowering the cost of imported goods to consumers is quite different from lowering the cost of

intermediate inputs to domestic firms which in turn may be competing with imports in the final product market.

As well, products are differentiated by place of production. The linkage between the different prices of a product is typically quite strong, but will depend on the degree of substitutability in consumption. In addition to matching up more effectively with reality, this approach has the advantage of permitting us to track bilateral trade, as opposed to simply reporting total exports net of imports.

The standard GTAP parameters used are documented in Hertel (1997, Ch. 4), with two exceptions. First, the income elasticities of demand for farm and food products have been upgraded (see Anderson et al. 1996, Appendix). Secondly, the values for the Armington elasticities of substitution used to specify the extent to which similar products from different countries substitute for one another have been doubled, following Gehlhar's (1994) study which found that the earlier elasticities used in GTAP were too small to accurately predict -- in a backcasting exercise -- the changes in actual trade shares observed over the 1980s. Even then the current assumed Armington elasticities may still be lower than is reasonable for the long run changes to be projected below for our ever-more integrated global economy.

Since it is cumbersome to conduct and present projections with the full 37-sector, 30-region GTAP data base, we have aggregated up to a level which highlights sectors and countries of interest for this particular study. The regional aggregation presented in the left margin of Table 1 allows us to identify each of the main APEC economies while keeping the overall dimensions of presentations manageable. The sectoral aggregates are shown in Table 2. A total of 13 aggregates are shown in the body of Table 2, but for brevity of presentation we sometimes use the five super-aggregate sectors listed below the table.

Table 1 reports the assumed rates of growth in factors and real GDP (from which the implied rates of total factor productivity growth may be derived). We utilize exogenous projections of each region's endowments of agricultural land, physical capital, human capital, the state of technology, population and the labor force. These are based on combinations of historical data and World Bank projections of the growth in population, labor force, real GDP and investment. Capital stock projections were generated by adding investment in each year and subtracting depreciation, using the methodology of

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Nehru and Dhareshwar (1993). The human capital projections were based on projections of the growth in the stock of tertiary educated labor in each developing country (Ahuja and Filmer 1995) and historical growth rates in developed countries to provide an indication of changes in the stock of those qualified for employment as professional and technical workers. The stock of agricultural land is held constant in this study. Finally, base case estimates of non-agricultural, neutral total factor productivity (TFP) growth rates for each of the countries/regions were obtained by subtracting the growth in total factor inputs from the real, non-agricultural GDP projections. (Agricultural TFP growth rates are treated slightly differently -- see the published version of Anderson *et al.* 1996.)

From the estimates in Table 1 it can be seen that the structure of the world economy will change in a number of important ways over the coming decade. Given the substantial differential between the growth rates of developed and developing countries, the developing countries will constitute a considerably larger share of the global economy in 2005. Furthermore, given the particularly high rates of savings and investment in East Asia, the capital-labor ratios of these economies are expected to increase, creating supply-side pressures for changes in the composition of output in these economies (Krueger 1977; Leamer 1987). The relatively high rates of accumulation of human capital in developing economies also are likely to contribute to pressures for structural change as developing countries upgrade the skill-intensity of their product mix. Taking all these things into account and starting with the 1992 baseline, the model generates a projection of the world economy in 2005 assuming no changes to existing trade and other policies. That base scenario is then compared with various alternative scenarios.

2. Effects of global economic growth, Uruguay Round implementation, and China's WTO accession by 2005

In order to examine the effects of implementing the Uruguay Round, Hertel et al. (1995) specify the associated commitments including cuts in tariffs, tariff equivalents of nontariff import restrictions, and export subsidies. Reform of the system of textile and apparel quotas is an especially important part of the Uruguay Round, so particular care has been taken in modelling the elimination of these quotas under the UR Agreement on Textiles and Clothing. The nonagricultural information is obtained largely from the WTO's Integrated Data Base (Reincke 1997), and the agricultural cuts are based on work conducted at the World Bank (Hathaway and Ingco 1995). These modelled offers

explicitly exclude protection cuts in China and Taiwan initially (since they are not yet WTO members), and we then consider separately the implications of China and hence Taiwan joining the WTO. Table 3 presents a summary of estimated protection levels prior to implementation of the Uruguay Round, and also of what they would be with the Round's full implementation and with China and Taiwan fully phased into the WTO in 2005.

The expected impacts of the Uruguay Round on international product prices, on global trade, and on country/regional export and import volumes and economic welfare are summarized in Table 4. Table 4a assumes that China and Taiwan are kept out of the WTO and undertake no further reforms unilaterally over the next decade, and in particular that they are not allowed to enjoy the improved access to OECD markets for textiles and clothing that WTO members have been promised under the Round. Table 4b assumes China and Taiwan have joined the WTO, have fully implemented their accession commitments by 2005, and have shared with other developing countries in the promised acceleration in access to OECD markets for textiles and clothing.

Effects on global trade and welfare

Even without China and Taiwan participating, the Round is projected to boost global trade by 10 per cent in aggregate. Trade in all 13 product groups expands, with the biggest gainers being agriculture, textiles and clothing, where the Uruguay Round was most contentious. Prices in international markets rise most for farm products but fall sharply for clothing. Developing Asian countries enjoy by far the largest trade boost, but even OECD trade is boosted 9 per cent. Economic welfare is projected to increase virtually everywhere because of the Round, but the gains are especially large for Asia's developing countries thanks to MFA reform. Economic welfare for the world as a whole is greater by \$179 billion per year in this scenario. This is less than earlier-estimated gains (see, e.g., the modelling studies reported in Martin and Winters 1995). The reason for the lower number has to do with the way China and Taiwan are treated: those earlier studies assume MFA quotas are eliminated for all countries including China and Taiwan, whereas in this study we assume the latter's quotas continue to expand only at the slow rates agreed previously under the MFA while those customs territories remain outside the WTO.

