

THE ECONOMIC IMPACT OF NEW REGIONAL TRADING DEVELOPMENTS IN THE ESCAP REGION¹

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In this paper the results of a number of numerical simulations of possible trade liberalization scenarios in the ESCAP region are presented. The scenarios considered include: expansion of existing trade blocs to encompass new members; consolidation and deepening of existing trade agreements; and a region-wide free trade area. The simulations were conducted using the model of the Global Trade Analysis Project (GTAP) and were based on a projection of the database to 2010.

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I. INTRODUCTION

Preferential trading agreements have been proliferating rapidly across the globe, and the Asia-Pacific region is no exception (for early work on this area, see Scollay and Gilbert, 2001, and more recently Mikic, 2007). The architecture that will emerge in this new environment remains uncertain, although several tendencies are discernible (Scollay and Gilbert, 2010). The trend that has progressed most rapidly has been the proliferation of small, bilateral free trade agreements, a trend about which Menon (2009) has been critical. According to Scollay and Gilbert (2010), since 2000 some 30 bilateral free trade agreements (FTAs) have been concluded among Asia-Pacific economies, with several others being under negotiation for some time

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and still others at the stage of preliminary study. Asia-Pacific economies have also been actively negotiating FTAs with partners outside the Asia-Pacific region.

There has also been a trend towards consolidating and expanding existing agreements in the region. The most notable developments in this regard are the ASEAN+3 agreement, which would bring together the economies of the Association of Southeast Asian Nations (ASEAN) along with China, Japan and the Republic of Korea, and the possible expansion of the agreement to ASEAN+6 (introducing Australia, India and New Zealand) or other states as well. Another possibility is a region-wide agreement. Scollay and Gilbert (2010) discussed possible modalities in more detail, and ESCAP (2012) provided a comprehensive overview of the various issues surrounding economic integration in the Asia-Pacific region.

The purpose of this paper is to use computable general equilibrium (CGE) modelling techniques to gain insights into the possible economic implications of these potential regional trade developments. In the paper the GTAP model is used to analyse a total of seven different trade liberalization scenarios, under a variety of different assumptions. In the first set consideration is given to the implications of expanding one of the current trade agreements (ASEAN) to include other countries in the region, through ASEAN+3, and then ASEAN+6. The question is then considered of whether it is more important to “deepen” trade liberalization between existing groups, or to consolidate existing groups through intragroup liberalization. In the scenarios the following groups are considered: ASEAN, the Pacific Agreement on Closer Economic Relations (PACER) Plus, the South Asian Free Trade Area (SAFTA) and the Economic Cooperation Organization Trade Agreement (ECOTA). Finally, the results are benchmarked with analysis of completing trade liberalization among the current members of the Asia-Pacific Trade Agreement (APTA) and an ESCAP-wide FTA, and with multilateral trade liberalization.

The analysis is broad by design, and a number of important policy insights have been generated as a result. In particular, it was found that: the expansion of ASEAN to ASEAN+3 and ASEAN+6 generated substantial welfare gains for China, the Republic of Korea and most of the members of ASEAN; there would be substantially larger and broader-based gains to be realized from consolidation of existing trade agreements into larger groups than from deepening the agreements only by removing internal tariffs; and the total welfare gains associated with an ESCAP-wide agreement would be much larger than those associated with any of the other scenarios, except full multilateral reform. Hence, other regional trade reform scenarios, while perhaps generating important welfare gains, still leave a lot of potential gains on the table relative to a broader agreement. Nonetheless, for many ESCAP economies, the benefits of multilateral trade reform are larger still than those associated with

preferential reform, even on an ESCAP-wide scale, suggesting that extraregional trade remains vitally important and should be pursued concurrent with intraregional trade negotiations.

The structure of the paper is as follows. Section II contains a discussion of the methodology adopted, including brief notes on CGE analysis, the GTAP model and database, and the experimental design. Also discussed is the method for projecting the GTAP database from its 2004 base year to 2010, and a brief assessment of the veracity of the projection. Section III contains a discussion of the main results of the simulations. Concluding comments, including notes on the limitations of the study and potential future directions, follow.

II. SIMULATION METHODOLOGY

The idea behind CGE is to program a large-scale mathematical system representing (in this case) the global economy and to combine that theoretical system with a benchmark set of real world data representing the status quo. The equilibrium is then perturbed to generate insights into the direction and magnitude of the economic effects of policy interventions and/or other changes in the economic system.

CGE techniques differ from other methods of analysis of trade policy (e.g. gravity analysis or partial equilibrium simulation) and from macroeconomic forecasting models in that they are used to try to explicitly account for the behaviour of the entire system at a disaggregate level, attempting to capture all the relevant interconnections between markets. The technique is particularly well-suited to analysing changes in economic policy that are large enough to have an impact on the overall economic system and/or spread over multiple sectors/regions. Given the magnitude of the changes in the international trade environment that are likely to occur in the ESCAP region and their broad regional and sectoral coverage, CGE analysis is thus an appropriate methodological choice.

Gilbert and Wahl (2002) provided a brief overview of the technique, as well as a survey of numerous applications. A more comprehensive introduction to CGE methods was conducted by Gilbert and Tower (2013). Recent surveys of applications include Scollay and Gilbert (2000), Robinson and Thierfelder (2002) and Lloyd and MacLaren (2004). Recent CGE papers dealing with developments in the Asia-Pacific region include Brooks, Roland-Holst and Zhai (2005), Strutt and Mikic (2009), Anderson and Strutt (2011) and Gilbert (2013).

Model and base data

The simulations presented in this paper were run using the GTAP model (Hertel, 1997). This particular CGE model has become very widely used over the last decade (see the surveys listed above), and represents a benchmark model of sorts. The structure of the model is a standard, multiregion CGE, discussed in detail in Hertel (1997). Given that the structure of this model is widely known and fairly standard, a detailed description has been dispensed with.

The database used in the simulations was GTAP7.1, which has a base year of 2004.² Since working with the full GTAP data is very computationally expensive, for the simulations reported in this the paper the data were aggregated to 35 regions and 15 sectors.³ On the regional side the primary objective was to identify individually the member economies of ESCAP wherever possible. The remaining countries/regions were chosen to balance the natural geographic/economic breakdowns, while factoring in the major trading partners and the requirements of the trade policy scenarios. The sectoral aggregation was similarly a compromise of natural aggregation across similar categories and the major export categories of the ESCAP economies.

Update to 2010

Given that the initial database year of 2004 is somewhat dated, the first step was to project the database to a more recent year. The author updated the GTAP database to 2010 via a growth projection. The methodology is similar to that adopted in Gilbert (2013) and Strutt and Anderson (2011).

In a CGE model such as GTAP, growth of output is driven by changes in productivity, the capital stock and other resources, the size of the labour force and (in the case of GTAP, which splits skilled and unskilled labour) changes in the composition of the labour force. Hence, it is necessary to develop baseline projection scenarios for each of these factors in addition to projections of changes in populations which affect the demand side of the model. Moreover, tariffs and other trade policies may have changed significantly over the period 2004-2010, and ideally that should be taken into account. Hence, in this paper, in contrast to the work of

² While GTAP7.1 has the same base year as GTAP7, it has improved input-output data for a number of economies important for this study, including China and Viet Nam, as well as the European Union. Subsequent to the completion of this study, GTAP8 became available, with a base year of 2007.

³ See the tables for the regional aggregation. For sectors, primary crops, primary animal based, forestry and fisheries, mining and quarrying, oil and gas, food products, textiles, wood products, chemicals, metals, fabricated metal products, motor vehicles, electronics, machinery and services have been identified.

Gilbert (2013) and Strutt and Anderson (2011), tariff rates have also been adjusted to the most recently available data. The end result of this process is a projected equilibrium for the global economy as at 2010 that fits the broad macroeconomic data, including aggregate trade, and reflects the current tariff rates.

The basic assumptions of the update to 2010 are presented in table 1. The data for population growth were obtained from the database of the World Population Prospects: The 2010 Revision,⁴ which were mapped onto the author's dataset, with the actual annual population growth rates used for the period 2004-2009 extracted from the Laborsta database of the International Labour Organization (ILO). The primary source of information on changes in the size of the overall labour force is the ILO Laborsta database. The average annual growth rate is about 1.6 per cent over the simulation period. Growth rates are higher for developing economies, averaging about 2 per cent.

Recent data by Barro and Lee (2010) would suggest that there has been significant growth in the availability of skilled labour (defined as having completed tertiary education) in many of the countries of interest over the last decade.⁵ Accordingly, the author split the accumulation of labour into skilled and unskilled components using the changes in the Barro and Lee (2010) database, which again were matched to the author's aggregation.

