Assessing the impacts of preferential trade agreements in the Asian and Pacific region

by

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ASSESSING THE IMPACTS OF PREFERENTIAL TRADE AGREEMENTS IN THE ASIAN AND PACIFIC REGION

By Anna Strutt and Allan N. Rae[*]

Introduction

The negotiation and implementation of preferential trade agreements has gained momentum in recent years. Given the range of agreements being simultaneously negotiated and implemented, there is potential for significant, and perhaps unanticipated, interactions between them. In this chapter, a dynamic global trade model is used to focus on illustrative examples from Asia and the Pacific, a region that has been particularly active in pursuing preferential trade agreements. First, the focus is on a number of bilateral "hub-and-spoke" agreements, with China as the "hub". Then the implications of the "spokes" being joined are considered and the outcomes are compared to a broader Asia-Pacific Economic Cooperation (APEC) liberalization.

The proliferation of bilateral and regional preferential or free trade agreements (PTAs/FTAs)[1] since the 1980s is a phenomenon described as the "new regionalism" (Ethier, 1998; Majluf, 2004). As of 15 September 2008, 222 regional trade agreements[2] had been notified to the World Trade Organization (WTO) and were in force, with close to 400 scheduled to be implemented by 2010.[3] Many Pacific Rim countries have been particularly active in the new regionalism (Lloyd, 2002) including China, which has emerged from its earlier preoccupation with WTO accession and is looking to achieve further gains through regional arrangements. With continuing difficulties at the multilateral level, Asia-Pacific bilateralism and regional integration may well become an even more important avenue for continuing trade negotiations in the region. Menon (2006) indicated that the number of bilateral and preferential agreements in the Asia-Pacific region (involving at least one Asia-Pacific country) had increased from 57 in 2002 to 176 by October 2006, each with its distinctive product coverage, time lines and varying rules of origin.

What are some of the reasons for the emergence of the new regionalism? The list of reasons given by Sagar (1997) for the establishment of PTAs included: (a) recognition of the political needs of member nations; (b) geographic proximity of the partners; (c) dissatisfaction with the GATT/WTO process for trade liberalization; (d) the opportunity to address issues not addressed by WTO or not effectively addressed, such as barriers to services trade, foreign investment flows, various non-tariff barriers and labour, and environmental standards; and (e) a response to regional trade agreements formed or forming elsewhere, including a reflection of the fear of exclusion from major markets. This "domino" effect (Baldwin, 1996) is clearly evident in the Asian and Pacific region, with the Association of Southeast Asian Nations (ASEAN), Japan, the Republic of Korea,

[1] This term is used to cover all bilateral or regional preferential or free trade arrangements.
[2] See www.wto.org/english/tratop_e/region_e/a_z_e.xls.
[3] See www.wto.org/english/tratop_e/region_e/region_e.htm.

Singapore, Chile and New Zealand showing initial interest in PTAs in the 1990s. By 2000, the United States of America, Australia, individual ASEAN members such as Thailand, and China had joined the trend, and the momentum has since continued.

In addition to these broad factors, Menon (2006) listed an additional three specific factors. Apart from the well-known economic reasons (market or sectoral expansion and access), strategic factors include some developed countries engaging with others to pursue their objectives regarding labour and environmental standards, or anti-terrorism objectives. Event-driven factors include individual countries' desires to form closer links with an existing regional agreement (such as India and others currently pursuing agreements with individual members of ASEAN), linking with an existing WTO member so as to facilitate eventual accession, and strengthening political integration such as the China-Hong Kong, China, and China-Macao, China, agreements.

1. Some concerns associated with PTAs

Various concerns can be mentioned in association with PTAs, including the well-known possibilities of trade diversion rather than creation, concentration on regional arrangements diverting scarce negotiating resources away from multilateral negotiations, and the administrative costs and confusion that could result from a plethora of overlapping trade agreements (Hilaire and Yang, 2003). The likelihood of PTAs excluding sensitive sectors and the possible one-sided nature of the agreements can be added to these concerns.

A comprehensive analysis of potential trade creation and diversion effects within Asian and Pacific region PTAs is that of Gilbert and others (2001). They found evidence of both, but importantly demonstrated that larger regional trade groupings were economically preferable to a "spaghetti bowl" of smaller and overlapping agreements. Given the current activities of larger economies in the region – including China, the United States, Japan and India – in undertaking PTA studies and negotiations, there is clearly the risk that a hub-and-spoke system will dominate, with these leading economies as the hubs. Zhai (2006) considered the possibility of China or Japan being regional hubs. While ASEAN may also be a hub contender, this is complicated because individual ASEAN members are also pursuing PTAs, especially with the United States and Japan. The resulting spaghetti bowl of agreements and rules could enormously complicate the life of international traders. When an exporter can enter another market under different sets of preferences where multiple agreements exist, information and other costs may prohibit preferences being realized and MFN entry may appear the least costly option.

While the negotiation of bilateral agreements is often politically easier than multilateral or regional approaches, is it possible that such agreements may eventually be aggregated to a wider grouping? A danger is that (apart from the exhaustion of negotiating resources) trade diversion costs imposed on non-members may lead to political frictions that impede wider integration, rather than act as the driving force. Regionalism is advanced as an alternative to the hub-and-spoke system, which essentially requires the spokes also to be connected under PTA arrangements. The likelihood of trade creation is thereby enhanced and that of trade diversion reduced. A further advance on this approach is the "open regionalism" approach such as that taken by APEC in its 1994 Bogor Declaration, in which the PTA's preferences would be extended to non-members (Scollay and others, 2003). This has the advantages of simplifying administrative procedures (for example, the rules of origin would not be necessary) and the non-existence of trade diversion costs.