Should China and Taiwan be allowed to join the WTO, the Round's impact would be considerably larger, depending on the level of liberalization they commit to in their accession and the date they

join.¹ We have conservatively assumed China's commitments would be the same as they offered WTO members in late 1994. Unacceptable as China's offer was at that time, it nonetheless involved very substantial tops-down reductions in protection rates (Bach, Martin and Stevens 1996). Assuming that each tariff is cut only when the tariff binding offered to WTO is below the applied rate, that offer involves a fall in the weighted average rate of protection in China from 30 per cent in 1992 to 16 per cent. This reduction would be complemented by a substantial reduction in the coverage of nontariff barriers. In this paper, we have used the reductions in the trade-weighted bilateral tariffs as documented in Bach *et al.* to estimate the extent of the offer.² For Taiwan, in the absence of better information we have simply assumed that its non-agricultural tariffs would be cut by 36 per cent as for other Uruguay Round participants and that its agricultural cuts would be half as deep (18 per cent). The latter assumption is consistent with the tendency for trade-weighted protection cuts in the sensitive agricultural area to be relatively modest under the Round because of 'dirty' tariffication (Hathaway and Ingco 1995).

Admission of these two economies to the WTO would accentuate the rise in international prices of agricultural products relative to light manufactures, and it would boost not only their trade but also that of many other countries, adding substantially to world trade growth from the Round (a 14 instead of 10 per cent boost). But notice from Table 4 that the trade boost to other Asian developing countries from the Round would be slightly lessened by China's accession. This is because of the extreme assumption made above, namely, that if China and Taiwan were kept out of the WTO they would enjoy *none* of the benefits of MFA reform. A more realistic assumption might be that they would enjoy some but not a full share of the benefits, in which case the difference between the two scenarios in Table 4 would be smaller.

¹ Our results for China/Taiwan accession to the WTO hinge crucially on the timing of their entry. Most quota rents associated with the bilateral restrictions on textiles and wearing apparel are expected to grow over the period of implementation of the Round, despite expanding market access (Hertel *et al.*, 1995). However, assuming the promise is kept to abolish quotas for all other exporters at the end of the decade-long implementation, quota rents for China and Taiwan will be greatly reduced. In the analysis of China/Taiwan accession reported here, we take that into account. This contrasts with the results reported in Bach, Martin and Stevens (1996), for example, because in their study it is assumed initial quota rents are at the 2005 level predicted *in the absence of* implementation of the Uruguay Round.

² This specification omits two important, but partially offsetting, features of the situation. The neglect of the current system of tariff exemptions tends to overstate the impact. The omission of non-tariff barrier abolition tends to underestimate the effect. Dealing with the tariff exemptions will clearly change the specific results, but does not appear to change the broad conclusions (Bach, Martin, and Stevens 1996).

That same assumption affects the welfare results in Table 4. Globally, the inclusion of China and Taiwan boosts the estimated welfare gain from the Round by 28 per cent, to \$230 billion. Some of East Asia's other developing countries, on the other hand, have their estimated gains from the Round slightly reduced when the greater access to OECD markets for textiles have to be shared with a supplier as large as China. Even so, they remain the largest gainers in terms of percentage boosts to national economic welfare. In absolute dollar terms it is Western Europe that is projected to gain the most from the Round. That gain is as much due to its liberalization of textile and clothing imports as to Europe's agricultural reform.

It needs to be kept in mind that these welfare (and probably trade) results are very much lower-bound estimates, for several reasons. One is that the GTAP model assumes constant returns to scale and perfect competition in all sectors. Changing that to allow for increasing returns to scale and imperfect competition in some sectors can raise very substantially the estimated impacts of liberalization.³ Secondly, GTAP is not a dynamic model with endogenous growth built in. In so far as liberalization boosts investment, the effects reported here are underestimates of potential gains. Specifically, with endogenous growth it would be most unlikely that ASEAN countries would be projected to lose from China's accession to WTO. The third and related qualification is that there are many positive effects of the Round that are not modelled here. Most notable but most difficult to quantify of these is the strengthening of the multilateral trading system itself and the boost that it has given to investor confidence. If these considerations were included, along with more liberalization of services trade (following the on-going negotiations that had been postponed), the projected net national benefits from the Round may well be much larger.

³ See, for example, the various modelling papers in Martin and Winters (1995) and the survey by Francois, McDonald and Nordstrom (1996).

Effects on the sectoral composition of production and trade

Table 5 reports the projected changes in the composition of production in the world's economies over the projection period 1992-2005. (ASEAN-4 includes Indonesia, Malaysia, Philippines, and Thailand; NIEs include Hong Kong/Singapore, South Korea, and Taiwan.) Entries in each row refer to the percentage change in the relative importance of each sector in the real GDP of each region between 1992 and 2005; the base case assumes no Uruguay Round implementation, case E2 assumes full UR implementation by current WTO members, and case E3 assumes that China and Taiwan also participate. From the first column, for example, we see that the base case projection implies massive structural change in China over the coming decade. The relative volume contribution of agriculture to GDP is projected to decline by 42 per cent, in favour of growth in the relative importance of manufacturing and services. Similar declines in the relative importance of primary sectors are projected for the other East Asian developing economies. For the more-advanced economies, the primary sectors are already relatively small but they still decline a little with the economic growth assumed over the 13-year period.

The Uruguay Round is projected to do little to the structure of production in China if China stays out of the WTO, but it accelerates the move away from primary production elsewhere in East Asia (compare the first and second sets of rows in Table 5). In ASEAN-4, light manufacturing booms while in the NIEs and Japan the growth is concentrated in more capital-intensive manufactures. Uruguay Round reforms help the farm sectors of Australasia and North America while reducing agriculture's share of Western European economies, and in all three regions services and/or capital-intensive manufacturing grow faster because of the Round.

Allowing China and Taiwan to join the WTO and thereby share greater access to OECD markets, especially for textiles and clothing, in return for liberalizing their own trade regimes, would result in even faster relative decline for China's primary sectors (compare the third set of rows in Table 5). It would also ensure that resources released from agriculture to the non-primary sectors were concentrated more in light manufactures, where China has its strongest comparative advantage. That would mean, though, that fewer of the resources released from primary sectors in ASEAN-4 would go into textiles and clothing. It would also mean an even larger contraction in shares of the latter sectors in OECD countries.