Data on factor productivity changes are not widely available; hence, a standard approach was followed and the cumulative changes in total factor productivity (TFP) were calculated residually using gross domestic product (GDP) projections. The average real GDP growth over the period 2004-2010 was approximately 4.3 per cent (5.4 for developing economies, 2.7 for developed, including the Republic of Korea), with a high of 11.2 for China and a low of 0.4 for Japan. The fitted aggregate TFP values from the projection are reported in the table 1 as a consistency check. These are cumulative from 2004 to 2010. The average annual growth rates in productivity implied by these estimates generally fall into the range 0.4 to 2 per cent, with only India being slightly higher than 2 per cent and most of the developing economies slightly below 1 per cent. The average rate of aggregate TFP growth was 0.7 per cent over the period 2004-2010, a little low but reflecting the relatively poor economic performance of many developed economies over the last few years of the decade.⁶ Productivity growth rates are typically assumed to be in the

⁴ See <http://esa.un.org/wpp/>.

⁵ Alternative definitions of human capital are frequently used, but this corresponds to the method used in GTAP to distinguish between skilled and unskilled labour.

⁶ Given that the TFP rates are computed residually, this largely reflects the relatively low growth in GDP.

1-2 per cent range (see Duval and de la Maisonneuve, 2009); hence, the estimates seem quite plausible, if on the conservative side.

Table 1. Growth assumptions for projection of percentage change to 2010

Country or area	Population	Labour force growth		GDP	Aggregate TFP	Capital growth
		Unskilled	Skilled			
Australia	6.7	8.7	21.0	18.3	1.4	17.7
New Zealand	5.9	7.9	24.2	8.4	-0.7	7.2
Pacific islands	13.3	16.1	14.0	21.1	0.4	23.1
China	3.9	3.3	51.7	89.1	9.2	67.1
Hong Kong, China	3.2	4.7	9.9	28.4	2.7	31.2
Japan	-0.3	-4.8	9.6	2.5	0.5	2.6
Republic of Korea	2.4	4.0	12.2	24.9	3.5	24.1
Rest of East Asia	3.1	5.8	53.3	49.3	4.5	45.0
Cambodia	10.3	17.8	47.5	51.5	7.7	33.2
Indonesia	7.4	12.0	30.9	39.3	6.4	31.9
Lao People's Democratic Republic	11.3	16.3	54.4	56.3	13.1	31.2
Malaysia	10.9	13.4	30.8	30.4	2.5	28.3
Philippines	11.6	10.6	18.6	32.8	4.9	26.4
Singapore	15.2	19.3	25.9	46.3	3.5	40.2
Thailand	4.4	2.3	51.0	24.3	2.1	20.7
Viet Nam	7.2	12.6	63.2	51.7	4.6	50.0
Rest of South-East Asia	5.6	4.5	42.0	39.1	7.2	31.5
Bangladesh	9.1	14.7	20.8	42.5	8.4	28.9
India	9.1	12.6	29.9	62.2	12.7	44.9
Pakistan	13.9	24.1	31.1	32.9	5.8	15.8
Sri Lanka	5.4	2.8	12.2	43.4	8.4	40.5
Rest of South Asia	17.1	23.2	19.2	58.0	10.7	41.9
Kazakhstan	4.4	4.5	46.1	45.5	7.8	41.1
Kyrgyzstan	7.4	17.1	34.1	19.6	-0.8	25.7
Russian Federation	-2.4	2.5	-2.1	25.8	5.1	25.8
Rest of Central Asia	7.5	22.3	6.7	68.8	14.1	47.1
Armenia	0.9	5.6	15.5	48.7	11.0	40.9
Azerbaijan	6.7	10.9	5.9	168.4	22.9	102.8
Georgia	-6.6	-3.6	-7.9	39.6	10.7	38.5

Table 1. (continued)

Country or area	Population	Labour force growth		GDP	Aggregate TFP	Capital growth
		Unskilled	Skilled			
Iran (Islamic Republic of)	7.3	9.9	56.8	23.9	2.1	19.5
Turkey	7.8	4.9	34.0	25.4	3.3	22.8
United States	5.9	6.5	3.4	7.8	0.9	7.8
EU-27	2.7	3.8	13.8	7.1	0.0	6.2
Rest of world	11.1	14.3	29.0	24.1	2.1	20.6

Sources: International Monetary Fund, World Economic Outlook database. Available from www.imf.org/external/pubs/ft/weo/2013/01/index.htm; International Labour Organization, Laborsta database. Available from <http://laborsta.ilo.org/>; United Nations, Department of Economic and Social Affairs, World Population Prospects database. Available from <http://esa.un.org/wpp/>; and Barro and Lee (2010).

Note: Growth rates are cumulative from 2004 to 2010. Pacific islands refers to all countries in Oceania except Australia and New Zealand. EU-27 refers to the 27 current members of the European Union.

Because of a tendency for GTAP to slightly underpredict the growth in world trade over the simulation period noted in Gilbert (2013), a reduction in transportation costs (system wide) was also implemented to match the changes in aggregate global exports (the shock was an improvement in productivity in the order of 10 per cent).

As with labour force, technology and population changes, growth in the capital stock can be imposed directly in a projection scenario. From a growth theory perspective, however, technological advances and population growth are usually regarded as exogenous, and the growth of the capital stock is endogenous. Indeed, in comparative static simulations of long-run scenarios with CGE models it is common to impose a steady-state closure whereby the real return to capital is fixed and the supply of capital is endogenously determined in response to other changes in the economic system, while in recursive dynamic simulations the capital stock is usually determined by an investment/depreciation rule.⁷

The steady-state convention has been used in the analysis. The growth rate in the capital stock is therefore determined within the projection simulation and reported in table 1 as a consistency check. The ratio of the current account balance to GDP is fixed, and capital is not free to move across countries. Over the period 2004-2010, the projected average annual growth rate in the capital stock is about 3.3 per cent. As with TFP, accumulation rates are somewhat faster in developing economies (3.9 per cent) than developed economies (2.5 per cent). Also as with TFP,

⁷ See Harrison, Rutherford and Tarr (1997) for further details.

the projections for capital accumulation are in a very plausible range. Using a simple perpetual inventory projection from the GTAP7.1 data, for example, with a 5 per cent depreciation rate, the average rate of capital accumulation in 2004/05 would have been 3.7 per cent. The update projection used in the study is perhaps a little more conservative, but again this reflects relatively poor economic growth in the last part of the projection period (i.e. 2008-2010). Hence, the author is satisfied that his projection generated a sensible capital accumulation and productivity growth scenario.

Finally, changes in tariffs were determined by aggregating the most recently available effectively applied rates in the Trade Analysis and Information System (TRAINS) database of the United Nations Conference on Trade and Development (UNCTAD) to match the study's sectoral and regional aggregation of GTAP data.⁸ Tariff reductions were then included in the projection simultaneously with the other factors. Table 2 presents the trade weighted average tariff (applied and faced) for selected economies in the GTAP7.1 data and in the adjusted dataset. For comparison purposes the tariffs in the GTAP6 data have also been included, as they have in the newly released GTAP8 data; the base years of both are 2001 and 2007, respectively. As can be seen, tariffs have fallen substantially over the period, so it is important to take this feature into account.

Table 2. Weighted average tariff effectively applied and faced 2001, 2004, 2007, 2010

(Percentage)

Country	2001		2004		2007		2010	
	Applied	Faced	Applied	Faced	Applied	Faced	Applied	Faced
Australia	4.3	6.3	3.2	5.3	2.9	3.8	1.8	3.3
China	11.4	5.8	5.6	5.0	8.5	4.7	3.4	3.3
India	21.6	5.3	12.8	4.6	11.4	3.4	10.3	3.6
Indonesia	3.6	6.2	3.4	5.3	3.3	5.3	1.7	4.2
Japan	4.1	5.0	3.2	4.8	1.9	6.2	1.6	4.0
Malaysia	4.7	3.3	5.2	2.8	3.5	2.5	2.6	2.1
New Zealand	1.7	7.5	2.5	6.7	1.9	6.9	1.5	4.9
Philippines	2.8	2.9	3.3	2.1	3.5	1.7	3.1	1.5
Republic of Korea	8.4	6.4	5.3	4.9	6.5	4.7	4.7	3.9
Singapore	0.0	3.4	0.0	2.2	0.0	2.2	0.0	1.1
Thailand	8.8	6.6	8.0	5.5	5.3	4.1	4.4	3.1
Viet Nam	10.2	6.2	11.4	6.5	9.3	5.3	5.5	6.2

Sources: GTAP6 database, GTAP7.1 database, GTAP8 database and TRAINS.