Levy (2006) took a positive view of experiences in the Asian and Pacific region with smaller bilateral or regional groupings which could successfully take on new members. Smaller steps are often easier from a political view; adjustment costs may be less problematic, while a momentum in favour of regional integration is developed. The process of progressive expansion may also serve to desensitize entrenched domestic interests to the benefits of regional liberalization, and may also provide an "incubator" to enable domestic firms to adjust to new competitive pressures and learn to trade regionally while being shielded from the full forces of international competition.

Agriculture, of course, is the problematic sensitive sector in many of the completed agreements as well as in ongoing negotiations. Asia-Pacific PTAs have followed a variety of approaches in incorporating agricultural preferences, and the agreements range from quite comprehensive to very restrictive coverage. Within the ASEAN Free Trade Area (AFTA), for example, a step-by-step approach to agricultural inclusivity is adopted using temporary exclusion, sensitive and highly-sensitive product lists. These products are being liberalized according to an agreed timetable and end-of period tariffs, and as a result very few products will be excluded from the common preferential tariff scheme (ESCAP, 2007).

The Early Harvest Programme of the China-ASEAN agreement presents another case where substantial agricultural inclusion is being achieved. Several ASEAN countries, including Thailand, have not excluded any such products and China will exactly match those concessions. The Republic of Korea-Chile FTA also provides wide coverage of agricultural liberalization despite opposition from Korean farmers, albeit using tariff rate quotas to limit access and exclusion lists. There are, therefore, some encouraging experiences from the region that suggest sensitive sectors can be addressed in regional agreements despite long transitional periods.

2. Motivation and methodology

This study is motivated by the many PTAs that are being simultaneously negotiated and implemented in the Asian and Pacific region with potential to interact and change outcomes, perhaps in ways that may not have been anticipated. For example, China is involved in a range of agreements; those already in force include agreements with ASEAN, Chile, New Zealand, Pakistan, Hong Kong, China, and Macao, China (from 1 October 2008), while other partner countries now at the study, consultation, negotiation or ratification stage include Australia and the Republic of Korea. ASEAN has agreements or negotiations with Australia and New Zealand, Japan, the Republic of Korea and the European Union. The web of agreements becomes even more tangled when considering those agreements involving individual ASEAN member countries.[4]

In the current study, the Global Trade Analysis Project (GTAP) dynamic model is applied to bilateral and regional trade analyses in the Asian and Pacific region. In particular, a number of China's possible preferential agreements are examined, the implications of these trading partners also liberalizing among themselves are considered. Finally, these outcomes are compared to a full APEC liberalization.

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[4] See www.unescap.org/tid/aptiad for an excellent database of agreements.

A. Modelling regional agreements

1. Model and baseline

In analysing some of the potential impacts of several different Asia-Pacific preferential agreements this study uses GTAP-Dyn, a recursive dynamic version of the GTAP model. The GTAP model and database are widely used internationally, and are fully documented and publicly available.[5] Using a global computable general equilibrium (CGE) model such as GTAP enables interactions between regions and sectors to be modelled within a fully consistent framework.

The GTAP-Dyn model permits capital accumulation, together with international mobility and foreign ownership of capital (Ianchovichina and McDougall, 2001). Other features of the standard version of the GTAP model are retained (Hertel, 1997). For example, consumers maximize welfare, subject to their budget constraints, and a relatively sophisticated representation of consumer demand allows for regional differences in the price and income elasticities of demand. Firms maximize profits, using the limited resources available in the economy. Five primary factors of production (land, natural resources, physical capital, and unskilled and skilled labour) combine with intermediate inputs, including imports, to produce final output. Armington elasticities specify the extent to which substitution is possible between imports from various sources as well as between imports and domestic production. Markets are assumed to be perfectly competitive, with constant returns to scale. When a policy change is simulated, prices and quantities of commodities, together with other impacts including on welfare and incomes, are endogenously determined within the model.[6]

The current study uses version 6 of the GTAP database, comprising 87 economic regions, and 57 sectors (Dimaranan, 2006), extended to facilitate analysis of dynamic capital accumulation. The database is aggregated to the 26 regions detailed in annex table 1, maintaining a high level of disaggregation of the Asian and Pacific region, although with some results presented at a more aggregate level. The 57 commodities in the GTAP database are aggregated to 24 sectors, with the aggregation designed to capture sectors that are of particular significance to Asian and Pacific economies, including agricultural products and labour-intensive manufactures.

First, a baseline "business as usual" is developed, up to 2020, from the benchmark GTAP 6 dynamic database projection. To project the baseline global economy forward in time, exogenous projections of each region's GDP growth as well as endowments of population, skilled and unskilled labour are applied to each region (Walmsley, 2006). Total factor productivity and capital stock growth are endogenous in the baseline, accommodating the combination of these exogenous shocks. (Details of the macroeconomic assumptions are provided in annex table 2.) The initial baseline tariffs are estimates developed by CEPII,[7] with the 2005 baseline also including European Union enlargement and WTO

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[5] See www.gtap.agecon.purdue.edu for detailed information on the GTAP model and database.

[6] The model is solved using GEMPACK software (Harrison and Pearson, 1996), using the RunGDYN interface.

[7] Tariffs between Australia and New Zealand are also eliminated to reflect the CER agreement that is in place. These adjustments to the initial database tariff levels are done in such a way as to maintain the integrity of the initial database, following Malcolm (1998).

commitments,[8] together with elimination of Multi-Fibre Arrangement (MFA) quotas. The baseline is aimed at capturing the underlying structures of the economies at the time they liberalize, with simulations that include implementation of the various PTAs that can be compared with this baseline.

