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# Impacts of FTAs in East Asia: CGE Simulation Analysis

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# Impacts of FTAs in East Asia: CGE Simulation Analysis

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**Abstract**

In light of the recent movement toward regional integration through bilateral/plurilateral FTAs in East Asia, this paper attempts to estimate the impacts of several FTA scenarios in East Asia, using a CGE model. Although most previous simulation studies on the impacts of FTAs focus only on the liberalization of trade in goods, our paper attempts to consider other possible aspects of FTAs such as various trade and investment facilitation and technical assistance to developing countries in the region. Our results suggest that the economic effects of FTAs with a larger number of members are likely to be greater. Moreover, for the establishment of FTAs among countries such as ASEAN+3, ASEAN+6, and APEC, a high quality of trade liberalization including the agricultural sector is essential. Furthermore, it is vital for an agreement to be comprehensive, covering not only intraregional trade liberalization but also other elements such as facilitation measures and technical assistance. The larger the coverage, in terms of membership and contents, the greater the benefits accrued to the members.

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## 1. Introduction

In recent years, efforts to conclude free trade agreements (FTAs) and economic partnership agreements (EPAs) have been gathering momentum in East Asia. Table 1 presents the status of FTA networking in extended East Asia (ASEAN+6) as of March 2009.[1][2] It reveals two interesting insights. First, while the movement toward regional integration through bilateral/plurilateral trade agreements in East Asia was lagging behind the rest of the world until recently, countries in the region have started to rapidly accelerate such a movement since the 2000s, particularly the latter half of the 2000s. FTAs signed before, or in the 1990s, consist of only the two in extended East Asia: the Australia New Zealand Closer Economic Relations (CER) Trade Agreement and the Association of Southeast Asian Nations (ASEAN) Free Trade Area (AFTA). Moreover, in the case of AFTA, the utilization of preferential tariffs or Common Effective Preferential Tariffs (CEPT) has been expanding explosively of late, as in the case of Thailand shown in Figure A.1 of the Appendix; preferential tariffs were not significantly utilized in the 1990s, even after the enforcement of AFTA in 1993. In the 2000s, however, particularly in the second half, many FTAs within the region have been signed, have been under negotiation, or have at least been subject to feasible study/preparatory talks. As a result, with the exception of the case between Japan and New Zealand (and the case between Japan and Korea where negotiations have been suspended), certain relations have been forged between ASEAN as a whole and one of the "plus six countries" or between two of the "plus six countries." This suggests how rapidly the FTA networking has extended even in East Asia recently.

== Table 1==

Second, FTA networking in the region has been developed with ASEAN as its hub in terms of both bilateral and plurilateral trade agreements.[3] As of March 2009, all

[1] For some FTAs, their status in Table 1 is based on the agreement of trade in goods; negotiations may be still ongoing over other areas such as investment and services even if the agreements are identified as those signed or in effect.

[2] The "plus three" members of ASEAN+3 are China, Japan, and Korea, and the "plus six" economies of ASEAN+6 are "plus three" countries, Australia, New Zealand, and India.

[3] Most plurilateral/bilateral agreements with ASEAN have in general introduced a system of rules of origin that permits to choose either regional value content (RVC) or common

"plus six countries" have signed or enforced FTAs/PTAs with ASEAN as a whole, namely ASEAN+1, except India, which has completed the corresponding negotiations. In addition to such plurilateral agreements, those "plus six countries", particularly Japan, Australia, and New Zealand, have simultaneously made efforts to form bilateral FTAs with ASEAN countries (see Table 2 for the case of Japan).[4]

== Table 2==

Besides bilateral/plurilateral agreements identified in Table 1, preliminary talks for an ASEAN+3 FTA (EAFTA: East Asia Free Trade Area) and an ASEAN+6 FTA (CEPEA: Comprehensive Economic Partnership in East Asia) have commenced, in addition to an FTA among Asia-Pacific Economic Cooperation (APEC) countries (FTAAP: Free Trade Area of the Asia-Pacific). Furthermore, ASEAN itself has attempted to strengthen the integration by signing the ASEAN Trade in Goods Agreement (ATIGA) in 2008/2009 and establishing ASEAN Economic Community (AEC) with a targeted year of 2015.

FTAs can have significant economic impacts on their member and non-member countries. In particular, the economic impacts are likely to be greater when FTAs/EPAs are more comprehensive, involving not only trade liberalization but also liberalization of trade in services and investment, trade facilitation measures such as simplified customs clearance and mutual recognition of standards, and technical assistance. Given the growing number of FTAs in East Asia, as discussed above, in particular those with wider coverage of contents, it is increasingly important to examine their impacts on economies.

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change in tariff classification (CTC). The stronger points of plurilateral agreement would be that (i) the cumulative rules of origin in calculating RVC can be applied when RVC is selected and (ii) the common CTC can be applied when CTC is chosen, which facilitate intra-regional trade. On the other hand, the stronger point of bilateral agreements would be the possibility to achieve higher degrees of liberalization in some sectors without enforcing consolidation at lower degrees of liberalization.

[4] Some preferential tariffs are lower in bilateral agreements than in plurilateral agreements, and others vice versa. It depends on the timing of enforcement (which influences the amount of tariff reduction for the phasing-out of tariffs) and the baseline tariffs for preferential tariffs. See JETRO (2009b) for the case of Japan and Malaysia.

This study employs a computable general equilibrium (CGE) model simulation analysis, the most widely utilized method to estimate the economic effects of FTAs and regional integration, to assess economic impacts of possible (hypothetical) FTAs in East Asia such as those among ASEAN+3 countries, ASEAN+6 countries, and APEC. In the analysis, the paper examines not only the effects of trade liberalization but also the effects of other contents, i.e., trade facilitation and technical assistance to developing countries.

The rest of the paper is organized as follows: Section 2 reviews previous studies on the impacts of FTAs in East Asia using CGE models. Section 3 attempts to capture the economic situation of the ASEAN+6 countries based on the database used in the analysis. This section also explains the methodology to analyze the economic effects of several scenarios of FTAs in East Asia using a CGE model. Section 4 discusses results of the analysis, followed by conclusion in Section 5.

## 2. Features of CGE Models and Recent Studies on FTAs in East Asia

As Table A.2 presents, many studies based on CGE models use variations of the GTAP (Global Trade Analysis Project) model.[5] A recent trend of CGE simulation studies, however, is to use original CGE models such as the MIRAGE model, the LINKAGE model, the GEMAT model, and the Michigan model in addition to the simple variations of the GTAP model (Table 3). For instance, the Michigan model, which is one of the other typical CGE models, assumes imperfect competition for non-agricultural sectors and perfect competition for agricultural sectors, while most CGE models assume perfect competition.

== Table 3 ==

Given a variety of FTA components in recent years, regardless of the models, analysts are now forced to face an enormous challenge for the incorporation of those components into the CGE models in order to analyze the impacts of FTAs with greater confidence. Let us briefly explain the features of CGE models and list some limitations for the analysis of the effects of FTAs other than those of the liberalization in goods

[5] As for the GTAP model, see Hertel (1997).

trade.[6][7]

In virtually all the CGE models, factors of production, labor and capital, are assumed to be mobile among sectors within a country but immobile across borders, though such an assumption of international immobility of factors is unrealistic in an age of globalization. Therefore, foreign direct investment (FDI) and foreign workers have not yet been satisfactorily incorporated into CGE models.[8] Moreover, most CGE models are static in the sense that no time dimension is explicitly considered. Although some models incorporate inter-temporal linkages, investment is determined, in most cases, not on the basis of inter-temporal optimization on the part of investors but in a static fashion from the optimizing behavior of the investor in the current period without considering the future.[9]

In addition, the liberalization of trade in services has not been analyzed in CGE model simulations mainly because of the lack of information on barriers to the services trade. One exception is the Michigan model, which adopts information on barriers to the services trade obtained from earlier studies to analyze the impacts of liberalization in the services trade.

Furthermore, trade facilitation has not been incorporated in many CGE models. Hertel, Walmsley, and Itakura (2001) provide an interesting attempt by using reduction in transportation costs as proxy to measure trade facilitation.

Although some limitations still remain as discussed above, CGE models are

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[6] The description of the features of CGE model is heavily drawn from Ando and Urata (2007).

[7] Trade liberalization through setting domestic prices equal to international prices is interpreted as removing tariff and non-tariff barriers such as import quotas. Although such treatment of import quotas is not satisfactory, because the mechanism of quantity restriction under the import quota system is not explicitly incorporated, it may be justified as a rough approximation.

[8] As for international capital movement, some models assume that capital moves freely among the sectors and countries so as to equalize the rate of return on capital globally. Such treatment of capital, however, is not relevant to the analysis of FDI, which is subject to sectoral specificity. As for international labor movement, some studies incorporate it into their models in a very ad hoc way, in which the number of workers moving internationally is assumed exogenously.

[9] One notable exception is the Asia-Pacific G-Cubed (APG-Cubed) model, in which investment is determined endogenously to maximize the welfare of the consumers over time. See Davis, McKibbin and Stoeckel (2000) and McKibbin, Lee, and Cheong (2004) for studies based on the APG-Cubed model.

considered as the best tool for analyzing the impacts of FTAs, and a number of analyses on the economic impacts of FTAs in East Asia have been conducted with a variety of groupings under different FTAs.[10] Some groupings represent actual and existing FTAs, while some represent hypothetical FTAs. Among the different groupings, those frequently chosen include AFTA, ASEAN+1 FTA, China+Japan+Korea, ASEAN+3 FTA, and ASEAN+6 FTA.

Prior work provides some general trends for the overall impacts of FTAs. First, FTA members gain in terms of welfare and GDP, while non-FTA members lose. Second, the larger the number of FTA members, the larger the gain from an FTA. At the same time, a comparison of previous studies reveals some different results in details as well. The differences are mainly due to the specification of the CGE model, because the data used in the analysis are more or less the same. They imply that CGE model simulations can produce different results depending on the specifications and assumptions made for the model, and therefore, the results of CGE simulation exercises should be carefully interpreted with special attention to the specifications and assumptions made for the model.

## 3. An Analysis of FTAs in East Asia

This section attempts to estimate the impacts of various FTAs in East Asia in undertaking simulation analysis based on the CGE model. As mentioned above, we employ the most pervasively used CGE model, i.e., the GTAP model. The database used in the paper is Version6 of the GTAP database that corresponds to the global economy in the year 2001. Therefore, compared to those in the previous studies using Version5 (data as of 1997) or earlier versions of the GTAP database, our estimates would reflect a more updated picture of the global economy as a benchmark. The GTAP Version6 database is composed of 87 regions and 57sectors.[11] In our analysis, 87 regions are aggregated into

[10] Some of the recent studies on FTAs in East Asia including Park (2006) and Zhai (2006) examine various scenarios with different hubs and spokes and compare them with scenarios of regional/global FTA. Another recent work by Sulamaa and Widgren (2005) also compares the Asian FTA scenario with the world FTA scenario.

[11] While the number of regions and sectors are 87 and 57 in the GTAP ver.6 database, the corresponding figures are 66 and 57 in the GTAP ver.5 database (with data for 1997). In addition, there are some modifications in the models; for instance, an elasticity of substitution between imported goods and domestic products are greater in the GTAP ver.6

18 regions (Table A.3 of the Appendix), and 57 sectors are aggregated into 16 sectors (Table A.4).

### 3.1 Economic and Trade Structure of ASEAN +6 in 2001

Table 4 presents basic economic data available from the GTAP database for 18 countries/regions. This table shows that income levels vary considerably among the 13 ASEAN+6 economies. Moreover, while the ASEAN+3 economies account for approximately 90 percent of ASEAN+6 in total in terms of GDP, exports, and imports, just two countries, China and India, make up 76 percent of the regional population.

== Table 4 ==

Table 5 represents the trade matrix among the ASEAN+6 economies (total = 100). Patterns of trade among ASEAN+6 countries in terms of exporters (importers) are as follows: the share is about 26 percent (26 percent) for Japan, 18 percent (20 percent) for China, 12 percent (11 percent) for Korea, 35 percent (34 percent) for the ASEAN countries, and nine percent (nine percent) for the sum of Australia, New Zealand, and India. Moreover, bilateral trade patterns demonstrate that trade among ASEAN+3 countries consists of 83 percent of trade among ASEAN+6 countries. Furthermore, trade among "plus three" countries only - China, Japan, and Korea - make up one-third of trade among ASEAN+6 countries. These facts suggest that patterns and degrees of trade liberalization among these three countries, in particular, could have significant impacts not only on their economies but also on other economies such as ASEAN countries.

== Table 5 ==

Table 6a shows import-weighted sectoral average tariff rates in ASEAN+6, which are calculated by using sectoral import values at domestic prices and world prices. As Table 6a shows, average tariffs for all sectors are particularly high in some countries such as India with a tariff rate of 25 percent, China at 12 percent, and Vietnam at 10 percent. At the sectoral level, clearly, the agriculture and food sector is protected by high

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database than in the GTAP ver.5 database.

tariffs for many countries. On the other hand, tariffs in manufacturing sectors on average are already less than six percent except 25 percent for India, 15 percent for Vietnam, 12 percent for China, and nine percent for Thailand and Other Southeast Asia. Some of the manufacturing sectors, however, have relatively high tariffs. A typical high sector tariff is the textile and apparel sector: tariffs are close to or over 10 percent in all ASEAN+6 countries except Singapore. The transport equipment sector is another high tariff sector; India with a tariff rate of 27 percent, China at 21 percent, all ASEAN countries other than Singapore with an average 15 percent tariff rate, and Australia with 13 percent. One would expect that there is considerable room for trade liberalization in these countries/sectors.

== Table 6 ==

Table 6b, on the other hand, provides bilateral import-weighted average tariffs in ASEAN+6. For instance, India's tariffs and China's tariffs imposed on imports from most other ASEAN+6 countries exceed 20 percent and 10 percent, respectively. In scenarios of full trade liberalization in all sectors, all tariffs in Table 6b are removed. More specifically, when trade is fully liberalized among China, Japan, and Korea with a significant amount of trade, tariffs are removed; for example Korea's 22 percent tariffs on imports from China, China's 14 percent tariffs on imports from Japan, China's 13 percent tariffs on imports from Korea, and so on.

**3.2 Experimental Design**

With the above-mentioned aggregation of countries/regions and sectors, the paper examines the impacts of the following (hypothetical) FTAs. To compare several types of East Asian FTA framework, our study basically focuses on ASEAN+3 FTA, ASEAN+6 FTA, and APEC. In addition to these, however, global trade liberalization is also examined as a reference. Furthermore, considering the fact that FTAs between ASEAN and one of the "plus six" countries have been concluded or are under negotiation, as discussed in Section 1, the study includes the following cases; that is, three ASEAN+1 FTAs and six ASEAN+1 FTAs ((ASEAN+1 FTA)x3 and (ASEAN+1 FTA)x6,) as well.

The reduction or elimination of trade barriers within the region is of course important in establishing FTAs in East Asia. Since intraregional trade has already grown

dramatically in East Asia, however, FTAs in the region are expected to be comprehensive; they cover not only trade liberalization but also other contents such as trade facilitation, including the simplification of customs clearance procedures and mutual recognition of standards, and technical assistance to developing countries. Therefore, our analysis attempts to investigate the impacts of trade facilitation as well as technical assistance to developing countries in the region, in addition to those of trade liberalization.

Trade liberalization in our analysis assumes the partial/complete elimination of import tariffs and export subsidies (taxes) for the countries involved in an FTA. Given the fact that World Trade Organization (WTO) negotiations over agricultural trade liberalization are at a standstill, this study attempts to discuss agriculture trade liberalization by examining not only scenarios of full trade liberalization in all sectors but also those of partial trade liberalization in the agriculture sector (i.e., full trade liberalization in the non-agriculture sector and 50%-trade liberalization in the agriculture sector) as well as those excluding the agriculture sector from trade liberalization (full trade liberalization only in non-agriculture sectors).[12]

Implementation of trade facilitation measures is formulated in our simulation as a positive “import-augmenting technical change" in the model. The technical improvement in importing products can lead to improved efficiency. If an FTA covers trade facilitation other than trade liberalization, such facilitation and coordination would contribute to improve efficiency in importing products and lower the market price of imported products. The technical improvement can also be interpreted as a reflection of reduced service link costs across borders. In East Asia, the international production/distribution networks, particularly in machinery industries, have been rapidly developing since the 1990s. When production processes are fragmented into several production blocks (PBs) and remotely located, the geographical distance requires service link costs connecting PBs such as transport cost, telecommunication cost, and various

[12] While WTO negotiations over agriculture trade liberalization have not made any progress, there have been cases in which market access in the agriculture sector has improved under FTAs/EPAs. In the case of Japan, agriculture trade liberalization has improved to some degree according to the conclusion of FTAs/EPAs. Note that Japanese FTAs/EPAs tend to maintain a complicated tariff structure as well as not a few number of commodities excluded from the liberalization list in the agricultural sector. For features of and problems in the tariff structure under Japanese FTAs/EPAs for major commodities of agricultural imports, see Ando and Kimura (2008).

coordination costs. If an FTA helps to lower these service link costs across borders among the member countries, there would be room for international production/distribution networks in the region to be more actively utilized.

Specifically, we investigate the effects of 10 percent change in this efficiency improvement as an exogenous change. Note that five percent change in the corresponding variable is applied to Singapore where importing efficiency is relatively high. Moreover, different rules of origin exist for each FTA in the case of (ASEAN+1 FTA)x3 and (ASEAN+1 FTA)x6 unlike the case of ASEAN+3 FTA and ASEAN+6 FTA with only one rules of origin. Considering decreased efficiency resulting from a lack of common rules of origin, the degree of efficiency improvement is reduced by half in the case of (ASEAN+1 FTA)x3 and (ASEAN+1 FTA)x6.