⁸ For most countries the data used is for 2010. We matched all the countries reported in TRAINS to the corresponding GTAP regions in our aggregation (including aggregate regions). Similarly, the disaggregate harmonized system tariff rates of TRAINS are aggregated up to the GTAP concordance.

Experimental design

Using the aggregated database projected to 2010 as the starting point, a total of seven trade liberalization scenarios are considered as follows:

- (a) ASEAN+3 (ASEAN, China, Japan and the Republic of Korea). In the tables this grouping is referred to as “ASEAN+3”;
- (b) ASEAN+6 (ASEAN, Australia, China, India, Japan, New Zealand and the Republic of Korea). In the tables this grouping is referred to as “ASEAN+6”;
- (c) Liberalization of trade among PACER+, ASEAN, SAFTA and ECOTA. In the tables this grouping is referred to as the “Completion” scenario;
- (d) Liberalization of trade among and between PACER+, ASEAN, SAFTA and ECOTA. In the tables this grouping is referred to as the “Consolidation” scenario;
- (e) Completion of liberalization of trade among the current APTA members. In the tables this is referred to as “APTA”;
- (f) A free trade agreement encompassing all members of ESCAP. In the tables this is referred to as “APTA II”;
- (g) Global multilateral liberalization of merchandise trade (tariffs). In the tables this is referred to as “Global”.

In each simulation the liberalization is modelled as a complete removal of the applied tariffs on merchandise trade. From this perspective the simulations represent the upper bounds of the liberalization that could potentially take place, since in practice agreements typically provide for the exclusion of some products (notably agricultural products), and extensive phase-in periods for the elimination of tariffs on others.

On the other hand, since GTAP does not have protection data for services and does not have an adequate theoretical foundation for dealing with services trade reform, the results may understate the potential effects of liberalization where services are likely to be included. This issue is discussed in the concluding comments with reference to the current literature.

CGE simulations may be static or dynamic. In this paper comparative static simulations are used. This has the disadvantage relative to dynamic techniques of not describing the time-path, i.e. attention in the analysis is concentrated on the end outcomes (the projection) rather than the transition. However, this disadvantage is

countered by the reduced degree of computational complexity, which enables consideration of a greater range of potential scenarios, and greater levels of sectoral and regional disaggregation that have been adopted, while still addressing the primary questions of interest. The results presented in section III should be interpreted as indicating how the economies would differ along the relevant economic dimension, relative to the projected 2010 equilibrium, after all adjustments in response to the liberalization scenario had taken place if the trade arrangements being simulated had been implemented.

Each of the scenarios is run in four different permutations, which are designed to help understand the potential importance of various factors for the economic impact of the trade reform. In the first, a neoclassical factor market closure is used, whereby the total availability of all primary factors is fixed and factor prices are flexible. This is a conservative approach, intended to capture the medium-run effect of the trade liberalization, i.e. focus is given to the effect of reallocation of production, consumption and trade, for a given resource/technology base. Next, the same scenarios are run using a steady-state (long-run) closure in the market for productive capital. In this approach, as described above, the real return to capital is fixed and the supply of capital is endogenously determined in response to other changes in the economic system (see Harrison, Rutherford and Tarr, 1997; Wang and Schuh, 2002; and Gilbert and Wahl, 2002, for other examples). This is a relatively low-cost method of approximating the dynamic gains from trade reform associated with capital accumulation.

Because FTAs may involve reforms that facilitate international trade other than tariff reform, in a third permutation improvements to transportation technology are introduced to the simulations at the bilateral level that are on the order of 10 per cent. The shock is applied only to the bilateral trade flows of the liberalizing economies. This is a rather simple approach, of course, but it does give some idea of how much trade facilitation might matter relative to trade reform. This trade facilitation is called “assumption 1”.

Finally, in the fourth permutation the trade facilitation issue is explored further by utilizing data provided by ESCAP on trade costs at the bilateral level. The approach is to use the variation in the bilateral trade costs to adjust the transportation productivity shock. The base productivity shock to transportation efficiency is increased from 10 per cent to 20 per cent. More importantly, while the average shock is 20 per cent, the actual shock on any given country pair is inversely proportional to the ESCAP estimate of trade costs, net of the actual applied tariff. Hence country pairs with relatively high trade costs get a proportionally bigger shock to productivity, and country pairs with relatively low bilateral trade costs get a proportionally smaller

shock to productivity. That is to say, it is assumed that there are diminishing returns to trade facilitation. This scenario can be interpreted as simulating something similar to adopting best practices. The benefits of trade facilitation are also assumed to have an impact on all trade flows, not just the country pairs liberalizing in any particular simulation. That is, in the previous simulation when, say, Thailand liberalizes trade with China, the trade facilitation productivity shock applied only to Thailand-China trade. Now it is assumed to apply to all of Thailand's trade (i.e. the efficiency improvements are assumed to spill over). Again, this is still a rather simple approach, but it provides a useful demonstration of the impact of more aggressive trade facilitation assumptions. This is called trade facilitation "assumption 2". The results under both sets of assumptions can be thought of as a type of sensitivity analysis. While only selected results have been presented in this paper, the full results are available on request.

III. SIMULATION RESULTS

The results of the trade liberalization scenarios are now considered. The seven scenarios under consideration can be grouped into three broad categories, which each highlighting different regional trade liberalization modalities. The first two are concerned with sequential expansion centred on ASEAN. The next two are concerned with two different modalities for consolidating existing free trade agreements in the region, first by deepening the degree of liberalization among current members and second by also liberalizing between blocks. The final group of three, which comprise APTA, an ESCAP-wide FTA and complete multilateral trade reform, respectively, can be considered benchmarks against which the other results can be compared.

Expanding ASEAN

In table 3 the estimated welfare effects of the first group of scenarios are presented for both the medium-run and long-run closures, and it contains the two trade facilitation assumptions. It may be recalled that the medium-run simulations capture only the effect of reallocating existing resources, while the long-run simulations also capture the effect of capital accumulation. The data have been summarized for the economies directly affected by the reform, but also take account of the aggregate effects on countries not included in the scenarios, split by those within ESCAP and those outside. The figures presented are the equivalent variation in household income (EV), which is the monetary value of the increment in income that would have to be given to (or taken away from) the regional household at today's

prices to make them as well off today as they would be under the proposed policy change, after the required economic adjustments have taken place.⁹

The total welfare gain to the economies of ASEAN is estimated at roughly \$3.7 billion from completion of ASEAN+3, rising to \$5.9 billion from ASEAN+6. In both scenarios the largest gainer in absolute terms is Viet Nam. When moving from ASEAN+3 to ASEAN+6, there are large additional gains to Indonesia and Malaysia, suggesting that for these countries the expanded trade opportunities with Australia, India and New Zealand are particularly important.¹⁰

To gain a better idea of the magnitude of the welfare gains, for the ASEAN economies under ASEAN+3, the (simple) average gain as a percentage of base GDP is about 0.4 per cent, with the highest gain realized by Viet Nam at 2.7 per cent and the lowest by the Lao People's Democratic Republic at -1.3 per cent. Under ASEAN+6 the gain rises to an average of 0.5 per cent.

For China and Japan, the estimated effects are larger in absolute terms, but smaller as a percentage of GDP, a loss of approximately 0.1 per cent of GDP in the case of China, and a gain of the same order of magnitude for Japan in the case of ASEAN+3. For the Republic of Korea the gain is of the same order of magnitude as for the ASEAN economies, about 0.5 per cent of GDP. The figures remain similar in ASEAN+6, with only small gains for each of these economies relative to ASEAN+3. India, the other major developing economy introduced in this scenario, is also estimated to lose in this scenario, again by a lower magnitude (about 0.1 per cent of GDP).

While the numbers have not been presented in table 3, some further insight into the results can be gained by considering how they can be decomposed. Overall welfare effects can be broken down into allocative efficiency and terms of trade components. The allocative efficiency effect is the change in welfare associated with movements across distortions in the initial equilibrium (i.e. the total of expansions and contractions in deadweight losses across the entire range of economic activities). The terms of trade component measures the impact of changes in the prices of exports

⁹ This type of estimate of the benefit/cost of the proposed change is sometimes called a "one off" gain/loss. However, this is somewhat misleading since the changes are permanent. Rather this (roughly) can be thought of as a permanent increment to household incomes, at constant prices. If the total "one-off" benefit is desired, then an appropriate approximation would be the discounted stream of annual gains, using the desired discount factor (e.g. with a 5 per cent discount rate, the total gain is roughly 20 times the annual gain; with a discount rate of 2 per cent, the total gain is roughly 50 times the annual gain).