The baseline simulation captures some of the significant ways in which the structure of the world economy is anticipated to change by 2020. Changes in the structure of production for each region are driven by differences in the relative rates of factor accumulation, including endogenous capital growth. These combine with different factor intensities in each sector, as well as price and income elasticities. Given the differential that is typical between the growth rates of developed and developing countries, the regions comprising predominantly developing regions tend to increase their share of global GDP most significantly, with relatively large changes in the structure of output in these economies (Anderson and others, 2001).

Table 1 shows the changes in contributions to global GDP, exports and imports in the baseline scenario to 2020. Over time, the share of global GDP that is contributed by relatively high income regions tends to decrease, while developing countries are projected to gain in significance. While the economies of New Zealand and Australia are projected to increase their share of global output by less than 0.1 per cent from the initial contribution of 1.3 per cent, China's share increases from 3.7 per cent of global GDP in 2001 to 7.4 per cent in 2020. ASEAN economies increase their share of global GDP from just under 2 per cent in 2001 to 2.6 per cent in 2020.

Table 1. Regional contributions to global GDP, exports and imports

(Unit: Per cent)

Country/region[a]	Proportion of world GDP		Proportion of world exports		Proportion of world imports	
	2001	2020	2001	2020	2001	2020
Australia and New Zealand	1.3	1.4	1.3	0.9	1.2	1.5
China	3.7	7.4	5.5	11.6	3.9	5.9
Republic of Korea	1.4	1.8	2.5	3.5	2.2	2.6
ASEAN	2.0	2.6	6.5	8.5	5.4	7.0
APEC	60.7	63.3	46.6	57.2	46.4	51.5
Europe	30.0	25.9	45.0	33.6	44.4	39.4
Rest of the world	10.0	11.6	9.8	9.8	10.2	11.7

[a] Regional contributions add up to more than 100 per cent as some countries are duplicated in APEC.

2. Liberalization scenarios

From the baseline described above, the current study models four scenarios. First, a "hub-and-spoke" set of agreements is modelled with China as the spoke. As noted above, China is engaged in bilateral negotiations and agreement with a number of different trading partners. Only bilateral agreements with Australia, New Zealand,[9] the Republic of Korea and the implementation of a China-ASEAN agreement are modelled, all of which are signed

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[8] See www.gtap.agecon.purdue.edu/databases/v6/V6_dohascen.asp.
[9] This agreement was signed in April 2008 and is the first bilateral agreement that China has signed with a "developed" country. See www.chinafta.govt.nz for details.

or relatively advanced in the negotiating process. It is assumed that the bilateral agreements have been progressively implemented by 2020.

There is potential for the spokes around the hub of China to be joined to form a regional FTA, since the regions are also in the process of negotiating agreements that may be implemented with one another. Therefore the second scenario examines the impact of joining the spokes into a regional FTA incorporating China, Australia, New Zealand, the Republic of Korea and ASEAN. Third, we consider the impact of allowing a small number of sectors to be classified as "sensitive", with no liberalization of these sectors during the time period under consideration. Most regions are likely to have sensitive sectors that they will be reluctant to reform, and the model uses a relatively simple set of assumptions that the products deemed to be sensitive are imports of rice, meat and dairy products for China and ASEAN, while textiles, wearing apparel and leather products assumed to be sensitive imports for New Zealand and Australia.

The final simulation considered is APEC liberalization with the full elimination of tariffs imposed by APEC members.[10] Details of each scenario are summarized in table 2.

Table 2. Summary of scenarios modelled

1. Bilateral agreements (hub-and-spoke)
All bilateral tariffs are removed between China (the hub) and three regions: Australia and New Zealand in 2009; ASEAN countries in 2010 (new ASEAN countries in 2015);[a] and the Republic of Korea in 2012.

2. Regional free trade area (RFTA)
All bilateral tariffs are removed within an FTA comprising China, ASEAN, the Republic of Korea, Australia and New Zealand. The timing of liberalization is as for scenario 1, but now also liberalizing trade between ASEAN, Australia and New Zealand and the Republic of Korea in 2013 (extended to 2017 for tariffs imposed by new ASEAN countries).

3. Regional free trade area with sensitive products (RFTA-Sensitive)
As for scenario 2, but with sensitive sectors not liberalized. For Asian countries, sensitive products are assumed to be the rice, cattle and sheep meat, and dairy product sectors. For Australia and New Zealand, the sectors assumed to be sensitive are textiles, wearing apparel and leather products.

4. APEC
Developed APEC countries are assumed to fully liberalize their tariffs by 2010, and developing countries by 2020.

[a] Intra-ASEAN tariffs are also eliminated.

B. Results and discussion

What are the likely impacts of bilateral agreements with China acting as a hub? How will these impacts change if the spokes are joined and a regional FTA encompassing all of these economies is formed? What will be the impact of sensitive products not being

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[10] Assumed to be on an MFN basis.

liberalized? Finally, how would the impacts of these agreements compare with a much more comprehensive APEC liberalization? In this section, the authors use results from their simulations to explore some of these issues, given the assumptions and scenarios outlined above. The focus here is on aggregate results for the economies engaged in the arrangements, particularly changes in welfare, real output and total exports.

Figure 1 shows the estimated impact on real GDP in each region for each scenario modelled. The impacts are shown as deviations from the baseline level of real output for China, the Republic of Korea, Australia and New Zealand and ASEAN.[11] For China, positive changes in real output are projected under each scenario. However, once the spokes of the bilateral agreements start to join in 2013, the annual changes in real output projected fall to slightly lower levels than would have been the case with only the bilateral agreements implemented. By 2020, the increase in real output is almost 0.1 per cent per annum lower than with just the hub-and-spoke agreement. However, if the regional FTA is expanded to cover the whole of APEC, the gains in terms of real GDP rise to 0.55 per cent per annum, which is more than double that projected for even the hub-and-spoke agreement. It is notable that a significant proportion of these gains come in 2020, that is, when the developing APEC economies (including China) liberalize.