Technical assistance to developing countries is formulated in our simulation as an "output technical change". More specifically, we investigate the effects of one percent exogenous change in this output technical change. Developing countries are defined as China and ASEAN countries, except Singapore in the case of ASEAN+3 FTA, and China, India, and all ASEAN countries other than Singapore in the case of ASEAN+6 FTA.

The scenarios with a combination of trade liberalization, trade facilitation, and technical assistance are as follows:

*Sim1: Full trade liberalization in non-agriculture sectors*

*Sim2: Full trade liberalization in non-agriculture sectors and 50%-trade liberalization in the agriculture sector*

*Sim3: Full trade liberalization in all sectors*

*Sim4: Full trade liberalization and trade facilitation in all sectors*

*Sim5: Full trade liberalization, trade facilitation, and technical assistance in all sectors*

Based on the results of these simulations, we discuss the significance of several types of FTA framework in East Asia in the next section.

## 4. Results of the Simulation Analysis

Tables 7a-11a display the economic effects of three trade liberalization scenarios on real GDP, welfare, per capita welfare, real exports, and real imports. Tables

7b-11b in turn show the corresponding economic effects of FTA scenarios, including trade facilitation and technical assistance, in addition to trade liberalization. These provide five interesting insights. First, the economic effects of trade liberalization are likely to be greater for FTAs with a larger number of member countries. The ASEAN+6 FTA is beneficial not only to Australia, New Zealand, and India, who are non-members of an ASEAN+3 FTA, but also to the individual ASEAN+3 countries to a greater extent compared with the ASEAN+3 FTA. The APEC includes all ASEAN+6 countries as its members except India, together with other major economies such as NAFTA member countries. Thus, the impacts on GDP tend to be greater for most ASEAN+6 countries, compared with those of the ASEAN+6 FTA.

== Table 7 ==

== Table 8 ==

== Table 9 ==

== Table 10 ==

== Table 11 ==

Second, agricultural trade liberalization is important as well. Sim1 to Sim3 in Table 7a-11a present the results of three trade liberalization scenarios: full trade liberalization in non-agriculture sectors (Sim1), partial trade liberalization in the agriculture sector with full trade liberalization in non-agriculture sectors (Sim2), and full trade liberalization in all sectors including agriculture (Sim3). Regardless of GDP, economic welfare, or trade, positive economic effects are greater in partial liberalization of trade scenarios in the agricultural sector than in scenarios of exclusion of that sector from trade liberalization, and are the greatest in scenarios of trade liberalization in all sectors including agriculture for ASEAN, ASEAN+3, ASEAN+6, and APEC as a whole.

The effects on individual countries present a different picture to some extent in a few countries; the economic effects are greater in scenarios of partial trade liberalization than in scenarios of full trade liberalization in the agriculture sector. For a majority of the

countries, however, economic effects are greater in scenarios of partial liberalization of trade in the agricultural sector than in scenarios of exclusion of that sector from trade liberalization, and are the greatest in scenarios of trade liberalization in all sectors including agriculture. In China and India, in particular, economic welfare significantly deteriorates when the agricultural sector is excluded from trade liberalization. Welfare decomposition in this scenario demonstrates a negative effect on terms of trade for China and a negative effect on both terms of trade and resource allocation for India. This indicates that economic welfare significantly deteriorates in scenarios of trade liberalization only in non-agriculture sectors due to an intensified inefficiency in resource allocation due to the exclusion of the agriculture sector from trade liberalization in addition to the deteriorated terms of trade. All of these results suggest the importance of agriculture trade liberalization for the economies in the region.

Third, trade facilitation yields significant economic impacts on the member economies. Sim4 and Sim5 incorporate trade facilitation by formulating as a positive “import-augmenting technical change" (technical improvement) and assume its exogenous change by 10 percent (or five percent). Comparing their results with those of Sim3 containing only full trade liberalization, the magnitude of the economic impacts of scenarios, including trade facilitation, is apparently larger (Table 7b-11b).

Trade liberalization indeed yields a certain degree of positive economic effects as the results of Sim3 show. Developed countries, however, have already liberalized trade to a considerable degree except in a few sectors. Moreover, in developing countries in East Asia, implied tariffs (actually imposed tariffs) might be lower due to the introduction of duty-drawback systems mainly to machinery industries including the electronic machinery industry. Therefore, not only trade liberalization, but also trade facilitation is important particularly in East Asia. An efficiency improvement in imports indicates reduction of service-link costs connecting fragmented production blocks across borders. If cross-border service-link costs are reduced by various facilitation measures, international production/distribution networks in East Asia can be further developed, with potential extension to other countries such as India.

Fourth, technical assistance to developing countries also brings significant economic impacts. Sim5 formulates technical assistance to developing countries as an “output technical change” and assumes exogenous improvement in this productivity change by one percent. A comparison of the results of Sim4 with those of Sim5 in Tables

7b-11b demonstrates sizeable economic impacts on developing countries as recipients of that assistance. With a comprehensive FTA covering, not only trade liberalization but also other elements, such as facilitation measures and technical cooperation, is likely to have much greater impact than an FTA with just trade liberalization.

Fifth, economic impacts of ASEAN+3 FTA/ASEAN+6 are greater than those of (ASEAN+1 FTA)x3/(ASEAN+1 FTA)x6 if the FTA incorporates trade facilitation and/or technical assistance. This is true even for some ASEAN economies which experience the opposite results when the FTA covers only trade liberalization. In Sim3, with only trade liberalization, the impacts on both GDP and economic welfare are slightly greater in the cases of (ASEAN+1 FTA)x3/(ASEAN+1 FTA)x6 than in the cases of ASEAN+3 FTA/ASEAN+6 FTA for ASEAN as a whole. This would be due to trade diversion from ASEAN to China by trade liberalization among China, Japan, and Korea. As discussed in subsection 3.1, trade among China, Japan, and Korea accounts for a large portion of trade among ASEAN+6 countries, and tariffs are relatively high. Thus, whether or not trade among these three countries is liberalized seems to influence the economic effects on ASEAN.

In the case of (ASEAN+1 FTA)x3/(ASEAN+1 FTA)x6, different rules of origin exist for each FTA unlike ASEAN+3 FTA/ASEAN+6 FTA which has common rules of origin. As indicated by Sim4, which takes into account inefficiency due to lack of common rules of origin, the ASEAN+3 FTA/ASEAN+6 FTA covering trade facilitation in addition to trade liberalization is more beneficial for all ASEAN economies than (ASEAN+1 FTA)x3/(ASEAN+1 FTA)x6 is. Moreover, if the ASEAN+3/ASEAN+6 FTA also cover technical assistance, the incentive for ASEAN countries to form that FTA would become larger, rather than concluding multiple ASEAN+1 FTAs. The relevance of the ASEAN+6 FTA and the incentive for each ASEAN+6 country to form that agreement heavily depend on how comprehensively the agreement incorporates elements other than trade liberalization.

The effects of FDI are not considered in our simulations. With an increase in FDI contributing to enhancing capital accumulation, however, the economic impacts would be even greater than those indicated in our simulations, particularly in developing countries.[13] Moreover, further trade facilitation would help lower cross-border

[13] In the basic version of the standard GTAP model, a change in investment levels has no

service-link costs, resulting in accelerating FDI inflows. Implementing various facilitation measures in addition to trade liberalization should further stimulate FDI, which would be beneficial to countries in the region.

As an example of sectoral impacts, let us briefly discuss the case of ASEAN+6 FTA. Table 12 shows by-sector impacts of the ASEAN+6 FTA with full trade liberalization, trade facilitatio, and technical assistance to developing countries on production, exports, and imports (Sim5). In terms of imports, a substantial increase is observed in all sectors and countries except Japan's fishing and forestry and mining sectors. A large number of countries tend to experience a considerable increase in imports in sectors such as agriculture, textiles and apparel, and transport equipment, which are typically protected by high tariffs. In terms of exports, an overall uptrend is observed mainly for trade in goods. These results suggest that the conclusion of an ASEAN+6 FTA contributes to further strengthen trade linkages in many sectors. While outputs as a whole economy never shrink as discussed above, they decline in some sectors. This implies that the industrial structure of economies significantly changes, shifting toward a more efficient one, through trade liberalization, trade facilitation measures, and technical assistance.

= Table 12 =

## 5. Conclusion

This study has examined economic impacts of possible (hypothetical) FTAs in East Asia such as EAFTA, CEPEA, and FTAAP by using a simulation analysis based on a GTAP/CGE model. In the analysis, the paper has focused not only on the effects of trade liberalization (elimination and reduction of trade barriers for both exports and imports) but also the effects of other contents, i.e., trade facilitation and technical assistance to developing countries in the region.

We found that although trade liberalization is, of course, important, trade

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influence on the levels of capital stock that is one factor of production. By allowing for capital accumulation in the model, however, the model can be modified so that capital stock increases when investment does. Although the effects of FDI are not directly considered in their simulations, Ando and Urata (2007), which incorporate capital accumulation in the model, emphasize that the effects of FDI as an international capital movement would be large particularly for developing countries.

facilitation and technical assistance in addition to trade liberalization are even more beneficial to the member countries. The economic impacts of ASEAN+3 FTA/ASEAN+6 are greater than those of (ASEAN+1 FTA)x3/(ASEAN+1 FTA)x6 if the FTA incorporates various facilitation measures and/or technical assistance, even for some ASEAN economies who experience the opposite results when the FTA covers only trade liberalization. How comprehensively the agreement incorporates elements other than trade liberalization heavily influences the possibility of the establishment and the effects of FTAs in East Asia, particularly ASEAN+3 FTA/ASEAN+6 FTA. Furthermore, if cross-border service-link costs are reduced by trade facilitation, international production/distribution networks in East Asia can be further developed.

As for trade liberalization, we investigated not only scenarios of full trade liberalization in all sectors including agriculture but also those of full trade liberalization in only non-agriculture sectors and those of partial trade liberalization in the agriculture sector with full trade liberalization in non-agriculture sectors. Our results demonstrated that positive economic effects are greater in scenarios of partial liberalization of trade in the agricultural sector than in scenarios of exclusion of that sector from trade liberalization, and are the greatest in scenarios of trade liberalization in all sectors including agriculture. In some countries, the exclusion of the agriculture sector from trade liberalization worsened terms of trade and intensified inefficiency in resource allocation, resulting in a deterioration of economic welfare. It is thus important to improve market access in the agriculture sector in addition to other sectors.

The study also demonstrated that the economic effects of FTAs with a larger number of members are likely to be greater. The ASEAN+6 FTA is beneficial not only to Australia, New Zealand, and India—non-members of an ASEAN+3 FTA—but also to the individual ASEAN+3 countries, to a greater extent than the ASEAN+3 FTA. In addition, since APEC includes all ASEAN+6 countries as its members except India, together with other major economies, the impacts on GDP tend to be greater for most ASEAN+6 countries, compared with those of the ASEAN+6 FTA.

The effects of FDI were not considered in our simulations. With an increase in FDI contributing to expanding capital accumulation, particularly in developing countries, however, the economic impacts of FTAs in East Asia would be even greater than those indicated in our simulations. Moreover, further trade and investment facilitation would help lower cross-border service-link costs, resulting in accelerating FDI inflows. For the

establishment of FTAs among countries such as ASEAN+3, ASEAN+6 FTA, and APEC, a high quality of trade liberalization including that in the agricultural sector is essential. Furthermore, it is vital for an agreement to be comprehensive, covering not only intraregional trade liberalization but also other elements such as trade facilitation and technical assistance.

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Table 1 FTA networking in extended East Asia

(As of March 2009)

| | Japan | Korea | China | ASEAN | Brunei | Indonesia | Malaysia | Philippines | Singapore | Thailand | Vietnam | CLM | India | Australia | New Zealand |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Japan | | ○ (suspended) | △ | ◎: 2008 - | ◎: 2008 | ◎: 2008 | ◎: 2006 | ◎: 2008 | ◎: 2002 | ◎: 2007 | ◎ | | ○ | ○ | |
| Korea | ○ (suspended) | | △ | ◎: 2007 - | | | | | ◎: 2006 | | | | ○ | △ | △ |
| China | △ | △ | | ◎: 2005 - | | | | | ◎: 2009 | | | | △ | ○ | ◎: 2008 |
| ASEAN | ◎: 2008 - | ◎: 2007 - | ◎: 2005 - | ◎: 1993 - | (1992) | (1992) | (1992) | (1992) | (1992) | (1992) | (1995) | (LM:1997/ C:1999) | ○* | ◎ | ◎ |
| Brunei | ◎: 2008 | | | (1992) | | (1992) | (1992) | (1992) | (1992) | (1992) | (1995) | (LM:1997/ C:1999) | | | ◎: 2006 |
| Indonesia | ◎: 2008 | | | (1992) | (1992) | | (1992) | (1992) | (1992) | (1992) | (1995) | (LM:1997/ C:1999) | | △ | |
| Malaysia | ◎: 2006 | | | (1992) | (1992) | (1992) | | (1992) | (1992) | (1992) | (1995) | (LM:1997/ C:1999) | ○ | ○ | △ |
| Philippines | ◎: 2008 | | | (1992) | (1992) | (1992) | (1992) | | (1992) | (1992) | (1995) | (LM:1997/ C:1999) | | | |
| Singapore | ◎: 2002 | ◎: 2006 | ◎: 2009 | (1992) | (1992) | (1992) | (1992) | (1992) | | (1992) | (1995) | (LM:1997/ C:1999) | ◎: 2005 | ◎: 2003 | ◎: 2001 |
| Thailand | ◎: 2007 | | | (1992) | (1992) | (1992) | (1992) | (1992) | (1992) | | (1995) | (LM:1997/ C:1999) | △ | ◎: 2005 | ◎: 2005 |
| Vietnam | ◎ | | | (1995) | (1995) | (1995) | (1995) | (1995) | (1995) | (1995) | | (LM:1997/ C:1999) | | | |
| CLM | | | | (LM:1997/C:1 999) | (LM:1997/ C:1999) | (LM:1997/ C:1999) | (LM:1997/ C:1999) | (LM:1997/C: 1999) | (LM:1997/ C:1999) | (LM:1997/ C:1999) | (LM:1997/ C:1999) | | | | |
| India | ○ | ○ | △ | ○* | | | ○ | | ◎: 2005 | △ | | | | △ | △ |
| Australia | ○ | △ | ○ | ◎ | | △ | ○ | | ◎: 2003 | ◎: 2005 | | | △ | | ◎: 1983 |
| New Zealand | | △ | ◎: 2008 | ◎ | ◎: 2006 | | △ | | ◎: 2001 | ◎: 2005 | | | △ | ◎: 1983 | |

Notes: ◎: signed or in effect, ○: under negotiation or agreed to negotiate (○*: negotiation completed), △: feasibility study or preparatory talks. The year indicates when the concerned FTA was in force. "-" after the year means that some ASEAN countries are under the corresponding FTAs in force and others follow later. Dark blue indicates FTAs signed before or in the 1990s, blue indicates FTAs signed in the first half of the 2000s, and light blue indicates FTAs signed in the second half of the 2000s. For some FTAs, their status in this table is based on the agreement of trade in goods; negotiations may be still ongoing over other areas such as investment and services even if the agreements are identified as those signed or in effect here. The year in parenthesis shows the year for the corresponding ASEAN country to be a member of ASEAN/AFTA.

Sources: Websites of trade ministries in each country and others including JETRO website (http://www.jetro.go.jp/world/).

Table 2 Japan's FTA negotiations

(As of March 2009)

| Counterpart | Negotiation started | Agreement signed | Entry into force |
|---|---|---|---|
| Singapore | 01/2001 | 01/2002 | 11/2002 |
| Mexico | 11/2002 | 09/2004 | 04/2005 |
| Malaysia | 01/2004 | 12/2005 | 07/2006 |
| Chile | 02/2006 | 03/2007 | 09/2007 |
| Thailand | 02/2004 | 04/2007 | 11/2007 |
| Indonesia | 07/2005 | 08/2007 | 07/2008 |
| Brunei | 06/2006 | 06/2007 | 07/2008 |
| ASEAN | 04/2005 | 04/2008 | 12/2008 - |
| Philippines | 02/2004 | 09/2006 | 12/2008 |
| Vietnam | 01/2007 | 12/2008 | |
| Switzerland | 05/2007 | 02/2009 | |
| GCC | 09/2006 | | |
| India | 01/2007 | | |
| Australia | 04/2007 | | |
| (Korea) | 12/2003 | (11/2004: negotiation suspende | |

"-" : in effect between Japan and Singapore/Laos/Vietnam/Myanmar in December 2008, Brunei in January 2009, and Malaysia in February 2009. Other countries are expected to follow.

Source: MOFA, GOJ (http://www.mofa.go.jp).