¹⁰ It should be noted that all results presented in table 3 were measured relative to the same projected equilibrium. Hence, the incremental or marginal benefit can be determined by taking the difference between two columns.

Table 3. Medium and long-run welfare impact of ASEAN expansion scenarios

(Millions of United States dollars, EV)

Country or area	Medium run		Long run		Long-run trade facilitation 1		Long-run trade facilitation 2	
	ASEAN+3	ASEAN+6	ASEAN+3	ASEAN+6	ASEAN+3	ASEAN+6	ASEAN+3	ASEAN+6
Cambodia	46.4	51.8	37.2	18.4	63.8	44.1	133.2	113.2
Indonesia	456.1	1 894.2	-52.8	-436.8	514.0	144.8	1 757.7	1 342.8
Lao People's Democratic Republic	-49.8	-49.8	-5.7	-7.3	4.5	2.8	26.2	24.6
Malaysia	107.3	1 025.1	545.4	1 780.8	1 034.1	2 314.1	1 775.4	3 003.9
Philippines	127.3	124.4	-116.6	-261.8	10.3	-139.8	515.4	357.2
Singapore	425.0	391.4	673.0	579.2	1 150.3	1 050.5	2 373.0	2 233.1
Thailand	916.3	772.7	1 145.7	882.1	1 650.1	1 416.8	2 706.2	2 436.3
Viet Nam	1 631.2	1 668.3	1 605.4	1 608.2	1 841.0	1 851.2	2 348.8	2 339.2
Total ASEAN	3 659.8	5 878.0	3 831.5	4 162.9	6 268.0	6 684.4	11 635.9	11 850.4
Australia	-459.4	3 029.6	-457.2	5 010.4	-557.8	5 815.4	6.5	6 305.1
China	-2 057.3	-1 880.5	808.1	2 822.2	3 454.1	5 992.4	10 452.6	12 132.0
India	-291.8	-1 370.1	-552.3	7 810.5	-700.9	8 249.3	-753.4	10 158.1
Japan	6 015.0	6 134.7	12 679.9	13 951.3	14 608.4	16 131.5	16 299.9	17 408.4
New Zealand	-98.4	299.0	-101.6	457.2	-121.5	654.1	-43.3	746.4
Republic of Korea	4 171.1	4 294.3	23 902.1	25 043.8	25 573.7	26 840.7	25 158.9	26 254.6
Total (Rest of ESCAP)	-899.8	-1 139.7	-514.6	-765.4	-726.1	-1 054.9	12 881.0	13 359.0
Total (Rest of world)	-5 219.7	-6 311.4	-6 146.9	-8 676.8	-7 981.7	-11 179.3	-4 150.9	-6 049.2

and imports, reflecting changes in both market access and potentially trade diversion effect (a potential flip-side of increased access).

In the case of the biggest gainer within ASEAN in both the ASEAN+3 and ASEAN+6 scenarios, that is, Viet Nam, most of the gains are from positive terms of trade effects, i.e. improved market access. Decomposition of the terms of trade reveals that the primary source is improved regional export prices in primary crops and food products. Terms of trade movements are also important for both Indonesia and Malaysia in the ASEAN+6 scenario, driven by improvements in regional export prices for food products and electronics, respectively. Although Japan gains modestly in both scenarios, it is mostly through the terms-of-trade mechanism, with improvements in export prices for motor vehicle and electronics being the driving force. The Republic of Korea, however, is different; its gains come about mostly through increased allocative efficiency.

When we look at the cases of China and India, both of which are estimated to lose from their respective agreements in the medium run, we again find terms-of-trade movements at the root. For both economies, the agreements are estimated to generate substantial gains in allocative efficiency, but these are offset by adverse terms-of-trade movements in their manufactured export sectors. Hence, at least in part, the terms of trade benefits to the other economies are trade diverting with respect to the larger economies of China and India. To the extent that trade diversion effects are in play for the larger developing economies in the group, it would be expected that they would be mitigated as the agreements expand or as the economies engage in further unilateral trade liberalization, both of which potentially introduce more competitive supply and limit the extent of trade diversion.

Next the long-run effects of expansion of ASEAN are considered. The long-run simulations open up a new pathway for gains from trade reform – the dynamic gains associated with increased capital accumulation. Opening up this channel produces some significant changes in the results. While the overall gains to the members of ASEAN remain similar under ASEAN+3 and ASEAN+6, the effect of ASEAN+3 on China becomes positive, and for ASEAN+6 reaches nearly \$3 billion. Hence, while the immediate gains from agreements with ASEAN and the other economies might be small or even negative, the long-run gains are more likely to be significant and positive. For Japan and especially the Republic of Korea, the gains associated with ASEAN+3 and ASEAN+6 are orders of magnitude larger when capital accumulation effects are taken into account. For India too, the small welfare loss estimated for ASEAN+6 in the medium run is converted into a substantial gain (\$8 billion, or 0.8 per cent of GDP) in the long run.

In sum, once potential dynamic effects of trade reform are taken into account, the expansion of ASEAN to ASEAN+3 and ASEAN+6 could be expected to generate welfare gains that are much more substantial, in particular for China, the Republic of Korea and some of the members of ASEAN. Consideration of dynamic gains also converts several countries that in the initial set of simulations appeared to be “losers” into “gainers”, most notably India.

The results of the final set of experiments on ASEAN expansion introduce another potential channel for gains from trade reform, through trade facilitation. Of course, trade facilitation is a general term, and is not explicitly modelled within GTAP or any other CGE model of its class. So, it is necessary to try to get an idea of the economic significance of trade facilitation through other mechanisms. One approach might be to try to implement tariff equivalents. The alternative, which has been adopted here, is to modify the productivity of transportation technology. GTAP enables the productivity of the transportation activity to be altered at the bilateral level.¹¹ Hence, improvements in trade facilitation can be simulated through improvements in transportation productivity between the liberalizing economies, i.e. by lowering the cost of moving goods from one country to another.

Unfortunately, good data are not available on exactly how large an effect that trade facilitation measures might have on transportation productivity, so these simulations are inherently speculative. As described in the previous section, two approaches have been used. In the first, a simple shock has been chosen, a 10 per cent improvement in the productivity of transportation at the bilateral level (in both directions). This is roughly the level that matches aggregate changes in trade flows between 2004 and 2010, after accounting for other changes at the macroeconomic level. Hence, it is a reasonable benchmark. Although the results should be interpreted cautiously, they do, at the least, help in understanding the relative magnitude of the benefits associated with facilitating trade through improving the productivity of transportation vis-à-vis tariff reductions.¹²

The results of the analysis (with a long-run closure), which are presented in the last four columns of table 3, are quite striking. Although the trade facilitation shock is small, the effect on economic welfare under each of the scenarios is quite

¹¹ In principle, it is also possible to modify transportation technology by mode of transport. Future work might usefully consider how differences in the mode of transportation across regions affect the results.

¹² Another caveat is that achieving productivity gains is not generally costless, so the gains are different from those associated with tariff reform. While some trade facilitation measures may be relatively inexpensive (e.g. reducing paperwork requirements), others, such as improving road infrastructure, obviously are not. One way of interpreting the marginal welfare effect is representing only the benefit side of the calculation, which must be compared with external estimates of cost.

large. The results should be compared with the long-run results, since they include the same dynamic gain mechanism. The inclusion of the productivity improvement doubles the total gain to ASEAN members from ASEAN+3 and ensures that all members of ASEAN benefit from the agreement in absolute terms. The most substantial beneficiaries of trade facilitation, relative to the simulations without trade facilitation, are Indonesia, Malaysia, Singapore and Thailand. Moreover, while the benefits to Japan and the Republic of Korea under ASEAN+3 do not change substantially, the gain to China is increased fourfold. A similar pattern holds with the extension to ASEAN+6, larger and broader gains, with especially large (positive) welfare effects for China, Malaysia and Singapore.

Taking into account the variation in trade costs (assumption 2, again with a long-run closure) generates welfare effects that are considerably larger for most economies, as presented in the last two columns of table 3. The alternative assumption also tends to lower, though not eliminate, losses to non-members through enabling them to take advantage of trade facilitation. Welfare results also tend to be larger for developing economies than before, with less difference for developed economies. This is what would be expected with adoption of best practices, since the developed economies tend to be those with lower trade costs.

