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Abstract

This paper discusses a quantitative simulation analysis on the impact of Japan's FTAs in Asia using a CGE model of global trade. It has been argued that a regional FTA would be a step toward global trade liberalization rather than a final goal. In fact, it is shown that changes in sectoral trade balance and production would vary according to the partners in Japan's FTAs in Asia deviating from those expected in global trade liberalization. Moreover, the terms of trade effects would be relatively significant in determining the overall welfare impacts in partial trade liberalization. On the other hand, capital formation mechanisms, one through dynamic capital accumulation and another through international capital movements, are shown to be particularly important for macroeconomic gains in several ASEAN countries. It is suggested that liberalization and facilitation of not just the trade of goods but also investment would be essential for economic partnerships in Asia.

Key words: Free Trade Agreement, Regional Integration, CGE model, Asia

JEL classification: C68, F14, F15, F21

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I. Introduction

It was decided at the fourth Ministerial Conference of the World Trade Organization (WTO) in November 2001 that a new multilateral trade negotiation be launched. Although it has taken some time to begin a new round of negotiations after the Uruguay Round was concluded in 1993, trade liberalization and facilitation was revitalized and enlarged when China and Chinese Taipei joined the WTO.

Regionalism coexists with the principles of multilateral trade in the process of globalization of the world economy, as symbolized by recent worldwide liberalization of trade and investment. In fact, in the 1990s when the WTO was established with the subsequent reinforcement of its functions, the North American Free Trade Agreement (NAFTA) was established, the Asia-Pacific Economic Cooperation (APEC) was activated, and unification of the European Union (EU) was promoted.

In particular, it is noteworthy that Japan, that had not joined any regional agreement until recently,[1] started the negotiations for a bilateral and/or regional Free Trade Agreement (FTA). In January 2002, the "Japan-Singapore Economic Partnership Agreement (JSEPA)" was signed. Other efforts have been made with Mexico, Korea and other Asian economies,[2] although with variations in their progress and status.

The purpose of this paper is to discuss a quantitative simulation analysis on the economic impact of trade liberalization with an economic model. The relative significance of bilateral and regional trade liberalization will be investigated in comparison with multilateralism employing a Computable General Equilibrium (CGE) model of global trade. The goal is to compare and consider the impact of Japanese trade policy measures in a quantitative manner.

Moreover, one objective of this paper is to discuss a possible range of the impacts of trade liberalization using several versions of model simulations rather than to draw a conclusion from a single estimate, while also clarifying the key source of an economic impact which differentiates those simulation outcomes.[3] This also provides a benchmark simulation and a starting point for the assessment of the economic impact of Japan's FTAs in Asia, based on a relatively standard version of an economic model. However, the intent is to look at the detailed contents of the impact of trade liberalization in light of the theoretical expectation.

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[1] As of 2000, it was only Japan, China, Korea and Chinese Taipei that had not joined any regional free trade agreements among the thirty largest economies in the world in terms of GDP levels.

[2] See METI (2003) for recent developments in Japan's bilateral trade negotiations.

[3] There have been several simulation studies on the impacts of certain regional FTAs in Asia. Those include EPA (2000), Hertel, Walmsley and Itakura (2001), IDE (2000), Itakura, Hertel and Reimer (2002), KIEP (2000), Nakajima and Kwon (2001) and Tsutsumi and Kiyota (2002). However, both the policy scenario of trade liberalization measures, which is the subject of a study, and the structures of the model employed, vary among these studies. Therefore, it may not be so useful or fruitful to compare the outcomes of those simulations.

The remaining part of this paper is organized as follows. In chapter II, the framework of a CGE model used for the simulation experiments in this paper will be presented. After a brief survey of the stylized features of the impact of trade liberalization in general by conventional CGE model simulations is presented in Chapter III, emphasizing the significance of multilateral trade liberalization, the impact of Japan's FTAs in Asia in particular will be discussed in Chapter IV. The paper concludes with Chapter V.

II. The Framework of CGE Model Simulations

To analyze the economy-wide impact of trade liberalization, a CGE model of global trade is employed for model simulations in this paper. A CGE model numerically simulates the general equilibrium structure of the economy. It is built on the Walrasian general equilibrium system, in which the central idea is that market demand equals supply for all commodities at a set of relative prices. Moreover, a CGE model has solid micro-foundations that are theoretically transparent. Functional forms are specified in an explicit manner, and interdependencies and feedback are incorporated. Therefore, the model provides a framework for assessing the effects of policy and structural changes on resource allocation by clarifying "who gains and who loses."

These characteristics differentiate it from the partial equilibrium model, which is not economy-wide, the macroeconomic model, which is not multi-sectoral, and the input-output model, in which economic agents do not respond to changes in prices. Moreover, the multi-country model is required to analyze international economic affairs such as trade and investment policies, which affect not just one but a number of economies.

Among others, the database and the standard version of a model by the Global Trade Analysis Project (GTAP)[4] are utilized as a basis of simulation experiments in this paper. The GTAP model is a standard CGE model, which depicts the behavior of households, governments and global sectors across each economy in the world. It is composed of regional models, which are linked through international trade. Prices and quantities are simultaneously determined in factor markets and commodity markets by accounting relationships, by the equilibrium conditions specified by the behavior of economic agents, and by the structure of international trade. The model includes three main factors of production: labor, capital, and land. Labor and capital are used by all industries, but land is used only in agricultural sectors. Capital and intermediate inputs are traded, while labor and land are not traded between regions.

The standard version of the GTAP model includes several key assumptions.

[4] The GTAP model was applied to the analysis of the economic impact of the Uruguay Round Agreement by the Secretariat of the General Agreement on Tariff and Trade (GATT) for that day, as seen in GATT (1994). And later, in 1997, it was also utilized in the assessment of the economic impact of the Manila Action Plan by the APEC Economic Committee, as seen in APEC (1997). At present, this model and database are widely used by international organizations and researchers on international affairs. See Hertel (1997) for the description of the GTAP database and model.

First, perfect competition, therefore a constant return to scale, is assumed. Second, imperfect substitution in goods and services between the home economy and those abroad and among different origins of economies are assumed by the Armington parameters.[5] Third, the amount of total labor -- one factor endowment -- is fixed. This means that the model assumes full employment and no unemployment. The amount of total capital is also fixed in the standard GTAP model.

A common criticism has often been that a standard CGE model focuses evaluation of static efficiency improvements, therefore the dynamic effects among production, income, and savings and investment are not captured. In fact, concerning the dynamic impact of trade liberalization, the growth effects through productivity gains and capital accumulation have been pointed out. In this paper, certain dynamic aspects are studied in the model simulations.

One deals with the dynamic aspects of capital formation by modifying the standard version of the GTAP model. Two mechanisms are considered in this paper. First, the important "dynamic" effects of capital accumulation are introduced[6] into the standard static model. According to the growth theory, a medium-run growth or accumulation effect induces additional savings and investment. The induced savings[7] and investment (larger capital stock) in turn link to the production capacities and cause a further increase in income. Second, trade balance is endogenously determined and international capital movement is allowed. It is assumed that the expected rate of return on capital would be equalized among the regions.

In addition to these, pro-competitive productivity growth effects[8] are also investigated in the model simulation. It is assumed that productivity of domestic industries would increase in order to compensate for the lower import prices. Such a rate of productivity increase is set as equal to the rates of change in import prices weighted by a share of imports over total production including domestic goods.

The GTAP database provides fairly arranged data of countries and regions in which Japan is highly interested - namely, Asian Newly Industrializing Economies (NIEs), the Association of Southeast Asian Nations (ASEAN) countries and others.