Table 3 Survery of recent CGE studies on FTAs in East Asia: the model structures and simulation methods

| papers | FTAs in analysis | model/database used for analysis | aggregation of regions and sectors | structure of model | method and characteristic of simulation |
|---|---|---|---|---|---|
| Bchir and Fouquin (2006) | 1. ASEAN10 (as a hub) and China, India, Japan, and Korea (as spokes) with/without the exclusion of sensitive products from liberalization | - MIRAGE (Modeling International Relationships in Applied General Equilibrium) CEPII's model | - countries/regions: 18 | - imperfect competition in an oligopolistic structure (Cournot) | - four scenarios: two Asian hub-and-spoke scenarios centered around ASEAN10 and two Asian single market scenarios |
| | 2. FTA including ASEAN10, China, India, Japan, and Korea with/without the exclusion of sensitive products | - GTAP Version6 database | - sectors: na | - horizontal product differentiation linked to varieties, but also to geographical origin (nested Armington – Dixit-Stiglitz utility function) | - estimating the impact of elimination of tariff and non-tariff barriers between FTA member countries |
| | | - MacMaps database for data on tariff and non-tariff barriers | | - FDI is explicitly described | - estimating the impact of each scenario on FTA member countries and other countries/regions in the world |
| | | | | - a notion of vertical product differentiation is introduced | - 10% of the tariff lines to be defined as sensitive products |
| Mohanty, Pohit, and Roy (2004) | 1. FTA among JACIK countries (including Japan, ASEAN5, China, India, and Korea) with/without free movements of investment and skilled labor | - the monopolistic competition version of CGE model | - countries/regions: 14 | - the market structure of agricultural sectors and service sectors is assumed to be perfectly competitive; Dixit-Stiglitz type of monopolistic competition is assumed in manufacturing sectors | - three scenarios of regional integration arrangements (RIA) among JACIK countries: FTA only (liberalization of both tariff and non-tariff barriers), FTA with investment liberalization, and FTA with free movements of both investment and skilled labor |
| | | - GTAP Version5 database | - sectors: 26 | - among three factors of production, unskilled labor is perfectly mobile across sectors within a country; skilled labor and capital is assumed to be perfectly mobile across JACIK countries in certain scenarios, in addition to being perfectly mobile across sectors within a country | - estimating the impact of each scenario on each of JACIK countries and the regional economy as a whole |
| | | - Handbook of Industrial Statistics (UNIDO), WDI, UNDP's statistics, etc. | | | |
| Mohanty and Pohit (2007) | 1. ASEAN+3 (Indonesia, Malaysia, Philippines, Singapore, Thailand, Japan, South Korea, and China) | - applied general equilibrium model (monopolistic competition version of CGE model) | - countries/regions: 16 | - static model | - nine scenarios with three different country groupings for Asian Economic Community (AEC) and three different depth of Economic integration |
| | 2. ASEAN+4 (including India) | - GTAP Version6 database | - sectors: 26 | - among three factors of production, unskilled labor is considered perfectly mobile across sectors within a country but not across borders; skilled labor and capital are perfectly mobile across borders | - estimating the impact of economic liberalization within AEC: (1) tariff elimination, (2) investment liberalization, and (3) movement of natural persons representing trade in services |
| | 3. ASEAN+6 (including Australia and New Zealand) | | | | - estimating the impact on not only AEC member countries but also non-member countries such as NAFTA and European Economic Area (EEA) |
| Kawai and Wignaraja (2007) | 1. ASEAN+China FTA (including 10 ASEAN members) | - GTAP model (same as the model used in Francois and Wignaraja (2007)) | - countries/regions: 36 | - intermediate linkages between sectors are included | - five East Asian FTA scenarios |
| | 2. ASEAN+Korea FTA | - GTAP Version6.3 database | - sectors: na | - trade is allowed to affect capital stocks through investment activities (the medium- to long-run investment effects) | - estimating the impact of regional tariff elimination for goods, liberalization of services trade, and trade facilitation including improved trade-related infrastructure |
| | 3. ASEAN+Japan FTA | | | - projected through to 2017 trade and production patterns | - estimating the impact on member and non-member countries |
| | 4. ASEAN+3 | | | | |
| | 5. ASEAN+6 | | | | |

(Continue)

| papers | FTAs in analysis | model/database used for analysis | aggregation of regions and sectors | structure of model | method and characteristic of simulation |
|---|---|---|---|---|---|
| Park (2006) | 1. AFTA | - GTAP6inGAMS model, a modified version of the GTAP model version 6 developed for generalized algebraic modeling system (GAMS) users | - countries/regions: 25 | - static model | - 16 East Asian RTA scenarios: one currently effective RTA, five expansionary RTAs, three pairs of duplicate RTAs, and seven cases of overlapping RTAs |
| | 2. ASEAN+3 with/without Hong Kong and Taiwan | - GTAP Version6 database | - sectors: 7 | - Cobb-Douglas preferences are assumed (the GTAP model is based on constant different elasticity (CDE) demand system) | - estimating the impact of elimination of both import tariffs and export taxes |
| | 3. ASEAN+6 with/without Hong Kong and Taiwan | | | - global capital flows are exogenously fixed for simplicity (the GTAP model assumes that global capital is endogenously allocated by regional rate of return) | - estimating the impact on intra- and extra-bloc trade as well as the impact on welfare and output of member and non-member countries and the world economy as a whole |
| | 4. APEC<br>5. China-Japan-Korea RTA<br>6. bilateral RTAs among China, Japan, Korea with/without AFTA<br>7. ASEAN+1 RTAs (ASEAN-China, ASEAN-Japan, and ASEAN-Korea RTA) | | | - calibrated with 2001 as the base year | |
| Plummer and Wignaraja (2006, 2007) | 1. fragmentation scenario (coexistence of several bilateral or small regional FTAs) | - ADB's General Equilibrium Model for Asia's Trade (GEMAT), an applied general equilibrium model of the global economy with a focus on Asia (extended version of the LINKAGE model developed at WB) | - countries/regions: 14 | - incorporating firm heterogeneity, fixed trade costs and imperfect competition | - five FTA scenarios are compared with global free trade scenario |
| | 2. ASEAN+3 FTA (including PRC + Hong Kong, Japan, and Kore) | | - sectors: na | | - estimating the impact of each scenario on regions/countries in the world and the world economy as a whole |
| | 3. ASEAN+6 FTA | | | | - the impact of Asian FTA scenarios (ASEAN+3, ASEAN+6, and Asia-wide FTAs) on 10 East Asian countries are further examined |
| | 4. Asia-wide FTA among all Asian countries<br>5. APEC FTA among all APEC members | | | | |
| Sulamaa and Widgrén (2005) | 1. ASIAFTA with/without China's TFP increase (including Japan, India, the rest of SAARC, China, Hong Kong, Korea-Taiwan, ASEAN6, Australia-New | - GTAP model | - countries/regions: 16 | - static model | - four Asian regional FTA scenarios |
| | 2. ASIA-C FTA (the above scenario excluding China) | - GTAP Version6 database (data as of 2001) | - sectors: 15 | - comparative analysis between a global free trade scenario as a benchmark and Asian region integration scenarios | - estimating the impact of elimination of both import tariffs and export taxes |
| | 3. ASIA-NAFTA (FTA between ASIAFTA and NAFTA) | | | | - estimating the impact on welfare and output of member and non-member countries<br>- as for ASIAFTA, the potential spillover effects of productivity increase in the Chinese economy are investigated by exogenously imposing four percent TFP shock |
| Zhai (2006) | 1. China-hub bilateral FTAs (with other Asian countries) | - built on LINKAGE model developed at the WB by van der Mensbrugghe (2005) | - countries/regions: 19 | - static model | - four scenarios of hub-and-spoke configurations in Asia |
| | 2. Japan-hub bilateral FTAs (with other Asian countries) | - GTAP Version6 database | - sectors: 14 | - agriculture, mining, and public administration are assumed to be in perfect competition; manufacturing sector and service sectors are characterized by monopolistic competition | - estimating the impact of elimination of both import tariffs and export taxes to merchandise trade between hub and spokes |
| | 3. individual ASEAN-hub bilateral FTAs (with non-ASEAN countries) | | | - incorporating firm heterogeneity and fixed cost of exporting into the model | - estimating the impact of each scenario on its hub and spokes and the world as a whole |
| | 4. AFTA-hub FTAs (with other Asian countries) | | | - Dixit-Stiglitz preference is assumed for the demand side | - simulation results of four scenarios are compared with the cases of Asia-wide FTA and multilateral global trade liberalization |

Table 4 Basic economic statistics

| | GDP (millions US$) | (Share in ASEAN +6) | GDP per capita (millions US$) | Population (millions) | (Share in ASEAN +6) | Exports (millions) | (Share in ASEAN +6) | Imports (millions) | (Share in ASEAN +6) |
|---|---|---|---|---|---|---|---|---|---|
| Japan | 4,177,570 | (57.5%) | 32,946 | 127 | (4.2%) | 478,422 | (28.6%) | 413,063 | (29.6%) |
| China | 1,159,031 | (16.0%) | 913 | 1,270 | (41.9%) | 388,381 | (23.2%) | 281,232 | (20.2%) |
| Korea | 427,646 | (5.9%) | 8,988 | 48 | (1.6%) | 191,797 | (11.5%) | 162,579 | (11.7%) |
| Indonesia | 145,306 | (2.0%) | 681 | 213 | (7.0%) | 69,128 | (4.1%) | 45,415 | (3.3%) |
| Malaysia | 88,041 | (1.2%) | 3,720 | 24 | (0.8%) | 128,137 | (7.7%) | 76,683 | (5.5%) |
| Philippines | 71,437 | (1.0%) | 894 | 80 | (2.6%) | 38,836 | (2.3%) | 43,778 | (3.1%) |
| Singapore | 84,855 | (1.2%) | 25,482 | 3 | (0.1%) | 116,937 | (7.0%) | 124,467 | (8.9%) |
| Thailand | 114,681 | (1.6%) | 1,828 | 63 | (2.1%) | 81,251 | (4.9%) | 63,877 | (4.6%) |
| Vietnam | 32,723 | (0.5%) | 412 | 79 | (2.6%) | 15,784 | (0.9%) | 25,136 | (1.8%) |
| Other Southeast Asia | 79,053 | (1.1%) | 1,179 | 67 | (2.2%) | 8,700 | (0.5%) | 6,709 | (0.5%) |
| Australia | 357,365 | (4.9%) | 18,392 | 19 | (0.6%) | 73,934 | (4.4%) | 72,913 | (5.2%) |
| New Zealand | 50,569 | (0.7%) | 13,135 | 4 | (0.1%) | 19,024 | (1.1%) | 15,800 | (1.1%) |
| India | 477,342 | (6.6%) | 462 | 1,032 | (34.1%) | 63,232 | (3.8%) | 62,295 | (4.5%) |
| Hong Kong | 162,793 | | 22,736 | 7 | | 105,187 | | 114,406 | |
| Taiwan | 281,436 | | 12,620 | 22 | | 138,961 | | 116,766 | |
| NAFTA | 11,414,991 | | 27,865 | 410 | | 1,345,048 | | 1,693,832 | |
| EU | 7,929,525 | | 21,075 | 376 | | 2,603,932 | | 2,571,408 | |
| Others | 4,224,237 | | 1,846 | 2,288 | | 1,277,982 | | 1,254,312 | |
| ASEAN | 616,096 | (8.5%) | 1,163 | 530 | (17.5%) | 458,772 | (27.4%) | 386,065 | (27.7%) |
| ASEAN+3 | 6,380,343 | (87.8%) | 3,233 | 1,974 | (65.2%) | 1,517,372 | (90.7%) | 1,242,939 | (89.2%) |
| ASEAN+6 | 7,265,620 | (100.0%) | 2,399 | 3,029 | (100.0%) | 1,673,561 | (100.0%) | 1,393,947 | (100.0%) |

Data source: author's preparation, based on GTAP ver.6 database.

Table 5 Trade matrix among ASEAN+6 countries

(%)

| | | Importers | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Japan | China | Korea | ASEAN (Total) | | | | | | | | Australia | New Zealand | India | Total |
| | | | | | | Indonesia | Malaysia | Philippines | Singapore | Thailand | Vietnam | Southeast Asia | | | | |
| Exporters | Japan | 0.0 | 8.6 | 4.8 | 10.2 | 1.2 | 2.1 | 1.6 | 2.7 | 2.2 | 0.4 | 0.1 | 1.4 | 0.2 | 0.4 | 25.7 |
| | China | 10.1 | 0.0 | 2.5 | 4.0 | 0.5 | 0.7 | 0.3 | 1.3 | 0.6 | 0.5 | 0.2 | 1.0 | 0.1 | 0.5 | 18.2 |
| | Korea | 2.9 | 4.8 | 0.0 | 3.1 | 0.6 | 0.5 | 0.5 | 0.7 | 0.4 | 0.3 | 0.1 | 0.5 | 0.1 | 0.3 | 11.6 |
| | ASEAN (total) | 9.7 | 5.1 | 2.7 | 14.4 | 1.1 | 3.4 | 1.1 | 5.7 | 2.0 | 0.7 | 0.5 | 1.5 | 0.2 | 1.4 | 35.0 |
| | Indonesia | 2.2 | 0.8 | 0.6 | 1.8 | 0.0 | 0.4 | 0.1 | 0.9 | 0.2 | 0.1 | 0.0 | 0.3 | 0.0 | 0.3 | 5.9 |
| | Malaysia | 2.5 | 1.6 | 0.7 | 4.5 | 0.3 | 0.0 | 0.2 | 3.3 | 0.6 | 0.1 | 0.1 | 0.4 | 0.1 | 0.6 | 10.2 |
| | Philippines | 1.1 | 0.3 | 0.2 | 1.0 | 0.0 | 0.2 | 0.0 | 0.5 | 0.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.6 |
| | Singapore | 1.3 | 1.5 | 0.7 | 4.3 | 0.6 | 2.2 | 0.5 | 0.0 | 0.7 | 0.3 | 0.2 | 0.3 | 0.1 | 0.4 | 8.5 |
| | Thailand | 2.0 | 0.9 | 0.3 | 2.2 | 0.2 | 0.5 | 0.2 | 0.9 | 0.0 | 0.2 | 0.2 | 0.3 | 0.0 | 0.1 | 5.8 |
| | Vietnam | 0.5 | 0.2 | 0.1 | 0.3 | 0.0 | 0.0 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.1 | 0.0 | 0.0 | 1.2 |
| | Southeast Asia | 0.2 | 0.1 | 0.1 | 0.3 | 0.0 | 0.0 | 0.0 | 0.1 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.7 |
| | Australia | 2.2 | 0.9 | 0.8 | 1.3 | 0.3 | 0.3 | 0.1 | 0.3 | 0.2 | 0.1 | 0.0 | 0.0 | 0.5 | 0.3 | 6.0 |
| | New Zealand | 0.4 | 0.2 | 0.1 | 0.3 | 0.0 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.4 | 0.0 | 0.0 | 1.4 |
| | India | 0.5 | 0.4 | 0.2 | 0.8 | 0.1 | 0.2 | 0.1 | 0.2 | 0.1 | 0.1 | 0.0 | 0.1 | 0.0 | 0.0 | 2.0 |
| | Total | 25.8 | 20.0 | 11.2 | 34.1 | 3.8 | 7.2 | 3.7 | 11.0 | 5.6 | 2.0 | 0.8 | 4.9 | 1.2 | 2.9 | 100.0 |

Data source: author's preparation, based on GTAP ver.6 database.

Note: shares are calculated as a percentage of total exports in ASEAN+6.

Table 6 Import-weighted average tariffs for ASEAN+6

| Importers | Japan | China | Korea | ASEAN (Total) | | | | | | | | Australia | New Zealand | India |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Indonesia | Malaysia | Philippines | Singapore | Thailand | Vietnam | Southeast Asia | | | |
| **(a) Sectoral import tariffs** | | | | | | | | | | | | | | |
| Agriculture and food | 30.2 | 37.6 | 81.7 | 13.9 | 5.0 | 17.1 | 9.5 | 0.4 | 29.4 | 36.6 | 20.4 | 2.8 | 2.0 | 50.2 |
| Fishery and forestry | 1.8 | 0.7 | 6.9 | 2.7 | 0.6 | 0.2 | 0.5 | 0.0 | 10.3 | 3.9 | 1.0 | 0.1 | 0.0 | 6.8 |
| Mining | 0.0 | 0.3 | 3.7 | 0.7 | 0.3 | 1.6 | 3.2 | 0.0 | 0.2 | 3.8 | 2.6 | 4.9 | 0.0 | 16.2 |
| Texitle and apparel | 9.0 | 20.5 | 10.0 | 11.1 | 8.6 | 12.3 | 6.5 | 0.0 | 18.5 | 31.3 | 10.1 | 17.0 | 6.0 | 26.6 |
| Wood and paper | 1.1 | 9.0 | 4.0 | 5.4 | 3.4 | 6.6 | 4.7 | 0.0 | 11.0 | 14.7 | 5.3 | 3.6 | 1.1 | 22.0 |
| Mineral products | 1.1 | 13.0 | 6.7 | 5.2 | 4.4 | 5.9 | 4.5 | 0.0 | 11.7 | 7.8 | 5.4 | 3.0 | 1.3 | 28.8 |
| Iron and steel | 0.5 | 7.5 | 3.8 | 5.6 | 5.9 | 8.5 | 3.9 | 0.0 | 9.3 | 5.1 | 3.5 | 3.6 | 1.4 | 33.6 |
| General machinery | 0.1 | 13.1 | 6.1 | 3.3 | 3.0 | 3.9 | 2.3 | 0.0 | 8.2 | 8.0 | 6.0 | 3.5 | 2.1 | 25.4 |
| Electronic machinery | 0.0 | 10.1 | 1.1 | 0.8 | 2.1 | 0.4 | 0.1 | 0.0 | 4.7 | 8.8 | 8.8 | 0.8 | 1.2 | 15.1 |
| Transport equipment | 0.0 | 20.5 | 3.9 | 14.6 | 9.6 | 31.7 | 11.5 | 0.0 | 24.0 | 46.9 | 25.0 | 12.9 | 3.5 | 27.4 |
| Other manufacturing | 5.3 | 13.9 | 8.5 | 6.1 | 6.5 | 6.8 | 6.1 | 0.0 | 7.1 | 20.2 | 13.7 | 5.2 | 3.8 | 33.8 |
| Construction | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Trade | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Transport and communication | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Public services | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Other services | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Manufacturing total | 1.4 | 12.0 | 4.5 | 4.0 | 4.7 | 4.7 | 2.4 | 0.0 | 8.6 | 14.5 | 8.6 | 5.4 | 2.2 | 24.8 |
| Total | 4.1 | 11.6 | 8.5 | 4.0 | 3.6 | 4.7 | 2.8 | 0.0 | 8.8 | 10.3 | 9.0 | 4.3 | 1.7 | 21.8 |
| **(b) Bilateral import tariffs** | | | | | | | | | | | | | | |
| Japan | - | 13.6 | 5.1 | 5.5 | 5.3 | 7.8 | 2.3 | 0.0 | 11.2 | 11.3 | 9.7 | 8.8 | 4.6 | 23.6 |
| China | 5.2 | - | 21.6 | 6.7 | 6.6 | 6.7 | 5.9 | 0.0 | 11.1 | 19.9 | 7.9 | 8.4 | 5.1 | 25.1 |
| Korea | 2.6 | 13.4 | - | 6.1 | 5.8 | 5.3 | 3.0 | 0.0 | 10.4 | 19.1 | 9.1 | 6.2 | 3.5 | 23.9 |
| ASEAN (total) | 2.8 | 11.6 | 3.8 | 3.8 | 3.5 | 4.1 | 3.4 | 0.0 | 8.7 | 16.2 | 10.6 | 3.3 | 1.6 | 28.5 |
| Indonesia | 1.2 | 11.4 | 4.1 | 4.6 | - | 7.1 | 3.9 | 0.0 | 15.9 | 14.8 | 7.6 | 4.0 | 1.9 | 37.5 |
| Malaysia | 0.5 | 10.3 | 2.7 | 1.9 | 2.7 | - | 2.0 | 0.0 | 9.0 | 12.2 | 11.8 | 2.5 | 1.2 | 31.3 |
| Philippines | 1.0 | 10.1 | 3.3 | 3.2 | 4.3 | 3.8 | - | 0.0 | 7.9 | 13.3 | 10.3 | 2.9 | 1.5 | 23.9 |
| Singapore | 1.5 | 10.6 | 1.9 | 4.6 | 2.7 | 2.2 | 2.0 | - | 7.4 | 21.1 | 10.2 | 1.4 | 1.1 | 18.3 |
| Thailand | 8.8 | 16.7 | 8.7 | 5.4 | 6.3 | 9.5 | 4.4 | 0.0 | - | 12.3 | 10.9 | 4.5 | 2.1 | 24.4 |
| Vietnam | 4.7 | 12.7 | 9.6 | 7.2 | 4.5 | 5.0 | 14.9 | 0.0 | 17.6 | - | 0.0 | 5.8 | 4.8 | 22.6 |
| Southeast Asia | 0.9 | 7.2 | 3.6 | 1.5 | 3.8 | 1.1 | 3.0 | 0.0 | 1.9 | 2.7 | 2.1 | 5.4 | 0.7 | 26.3 |
| Australia | 15.1 | 10.8 | 5.9 | 3.8 | 3.8 | 3.4 | 4.1 | 0.0 | 7.9 | 8.0 | 5.4 | - | 0.2 | 26.5 |
| New Zealand | 8.4 | 11.9 | 7.7 | 5.3 | 3.9 | 1.8 | 3.9 | 0.0 | 12.5 | 13.1 | 5.3 | 4.5 | - | 15.0 |
| India | 2.0 | 7.5 | 10.6 | 4.9 | 4.3 | 3.9 | 6.2 | 0.0 | 12.2 | 8.3 | 3.1 | 5.6 | 3.0 | - |