In summary, while not too much emphasis should be placed on the numbers themselves, since they are speculative, the results do clearly indicate that even modestly effective trade facilitation measures could make a dramatic difference to the total economic benefits associated with ASEAN+3 and ASEAN+6, and could also go a long way to ensuring gains by a broader regional spectrum of participants.

It is useful to consider more deeply exactly why the gain from relatively small productivity changes can be so large relative to the gains from trade reform. Clearly, there is the direct gain from the productivity improvement itself. Since this is a rectangle not a triangle, the direct welfare effect of a productivity increase can be large relative to the typical efficiency gains from tax removal. However, there are two other major general equilibrium effects at work here. First, the trade facilitation measures tend to encourage greater intraregional trade. This tends to result in a shift in the terms of trade in favour of the liberalizing region. Second, these two effects increase income (on average), some portion of which is invested, resulting in larger capital accumulation gains in the steady state closure. The total effect of the trade facilitation scenarios must reflect the cumulative impact of all three mechanisms.

The relative importance of each component can be formally examined by using the welfare decomposition routines in GTAP. In table 4, the results of the ASEAN+6 scenarios with the two trade facilitation assumptions have been presented as differences in EV relative to the long-run scenario without any changes to

Table 4. Decomposing the effect of trade facilitation in ASEAN+6 expansion scenarios

Country or area	Trade facilitation assumption 1			Trade facilitation assumption 2		
	Total	Productivity	TOT ^a	Total	Productivity	TOT ^a
Cambodia	25.7	17.2	1.0	94.8	36.2	7.7
Indonesia	581.6	119.1	282.6	1 779.5	508.0	405.1
Lao People's Democratic Republic	10.1	6.3	1.0	31.9	14.4	5.0
Malaysia	533.3	151.0	233.0	1 223.1	443.9	228.2
Philippines	122.0	52.8	28.0	619.0	251.9	42.5
Singapore	471.3	153.6	53.7	1 653.9	810.2	-98.4
Thailand	534.6	81.9	247.4	1 554.2	467.4	275.8
Viet Nam	243.0	64.4	99.8	731.0	285.2	74.9
Total ASEAN	2 521.5	646.3	946.6	7 687.5	2 817.2	940.9
Australia	805.0	314.6	227.8	1 294.7	502.5	346.4
China	3 170.2	1 738.8	-159.4	9 309.8	3 234.7	898.7
India	438.9	291.7	-79.9	2 347.6	869.8	183.1
Japan	2 180.2	1 176.2	-15.6	3 457.0	1 738.9	86.0
New Zealand	196.8	72.3	41.7	289.2	99.7	77.8
Republic of Korea	1 797.0	629.7	62.7	1 210.8	620.6	-113.7
Total (Rest of ESCAP)	-289.5	0.0	-94.6	475.9	0.0	192.2
Total (Rest of world)	-2 502.5	0.0	-946.9	6 174.3	0.0	2 610.7

Note: ^a TOT stands for terms of trade effect.

transportation productivity. The change has been broken down into components representing the direct effect of the productivity shock, the indirect effect on the terms of trade and the indirect effect on capital accumulation (the remainder represents various effects, mostly indirect changes in allocative efficiency). In considering the simple 10 per cent productivity shock first, for the ASEAN economies just over a quarter of the welfare difference can be attributed to the direct effect, with nearly 40 per cent coming from terms of trade movements and nearly 30 per cent from capital accumulation. For the other members, the direct effect is larger but still only explains about 40 per cent of the difference, with the majority of the remainder explained by increased capital accumulation. For the second scenario, approximately 40 per cent of the difference is the direct effect, 40 per cent from accumulation, and roughly 10 per cent from terms of trade, for both ASEAN and other members, on average. The larger productivity effect reflects the larger average productivity shock, while the smaller terms of trade effect reflects the assumption that the shock applies to all members' trade and not only intramember trade, and therefore results in less of a movement towards intraregional trade.

Compared with existing studies of ASEAN+3 and ASEAN+6, such as the Comprehensive Economic Partnership for East Asia (CEPEA, 2008) report, the welfare results in the present study are generally somewhat smaller than what has been estimated in the past, although those for scenarios that include trade facilitation are quite close and all are well within norms for CGE analysis. The main difference between this study and earlier work is the updated tariff data. CEPEA (2008), for example, is based on GTAP6 and does not make any adjustments to the tariffs. Hence the tariffs used are at the 2001 level. As shown in table 2, these tariffs are much higher than those in 2004 for a number of economies, notably China and India. They are also substantially higher than those applying in 2010 for almost all of the economies. Since the efficiency cost of any price intervention is (to a first order approximation) proportional to the square of the intervention, the gains from removing the 2010 tariffs would be expected to be lower than those from removing the 2001 tariffs. This just reflects the fact that a number of the economies in the region have already captured some of the gains indicated in the earlier studies, through trade liberalization over the last decade.

Deepening and consolidating

The next group of simulations addresses interesting questions. What are the benefits of deepening existing agreements in the region by improving the degree of trade reform among the members? How do they compare with the benefits of encouraging existing agreements to consolidate into broader groupings? There are

now a very large number of agreements in the ESCAP region, making the questions highly relevant.

To shed some light on the issue a scenario is first considered in which a subset of existing regional trading groups complete merchandise trade liberalization among themselves (i.e. lower bilateral tariffs on merchandise trade to zero).¹³ Next the case is considered where the “within group” tariffs are lowered, but the same groups also lower tariffs between themselves, resulting in a single large FTA. In constructing the exercise only a small sample of the agreements is considered to keep the analysis manageable. These are PACER Plus, SAFTA, ASEAN and ECOTA.¹⁴ As with the ASEAN scenarios covered in the previous section, the simulations were undertaken with a medium-run closure, a long-run closure and with two alternative adjustments to transportation technology, but for the sake of economy only the long-run results and the results of one of the trade facilitation scenarios are presented. The results are shown in table 5.

A number of interesting patterns emerge. First, even the long-run benefits of completing all of these agreements (the first column in table 5) are estimated to be quite modest in absolute terms, although the gains are relatively large for some of the smaller economies countries when considered as a proportion of GDP (0.6 per cent and 1.9 per cent for Kyrgyzstan and Azerbaijan, respectively, after removing remaining tariff barriers among the members of ECOTA, 0.6 per cent for Viet Nam and 1.4 per cent for Cambodia after removing remaining tariff barriers among the members of ASEAN, and 0.6 per cent for Sri Lanka after removing remaining tariff barriers among the members of SAFTA).¹⁵ The gains seem to be fairly broad-based, with most member economies of the groups considered to be benefiting from completing intraregional trade reform within their various groups.

What is most interesting, however, is that the effects are dwarfed by those associated with consolidation, as presented in the second column of table 5. In the case of PACER Plus, the gains are many orders of magnitude higher and, although they are dominated by Australia in absolute terms, the Pacific island countries and territories are by far the largest beneficiary relative to GDP (0.8 per cent). The total gains to the ASEAN economies are increased threefold, driven by improvements in economic efficiency in Indonesia and Malaysia. The gains to the economies

¹³ For more detailed scenarios of reform in SAFTA, see Gilbert and Oladi (2010).

¹⁴ For the regional groupings within each FTA, see table 5. It should be noted that Pakistan is in both SAFTA and ECOTA.

¹⁵ As expected, the effects are even smaller in the medium-run scenarios. Consistent with the results of the ASEAN+6 simulations, a medium-run loss in the scenarios for India is reversed once dynamic gains are taken into account.

