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Economic Effects of Singapore's Bilateral Free Trade Agreement with Japan on Other ASEAN Economies: A Computable General Equilibrium Approach

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Abstract

Singapore, as one member of ASEAN, while active in this ASEAN integrating process, is also implementing its strategy of additive regionalism—negotiating bilateral free trade agreements with all of its significant trading partners. How do Singapore's Bilateral Free Trade agreements (SBFTA) with the non-ASEAN countries affect other ASEAN economies. Further, if other ASEAN countries emulate Singapore's experience and sign bilateral free trade agreements with non-ASEAN countries, what are the effects of these bilateral free trade agreements on ASEAN economies? This study focuses on SBFTA with Japan and explores answers to these questions using a Computable General Equilibrium (CGE) Model—GTAP model. The simulation results show that other five ASEAN economies are nevertheless adversely though insignificantly affected by JSEPA. Before a proposed Japan-ASEAN FTA comes into force finally, more newly-signed bilateral FTAs by Japan and individual ASEAN economies will have a much stronger impacts on ASEAN's non-participants of new FTAs than JSEPA has. For the benefit of the whole ASEAN economy, a FTA signed by Japan and ASEAN as a whole party is preferable and recommended.

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1. Introduction

ASEAN is generally perceived to be unsuccessful in fostering growth and intra-regional trade expansion (Tan, et al., 1999). To make up for this dysfunction, policy-makers have taken several strategic measures, such as ASEAN Free Trade Area (AFTA). Singapore, as one member of ASEAN, while active in this ASEAN integrating process, is also implementing its strategy of additive regionalism—negotiating bilateral free trade agreements with all of its significant trading partners (Harrison et al., 2002). Bilateral trade liberalization has become an integral part of Singapore's trade policy. To date, Singapore has already concluded Free Trade Agreement (FTA) with the likes of New Zealand, Japan, European FTA (EFTA¹), Australia and US and there are several more FTAs on the table. Singapore becomes a “hub” of a hub-and-spoke system, and it is well believed by policymakers and theorists that Singapore will enjoy “first-mover advantages” in forming free trade areas with a large number of different countries (Wonnacott and Lutz, 1989; Rajan et al., 2002).

One concern for other ASEAN countries, however, is how Singapore's Bilateral Free Trade agreements (SBFTA) with the non-ASEAN countries affect other ASEAN economies. Further, if other ASEAN countries emulate Singapore's experience and sign bilateral free trade agreements with non-ASEAN countries, what are the effects of these bilateral free trade agreements on ASEAN² economies?

In this study, I focus on SBFTA with Japan and explore answers to these questions using a Computable General Equilibrium (CGE) Model—GTAP model. The short-run and long-run impacts of Japan-Singapore Economic Partnership Agreement (JSEPA) on other ASEAN-5 member countries³ are firstly analyzed in terms of GDP, external trade and sectoral outputs.

¹ The EFTA involves an FTA between Singapore, Norway, Iceland, Switzerland and Liechtenstein.

² Due to lack of the data for all ASEAN members, instead of the effects on all ASEAN economies, I only analyse the effects on 6 ASEAN economies: Singapore, Malaysia, Thailand, Indonesia, Philippine, and Vietnam. According to ASEAN Secretariat, the total exports of these six economies account for 98.6% of total ASEAN export and total imports of these six economies account for 98.2% of total ASEAN import. Hence, the simulation results can approximately represent main features of economic effects on ASEAN economies.

³ ASEAN-5 denotes Malaysia, Thailand, Indonesia, Philippine, and Vietnam. Henceforth, ASEAN-5 refer to these 5 countries.

Further, I explore the impacts of other optional bilateral free trade agreements between Japan and ASEAN members after JSEPA comes into force and simulate four counterfactual scenarios: Japan-Thailand FTA, Japan-Philippine FTA, Japan-Indonesia FTA and Japan-ASEAN FTA.

The simulation results show that other five ASEAN economies are nevertheless adversely though insignificantly affected by JSEPA. Before a proposed Japan-ASEAN FTA comes into force finally, more newly-signed bilateral FTAs by Japan and individual ASEAN economies will generate much stronger impacts on ASEAN's non-participants of new FTAs than JSEPA has. For the benefit of the whole ASEAN economy, a FTA signed by Japan and ASEAN as a whole party is preferable and recommended.

Distinct from the previous studies and consistent with new trends in FTA, this study emphasizes two points about FTA: service trade liberalization and the derivative effects of "hub" country's new FTA on spoke economies in previous FTA. To highlight the trade liberalization in service sectors, I incorporate new data for tariff equivalent rates from recent studies on measurement of service trade restriction based on original GTAP data (Hoekman, 1995; Hardin et al., 1997; Findlay et al., 2000). This is in contrast to previous GTAP model applications with the original data on service restriction provided by GTAP database.

The remainder of this paper is organized as follows. Section 2 briefly introduces ASEAN countries' integration progress, especially in terms of economy, and describes the vision of Singapore's trade and previous views on the impacts of SBFTA on other ASEAN economies. Section 3 introduces the model and data used, followed by simulation designs in section 4. Section 5 explains the simulation results. Section 6 summarizes and concludes.

2. ASEAN and Singapore's Trade Liberalization

2.1 ASEAN and Singapore

The Association of Southeast Asian Nations (ASEAN) established in 1967 was originally conceived as a political grouping and ASEAN was unsuccessful in fostering growth and intra-regional trade expansion since early efforts in economic cooperation were inward-looking (Tan et al. 1999). ASEAN countries are heavily dependent on foreign direct investment (FDI) from outside the region to drive the industrialization process. Its intra-regional trade dependence is fairly low. For the purpose of integrating ASEAN economies,

several strategic proposals of reforming ASEAN had been suggested and discussed by the academe, and several measures are taken by policy-makers to accelerate the liberalization process of ASEAN economies, such as AFTA, ASEAN-China Free Trade Area etc.(Tan et al. 1999).

AFTA was established in January 1992 to eliminate tariff barriers among the ASEAN countries with a view to integrating the ASEAN economies into a single production base and creating a regional market of 500 million people. The Agreement on the Common Effective Preferential Tariff (CEPT) Scheme for the AFTA⁴ requires tariff rates levied on a wide range of products traded within the region to be reduced to no more than five percent. Quantitative restrictions and other non-tariff barriers are to be eliminated. Since the establishment of AFTA, intra-ASEAN trade has intensified, which lead to an increased share of intra-ASEAN trade in total ASEAN trade (see figure 1). In the long term, AFTA aims to reduce all the tariff rates of trades within the region to zero.

As one member of ASEAN, Singapore is the most liberal economy with highest per capita income in South East Asia. Scarcity of natural resources and small domestic markets make Singapore a highly trade-dependent economy. Now Singapore is featured with the highest trade to GDP ratio in the world. On one hand, Singapore's economy relies heavily on imports as its only source of food, energy and industrial raw materials; on the other hand, its industries must rely on overseas export markets to absorb their outputs. Therefore trade activities have historically been and will continue to be an important factor of its national economic growth.

The primary objective of Singapore trade policy is to guard its trading interests by ensuring a free and open international trading environment where goods and services can flow freely with minimum impediment. Consistent with this aim, Singapore has joined several multilateral economic cooperation organizations, such as ASEAN/AFTA, APEC, Asia-Europe Meeting (ASEM) and WTO.

While participation in these multilateral economic cooperation organizations does reflect Singapore's desire for greater trade liberalization, the progress is too slow for comfort. For example, AFTA, in which Singapore is a key proponent, fails in providing expected

⁴ According to ASEAN's official report, by the beginning of 2002, only 3.8% of products in the CEPT inclusions list of the first six signatories, or 1683 items out of 44,060, would have tariffs above five percent. Till 2003, the average CEPT tariff rate will be under 3 percent.

expansion in markets for Singapore's products. Since 1993 Singapore has only enjoyed a mild increase in intra-ASEAN trade compared with a much bigger one in extra-ASEAN trade (see figure 2) while intra-ASEAN trade by the whole ASEAN earns more weight on ASEAN's total trade. This trend results in a stable ratio of Singapore's intra-ASEAN trade (see figure 3) to its total trade opposed to an increasing ratio of ASEAN's intra-ASEAN trade to ASEAN's global trade since 1993.