Data source: author's preparation, based on GTAP ver.6 database.

Table 7a Economic effects of trade liberalization: real GDP growth (Percent)

| | ASEAN | | | ASEAN+3 | | | ASEAN+6 | | | APEC | | | Global | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 |
| Japan | 0.00 | 0.00 | 0.00 | 0.03 | 0.03 | 0.01 | 0.03 | 0.06 | 0.05 | 0.03 | 0.10 | 0.11 | 0.02 | 0.09 | 0.11 |
| China | 0.00 | 0.00 | 0.00 | 0.20 | 0.19 | 0.13 | 0.22 | 0.20 | 0.15 | 0.87 | 0.96 | 0.99 | 1.47 | 1.73 | 1.92 |
| Korea | 0.00 | 0.00 | -0.01 | 0.26 | 0.76 | 1.13 | 0.29 | 0.77 | 1.15 | 0.30 | 0.96 | 1.50 | 0.48 | 1.32 | 1.99 |
| Indonesia | 0.01 | 0.02 | 0.02 | 0.06 | 0.07 | 0.07 | 0.07 | 0.08 | 0.07 | 0.08 | 0.10 | 0.10 | 0.24 | 0.25 | 0.25 |
| Malaysia | -0.07 | 0.04 | 0.05 | 0.26 | 0.36 | 0.39 | 0.29 | 0.43 | 0.50 | 0.33 | 0.60 | 0.76 | 0.58 | 0.88 | 1.09 |
| Philippines | 0.05 | 0.11 | 0.17 | 0.13 | 0.17 | 0.21 | 0.14 | 0.19 | 0.25 | 0.17 | 0.28 | 0.39 | 0.27 | 0.38 | 0.50 |
| Singapore | 0.01 | 0.03 | 0.07 | -0.01 | 0.01 | 0.06 | 0.00 | 0.02 | 0.05 | -0.03 | -0.01 | 0.02 | -0.01 | 0.01 | 0.04 |
| Thailand | 0.03 | 0.11 | 0.09 | 0.51 | 0.65 | 0.68 | 0.55 | 0.70 | 0.74 | 0.59 | 0.74 | 0.77 | 0.91 | 1.18 | 1.33 |
| Vietnam | -0.39 | 0.18 | 0.54 | 1.29 | 1.86 | 2.21 | 1.31 | 1.86 | 2.25 | 2.28 | 3.00 | 3.53 | 3.14 | 3.86 | 4.42 |
| Other Southeast Asia | -0.01 | 0.02 | 0.01 | 0.05 | 0.08 | 0.09 | 0.05 | 0.10 | 0.10 | 0.09 | 0.12 | 0.12 | 0.11 | 0.15 | 0.15 |
| Australia | 0.00 | 0.00 | 0.00 | -0.03 | -0.03 | -0.03 | 0.14 | 0.15 | 0.16 | 0.13 | 0.14 | 0.15 | 0.19 | 0.19 | 0.20 |
| New Zealand | 0.00 | 0.00 | -0.01 | -0.02 | -0.03 | -0.02 | 0.06 | 0.08 | 0.10 | 0.06 | 0.09 | 0.12 | 0.07 | 0.10 | 0.14 |
| India | -0.01 | -0.01 | -0.01 | -0.04 | -0.04 | -0.04 | -0.10 | 0.16 | 0.41 | -0.12 | -0.11 | -0.10 | 0.64 | 0.94 | 1.24 |
| Hong Kong | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -0.02 | -0.02 | -0.02 | 0.05 | 0.05 | 0.05 |
| Taiwan | 0.00 | 0.00 | 0.00 | -0.05 | -0.06 | -0.06 | -0.06 | -0.06 | -0.07 | 0.10 | 0.12 | 0.12 | 0.19 | 0.21 | 0.21 |
| Canada | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -0.01 | -0.01 | -0.01 | 0.03 | 0.04 | 0.04 | 0.03 | 0.05 | 0.06 |
| United States | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.02 | 0.01 |
| Mexico | 0.00 | 0.00 | 0.00 | -0.01 | -0.01 | -0.01 | -0.01 | -0.01 | -0.01 | 0.11 | 0.13 | 0.15 | 0.33 | 0.36 | 0.38 |
| Other APEC | 0.00 | 0.00 | 0.00 | -0.02 | -0.02 | -0.02 | -0.03 | -0.02 | -0.02 | 0.05 | 0.08 | 0.09 | 0.37 | 0.43 | 0.48 |
| EU | 0.00 | 0.00 | 0.00 | -0.01 | -0.01 | 0.00 | -0.01 | -0.01 | -0.01 | -0.02 | -0.01 | -0.01 | 0.05 | 0.07 | 0.09 |
| Rest of the world | 0.00 | 0.00 | 0.00 | -0.02 | -0.02 | -0.02 | -0.03 | -0.03 | -0.03 | -0.07 | -0.07 | -0.06 | 0.44 | 0.49 | 0.51 |
| | | | | | | | | | | | | | | | |
| ASEAN | -0.01 | 0.06 | 0.09 | 0.23 | 0.32 | 0.36 | 0.25 | 0.35 | 0.39 | 0.33 | 0.45 | 0.53 | 0.52 | 0.67 | 0.78 |
| ASEAN+3 | 0.00 | 0.00 | 0.01 | 0.10 | 0.13 | 0.14 | 0.10 | 0.16 | 0.17 | 0.23 | 0.34 | 0.40 | 0.36 | 0.53 | 0.63 |
| ASEAN+6 | 0.00 | 0.00 | 0.01 | 0.08 | 0.11 | 0.12 | 0.09 | 0.16 | 0.19 | 0.20 | 0.30 | 0.36 | 0.37 | 0.53 | 0.65 |
| APEC | 0.00 | 0.00 | 0.00 | 0.03 | 0.04 | 0.04 | 0.03 | 0.05 | 0.06 | 0.09 | 0.13 | 0.15 | 0.16 | 0.22 | 0.25 |
| Global | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 | 0.02 | 0.01 | 0.03 | 0.04 | 0.04 | 0.07 | 0.08 | 0.17 | 0.22 | 0.26 |

Table 7b Economic effects of FTAs in Asia-Pacific: real GDP growth (Percent)

| | (ASEAN+1)x3 | | ASEAN+3 | | | (ASEAN+1)x6 | | ASEAN+6 | | | APEC | | Global |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sim3 | Sim4 | Sim3 | Sim4 | Sim5 | Sim3 | Sim4 | Sim3 | Sim4 | Sim5 | Sim3 | Sim4 | Sim3 |
| Japan | 0.00 | 0.08 | 0.01 | 0.44 | 0.44 | -0.01 | 0.07 | 0.05 | 0.54 | 0.54 | 0.11 | 0.91 | 0.11 |
| China | 0.01 | 0.19 | 0.13 | 1.66 | 4.73 | 0.01 | 0.19 | 0.15 | 1.77 | 4.84 | 0.99 | 3.67 | 1.92 |
| Korea | -0.05 | 0.19 | 1.13 | 3.56 | 3.55 | -0.04 | 0.20 | 1.15 | 3.72 | 3.71 | 1.50 | 5.04 | 1.99 |
| Indonesia | 0.07 | 0.90 | 0.07 | 1.74 | 3.94 | 0.07 | 1.01 | 0.07 | 1.94 | 4.14 | 0.10 | 2.47 | 0.25 |
| Malaysia | 0.42 | 3.11 | 0.39 | 5.83 | 8.62 | 0.51 | 3.34 | 0.50 | 6.21 | 9.00 | 0.76 | 8.06 | 1.09 |
| Philippines | 0.18 | 2.06 | 0.21 | 3.94 | 6.27 | 0.20 | 2.18 | 0.25 | 4.18 | 6.52 | 0.39 | 6.06 | 0.50 |
| Singapore | 0.09 | 2.18 | 0.06 | 4.22 | 4.24 | 0.10 | 2.30 | 0.05 | 4.40 | 4.42 | 0.02 | 6.05 | 0.04 |
| Thailand | 0.73 | 2.62 | 0.68 | 4.48 | 7.02 | 0.80 | 2.82 | 0.74 | 4.78 | 7.32 | 0.77 | 5.62 | 1.33 |
| Vietnam | 2.29 | 4.81 | 2.21 | 7.08 | 9.67 | 2.33 | 4.97 | 2.25 | 7.33 | 9.92 | 3.53 | 10.42 | 4.42 |
| Other Southeast Asia | 0.09 | 0.49 | 0.09 | 0.88 | 2.91 | 0.11 | 0.52 | 0.10 | 0.92 | 2.95 | 0.12 | 1.07 | 0.15 |
| Australia | -0.02 | -0.03 | -0.03 | -0.09 | -0.09 | 0.01 | 0.16 | 0.16 | 1.35 | 1.35 | 0.15 | 1.81 | 0.20 |
| New Zealand | -0.02 | -0.02 | -0.02 | -0.06 | -0.06 | 0.00 | 0.14 | 0.10 | 1.87 | 1.87 | 0.12 | 2.61 | 0.14 |
| India | -0.03 | -0.06 | -0.04 | -0.10 | -0.10 | 0.31 | 0.51 | 0.41 | 1.30 | 3.45 | -0.10 | -0.26 | 1.24 |
| Hong Kong | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -0.01 | -0.01 | -0.02 | 5.30 | 0.05 |
| Taiwan | -0.03 | -0.03 | -0.06 | -0.09 | -0.09 | -0.03 | -0.04 | -0.07 | -0.10 | -0.10 | 0.12 | 3.47 | 0.21 |
| Canada | 0.00 | 0.00 | 0.00 | -0.01 | -0.01 | 0.00 | 0.00 | -0.01 | -0.02 | -0.02 | 0.04 | 2.96 | 0.06 |
| United States | 0.00 | 0.00 | 0.00 | -0.01 | -0.01 | 0.00 | 0.00 | 0.00 | -0.01 | -0.01 | 0.00 | 0.86 | 0.01 |
| Mexico | -0.01 | -0.01 | -0.01 | -0.03 | -0.03 | 0.00 | -0.01 | -0.01 | -0.04 | -0.04 | 0.15 | 2.21 | 0.38 |
| Other APEC | -0.01 | -0.01 | -0.02 | -0.05 | -0.05 | -0.01 | -0.01 | -0.02 | -0.06 | -0.06 | 0.09 | 1.00 | 0.48 |
| EU | 0.00 | 0.00 | 0.00 | -0.01 | -0.01 | 0.00 | 0.00 | -0.01 | -0.01 | -0.01 | -0.01 | -0.04 | 0.09 |
| Rest of the world | -0.02 | -0.03 | -0.02 | -0.06 | -0.06 | -0.02 | -0.03 | -0.03 | -0.08 | -0.08 | -0.06 | -0.20 | 0.51 |
| | | | | | | | | | | | | | |
| ASEAN | 0.38 | 2.00 | 0.36 | 3.60 | 5.67 | 0.41 | 2.14 | 0.39 | 3.83 | 5.89 | 0.53 | 5.01 | 0.78 |
| ASEAN+3 | 0.03 | 0.29 | 0.14 | 1.18 | 1.93 | 0.04 | 0.30 | 0.17 | 1.30 | 2.05 | 0.40 | 2.08 | 0.63 |
| ASEAN+6 | 0.03 | 0.25 | 0.12 | 1.02 | 1.68 | 0.05 | 0.31 | 0.19 | 1.30 | 2.11 | 0.36 | 1.92 | 0.65 |
| APEC | 0.01 | 0.09 | 0.04 | 0.38 | 0.63 | 0.01 | 0.10 | 0.06 | 0.45 | 0.71 | 0.15 | 1.50 | 0.25 |
| Global | 0.00 | 0.05 | 0.02 | 0.22 | 0.38 | 0.01 | 0.07 | 0.04 | 0.28 | 0.47 | 0.08 | 0.87 | 0.26 |

Data source: author's simulations

Note: Simulations are as follows:

Sim1: Full trade liberalization in the non-agriculture sector

Sim2: Full trade liberalization in the non-agriculture sector and 50%-trade liberalization in the agriculture sector

Sim3: Full trade liberalization in all sectors

Sim4: Full trade liberalization and various facilitation measures in all sectors
(Less efficient falicitation due to lack of common rules of origins for (ASEAN+1)x3 and (ASEAN+1)x6)

Sim5: Full trade liberalization, various facilitation measures, and technical cooperation to LDCs in all sectors
(LDCs include ASEAN countries except Singapore, China, and India (only for ASEAN+6))