In the bilateral agreements scenario, the Australia-New Zealand is assumed to be first off the mark in implementing a bilateral FTA with China. There are some (relatively small) increases in real output projected initially for Australia and New Zealand. However, once China implements agreements with ASEAN and the Republic of Korea, these appear to cut into the real output gains for Australia and New Zealand. By 2014, real output is projected to fall below the baseline level; with this decline continuing over time, by 2020 real output is projected to be 0.08 per cent per annum lower than in the baseline. However, if the spokes can be joined into a regional FTA, Australia and New Zealand are able to maintain and even increase the initial increases in real output. By 2020, real output is projected to be higher than the baseline by 0.17 per cent per annum. APEC liberalization in scenario 4 leads to still larger gains, with real output increases well over three times higher than under the regional FTA scenario.

For the Republic of Korea, significant increases in real output are projected in the first three scenarios. The regional FTA is expected to lead to the highest gains in real GDP – more than 6.8 per cent per annum, compared with 5.5 per cent when there is no joining of the spokes. Non-liberalization of sensitive products, however, appears to have quite an adverse impact on the economic growth of the Republic of Korea, with results in scenario 3 even lower than under the bilateral agreements alone. Surprisingly, perhaps, APEC liberalization is projected to bring gains in terms of real output that are less than 40 per cent of those projected for the regional FTA. This appears to be largely due to differences in Republic of Korea exports under the different scenarios. In particular, there is an almost 8 per cent increase in total export volume in scenario 2, but a reduction of 0.8 per cent under the APEC scenario. Exports in a number of manufacturing sectors are much lower in scenario 4 than in scenario 2, particularly from the other machinery and the textile sectors. It appears that, for the Republic of Korea, the gain from more market access offered by APEC liberalization does not offset the lost benefits of preferential access to the four-region FTA considered in scenario 2.

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[11] For the regional aggregations of Australia and New Zealand and ASEAN, projected percentage changes in real output are weighted by the share of real GDP for each country in the corresponding year of the baseline.

The ASEAN region appears to have some similarities with the Republic of Korea in terms of the impact on real output. There are strong gains from the bilateral agreements, further accentuated if the spokes can be joined into a regional FTA. In the case of ASEAN, unlike the Republic of Korea, non-liberalization of the products assumed to be sensitive does not appear to greatly affect the overall level of economic output. As with the Republic of Korea, gains from APEC liberalization are significantly lower than gains from the four-region FTA. However, the gains from APEC liberalization are still significant, particularly by 2020, when developing APEC regions implement their liberalization.

Figure 1. Change in real GDP under each scenario
## (in percentages)
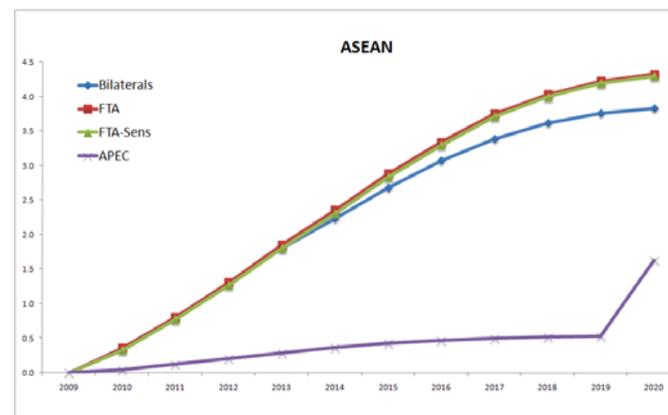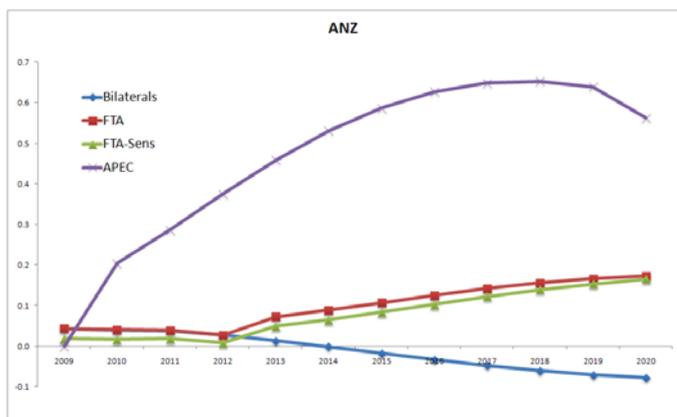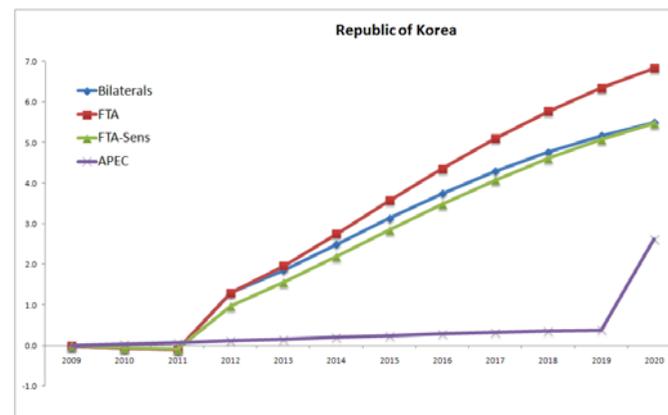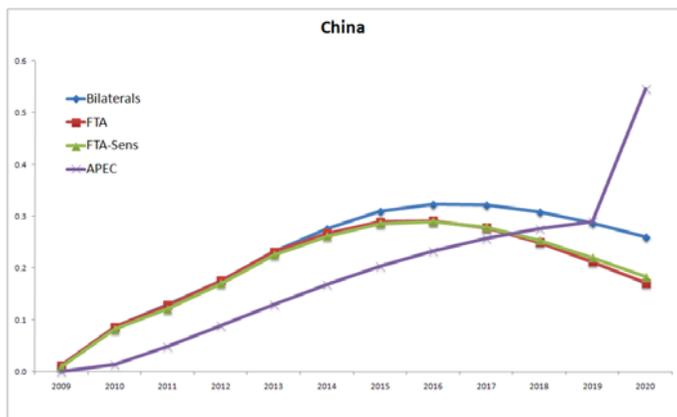
We now turn to the changes in welfare implied by these four alternative scenarios. Welfare in the GTAP model is measured by an equivalent variation in income (Hertel, 1997). However, in the dynamic version of the model, welfare results are complicated by the lack of an inter-temporal utility function and the path dependence of the welfare decomposition used in the comparative static version of GTAP (Ianchovichina and McDougall, 2001; Huff and Hertel, 2001). Therefore, the approach of Walmsley and Hertel (2001) and Walmsley and others (2006) is followed in using a comparative static simulation which repeats the dynamic simulation but removes the impact of time-dependent variables. This enables determination of the difference in welfare at a given point in time, with and without implementation of the preferential trade agreements described above.