Table 5. Welfare impacts of free trade agreement completion/consolidation*(Millions of United States dollars, EV)*

Country or area	Long run		Long run with trade facilitation	
	Completion	Consolidation	Completion	Consolidation
Australia	55.6	2 120.6	1 379.2	3 452.3
New Zealand	126.9	293.4	420.0	590.8
Pacific islands	12.9	210.6	333.2	533.5
Total PACER Plus	195.4	2 624.6	2 132.4	4 576.6
Cambodia	97.3	94.0	199.2	195.5
Indonesia	295.4	725.7	2 147.5	2 603.1
Lao People's Democratic Republic	10.0	7.2	43.1	40.1
Malaysia	488.7	3 542.8	1 780.9	4 864.8
Philippines	331.2	511.3	990.1	1 161.2
Singapore	661.5	1 354.9	2 509.6	3 218.2
Thailand	641.4	1 981.4	2 359.0	3 734.5
Viet Nam	368.7	534.2	1 235.5	1 404.1
Total ASEAN	2 894.1	8 751.5	11 265.0	17 221.3
Bangladesh	-51.3	202.3	315.0	575.6
India	1 110.4	12 609.9	3 324.4	15 012.3
Pakistan	384.6	133.9	943.3	688.0
Sri Lanka	177.4	558.2	514.8	891.3
Rest of South Asia	-92.4	-160.5	113.0	112.2
Total SAFTA	1 528.7	13 343.9	5 210.5	17 279.4
Kazakhstan	59.3	47.7	300.1	290.8
Kyrgyzstan	16.1	19.5	65.3	68.9
Rest of Central Asia	87.9	98.2	244.9	256.7
Azerbaijan	323.8	300.4	663.7	639.6
Iran (Islamic Republic of)	145.2	2 253.9	2 641.6	4 979.8
Turkey	1 436.9	2 248.4	3 119.4	3 924.3
Total ECOTA	2 453.9	5 101.8	7 978.2	10 848.1

Note: Pacific islands refers to all countries in Oceania except Australia and New Zealand. Acronyms: PACER Plus refers to the Pacific Agreement on Closer Economic Relations; ASEAN, the Association of Southeast Asian Nations; SAFTA, the South Asian Free Trade Area; and ECOTA, the Economic Cooperation Organization Trade Agreement.

comprising ECOTA are less dramatic, but still more than double those available from deepening trade liberalization within the region alone. For SAFTA the total gains from deepening and consolidating are nearly nine times larger. The gains are, perhaps not surprisingly, dominated by India in absolute terms, but the principal winner in the SAFTA economies is Sri Lanka, with a gain of roughly 1.9 per cent of GDP in the long-run consolidation scenario.

Again, the gains are also relatively broad-based in the sense that there are few regions that are estimated to be worse off in the long run from either deepening integration or deepening and consolidating. The lesson seems to be quite clear: the long-run benefits of both deepening and consolidating existing trade agreements in the ESCAP region are substantial, but consolidating is much more important than deepening. Of course, this is pretty much what economic theory would lead one to predict, but the simulations afford a striking insight into just how much more important consolidation is relative to deepening.¹⁶

A result worth highlighting is that Pakistan is predicted to be better off under the deepening scenario than under the consolidation scenario, in contrast to the general pattern.¹⁷ This reflects what is sometimes called the “preference erosion” effect, that is to say, Pakistan is a member of both SAFTA and ECOTA. Hence, in the deepening scenario, Pakistan is liberalizing with respect to both of these groups and gains preferential access to the markets of ECOTA relative to the other economies in SAFTA. When shifting to the consolidating scenario, this preferential access disappears, as the other members of SAFTA (and indeed the other groups) gain access to the ECOTA market. Since the initial access preference was trade diverting, the total welfare gain to the members of ECOTA rises, but the gain to Pakistan falls. This hypothesis can be verified by checking the welfare decomposition; it is found that there is indeed an improvement in the terms of trade for Pakistan in the deepening scenario, which disappears in the consolidating scenario, which is exactly what the preference erosion hypothesis would predict.

Table 5 (columns 3 and 4) also presents the long-run results with the second adjustment to transportation productivity that had been discussed in section II. Since

¹⁶ It might be argued that the comparison used here is somewhat unfair in that the consolidation scenario includes “within reform”, so that the marginal benefit, i.e. the benefit of consolidating alone, is really the difference between the two sets of results. Making this adjustment does not change the broad conclusion – the total estimated benefits to ASEAN members from consolidation alone are still more than double those to be obtained from deepening; for SAFTA, they are nearly 8 times as large and for PACER Plus more than 12 times as large. Only in the case of ECOTA are the benefits of deepening roughly similar to those of consolidating.

¹⁷ This result holds in the medium-run simulations also.

the mechanisms involved were discussed under the ASEAN scenarios, it is simply noted here that, as in the previous simulations for ASEAN+3 and ASEAN+6, the results clearly indicate that trade facilitation measures can make a dramatic difference to the economic total benefits associated with trade liberalization and can help to ensure gains by a broad regional spectrum of participants in trade reform.

Region-wide and multilateral reform

The final group of simulations involve a complete FTA consisting of all ESCAP member economies and a complete multilateral trade liberalization benchmark. Since the former can be interpreted as the effect of an "APTA II", for comparison purposes, the effect of completing liberalization among the current members of APTA¹⁸ is also considered. The purpose of the simulations is not necessarily to suggest that they are a likely outcome, in particular given the current difficulties with multilateral trade negotiations, but rather to provide a deeper understanding of the degree to which the regional configurations that we have explored are capturing available gains. The long run results with and without a trade facilitation adjustment are presented in table 6.

First, the implications of completing APTA should be considered. In the medium run, it was found that most of the gains accrued to the Republic of Korea and that these were dominated improvements in the terms of trade, driven by the manufacturing sector. The Republic of Korea was followed by China, with smaller gains and/or losses experience by other members. The losses were reduced or eliminated for most economies in the long run (column 1), but gains remained dominated by the Republic of Korea. Completion of APTA was also considered by Gilbert and Wahl (2002). While the regional pattern of results was similar, the magnitude of the gains was considerably larger in the earlier study. As with ASEAN+3 and ASEAN+6, however, the earlier study used much older data, so the difference largely reflects the effect of reductions in the pre-existing tariffs.¹⁹

The results are quite different when potential trade facilitation effects are accounted for, in particular under assumption 2 (adoption of best practices, column 4). While the gains for the Republic of Korea are still large, all members benefit, with substantial gains as a percentage of GDP for Sri Lanka (2.4 per cent) and the Lao People's Democratic Republic (1.2 per cent), and moderate gains for Bangladesh, China and India (0.7, 0.6, and 0.5 per cent, respectively). This outcome

¹⁸ Bangladesh, China, India, the Lao People's Democratic Republic, the Republic of Korea and Sri Lanka. Mongolia is currently in the accession process, so it is not included in the simulation as it is not identified within GTAP7.1.

¹⁹ Gilbert and Wahl (2002) used GTAP4 data, with a base year of 1995.

**Table 6. Long-run welfare impact of ESCAP free trade agreements/
multilateral benchmark***(Millions of United States dollars, EV)*

Country or area	Long run			Long run with trade facilitation		
	APTA	APTA II	Global	APTA	APTA II	Global
Australia	-235.9	5 461.1	4 176.3	90.1	6 696.3	5 370.2
New Zealand	-50.5	658.8	1 081.8	-26.0	923.9	1 323.1
Pacific islands	-7.6	213.7	69.5	41.5	526.2	381.2
China	-997.5	7 487.1	28 358.6	9 721.8	15 901.3	36 234.8
Hong Kong, China	-303.5	160.1	1 588.8	-77.5	1 219.3	2 603.2
Japan	-680.1	19 367.7	25 940.8	-666.8	22 383.7	28 384.7
Republic of Korea	16 443.8	31 553.5	40 917.3	18 273.4	32 432.8	41 464.7
Rest of East Asia	-557.2	13 181.6	17 704.7	490.3	10 697.3	13 134.8
Cambodia	-2.4	153.4	299.2	2.4	246.0	391.0
Indonesia	-99.3	447.6	2 759.3	146.3	2 202.3	4 481.0
Lao People's Democratic Republic	-5.4	8.2	-9.0	28.9	40.0	22.5
Malaysia	-167.7	5 209.0	5 983.5	106.5	6 420.5	7 206.1
Philippines	12.5	430.2	1 062.0	48.4	1 018.6	1 631.6
Singapore	-222.6	417.9	557.4	43.8	1 882.8	1 798.2
Thailand	-302.8	2 959.9	5 383.1	-243.6	4 460.0	6 824.3
Viet Nam	-127.5	1 604.3	3 731.1	-51.3	2 336.8	4 484.4
Rest of South-East Asia	6.7	119.4	406.1	57.7	318.6	618.1
Bangladesh	8.4	319.0	614.2	399.1	670.2	946.9
India	334.7	11 012.2	23 705.0	2 915.6	13 104.2	25 623.7
Pakistan	-131.4	-1 337.2	-393.8	-106.3	-808.3	99.1
Sri Lanka	151.0	490.7	623.7	504.1	799.6	932.2
Rest of South Asia	-50.2	-204.8	-255.9	-7.1	-40.6	-97.4
Kazakhstan	-2.9	222.4	1 146.9	30.6	458.2	1 381.4
Kyrgyzstan	-3.3	44.4	-14.3	8.7	89.9	29.8
Russian Federation	160.0	2 459.3	11 565.6	247.7	4 712.6	13 752.6
Rest of Central Asia	7.0	193.2	466.4	29.0	348.4	626.8
Armenia	-0.4	22.5	14.7	-2.7	42.8	32.8
Azerbaijan	6.6	163.9	42.7	18.6	479.1	329.3
Georgia	1.0	3.8	196.6	-1.2	42.3	238.1
Iran (Islamic Republic of)	29.7	4 485.4	8 643.2	568.5	7 124.1	11 430.9