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[5] The basic framework of the trade model is guided by the comparative advantage theory by Hecksher-Ohlin. However, the original theory of comparative advantage cannot explain such aspects as the two-way trade seen in actual trading behavior. This is because the theory makes no distinctions between the same goods from different areas of production. Therefore, the general equilibrium model introduces heterogeneity into the same goods according to their production areas, namely, imperfect substitutes of goods between home and abroad, the so-called Armington assumption, and thus describes realistic trade developments. See Armington (1969) for the description of the Armington assumption.

[6] See Francois, McDonald and Nordstrom (1996) for the methodology for implementing this mechanism into the GTAP model.

[7] It is assumed that a fixed share of induced income is saved. The saving ratio is exogenous rather than endogenous in the current model.

[8] See, for examples, Itakura, Hertel and Reimer (2003) regarding incorporating productivity linkages in general into the GTAP model simulations, and Ianchovichina, Binkley and Hertel (2000) for incorporating pro-competitive productivity effects into a CGE model with an assumption of imperfect competition.

One of the notable distinguishing features of the model is its function to separately evaluate the mutual dependence between Japan and these economies. The GTAP database currently consists of fifty-seven disaggregated sectors and sixty-six economies,[9] which are aggregated into the appropriate version for simulations. In this study, as shown in Table 1, economies are aggregated into twenty-three areas. The development of the APEC member economies is individually analyzed as far as the data exist in the database.[10] Industries/commodities are aggregated into sixteen, taking into account the features of Japanese trade protection based on the medium classification of standard national accounts.

(Table 1: Regional and Commodity Aggregation)

It must be noted that the estimated economic impact of a CGE model is not a forecast. As described in Dee, Geisler and Watts (1996), economic policy measures will be implemented over time and adjustments to those changes may take time. During the course of such adjustments, other economic changes will also take place. However, those changes, including economic growth and structural changes in trade and industries, are not taken into account in the current analysis. The model simulation shows the differences at a certain point in time between when trade liberalization measures were implemented and when they were not[11].

The simulations throughout this paper were carried out to assess the impact of the removal of import protection on goods. Trade liberalization in service sectors is not included. Other measures, such those for investment liberalization and free movement of labor, are not explicitly considered. Trade protection data are derived also from the current GTAP database as they are, without any modification. It must be noted that although the import protection data are mainly derived from tariff schedules in merchandise trade, they may include certain estimated certain Non-Tariff Measures (NTMs), such as import quotas and subsidies for domestic products in agricultural trade. In fact, as is shown later, the protection levels in agricultural sectors are measured as significantly higher compared with those indicated by actual tariff revenues.

III. The Significance of Multilateral Trade Liberalization

According to the conventional simulations by a CGE model of global trade, trade liberalization measures, including tariff reductions, will stimulate trade by lowering prices on tradable goods. This will result in increases in the national output of exporting countries while increasing access to the markets of trading partners. On the other hand, domestic production resources -- land, capital, labor, and intermediate inputs -- will be used more efficiently in importing countries, in particular, when

[9] This is the version five database, which was released in summer 2002, although the base year is 1997.

[10] The data for Brunei and Papua New Guinea are not available in the current GTAP database.

[11] Although the structure of the model is non-linear, simulation outcomes tend to be almost linear to external shocks. The impact of trade liberalization is estimated to be not so much different, based either on the current or future economic structures incorporating growth effects as far as it can be estimated in terms of rates of change, given that the general equilibrium elasticities are unchanged.

domestic distortions, including those due to trade barriers, are reduced. These combined effects -- one from foreign markets and the other from the domestic market -- are expected to result in the expansion of production and an increase in income and welfare.

From past empirical analyses[12], it can be seen that more significant effects are generated by an abolition of trade barriers by trading partners and a relaxation of restrictions upon entry into overseas markets in comparison with the trade creation and diversion effects discussed in theoretical studies that concern the economic impact from the formation of a customs union and an FTA. An analysis of the influence of protectionism in developed countries on developing economies indicates that various expenses are required of developing economies for an amount equal to the aid volume they receive annually from developed countries. Therefore, there is even an example where aid effects are almost balanced out by trade effects.

The impact of partial and preferential trade liberalization has generally been shown to be limited compared with that of much wider trade liberalization without any discriminative treatment in earlier studies by CGE model simulations. Moreover, as it is pointed out in Dee, Hardin and Schuele (1998), which analyzes the economic impact of the Early Voluntary Sectoral Liberalization (EVSL) in APEC, the outcomes of trade liberalization in limited sectors may deviate from efficient resource allocation which would be realized by wider liberalization.

Among others, the following three points are emphasized in Kawasaki (2003) as stylized features in analyzing the impact of trade liberalization including an FTA. First, “free rider” gains may be limited. In order to enjoy the benefits from trade liberalization, it is essential for an economy to liberalize its own markets rather than to wait for those in other economies. Second, wider trade liberalization in terms of coverage of both regions and sectors would be much more beneficial. An FTA would be a step toward global trade liberalization rather than a final goal. Third, successful structural adjustments would be required to realize possible gains from trade liberalization. Useful information will be given by model simulation experiments for the required changes in the industry structures.

One of the concerns in regional trade liberalization is the comparative economic benefits between those who join a regional regime and those who do not. It has been argued that those economies who will not liberalize their own markets might enjoy the economic benefits from trade liberalization by other economies as “free rider” gains. However, earlier studies, including APEC (1997), which analyzed the impact of “open-regional” trade liberalization initiatives in APEC, have tended to reject the significance of such benefits.

Estimated gains in real GDPs according to global trade liberalization and trade liberalization just in the Asian economies, are compared in Chart 1. In the case of trade liberalization in Asia, Asian economies -- Japan; China; Korea; Hong Kong,

[12] See Shoven and Whalley (1992) for the analysis of global trade developments by general equilibrium model simulations

China; Chinese Taipei and ASEAN countries -- remove import protection on the goods imported not just from these Asian economies but also from the other economies in the world. It is shown that these Asian economies would mainly gain from trade liberalization by Asian economies. Other economies, except Australia and New Zealand, would more or less lose rather than gain from trade liberalization in Asia. However, those economies would also gain from their own trade liberalization. It can be pointed out that "free rider" gains could be limited or even negative. In order to enjoy the benefits from trade liberalization, it is essential for an economy to liberalize its own markets rather than wait for liberalization to occur in other economies.

(Chart 1: The Impact of Trade Liberalization in Asia)

As is touched upon in the introduction, Japan signed the JSEPA with Singapore in 2002. Other efforts for bilateral FTAs have been made with Mexico, Korea and other Asian economies. Japan's benefits from bilateral trade liberalization between Japan and other economies and those from global trade liberalization are compared in Chart 2. Japan's real GDP would increase but by almost zero percent from the FTA with Singapore, 0.03 percent from that with Mexico, and 0.12 percent from that with Korea. In contrast, Japan would significantly gain in real GDP by 0.71 percent from global trade liberalization.

(Chart 2: The Impact of Bilateral FTAs on the Japanese Economy)

The macroeconomic impact of trade liberalization would be roughly proportional to the amount of removed trade protection. This means that the economies whose protection levels are higher prior to trade liberalization would tend to gain more from it. In addition, in comparison with the benefits of global trade liberalization, those from regional trade liberalization among certain economies, in which a direct impact on trade would be in a limited area, would be smaller. A regional FTA would be considered as a step toward global trade liberalization rather than a final goal.

In the negotiation process for trade liberalization, it is possible that certain economies would prefer trade liberalization in limited sectors in order to protect their less competitive sectors. Keeping this in mind, the impact of global trade liberalization on the Japanese economy in the primary industries, i.e. agriculture, forestry, fisheries, and processed food, and in the other secondary industries, i.e. mining and other manufacturing, are compared in Chart 3.