The impact on sectoral trade balances of full implementation of the Round, including participation by China and Taiwan, is summarized in Table 6. It shows for China, for example, that net exports of light manufactures would be almost \$60 billion greater (in 1992 constant dollars) in 2005 than in 1992, whereas net imports of primary products and other manufactures would be \$24 billion and \$33 billion greater, respectively. Similar changes occur for ASEAN-4 and the NIEs. (We have held each country's trade balance constant in these projections, which is why the column sums are all zero.) Japan and Western Europe increase their net imports of primary products while Australasia and North America do the opposite thanks to the agricultural reforms of the Round. For all the OECD country groups except Japan, net imports of light manufactures rise and the big gainers are net exports of other manufactures and services. Services export growth is especially large for North America and Western Europe. All these changes are what one would expect from the theory of changing comparative advantage and from past Asian growth experience, and together with Table 5 they suggest that the Uruguay Round is helping to reallocate global production towards its most efficient locations.

Bilateral trades are also projected to change substantially between 1992 and 2005, partly because of different rates of economic growth but additionally if the Round is implemented. Appendix Table A1 provides the details, but for illustrative purposes just consider the trade between Western Europe and East Asia. Not surprisingly, given the assumed high rates of growth of East Asia's developing economies and their trade boost from the Round, they are the countries enjoying the largest increases in Western Europe's export shares. Even without the Round their share of Western Europe's exports is estimated to rise from 14 to 18 per cent between 1992 and 2005. With the Round (and China/Taiwan accession to WTO) that share rises to 21 per cent. The APEC region as a whole becomes more important to Western Europe's exports: its share rises from 34 per cent in 1992 to 36 per cent in 2005 if the Round were not implemented and to 41 per cent if it is and China participates. In proportional terms, it is China's share that rises most, followed by ASEAN's.

By contrast, Western Europe's shares of East Asia's and APEC's exports are projected to continue declining as the relative importance of the East Asian region in world trade grows. For example, the NIE's export share to Western Europe drops 3 percentage points between 1992 and 2005 if the Round is not implemented; and similarly for China, ASEAN-4, and Japan. However, it rebounds for China and the ASEAN-4 if the Uruguay Round is implemented, largely due to textiles and apparel

reforms. At the same time, intraregional trade within East Asia, and within APEC as a whole, increases over this period -- mostly as a consequence of rapid growth in the region (see Table 10 below).

3. Effects of altering some assumptions and of further trade reform in APEC

The projections presented above depend of course on myriad assumptions, some of which may have a significant effect on the results. Two in particular are worth scrutinizing. The first is the rate of economic growth assumed for China; the second is the full implementation of the commitment to reform the Multifibre Arrangement. The trade effects of relaxing each of these assumptions are considered in turn. Then the impact of further MFN trade liberalization by APEC countries is examined, both without and then with agriculture included. The estimated welfare consequences of each of these four alternative scenarios are then compared with those for the Uruguay Round and for China and Taiwan's accession to the WTO.

Trade effects of faster GDP growth in China

In the cases presented above, China's real GDP is assumed to grow from 1992 to 2005 at 7.8 per cent per year in total and at 6.9 per cent on a per capita basis. Since this is lower than the rate which has been sustained during the past 15 years, it is of interest to see what difference it makes if these higher historical growth rates are continued. We therefore re-ran the simulation with the Round being implemented and China and Taiwan joining the WTO but with faster total factor productivity growth in China's non-farm sectors, such that real GDP growth was about one-fifth faster (or 1.4 percentage points, 9.2 instead of 7.8 per cent per year), assuming other countries' growth rates are unchanged. Since there is the possibility that other East Asian economies would also grow faster with Uruguay Round liberalization and faster growth in China, the effects discussed below should be considered lower-bound estimates of likely changes.

Faster Chinese industrialization means more inter-sectoral adjustment away from primary production and a non-trivial increase in international prices for and trade in primary products (see first pair of columns in Table 7). China's trade would be 29 per cent higher and global trade would rise by more than 2 per cent, with ASEAN-4 being the only region shown in Table 8 to suffer a decline in trade

volume (because of increased competition in exports of light manufactures from China). There is a considerable increase in each region's exports to and imports from China, and only a partial offset in terms of Europe's decreased trade with other East Asian economies. For example, Western Europe's exports to China would be higher by \$13.5 billion per year in 2005, and its imports higher by \$23 billion, if China's economic growth rate increased by 18 per cent over the period. (Appendix Table A2).

Trade effects of incomplete reform of the MFA

Elimination of the bilateral quotas associated with the MFA under the Uruguay Round is designed to occur gradually. The first step under the Agreement on Textiles and Clothing during the ten-year transition period to 2005 involves increases in the growth rates of MFA quotas, followed by a progressive integration of textile and clothing items into the WTO system, after which the quotas are abolished altogether. The tariff lines to be integrated under GATT are selected by the importing countries, and it appears that few commodities subject to binding quotas will be integrated until near the end of the transition period. Therefore the real liberalization of trade in these products is heavily loaded towards the end of the period (2005).

Based on earlier analysis (Hertel *et al.* 1995), it appears that the degree of quota acceleration committed to under the Agreement on Textiles and Clothing is not going to be sufficient to reduce the quota rents for most of the bilateral flows. Therefore, abolition of the quotas is likely to remain a contentious issue, even though the Agreement cannot be extended; and developing countries are sure to resist any artifice that would continue such protection.

Failure to fully eliminate the trade-restrictive effects of the MFA would substantially reduce export opportunities for high-performing East Asian developing economies. We explore the quantitative implications of this possibility in a scenario that permits the MFA quotas to "snap-back" to the same level of restrictiveness observed in our initial (1992) data set. In other words, we conduct a simulation in which the bilateral quotas on textiles and clothing are reintroduced to the point where they generate the same quota rent per unit of sales as in 1992. While this may seem extreme in light of the quota acceleration built into the Agreement on Textiles and Clothing, such is not the case. Hertel *et al.* (1995) find that even with the ATC growth rates in place, quota rents are expected to *increase* over the period 1992-2005 for 37 of the 44 bilateral flows examined. Given that finding, our

MFA snapback scenario may be more modest than the true consequences of failing to abolish these quotas in 2005.

Table 7 shows that such a snapback would raise the international price of light manufactures and reduce global trade in these products by 11 per cent (and in agricultural trade by 2 per cent because of reduced agricultural imports by East Asia). Total trade of most regions but especially China and ASEAN-4 shrinks, with global trade being reduced by 2 per cent (Table 8).