In a globalizing economy, FTAs are attractive trade tools because they not only offer market access through lower tariffs, but also include usually regional investment agreements and extend credit lines and double-taxation-avoidance agreements between participating nations. In tandem with multilateral trade liberalization, Singapore gives more emphasis on bilateral FTAs and takes a strategy of "additive regionalism" by signing bilateral free trade agreements with its main trading partners while it actively supports multilateral trade liberalization (Harrison et al., 2002).

2.2 Japan-Singapore Economic Partnership Agreement

Negotiations for the Agreement between Japan and the Republic of Singapore for a New-Age Economic Partnership (JSEPA) were launched on 22 October 2000 between the governments of Japan and the Republic of Singapore. The JSEPA was finally signed between Prime Minister Goh Chok Tong and Prime Minister Koizumi in Singapore in January 2002. The JSEPA enters into force on 30 November 2002, after the Agreement has undergone the necessary legislative processes in the respective parties⁵.

Before JSEPA is effective, both Japan and Singapore are relatively open economies and are intensively linked in trade and investment. In figure 4, trade dependency between Japan and Singapore is shown to have decreased between 1993-2001. Although the trade dependency is weakening over the period 1993-2001, Japan remains a key trade partner of Singapore.

According to a statement of Ministry of Foreign Affairs, Singapore, on Oct. 31, 2002, with the entry into force of JSEPA, 99% of bilateral trade, or 94% of Singapore exports to Japan will be duty free. Exporters to Japan will be able to enjoy tariff benefits for a wide range of products, particularly in the following key sectors: chemicals & petroleum products, electrical & electronic products, plastic products, pharmaceuticals, instrumentation

⁵ For more information on Japan-Singapore FTA, see www.mti.gov.sg.

equipment, transport equipment and fabricated metal products. Based on 2001 trade figures, it is estimated that immediate tariff savings per annum would be S\$60 million⁶. For Japan, JSEPA is a landmark case because it is the first such arrangement for Japan, which has in the past opted only for a multilateral approach for trade liberalization. According to one report of Japan Federation of Economic Organizations (2000), JSEPA will improve its business environment, strengthen the competitiveness of industry, and promote closer economic ties in the Asian region.

Singapore experiences persistent trade deficits over the period 1993-2001. Persistent trade deficits with Japan might at least partly be reflection of the inability of foreign (including Singapore) exporters to penetrate the Japanese market due to the maintenance of both formal and informal non-tariff barriers (Lawrence, 1987; Rajan et al., 2001). In the context of a JSEPA, this situation can be expected to be improved as Singapore can get a preferential access to the Japanese market through JSEPA.

According to JSEPA, flexible rules of origin, which take into account the unique production patterns of manufacturers in Singapore, will enable more businesses to benefit from these tariff reductions. This will also benefit the many Japanese companies with manufacturing operations in Singapore that export goods from Singapore to Japan. Together with enhanced investor protection, ease of entry and operation for investors and improved commitments in the services industries, the JSEPA makes it more attractive for Japanese companies to invest in Singapore. Similarly, the JSEPA will make it easier for Singapore based companies to invest in Japan.

The JSEPA will also provide for increased cooperation between Singapore and Japan in a number of sectors including R&D in life sciences, tourism, ICT, and financial services. This will create new business opportunities for all.

2.3 Previous Studies on the Impact of SBFTA on other ASEAN Countries

A few studies have investigated the impact of SBFTA on other ASEAN countries. There exist two lines of views on this impact: optimistic and pessimistic.

On the optimistic side, Japan-Singapore Free Trade Agreement Joint Study Group released a report on JSEPA in September 2000. This report mentioned JSEPA's effects on other ASEAN

⁶ Average exchange rate is 1.7906 S\$ per US \$ in 2002 (Monetary Authority of Singapore, www.mas.gov.sg).

countries. According to Japan-Singapore Joint Study Group's report, the JSEPA would strengthen Japan's involvement in and commitment to Southeast Asia in a long term, which is beneficial to both Japan and the ASEAN countries. Singapore serves as a hub and a base for the regional operations of many Japanese companies, which use Singapore as a gateway to Southeast Asia. ASEAN, with a population of about 500 million people, would continue to be an important market for Japanese products and services and as a manufacturing base for global sales.

Contrary to the above views, the Malaysian Institute of Economic Research (MIER) (2001) expresses more pessimistic viewpoint about the impact of SBFTA on other ASEAN countries. MIER argues that other ASEAN countries will be adversely affected by SBFTA in three aspects: Firstly, the SBFTA would make Singapore as a backdoor of non-ASEAN products into the ASEAN market. Secondly, products of other ASEAN countries would be rendered less competitive vis-à-vis those of Singapore in the market where Singapore has bilateral trading arrangements such as New Zealand, Japan and the US. In the latter markets, Singapore's products would be imported duty-free or at more favorable import duties than those imposed on the products of other ASEAN countries. Thirdly, Singapore's bilateral free trade agreement with non-ASEAN economies would result in the diversion of investment from other ASEAN countries to Singapore.

Japan-Singapore FTA Joint Study Group and MIER represent two schools of views on the impact of SBFTA. However, the above studies often use qualitative analysis and especially partial equilibrium analysis, the qualitative results from which are not usually convincing and in some situations are even misleading.

A more convincing and accurate empirical analysis can be made with Computable General Equilibrium (CGE) Models. CGE analysis has been well recognized as a useful methodology to measure the impact of trade liberalization. As the impact of trade liberalization depends on complex microeconomic relations, inter-sectoral and inter-country linkages, CGE analysis is preferable to traditional econometric models and partial equilibrium analysis, which have difficulty in capturing the variety of microeconomic relations and complicated feedback effects. Hence, I employ CGE model to study the impact of JSEPA on other ASEAN economies.

3. Model and Data

This study employs a Computable General Equilibrium (CGE) model of the Global Trade Analysis Project (GTAP). The GTAP model has been widely used to assess the impact of trade liberalization. The standard GTAP model is a multi-region, multi-sector, computable general equilibrium model, with perfect competition and constant returns to scale. Bilateral trade is handled via the Armington assumption (Hertel, 1997). GTAP model has been modified for several times since 1994, and the latest version GTAP.TAB Version 6.1 was released in 2001. By this version of GTAP model, long-term capital accumulation effects can be analyzed.

As Rutherford and Tarr (1998) suggest, the standard comparative static GTAP model usually underestimates the real effects of economic shocks. Therefore, I incorporate dynamic components to calculate long-run effect following Francois et al. (1996). Francois et al. argue that the standard short-run GTAP closure does not take into account the dynamic benefits of trade liberalization. They recognize three distinct gains from the trade liberalization: a static gain and two dynamic gains.

To know the short-run effects and long-run effects, two distinct closures are adopted: standard closure and particular long-run closure. The mechanism behind the long-run closure is as follows: enlarged incomes caused by an enhanced efficiency of the economies give rise to higher savings, and the higher savings fuel an expansion in investment, and such a trend continues until the increased capital stock requires a larger amount of capital depreciation to balance the net investment.

The data used in this study is from GTAP database Version 5, which identifies 66 countries or regional groups, each producing, consuming and trading in 57 commodity categories. Based on the GTAP database I aggregate it into 10 region and 14 commodities for this study, viz. a 10-region and 14-sector GTAP model used here.

Furthermore, to get the baseline for this study, another two stages of data processing are needed: to alter import tariff equivalent in service trade and to incorporate underlying scenario of ASEAN Free Trade Area (AFTA) coming into force since 1992.