(Chart 3: The Impact of Sectoral Trade Liberalization on the Japanese Economy)

It is shown that Japanese real GDP gains would largely come from agricultural and food trade liberalization.[13] Japanese consumers would also mainly benefit from agricultural and food trade liberalization, although Japanese exporters, i.e. producers,

[13] As far as economic benefits in the world economy as a whole are concerned, the impact of trade liberalization in primary sectors would be relatively small. As it is also shown later, those gains due to reduction in tariffs in manufacturing sectors would be much more significant, mainly in developing economies.

would largely gain from other manufacturing trade liberalization. On the other hand, in decomposing welfare gains measured by changes in Equivalent Variation (EV),[14] it is shown that agricultural and food trade liberalization would be a vital source of those gains due to more efficient resource allocation. Other manufacturing trade liberalization would be a major source of the terms of trade gains.

These gains indicate that it would be better to improve resource allocation through trade liberalization and structural reforms, including the sectors in which they are less competitive in international markets. However, it would not necessarily be enough for trade liberalization to be limited in those less competitive sectors. Trade liberalization, both in the primary and the secondary industries, would be much more beneficial to Japan without discrimination in certain sectors. In any event, the economic impact of wider trade liberalization covering more sectors would be greater.

The impact of structural reform measures including trade liberalization would be more widely observed at sectoral levels compared with those changes in income and production at a macro level. In particular, trade liberalization may result in a realignment of regional production. In principle, it would be in accordance with a comparative advantage of the regions. According to conventional simulations by a CGE model of global trade, developing and transition economies are expected to expand production of labor-intensive manufactured products as a result of broadly based trade liberalization measures. On the other hand, developed economies are expected to expand production in capital- and technology-intensive manufacturing sectors, while, in the geographically larger countries, agricultural and food industries would expand production.

An estimated impact on the structure of sectoral production according to global trade liberalization is shown in Table 2.[15] As a result of global trade liberalization, output will increase in transport equipment in Japan, in textiles and apparel in ASEAN countries, China and Asian NIEs, in agriculture and food industries in Oceania, and in agriculture in North America.

(Table 2: Changes in Production Structures)

It is indicated that not just “winners” but also “losers” may emerge from implementing trade liberalization measures. It should be noted that the reallocation of resources to more productive uses usually involves some adjustment costs,[16] including the displacement of employment across industries within the economies. In Japan, production, on the other hand, in agricultural and food sectors, and light industries, like

[14] The methodology to decompose an aggregated welfare impact was developed and revised by Huff and Hertel (2001) and extended by Hanslow (2000).

[15] This estimate is given by running the standard static version of a CGE model in this paper. This version of the model does not incorporate a dynamic capital formation mechanism and the productivity linkages discussed above, which are included in the other simulations in this chapter. It measures the static impact of resource allocation due to a comparative advantage. It may be possible, for example, that a negative impact on certain sectors would be more than offset by incorporating these dynamic effects.

[16] These adjustment costs are not considered in the current model simulations.

textiles and apparel, would shrink. In order to enjoy macroeconomic benefits from trade liberalization, successful structural adjustments would be required.[17] Useful information will be given by model simulation experiments for the required changes in the industry structures.

IV. The Impact of Japanese Trade Liberalization in Asia

The main purpose of the CGE simulation experiments in this paper is to investigate the impact of Japan's several FTAs in Asia. The macroeconomic as well as sectoral impacts of the six independent FTAs between Japan and Asian countries -- China, Korea, Indonesia, Malaysia, the Philippines and Thailand -- are presented in this chapter after looking at trade and protection structures in the bilateral trade between them and Japan. Moreover, the theoretical aspects of trade liberalization are quantitatively studied by CGE model simulations.

a) Trade and Protection Structures

One of the emerging features in the longer-term trends in world trade is the remarkable development of trade in East Asia. Trade volume in Asian economies increased rapidly, particularly in the 1980s, compared with that in the other regions. According to the GTAP database, the share of Asian trade in the world was around five percent in the 1970s but reached fifteen to twenty percent at the end of the 1990s.

The mutual interdependence between Japan and those Asian economies has also significantly deepened. As it is shown in Table 3, Asian economies as a whole made up more than forty percent of the sources of Japan's trade in 2002. By economies, it must first be noted that the share of Japanese trade with China strikingly expanded. China became the number one economy for Japanese imports in 2002 in the world, exceeding the United States. Asian NIEs follow China as destination regions for Japanese exports in Asia. On the other hand, Indonesia still shares a relatively higher ratio in Japanese imports compared with Asian NIEs and also with the other ASEAN countries.

(Table 3: The Share of Asian Economies in Japanese Trade)

The impact of trade liberalization can more likely be determined by trade structures and the degree of import liberalization by sectors, in the case of partial trade liberalization like a bilateral FTA, compared with that of the global trade liberalization, in which case the comparative advantage of the sectors among regions is a key factor. Therefore, the structures of trade and protection levels are much more worthy of consideration in the cases of bilateral FTAs between Japan and Asian economies prior to simulation experiments. The structures of Japanese exports to selected Asian countries and that of Japanese imports from those Asian countries are shown in Tables 4-A and 4-B respectively.

[17] For example, in order for the structural changes shown in Table 2 to succeed, more than a million movements of workers among the sectors would be required in Japan.

(Table 4-A: The Structure of Japanese Exports to Asia)
(Table 4-B: The Structure of Japanese Imports from Asia)

Other machinery and equipment, besides transport equipment and including electronic appliances, make up half of the Japanese exports to the world as a whole. In addition, transport equipment, including autos and auto parts, makes up another fifth. In total, machinery and equipment account for two thirds of Japanese exports. In contrast, the share of transport equipment is relatively low, although that of other machinery and equipment is higher in Asian economies. According to economies, the share of textiles and apparel is relatively higher, while that of transport equipment is lower, in China; in Korea, chemicals and metal share higher ratios, while transport equipment shares quite a low ratio.

On the other hand, natural resources including oil, machinery and equipment share higher ratios in Japanese imports from the world. However, the structure of Japanese imports from Asian economies varies widely. Textiles and apparel are important import goods from China. In Korea, two-way trade is observed in chemicals, metal and other machinery and equipment. Indonesia is a crucial source of energy products. Meanwhile, imports of other machinery and equipment share a remarkably higher ratio in other ASEAN countries like Malaysia, the Philippines and Thailand. In addition, Thailand is a larger exporter of processed food, but not necessarily agricultural products, to Japan.

Free trade has been widely promoted in the world economy during the last several decades. In addition to the trade liberalization measures under the GATT/WTO system, APEC was established in 1989 in the Asia-Pacific region. An important initiative for the APEC region is contained in the "Declaration of Common Resolve (Bogor Declaration)" of 1994 by the APEC economic leaders. It states that the APEC economies will establish free and open trade and investment in the region by 2010 for the industrialized economies, and by 2020 for the developing economies. Moreover, it was agreed to establish the ASEAN Free Trade Area (AFTA) in 1992. So far, tariff reduction has successfully been carried out in major ASEAN countries.

According to the current GTAP database, an import protection of around 4.8 percent[18] remained in world trade on average in the late 1990s. By regions, trade barriers are lower in North America and the EU, and free trade is mostly realized in Hong Kong, China; and Singapore. However, higher trade protection is still observed mainly in developing economies. By commodities and industries, although variations are smaller compared with regional differences, trade protection is higher in primary products and food, followed by textiles, apparel and leather.

The import protection that Japan imposes on selected Asian countries and that Japan faces in those Asian countries are compared in Tables 5-A and 5-B respectively.[19]

[18] It may be noted that this figure is weighted by the actual volume of imports. If the import volume of certain products with higher import protection is smaller, an average level of import protection in this measurement would be calculated to be somewhat lower.