Table 6. (continued)

Country or area	Long run			Long run with trade facilitation		
	APTA	APTA II	Global	APTA	APTA II	Global
Turkey	-150.1	2 080.4	2 769.4	-223.2	3 504.8	4 086.1
United States	-1 003.8	-4 403.7	-9 003.0	-834.2	-3 940.3	-7 168.7
EU-27	-1 116.2	-9 461.6	36 335.1	-2 774.3	-12 561.2	36 535.5
Rest of world	984.0	3 629.6	89 866.2	2 030.5	8 328.9	102 590.3
Total (ESCAP region)	13 593.7	102 894.7	180 602.3	31 910.3	129 982.3	203 529.7
Total (World)	11 927.2	99 152.8	306 333.3	30 789.1	132 061.2	347 723.4

Note: Pacific islands refers to all countries in Oceania except Australia and New Zealand. EU-27 refers to the 27 current members of the European Union.

suggests that trade facilitation measures should be a major component of APTA for the purpose of increasing the total benefits and evening out their distribution.

The implications of a more comprehensive ESCAP-wide FTA should now be considered. In the medium run, it was found that total static gains for ESCAP members from such an agreement are about \$25 billion. However, the gains were very unevenly distributed. All of the member economies of SAFTA were estimated to lose under the scenario, as would many of the smaller economies of ASEAN (Cambodia, the Lao People's Democratic Republic and the Philippines) and, importantly, China. The gains were concentrated in the larger economies of East Asia, most notably the Republic of Korea, and of South-East Asia (Indonesia and Malaysia). As in previous simulations, however, the picture changes significantly in the long run (column 2). The overall static gains are much larger at approximately \$100 billion, and are also much more evenly distributed. While the Republic of Korea continues to do well under this scenario, the estimated gains for all ESCAP members except Pakistan are positive, and exceed 1 per cent of GDP for Azerbaijan, Cambodia, India, the Islamic Republic of Iran, Kyrgyzstan, Malaysia, Sri Lanka, Thailand and Viet Nam. Adding the trade facilitation changes to the scenario increases the estimated gains still further (column 5).

In comparing the results to the results of the scenarios so far, two important points emerge. First, the total welfare gains associated with an ESCAP-wide agreement are substantially larger than those associated with any of the other scenarios that have been considered. Perhaps the best comparison point is ASEAN+6, which also involves a large number of ESCAP members. The total gains for ESCAP members in ASEAN+6 in the long run are approximately two thirds of the size of the ESCAP-wide agreement. In the next broadest coverage, the consolidation

scenario involving ASEAN, ECOTA and SAFTA, the long run gains are approximately one quarter of the size of the gains associated with the ESCAP-wide FTA. Thus, these scenarios leave a lot of economic welfare on the table relative to a broader agreement.²⁰ Perhaps as importantly, they also create a number of losers. The ESCAP members that are not included in these agreements are, as a general matter, estimated to suffer welfare losses as a consequence of an agreement between only a subset of ESCAP economies. This is exactly what theory would lead one to expect, countries which are excluded from FTAs tend to be hurt.

The multilateral benchmark scenario gives an indication of how much of the total available gains from trade liberalization can be achieved through regional trade reforms. As has been seen, the largest gains for the ESCAP region are under an ESCAP-wide FTA in the long run. The total gains available are approximately half those available through complete multilateral trade reform (column 3). Moreover, for a number of ESCAP economies, the benefits of multilateral trade reform are substantially larger than those associated with preferential reform, even on a grand scale as with APTA II (see, for example, China, India, Indonesia, the Republic of Korea, the Russian Federation, Thailand and Viet Nam). Moreover, the gains within the ESCAP region appear to be quite broad-based under multilateral reform. Perhaps the policy implication is not that multilateral trade reform should be pursued at the expense of regional trade reform – that ship appears to have already sailed – but rather that for many of the ESCAP economies extraregional trade remains vitally important. Hence, concurrently with intraregional trade negotiations, it makes sense to continue with extraregional trade negotiations, in particular with the United States and the European Union (e.g. ASEAN-European Union, Republic of Korea-European Union, Republic of Korea-United States and more recently the Trans-Pacific Partnership).

Regional trade reform and international trade flows

While the discussion has been concentrated on overall economic welfare effects of trade reforms, one of the great advantages of CGE methods is that they can generate insights into the economic effect of policy changes on the entire economic system. In tables 7 and 8, data have been presented on the estimated percentage changes in the total value of exports under the various scenarios considered in this paper. Table 7 contains the results under a long-run closure, with no adjustment for possible trade facilitation effects, while in table 8 the results have been presented with the second trade facilitation assumption.

²⁰ Of course, the difficulty of implementing an FTA on this scale should not be underestimated.

Table 7. Long-run change in the value of total exports*(Percentage change)*

Country or area	ASEAN+3	ASEAN+6	Completion	Consolidation	APTA	APTA II	Global
Australia	-0.4	5.0	0.0	1.7	5.2	4.8	-0.2
New Zealand	-0.3	2.1	0.5	1.3	2.8	4.3	-0.2
Pacific islands	-0.2	-0.5	2.8	4.5	5.2	5.4	0.0
China	3.3	3.8	-0.1	-0.2	5.6	9.8	1.7
Hong Kong, China	-0.8	-0.8	-0.1	0.0	0.0	0.9	-0.3
Japan	3.1	3.7	-0.1	-0.1	4.7	6.5	-0.2
Republic of Korea	8.3	8.9	-0.1	-0.1	10.2	14.4	5.7
Rest of East Asia	-0.3	-0.5	0.0	-0.1	2.0	6.3	-0.2
Cambodia	4.9	4.5	6.3	6.4	9.7	13.1	-0.1
Indonesia	0.9	2.3	0.4	3.0	3.9	6.1	-0.2
Lao People's Democratic Republic	20.2	20.1	21.6	21.5	20.9	19.4	2.4
Malaysia	0.7	1.6	0.7	3.1	5.2	6.4	-0.2
Philippines	0.9	0.8	1.5	2.1	4.3	6.0	0.0
Singapore	0.5	0.4	0.6	1.2	0.1	-0.7	-0.3
Thailand	1.8	1.7	1.6	3.3	7.7	11.7	-0.3
Viet Nam	2.1	1.9	2.0	2.5	13.3	24.1	-0.3
Rest of South-East Asia	-0.2	-0.4	0.0	-0.1	1.8	5.7	-0.1
Bangladesh	-0.3	-0.4	8.9	17.7	28.5	29.5	19.9
India	-0.3	14.3	1.5	15.0	18.4	31.3	4.1
Pakistan	-0.6	-1.2	2.6	7.8	13.2	20.3	-0.4
Sri Lanka	-0.2	-0.5	3.6	8.2	8.1	11.5	3.8
Rest of South Asia	-0.2	-2.3	15.2	16.2	16.6	16.2	-1.0
Russian Federation	-0.1	-0.1	0.0	-0.2	1.5	4.6	0.0
Kazakhstan	-0.2	-0.1	0.4	0.4	1.2	3.8	-0.1
Kyrgyzstan	-0.2	-0.1	1.0	1.7	4.5	2.8	-0.1
Rest of Central Asia	0.0	0.0	1.5	1.6	2.0	3.6	0.0
Armenia	-0.1	-0.2	-0.1	-0.2	2.3	7.9	0.0
Azerbaijan	0.0	-0.1	7.6	7.7	5.3	5.2	0.0
Georgia	-0.2	-0.2	0.0	-0.1	0.3	8.4	0.0
Iran (Islamic Republic of)	0.0	0.0	1.8	5.9	9.4	16.3	0.0
Turkey	-0.2	-0.3	1.4	3.0	3.6	5.7	-0.1
United States	-0.3	-0.4	0.0	0.0	-0.7	2.6	-0.1
EU-27	-0.2	-0.2	0.0	-0.1	-0.5	1.5	-0.1
Rest of world	-0.2	-0.3	0.0	-0.2	-0.8	8.5	-0.1

Note: Pacific islands refers to all countries in Oceania except Australia and New Zealand. EU-27 refers to the 27 current members of the European Union.