Figure 2 shows the overall impact on welfare in 2020 of each scenario, for each of the regions under focus. These results suggest that, in general, more ambitious liberalization that encompasses more regions is likely to lead to higher welfare gains for the liberalizing regions. In particular, Australia and New Zealand, the Republic of Korea and ASEAN all benefit from the spokes of their bilateral agreements when joined into a regional FTA. For Australia and New Zealand, the gains from the regional FTA are 65 per cent higher than from only the bilateral agreements. For the Republic of Korea, the increase is 44 per cent while for ASEAN it is a 15 per cent gain. However, for China, an approximate 30 per cent reduction in welfare projected if the spokes are joined. When sensitive products are not liberalized in the third scenario, all of the regions experience diminished gains in welfare.

The impact of the sensitive sectors modelled here lowers welfare for Australia and New Zealand by 13 per cent, China by 15 per cent, the Republic of Korea by 9 per cent and ASEAN by 2.6 per cent. However, if the liberalization is instead a much more ambitious full APEC removal of tariffs, welfare gains for most of the regions under focus are much higher. Unsurprisingly, the gains for the whole APEC region increase significantly if the whole region liberalizes. The overall welfare gain projected for the APEC region in the fourth scenario is more than 3.5 times as large as even the gains from the regional FTA scenario. For China, there is approximately a 250 per cent welfare gain from moving to APEC rather than just the regional FTA modelled here. For the Republic of Korea, the estimate is a more than 60 per cent further improvement and for ASEAN a more than 30 per cent gain. However, for Australia and New Zealand, the welfare gains from the earlier scenarios appear largely wiped out by adverse terms of trade movements.

**Figure 2. Welfare impacts of alternative scenarios for
selected regions, 2020**
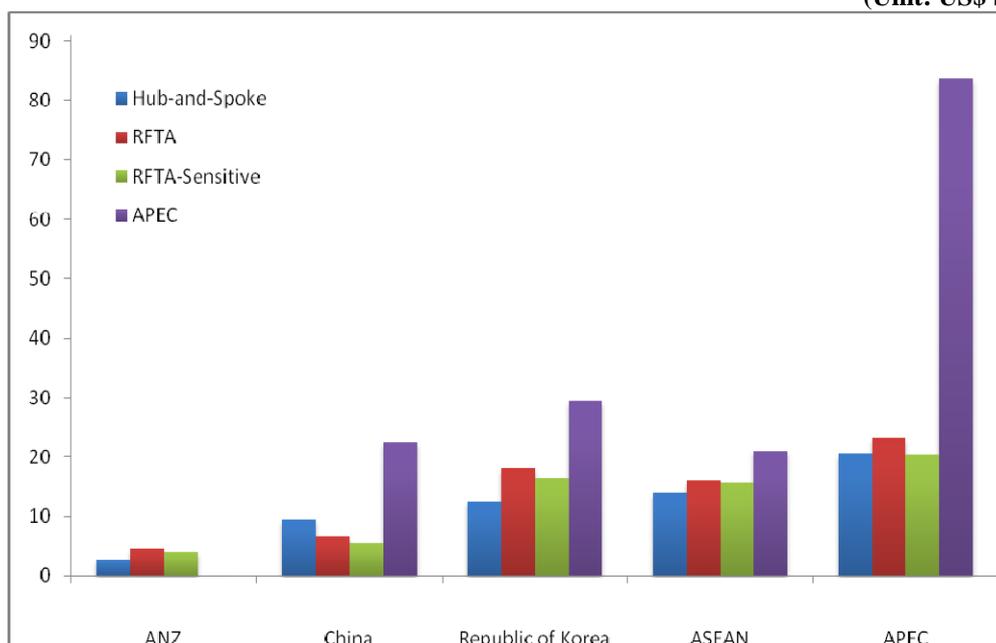
Further insights into these projected changes in welfare may be gained by decomposing the overall changes in welfare into four determinants: the allocative efficiency; terms of trade; capital; and equity effects (Huff and Hertel, 2001; McDougall, 2002). Table 3 presents the full welfare results and decomposition for 2020 for each region under focus. An overall allocative efficiency improvement is found for all regions under each of the four scenarios (table 3). This improvement in allocative efficiency is an impact typically expected when tariffs are eliminated, if resources are able to move into more efficient sectors. It is this improved efficiency in the allocation of resources that drives much of the overall welfare gain in all of the scenarios modelled.