[19] The figures in the Tables show the "net" levels of import protection. They can be negative, for

Japanese import protection in most manufacturing sectors is quite low by international standards - actually almost zero. However, higher protection remains in primary industries, food, textiles and apparel. These protection levels exceed those of world averages and are not necessarily lower than those in Asian economies.

(Table 5-A: Import Protection by Japan)
(Table 5-B: Import Protection Japan Faces)

In contrast, the higher trade protection that Japan faces is widely observed in the other economies across primary and secondary industries. As is discussed above, trade protection in textiles and apparel is higher, following that in primary products and food in world trade as a whole. In addition, trade protection in transport equipment is relatively higher in Asian economies on average.

According to economies, higher trade protection on average is suggested in Thailand[20] among selected Asian countries. However, trade protection by sectors varies among Asian economies. In Korea, trade protection in food is as high as Japan's, although in primary products on average it is not as high. In Indonesia and Thailand, it is relatively higher in transport equipment; in Malaysia, it is higher in other primary products, leather and transport equipment; in the Philippines, a higher protection is suggested for grain.

b) The Macroeconomic Impact of an FTA in Asia

The simulation outcomes on the macroeconomic impact of the six independent FTAs between Japan and Asian countries are compared in Tables 6-A and 6-B. Japanese macroeconomic gains measured in terms of rates of change in real GDP range between 0.45 percent from the Japan-China FTA to 0.03 percent from the Japan-Philippines FTA. These macroeconomic gains are more or less proportional to the expansion of trade. However, expansions in Japanese import volumes are shown to be larger than those in Japanese export volumes. Japanese trade balances are generally deteriorating with the exception of Japan's FTAs with Malaysia and the Philippines.

(Table 6-A: The Macroeconomic Impact of an FTA - The Impact on the Japanese Economy -)
(Table 6-B: The Macroeconomic Impact of an FTA - The Impact on Asian Countries -)

The rates of change in trade, production and capital formation are shown to be significantly larger in six Asian countries compared with that in Japan. However, in terms of absolute changes, both Japan and its trading partners, more or less equally benefit from the FTAs between Japan and Asian countries. In fact, looking at welfare improvements measured by changes in equivalent variation, Japanese gains exceed those in China and Malaysia, are equally as large as those in Korea and the Philippines, and are around half of those in Indonesia and Thailand. The trade balances in Asian

example, when subsidies are paid, reducing the price of import goods in the domestic market.

[20] An average trade protection in China is also shown to be higher in Table 5-B. However, it must be noted that the base year of the current GTAP database is 1997, and tariff reductions due to the China's accession to the WTO are not reflected.

countries would deteriorate without Thailand.

From the perspectives of Japanese policymakers, it is interesting to estimate which FTAs gain Japan the most. It is also worth looking at the relative significance of Japan's FTAs with the selected Asian countries discussed in this paper compared with those with the other economies. The impacts of Japan's bilateral FTAs with other economies are compared in Chart 4. As far as the real GDP gains are concerned, China is ranked as the top trading partner of Japan.[21] This position is followed by developed economies like the EU, North America, and Oceania, rather than most Asian economies.

(Chart 4: The Impact of Japan's Bilateral FTAs on the Japanese Economy)

It must be noted that the outcomes of model simulations may vary according to the macroeconomic assumptions and closures discussed above.[22] Earlier studies on the impact of trade liberalization like GATT (1993) and APEC (1997) have emphasized the significance of dynamic impacts through capital formation. It has been pointed out that the economic effects measure several times larger when a framework allowing international capital flows is introduced into the model if the economy concerned needs finances from other countries to strengthen trade integration, as in the case of Mexico in relation to NAFTA[23].

It is interesting to look at a possible range of the impacts of trade liberalization using different structures of the model, incorporating or not those certain economic mechanisms. On the other hand, this gives insights into key economic mechanisms, that bring about significant gains from trade liberalization. The sensitivity of simulation outcomes to model structures may be worth investigating.

The macroeconomic gains of six FTAs in terms of rates of change in real GDP are compared by four different model structures, as is shown in Charts 5-A and 5-B. The first model is a standard static CGE model, which does not incorporate any dynamic aspects. In the second model, a capital accumulation mechanism is incorporated into the first static model. In the third model, international capital movements are allowed, in addition to capital accumulation in the second model. Moreover, a pro-competitive productivity mechanism is further incorporated into the fourth model in addition to two capital formation mechanisms.

(Chart 5-A: Sensitivity to Model Structures - The Impact on the Japanese Economy -)
(Chart 5-B: Sensitivity to Model Structures - The Impact on Asian Countries -)

[21] This is not strange in light of the fact that China has become the first Japanese trading partner that is a source region of Japanese imports as discussed above. However, it must also be noted that the estimated impact of the Japan-China FTA might be overemphasized due to the other fact that the protection data used for the current model simulation is dated and is more likely much higher than the recent developments (see footnote 20).

[22] See, for example, Kawasaki (1999) for a diagnostic analysis of such model sensitivities in the case of simulations on the impact of trade liberalization.

[23] See Brown (1992)

As far as the impact on the Japanese economy is concerned, a significant jump in macroeconomic gains is suggested by the common productivity effects across the six FTAs with Asian countries. The capital accumulation mechanism also generally underlines the significance of dynamic linkages between income and savings, and therefore, investment and capital stock. However, this effect could be mitigated by allowing international capital movement in the case of an FTA with Malaysia and marginally in the case of an FTA with the Philippines. These are consistent with the results shown in Table 6-A, which suggests improvements in the Japanese trade balance, and therefore, deterioration of the capital balance in the cases of FTAs with these two countries. External outflows of capital would result in a decrease of capital rather than its further accumulation.

On the other hand, the relative significance of these dynamic aspects of trade liberalization seems to vary among the Japanese trading partners in Asia. In China and Korea, pro-competitive productivity gains are relatively important factors for bringing about larger macroeconomic gains. In the Philippines, the impact through international capital movement is significantly important, compared especially with that through capital accumulation. On the contrary, capital accumulation would be a crucial source of dynamic gains in Thailand, although this effect could be reduced by international capital movements; several dynamic aspects looked at in this section are shown to be equally important in Indonesia and Malaysia.

The sensitivity analysis above has another important implication on the impact of investment liberalization. Although the simulations are carried out to estimate the impact of trade liberalization, they are at the same time implicit experiments for studying the impact of the free movement of capital. Comparing the impact of trade liberalization between the two cases a) when international capital movement is not allowed, and b) when it is allowed, the significance of international capital movement could be indirectly evaluated.[24]

It can be interpreted that in order to enjoy the benefits from trade liberalization, free movement of international capital including FDI, therefore liberalization of investment is essential, particularly in the Philippines and to a lesser extent in Korea, Indonesia and Malaysia.[25] In fact, the recent discussion and negotiation on an FTA is not limited to free trade of goods but also covers trade of services and investment.

c) The Sectoral Aspects of an FTA in Asia

[24] The current structure of the standard GTAP model needs to be essentially expanded to evaluate the impact of investment liberalization, incorporating explicitly the behavior of Foreign Direct Investment (FDI). See Hanslow, Phamduc and Verikios (2000) for an attempt to incorporate FDI behaviors into the GTAP model.

[25] Capital balance in Thailand is shown to have deteriorated from the Japan-Thailand FTA in the current simulation. However, this may be a special feature in the case of limited trade liberalization, such as the bilateral FTAs between Japan and selected Asian economies. It has been shown in the case of global trade liberalization that developed economies like Japan, North America and the EU would enjoy a trade surplus but export relatively affordable capitals, while developing economies in general would enjoy inflows of capital but experience a deteriorating trade balance, on the other hand.