Table 8. Long-run change in the value of total exports with trade facilitation*(Percentage change)*

Country or area	ASEAN+3	ASEAN+6	Completion	Consolidation	APTA	APTA II	Global
Australia	-0.3	5.6	0.7	2.3	5.7	5.2	-0.1
New Zealand	-0.3	2.7	1.1	1.8	3.2	4.7	-0.2
Pacific islands	0.0	-0.3	3.8	5.7	6.2	6.4	0.0
China	4.2	4.7	0.0	-0.2	6.4	10.6	2.7
Hong Kong, China	-0.6	-0.7	-0.1	-0.1	0.4	1.3	-0.2
Japan	3.6	4.1	-0.1	-0.1	5.1	6.8	-0.2
Republic of Korea	8.6	9.2	-0.1	-0.1	10.5	14.7	6.1
Rest of East Asia	0.0	-0.1	0.0	0.0	3.3	7.6	0.0
Cambodia	6.9	6.4	8.4	8.5	11.6	14.8	-0.2
Indonesia	2.4	3.9	2.0	4.6	5.4	7.6	0.0
Lao People's Democratic Republic	22.1	21.9	23.6	23.4	22.7	21.2	4.1
Malaysia	1.6	2.5	1.6	4.0	6.1	7.3	0.0
Philippines	1.6	1.5	2.3	2.9	5.0	6.6	0.0
Singapore	2.2	2.0	2.4	2.9	1.6	0.7	0.0
Thailand	3.2	3.0	3.1	4.9	9.0	13.0	-0.3
Viet Nam	3.7	3.4	3.8	4.3	14.9	25.8	-0.3
Rest of South-East Asia	0.7	0.7	0.7	0.6	3.4	7.4	0.3
Bangladesh	-0.1	-0.2	10.8	19.9	30.7	31.7	22.3
India	-0.3	15.5	2.5	16.3	19.6	32.4	5.2
Pakistan	-0.6	-1.2	3.9	9.2	14.6	21.7	-0.5
Sri Lanka	-0.1	-0.3	5.2	10.0	9.6	13.1	5.5
Rest of South Asia	-0.3	-2.2	16.5	17.7	17.9	17.5	-0.8
Kazakhstan	-0.1	-0.1	1.0	1.0	1.7	4.3	-0.1
Kyrgyzstan	-0.1	-0.1	2.5	3.1	5.8	4.1	0.0
Russian Federation	-0.1	-0.2	0.0	-0.2	2.1	5.1	-0.1
Rest of Central Asia	0.0	0.0	2.3	2.5	2.7	4.4	0.0
Armenia	-0.3	-0.5	-0.2	-0.3	3.0	8.5	-0.2
Azerbaijan	0.0	-0.1	10.9	11.0	8.2	7.7	0.0
Georgia	-0.3	-0.4	0.2	0.1	1.2	9.4	-0.1
Iran (Islamic Republic of)	0.2	0.6	3.8	8.3	11.6	18.9	0.4
Turkey	-0.3	-0.4	2.5	4.1	4.5	6.6	-0.2
United States	-0.3	-0.4	-0.1	-0.1	-0.7	2.8	-0.2
EU-27	-0.3	-0.4	-0.1	-0.1	-0.7	1.4	-0.2
Rest of world	-0.3	-0.4	-0.1	-0.2	-0.9	8.7	-0.2

Note: Pacific islands refers to all countries in Oceania except Australia and New Zealand. EU-27 refers to the 27 current members of the European Union.

In the ASEAN expansion scenarios, the simulations predict substantial growth in trade for the economies involved, with the strongest growth being for developing economy participants, including India (in ASEAN+6), the Republic of Korea and especially the Lao People's Democratic Republic. The strongest export growth for the latter continues through all the scenarios, except the multilateral benchmark. This suggests that the Lao People's Democratic Republic would be a particularly strong beneficiary of regional preferences in the preferential scenarios. On the other hand, it appears that export growth for some of the other smaller economies, such as Bangladesh, would be stronger under broader agreements.

As expected, trade facilitation measures increase the predicted changes in export values and, if applied to all trade, have a role to play in mitigating the potential for the trade diversion effects of regional trade policy reforms. In the ASEAN expansion scenarios, trade facilitation appears to be especially significant in terms of increasing international trade for the more developed members of the ASEAN (Indonesia, Malaysia, Singapore and Thailand), where tariffs are lower.

IV. CONCLUDING COMMENTS

The results of a number of CGE-based numerical simulation exercises have been presented in this paper. As with all CGE studies, the modelling cannot capture all of the possible economic effects that might matter. A limitation of the modelling in this paper is that perfectly competitive markets have been assumed throughout, as in most CGE studies. Studies that do incorporate imperfect competition tend to generate welfare estimates that are roughly double those of competitive models (see the surveys of Scollay and Gilbert, 2000; Gilbert and Wahl, 2002; Francois and Martin, 2010). Hence, the estimates presented here are probably conservative.²¹

Another reason that the model results are probably conservative is that only merchandise trade liberalization is considered. Many new regional trade agreements do contain provisions for liberalizing trade in services, although it is not always clear to what extent they are effective. The mechanisms for incorporating services trade

²¹ Recent developments in the pure theory of international trade are also aimed at explaining the extensive margin phenomenon by introducing firm heterogeneity. Zhai (2010) presented a CGE model based on the Melitz (2003) framework, and examined the relative importance of the intensive and extensive margins in trade expansion following trade liberalization and a reduction in fixed trade costs. Callendo and Parro (2010) generalized the Eaton and Kortum (2002) model by adding multiple sectors and countries, and incorporating trade in intermediate goods and the interaction across tradables and non-tradables. While these "new new" models tend to be used to predict greater changes in the volumes of trade, the welfare results tend to be similar to those of existing models (see Arkolakis, Costinot and Clare, 2012).

liberalization into CGE models are still unsettled. One possibility is to use tariff equivalents (e.g. Fontagne, Guillin and Mitaritonna, 2011). However, it is not clear that services trade barriers really affect trade in the same way as tariffs affect merchandise trade. Dee (2010), for example, argued that it is better to model the reform in terms of productivity enhancements. Her work on the Asia-Pacific Economic Cooperation (APEC) economies indicates productivity gains in the region of 2-14 per cent. Clearly, this approach is closely related to the trade facilitation question. As has been seen, even small productivity changes can have quite dramatic welfare effects. Hence, to the extent that it is possible to realistically assume that effective service trade liberalization will in fact be a part of the agreements, the results presented here again probably understate the potential benefits. This would be a useful area for future research.

Bearing these caveats in mind, the results generate some interesting policy insights. First, once potential dynamic effects of trade reform are taken into account, the expansion of ASEAN to ASEAN+3 and ASEAN+6 generates substantial welfare gains for China, the Republic of Korea and most of the members of ASEAN. Furthermore, even modest trade facilitation measures might be effective in expanding those gains. However, might be expected, ESCAP members that are not included in the agreements are, as a general matter, estimated to suffer welfare losses. Second, there are substantially larger gains (in most cases several orders of magnitude) in the long run from consolidation of existing trade agreements into larger groups relative to deepening the agreements only by removing internal tariffs. The gains are also relatively broad-based in the sense that there are few areas within the ESCAP region that are estimated to be worse off in the long run from either deepening integration or deepening and consolidating. Third, the total welfare gains associated with an ESCAP-wide agreement are substantially larger than those associated with any of the other scenarios except full multilateral reform. Hence, other regional trade reform scenarios, while perhaps generating important welfare gains, still leave a lot of potential gains on the table relative to a broader agreement. Fourth, for many of the ESCAP economies, though not all, the benefits of multilateral trade reform are substantially larger than those associated with preferential reform, even on an ESCAP-wide scale. Moreover, the gains within the ESCAP region appear to be quite broad-based under multilateral reform. This suggests that, for many of the ESCAP economies, extraregional trade remains vitally important, and concurrent with intraregional trade negotiations, it makes sense to continue with extraregional trade negotiations, in particular with the United States and the European Union. Fifth, these results generally apply also to the least developed economies in the region (Bangladesh, Cambodia and the Lao People's Democratic Republic). These countries would benefit from regional economic integration, in particular where coverage of the agreements is relatively broad. There are two caveats, however: the gains tend to be

much more substantive in the long run, suggesting that adjustment assistance may be helpful for this group. More importantly, trade facilitation seems to be particularly important for this group of economies, suggesting that investing in trade facilitation might be an especially effective means for reducing the vulnerability of this group of economies to external shocks.

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