Trade effects of additional APEC MFN liberalization

APEC Heads of Governments agreed in November 1994 at Bogor to eliminate, on an MFN basis, all trade barriers in the APEC region by 2010 in the case of advanced economies and by 2020 in the case of developing countries. The agreement was reaffirmed at the subsequent summits in Osaka and Subic Bay. If that reform were to be smoothly phased in, then by 2005 advanced countries would be two-thirds reformed and developing countries two-fifths there. Assuming a delayed start by the former, one might expect the region on average to be half way along in a decade's time. To examine the effects of such a scenario, we explored the impact of a further halving of the barriers to merchandise trade that would otherwise have remained in APEC countries in 2005 after the Uruguay Round's implementation (see Table 3 above).⁴ This was done first with agricultural policies exempted and then with them liberalized as well.

Under both APEC liberalization scenarios, trade would be higher in non-farm primary products by 3 per cent, in light manufactures by 11 per cent, in other manufactures by 6 per cent, and in services by 3 per cent (Table 7). If agricultural policies are not reformed then trade in farm products only rises by 2 per cent, but if agricultural protection rates were to be halved also, farm trade would be 18 per cent greater in 2005 than without this additional APEC initiative (Table 7 final column). Global trade would be boosted between 5 and 6 per cent (including agriculture makes it one-fifth higher), but notice from Table 8 that most of that trade growth would be

⁴ Without reliable estimates of the barriers to services trade (which are considered likely to be lowered very little under the Uruguay Round -- see Martin and Winters 1995), we only modelled goods trade liberalization. For an attempt to also include services trade reform and trade facilitation measures in modelling APEC reform, see Dee, Geisler and Watts (1996). See also McKibbin (1996) for a dynamic empirical study of APEC reform. Lewis, Robinson and Wang (1995) also model APEC liberalization beyond the Uruguay Round. On the complexities of modelling multilateral trade liberalization in services generally, see Brown, Deardorff and Stern (1995).

confined to the APEC region. Indeed the share of APEC countries' trade that is intra-APEC is 1.5 percentage points greater following APEC liberalization; and among just the East Asian economies their intra-East Asian trade would rise by 1.3 percentage points (Table 10). This concentration of the trade gains within APEC is not surprising, and helps explain why most APEC governments are willing to liberalize on an MFN basis: the strong complementarities between trade patterns within the APEC region, and the bias toward intra-regional trade because of relative proximity and cultural affinities, ensure that most of the benefits from market opening go to other countries of the region even without the liberalization being preferential. Even so, one of the great virtues of the proposal to liberalize on an MFN basis is that the APEC reforms also would boost extra-regional trade. For example, Western Europe's export volume to APEC would be about \$56 billion greater and its imports from the APEC region would be \$33 billion more in 2005 under 50 per cent APEC liberalization including agriculture (Appendix Table A2).

Comparing welfare effects in these different scenarios

How do these alternative scenarios compare in terms of their estimated welfare effects? Table 9 summarizes those results. It needs to be recalled that these are very much lower-bound estimates, not least because imperfect competition, economies of scale, dynamic effects, and benefits from services trade reforms and the strengthening of the global trading system are not incorporated. That is less of a problem when attention is focused on the relative orders of magnitudes as between scenarios though. Globally, the gains from the Uruguay Round are estimated to be \$179 billion per year if China and Taiwan are not admitted to the WTO during the next decade.⁵ The global gain from the reforms likely to accompany the accession of China and Taiwan to the WTO is estimated to be a further \$50 billion (nearly half of it going to the new members themselves). The size of this additional gain should not be surprising given the huge contribution of the Agreement on Textiles and Clothing to the overall welfare benefits of the Uruguay Round (Hertel et al. 1995), and of the weight of China and Taiwan in global trade in those goods.

Of course these gains from the Uruguay Round would be further increased if faster factor productivity growth in China were to result in faster overall growth than is assumed in the base

⁵ This is somewhat lower than earlier estimates by Hertel *et al.* (1995) and others, because those earlier studies allowed China and Taiwan to enjoy similar increases in market access for textiles and clothing as WTO members. Experience to date suggests that is not going to happen while China remains outside the WTO.

case. That highlights the importance of facilitating -- or at least not frustrating -- economic growth processes in the region. A failure of OECD countries to deliver their MFA reform commitments on time has a more modest impact, but still would reduce global welfare by a sizable \$44 billion per year (MFA Snapback, Table 9). That is, not delivering fully on just this one element of the Uruguay Round reduces the expected benefits of the Round by one-quarter if China stays out of the WTO or at least one-fifth if it is admitted. On the other hand, going an additional half way towards free trade in the APEC region would boost world welfare in 2005 by \$81 billion per year - - unless the agricultural protectionist interests succeed in having farm trade reform exempted, in which case the estimated gain would be reduced by a hefty \$32 billion per year.

Of course the gains or losses are not spread evenly. China gains almost as much as the ASEAN-4 and twice as much as the NIEs from the Uruguay Round, but only if it joined the WTO. This is because the vast majority of China's estimated gain comes from MFA reform, which cannot be achieved unilaterally. Both other East Asians and Western Europe gain considerably more (half as much again) from the Round if China joins, but for different reasons. East Asia's extra gain is mainly because of inter-and intra-industry trade growth with China and Taiwan, whereas for Western Europe a large part of the extra welfare gain comes from liberalization of its own barriers to textile and clothing imports from China and Taiwan.

Turning to the middle columns of Table 9, the welfare gained from an increase in China's productivity growth can be seen to accrue mainly to China. Nonetheless, the ripple effects on the more advanced Asian and European economies are significant. A slowdown of MFA reform, by contrast, has quite mixed effects on national welfare as estimated by this comparative static model. Western Europe would be worse off by \$29 billion per year because it would be liberalizing less than promised under the Round; Japan would be slightly better off because the price of its textile and clothing imports would be lower; and China and the NIEs also are projected to be slightly better off, in their case because the rents they would continue to receive from preferential access to the protected EU and US markets would more than offset the effects of a lower volume of trade. With a smaller proportion of their sales so protected, the ASEAN-4 producers, however, are expected to lose considerably from any MFA reform delays. Remember, though, that the slight gains estimated for the other East Asians are based on the assumption that GDP growth does not slow with the slowdown in MFA reform, whereas in reality growth would be slower and those countries most likely would be net losers too.