As was already noted, the sectoral impact of trade liberalization, which is observed more than at a macro level, will be determined more by trade structures and protection levels prior to trade liberalization, rather than simply by a comparative advantage of the sectors among regions in the cases of partial trade liberalization such as that from a bilateral FTA. The changes in sectoral trade balances in Japan and Asian countries according to the six FTAs are shown in Tables 7-A and 7-B[26] respectively. The changes in sectoral production are also shown in Tables 8-A and 8-B.

(Table 7-A: Changes in the Sectoral Trade Balance in Japan)
(Table 7-B: Changes in the Sectoral Trade Balance in Asian Countries)

(Table 8-A: Changes in Sectoral Production in Japan)
(Table 8-B: Changes in Sectoral Production in Asian Countries)

In fact, changes in the sectoral trade balance and production vary according to the partners of Japan's FTAs in Asia, deviating from those expected in the case of global trade liberalization. In the case of the Japan-China FTA, Japan is shown to have an improved trade balance[27] and ability to expand production in textiles and apparel, as is China. On the other hand, China would expand production in grain, other primary products and processed food. In the case of the Japan-Korea FTA, the possibility of a deterioration of the trade balance and production shrinkage in the transport equipment industries is suggested in both countries.[28] Moreover, the production of grain and other primary products would increase in Korea. These are entirely different outcomes compared with those from global trade liberalization shown in Table 2.

It is expected that Japan would gain in capital- and technology-intensive trade and production, while ASEAN countries would gain in labor-intensive sectors. Notable differences from this general expectation is that Japan might lose rather than gain in the other machinery and equipment sector, while ASEAN countries except for Thailand would gain in this sector. However, in the transport equipment sector, the above general expectation would still be satisfied. Another common feature in bilateral FTAs between Japan and ASEAN countries is that trade balances in Japanese grain are not necessarily seen to be deteriorating, although production would decrease. According to country, there are also several different changes in production structures suggested in a bilateral FTA. It can be noted that production shrinkage may occur in textiles, apparel and leather in Thailand, while Indonesia is shown to expand production

[26] The simulation outcomes shown in the Tables in this section are from a standard static version of the model. It may be noted that international capital movement is not assumed in this version of the model. Therefore, the trade balances of certain economies as a whole are also assumed to remain unchanged, although they will change at sectoral levels. It might be possible that those outcomes in terms of not just size but also direction would change, implementing dynamic aspects into model simulations.

[27] The figures show changes in the sectoral trade balances of the countries in the world market as a whole but not those of bilateral balances between the two countries.

[28] However, this finding must be elaborated further. The Armington parameters given to the transport equipment sector in the current GTAP model and database are relatively higher compared with those in the other sectors. It has been pointed out, for example by Nakajima (2002), that this may cause unexpected outcomes.

in processed food and the Philippines is shown to increase production in grain.

Although these observations need to be carefully verified, those supporting the earlier findings touched upon before show that the outcome of partial trade liberalization may deviate from efficient resource allocation realized by wider liberalization. It is not certain that a regional FTA would result in line with optimal welfare improvements in this regard.

Protectionist views may still exist at sectoral levels, both in Japan and with Japanese trading partners in Asia even though activity toward a regional FTA in general has accelerated. From the perspective of interests of domestic industries and policymakers, it is worth looking at the relative significance of trade liberalization by sectors. The amount of macroeconomic impact of Japan's FTAs with Asian countries using the three categories of sectors is compared in Chart 6. The first category is primary industries and Processed Food; the second category is light manufacturing, which is composed of Textiles and Apparel, Leather and Other Manufacturing shown in commodity aggregation in Table 1; the third category is heavy manufacturing composed of Mining, Chemicals, Metal, Transport Equipment, and Other Machinery and Equipment.

(Chart 6: The Impact of Sectoral Trade Liberalization)

As far as macroeconomic impacts on Japan's economy are concerned, substantial benefits are generally expected from trade liberalization in heavy manufacturing sectors. The benefits from trade liberalization in primary industries and food measured in terms of real GDP gains would be more than half of the Japan-Thailand FTA and would also be relatively important in the Japan-China FTA and the Japan-Korea FTA. However, the benefits in terms of utility changes would be less important.

On the contrary, the benefits from trade liberalization in primary industries and food would be significantly important in Asian countries except in Malaysia, where they are looked at in terms of utility changes rather than real GDP gains. The benefits from trade liberalization in light manufacturing would also be relatively large in Asian countries, particularly in China.

d) The Theoretical Aspects of Trade Liberalization

There have been several possible points made on the impact of trade liberalization in standard economic and trade theory. However, numerical studies to look at these points using empirical economic model simulations, in particular, those using a larger model, have been infrequent. Among others, the relative significance of trade creation and trade diversion effects, large and small country assumptions, and therefore, levels of optimum tariff rates are investigated below with simulation experiments of the CGE model of global trade employed in this paper.

The economic impact of regional integration can largely be classified under two categories: static and dynamic impacts. Two of the impacts are static: one is a

trade creation effect, which argues intra-trade expansion due to the removal of trade barriers within the regions and the other is a trade diversion effect, which argues that imports of efficient production from outside regions would be replaced by imports from inside regions. The overall welfare impact of trade liberalization will be a result of complex interactions that include these effects.[29]

On the other hand, because of this trade diversion effect, an outsider economy may worry that it will lose from a particular regional FTA. The impacts of several regional FTAs on the third economies are estimated in Table 9. Real GDP gains according to trade liberalization 1) between Japan and China, 2) among Japan and ASEAN countries (Singapore, Indonesia, Malaysia, the Philippines Thailand and Vietnam)[30], 3) among China and ASEAN countries, and 4) among Japan, China and ASEAN countries are compared.

(Table 9: The Impact of Trade Liberalization among Japan, China and ASEAN Countries)

The negative impact of trade diversion effects is relatively significant in smaller economies. As a result of the Japan-China FTA, the rates of reduction in real GDP in neighboring Asian countries seem to be roughly of the same magnitude as those estimated gains in Japan. China's reduction in real GDP is also shown to be equivalent in magnitude to Japanese gains from trade liberalization among Japan and ASEAN countries when they are compared in terms of rates of change. On the contrary, a negative impact on the Japanese economy from trade liberalization among China and ASEAN countries is limited by the same comparison.

The relative gains from several FTAs in Asia shown in Table 9 may be interpreted in a different manner in light of the interests of policymakers. Japanese gains from trade liberalization with ASEAN countries as a whole (0.38 percent) would be as large as those from trade liberalization with China (0.45 percent). On the other hand, China would benefit significantly from bilateral trade liberalization with Japan (3.06 percent) rather than from that with ASEAN countries (0.97 percent). Meanwhile, those benefits in ASEAN countries are relatively significant in the case of China and ASEAN countries, as well as Japan and ASEAN countries FTAs. These asymmetric structures in the source economies of benefits from trade liberalization are matters of concern for policymakers.

[29] These two effects - trade creation and diversion - are largely described by the Armington structures in the current model. However, it is composed of two stages. The first concerns the substitution of goods between home and abroad as a whole. Reductions in the price of imported goods from certain economies - for example, those due to a bilateral FTA - could lower the average price of imported goods from the world market. This would stimulate the aggregated imports of those goods from abroad as a whole, substituting domestic products. On the other hand, the second concerns the source of generic substitutes among different origins of economies. Removal of the tariff on imports from certain economies would stimulate those imports to substitute those from the other economies. The overall impact on the imports from outside regions would be determined by the relative significance of these two substitution effects. In fact, it is estimated that imports from outside regions would often increase in certain sectors.