Table 8a Economic effects of trade liberalization: welfare effect '(millions US$)

| | ASEAN | | | ASEAN+3 | | | ASEAN+6 | | | APEC | | | Global | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 |
| Japan | -519 | -520 | -506 | 8,283 | 7,985 | 6,492 | 8,999 | 9,537 | 7,118 | 9,312 | 10,979 | 9,352 | 7,386 | 8,952 | 7,575 |
| China | -218 | -238 | -269 | -1,236 | -692 | 658 | -546 | -193 | 673 | 4,862 | 5,612 | 5,732 | 9,801 | 12,021 | 12,789 |
| Korea | -141 | -142 | -142 | 3,679 | 5,713 | 5,964 | 4,133 | 5,995 | 6,287 | 4,098 | 6,538 | 7,597 | 5,585 | 8,766 | 10,440 |
| Indonesia | 192 | 245 | 345 | 506 | 569 | 693 | 714 | 829 | 1,166 | 734 | 721 | 725 | 926 | 969 | 1,186 |
| Malaysia | 338 | 414 | 376 | 1,420 | 1,505 | 1,471 | 1,670 | 1,938 | 2,529 | 1,550 | 1,702 | 1,686 | 1,885 | 2,271 | 2,960 |
| Philippines | 226 | 264 | 268 | 67 | 121 | 145 | 97 | 131 | 129 | 151 | 168 | 151 | 62 | 57 | 24 |
| Singapore | 913 | 1,065 | 1,411 | 1,130 | 1,342 | 1,812 | 1,562 | 1,728 | 2,057 | 959 | 1,119 | 1,424 | 1,522 | 1,660 | 1,888 |
| Thailand | 367 | 522 | 569 | 1,248 | 1,935 | 2,855 | 1,411 | 2,013 | 2,650 | 1,412 | 1,794 | 2,024 | 1,985 | 2,595 | 3,219 |
| Vietnam | -250 | -70 | -50 | 373 | 581 | 633 | 446 | 617 | 645 | 835 | 1,016 | 1,030 | 1,263 | 1,393 | 1,371 |
| Other Southeast Asia | -50 | -50 | -81 | 2 | 3 | -27 | 13 | 31 | -1 | 28 | 26 | -7 | -78 | -76 | -118 |
| Australia | -22 | -62 | -122 | -309 | -490 | -722 | 1,181 | 2,195 | 4,833 | 473 | 1,152 | 2,673 | 532 | 1,073 | 2,411 |
| New Zealand | -2 | -20 | -47 | -40 | -87 | -145 | 135 | 218 | 269 | 151 | 251 | 393 | 197 | 374 | 619 |
| India | -80 | -87 | -100 | -468 | -484 | -505 | -2,010 | -1,060 | -872 | -1,305 | -1,415 | -1,539 | 293 | 1,272 | 1,528 |
| Hong Kong | 17 | 12 | 6 | -254 | -326 | -459 | -340 | -404 | -514 | 1,321 | 1,377 | 1,554 | 4,054 | 4,151 | 4,402 |
| Taiwan | -105 | -109 | -113 | -1,489 | -1,506 | -1,511 | -1,649 | -1,700 | -1,759 | 2,036 | 1,968 | 1,843 | 2,264 | 2,168 | 2,005 |
| Canada | 1 | -1 | -4 | -24 | -44 | -63 | -73 | -125 | -172 | 79 | 233 | 442 | -652 | -541 | -368 |
| United States | -428 | -455 | -489 | -3,507 | -4,050 | -4,800 | -4,205 | -4,985 | -6,008 | 157 | 2,890 | 6,768 | 1,083 | 3,535 | 6,669 |
| Mexico | -9 | -7 | -6 | -58 | -37 | -2 | -139 | -126 | -112 | -726 | -824 | -1,049 | 44 | -3 | -190 |
| Other APEC | 0 | 0 | -2 | -237 | -258 | -271 | -330 | -334 | -295 | 176 | 223 | 177 | -129 | -262 | -453 |
| EU | -482 | -478 | -455 | -3,131 | -3,112 | -3,054 | -4,027 | -4,027 | -3,989 | -7,259 | -7,743 | -8,381 | 11,620 | 13,282 | 13,703 |
| Rest of the world | -147 | -199 | -292 | -2,138 | -2,343 | -2,494 | -3,275 | -3,606 | -3,802 | -6,641 | -7,428 | -8,125 | 3,500 | 5,702 | 7,827 |
| | | | | | | | | | | | | | | | |
| ASEAN | 1,738 | 2,392 | 2,839 | 4,746 | 6,056 | 7,582 | 5,913 | 7,287 | 9,176 | 5,669 | 6,545 | 7,034 | 7,566 | 8,868 | 10,530 |
| ASEAN+3 | 860 | 1,492 | 1,922 | 15,472 | 19,061 | 20,696 | 18,499 | 22,625 | 23,253 | 23,941 | 29,675 | 29,715 | 30,338 | 38,607 | 41,334 |
| ASEAN+6 | 755 | 1,322 | 1,653 | 14,655 | 18,000 | 19,324 | 17,805 | 23,979 | 27,484 | 23,260 | 29,663 | 31,242 | 31,360 | 41,326 | 45,893 |
| APEC | 312 | 848 | 1,145 | 9,553 | 12,263 | 12,723 | 13,080 | 17,365 | 19,496 | 27,609 | 36,946 | 42,516 | 37,731 | 49,103 | 56,429 |
| Global | -398 | 84 | 299 | 3,816 | 6,324 | 6,669 | 3,768 | 8,673 | 10,833 | 12,404 | 20,360 | 24,471 | 53,144 | 69,359 | 79,487 |

Table 8b Economic effects of FTAs in Asia-Pacific: welfare effect '(millions US$)

| | (ASEAN+1)x3 | | ASEAN+3 | | | (ASEAN+1)x6 | | ASEAN+6 | | | APEC | | Global |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sim3 | Sim4 | Sim3 | Sim4 | Sim5 | Sim3 | Sim4 | Sim3 | Sim4 | Sim5 | Sim3 | Sim4 | Sim3 |
| Japan | -573 | 2,580 | 6,492 | 29,690 | 29,468 | -877 | 1,986 | 7,118 | 32,815 | 32,520 | 9,352 | 48,351 | 7,575 |
| China | -1,233 | 68 | 658 | 18,041 | 54,321 | -1,443 | -269 | 673 | 19,064 | 55,370 | 5,732 | 37,490 | 12,789 |
| Korea | -188 | 792 | 5,964 | 18,858 | 18,758 | -257 | 650 | 6,287 | 19,833 | 19,736 | 7,597 | 25,730 | 10,440 |
| Indonesia | 969 | 3,094 | 693 | 4,530 | 7,909 | 1,734 | 4,140 | 1,166 | 5,273 | 8,664 | 725 | 5,380 | 1,186 |
| Malaysia | 2,064 | 6,976 | 1,471 | 10,453 | 13,403 | 3,403 | 8,722 | 2,529 | 12,041 | 15,052 | 1,686 | 12,879 | 2,960 |
| Philippines | 370 | 2,192 | 145 | 3,375 | 5,062 | 425 | 2,338 | 129 | 3,468 | 5,152 | 151 | 4,887 | 24 |
| Singapore | 2,253 | 5,486 | 1,812 | 7,630 | 7,785 | 2,826 | 6,398 | 2,057 | 8,261 | 8,414 | 1,424 | 8,918 | 1,888 |
| Thailand | 3,618 | 6,939 | 2,855 | 8,822 | 11,879 | 3,880 | 7,425 | 2,650 | 8,839 | 11,898 | 2,024 | 9,311 | 3,219 |
| Vietnam | 868 | 2,093 | 633 | 2,723 | 3,489 | 942 | 2,243 | 645 | 2,814 | 3,578 | 1,030 | 3,687 | 1,371 |
| Other Southeast Asia | -17 | 354 | -27 | 691 | 2,338 | 12 | 404 | -1 | 730 | 2,380 | -7 | 773 | -118 |
| Australia | -358 | -646 | -722 | -1,673 | -1,683 | -151 | 364 | 4,833 | 11,677 | 11,690 | 2,673 | 10,702 | 2,411 |
| New Zealand | -69 | -88 | -145 | -226 | -220 | -9 | 83 | 269 | 1,659 | 1,673 | 393 | 2,237 | 619 |
| India | -372 | -649 | -505 | -1,033 | -1,061 | -594 | -66 | -872 | 2,766 | 13,146 | -1,539 | -3,330 | 1,528 |
| Hong Kong | -42 | -12 | -459 | -688 | -484 | -68 | -38 | -514 | -794 | -585 | 1,554 | 13,990 | 4,402 |
| Taiwan | -677 | -1,190 | -1,511 | -3,197 | -3,219 | -748 | -1,280 | -1,759 | -3,600 | -3,622 | 1,843 | 13,533 | 2,005 |
| Canada | -48 | -93 | -63 | -195 | -255 | -45 | -105 | -172 | -471 | -536 | 442 | 30,194 | -368 |
| United States | -2,479 | -4,822 | -4,800 | -12,319 | -12,815 | -2,579 | -5,035 | -6,008 | -14,393 | -14,992 | 6,768 | 85,232 | 6,669 |
| Mexico | -31 | -115 | -2 | -189 | -260 | -65 | -167 | -112 | -387 | -462 | -1,049 | 16,350 | -190 |
| Other APEC | -96 | -297 | -271 | -1,057 | -1,150 | -68 | -291 | -295 | -1,392 | -1,498 | 177 | 4,830 | -453 |
| EU | -2,045 | -3,641 | -3,054 | -7,010 | -7,460 | -2,208 | -3,945 | -3,989 | -8,663 | -9,225 | -8,381 | -30,348 | 13,703 |
| Rest of the world | -1,187 | -2,785 | -2,494 | -8,167 | -8,503 | -1,590 | -3,394 | -3,802 | -11,641 | -12,052 | -8,125 | -28,782 | 7,827 |
| | | | | | | | | | | | | | |
| ASEAN | 10,125 | 27,135 | 7,582 | 38,225 | 51,865 | 13,222 | 31,670 | 9,176 | 41,426 | 55,139 | 7,034 | 45,835 | 10,530 |
| ASEAN+3 | 8,132 | 30,574 | 20,696 | 104,814 | 154,413 | 10,644 | 34,037 | 23,253 | 113,138 | 162,765 | 29,715 | 157,407 | 41,334 |
| ASEAN+6 | 7,333 | 29,191 | 19,324 | 101,881 | 151,450 | 9,891 | 34,418 | 27,484 | 129,241 | 189,273 | 31,242 | 167,016 | 45,893 |
| APEC | 4,332 | 23,311 | 12,723 | 85,270 | 134,327 | 6,912 | 27,567 | 19,496 | 105,438 | 154,433 | 42,516 | 334,474 | 56,429 |
| Global | 727 | 16,236 | 6,669 | 69,060 | 117,303 | 2,520 | 20,162 | 10,833 | 87,900 | 146,301 | 24,471 | 272,014 | 79,487 |

Data source: author's simulations

Note: Simulations are as follows:

Sim1: Full trade liberalization in the non-agriculture sector

Sim2: Full trade liberalization in the non-agriculture sector and 50%-trade liberalization in the agriculture sector

Sim3: Full trade liberalization in all sectors

Sim4: Full trade liberalization and various facilitation measures in all sectors
(Less efficient falicitation due to lack of common rules of origin for (ASEAN+1)x3 and (ASEAN+1)x6)

Sim5: Full trade liberalization, various facilitation measures, and technical cooperation to LDCs in all sectors
(LDCs include ASEAN countries except Singapore, China, and India (only for ASEAN+6))

Table 9a Economic effects of trade liberalization: per capita welfare effect '(US$)

| | ASEAN | | | ASEAN+3 | | | ASEAN+6 | | | APEC | | | Global | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 |
| Japan | -4 | -4 | -4 | 65 | 63 | 51 | 71 | 75 | 56 | 73 | 87 | 74 | 58 | 71 | 60 |
| China | 0 | 0 | 0 | -1 | -1 | 1 | 0 | 0 | 1 | 4 | 4 | 5 | 8 | 9 | 10 |
| Korea | -3 | -3 | -3 | 77 | 120 | 125 | 87 | 126 | 132 | 86 | 137 | 160 | 117 | 184 | 219 |
| Indonesia | 1 | 1 | 2 | 2 | 3 | 3 | 3 | 4 | 5 | 3 | 3 | 3 | 4 | 5 | 6 |
| Malaysia | 14 | 18 | 16 | 60 | 64 | 62 | 71 | 82 | 107 | 65 | 72 | 71 | 80 | 96 | 125 |
| Philippines | 3 | 3 | 3 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 0 |
| Singapore | 274 | 320 | 424 | 339 | 403 | 544 | 469 | 519 | 618 | 288 | 336 | 427 | 457 | 498 | 567 |
| Thailand | 6 | 8 | 9 | 20 | 31 | 45 | 22 | 32 | 42 | 23 | 29 | 32 | 32 | 41 | 51 |
| Vietnam | -3 | -1 | -1 | 5 | 7 | 8 | 6 | 8 | 8 | 11 | 13 | 13 | 16 | 18 | 17 |
| Other Southeast Asia | -1 | -1 | -1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | -1 | -1 | -2 |
| Australia | -1 | -3 | -6 | -16 | -25 | -37 | 61 | 113 | 249 | 24 | 59 | 138 | 27 | 55 | 124 |
| New Zealand | 0 | -5 | -12 | -10 | -23 | -38 | 35 | 57 | 70 | 39 | 65 | 102 | 51 | 97 | 161 |
| India | 0 | 0 | 0 | 0 | 0 | 0 | -2 | -1 | -1 | -1 | -1 | -1 | 0 | 1 | 1 |
| Hong Kong | 2 | 2 | 1 | -35 | -46 | -64 | -48 | -56 | -72 | 185 | 192 | 217 | 566 | 580 | 615 |
| Taiwan | -5 | -5 | -5 | -67 | -68 | -68 | -74 | -76 | -79 | 91 | 88 | 83 | 102 | 97 | 90 |
| Canada | 0 | 0 | 0 | -1 | -1 | -2 | -2 | -4 | -5 | 3 | 7 | 14 | -21 | -17 | -12 |
| United States | -2 | -2 | -2 | -13 | -15 | -17 | -15 | -18 | -22 | 1 | 10 | 24 | 4 | 13 | 24 |
| Mexico | 0 | 0 | 0 | -1 | 0 | 0 | -1 | -1 | -1 | -7 | -8 | -10 | 0 | 0 | -2 |
| Other APEC | 0 | 0 | 0 | -1 | -1 | -1 | -2 | -2 | -2 | 1 | 1 | 1 | -1 | -1 | -2 |
| EU | -1 | -1 | -1 | -8 | -8 | -8 | -11 | -11 | -11 | -19 | -21 | -22 | 31 | 35 | 36 |
| Rest of the world | 0 | 0 | 0 | -1 | -1 | -1 | -2 | -2 | -2 | -3 | -4 | -4 | 2 | 3 | 4 |
| | | | | | | | | | | | | | | | |
| ASEAN | 3 | 5 | 5 | 9 | 11 | 14 | 11 | 14 | 17 | 11 | 12 | 13 | 14 | 17 | 20 |
| ASEAN+3 | 0 | 1 | 1 | 8 | 10 | 10 | 9 | 11 | 12 | 12 | 15 | 15 | 15 | 20 | 21 |
| ASEAN+6 | 0 | 0 | 1 | 5 | 6 | 6 | 6 | 8 | 9 | 8 | 10 | 10 | 10 | 14 | 15 |
| APEC | 0 | 0 | 0 | 4 | 5 | 5 | 5 | 7 | 7 | 11 | 14 | 16 | 14 | 19 | 22 |
| Global | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 4 | 9 | 11 | 13 |

Table 9b Economic effects of FTAs in Asia-Pacific: per capita welfare effect '(US$)

| | (ASEAN+1)x3 | | ASEAN+3 | | | (ASEAN+1)x6 | | ASEAN+6 | | | APEC | | Global |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sim3 | Sim4 | Sim3 | Sim4 | Sim5 | Sim3 | Sim4 | Sim3 | Sim4 | Sim5 | Sim3 | Sim4 | Sim3 |
| Japan | -5 | 20 | 51 | 234 | 232 | -7 | 16 | 56 | 259 | 256 | 74 | 381 | 60 |
| China | -1 | 0 | 1 | 14 | 43 | -1 | 0 | 1 | 15 | 44 | 5 | 30 | 10 |
| Korea | -4 | 17 | 125 | 396 | 394 | -5 | 14 | 132 | 417 | 415 | 160 | 541 | 219 |
| Indonesia | 5 | 15 | 3 | 21 | 37 | 8 | 19 | 5 | 25 | 41 | 3 | 25 | 6 |
| Malaysia | 87 | 295 | 62 | 442 | 566 | 144 | 368 | 107 | 509 | 636 | 71 | 544 | 125 |
| Philippines | 5 | 27 | 2 | 42 | 63 | 5 | 29 | 2 | 43 | 64 | 2 | 61 | 0 |
| Singapore | 677 | 1,647 | 544 | 2,291 | 2,338 | 849 | 1,921 | 618 | 2,481 | 2,527 | 427 | 2,678 | 567 |
| Thailand | 58 | 111 | 45 | 141 | 189 | 62 | 118 | 42 | 141 | 190 | 32 | 148 | 51 |
| Vietnam | 11 | 26 | 8 | 34 | 44 | 12 | 28 | 8 | 35 | 45 | 13 | 46 | 17 |
| Other Southeast Asia | 0 | 5 | 0 | 10 | 35 | 0 | 6 | 0 | 11 | 35 | 0 | 12 | -2 |
| Australia | -18 | -33 | -37 | -86 | -87 | -8 | 19 | 249 | 601 | 602 | 138 | 551 | 124 |
| New Zealand | -18 | -23 | -38 | -59 | -57 | -2 | 22 | 70 | 431 | 435 | 102 | 581 | 161 |
| India | 0 | -1 | 0 | -1 | -1 | -1 | 0 | -1 | 3 | 13 | -1 | -3 | 1 |
| Hong Kong | -6 | -2 | -64 | -96 | -68 | -10 | -5 | -72 | -111 | -82 | 217 | 1,954 | 615 |
| Taiwan | -30 | -53 | -68 | -143 | -144 | -34 | -57 | -79 | -161 | -162 | 83 | 607 | 90 |
| Canada | -2 | -3 | -2 | -6 | -8 | -1 | -3 | -5 | -15 | -17 | 14 | 967 | -12 |
| United States | -9 | -17 | -17 | -44 | -46 | -9 | -18 | -22 | -52 | -54 | 24 | 307 | 24 |
| Mexico | 0 | -1 | 0 | -2 | -3 | -1 | -2 | -1 | -4 | -5 | -10 | 162 | -2 |
| Other APEC | -1 | -2 | -1 | -6 | -6 | 0 | -2 | -2 | -7 | -8 | 1 | 26 | -2 |
| EU | -5 | -10 | -8 | -19 | -20 | -6 | -10 | -11 | -23 | -25 | -22 | -81 | 36 |
| Rest of the world | -1 | -1 | -1 | -4 | -4 | -1 | -2 | -2 | -6 | -6 | -4 | -14 | 4 |
| | | | | | | | | | | | | | |
| ASEAN | 19 | 51 | 14 | 72 | 98 | 25 | 60 | 17 | 78 | 104 | 13 | 87 | 20 |
| ASEAN+3 | 4 | 15 | 10 | 53 | 78 | 5 | 17 | 12 | 57 | 82 | 15 | 80 | 21 |
| ASEAN+6 | 2 | 10 | 6 | 34 | 50 | 3 | 11 | 9 | 43 | 62 | 10 | 55 | 15 |
| APEC | 2 | 9 | 5 | 33 | 51 | 3 | 11 | 7 | 40 | 59 | 16 | 127 | 22 |
| Global | 0 | 3 | 1 | 11 | 19 | 0 | 3 | 2 | 14 | 24 | 4 | 44 | 13 |

Data source: author's simulations

Note: Simulations are as follows:

Sim1: Full trade liberalization in the non-agriculture sector

Sim2: Full trade liberalization in the non-agriculture sector and 50%-trade liberalization in the agriculture sector

Sim3: Full trade liberalization in all sectors

Sim4: Full trade liberalization and various facilitation measures in all sectors
(Less efficient falicitation due to lack of common rules of origin for (ASEAN+1)x3 and (ASEAN+1)x6)