Finally, APEC liberalization, as with most trade liberalizations, benefits mostly the countries undertaking the reform. But because there are strong complementarities between APEC's resource-rich and resource-poor economies, and much of their remaining protectionism restricts the exploitation of those complementarities, it is not surprising that the gains from APEC regional liberalization are especially concentrated within the region. Nor is it surprising that the gains are much less when agricultural reform is exempted, given the high levels of agricultural protection in Northeast Asia. What *is* surprising is that APEC liberalization does not seem to benefit NAFTA (a loss in fact is reported in Table 9, albeit a very small one as a proportion of NAFTA's GDP). According to our decomposition of the change in welfare, one reason for that result is that while NAFTA is estimated to gain about \$18 billion from improved resource allocation following the APEC liberalization, it loses almost \$22 billion from a decline in its terms of trade (mostly because of lower prices for its exports). Had we assumed slightly higher Armington elasticities of substitution between products of different national origins, the negative terms of trade effect would have been sufficiently smaller to ensure an estimated gain for North America. Perhaps most importantly, we have omitted services trade liberalization from our APEC liberalization experiment, due to a lack of quantitative information for that sector. Were that to be included, a strong gain for NAFTA would be expected, given NAFTA's strengthening comparative advantage in services evident in Table 6.

4. Conclusions

The paper began by stressing several strategic issues affecting trade and welfare prospects in the Asia-Pacific over the next decade. One is the accession to the WTO of China and hence Taiwan. Another is the extent to which the Uruguay Round commitments are implemented on time, particularly with respect to the Agreement on Textiles and Clothing. A third is the extent to which the East Asian economies, and especially China, continue their rapid growth through export-oriented industrialization. And a fourth is the challenge of delivering further MFN trade liberalization in the region through the APEC process.

Each of these concerns has been addressed in the empirical simulations reported above, all in the context of on-going global economic growth. The results suggest WTO accession for China

(thereby extending the country coverage of MFA reform) would boost the welfare gains from the Uruguay Round by nearly 30 per cent. Of course, this would further increase the pressure for structural adjustment away from producing light manufactures in OECD countries (see Table 5). However, that pressure would be concentrated in the clothing sub-sector, so OECD countries may try to use that as an excuse for not fully implementing their promised reform of the MFA by 2005 - - the costs of which are shown above to be very substantial.

Several other implications can be drawn from the results. First, the importance of fast-tracking the WTO applications for the former centrally planned economies and especially China is clear. Getting them to adopt trade policy regimes consistent with GATT, GATS and TRIPs will help boost their economies and hence global welfare. Second, strengthening the multilateral trading system's capacity to facilitate the continuation of rapid economic growth in East Asia and its positive spillover effects to other regions also is important. And thirdly, the idea of setting target dates to achieve certain degrees of trade reform (as the EU did for 1992 and now the APEC Heads of Government have done for 2010 and 2020) might be contemplated for the next round of multilateral trade negotiations, as a way of focusing attention on the still very considerable gains that remain to be exploited from trade liberalization.

Many other issues could have been addressed with the projections results generated for this paper. We conclude with just two examples. One is the concern about how China will be fed and fueled into the next century if its industrialization continues. The above results, on inspection, suggest that can easily be accommodated through trade, and without very much decline in China's self-sufficiency ratios for food and fuels or decline in China's terms of trade.⁶ Another is the question of whether the world is becoming more regionalized in its trade. The answer depends on the criterion to be used, the simplest being the share of a region's total trade that is intra-regional. For the APEC region, that share is projected to rise 3.1 percentage points between 1992 and 2005 without the Round, or slightly less (2.8 percentage points) assuming full Uruguay Round implementation (upper half of Table 10). A further APEC 50 per cent liberalization would raise it another 1.6 percentage points, to almost 70 per cent (the same as Western Europe's current intra-regional trade share). A more appropriate criterion, though, might be the share of GDP traded extra-regionally, because that would take into account greater openness also. By that criterion both

⁶ See Anderson and Peng (1996) for a recent empirical analysis of this issue.

East Asia and the APEC region generally are projected to become more rather than less outward oriented (lower half of Table 10 and Anderson 1996).

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Table 1: Assumptions used in the projections: cumulative percentage growth rates, 1992-2005
(per cent, with annual rate of change in parentheses)

Region	Population (1)	Labor Force (2)	Physical Capital (3)	Human Capital (4)	Real GDP (5)
China	12 (0.9)	16 (1.1)	303 (11.3)	57 (3.5)	167 (7.8)
Indonesia	19 (1.3)	30 (2.0)	152 (7.4)	242 (9.9)	129 (6.6)
Philippines	33 (2.2)	40 (2.6)	92 (5.1)	109 (5.8)	76 (4.4)
Thailand	18 (1.3)	26 (1.8)	265 (10.5)	150 (7.3)	173 (8.0)
Malaysia	28 (1.9)	41 (2.7)	214 (9.2)	257 (10.3)	174 (8.1)
South Korea	11 (0.8)	12 (0.9)	209 (9.1)	119 (6.2)	131 (6.7)
Taiwan	11 (0.8)	18 (1.3)	211 (9.1)	119 (6.2)	115 (6.1)
Hong Kong/Singapore	11 (0.8)	13 (0.9)	158 (7.6)	83 (4.8)	117 (6.1)
Japan	3 (0.2)	-2 (-0.2)	69 (4.1)	81 (4.7)	44 (2.8)
Australia/New Zealand	15 (1.1)	16 (1.1)	46 (3.0)	155 (7.5)	54 (3.4)
NAFTA	15 (1.1)	18 (1.3)	56 (3.5)	95 (5.3)	40 (2.6)
Western Europe	2 (0.2)	1 (0.1)	36 (2.4)	217 (9.3)	37 (2.5)
Former Soviet Union	6 (0.4)	8 (0.6)	10 (0.7)	10 (0.7)	10 (0.7)
India	24 (1.7)	31 (2.1)	98 (5.4)	107 (5.6)	94 (5.2)
Rest of World	32 (2.2)	28 (2.6)	50 (3.2)	133 (6.7)	57 (3.5)

Agreggates used are: ASEAN-4 (Indonesia, Malaysia, Philippines, Thailand); NIEs (Hong Kong/Singapore, South Korea, Taiwan); and ROW (Former Soviet Union, India, Rest of World).