[30] It is assumed that trade barriers are removed among the ASEAN countries as well, rather than just bilaterally between Japan and individual ASEAN countries.

There may be no region that absolutely satisfies the condition of a "small" country assumption in a standard trade model. The terms of trade effects are more or less expected as a result of the removal of trade barriers, including tariffs. Therefore, it may be worth looking at the extent to which the terms of trade effects are significant[31] in the FTAs between Japan and the Asian countries.

The decomposition of the welfare impact measured in terms of changes in the equivalent variation due to the six FTAs between Japan and Asian countries is shown in Chart 7: a) between trade liberalization by Japan and by Japanese trading partners, and b) among the factors of welfare gains such as: i) more efficient resource allocation, ii) improvements of the terms of trade, iii) expansion of production endowments, and iv) technology innovation and productivity improvements.

(Chart 7: The Decomposition of Welfare Gains)

It is not surprising that both Japan and the Asian countries would deteriorate the terms of trade from their own trade liberalization but improve them from trade liberalization by trading partners. What may be relatively surprising, however, is that these changes in the terms of trade are larger due to trade liberalization in Asian countries - those that are smaller countries - compared with those due to trade liberalization in Japan - that is a larger country. As a result, Japan is shown to gain in the terms of trade effects from reciprocal trade liberalization with Asian countries, while, Asian countries are generally shown to lose, although marginally, from the same effects. This counterintuitive result can be explained by relatively higher trade barriers prior to trade liberalization in Asian countries.

In comparison to those terms of trade effects with other sources of welfare impacts, it is also shown that Japan will gain largely in the terms of trade effects. On the other hand, the effects of the expansion of production endowments, i.e. capital, are shown to be relatively important in Asian countries. As a result, it is shown that overall welfare would improve in Asian countries from their own trade liberalization, but would deteriorate in Japan, although to a lesser extent.

The significance of the terms of trade effects in a "large" country highlights another concern on the level of the optimum tariff rate. In other words, it is questionable whether full trade liberalization will maximize economic welfare. In fact, analyzing the welfare impact of the FTA between the EU and the Republic of South Africa as an example, it is pointed out in McDonald and Walmsley (2003) that the "optimal degree of food trade liberalization by the EU is less than 100 percent, and declines appreciably after the optimum."

This feature is not necessarily pronounced in the case of FTAs between Japan and the six Asian countries analyzed in the current studies. For further studies on this point, data for simulation experiments in general and protection data in particular would

[31] It is discussed, for example, in McDonald and Walmsley (2003), that the terms of trade effects have taken a prominent position in previous studies of trade agreements.

first need to be verified. In any event, it is beyond the scope of coverage in the current study in this paper.

V. Summary and Conclusions

According to the conventional simulations by a CGE model of global trade, several stylized features have been pointed out analyzing the impact of trade liberalization. First, "free rider" gains may be limited. In order to enjoy the benefits from trade liberalization, it is essential for an economy to liberalize its own markets rather than wait for those in other economies. Second, wider trade liberalization in terms of coverage of both regions and sectors would be much more beneficial. A regional FTA would be a step toward global trade liberalization rather than a final goal. Third, successful structural adjustments would be required to realize possible gains from trade liberalization. Useful information will be given by model simulation experiments for the required changes in the industry structures.

It is expected from comparative advantage theory that the developed economies, including Japan, would gain in capital- and technology-intensive trade and production, while the developing economies, including ASEAN countries, would gain in labor-intensive sectors from global trade liberalization. However, the impact of a regional FTA may more likely be determined by trade structures and the degree of import liberalization by sectors. In fact, estimating the impact of bilateral FTAs between Japan and Asian countries, it is shown that changes in sectoral trade balance and production would vary according to the partners of Japan's FTAs in Asia deviating from those expected in the case of global trade liberalization.

There may be no economies that absolutely satisfy the condition of a "small" country assumption in a standard trade model. The terms of trade effects are relatively significant for determining the overall welfare improvements in partial trade liberalization like that from a bilateral FTA. It may be noted that the effects would be pronounced, not just in larger economies like Japan, but also in smaller economies, like the Asian countries, where trade barriers are relatively high compared with other developed economies.

The macroeconomic impact of trade liberalization including a regional FTA is subject to several key economic mechanisms, in particular the dynamic aspects of economic activities. In Japan, productivity improvements would be a significant factor for generating larger macroeconomic gains. On the other hand, capital formation mechanisms, one from dynamic capital accumulation and another from international capital movement, are shown to be particularly important in several ASEAN countries. It is suggested that liberalization and facilitation of not just the trade of goods, but also investment, would be essential in economic partnerships in Asia.

All in all, as far as the economic impact of trade liberalization is concerned, it must be noted that the estimated impacts of Japan's FTAs in Asia vary in terms of both the size of macroeconomic gains and the direction of structural change according to the partners in the agreement. It is not certain that regional and preferential trade

liberalization would realize welfare improvements with more efficient resource allocation given by global and non-discriminatory trade liberalization.

However, multilateral trade liberalization has been much more difficult to reach agreement, having more participants with various concerns, not just in trade but also in other areas such as the environment, labor and development. In addition, the costs and disadvantages of not participating in an FTA have emerged along with the expansion of the network of FTAs. Moreover, an FTA can be a political and diplomatic mater of concern. From the practical point of view, there may be a good reason why regional efforts in trade liberalization have been made under the principle of multilateral trade liberalization.

In fact, DFAT (1999) points out that economic benefits will be larger with fast implementation of trade liberalization measures when the dynamic impact on the time horizon is taken into account. In order to make actual progress and to enjoy an earlier harvest of trade liberalization, regional efforts could be promoted to complement, rather than to substitute, for multilateralism. What is important is not to generate another distortion to deteriorate economic welfare promoting partial trade liberalization in certain regions and sectors.

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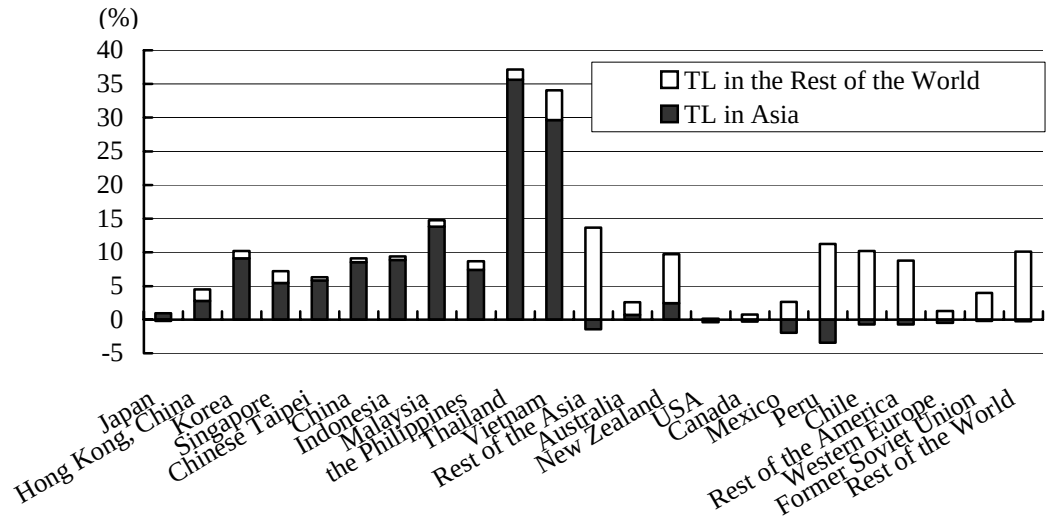
Table 1: Regional and Commodity Aggregation