All of these allocative efficiency effects can be decomposed to find the driving forces, but here only a small sample of some of the strongest effects is presented. The Republic of Korea has rather striking increases in allocative efficiency in all scenarios, and further investigation suggests these are largely due to the food and agricultural sectors. Liberalization leads to particularly strong allocative efficiency gains in the other crops sector and also strong gains in the rice sector (with the exception of the third scenario, when rice is not liberalized). Significant gains are also found in the other processed foods and electrical equipment sectors.

Table 3. Welfare projections and decomposition, 2020

(Unit: US$ million)

	Total welfare	Contribution of:			
		Allocative efficiency	Terms of trade	Capital	Equity
Scenario 1: Hub-and-spoke					
Australia and New Zealand	**2 739**	276	2 365	169	-71
China	**9 359**	4 291	2 544	-645	3 169
Republic of Korea	**12 575**	14 898	-2 272	-226	175
ASEAN	**13 953**	10 209	-47	734	3 058
APEC	**20 528**	26 920	-12 040	-3 495	9 144
Scenario 2: RFTA					
Australia and New Zealand	**4 504**	1 037	3 245	568	-346
China	**6 499**	3 484	1 016	-345	2 344
Republic of Korea	**18 083**	17 104	574	-324	730
ASEAN	**16 032**	11 950	-50	1 019	3 113
APEC	**23 255**	30 188	-12 748	-3 430	9 245
Scenario 3: RFTA-Sensitive					
Australia and New Zealand	**3 947**	789	2 917	635	-394
China	**5 517**	3 747	-68	-46	1 883
Republic of Korea	**16 458**	13 416	2 625	-392	808
ASEAN	**15 618**	11 838	-336	948	3 168
APEC	**20 333**	26 519	-11 708	-3 058	8 581
Scenario 4: APEC					
Australia and New Zealand	**-6**	1 521	-1 798	-1 042	1 313
China	**22 442**	8 656	-381	-2 019	16 186
Republic of Korea	**29 369**	16 361	12 517	-226	716
ASEAN	**20 977**	11 854	12 484	236	-3 597
APEC	**83 591**	90 964	-10 601	-8 794	12 022

Terms of trade effects are more mixed, with only China, Australia and New Zealand seeing improved terms of trade and therefore positive contributions to welfare in the first scenario. Terms of trade in the GTAP model may be decomposed into the contribution of three effects: changes in world prices of traded products; changes in regional export prices; and changes in regional import prices (McDougall, 1993).[12] For Australia and New Zealand, the terms of trade effect appears particularly important, dominating the overall welfare effect. The terms of trade improvement accrues mainly to Australia, and is driven primarily by an increase in the world prices as well as Australia's export prices in the coal-oil-gas-minerals sector. While these effects are significant and positive in the first three scenarios, the world price and Australia's export prices fall for this same sector in the APEC scenario, driving a fall in the terms of trade for Australia and New Zealand.

However, this same sector is an important import sector for the Republic of Korea, and the negative terms of trade impact in the first scenario is largely due to the increased world prices in the coal-oil-gas-minerals sector. While this world price effect remains negative in the second RFTA scenario, it is more than offset by improvements in the Republic of Korea's regional export prices, particularly in some of the

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[12] The latter two effects are due to the bilaterally differentiated products; these would not arise in a perfect substitutes model.

manufacturing and services sectors.

How will each of the scenarios modelled have an impact on exports from each economy? Table 4 shows the projected percentage change in total exports from each country/region.[13] For China, annual exports increase by 5.2 per cent per annum in 2020, with implementation of the bilateral agreements. This increase is slightly more than 5 per cent when the spokes are joined, falling to 4.9 per cent if sensitive products remain unliberalized. However with APEC reform, exports are projected to increase by almost 6.7 per cent per annum in 2020. The increase in exports of Australia and new Zealand with the bilateral and regional FTA agreements is more moderate, increasing by slightly more than 0.6 per cent in 2020 in the first scenario. When the spokes are joined, the increase in exports rises to 2.5 per cent, but slipping back to 1.85 per cent with sensitive products. The most striking result in terms of export growth for Australia and New Zealand is with APEC liberalization, when exports increase by more than 8.5 per cent per annum.

The Republic of Korea is expected to increase exports significantly in the first three scenarios – by 6.5 per cent in 2020 for the first scenario, almost 8 per cent in the second scenario, and slipping back to 6.3 per cent in the third scenario that includes sensitive products. While the Republic of Korea appears to benefit greatly from preferential access to regional markets, once APEC fully reforms exports are projected to reduce slightly relative to the baseline for the reasons discussed above. ASEAN exports are anticipated to increase by even more than those of China and the Republic of Korea in the first three scenarios. In the first bilateral agreement scenario, they increase by more than 8.5 per cent, although much of this will be due to liberalization of intra-ASEAN trade in addition to liberalization of trade with China. When the bilateral agreements are extended into a regional FTA, exports increase by 9.75 per cent, falling back to 9.6 per cent with sensitive products. However, with full APEC liberalization, exports are projected to increase by less than 2 per cent per annum in 2020.