Source: Anderson et al.'s (1996) modifications of World Bank projections.

Table 2. Commodity aggregation in the GTAP Model.

Aggregated Commodity	GTAP Commodity	Aggregated Commodity	GTAP Commodity
Rice	paddy rice processed rice	Textiles	textiles
Wheat	wheat	WearApp	wearing apparel
Crsgms	other grains	LightMnfc	leather, etc. lumber fabricated metal products other manufacturing
OthCrops	non-grain crops	TMEq	transport goods machinery and equipment
LstkProd	meat products milk products wool other livestock products	HeavyMnfc	chemicals, rubber, and plastic primary ferrous metals nonferrous metals fabricated metal products pulp paper, etc. petroleum and coal nonmetallic minerals
ProcFood	beverages and tobacco fish products other food products	Services	electricity, water and gas construction trade and transport other services (private) other services (government) ownership of dwellings
NatRes	forestry products coal oil gas other minerals		

Super-aggregate sectors are: Agriculture (Rice, Wheat, Crsgms, OthCrops, LstkProd); Other primary (ProcFood, NatRes); Light manufactures (Textiles, WearApp, LightMnfc); Other manufactures (TMEq, HeavyMnfc); and Services (Services).

Source: Authors' model disaggregation of each category.

Table 3. Average protection levels pre- and post-Uruguay Round implementation and China and Taiwan's accession to WTO, by sector and importer (per cent)

	Agriculture		Other Primary		Light Manufactures		Other Manufactures	
	Pre-UR	Post-UR	Pre-UR	Post-UR	Pre-UR	Post-UR	Pre-UR	Post-UR
China	13.1	8.6	22.3	11.9	56.8	24.9	26.9	15.0
Indonesia	32.7	22.0	5.2	1.1	26.6	22.5	12.4	12.2
Philippines	158.6	58.1	15.0	9.6	37.0	30.0	20.4	19.5
Thailand	98.5	62.4	30.6	11.2	46.1	27.8	35.0	27.7
Malaysia	133.7	57.0	7.5	3.2	19.3	15.2	8.9	6.1
South Korea	137.3	56.2	7.9	4.4	19.3	12.7	15.6	8.0
Taiwan	117.8	85.8	16.6	8.9	6.5	4.1	6.6	4.3
Hong Kong/Singapore	8.5	2.7	3.5	1.3	0.3	0.2	0.6	0.5
Japan	172.2	111.3	3.9	0.5	7.4	5.6	2.2	0.7
Australia	3.3	2.2	1.9	0.1	21.3	13.2	11.3	8.0
NAFTA	27.9	21.4	1.6	0.3	10.5	7.5	9.2	2.4
Western Europe	52.0	49.2	3.1	0.3	6.0	4.0	5.3	1.9
Former Soviet Union	7.5	7.5	0.0	0.0	0.0	0.0	-0.0	0.0
India	17.6	-6.0	6.9	3.1	74.0	62.5	61.9	38.9
Rest of World	23.1	10.6	21.0	11.3	33.3	28.7	20.0	17.3

Source: Authors' model.

Table 4a Impact of the Uruguay Round (without and then with China/Taiwan accession to WTO) on international prices, trade volumes, and welfare (equivalent variations in income), 2005 (percentage changes)

(a) Without China and Taiwan in the WTO

Commodity	World Trade		Region	Trade Volume		Economic Welfare		
	Price	Volume		Exports	Imports	% change	US\$ 1992 billion	
Rice		2.6	146	China	3	2	0.2	1.3
Wheat		5.6	8	Indonesia	42	33	5.5	13.5
Crsgrns		2.6	32	Philippines	31	21	2.5	1.8
OthCrops		2.8	13	Thailand	24	20	4.4	10.2
LstkProd		4.2	26	Malaysia	23	19	7.9	11.4
ProcFood		-0.2	51	South Korea	24	21	2.0	11.3
NatRes		0.8	0	Taiwan	3	4	0.9	3.5
Textiles		-3.4	34	HK/Singapore	2	1	0.4	0.8
WearApp		-12.0	109	Japan	7	8	0.4	18.9
LightMnfc		0.7	6	Australia/NZ	8	8	0.4	1.9
TMEq		0.6	6	NAFTA	7	9	0.4	34.3
HeavyMnfc		0.7	7	West. Europe	7	9	0.5	44.3
Services		0.8	4	F. Soviet Union	1	1	-0.1	-0.3
TOTAL		0.0	10	India	80	60	2.4	9.2
				Rest of World	17	15	0.5	16.8
				WORLD	10	10		179.1

Source: Authors' model results.

Table 4b Impact of the Uruguay Round (without and then with China/Taiwan accession to WTO) on international prices, trade volumes, and welfare (equivalent variations in income), 2005 (percentage changes) (Continued)

(b) With China and Taiwan in the WTO

Commodity	World Trade		Region	Trade Volume		Economic Welfare	
	Price	Volume		Exports	Imports	% change	US \$ 1992 billion
Rice	2.5	147	China	61	47	3.0	26.6
Wheat	5.6	7	Indonesia	33	24	3.7	9.1
Crsgms	2.7	33	Philippines	26	17	1.7	1.3
OthCrops	2.9	16	Thailand	21	18	3.2	7.4
LstkProd	4.4	38	Malaysia	20	16	6.6	9.5
ProcFood	-0.1	57	South Korea	24	22	2.1	11.9
NatRes	1.2	1	Taiwan	9	11	1.3	5.0
Textiles	-4.4	45	HK/Singapore	3	4	3.0	5.6
WearApp	-13.9	127	Japan	10	12	0.6	27.7
LightMnfc	0.8	11	Australia/NZ	8	8	0.5	2.1
TMEq	0.9	8	NAFTA	8	10	0.5	42.2
HeavyMnfc	1.0	8	Western Europe	8	10	0.6	57.0
Services	1.1	7	F. Soviet Union	3	3	0.0	0.2
TOTAL	0.0	14	India	73	53	1.7	6.6
			Rest of World	17	15	0.5	17.5
			WORLD	14	14		229.6

Source: Authors' model results.