Firstly, the import tariff equivalents in service trade are adjusted based on recent studies on service trade restrictions. Current Free Trade Agreements go beyond WTO trade

liberalization agreements and pay more emphasis on the liberal environment for service trade and investment. Given that Singapore and Japan are already relatively open economies with regards to merchandise trade, the focus of the FTA will be on investments and further integration in the services sectors. As Robinson et al. (2002) assert, trade liberalization of service sector not only directly affects world service production and trade, but also has significant implications for other sectors in the economy. However, due to the complexity and scarcity of the study on trade restriction on service trade, in the standard GTAP database the tariff equivalents of service trade are usually too low, therefore the impact of service trade liberalization under free trade agreements are usually underestimated. In a departure from the past FTA studies, this study employ higher tariff equivalents for service sectors, which derive from the study of Australia Productivity Commission⁷, and Hardin et al. and are closer to the realistic restriction in service trade.

Secondly, underlying AFTA scenario based on the Common Effective Preferential Tariff (CEPT) scheme is incorporated. The acceleration of the AFTA timetable has been adopted as part of the measurements in response to Asia financial crisis, which hit East Asia beginning in July 1997. Most of the Southeast Asian region is now a free trade area. Accounting for over 96 percent of all ASEAN trade, the first six signatories of the CEPT scheme for the ASEAN Free Trade Area have reduced their tariffs on intra-regional trade to no more than five percent for almost all products in the Inclusion List or removed them totally. The new members of ASEAN will maximize the number of their tariff lines in the 0-5 percent range by 2003 for Vietnam and 2005 for Laos and Myanmar (ASEAN Secretariat, 2002). For simplicity, an underlying scenario AFTA is got by 100% reduction in import tariff in goods trade, 50% reduction⁸ in tariff equivalent in service trade and 100% reduction in all exports tariffs within ASEAN countries.

After the baseline data is set, the impacts of SBFTA and other counterfactual bilateral FTAs designed in the later part will be the changes from the base case to the simulation results.

⁷ Refer to <http://www.pc.gov.au/research/memoranda/servicesrestriction/index.html> and Findlay and Warren (2000).

⁸ Implicit tariff is not reduced fully up to 100% because other than “man-made” non-tariff barriers, there are often natural barriers to trade, such as geographical proximity, culture etc. Hence, we cannot assume that once services tariff is reduced to zero, services can be traded freely like merchandise goods. Therefore, for simulation purpose, the service liberalization effort is assumed to reduce implicit services tariff equivalent by 50%.

4. Simulation Design

JSEPA has come into force at the end of 2002. To analyze the short-run and long-run impacts of this policy shock, two scenarios are designed. In the simulation of scenario 1, the standard closure is used, which can provide short-run effects of the policy shock; while simulating scenario 2, a long-run closure is used, in which capital accumulation is endogenized⁹ in contrast to short-run closure with exogenous capital endowment.

While Japan endeavors to push for a free trade area with ASEAN-10 countries, JSEPA may act as a catalyst for more ASEAN countries to sign bilateral free trade agreements with Japan or finally a Japan-ASEAN FTA with ASEAN as one party. In fact, Japan already initiates alternative FTA negotiation separately with some ASEAN countries, such as Thailand and Philippine. Before a final conclusion of Japan-ASEAN FTA, it is possible that other bilateral FTAs between Japan and the countries within ASEAN come into being first.

It is believed that sequence and timing of trade liberalization matters in the impact of Free Trade Area (Lee, 2002; Hertel et al., 2000; Freund, 2000). With that in mind, I design another four post-JSEPA scenarios based on possible FTAs involved with Japan and ASEAN countries. Scenario 3 refers to a post-JSEPA Japan-Thailand FTA; scenario 4 is a post-JSEPA Japan-Philippine FTA; scenario 5 is a post-JSEPA Japan-Indonesia FTA and scenario 6 is a post-JSEPA Japan-ASEAN FTA. The studies on the impact of FTAs other than JSEPA mainly focus on long-run effects. Hence, in simulating scenario 3-6, only long-run closure is adopted.

All the scenarios are listed as follows:

Scenario 1, **Japan-Singapore** FTA (short-run effects are analyzed);

Scenario 2, **Japan-Singapore** FTA (long-run effects are analyzed);

Scenario 3, Post-JSEPA **Japan-Thailand** FTA with long-run effect impact analyzed;

Scenario 4, Post-JSEPA **Japan-Philippine** FTA with long-run effect impact analyzed;

Scenario 5, Post-JSEPA **Japan-Indonesia** FTA with long-run effect impact analyzed;

⁹ The results by this closure can be referred to one simulated with Walmsley's (1998) "non-risk-adjusted method with standard benchmark database".

Scenario 6, Post-JSEPA **Japan-ASEAN** FTA with long-run effect impact analyzed.

5. Simulation Results

5.1 Macroeconomic perspective

This subsection mainly looks at the changes in gross domestic products and trade. While a clear trace of ownership of international investment is not conducted in the standard GTAP model with long-run simulations, the increases in GDP and welfare of one region cannot completely confer to the households in those regions. Therefore, the GDP change in my long-run simulations can only be an indication for welfare changes.

Table 2 summarizes the changes in real GDP by regions in all six scenarios. In scenario 1, the percentage changes and level changes in GDP are tiny, which means the short-run impacts of the JSEPA are not significant. Comparing the scenario 1 and scenario 2, we can see that the long-run effects of JSEPA are much greater than those of short-run. These larger changes in real GDP stem from larger increases in capital stocks under the long-run simulation. In the long-run period, the increased return attract more investments in the Japan and Singapore, which results in the expanded production capability in Japan and Singapore. In the short run, Singapore will benefit from the JSEPA and Vietnam, one of ASEAN country, also enjoy a mild gain in GDP. Contrary to Vietnam, other 4 ASEAN deteriorate a little in their GDPs. In the long run, Vietnam and other 4 ASEAN countries all suffer higher losses. These results means that in the long run other ASEAN countries will be adversely but insignificantly affected in their GDPs. According to the simulation results for scenario 2, Japan's GDP will appreciate while USA, China and rest of the world all will suffer losses.

An obvious feature we can see from table 2-4 is that the corresponding numbers in scenario 1 and 2 are much smaller than those in scenario 3-6. One important reason for this is that Singapore levies close to zero tariff rates on most of merchandise goods. Thus the scope for trade diversion from ASEAN to Singapore is fairly small.

Before analyzing the impacts of other free trade areas on the GDPs in other scenarios, the effects of JSEPA on the trades of other ASEAN countries needs to be addressed. According to table 3 and 4, trade will increase in Japan and Singapore while other ASEAN countries and other regions in the world suffer decreases in both exports and imports. Based on the level changes of trades in the short-run and long-run simulations, I find that there are both trade-

creation and trade-diversion, but trade-creation dominates trade diversion. For example, in the long run, Singapore's exports will increase by US\$ 1,214 million and Japan's will increase by US\$ 1,107 million while the exports of other 5 ASEAN countries decrease totally only by US\$ 157 million and other regions in the world totally by only US\$ 517 million.

Next I would like to address the effects of other free trade areas in this study. Provided that Thailand and Japan sign a bilateral free trade agreement, Thailand will enjoy a large increase in GDP, nearly 16.85%, while Malaysia and Indonesia bear much higher losses in GDP in this scenario than that in the scenario 2. In contrast to Malaysia and Indonesia, Singapore and Vietnam benefit from this free trade agreement in terms of GDPs.

Provided that Philippine sign a bilateral free trade agreement with Japan, there is a large positive change in Philippine's GDP (2.5%) and a small increase in Vietnam's GDP (0.027%). Other ASEAN countries will be adversely affected.

In the case of a Japan-Indonesia FTA, Indonesia's GDP will increase 2.2% while other ASEAN countries bear losses in GDP. In this scenario the whole world bear a high costs in terms of GDP changes.

When integration takes the form of a Japan-ASEAN FTA, ASEAN countries and Japan will all gain large increases in GDP¹⁰ while the GDPs of other regions will decrease.

Table 3 and 4 show the trade effects in scenario 3 to 6. The results of scenario 3, 4 and 5 suggest that a bilateral FTA between Japan and individual ASEAN country usually gives rise to moderate trade-diversion and dominant trade-creation. In scenario 6 there is a great increase in trade in Japan and ASEAN-5 countries. Singapore continues to increase its trade revenue in scenario 6, whereas other regions in the world will bear somewhat loss in trade due to trade-diversion.