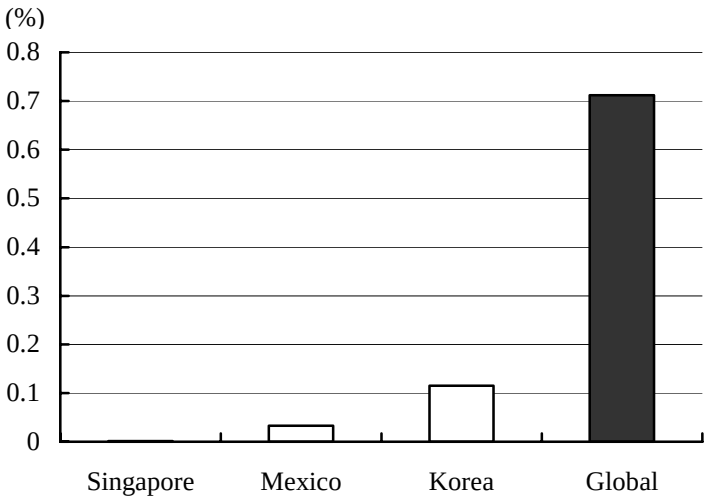
Countries and Regions		Commodities/Industries	
JPN	Japan	GRA	Grain
HKG	Hong Kong, China	MET	Meat
KOR	Korea	OCR	Other Primary Industry
SGP	Singapore	MNG	Mining
TWN	Chinese Taipei	PFD	Processed Food
CHN	China	TXL	Textiles and Apparel
IDN	Indonesia	LEA	Leather
MYS	Malaysia	CHM	Chemicals
PHL	the Philippines	MTL	Metal
THA	Thailand	TRN	Transport Equipment
VNM	Vietnam	OME	Other Machinery and Equipment
SAS	Rest of the Asia	OMF	Other Manufacturing
AUS	Australia	CNS	Construction
NZL	New Zealand	T_T	Trade and Transport
USA	The United States of America	OSP	Other Private Services
CAN	Canada	OSG	Public Services
MEX	Mexico		
PER	Peru		
CHL	Chile		
LTN	Rest of the America		
WEU	Western Europe		
RUS	Former Soviet Union		
ROW	Rest of the World		

Chart 1: The Impact of Trade Liberalization in Asia



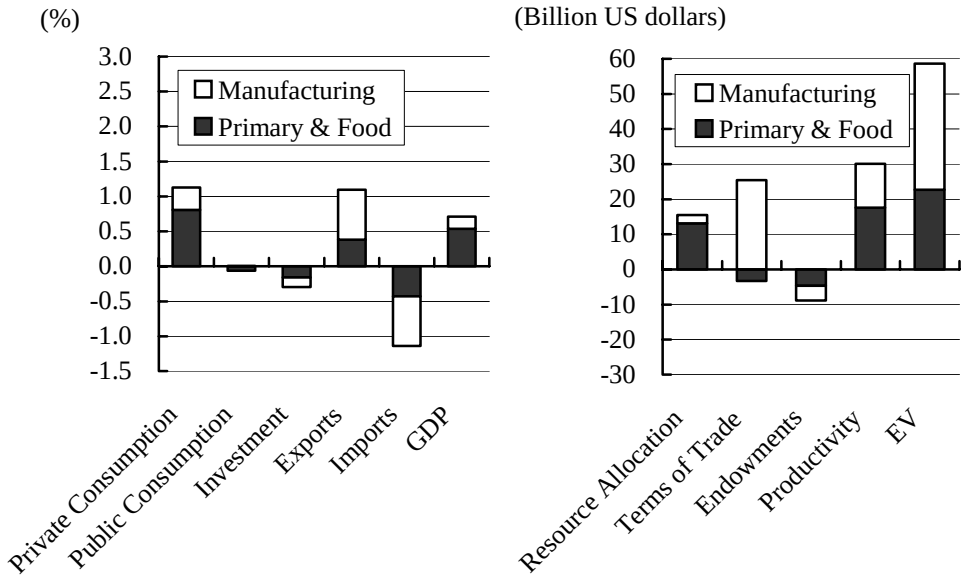
Note) Figures are changes in real GDP.
Source) Author's simulation

Chart 2: The Impact of Bilateral FTAs on the Japanese Economy



Note) Figures are changes in real GDP in Japan.
Source) Author's simulation

Chart 3: The Impact of Sectoral Trade Liberalization on the Japanese Economy



Note) Figures are contributions to percentage changes in real GDP.
Source) Author's simulation

Note) Figures are contributions to changes in equivalent variations.
Source) Author's simulation

Table 2: Changes in Production Structures

(%)

	JPN	HKG	KOR	SGP	TWN	CHN	IDN	MYS	PHL	THA	VNM	SAS
GRA	-18.4	13.8	-11.0	-0.3	0.0	-2.8	1.3	3.5	-6.6	22.7	8.6	0.9
MET	-17.0	-1.4	9.2	-3.3	0.9	3.3	-0.2	-1.1	-3.6	3.0	-1.6	0.3
OCR	-9.7	-2.4	-5.4	8.2	-3.2	-2.0	0.1	-8.7	2.5	-3.7	-7.6	0.9
MNG	3.2	-0.8	-10.1	-2.9	-5.2	-1.1	-6.6	0.6	1.3	-5.9	-16.7	-12.3
PFD	-6.2	1.9	13.0	9.5	-6.4	-5.3	-1.7	17.2	-0.8	5.6	-19.5	-1.0
TXL	-3.6	12.1	16.6	13.4	21.8	8.8	13.3	15.2	40.6	5.0	151.7	11.7
LEA	-18.9	-8.6	14.1	11.7	26.0	32.2	44.3	154.0	47.3	10.1	110.6	15.4
CHM	0.6	1.5	1.5	6.2	4.8	-1.8	-4.2	2.9	-0.2	-2.5	-15.1	-2.0
MTL	1.5	-0.8	-2.7	0.6	-2.1	-2.3	-8.3	-4.6	2.7	-5.3	-35.5	-11.2
TRN	12.0	-11.5	5.5	-18.4	-2.5	-16.4	-47.2	-29.8	24.7	-27.5	-64.4	-17.2
OME	0.1	0.5	-4.5	1.0	-1.9	-0.4	12.6	7.5	15.9	5.4	-17.8	-4.2
OMF	-0.1	3.6	1.6	-0.4	1.2	2.0	0.5	3.7	-1.4	-1.2	-5.0	-0.4
CNS	-0.1	-1.5	0.4	1.2	2.2	0.7	3.1	1.3	0.6	2.9	0.6	2.0
T_T	0.3	-0.6	0.7	0.4	-0.4	0.6	-0.1	0.9	0.2	-0.1	-3.3	0.7
OSP	0.0	-0.7	-0.1	-3.9	-1.1	0.0	0.5	-2.9	-4.5	0.4	-1.4	0.3
PUB	-0.1	0.6	-1.4	0.9	-0.7	-0.9	-0.5	-1.5	-0.4	-1.7	2.5	-0.8