Table 5. Cumulative percentage change in composition of real GDP, 1992-2005
(under different base cases)

	China	ASEAN-4	NIEs	Japan	Aus/NZ	NAFTA	WEurope	ROW
Agriculture								
E1: Base Case	-42	-21	-36	-11	-6	1	-12	-7
E2: E1 + UR	-42	-30	-39	-21	-0	6	-15	-9
E3: E2 + Ch/Ta	-46	-27	-39	-21	-2	7	-15	-8
Other Primary								
E1: Base Case	2	-13	-6	1	-6	-3	-6	1
E2: E1 + UR	1	-21	2	-2	-5	-2	-7	-4
E3: E2 + Ch/Ta	-11	-17	2	-2	-5	-2	-7	-3
Light Manufactures								
E1: Base Case	5	16	-5	-6	-9	-7	-10	0
E2: E1 + UR	8	68	0	-5	-20	-19	-19	9
E3: E2 + Ch/Ta	42	42	-0	-6	-23	-21	-21	5
Other Manufactures								
E1: Base Case	63	17	15	1	-4	1	2	-4
E2: E1 + UR	60	-12	9	2	-8	2	4	-10
E3: E2 + Ch/Ta	38	-4	9	2	-8	2	4	-9
Services								
E1: Base Case	15	6	1	1	2	0	1	3
E2: E1 + UR	14	-0	-0	0	2	0	2	2
E3: E2 + Ch/Ta	9	1	-0	0	2	1	2	2

Table 6. Change in trade balance resulting from the Uruguay Round, by commodity and by region 1992-005 (\$US 1992 billion)

	China	ASEAN-4	NIEs	Japan	Aus/NZ	NAFTA	WEurope
Agriculture	-13.3	-4.8	-8.4	-12.3	3.1	23.7	-7.2
Other Primary	-10.9	10.4	16.8	-13.4	1.9	3.8	-6.8
Light Manufactures	58.6	40.9	27.7	2.9	-3.8	-70.2	-80.3
Heavy Manufactures	-32.9	-37.5	-33.2	17.0	-3.1	15.3	44.1
Services	-1.5	-9.0	-2.9	5.9	1.9	27.4	50.2
Total ^a	0	0	0	0	0	0	0

^a Total trade balance is fixed by assumption in this simulation.

Source: Authors' model results

Table 7. Impact of alternative scenarios on international prices and world trade volume of different products in the year 2005 (percentage change)

Commodity	China Grows		MFA Snapback		APEC without Agr		APEC with Agr	
	Prices	Trade	Prices	Trade	Prices	Trade	Prices	Trade
Agriculture	2.1	12.9	-1.2	-1.8	0.2	2.1	-0.4	17.7
Other Primary	0.2	0.8	-0.8	0.3	0.2	2.6	0.0	2.8
Light Manufactures	0.1	2.6	1.4	-11.0	-0.1	10.6	-0.3	11.3
Other Manufactures	-0.1	1.4	-0.8	0.0	0.2	6.1	0.3	6.0
Services	0.1	2.2	-0.7	-1.3	0.2	2.7	0.4	3.3

Source: Authors' model results

Table 8. Impact of alternative scenarios on regional export and import volumes in the year 2005
(percentage change)

Region	China Slowdown		MFA Snapback		APEC without Agr		APEC with Agr	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
China	29.0	25.0	-6.0	-3.9	15.2	21.1	16.5	24.4
ASEAN-4	-0.7	-0.7	-7.2	-5.0	10.1	11.6	12.0	13.7
NIEs	0.6	1.3	-0.2	0.1	5.2	6.7	6.2	7.9
Japan	0.7	0.9	-0.2	0.5	9.9	12.1	11.4	14.8
Australia/NZealand	0.6	1.5	-0.1	-0.1	5.3	6.0	5.8	6.2
NAFTA	0.5	0.8	-2.4	-3.5	6.5	5.2	7.5	5.8
Western Europe	0.2	0.3	-1.8	-3.0	2.4	1.3	2.9	1.3
ROW	0.3	0.4	-0.6	-0.4	1.0	-0.1	1.5	0.1
WORLD	2.2	2.2	-2.0	-2.0	5.4	5.4	6.3	6.3

Source: Authors' model results.

Table 9. Annual welfare effects (equivalent variations in income) of various scenarios, 2005
(US\$ 1992 billion)

	UR without China	China/Taiwan WTO Accession	China Growth	MFA Snapback	APEC Non-agric.	APEC All Goods
China	1	25	193	6	4	6
ASEAN-4	37	-10	0	-7	0	2
NIEs	16	7	7	4	10	16
Japan	19	9	4	2	33	54
Australia/NZ	2	0	2	0	0	1
NAFTA	34	8	4	-28	-6	-4
Western Europe	44	13	3	-29	8	6
ROW	26	-1	3	8	0	0
WORLD	179	50	215	-44	49	81

Source: Authors' model results.

Table 10: Impact of economic growth and Uruguay Round implementation on intra-regional shares of East Asian and APEC trade, 1992 to 2005 (per cent)

(a) Share of total trade that is intra-regional		
	East Asia	APEC
1992	38.5	64.7
2005 (without UR)	46.1	67.8
2005 (with UR incl. China/Taiwan)	46.5	67.5
2005 (also with APEC liberalization)	47.6	69.1

(b) Extra-regional (intra-regional) trade as a percentage of regional GDP		
	East Asia	APEC
1992	11.1 (7.0)	5.0 (9.2)
2005 (without UR)	11.7 (10.0)	5.3 (11.2)
2005 (with UR incl. China/Taiwan)	13.5 (11.7)	6.1 (12.6)
2005 (also with APEC liberalization)	14.5 (13.1)	6.3 (14.1)

Source: Authors' model results.