If a post-JSEPA Japan-ASEAN FTA comes into force, regional trade directions will be changed. Table 5 presents the details. Table 5 prefigures three remarkable trends: most of ASEAN's exports¹¹ to non-ASEAN regions increased, which indicates that the economic competence of ASEAN economies is strengthened; the increased trade revenues between

¹⁰ Though in the scenario 6 Singapore's GDP decreases Singapore's total gain from Japan-ASEAN FTA and JSEPA is positive, which can be reached by summing Singapore's GDP changes in scenario 2 and scenario 6.

¹¹ Two numbers denoting changes of trade between Singapore and Japan will be positive if the effects of JSEPA on the trade between Singapore and Japan is included

Japan and ASEAN countries indicate that the economic relation of Japan and ASEAN is enhanced; most of intra-ASEAN trade will decrease, which indicates that the intensity of the intra-ASEAN trade will be weakened and the extra-ASEAN trades will play more important role in ASEAN economies.

5.2 Microeconomic perspective

This subsection examines the sectoral effects for the six scenarios.

Table 6 and 7 presents the short-run and long-run sectoral effects of JSEPA respectively. The changes of sectoral outputs for other ASEAN countries are insignificant in both cases. In the long term, the most of sectors deteriorate insignificantly in other ASEAN countries.

Table 8 illustrates the percentage changes of sectoral outputs in the scenario 3. Japan-Thailand FTA gives great rises to Thailand's sectoral outputs except for "transportation equipment manufacture"¹² (e.g. motor vehicles and parts, transport equipment necessities.). Changes in the sectoral output of other ASEAN countries are small except that there is a drastic decline in the outputs of transportation equipment manufactures in all ASEAN countries.

Table 9 provides sectoral changes in scenario 4. This FTA leads to increases in most of Philippine's sectoral output except for "other manufacture". Especially there is a great increase by 24.7% in "transportation equipment manufacture". Changes of the sectoral output in other ASEAN countries are small except for the outputs of transportation equipment manufacture with a moderate decline in Singapore, Indonesia, and Thailand.

Table 10 shows the sectoral changes in scenario 5. This Japan-Indonesia FTA leads to increases in most of Indonesia's sectoral output except for "transportation equipment manufacture" and "mineral resource manufacture" with a decline of -12.8% and -1.64% respectively. Changes in the sectoral output of other ASEAN countries are small except for the outputs of transportation equipment manufactures that decline with a moderate decline in Philippine, Malaysia, Singapore and Thailand.

Table 11 illustrates the sectoral changes in scenario 6. Japan-ASEAN FTA gives rise to mixed results in most of sectoral output in ASEAN-5, especially in Thailand. The results

¹² For the classification of sectors, see appendix 1.

indicate that the transportation equipment manufactures of ASEAN will decline sharply in contrast to an expansion in transportation equipment manufacture in Japan. Most of Singapore's sectoral outputs will decline. Other regions in the world will be adversely influenced by this FTA.

For convenience of reference, I summarize the effects of trade liberalization for the six scenarios in table 12. This table is self-explanatory. I will not reiterate here.

In conclusion of all simulation results, a Japan-ASEAN FTA will be preferable for the benefits of the whole ASEAN economy. From the perspective of Japan, a Japan-ASEAN FTA is also an optimal choice.

6. Concluding Remarks

Singapore is aggressively and continually pursuing bilateral FTAs with its main trading partners. The inevitable impacts of these FTAs arouse academe and related policy makers to contemplate and response to this new regionalism. This study has sought to quantify the effects of JSEPA, one of such FTAs, on other ASEAN economies and to explore several alternative FTAs between Japan and other ASEAN countries in response to SBFTAs. As shown by my simulation results, in the long term, other ASEAN countries will be adversely but insignificantly affected; if more FTAs between Japan and other individual ASEAN countries come into force, ASEAN countries left outside bilateral FTAs will suffer much higher loss although the countries inside new FTAs earn benefits. However, these adverse effects can be reversed if a Japan-ASEAN FTA comes into force.

For the benefits of the whole ASEAN, a Japan-ASEAN FTA in the near future is recommended. If a Japan-ASEAN FTA comes into force, ASEAN-5 countries will get considerable increases in output and trade. The economic competence of the whole ASEAN economy can be also strengthened.

SBFTAs have created an incentive for other ASEAN countries to pursue their own bilateralism. For example, Thailand is involved in several FTA negotiations with non-ASEAN countries, such as Australia, Japan and India for the time being. Contrary to its old stance against bilateral FTA between individual ASEAN country and non-ASEAN countries, Malaysia now shows great interest in US-Malaysia FTA in the wake of concluding US-Singapore FTA.

This study also has some implications for ASEAN integration at risk of going in different directions:

First, ASEAN as a group can embark on bilateral FTA with its key trade partners such as Japan. These key economies are central to most of, if not all, ASEAN members and closer economic ties between them can create more benefits. This “ASEAN+1” modality can make all the ASEAN members enjoy the benefits from trade liberalization and reduce the disparity in economic level of ASEAN countries, which could be worsen if only some ASEAN countries sign FTA with outsiders.

Second, differences in sectoral effects and benefits enjoyed by different ASEAN members, and resistance aroused by these differences should be paid attention to in the case of ASEAN+1. For example, transportation manufacture sector in ASEAN economies will drastically deteriorate if Japan-ASEAN FTA comes into force. How to improve the competence of this sector, or is it appropriate to compensate this sector by other sectors benefited from such a FTA?

Third, ASEAN integration should be deepened and accelerated, not only limited to ASEAN free trade area. Fast development of regionalism outside ASEAN and inter-ASEAN reduces the marginal benefit of AFTA, and even challenge the role of AFTA. For example, as noted above, given that Japan-ASEAN FTA comes into force, intra-ASEAN trade will generally reduced. Intra-ASEAN trade will be further reduced if only some ASEAN members separately sign FTAs with non-ASEAN countries. Hence, driven by extra and intra-ASEAN factors, a higher stage of ASEAN integration should be put into practice, such as ASEAN Economic Community and common currency in ASEAN.

Like most of CGE models, the firm-level effects of FTA are not modeled in this analysis, even though the effects of FTA on firms do exist. I briefly discuss here the firm-level effects of SBFTAs according to Freund (2000)’s study, which uses a three-country two-period mathematical model with quantity competition and sunk costs. Freund finds that a regional agreement in the first period, followed by a broader free trade in the second period, leads to permanently greater trade among the member nations. He argues that altering the structure of production and trade is costly¹³ and assumes that each firm incurs a distribution network cost

¹³In most of multinational CGE models, this cost and hysteresis derived from it are ignored, and so is GTAP model. As Freund noted, significant hysteresis has been observed in bilateral trade flows and is found to be

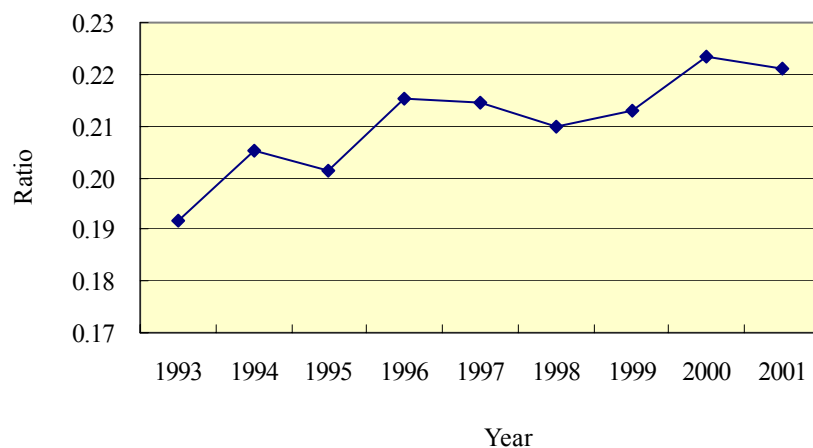
that is inherited in the second period and sunk. Due to irreversibility of investment in the distribution network, there is a strategic incentive for the firms in FTA member nations to commit to high bilateral exports in the first period in order to limit second-period exports by firms from the new member. Hence, the firms in original FTA member nations will effectively gain first-mover advantages in exporting to each other—to be precise, from the perspective of Singapore, SBFTAs make the domestic firms gain first-mover advantages even though more ASEAN countries emulate Singapore and sign FTAs with Japan or finally a Japan-ASEAN FTA comes into being. For other ASEAN countries, the way to mitigate the “later-mover disadvantages” born by their domestic firms is to haste their regionalism pace or, to be better, to jointly sign ASEAN-plus FTAs. This proposition also justifies that ASEAN-plus modality is preferable in processing ASEAN’s outward regionalism.