Sim5: Full trade liberalization, various facilitation measures, and technical cooperation to LDCs in all sectors
(LDCs include ASEAN countries except Singapore, China, and India (only for ASEAN+6))

Table 10a Economic effects of trade liberalization: real export growth (Percent)

| | ASEAN | | | ASEAN+3 | | | ASEAN+6 | | | APEC | | | Global | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 |
| Japan | 0.03 | 0.03 | 0.03 | 3.08 | 3.47 | 4.26 | 3.39 | 4.08 | 5.84 | 3.47 | 5.16 | 8.30 | 6.24 | 8.24 | 11.59 |
| China | -0.04 | -0.04 | -0.05 | 10.76 | 11.13 | 12.00 | 11.44 | 11.87 | 12.77 | 18.80 | 19.84 | 21.99 | 25.99 | 27.70 | 31.15 |
| Korea | -0.02 | -0.01 | -0.01 | 4.22 | 4.74 | 8.70 | 4.46 | 5.07 | 8.91 | 5.33 | 6.48 | 10.10 | 7.34 | 8.68 | 12.47 |
| Indonesia | 0.94 | 1.06 | 1.23 | 2.76 | 2.90 | 3.12 | 3.07 | 3.23 | 3.45 | 3.55 | 3.78 | 4.08 | 6.35 | 6.63 | 6.98 |
| Malaysia | 0.69 | 0.79 | 0.97 | 1.87 | 1.98 | 2.14 | 2.07 | 2.16 | 2.25 | 2.21 | 2.42 | 2.79 | 2.52 | 2.74 | 3.06 |
| Philippines | 0.31 | 0.58 | 1.38 | 1.70 | 1.88 | 2.60 | 1.77 | 2.10 | 2.95 | 1.68 | 2.57 | 4.06 | 2.19 | 3.26 | 4.82 |
| Singapore | 0.38 | 0.26 | -0.02 | 1.05 | 0.84 | 0.41 | 1.17 | 0.93 | 0.41 | 0.44 | 0.30 | 0.01 | -0.32 | -0.54 | -0.97 |
| Thailand | 2.46 | 2.59 | 3.14 | 6.69 | 6.46 | 6.60 | 7.01 | 6.98 | 7.48 | 7.39 | 7.77 | 8.81 | 8.54 | 9.21 | 10.47 |
| Vietnam | 6.53 | 8.00 | 13.40 | 18.98 | 20.67 | 26.61 | 19.29 | 21.37 | 27.23 | 28.45 | 31.04 | 37.94 | 36.96 | 40.25 | 47.17 |
| Other Southeast Asia | 4.37 | 5.62 | 7.43 | 8.33 | 9.70 | 11.68 | 8.43 | 10.12 | 12.10 | 11.04 | 12.57 | 14.79 | 12.43 | 14.14 | 16.28 |
| Australia | -0.04 | -0.04 | -0.03 | 0.03 | 0.01 | 0.00 | 3.94 | 3.82 | 3.59 | 4.49 | 4.50 | 4.48 | 6.55 | 6.60 | 6.61 |
| New Zealand | -0.02 | -0.01 | 0.00 | 0.06 | 0.08 | 0.14 | 1.51 | 1.41 | 1.32 | 1.80 | 1.80 | 1.90 | 2.47 | 2.51 | 2.66 |
| India | -0.01 | -0.01 | -0.02 | 0.03 | -0.02 | -0.07 | 14.98 | 17.22 | 24.73 | -0.37 | -0.36 | -0.26 | 34.68 | 38.59 | 47.55 |
| Hong Kong | -0.01 | -0.02 | -0.02 | -0.43 | -0.45 | -0.48 | -0.43 | -0.45 | -0.50 | 1.27 | 1.30 | 1.37 | 6.65 | 6.69 | 6.80 |
| Taiwan | -0.03 | -0.03 | -0.03 | -0.61 | -0.60 | -0.57 | -0.64 | -0.65 | -0.64 | 3.38 | 3.76 | 4.28 | 4.42 | 4.91 | 5.53 |
| Canada | -0.01 | -0.01 | -0.01 | 0.14 | 0.15 | 0.17 | 0.17 | 0.18 | 0.18 | 0.76 | 0.95 | 1.17 | 1.16 | 1.46 | 1.80 |
| United States | 0.01 | 0.01 | 0.01 | 0.06 | -0.02 | -0.11 | 0.05 | -0.03 | -0.08 | 3.74 | 4.10 | 4.67 | 7.19 | 7.67 | 8.36 |
| Mexico | 0.02 | 0.02 | 0.03 | 0.27 | 0.28 | 0.29 | 0.35 | 0.36 | 0.39 | 3.78 | 4.32 | 5.02 | 7.12 | 7.84 | 8.79 |
| Other APEC | 0.01 | 0.01 | 0.01 | -0.01 | -0.05 | -0.10 | 0.01 | -0.04 | -0.08 | 3.14 | 3.42 | 3.87 | 11.80 | 12.68 | 13.77 |
| EU | -0.01 | -0.01 | -0.01 | 0.04 | 0.03 | 0.03 | 0.04 | 0.03 | 0.02 | -0.03 | 0.01 | 0.08 | 1.59 | 1.88 | 2.30 |
| Rest of the world | -0.01 | -0.01 | -0.01 | 0.07 | 0.06 | 0.05 | 0.06 | 0.04 | 0.03 | -0.21 | -0.19 | -0.15 | 8.27 | 9.53 | 11.18 |
| | | | | | | | | | | | | | | | |
| ASEAN | 1.20 | 1.33 | 1.73 | 3.34 | 3.40 | 3.70 | 3.55 | 3.67 | 3.99 | 3.90 | 4.22 | 4.89 | 4.78 | 5.19 | 5.85 |
| ASEAN+3 | 0.36 | 0.40 | 0.52 | 5.27 | 5.57 | 6.63 | 5.63 | 6.07 | 7.44 | 7.76 | 8.80 | 11.00 | 11.00 | 12.35 | 14.97 |
| ASEAN+6 | 0.32 | 0.36 | 0.47 | 4.78 | 5.05 | 6.01 | 5.86 | 6.34 | 7.86 | 7.24 | 8.18 | 10.18 | 11.60 | 12.98 | 15.69 |
| APEC | 0.16 | 0.18 | 0.24 | 2.40 | 2.51 | 2.97 | 2.66 | 2.83 | 3.44 | 5.21 | 5.86 | 7.10 | 8.45 | 9.32 | 10.84 |
| Global | 0.07 | 0.08 | 0.11 | 1.15 | 1.19 | 1.40 | 1.40 | 1.49 | 1.84 | 2.39 | 2.71 | 3.33 | 6.15 | 6.90 | 8.11 |

Table 10b Economic effects of FTAs in Asia-Pacific: real export growth (Percent)

| | (ASEAN+1)x3 | | ASEAN+3 | | | (ASEAN+1)x6 | | ASEAN+6 | | | APEC | | Global |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sim3 | Sim4 | Sim3 | Sim4 | Sim5 | Sim3 | Sim4 | Sim3 | Sim4 | Sim5 | Sim3 | Sim4 | Sim3 |
| Japan | 1.25 | 2.00 | 4.26 | 8.80 | 8.92 | 1.28 | 2.04 | 5.84 | 10.71 | 10.89 | 8.30 | 16.77 | 11.59 |
| China | 3.03 | 4.23 | 12.00 | 22.02 | 22.60 | 2.89 | 4.02 | 12.77 | 23.28 | 23.89 | 21.99 | 37.38 | 31.15 |
| Korea | 0.72 | 1.05 | 8.70 | 13.98 | 13.98 | 0.72 | 1.03 | 8.91 | 14.25 | 14.25 | 10.10 | 17.04 | 12.47 |
| Indonesia | 3.40 | 5.99 | 3.12 | 7.73 | 8.50 | 4.01 | 6.97 | 3.45 | 8.59 | 9.37 | 4.08 | 10.38 | 6.98 |
| Malaysia | 2.45 | 4.38 | 2.14 | 5.35 | 6.61 | 2.73 | 4.82 | 2.25 | 5.64 | 6.90 | 2.79 | 6.67 | 3.06 |
| Philippines | 2.34 | 6.03 | 2.60 | 8.91 | 8.96 | 2.68 | 6.61 | 2.95 | 9.60 | 9.65 | 4.06 | 14.08 | 4.82 |
| Singapore | 1.13 | 5.17 | 0.41 | 6.64 | 6.64 | 1.21 | 5.23 | 0.41 | 6.55 | 6.54 | 0.01 | 6.73 | -0.97 |
| Thailand | 6.57 | 9.62 | 6.60 | 11.92 | 12.33 | 7.37 | 10.63 | 7.48 | 13.11 | 13.52 | 8.81 | 14.59 | 10.47 |
| Vietnam | 28.00 | 32.08 | 26.61 | 31.36 | 31.96 | 28.85 | 33.16 | 27.23 | 32.22 | 32.83 | 37.94 | 45.79 | 47.17 |
| Other Southeast Asia | 11.74 | 15.52 | 11.68 | 19.15 | 15.79 | 12.11 | 16.05 | 12.10 | 20.03 | 16.78 | 14.79 | 26.56 | 16.28 |
| Australia | -0.13 | -0.28 | 0.00 | -0.19 | -0.16 | 0.97 | 1.29 | 3.59 | 5.36 | 5.40 | 4.48 | 7.52 | 6.61 |
| New Zealand | -0.03 | -0.06 | 0.14 | 0.11 | 0.11 | 0.13 | 0.21 | 1.32 | 3.48 | 3.47 | 1.90 | 4.76 | 2.66 |
| India | -0.04 | -0.12 | -0.07 | -0.21 | -0.17 | 15.37 | 17.36 | 24.73 | 33.42 | 31.66 | -0.26 | -0.10 | 47.55 |
| Hong Kong | -0.17 | -0.34 | -0.48 | -1.00 | -1.04 | -0.18 | -0.35 | -0.50 | -1.02 | -1.05 | 1.37 | 3.14 | 6.80 |
| Taiwan | -0.26 | -0.79 | -0.57 | -2.22 | -2.25 | -0.27 | -0.82 | -0.64 | -2.41 | -2.44 | 4.28 | 12.36 | 5.53 |
| Canada | 0.00 | 0.00 | 0.17 | 0.32 | 0.31 | 0.01 | 0.00 | 0.18 | 0.37 | 0.37 | 1.17 | 8.29 | 1.80 |
| United States | 0.00 | -0.13 | -0.11 | -0.54 | -0.46 | 0.00 | -0.13 | -0.08 | -0.53 | -0.42 | 4.67 | 16.17 | 8.36 |
| Mexico | 0.11 | 0.13 | 0.29 | 0.49 | 0.49 | 0.14 | 0.17 | 0.39 | 0.67 | 0.69 | 5.02 | 11.05 | 8.79 |
| Other APEC | 0.00 | 0.02 | -0.10 | -0.09 | -0.07 | 0.01 | 0.03 | -0.08 | -0.05 | -0.01 | 3.87 | 7.76 | 13.77 |
| EU | -0.02 | -0.06 | 0.03 | -0.03 | -0.02 | -0.03 | -0.08 | 0.02 | -0.04 | -0.03 | 0.08 | 0.06 | 2.30 |
| Rest of the world | -0.01 | -0.02 | 0.05 | 0.12 | 0.13 | -0.02 | -0.03 | 0.03 | 0.10 | 0.13 | -0.15 | -0.20 | 11.18 |
| | | | | | | | | | | | | | |
| ASEAN | 4.03 | 7.06 | 3.70 | 8.66 | 9.16 | 4.43 | 7.62 | 3.99 | 9.16 | 9.66 | 4.89 | 11.00 | 5.85 |
| ASEAN+3 | 2.48 | 3.98 | 6.63 | 12.80 | 13.13 | 2.57 | 4.10 | 7.44 | 13.91 | 14.27 | 11.00 | 20.33 | 14.97 |
| ASEAN+6 | 2.24 | 3.59 | 6.01 | 11.59 | 11.90 | 2.96 | 4.44 | 7.86 | 14.15 | 14.41 | 10.18 | 18.82 | 15.69 |
| APEC | 1.11 | 1.73 | 2.97 | 5.59 | 5.76 | 1.18 | 1.82 | 3.44 | 6.24 | 6.44 | 7.10 | 15.99 | 10.84 |
| Global | 0.51 | 0.78 | 1.40 | 2.62 | 2.70 | 0.68 | 0.97 | 1.84 | 3.21 | 3.30 | 3.33 | 7.46 | 8.11 |

Data source: author's simulations

Note: Simulations are as follows:

Sim1: Full trade liberalization in the non-agriculture sector

Sim2: Full trade liberalization in the non-agriculture sector and 50%-trade liberalization in the agriculture sector

Sim3: Full trade liberalization in all sectors

Sim4: Full trade liberalization and various facilitation measures in all sectors
(Less efficient falicitation due to lack of common rules of origin for (ASEAN+1)x3 and (ASEAN+1)x6)

Sim5: Full trade liberalization, various facilitation measures, and technical cooperation to LDCs in all sectors
(LDCs include ASEAN countries except Singapore, China, and India (only for ASEAN+6))

Table 11a Economic effects of trade liberalization: real import growth '(Percent)

| | ASEAN | | | ASEAN+3 | | | ASEAN+6 | | | APEC | | | Global | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 | Sim1 | Sim2 | Sim3 |
| Japan | -0.23 | -0.24 | -0.25 | 6.19 | 6.63 | 7.47 | 6.64 | 7.33 | 8.93 | 6.56 | 8.17 | 11.09 | 5.89 | 7.69 | 10.65 |
| China | -0.14 | -0.15 | -0.16 | 16.09 | 16.58 | 17.77 | 17.12 | 17.70 | 18.88 | 27.75 | 29.27 | 32.55 | 36.71 | 39.12 | 44.31 |
| Korea | -0.13 | -0.13 | -0.12 | 7.83 | 8.55 | 13.73 | 8.36 | 9.19 | 14.17 | 9.55 | 11.07 | 15.73 | 12.37 | 14.13 | 18.97 |
| Indonesia | 2.03 | 2.24 | 2.62 | 5.83 | 6.11 | 6.59 | 6.64 | 6.97 | 7.63 | 7.66 | 7.96 | 8.39 | 12.08 | 12.47 | 13.10 |
| Malaysia | 1.90 | 2.08 | 2.53 | 5.19 | 5.41 | 5.80 | 5.65 | 5.90 | 6.49 | 5.84 | 6.16 | 6.89 | 6.27 | 6.71 | 7.73 |
| Philippines | 1.47 | 1.71 | 2.33 | 2.61 | 2.87 | 3.54 | 2.80 | 3.11 | 3.79 | 3.23 | 3.85 | 4.86 | 3.28 | 3.97 | 4.99 |
| Singapore | 1.31 | 1.33 | 1.40 | 2.17 | 2.18 | 2.21 | 2.72 | 2.65 | 2.47 | 1.39 | 1.40 | 1.39 | 1.07 | 0.98 | 0.76 |
| Thailand | 5.35 | 5.64 | 6.59 | 13.78 | 14.18 | 15.66 | 14.53 | 15.06 | 16.65 | 15.43 | 16.29 | 18.13 | 17.90 | 19.29 | 21.72 |
| Vietnam | 4.96 | 6.07 | 9.08 | 17.41 | 18.82 | 22.36 | 17.97 | 19.43 | 22.73 | 25.52 | 27.06 | 30.62 | 32.89 | 34.51 | 37.75 |
| Other Southeast Asia | 6.31 | 8.03 | 10.45 | 11.69 | 13.45 | 15.85 | 11.65 | 13.77 | 15.97 | 15.28 | 17.14 | 19.77 | 11.05 | 12.89 | 14.84 |
| Australia | -0.11 | -0.19 | -0.31 | -0.80 | -1.16 | -1.63 | 6.94 | 8.98 | 14.21 | 6.74 | 8.11 | 11.11 | 8.31 | 9.41 | 12.00 |
| New Zealand | -0.05 | -0.17 | -0.35 | -0.37 | -0.66 | -1.02 | 3.09 | 3.51 | 3.66 | 3.68 | 4.32 | 5.33 | 4.40 | 5.63 | 7.44 |
| India | -0.14 | -0.16 | -0.19 | -0.92 | -0.95 | -1.00 | 16.68 | 18.72 | 25.40 | -2.44 | -2.65 | -2.90 | 37.50 | 40.85 | 48.50 |
| Hong Kong | 0.00 | -0.01 | -0.02 | -0.70 | -0.79 | -0.94 | -0.82 | -0.90 | -1.05 | 2.32 | 2.38 | 2.58 | 9.81 | 9.93 | 10.23 |
| Taiwan | -0.13 | -0.13 | -0.13 | -2.03 | -2.02 | -1.98 | -2.25 | -2.27 | -2.30 | 5.96 | 6.34 | 6.89 | 7.00 | 7.47 | 8.07 |
| Canada | -0.03 | -0.03 | -0.03 | 0.01 | 0.01 | 0.00 | -0.01 | -0.04 | -0.10 | 0.65 | 0.95 | 1.36 | 0.15 | 0.50 | 0.98 |
| United States | -0.07 | -0.08 | -0.09 | -0.71 | -0.82 | -0.97 | -0.89 | -1.03 | -1.23 | 2.15 | 2.71 | 3.49 | 3.10 | 3.67 | 4.37 |
| Mexico | -0.02 | -0.01 | 0.00 | 0.04 | 0.08 | 0.14 | 0.05 | 0.10 | 0.13 | 3.59 | 3.97 | 4.40 | 7.21 | 7.76 | 8.45 |
| Other APEC | -0.04 | -0.04 | -0.05 | -0.71 | -0.78 | -0.88 | -0.82 | -0.92 | -1.04 | 5.40 | 5.66 | 6.07 | 15.45 | 16.24 | 17.20 |
| EU | -0.05 | -0.05 | -0.05 | -0.29 | -0.29 | -0.30 | -0.38 | -0.39 | -0.42 | -0.68 | -0.72 | -0.79 | 1.14 | 1.31 | 1.53 |
| Rest of the world | -0.04 | -0.04 | -0.06 | -0.38 | -0.40 | -0.41 | -0.53 | -0.58 | -0.65 | -1.32 | -1.46 | -1.60 | 9.62 | 11.00 | 12.86 |
| | | | | | | | | | | | | | | | |
| ASEAN | 2.52 | 2.77 | 3.39 | 6.33 | 6.62 | 7.36 | 6.87 | 7.20 | 7.92 | 7.36 | 7.80 | 8.69 | 8.68 | 9.23 | 10.20 |
| ASEAN+3 | 0.66 | 0.73 | 0.92 | 8.69 | 9.13 | 10.59 | 9.31 | 9.88 | 11.55 | 11.99 | 13.21 | 15.81 | 14.57 | 16.12 | 19.21 |
| ASEAN+6 | 0.57 | 0.63 | 0.79 | 7.66 | 8.03 | 9.30 | 9.44 | 10.15 | 12.22 | 10.98 | 12.13 | 14.61 | 15.16 | 16.76 | 20.01 |
| APEC | 0.21 | 0.23 | 0.29 | 2.81 | 2.92 | 3.38 | 3.14 | 3.33 | 3.98 | 6.09 | 6.85 | 8.28 | 8.18 | 9.09 | 10.70 |
| Global | 0.07 | 0.08 | 0.11 | 1.15 | 1.20 | 1.41 | 1.40 | 1.49 | 1.84 | 2.39 | 2.71 | 3.32 | 6.13 | 6.88 | 8.08 |