Appendix Table A1. Export Composition by Destination, 1992, 2005 without Uruguay Round, and 2005 with Uruguay Round

Total Exports (per cent and US \$ billion)										
	China	ASEAN-4	NIEs	Japan	Aus/NZ	NAFTA	WEurope	ROW	1992 \$ bn	% of total world
China										
1992	0.0	2.9	22.1	15.2	1.5	21.5	23.0	13.7	101	3
2005b	0.0	4.7	26.8	12.3	1.5	20.2	19.4	15.0	275	5
2005u	0.0	4.3	22.1	11.5	1.7	23.6	23.7	13.2	419	7
ASEAN-4										
1992	2.9	3.9	19.6	21.0	2.1	20.2	21.9	8.4	138	4
2005b	4.4	5.6	21.4	16.6	2.0	19.7	20.6	9.7	350	6
2005u	3.9	5.3	16.5	13.2	1.7	21.2	27.0	11.1	416	7
NIEs										
1992	8.6	9.2	11.2	13.4	2.3	25.2	18.5	11.7	292	9
2005b	12.1	13.9	12.3	11.2	2.2	20.6	15.5	12.2	639	12
2005u	18.0	15.0	11.4	11.1	2.0	18.1	14.0	10.3	719	12
Japan										
1992	5.1	7.7	19.1	0.0	2.7	30.3	22.5	12.6	378	11
2005b	7.3	11.5	23.1	0.0	2.5	25.3	18.7	11.6	526	10
2005u	11.6	11.5	23.9	0.0	2.4	23.5	17.3	9.9	581	10
Aus/NZ										
1992	3.7	6.9	15.6	27.6	7.9	11.4	16.4	10.5	61	2
2005b	11.3	9.1	19.7	22.0	7.0	8.2	13.3	9.4	95	2
2005u	9.6	9.0	21.9	22.7	5.5	8.8	12.3	10.1	103	2
NAFTA										
1992	1.8	2.5	7.5	10.4	1.9	37.3	24.7	13.9	770	23
2005b	3.4	3.9	10.0	9.6	1.8	34.8	22.9	13.6	1130	21
2005u	4.5	3.9	11.1	10.1	1.8	31.3	23.4	13.9	1219	20
WEurope										
1992	1.8	3.3	4.4	4.7	1.6	18.2	37.0	29.0	1025	31
2005b	3.0	5.1	5.5	4.1	1.6	17.1	34.5	29.1	1458	27
2005u	4.4	5.8	6.2	4.4	1.8	18.3	30.9	28.2	1559	26
ROW										
1992	1.8	1.9	5.6	11.3	0.8	16.2	42.5	20.0	567	17
2005b	2.5	2.9	8.2	9.5	0.8	15.2	40.2	20.6	927	17
2005u	2.5	3.3	7.3	9.1	0.7	13.3	35.5	28.3	1095	18
Total Imports (US\$1992 billion)										
1992	93	132	299	292	61	810	1013	632	3332	
2005b	247	336	636	441	96	1180	1469	993	5399	
2005u	373	399	717	498	105	1275	1582	1162	6113	
% of total										
1992	3	4	9	9	2	24	30	19		100
2005b	5	6	12	8	2	22	27	18		100
2005u	6	7	12	8	2	21	26	19		100

Note: 2005b refers to year 2005 without the UR and 2005 u refers to 2005 with the UR including China and Taiwan's accession to WTO.

Source: Authors' model results.

Appendix Table A2. Impact of Alternative scenarios on changes in total bilateral trade volume in the year 2005 (\$US million at constant 1992 prices).

	China	ASEAN-4	NIEs	Japan	Aus/NZ	NAFTA	WEurope	ROW	WORLD
China									
China Grows	0	6865	32370	11950	1760	27781	22939	18344	122031
MFA Snapback	0	203	4953	2515	237	-15302	-15809	5181	-18022
APEC without Agr	0	5451	10624	18557	1303	13306	7384	7206	63830
APEC with Agr	0	5431	11244	18865	1378	15201	8777	8542	69437
ASEAN-4									
China Grows	4948	-4	-2873	-465	73	-2401	-3009	-202	-3935
MFA Snapback	1258	1572	7468	6892	1141	-17360	-28043	6498	-20572
APEC without Agr	3427	6184	7652	6138	2390	9440	6978	167	42375
APEC with Agr	5291	6554	7450	6675	2309	9241	8108	4638	50267
NIEs									
China Grows	22807	-3969	-4519	-2491	-240	-3844	-2815	-1901	3027
MFA Snapback	-5458	-10583	-451	-59	9	8156	5399	1626	-1362
APEC without Agr	29653	14442	-90	5094	40	-1634	-6001	-4422	37082
APEC with Agr	31546	15648	-383	9586	111	-2061	-5056	-4183	45208
Japan									
China Grows	12337	-1926	-5128	0	-34	-1718	-852	-552	2194
MFA Snapback	-1897	-1851	-1449	0	-33	2596	2029	553	-52
APEC without Agr	11652	3958	-10178	0	1043	78034	-15902	-10101	58507
APEC with Agr	15583	4908	-8018	0	1124	78856	-15506	-9902	67044
Aus/NZ									
China Grows	4561	-481	-1110	-947	-172	-502	-637	-622	84
MFA Snapback	-294	-374	-129	44	12	332	385	151	126
APEC without Agr	773	1391	1313	1631	-505	-483	668	382	5169
APEC with Agr	1100	1888	652	1453	-542	204	541	227	5522
NAFTA									
China Grows	22201	-1362	-4379	-1995	-127	-6573	-4251	-2463	1050
MFA Snapback	-3108	-3203	-5639	-3884	-789	-4953	-3167	-3025	-27768
APEC without Agr	12437	6048	24552	19750	729	-43753	36492	19714	75968
APEC with Agr	14304	8143	29835	27818	709	-47366	35966	18718	88128
WEurope									
China Grows	13525	-2149	-4168	-1112	31	-3013	-4417	-4151	-5453
MFA Snapback	-3355	-4740	-3895	-2287	-817	-1777	-714	-7142	-24727
APEC without Agr	16164	7582	9096	3242	783	11783	-7888	-11852	28909
APEC with Agr	17846	8501	10044	3520	862	15053	-7599	-13308	34919
ROW									
China Grows	11541	76	-1257	-1100	-13	-1706	-3957	-4255	-671
MFA Snapback	-1132	-222	-964	-945	76	-4030	4692	-99	-2625
APEC without Agr	3499	303	4632	4556	292	-4168	-740	-2462	5911
APEC with Agr	4184	2185	5354	4326	286	1472	-3327	-4435	10045
WORLD									
China Grows	91918	-2955	8935	3841	1366	8024	3000	4198	118327
MFA Snapback	-13987	-19198	-106	2275	-165	-32338	-35228	3744	-95002
APEC without Agr	77606	45356	47601	58967	6074	62525	20991	-1369	317751
APEC with Agr	89853	53258	56178	72243	6239	70599	21903	297	370569

Source: Authors' model results.