There are some other limitations in this study. The model used cannot attribute the ownership of investments thus it lacks of a clear trace of international capital flows, which makes it impossible to explain regional welfare changes precisely from the trade liberalization, but an approximate measurement of welfare in terms of GDP is used. Additionally, the technological spillovers from expanded trade are ignored in this model, which may result in an underestimation of the benefit of trade liberalization.

associated with sunk costs involved in exporting. Roberts and Tybout (1997) find empirical evidence that sunk costs associated with exporting play a significant role in determining exports at the firm level. The theoretical contribution linking observed trade pattern to sunk costs are made by Baldwin (1988), Baldwin and Krugman (1989), and Dixit (1989).

Figures

Figure 1 The Ratio of ASEAN's Intra-ASEAN Trade to ASEAN's Total Trade



Source: ASEAN Trade Statistics Database

Note:

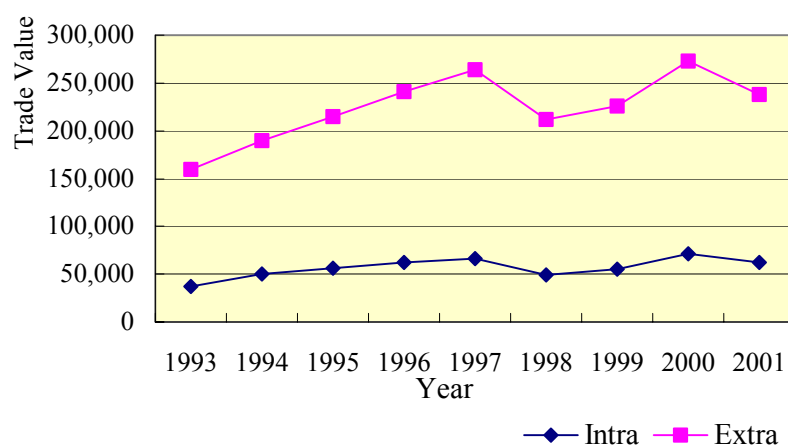
Figures cover only Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore and Thailand (1993 - 1998)

Figures cover only Brunei Darussalam, Indonesia, Malaysia, Myanmar, Philippines, Singapore and Thailand (1999)

Figures cover only Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Singapore and Thailand (2000 - 2001)

Figure 2 Intra-and Extra-ASEAN Trade by Singapore (1993-2001)

(Value In million US \$)



Source: ASEAN Trade Statistics Database

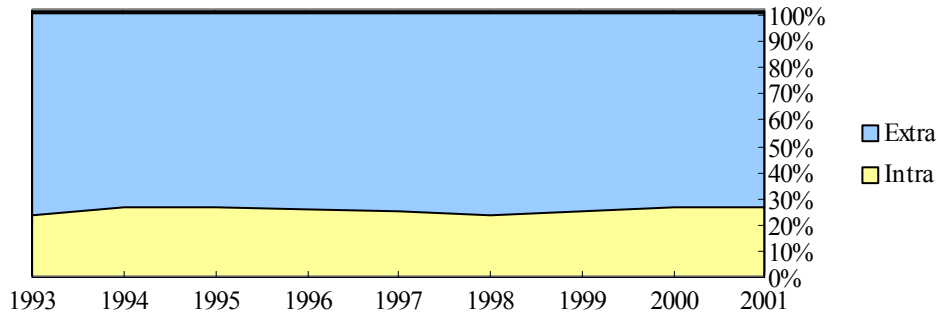
Note:

Figures cover only Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore and Thailand (1993 - 1998)

Figures cover only Brunei Darussalam, Indonesia, Malaysia, Myanmar, Philippines, Singapore and Thailand (1999)

Figures cover only Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Singapore and Thailand (2000 - 2001)

Figure 3 The Ratio of Intra-ASEAN Trade to total trade by Singapore (1993-2001)

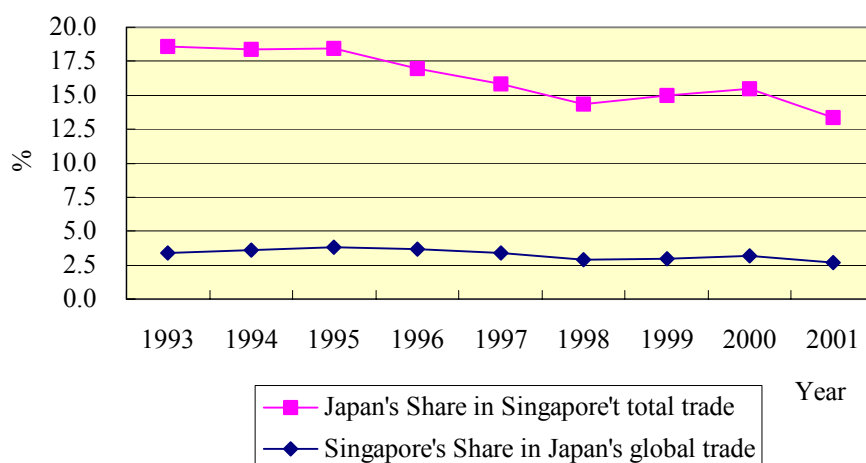


Source: ASEAN Trade Statistics Database

Note:

Figures cover only Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore and Thailand (1993 - 1998)
 Figures cover only Brunei Darussalam, Indonesia, Malaysia, Myanmar, Philippines, Singapore and Thailand (1999)
 Figures cover only Brunei Darussalam, Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Singapore and Thailand (2000 - 2001)

Figure 4 The Trade Dependence between Singapore and Japan (1993-2001)

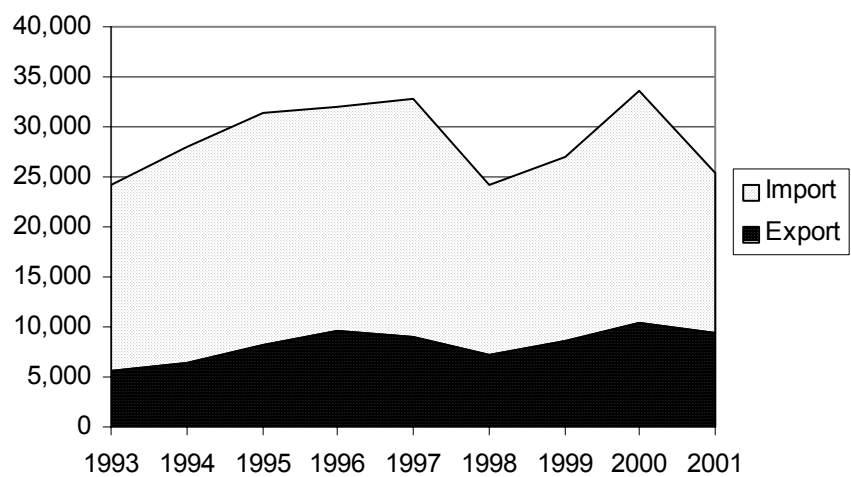


Source: ASEAN Trade Statistics Database

The Summary Report, Trade of Japan (Japan Tariff Association), Cited by ASEAN-Japan Center.