Table 4. Change in real exports under each scenario, 2020

(Unit: Percentage)

Country/region	Hub-and-spoke	RFTA	RFTA-Sensitive	APEC
Australia and New Zealand	0.62	2.50	1.85	3.98
China	5.19	5.06	4.90	6.67
Republic of Korea	6.49	7.97	6.34	-0.80
ASEAN	8.53	9.75	9.61	1.96
APEC	2.47	2.77	2.60	4.15

Discussion

The quantitative results shown above clearly demonstrate the economic advantages of connecting the spokes within the illustrative hub-and-spoke system of five Asia-Pacific PTAs. However, the incentives are a little mixed, with the gains to China (the "hub") somewhat eroded once a regional FTA is formed with the spokes joined. The increased gains available to the "spoke" regions more than offset China's

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[13] Weighted by the value of exports in the corresponding year of the baseline.

loss, leading to significantly higher overall gains when the spokes are connected, particularly if sensitive products are also liberalized. If the liberalization were an even more ambitious full APEC reform, the overall gains would be even higher. However, the results for individual countries are rather mixed, with some regions indicators suggesting greater benefits from preferential access to regional markets than if there is a full liberalization of APEC markets.

If the overall gains from enlarging preferential agreements are as significant as suggested above, this begs the question of how, in practice, this outcome might be realized (Baldwin, 2004 and 2006)? Where existing individual agreements differ widely in (a) product coverage, (b) the depth of preferences and (c) the "rules of the game", amalgamation of such disparate trade agreements will clearly be a challenge. It is therefore suggested that harmonization of approaches can facilitate the extension and amalgamation of PTAs through the adoption of what Harrigan and others (2006) called "good practices".[14] Examples have been given above of regional experiences in achieving wider product coverage through the inclusion of sensitive sectors. In addition, the selected use of safeguards, which may be harmonized if based on WTO rules, could also be valuable in achieving inclusivity for sensitive products if applied over a strict transitional period. Where the depth of preferences varies widely across agreements, transitional safeguards and differential national treatments according to stage of economic development (as in WTO agreements) may be useful.

The rules of origin are used in PTAs to determine preference eligibility (Krishna and Krueger, 1995; Augier and others, 2005). However, inefficiencies in production may occur when imported raw materials are diverted from the lowest-cost source in order to meet the rules of origin. Should a country belong to two or more agreements, other problems arise since the relevant rules are determined by the intended trade destination. The rules of origin may permit only limited or no cumulation, and may also divert purchases away from lowest-cost sources. The rules of origin may also be used as a protective device where they are more severe for sensitive products. The amalgamation of PTAs can be facilitated if such rules of origin problems can be overcome through (a) appropriate simplification and harmonization, (b) recognition of the technical capacity of exporters and (c) adoption of a harmonized set of rules such as may eventually be adopted by WTO.

Some progress on regional harmonization of sanitary and phytosanitary (SPS) and technical barriers to trade (TBT) issues is found in some of the existing regional trade agreements. Adoption of relevant WTO agreements in these areas, and the use of recognized international standards where they exist, should further encourage such harmonization, thus facilitating the expansion and amalgamation of preferential trade agreements. Developed country partners in PTAs can, and do, play a role in assisting developing country members in improving their SPS and TBT regulations and inspection procedures – while, in some cases, this assistance may be provided to facilitate imports from foreign-based subsidiaries, the institutions and processes created will be available to all traders.

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[14] "Good practices" include product coverage, rules of origin, customs procedures, intellectual property protection, foreign direct investment, anti-dumping and dispute resolution, government procurement, competition and technical barriers to trade.

C. Conclusion and future challenges

The current study is aimed at contributing to the evolving literature on the "new regionalism". In particular, it focuses on illustrative examples to show how a range of different agreements may interact with each other in the Asian and Pacific region. It finds that there are significant overall gains from forming regional rather than bilateral free trade agreements, and that the overall gains tend to increase as the product and country coverage increases. However, at the individual economy and even sectoral level, the results are somewhat varied, with rather mixed incentives arising for some countries. This highlights the importance of countries considering the implications not only of the agreement they are currently negotiating but also of other agreements that they and their negotiating partner may implement, as those agreements may significantly change the expected outcomes. This is not an argument against implementing trade reform; indeed, if attention were to be focused on the regions not engaging in reform, their gains would be typically much smaller or even negative with a clear danger of being left out in the cold.

There are a number of important areas to which this type of study can be extended in the future. Data issues remain problematic. The above simulations are somewhat exploratory, but future work can incorporate more appropriate levels of tariff reduction and timing as further information becomes available. Tariff data should recognize any excluded products or those on temporary exclusion lists as well as special preferences offered to less-developed countries within the agreement, while MFN tariffs need to be accurate since these are critical in determining the achieved levels of preferences. Can safeguard components of agreements be usefully modelled, say, based on results of preliminary baseline simulations that may be suggestive of where and how safeguards might be applied? While the "devil is in the details", the authors recognize that these data intentions will always be compromised by necessary product aggregation in the international databases that CGE models access. A further issue is whether adequate data are available for modelling of services liberalization in PTAs.

The rules of origin are typically excluded from CGE analyses. Yet, these rules may be important in determining whether or not preferences are realized and therefore will have an impact on modelled welfare outcomes. While this raises issues regarding complex modelling and data, it could be a fruitful area for innovative research. Trade data will show, at least at the country level, the sources of imported raw material purchases; this will enable investigation of whether or not these sources are members of the regional trade agreement under study and whether they fall under the umbrella of any relevant cumulation rules. That may assist in making subsequent decisions as to whether or not preferential tariffs ought to be applied to that industry's exports to partner countries within the trade agreement. Modelling approaches may be devised (e.g., imposition of prohibitive tariffs on raw material imports from non-member countries) for achieving diversion of raw material imports from non-member countries to member countries, in order for preferences to be realized on subsequent exports to partner countries. Indeed, this could open up a rich field of investigation into the trade diversion costs of the rules of origin. A pioneering attempt was made in this direction by Gasiorek and others (2003) in a CGE analysis of the European Union and southern Mediterranean countries, where rules of origin constraints are measured as tariff-equivalents.