Table 11b Economic effects of FTAs in Asia-Pacific: real import growth '(Percent)

| | (ASEAN+1)x3 | | ASEAN+3 | | | (ASEAN+1)x6 | | ASEAN+6 | | | APEC | | Global |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sim3 | Sim4 | Sim3 | Sim4 | Sim5 | Sim3 | Sim4 | Sim3 | Sim4 | Sim5 | Sim3 | Sim4 | Sim3 |
| Japan | 1.20 | 2.51 | 7.47 | 17.71 | 17.76 | 1.05 | 2.26 | 8.93 | 19.49 | 19.50 | 11.09 | 25.76 | 10.65 |
| China | 4.59 | 6.05 | 17.77 | 31.40 | 32.25 | 4.26 | 5.56 | 18.88 | 33.16 | 34.01 | 32.55 | 53.41 | 44.31 |
| Korea | 1.03 | 1.55 | 13.73 | 23.33 | 23.30 | 0.92 | 1.36 | 14.17 | 23.90 | 23.86 | 15.73 | 27.53 | 18.97 |
| Indonesia | 7.78 | 13.84 | 6.59 | 16.61 | 18.16 | 9.89 | 16.85 | 7.63 | 18.42 | 19.96 | 8.39 | 20.22 | 13.10 |
| Malaysia | 6.86 | 11.18 | 5.80 | 12.29 | 13.49 | 8.05 | 12.77 | 6.49 | 13.28 | 14.47 | 6.89 | 13.87 | 7.73 |
| Philippines | 4.50 | 12.71 | 3.54 | 17.06 | 19.47 | 5.07 | 13.64 | 3.79 | 17.56 | 19.95 | 4.86 | 23.98 | 4.99 |
| Singapore | 3.37 | 9.18 | 2.21 | 11.32 | 11.47 | 4.06 | 10.13 | 2.47 | 11.74 | 11.87 | 1.39 | 11.21 | 0.76 |
| Thailand | 17.09 | 24.96 | 15.66 | 28.56 | 30.37 | 18.75 | 27.16 | 16.65 | 29.99 | 31.77 | 18.13 | 31.75 | 21.72 |
| Vietnam | 24.91 | 32.63 | 22.36 | 33.04 | 35.29 | 25.87 | 34.06 | 22.73 | 33.68 | 35.92 | 30.62 | 43.22 | 37.75 |
| Other Southeast Asia | 16.49 | 22.78 | 15.85 | 27.24 | 30.70 | 16.83 | 23.40 | 15.97 | 27.52 | 31.04 | 19.77 | 33.85 | 14.84 |
| Australia | -0.93 | -1.61 | -1.63 | -3.59 | -3.56 | 0.86 | 1.54 | 14.21 | 23.51 | 23.58 | 11.11 | 20.63 | 12.00 |
| New Zealand | -0.58 | -0.79 | -1.02 | -1.78 | -1.74 | 0.08 | 0.44 | 3.66 | 11.73 | 11.80 | 5.33 | 14.91 | 7.44 |
| India | -0.64 | -1.15 | -1.00 | -2.12 | -2.12 | 14.72 | 16.39 | 25.40 | 34.60 | 36.51 | -2.90 | -6.70 | 48.50 |
| Hong Kong | -0.22 | -0.37 | -0.94 | -1.73 | -1.54 | -0.26 | -0.41 | -1.05 | -1.92 | -1.72 | 2.58 | 9.01 | 10.23 |
| Taiwan | -0.88 | -2.03 | -1.98 | -5.60 | -5.65 | -0.96 | -2.15 | -2.30 | -6.22 | -6.28 | 6.89 | 18.82 | 8.07 |
| Canada | -0.09 | -0.15 | 0.00 | -0.02 | -0.05 | -0.10 | -0.17 | -0.10 | -0.18 | -0.22 | 1.36 | 16.39 | 0.98 |
| United States | -0.44 | -0.87 | -0.97 | -2.47 | -2.49 | -0.47 | -0.93 | -1.23 | -2.97 | -3.01 | 3.49 | 11.84 | 4.37 |
| Mexico | -0.01 | -0.10 | 0.14 | 0.03 | -0.04 | 0.00 | -0.09 | 0.13 | 0.01 | -0.07 | 4.40 | 18.14 | 8.45 |
| Other APEC | -0.34 | -0.56 | -0.88 | -1.80 | -1.85 | -0.33 | -0.57 | -1.04 | -2.15 | -2.21 | 6.07 | 13.83 | 17.20 |
| EU | -0.19 | -0.36 | -0.30 | -0.75 | -0.77 | -0.22 | -0.41 | -0.42 | -0.97 | -1.01 | -0.79 | -2.81 | 1.53 |
| Rest of the world | -0.21 | -0.41 | -0.41 | -1.05 | -1.08 | -0.27 | -0.49 | -0.65 | -1.51 | -1.55 | -1.60 | -4.60 | 12.86 |
| | | | | | | | | | | | | | |
| ASEAN | 8.61 | 14.90 | 7.36 | 17.33 | 18.58 | 9.72 | 16.45 | 7.92 | 18.21 | 19.44 | 8.69 | 20.12 | 10.20 |
| ASEAN+3 | 4.24 | 7.03 | 10.59 | 21.42 | 22.02 | 4.45 | 7.29 | 11.55 | 22.76 | 23.34 | 15.81 | 30.50 | 19.21 |
| ASEAN+6 | 3.70 | 6.13 | 9.30 | 18.80 | 19.33 | 4.67 | 7.32 | 12.22 | 23.20 | 23.81 | 14.61 | 28.14 | 20.01 |
| APEC | 1.32 | 2.11 | 3.38 | 6.57 | 6.79 | 1.43 | 2.25 | 3.98 | 7.48 | 7.67 | 8.28 | 19.77 | 10.70 |
| Global | 0.51 | 0.79 | 1.41 | 2.63 | 2.72 | 0.67 | 0.98 | 1.84 | 3.23 | 3.31 | 3.32 | 7.48 | 8.08 |

Data source: author's simulations

Note: Simulations are as follows:

Sim1: Full trade liberalization in the non-agriculture sector

Sim2: Full trade liberalization in the non-agriculture sector and 50%-trade liberalization in the agriculture sector

Sim3: Full trade liberalization in all sectors

Sim4: Full trade liberalization and various facilitation measures in all sectors
(Less efficient falicitation due to lack of common rules of origin for (ASEAN+1)x3 and (ASEAN+1)x6)

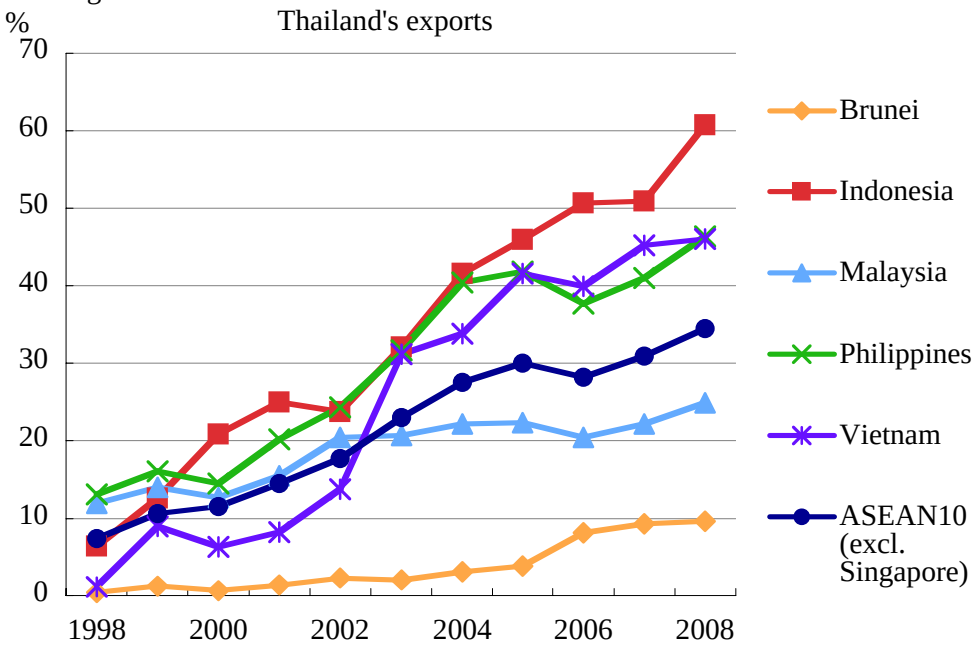
Sim5: Full trade liberalization, various facilitation measures, and technical cooperation to LDCs in all sectors
(LDCs include ASEAN countries except Singapore, China, and India (only for ASEAN+6))

Table 12 Sectoral effects of ASEAN+6 FTA: Sim 5 (%)

| | Japan | China | Korea | Indonesia | Malaysia | Philippines | Singapore | Thailand | Vietnam | Southeast Asia | Australia | New Zealand | India |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **(a) Outputs** | | | | | | | | | | | | | |
| Agriculture and food | -5.6 | 4.7 | -16.8 | 4.1 | 25.1 | -3.9 | 46.6 | 1.0 | -10.9 | 0.9 | 21.4 | 0.6 | -2.6 |
| Fishery and forestry | -2.5 | 1.1 | -5.5 | 1.9 | 1.0 | 2.1 | -1.2 | 0.1 | 2.6 | 3.2 | 0.5 | -0.2 | 1.6 |
| Mining | -5.2 | -0.3 | -18.3 | -0.3 | -1.1 | -22.6 | -1.2 | -7.4 | -0.3 | 4.6 | -2.7 | 0.0 | -2.2 |
| Texitle and apparel | -0.5 | -1.8 | 24.6 | -9.3 | 21.1 | -20.5 | -18.4 | -23.9 | 107.3 | -5.7 | -35.8 | -15.5 | 7.3 |
| Wood and paper | -1.7 | -4.6 | 1.4 | 0.5 | 1.7 | -10.7 | -2.2 | -15.5 | 11.0 | 5.7 | -6.5 | 5.6 | -0.4 |
| Mineral products | 1.0 | -3.3 | 5.0 | 2.0 | -1.6 | -2.4 | 5.0 | 9.1 | 14.0 | 1.6 | -6.9 | -0.1 | 4.8 |
| Iron and steel | 3.1 | -3.9 | -3.9 | 1.7 | 11.2 | -9.5 | 9.9 | 3.5 | -29.1 | -4.8 | -17.9 | -0.7 | -1.9 |
| General machinery | 3.9 | -3.7 | -9.3 | 35.2 | 21.4 | 17.9 | 16.0 | 23.0 | 23.2 | -10.2 | -25.0 | -2.9 | 2.1 |
| Electronic machinery | -5.9 | 24.1 | 1.7 | -4.3 | 0.3 | 20.9 | 17.2 | 27.2 | -11.5 | -5.6 | -20.9 | -23.4 | -4.2 |
| Transport equipment | 0.8 | -6.9 | -8.4 | -6.9 | -3.3 | 25.4 | -27.4 | 3.7 | -22.4 | -3.0 | -21.0 | -10.0 | -1.8 |
| Other manufacturing | -3.6 | -3.8 | 37.6 | -20.9 | 7.3 | -31.9 | -9.4 | -21.3 | 20.3 | 0.0 | -19.4 | 1.8 | 12.1 |
| Construction | 0.3 | -0.4 | 2.8 | 1.4 | -3.9 | 2.9 | -1.2 | 2.3 | -2.1 | 1.6 | 1.2 | 1.0 | 2.4 |
| Trade | 1.9 | 7.0 | 10.2 | 12.1 | 24.5 | 27.2 | 12.6 | 40.8 | 23.2 | 5.1 | 10.2 | 7.5 | 7.1 |
| Transport and communication | -0.3 | -0.9 | -2.5 | -1.4 | -5.9 | -5.2 | -7.9 | -8.5 | 5.6 | 1.6 | -3.8 | -3.8 | 2.9 |
| Public services | 0.1 | 2.9 | 0.4 | 2.0 | 4.5 | 3.5 | 5.6 | 1.0 | -4.5 | 1.9 | 0.6 | 1.1 | 0.2 |
| Other services | 0.0 | -0.1 | 0.2 | -0.4 | -9.0 | 1.1 | -10.0 | -2.3 | -3.8 | 1.6 | -0.6 | -0.3 | 1.6 |
| **(b) Exports** | | | | | | | | | | | | | |
| Agriculture and food | 31.8 | 117.5 | 200.5 | 33.9 | 59.2 | -20.9 | 82.4 | 25.1 | 18.7 | 64.8 | 60.8 | 3.2 | 34.5 |
| Fishery and forestry | 40.0 | 10.0 | 42.5 | 4.5 | -6.6 | -36.9 | -1.2 | -8.6 | -38.1 | 12.1 | -10.2 | -6.4 | 6.5 |
| Mining | 194.4 | 104.1 | 102.0 | 5.4 | 13.9 | -3.5 | 9.0 | 16.0 | -6.1 | 7.8 | 8.1 | 52.1 | 195.5 |
| Texitle and apparel | 124.1 | 27.8 | 51.3 | -2.2 | 33.5 | -15.8 | -16.7 | -26.9 | 147.1 | 2.0 | -3.0 | 4.8 | 24.7 |
| Wood and paper | 37.0 | -0.4 | 36.7 | 3.3 | 8.3 | -15.4 | 0.8 | -15.3 | 54.0 | 66.1 | 3.3 | 23.4 | 12.2 |
| Mineral products | 19.8 | 14.4 | 33.2 | 26.3 | 12.1 | 28.6 | 9.5 | 37.6 | 124.9 | 295.4 | 3.0 | 14.9 | 55.4 |
| Iron and steel | 32.8 | 16.1 | 20.8 | 18.9 | 44.2 | -24.0 | 26.6 | 25.6 | -25.3 | 39.7 | -18.3 | 17.0 | 38.1 |
| General machinery | 14.8 | 15.0 | 7.5 | 60.0 | 38.3 | 23.5 | 20.4 | 36.1 | 64.0 | 34.4 | -19.8 | 9.5 | 47.6 |
| Electronic machinery | 0.3 | 53.0 | 7.9 | 2.3 | 1.1 | 22.0 | 17.9 | 35.3 | 23.9 | 194.4 | -2.4 | -24.1 | 75.7 |
| Transport equipment | 2.7 | 22.4 | -10.4 | 25.6 | 56.1 | 81.2 | -33.4 | 44.9 | 95.0 | 39.5 | -12.7 | -1.7 | 23.9 |
| Other manufacturing | 11.7 | -1.1 | 79.5 | -21.0 | 26.2 | -39.1 | -5.3 | -27.3 | 28.4 | 9.9 | -20.6 | 22.1 | 26.5 |
| Construction | -3.2 | -5.5 | -9.9 | -20.4 | -23.9 | -40.9 | -27.6 | -41.6 | -38.0 | 0.2 | -29.7 | -15.4 | 8.3 |
| Trade | -6.2 | 1.8 | -16.7 | -6.6 | 2.7 | -25.9 | -26.2 | -19.5 | -20.6 | -1.1 | -25.7 | -10.9 | 5.5 |
| Transport and communication | -1.3 | -5.2 | -6.7 | -11.4 | -8.9 | -21.5 | -13.5 | -27.4 | 2.4 | -0.3 | -26.5 | -9.8 | 7.9 |
| Public services | -12.5 | -10.0 | -27.7 | -24.5 | -22.5 | -43.9 | -31.5 | -42.2 | -43.7 | -7.0 | -33.7 | -19.8 | -3.8 |
| Other services | -10.0 | -8.1 | -25.6 | -21.5 | -18.3 | -41.6 | -31.6 | -39.9 | -57.2 | -2.3 | -32.7 | -19.4 | 5.0 |
| **(c) Imports** | | | | | | | | | | | | | |
| Agriculture and food | 40.3 | 43.1 | 97.2 | 30.3 | 40.4 | 52.5 | 20.0 | 70.2 | 101.9 | 49.1 | 44.3 | 14.2 | 146.5 |
| Fishery and forestry | -1.1 | 9.8 | 0.8 | 18.8 | 18.3 | 12.0 | 9.0 | 10.7 | 52.7 | 12.4 | 23.2 | 7.0 | 12.2 |
| Mining | -0.6 | 18.4 | 2.6 | 53.3 | 44.1 | 0.2 | 3.5 | 10.7 | 239.2 | 104.4 | 44.7 | 12.9 | 20.8 |
| Texitle and apparel | 50.7 | 78.2 | 59.8 | 34.9 | 29.9 | 6.0 | 4.0 | 71.3 | 87.2 | 33.3 | 42.0 | 18.9 | 104.8 |
| Wood and paper | 13.6 | 24.6 | 27.2 | 20.9 | 16.1 | 12.1 | 10.8 | 26.2 | 54.3 | 20.8 | 31.0 | 19.5 | 31.5 |
| Mineral products | 13.5 | 35.8 | 22.8 | 12.2 | 16.6 | 9.5 | 7.4 | 24.0 | 18.5 | 18.5 | 18.8 | 7.4 | 32.8 |
| Iron and steel | 19.2 | 24.9 | 21.5 | 19.9 | 16.2 | 44.5 | 12.5 | 17.4 | 19.6 | 21.3 | 32.1 | 13.3 | 50.1 |
| General machinery | 21.4 | 41.0 | 31.8 | 14.9 | 17.2 | 18.2 | 11.8 | 29.6 | 22.5 | 14.3 | 16.2 | 9.0 | 38.1 |
| Electronic machinery | 28.7 | 28.2 | 11.8 | 18.4 | 4.9 | 13.4 | 12.0 | 27.8 | 32.3 | 66.1 | 7.9 | 16.9 | 37.2 |
| Transport equipment | 16.1 | 50.6 | 24.0 | 21.1 | 26.4 | 27.4 | 11.8 | 54.0 | 15.7 | 94.7 | 26.1 | 7.6 | 67.7 |
| Other manufacturing | 27.7 | 69.3 | 31.0 | 31.6 | 31.4 | 33.5 | 15.7 | 37.4 | 51.3 | 41.0 | 32.9 | 21.3 | 16.5 |
| Construction | 7.2 | 8.2 | 13.3 | 20.0 | 29.2 | 41.7 | 26.5 | 47.6 | 34.3 | 5.0 | 25.3 | 15.0 | 4.4 |
| Trade | 10.4 | 13.3 | 24.6 | 27.0 | 57.1 | 62.0 | 8.8 | 25.4 | 48.9 | 2.2 | 24.5 | 13.7 | 8.1 |
| Transport and communication | 7.3 | 8.5 | 8.6 | 14.2 | 13.2 | 25.1 | 9.0 | 29.3 | 10.8 | 6.9 | 20.5 | 7.8 | 0.9 |
| Public services | 7.9 | 11.9 | 24.1 | 21.6 | 22.7 | 44.7 | 8.0 | 38.3 | 37.4 | 8.9 | 28.3 | 15.9 | 4.6 |
| Other services | 8.3 | 7.9 | 17.2 | 15.5 | 3.3 | 42.0 | 15.3 | 34.6 | 44.0 | 7.0 | 27.0 | 14.7 | 2.4 |