Figure 5 Singapore's Trade with Japan (1993-2001)

(Value In million US \$)



Source: ASEAN Trade Statistics Database

Tables

Table 1 Degree of Foreign Discrimination (Tariff Equivalent) in Services Sectors (%)

	Construction	Transportation	Communication	Financial service	Business service	Other service
Singapore	7.75	10.26	10.20	26.66	28.65	23.81
Indonesia	26.18	34.87	33.00	47.64	48.43	35.57
Malaysia	29.25	26.80	34.00	37.40	41.69	35.29
Philippines	28.00	47.30	32.00	38.70	38.59	39.83
Thailand	11.95	46.77	36.00	39.01	31.81	41.20
Vietnam	23.84	38.94	40.00	40.69	40.13	37.97
Japan	11.13	26.10	0.00	6.34	17.29	12.17
USA	10.66	42.91	0.00	6.34	18.49	15.68
China	19.54	22.22	40.00	21.98	17.58	24.26
ROW	9.65	22.90	13.06	9.10	18.87	14.71

Source: Derived by author based on the services trade restrictiveness index by the Productivity Commission, Australia and Hardin et al. (1997)

Table 2 Changes in Real GDP by Regions and Scenarios

	Scenario 1		Scenario 2		Scenario 3		Scenario 4		Scenario 5		Scenario 6	
	(Sim)	Change	(Sim)	Change	(Sim)	Change	(Sim)	Change	(Sim)	Change	(Sim)	Change
SGP	0.150	125	0.846	704	0.062	52	-0.064	-54	-0.091	-77	-0.152	-128
MYS	-0.006	-7	-0.040	-44	-0.237	-264	-0.084	-93	-0.179	-199	3.425	3815
IDN	0.000	-1	-0.014	-31	-0.108	-243	-0.061	-137	2.203	4962	1.828	4119
THA	-0.003	-5	-0.072	-115	16.847	26810	-0.064	-102	-0.321	-511	15.253	24272
PHL	-0.003	-3	-0.012	-10	-0.615	-519	2.500	2111	-0.123	-104	1.418	1197
VNM	0.004	1	-0.017	-4	0.206	48	0.027	6	-0.076	-18	5.873	1358
JPN	0.000	-14	0.003	125	0.064	2777	0.005	211	0.009	378	0.115	4977
USA	0.000	-19	-0.006	-472	0.002	194	-0.015	-1211	-0.015	-1175	-0.045	-3576
CHN	-0.002	-15	-0.008	-82	-0.035	-347	-0.023	-230	-0.031	-302	-0.130	-1284
ROW	-0.001	-101	-0.007	-1062	0.004	656	-0.019	-2959	-0.018	-2719	-0.055	-8317

- Sim columns denote percentage changes, unit %;
- Change columns denote level changes, unit million US\$.

Table 3 Changes in Exports by Regions and Scenarios

	Scenario 1		Scenario 2		Scenario 3		Scenario 4		Scenario 5		Scenario 6	
	(Sim)	Change	(Sim)	Change	(Sim)	Change	(Sim)	Change	(Sim)	Change	(Sim)	Change
SGP	0.333	436	0.929	1,214	0.214	283	-0.122	-160	-0.106	-140	0.132	174
MYS	-0.074	-73	-0.069	-68	-0.257	-251	-0.124	-121	-0.220	-216	5.503	5,387
IDN	-0.002	-1	-0.013	-7	-0.269	-155	-0.093	-54	5.736	3,309	4.817	2,779
THA	-0.014	-10	-0.081	-58	25.514	18,360	0.108	78	-0.399	-287	23.262	16,739
PHL	-0.067	-27	-0.054	-22	-1.623	-666	6.182	2,537	-0.265	-109	3.255	1,336
VNM	0.015	1	-0.025	-2	0.027	3	-0.071	-7	-0.112	-11	11.265	1,102
JPN	0.190	944	0.223	1,107	1.590	7,916	0.337	1,676	0.679	3,379	3.186	15,865
USA	-0.005	-45	-0.014	-116	-0.082	-694	-0.030	-256	-0.049	-413	-0.219	-1,847
CHN	-0.014	-39	-0.015	-42	-0.135	-390	-0.037	-107	-0.071	-206	-0.323	-933
ROW	0.000	3	-0.009	-359	-0.008	-331	-0.026	-1,080	-0.026	-1,104	-0.084	-3,560

- Sim columns denote percentage changes, unit %;
- Change columns denote level changes, unit million US\$.

Table 4 Changes in Imports by Regions and Scenarios

	Scenario 1		Scenario 2		Scenario 3		Scenario 4		Scenario 5		Scenario 6	
	(Sim)	Chng	(Sim)	Change	(Sim)	Change	(Sim)	Change	(Sim)	Change	(Sim)	Change
SGP	0.919	1,242	1.297	1,753	0.214	292	-0.143	-196	-0.147	-201	0.027	37
MYS	-0.127	-113	-0.085	-76	-0.340	-304	-0.158	-141	-0.300	-268	5.686	5,084
IDN	-0.035	-20	-0.029	-17	-0.417	-242	-0.163	-94	7.644	4,430	6.126	3,550
THA	-0.065	-46	-0.091	-64	24.802	17,408	0.147	103	-0.468	-328	22.322	15,668
PHL	-0.071	-38	-0.049	-27	-1.848	-996	6.119	3,297	-0.314	-169	2.816	1,517
VNM	-0.059	-8	-0.038	-5	0.681	91	0.049	7	-0.165	-22	14.615	1,949
JPN	0.244	997	0.240	978	2.336	9,562	0.481	1,967	0.926	3,789	4.737	19,387
USA	-0.026	-263	-0.026	-255	-0.087	-867	-0.059	-585	-0.086	-851	-0.322	-3,193
CHN	-0.031	-94	-0.026	-79	-0.200	-603	-0.076	-228	-0.133	-401	-0.559	-1,684
ROW	-0.011	-467	-0.014	-561	-0.008	-331	-0.039	-1,618	-0.042	-1,749	-0.128	-5,279

- Sim columns denote percentage changes, unit %;
- Change columns denote level changes, unit million US\$.

Table 5 Changes of International Trade Flow by origins and destinations in scenario 6.

unit %

	SGP	MYS	IDN	THA	PHL	VNM	JPN	USA	CHN	ROW	Total
SGP	-	(0.0132)	(0.0350)	(0.0202)	(0.0475)	0.0309	(0.0002)	0.0095	0.0107	0.0085	0.0010
MYS	0.0413	-	(0.0544)	(0.0250)	0.0096	0.0578	0.1826	0.0543	0.0361	0.0544	0.0559
IDN	(0.0248)	(0.1274)	-	(0.1791)	(0.1343)	(0.0932)	0.3887	(0.0178)	(0.0352)	(0.0276)	0.0482
THA	0.1634	(0.0193)	(0.1234)	-	(0.0142)	(0.1422)	1.0799	0.1199	0.0525	0.1205	0.2341
PHL	0.0290	0.0015	(0.1468)	(0.4921)	-	0.0130	0.4053	0.0269	0.0121	0.0161	0.0319
VNM	(0.1430)	(0.1759)	(0.1905)	(0.1222)	(0.1628)	-	0.9319	(0.1401)	(0.1444)	(0.0436)	0.1189
JPN	(0.0586)	0.6401	0.6017	1.3042	0.4101	1.7009	-	(0.0575)	(0.0445)	(0.0537)	0.0335
USA	(0.0053)	(0.1108)	(0.0755)	(0.0774)	(0.0269)	0.0542	(0.0092)	-	0.0049	0.0020	(0.0024)
CHN	(0.0024)	(0.0408)	(0.0488)	(0.0164)	(0.0333)	(0.0048)	(0.0190)	0.0004	-	0.0013	(0.0034)
ROW	(0.0049)	(0.0792)	(0.0594)	(0.0148)	(0.0775)	(0.0119)	(0.0053)	0.0020	0.0022	0.0004	(0.0012)
Total	0.0008	0.0561	0.0597	0.2199	0.0270	0.1409	0.0468	(0.0030)	(0.0050)	(0.0012)	-

- The numbers in brackets point to negative ones.
- Goods and service flow from the regions in the first column toward the regions in the first row.