Trade facilitation costs such as those due to SPS and TBT rules and practices and other "behind the border" barriers have been shown to be substantial in some cases (ESCAP, 2006), and somewhat more progress appears to have been made in this area, compared to representation of the rules of origin, in CGE modelling. Lowering of these barriers, together with the development of appropriate institutions and infrastructure, has the potential to increase trade and allow trade preferences to be realized. Some recent examples of CGE studies have attempted to model the impact of trade liberalization on transaction costs. Philippidis and Sanjuan (2007) made use of gravity models to estimate tariff equivalents of non-tariff barriers, and adopted the "iceberg" approach (longer transit periods are associated with higher costs and a "melting down" of the value of the good) of Hertel and others (2001) in order to incorporate these into the GTAP model. Decreux and Fontagne (2006) used an iceberg variable in their CGE model through the imposition of an additional variable cost to producers aiming at acceding to foreign markets.

While the "iceberg" representation appears appropriate for indirect costs such as border clearance times, it does not capture directly incurred trade transaction costs such as the provision of documentation (OECD, 2003). Consequently, OECD (2003), Fox and others (2003), and Dennis (2006) incorporated trade facilitation into the GTAP model through splitting the costs into the indirect iceberg component and a tax component, to capture the direct transaction costs. A considerable data problem is the measurement of exiting transaction costs, and a related issue is the estimation of the impact of some degree of liberalization on the level of those costs. Some of these studies demonstrated substantial gains from reductions in transaction costs and trade margins, perhaps in excess of potential gains from tariff liberalization. An additional question is whether the investment flows generated within dynamic CGE models could be linked to such cost reductions, through their role in institution and infrastructure building, in cases where trade agreements extend to services and foreign investment.

Finally, the competitive effects of regional trade integration may lead to productivity improvements over time, and further thought may be given to how these effects may be captured. There is a vast theoretical and empirical pool of literature on this subject; one issue is how such technological gains might be estimated in relation to CGE analysis of regional trade agreements where liberalization may be less complete regionally, but perhaps deeper sectorally than in multilateral liberalizations. Given econometric estimates of productivity gains, these can, of course, be imposed exogenously. However, at least with dynamic CGE models, thought might be given to endogenizing the link between liberalization, openness and productivity growth.

Annex

Annex table 1. Regional aggregation

Grouping	Aggregation modelled	Description
Australia and New Zealand[*]	Australia	Australia
	New Zealand	New Zealand
China[*]	China	China

Republic of Korea[*]	Republic of Korea	Republic of Korea
ASEAN-5*	Singapore	Singapore
	Thailand	Thailand
	Philippines	Philippines
	Malaysia	Malaysia
	Indonesia	Indonesia
New ASEAN	Viet Nam[*]	Viet Nam
	Other ASEAN (R_ASEAN)	Cambodia, Lao People's Democratic Republic, Myanmar (also Brunei Darussalam, Timor-Leste)
High- Income Asian[*]	Japan	Japan
	Hong Kong, China; Taiwan Province of China	Hong Kong, China; Taiwan Province of China
NAFTA[*]	United States	United States
	Canada	Canada
	Mexico	Mexico
Central and Latin America[*]	Chile and Peru	Chile, Peru
	Rest of Central and Latin America	Rest of North America; Colombia; Venezuela; rest of Andean Pact; Argentina; Brazil; Uruguay; rest of South America; Central America; rest of FTAA; rest of the Caribbean.
Europe	Russian Federation [*]	Russian Federation
	European Union 25	Austria; Belgium; Denmark; Finland; France; Germany; United Kingdom; Greece; Ireland; Italy; Luxembourg; Netherlands; Portugal; Spain; Sweden
		Cyprus; Czech Republic; Hungary; Malta; Poland; Slovakia; Slovenia; Estonia; Latvia; Lithuania
	Rest of Europe	Switzerland; rest of EFTA; rest of Europe; Albania; Bulgaria; Croatia; Romania; rest of former Soviet Union; Turkey
South Asia	India	India
	Sri Lanka	Sri Lanka
	Bangladesh	Bangladesh
	Rest of South Asia	Rest of South Asia
ROW	ROW	Rest of Oceania; rest of East Asia; rest of Middle East; Morocco; Tunisia; rest of North Africa; Botswana; South Africa; rest of Southern African Customs Union; Malawi; Mozambique; Tanzania; Zambia; Zimbabwe; rest of Southern African Development Community; Madagascar; Uganda; rest of sub-Saharan Africa.

[*] Included in APEC (Brunei Darussalam and Papua New Guinea cannot be modelled separately).

Annex table 2. Projection assumptions – cumulative changes in GDP and factor endowments for selected countries, 2001-2020

(Unit: Percentage)

Country/area	GDP	Population	Unskilled labour	Skilled labour
Australia	90.9	15.0	39.3	19.8
New Zealand	84.4	15.3	10.5	-4.9
China	262.8	12.4	16.6	101.8
Hong Kong, China; and Taiwan Province of China	122.3	7.6	15.4	76.9
Japan	39.2	-3.4	3.1	-11.6
Republic of Korea	142.2	7.0	22.0	160.5
Singapore	142.3	21.3	16.0	28.3
Thailand	150.8	11.1	0.0	88.6
Philippines	104.2	34.3	37.3	138.2
Malaysia	183.2	32.4	-16.7	146.1
Indonesia	152.9	24.2	67.3	266.0
Viet Nam	172.9	22.8	30.7	44.5
United States	82.5	15.6	31.5	18.3
Mexico	92.8	29.6	57.8	133.6
Canada	64.1	9.5	34.2	20.7
Chile and Peru	108.3	24.7	34.3	143.3
Russian Federation	103.3	-10.0	-1.4	8.9

Source: Walmsley, personal communication, 2007, based on Walmsley, 2006.

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