Data source: author's simulations.

Figure A.1. The utilization of AFTA-CEPT: the case of Thailand's exports




Data source: JETRO (2009a).

Note: Singapore is excluded for ASEAN as a whole since it already removes all tariffs except 6 items.

Table A.2 Survery of previous studies: the model structures and simulation methods

| papers | FTAs in analysis | model/database used for analysis | aggregation of regions and sectors | structure of model | method and characteristic of simulation |
|---|---|---|---|---|---|
| **Adams and Park (1995)** | ASEAN Free Trade Area (AFTA) | - Linked CGE System: i) no inter- sectoral capital transference, ii) existence of misemployment, iii) connection btw. education/health- related consumption and human resource, iv) impact of government investment on long- term economic growth, v) governmental fiscal deficit is financed by household savings, vi) imbalance of current-account is financed by external investment and exchange reserve, vii) money supply is decided by governmental fiscal deficit and external imbalance<br>- See Zhai (2006) for more recent study using linkage CGE model | - countries/regions: 6 (ASEAN5+others)<br>- sectors: na | - static model<br>- accumulation process of physical and human capital is subject to dynamics | - estimating impact of tariff reduction by ASEAN countries<br>i) tariff reduction on imports from other ASEAN countries<br>ii) tariff reduction on imports from other countries/regions<br>iii) tariff reduction of both i) and ii) |
| **APEC (1997)** | APEC trade liberalization | - GTAP model<br>- GTAP Version2 database (data as of 1992) | - countries/regions: 19<br>- sectors: 16 | - static model with capital accumulation | simulating by giving impact on tariff as exogenous variable |
| **Tsutsumi and Kiyota(2000)** | 1. Japan, Singapore<br>2. Japan, Korea and Singapore<br>3. Japan, Mexico and Singapore<br>4. Japan, Korea, Mexico and Singapore<br>5. ASEAN4, China, Japan, Korea and Singapore<br>6. ASEAN4, China and Singapore<br>7. Japan - US<br>8. China - Japan | - GTAP model<br>- GTAP Version4 database (data as of 1995) | - countries/regions: 19<br>- sectors: 16 | - static model<br>- comparative analysis between benchmark case (growth of factors incorporated into base year of 1995 data) and FTA case | i) trade liberalization case (with and without the agriculture sector) - impact on tariffs<br>ii) capital movement/technology transfer case - sectoral TFPs are calculated from GTAP database; estimating under assumption that signatory of lower TFP would experience 1% increase of TFP<br>iii) labor movement case - estimating under assumption that scale of Japanese labor market would experience increase by 1% of labor of partner-signatory of FTA model formula considers impact of overseas remittance (by Francois) |
| **Davis, McKibbin and Stoeckel(2000)** | 1. ASEAN- CER trade liberalization 2. ASEAN- CER trade liberalization and APEC trade liberalization<br>3.APEC trade liberalization | - APG-Cubed model - existing applied general equilibrium model with characteristics of: i) modeling of financial sector. ii) linkage with macro economic variable (especially fiscal sector), iii) time series estimation of policy impact<br>- See McKibbin, Lee, and Cheong (2004) for other studies based on APG-Cubed model | - countries/regions: 18<br>- sectors: 14 | - dynamic model - 1999 data as base year: simulated till 2020 | i) ASEAN- CER liberalization - estimating impact of tariff reduction imposed on trade between Australia/New Zealand and ASEAN<br>ii) APEC liberalization - tariff reduction of APEC economies based upon Bogor Declaration |
| **ACEGEC (2001)** | ASEAN - China FTA | - GTAP model<br>- GTAP Version4 database (data as of 1995) | - countries/regions: 10<br>- sectors: 10 | - static model | - estimating impact of tariff reduction of China and ASEAN countries |
| **Hertel, Walmsley and Itakura(2001)** | APEC Region FTA | - Dynamic- GTAP model<br>- GTAP Version4 database (data as of 1995), estimation based on a data to which foreign income data (based on IMF Balance of Payment) is added | - countries/regions: 19<br>- sectors: 17 | - dynamic model<br>- estimation by distinct impact of FTA from dynamic and statistic models | i) Japan - Singapore, Japan - Korea FTAs - tariff decreasing effect (impose on tariff as shock), cost decreasing effect from trade procedure (as elimination of transportation cost), propulsive effect of e-Commerce (margin decreasing effect as shock to production tax), decreasing effect of service trade barrier calculating service barrier based on gravity model and impose as shock<br>ii) APEC- FTA - considering impact of decreasing service trade barrier |
| **Scollay and Gilbert (2001)** | 1. APEC trade liberalization<br>2. ASEAN - China - Japan - Korea - CER FTA<br>3. Global trade liberalization | - standard applied general equilibrium model<br>- GTAP Version4 database (data as of 1995) | - countries/regions: 22<br>- sectors: 21 | - static model<br>- tariff reduction by Uruguay Round and elimination of textile export restriction, impact from AFTA of ASEAN members are incorporated into trade barrier data in GTAP Version4 database | - estimating impact of tariff elimination by trading partners |

(Continue)

| | FTAs subject to analysis | model/database used for analysis | aggregation of regions and sectors | structure of model | method and characteristic of simulation |
|---|---|---|---|---|---|
| **APEC (2002)** | 1. APEC trade liberalization (50% tariff reduction)<br>2. APEC trade facilitation (elimination of trade cost)<br>3. APEC investment liberalization (elimination of investment cost) | - GTAP model<br>- GTAP Version5 database (data as of 1997) | - countries/regions: 22<br>- sectors: 20<br>investment facilitation<br>- countries/regions: 23<br>- sectors: 17 | - static model<br>- enables estimation of impact of trade facilitation by incorporating tariff, transportation cost and inefficiency of trade into formula of imported goods price | i) APEC trade liberalization - estimating impact of tariff elimination within the area<br>ii) APEC trade facilitation - estimating impact of reduction of trade cost<br>iii) APEC investment liberalization - estimating impact of decrease of capital price at rate of tariff- equivalent investment barrier |
| **Chirathivat (2002)** | ASEAN - China trade liberalization | - CAMGEM (Chulalongkorn and Monash General Equilibrium Model: GTAP- based applied general equilibrium model)<br>- See Park (2006) for more recent study using a different GTAP-based CGE model named GTAP6inGAMS model | - courtiers/regions: na<br>- sectors: 50 | - static model | - estimating impact of tariff reduction between analyzed countries |
| **Brown, Deardorff and Stern (2003)** | 1.APEC FTA<br>2.ASEAN＋3 FTA | - Michigan Model<br>- GTAP Version4 database (data as of 1995) and necessary data, e.g. numbers of corporations, is added<br>- In addition to the above, base data as of 2005 is composed by several data | - countries/regions: 21<br>- sectors: 18 | - static model<br>- modeled under assumption of perfect competition in agriculture sector and monopolistic competition in other sector<br>- merit of scale is considered | i) APEC trade liberalization - estimating impact of reduction of agriculture and manufacturing, service trade barriers among APEC economies: barriers are calculated as tariff- equivalent<br>ii) ASEAN+3 FTA - estimating under assumption that barriers be eliminated in agriculture, manufacture and service sectors among ASEAN countries (Indonesia, Malaysia, Philippines, Singapore and Thailand) and China/Hong Kong, Japan, Korea: barriers are calculated as tariff-equivalent |
| **Feridhanusetyawan and Pangestu (2003)** | 1.ASEAN Free Trade Area (AFTA)<br>2.APEC trade liberalization | - GTAP model<br>- GTAP Version3 database (data as of 1994) | - countries/regions: 19<br>- sectors: 12 | - static model | - estimating trade liberalizing effect based on the assumption of tariff elimination by liberalization of Uruguay Round, ASEAN Free trade Area and APEC |
| **Kawasaki(2003)** | 1. ASEAN - Japan<br>2. ASEAN - China<br>3. ASEAN - China -Japan<br>4. Global liberalization | - GTAP model<br>- GTAP Version5 database (data as of 1997) | - countries/regions: 23<br>- sectors: 16 | - static model with effect of productivity by trade liberalization | - estimating effect of tariff reduction of each FTA combination, based upon calculation of tariffs of countries/regions, industrial sectors, respectively, by GTAP database |
| **Lee, Choi and Park (2003)** | 1. China - Japan - Korea - FTA<br>2. ASEAN - Korea FTA<br>3. ASEAN+3 FTA | - GTAP model<br>- GTAP Version5 database (data as of 1997) incorporated impact of accession of China to WTO as the result of post- Uruguay Round negotiations | - countries/regions: 8<br>- sectors: 17 | - static model with capital accumulation impact by trade liberalization | - estimating impact of tariff reduction of agriculture, manufacture and service sectors |
| **Urata and Kiyota (2003)** | East Asian Region FTA (China, Japan, Korea, Hong Kong, Singapore, Taiwan, Indonesia, Malaysia, Philippines, Thailand, Vietnam) | - GTAP model<br>- GTAP Version5 database (data as of 1997) | - countries/regions: 20<br>- sectors: 21 | - static model | - estimating effect of tariff reduction of agriculture and manufacture calculated from GTAP database |

Source: Ando and Urata (2007).

Table A.3 Aggregated countries/regions

| 18 coutnries/regions | 87countries/regions （GTAP ver.6 database） | | | | | |
|---|---|---|---|---|---|---|
| Australia | 1 aus | Australia | | | | |
| New Zealand | 2 nzl | New Zealand | | | | |
| China | 4 chn | China | | | | |
| Hong Kong | 5 hkg | Hong Kong | | | | |
| Japan | 6 jpn | Japan | | | | |
| Korea | 7 kor | Korea | | | | |
| Taiwan | 8 twn | Taiwan | | | | |
| Indonesia | 10 idn | Indonesia | | | | |
| Malaysia | 11 mys | Malaysia | | | | |
| Philippines | 12 phl | Philippines | | | | |
| Singapore | 13 sgp | Singapore | | | | |
| Thailand | 14 tha | Thailand | | | | |
| Vietnam | 15 vnm | Vietnam | | | | |
| Other Southeast Asia | 16 xse | Rest of Southeast Asia (Brunei, Cambodia, Laos, Burma, (East)Timor Leste) | | | | |
| India | 18 ind | | | | | |
| Canada | 21 can | Canada | | | | |
| United Stata | 22 usa | USA | | | | |
| Mexico | 23 mex | Mexico | | | | |
| EU15 | 37 aut | Austria | 42 deu | Germany | 47 lux | Luxemburg |
| | 38 bel | Belgium | 43 gbr | U.K. | 48 nld | Netherland |
| | 39 dnk | Denmark | 44 grc | Greece | 49 prt | Portugal |
| | 40 fin | Finland | 45 irl | Ireland | 50 esp | Spain |
| | 41 fra | France | 46 ita | Italy | 51 swe | Sweden |
| Other APEC | 26 per | Peru | 31 chl | Chile | 69 rus | Russia |
| Rest of the world | 9 xea | Rest of East Asia (Macau, Mongolia, Democratic Korea) | | | | |
| | 3 xoc | Rest of Oceania | 53 xef | Rest of EFTA | 71 tur | Turkey |
| | 17 bgd | Bangladesh | 54 xer | Rest of Europe | 72 xme | Rest of Middle East |
| | 19 lka | Sri Lanka | 55 alb | Albania | 73 mar | Morocco |
| | 20 xsa | Rest of South Asia | 56 bgr | Bulgaria | 74 tun | Tunisia |
| | 24 xna | Rest of North America | 57 hrv | Croatia | 75 xnf | Rest of North Africa |
| | 25 col | Colombia | 58 cyp | Cyprus | 76 bwa | Bostwana |
| | 27 ven | Venezuela | 59 cze | Czech | 77 zaf | South Africa |
| | 28 xap | Rest of Andean Pact | 60 hun | Hungary | 78 xsc | Rest of SACU |
| | 29 arg | Argentina | 62 pol | Poland | 79 mwi | Malawi |
| | 30 bra | Brazil | 63 rom | Romania | 80 moz | Mozambique |
| | 32 ury | Uruguay | 64 svk | Slovakia | 81 tza | Tanzania |
| | 33 xsm | Rest of South America | 65 svn | Slovenia | 82 zmb | Zambia |
| | 34 xca | Central America | 66 est | Estonia | 83 zwe | Zimbabwe |
| | 35 xfa | Rest of FTAA | 67 lva | Latovia | 84 xsd | Rest of SADC |
| | 36 xcb | Rest of the Caribbean | 68 ltu | Lithuania | 85 mdg | Madagascar |
| | 52 che | Switzerland | 70 xsu | Rest of FSU | 86 uga | Uganda |
| | | | | | 87 xss | Rest of Sub-Saharan Africa |

Table A.4 Aggregated sectors

| 16 sectors | 57 sectors (GTAP ver.6 database) | | | |
|---|---|---|---|---|
| Agriculture and food | 1 pdr | Paddy Rice | 11 rmk | Raw milk |
| | 2 wht | Wheat | 12 wol | Wool |
| | 3 gro | Other grains | 19 cmt | Meat: cattle, sheep, goats, horses |
| | 4 v_f | Vegetables, fruits, nuts | 20 omt | Other meat |
| | 5 osd | Oil seeds | 21 vol | Vegetable oils |
| | 6 c_b | Sugar cane and sugar beet | 22 mil | Milk: dairy products |
| | 7 pfb | Plant fibres | 23 pcr | Processed rice |
| | 8 ocr | Other crops | 24 sgr | Sugar |
| | 9 ctl | Cattle, sheep, goats, horses | 25 ofd | Other food |
| | 10 oap | Other animal products | 26 b_t | Beverages and tobacco |
| Fishery and forestry | 13 frs | Forestry | 14 fsh | Fishing |
| Mining | 15 coa | Coal | 17 gas | Gas |
| | 16 oil | Oil | 18 omn | Other mining |
| Texitle and apparel | 27 tex | Textiles | 28 wap | Wearing apparel |
| Wood and paper | 30 lum | Wood products | 31 ppp | Paper products |
| Mineral products | 32 p_c | Petroleum and coke | 34 nmm | Non-metallic minerals |
| | 33 crp | Chemical rubber products | | |
| Iron and steel | 35 i_s | Iron and steel | 37 fmp | Metal products |
| | 36 nfm | Non-ferrous metals | | |
| General machinery | 41 ome | Other machinery and equipment | | |
| Electronic machinery | 40 ele | Electronic equipment | | |
| Transport equipment | 38 mvh | Motor vehicles | 39 otn | Other transport equipment |
| Other manufacturing | 29 lea | Leather | 42 omf | Other manufacturing |
| Construction | 46 cns | Construction | | |
| Trade | 47 trd | Trade | | |
| Transport and communication | 48 otp | Other transport | 50 atp | Air transport |
| | 49 wtp | Water transport | 51 cmn | Communications |
| Public services | 56 osg | Public administration, defense, education, health | | |
| Other services | 43 ely | Electricity | 53 isr | Insurance |
| | 44 gdt | Gas distribution | 54 obs | Other business services |
| | 45 wtr | Water | 55 ros | Recreation and other services |
| | 52 ofi | Other financial intermediation | 57 dwe | Dwellings |