Table 6 Changes in sectoral output in Scenario 1 (Short-run Effects of JSEPA)

unit %

	SGP	MYS	IDN	THA	PHL	VNM	JPN	USA	CHN	ROW
agri	-0.026	0.035	0.001	0.001	-0.003	0.018	-0.047	-0.004	-0.002	-0.003
food	12.763	0.012	-0.015	-0.025	-0.007	-0.031	-0.064	-0.012	-0.013	-0.007
texwl	0.301	0.151	0.020	0.071	-0.013	0.035	-0.029	0.008	0.011	0.004
mnrmtl	-0.884	0.027	0.011	0.004	-0.020	0.014	0.064	0.004	0.001	-0.003
trpmfg	-1.204	0.091	0.039	0.019	0.014	-0.095	-0.067	0.014	-0.001	0.013
elcmfg	0.592	-0.154	-0.015	-0.074	-0.186	-0.059	0.064	-0.023	-0.043	-0.029
petrch	0.181	-0.026	0.000	0.004	-0.017	0.038	0.009	0.001	0.003	-0.001
othmfg	-1.330	-0.118	0.015	-0.006	-0.020	0.061	0.051	0.003	0.005	0.003
trpserv	0.689	0.025	-0.005	0.019	-0.011	0.030	-0.022	0.004	0.002	0.004
constru	1.072	-0.049	-0.013	-0.032	-0.019	-0.061	0.012	-0.006	-0.009	-0.007
fnins	-0.439	-0.012	-0.003	0.009	-0.005	0.077	-0.002	0.000	0.001	0.001
comm	-0.347	0.011	-0.001	0.014	0.004	0.036	-0.012	0.000	-0.001	0.001
bizserv	-0.900	0.061	0.007	0.023	0.035	0.027	-0.002	0.001	0.009	0.005
othserv	0.358	-0.011	-0.005	-0.005	-0.010	-0.009	-0.010	0.000	-0.003	-0.001

Table 7 Changes in sectoral output in Scenario 2 (Long-run Effects of JSEPA)

unit %

	SGP	MYS	IDN	THA	PHL	VNM	JPN	USA	CHN	ROW
agri	0.041	0.020	-0.004	-0.015	-0.006	0.006	-0.044	-0.009	-0.005	-0.006
food	13.599	-0.017	-0.023	-0.053	-0.011	-0.068	-0.062	-0.015	-0.017	-0.011
texwl	0.946	0.101	0.012	-0.024	-0.011	-0.008	-0.019	0.005	0.010	0.000
mnrmtl	0.227	-0.035	-0.005	-0.080	-0.021	-0.025	0.073	-0.002	-0.008	-0.008
trpmfg	-0.031	-0.016	0.003	-0.082	-0.015	-0.112	-0.041	0.007	-0.011	0.005
elcmfg	0.855	-0.096	-0.043	-0.150	-0.129	-0.089	0.072	-0.035	-0.049	-0.043
petrch	0.755	-0.045	-0.018	-0.061	-0.023	-0.010	0.017	-0.004	-0.009	-0.008
othmfg	-0.430	-0.169	-0.004	-0.108	-0.020	-0.009	0.059	-0.004	-0.006	-0.006
trpserv	1.292	-0.016	-0.019	-0.053	-0.016	-0.008	-0.018	-0.003	-0.006	-0.002
constru	1.574	-0.063	-0.027	-0.087	-0.017	-0.036	0.006	-0.011	-0.016	-0.012
fnins	0.291	-0.045	-0.016	-0.062	-0.012	0.002	0.002	-0.005	-0.006	-0.006
comm	0.511	-0.030	-0.018	-0.060	-0.009	-0.006	-0.009	-0.006	-0.008	-0.006
bizserv	0.168	-0.013	-0.013	-0.056	0.007	-0.018	-0.001	-0.005	-0.002	-0.005
othserv	0.842	-0.035	-0.017	-0.067	-0.015	-0.019	-0.006	-0.005	-0.009	-0.007

Table 8 Changes in sectoral output in Scenario 3 (a post-JSEPA Japan-Thailand FTA) unit %

	SGP	MYS	IDN	THA	PHL	VNM	JPN	USA	CHN	ROW
agri	0.244	0.253	0.094	7.844	0.089	0.065	-0.513	0.061	0.013	0.043
food	-0.429	0.211	0.067	31.586	0.155	-0.553	-1.152	-0.146	-0.208	-0.048
texwl	-0.550	-0.150	0.063	17.872	1.479	-0.173	0.104	-0.094	-0.161	-0.162
mnrmtl	-0.495	-0.179	0.192	15.463	-1.562	0.469	0.671	0.017	0.023	-0.003
trpmfg	-8.149	-6.351	-10.369	-7.881	-52.944	-8.804	1.541	0.016	0.091	0.109
elcmfg	0.939	0.242	0.069	22.707	0.084	0.592	-0.274	-0.084	-0.111	-0.138
petrch	-0.039	-0.406	0.055	12.233	-1.205	0.212	0.391	0.016	0.000	0.007
othmfg	-0.119	-0.025	0.130	18.654	0.875	0.089	0.195	0.027	0.043	0.002
trpserv	0.247	0.115	-0.008	16.800	-0.250	0.943	-0.092	0.019	-0.002	0.044
constru	0.094	-0.312	-0.142	20.207	-0.942	0.660	0.144	0.007	-0.043	0.019
fnins	0.168	-0.163	-0.069	16.402	-0.895	0.366	0.012	0.007	-0.017	0.017
comm	0.195	-0.111	-0.095	17.732	-0.518	0.383	-0.014	0.008	-0.021	0.009
bizserv	0.197	-0.029	-0.140	16.498	0.251	0.299	0.050	0.003	-0.018	0.005
othserv	0.070	-0.180	-0.103	15.204	-0.891	0.397	0.024	0.005	-0.036	0.007

Table 9 Changes in sectoral output in Scenario 4 (a post-JSEPA Japan-Philippine FTA) unit %

	SGP	MYS	IDN	THA	PHL	VNM	JPN	USA	CHN	ROW
agri	0.039	0.010	0.005	0.022	2.474	0.070	-0.268	-0.016	-0.009	-0.007
food	0.077	-0.012	-0.015	0.117	2.059	0.693	-0.047	-0.010	-0.011	-0.006
texwl	-0.040	-0.030	0.071	0.085	3.370	-0.289	0.050	-0.012	-0.024	-0.026
mnrmtl	-0.130	-0.056	0.013	0.056	1.919	-0.094	0.072	-0.014	-0.022	-0.026
trpmfg	-4.229	-0.993	-3.254	-1.131	24.724	-0.954	0.352	-0.006	-0.070	-0.108
elcmfg	-0.097	-0.137	-0.025	0.067	6.004	-0.796	0.031	-0.083	-0.077	-0.064
petrch	-0.093	-0.118	-0.003	0.011	2.567	-0.127	0.037	-0.012	-0.013	-0.017
othmfg	-0.099	-0.062	0.059	0.092	-1.232	-0.166	-0.002	-0.011	-0.010	-0.011
trpserv	0.062	-0.019	-0.028	0.077	2.856	-0.024	-0.031	-0.003	-0.013	0.001
constru	-0.109	-0.124	-0.101	-0.011	4.009	0.077	0.017	-0.029	-0.048	-0.034
fnins	-0.007	-0.080	-0.053	0.013	2.066	-0.101	-0.013	-0.014	-0.020	-0.016
comm	0.031	-0.057	-0.064	0.044	2.173	-0.042	-0.014	-0.016	-0.025	-0.017
bizserv	0.093	-0.009	-0.063	0.035	0.681	-0.027	0.002	-0.014	-0.013	-0.013
othserv	-0.047	-0.075	-0.065	-0.028	2.739	0.062	-0.003	-0.013	-0.025	-0.018

Table 10 Changes in sectoral output in Scenario 5 (a post-JSEPA Japan-Indonesia FTA) unit %

	SGP	MYS	IDN	THA	PHL	VNM	JPN	USA	CHN	ROW
agri	0.114	0.098	1.303	-0.014	0.006	0.063	-0.246	0.019	-0.009	0.017
food	-0.633	-0.101	7.279	-0.159	-0.047	-0.544	-0.445	-0.081	-0.109	-0.046
texwl	0.060	0.037	2.827	-0.162	0.114	-0.244	-0.073	0.000	-0.065	-0.029
mnrmtl	-0.205	-0.103	-1.637	-0.269	-0.261	-0.006	0.259	-0.002	-0.005	-0.005
trpmfg	-2.769	-3.477	-12.800	-2.535	-7.043	-0.227	0.842	-0.027	-0.068	-0.082
elcmfg	-0.019	-0.006	3.446	-0.078	-0.052	-0.131	-0.057	0.012	0.007	-0.014
petrch	-0.221	-0.287	0.094	-0.185	-0.222	0.003	0.118	-0.002	0.002	-0.008
othmfg	-0.070	-0.088	1.519	-0.225	0.002	-0.067	0.018	-0.010	-0.008	-0.021
trpserv	0.049	-0.017	2.523	-0.152	-0.067	-0.041	-0.040	0.001	-0.013	0.002
constru	-0.172	-0.280	4.429	-0.377	-0.202	-0.150	0.031	-0.027	-0.061	-0.030
fnins	-0.018	-0.170	2.718	-0.270	-0.164	0.033	-0.005	-0.013	-0.024	-0.014
comm	-0.018	-0.144	2.601	-0.256	-0.114	-0.038	-0.019	-0.015	-0.031	-0.016
bizserv	0.030	-0.087	2.539	-0.272	0.006	-0.068	0.008	-0.015	-0.025	-0.019
othserv	-0.082	-0.152	2.584	-0.286	-0.169	-0.081	-0.008	-0.013	-0.035	-0.017

Table 11 Changes in sectoral output in Scenario 6 (a post-JSEPA Japan-ASEAN FTA) unit %

	SGP	MYS	IDN	THA	PHL	VNM	JPN	USA	CHN	ROW
agri	0.754	1.616	1.302	7.591	2.555	0.677	-1.204	0.077	-0.004	0.061
food	-0.311	2.303	6.279	30.567	1.845	10.842	-1.759	-0.234	-0.302	-0.096
texwl	-1.774	5.364	3.199	16.786	5.387	34.792	0.597	-0.165	-0.465	-0.353
mnrmtl	-1.712	2.498	-1.208	14.254	-0.687	-1.766	1.093	-0.019	-0.008	-0.060
trpmfg	-22.021	-33.246	-31.686	-19.608	-56.402	-31.470	4.145	-0.140	-0.156	-0.150
elcmfg	1.715	5.724	3.383	22.079	5.825	-4.127	-0.708	-0.140	-0.193	-0.252
petrch	-0.558	1.400	0.244	11.379	0.581	-0.924	0.622	-0.010	-0.016	-0.031
othmfg	-0.597	5.220	2.136	17.641	-0.073	-1.106	0.075	0.004	0.038	-0.033
trpserv	0.495	5.270	2.401	15.983	2.348	3.770	-0.243	0.015	-0.052	0.048
constru	-0.326	4.648	3.721	18.267	2.183	10.966	0.240	-0.081	-0.231	-0.081
fnins	0.199	3.325	2.279	15.055	0.553	-4.179	-0.013	-0.035	-0.093	-0.028
comm	0.268	3.837	2.190	16.428	1.188	1.517	-0.055	-0.038	-0.118	-0.040
bizserv	0.394	4.597	2.062	15.150	0.822	2.465	0.083	-0.046	-0.100	-0.053
othserv	-0.101	1.941	2.150	13.817	1.232	6.307	0.040	-0.035	-0.138	-0.047

Table 12 A Panorama of the Effects of Trade Liberalization in Six Scenarios

		<i>Singapore</i>	<i>Malaysia</i>	<i>Indonesia</i>	<i>Thailand</i>	<i>Philippine</i>	<i>Vietnam</i>	<i>Japan</i>
Scenario 1	GDP	+						
	Export	+						+
	Import	++	-					+
	No. of SPASs**	7	1	0	0	0	0	0
	No. of SNASs	7	2	0	0	1	0	0
Scenario 2	GDP	++						
	Export	++						+
	Import	+++						+
	No. of SPASs	11	1	0	0	0	0	0
	No. of SNASs	1	1	0	2	1	1	0
Scenario 3	GDP		-	-	+++	--	+	
	Export	+	-	-	+++	---		+++
	Import	+	-	-	+++	---	++	+++
	No. of SPASs	6	4	2	13	4	9	6
	No. of SNASs	5	8	4	1	8	3	3
Scenario 4	GDP					+++		
	Export	-	-		+	+++		+
	Import	-	-	-	+	+++		+
	No. of SPASs	0	0	0	1	13	1	1
	No. of SNASs	2	4	2	1	1	6	1
Scenario 5	GDP		-	+	-	-		
	Export	-	-	+++	-	-	-	++
	Import	-	-	+++	-	-	-	++
	No. of SPASs	1	0	11	0	1	0	3
	No. of SNASs	5	8	2	12	7	4	2
Scenario 6	GDP	-	+++	+++	+++	+++	+++	+
	Export	+	+++	+++	+++	+++	+++	+++
	Import		+++	+++	+++	+++	+++	+++
	No. of SPASs	6	13	12	13	11	8	5
	No. of SNASs	8	1	2	1	2	6	4

Resource: Derived from simulation results by the author.

Notes: * Notation & the impact ranges: 0-0.1% Blank, 0.1-0.5% (+), 0.5-1% (++), 1%-+∞ (+++); 0-(-0.1)% Blank, (-0.1)-(-0.5)% (-), (-0.5)-(-1)% (--), (-1)%-(-∞), (- - -).

** SPASs refers to Significantly and Positively Affected Sectors and SNASs to Significantly and Negatively Affected Sectors. "Significantly" means that the absolute effects are greater than 0.1%.

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Appendix

Table of Sectoral Aggregation in This Study

<i>Code</i>	<i>Notation used</i>	<i>Sectors in GTAP bases</i>
Agri	Agriculture	paddy rice, wheat, cereal grains nec, vegetables, fruit, nuts, oil seeds, sugar cane, sugar beet, plant-based fibers, crops nec, bovine cattle, sheep and goats, horses, animal products nec, raw milk, wool, silk-worm cocoons, forestry, fishing.
food	Processed foods	Bovine cattle, sheep and goat meat products, meat products, vegetable oils and fats, dairy products, processed rice, sugar, food products nec, beverages and tobacco products.
texwl	Textile, apparel and leather products	Textiles, wearing apparel, leather products
mnrmtl	Mineral resource manufacture	Coal, oil, gas, minerals nec, mineral products nec, ferrous metals, metals nec, metal products.
trpmfg	Transportation manufacture	motor vehicles and parts, transport equipment nec
elcmfg	Electronic manufacture	Electronic equipment
petrch	Petroleum and chemical products	petroleum, coal products, chemical, rubber, plastic products
othmfg	Other manufacture	wood products, paper products, publishing, machinery and equipment nec, manufactures nec
trpserv	Transportation service	Transport nec, water transport, air transport
constru	Construction	Construction
fnins	Financial and insurance service	Financial services nec, insurance,
comm	Communication	Communication
bizserv	Business service	Business services nec, trade
othserv	Other service	Electricity, gas manufacture, distribution, water, recreational and other services, public admin. and defence, education, health, ownership of dwellings

Table of Regional Aggregation in This Study

<i>Code</i>	<i>Regions</i>
SGP	Singapore
MYS	Malaysia
IDN	Indonesia
THA	Thailand
PHL	Philippine
VNM	Vietnam
JPN	Japan
USA	United States
CHN	China
ROW	Rest of the World (including rest of the regions in GTAP data 5)