	AUS	NZL	USA	CAN	MEX	PER	CHL	LTN	WEU	RUS	ROW	World
GRA	38.3	26.4	4.7	53.8	-7.5	-3.0	0.5	3.4	-11.4	1.1	-9.4	-2.7
MET	12.5	43.5	4.6	1.4	-4.5	36.2	1.4	9.0	-5.5	-8.8	-11.7	-1.0
OCR	1.6	-5.5	3.8	8.5	2.2	1.8	5.9	3.3	-0.4	-4.8	-2.8	-0.6
MNG	-5.2	-18.6	-1.9	-5.5	2.9	-4.7	-3.3	-2.8	5.1	0.5	2.6	-0.1
PFD	20.2	45.4	1.5	-3.8	0.7	2.3	4.9	2.6	-0.4	3.1	-6.1	-0.4
TXL	-17.4	-42.1	-7.1	-13.1	-14.7	-0.4	-5.0	-3.0	-9.3	-4.6	12.8	0.5
LEA	-21.0	-60.0	-12.3	-24.3	-11.7	-5.3	-8.4	-6.9	-10.9	-8.0	-5.3	2.5
CHM	-0.3	-6.7	-0.1	-1.2	-0.2	-1.4	0.0	-1.2	0.2	0.4	1.3	0.0
MTL	-4.8	-21.7	-0.6	-3.2	1.5	-2.7	-2.7	-3.2	0.4	4.1	2.8	-0.4
TRN	-13.1	-32.8	-2.8	-2.3	7.8	-9.5	-10.6	1.7	-0.9	-9.4	-1.1	0.1
OME	-4.4	-28.1	0.7	-0.4	2.7	-12.0	-5.8	-8.1	0.1	-3.3	2.6	0.0
OMF	-0.6	-12.4	0.2	-1.4	0.5	-1.1	-3.7	-2.1	0.2	-1.8	0.7	0.1
CNS	0.6	3.7	0.0	0.0	-0.2	1.1	1.6	1.1	0.1	0.0	0.4	0.3
T_T	0.1	-2.9	0.2	0.6	0.2	-0.2	0.4	0.4	1.1	1.6	1.2	0.6
OSP	-0.3	-0.7	0.0	0.3	0.4	-0.4	-0.7	-0.2	0.2	0.1	0.3	0.0
PUB	-0.4	0.7	-0.1	-0.5	-0.3	-0.3	-1.2	-0.2	-0.2	-0.2	-0.6	-0.2

Note) Figures are changes in sectoral production.
Source) Author's simulation

Table 3: The Share of Asian Economies in Japanese Trade

(%)

	Exports	Imports
China	9.6	18.3
Korea	6.9	4.6
Hong Kong, China	6.1	0.4
Chinese Taipei	6.3	4.0
Singapore	3.4	1.5
Indonesia	1.5	4.2
Malaysia	2.6	3.3
the Philippines	2.0	1.9
Thailand	3.2	3.1
Asia Total	43.1	43.5

Source) *Trade Statistics* , Ministry of Finance

Table 4-A: The Structure of Japanese Exports to Asia

(%)

	China	Korea	Indonesia	Malaysia	Philippines	Thailand	World
Grain	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meat	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Other Prinary Industry	0.1	0.2	0.1	0.0	0.0	0.1	0.1
Mining	0.0	0.1	0.1	0.0	0.0	0.1	0.0
Processed Food	0.5	0.7	0.2	0.3	0.6	0.8	0.5
Textiles & Apparel	8.2	2.1	2.4	0.9	1.4	1.3	1.8
Leather	0.2	0.1	0.0	0.0	0.1	0.1	0.1
Chemicals	13.7	18.2	13.5	9.6	9.1	12.3	10.0
Metal	11.9	12.0	11.8	12.2	5.3	13.6	5.9
Transport Equipment	5.0	2.6	19.2	11.4	12.2	13.2	18.9
Other Machinery & Equipment	54.8	57.0	47.6	61.2	67.1	54.1	47.6
Other Manufacturing	2.5	2.0	1.7	2.1	1.0	1.5	2.2

Table 4-B: The Structure of Japanese Imports from Asia

(%)

	China	Korea	Indonesia	Malaysia	Philippines	Thailand	World
Grain	0.2	0.0	0.1	0.0	0.0	0.6	1.2
Meat	1.8	1.7	0.1	0.1	0.0	3.5	2.1
Other Prinary Industry	3.2	2.9	2.4	5.1	6.2	1.8	3.7
Mining	4.9	0.2	39.2	14.9	6.6	0.0	12.1
Processed Food	5.0	6.7	7.5	3.8	5.3	16.0	5.7
Textiles & Apparel	27.3	8.1	4.9	2.5	3.2	5.1	5.4
Leather	6.3	2.5	1.6	0.0	0.5	0.7	1.4
Chemicals	7.7	19.8	5.5	7.5	3.9	11.5	9.7
Metal	4.8	15.3	4.3	2.9	3.3	3.8	5.0
Transport Equipment	1.0	1.0	0.5	0.5	1.6	0.9	4.2
Other Machinery & Equipment	25.0	31.9	7.1	40.5	57.5	36.2	18.7
Other Manufacturing	9.1	3.4	19.6	14.8	4.7	8.6	6.9

Source) GTAP Database Version 5.0

Table 5-A: Import Protection by Japan

(%)

	China	Korea	Indonesia	Malaysia	Philippines	Thailand	World
Grain	188.7	396.7	318.5	379.8	382.4	406.5	111.4
Meat	46.2	56.9	14.8	22.5	43.9	56.2	45.6
Other Prinary Industry	28.9	13.7	14.2	1.7	40.9	21.2	27.1
Mining	-1.4	0.0	-0.7	-0.7	0.0	-0.7	-1.4
Processed Food	37.7	37.3	38.9	17.0	36.5	47.6	46.4
Textiles & Apparel	11.6	10.4	8.3	5.9	11.8	9.5	10.7
Leather	14.4	14.5	16.6	13.8	17.1	15.1	15.3
Chemicals	2.0	2.8	2.7	1.9	2.5	1.3	2.1
Metal	1.1	2.1	0.3	1.3	0.2	0.9	1.0
Transport Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Machinery & Equipment	0.3	0.1	0.2	0.0	0.3	0.1	0.1
Other Manufacturing	2.7	2.3	6.2	5.4	2.7	1.6	2.1
Average	9.0	6.5	5.9	2.1	6.0	15.1	9.2

Table 5-B: Import Protection Japan Faces

(%)

	China	Korea	Indonesia	Malaysia	Philippines	Thailand	World
Grain	0.0	6.3	0.0	26.7	50.0	0.0	36.3
Meat	12.6	17.5	9.4	34.2	19.6	21.0	17.5
Other Prinary Industry	11.8	31.8	12.8	33.7	8.0	39.7	13.3
Mining	3.0	2.7	2.6	0.0	2.3	1.7	1.6
Processed Food	29.4	45.5	20.7	11.6	16.8	40.7	22.6
Textiles & Apparel	28.3	8.0	9.0	13.4	13.3	26.3	18.1
Leather	11.8	6.1	5.9	18.2	10.8	18.4	8.9
Chemicals	14.1	7.6	7.3	7.1	7.3	18.1	7.1
Metal	10.0	7.3	8.7	7.5	9.0	14.3	7.6
Transport Equipment	36.3	7.2	24.7	41.0	17.5	49.4	10.5
Other Machinery & Equipment	13.2	7.9	5.0	2.7	3.7	9.4	5.0
Other Manufacturing	19.6	6.7	10.9	11.2	12.1	22.0	6.1
Average	15.6	8.1	9.9	8.5	6.4	17.4	7.0

Source) GTAP Database Version 5.0

Table 6-A: The Macroeconomic Impact of an FTA
- The Impact on the Japanese Economy -

(%, *: Million US dollars)

	China	Korea	Indonesia	Malaysia	Philippines	Thailand
Real GDP	0.45	0.12	0.06	0.08	0.03	0.24
Export Volume	2.52	0.70	0.41	0.29	0.19	0.83
Import Volume	4.34	1.17	0.60	0.60	0.33	1.53
Trade Balance*	-606	-66	-137	93	41	-354
Equivalent Variation*	25,879	6,676	2,977	5,088	2,095	12,954
Capital Stock	0.59	0.14	0.05	0.12	0.03	0.27

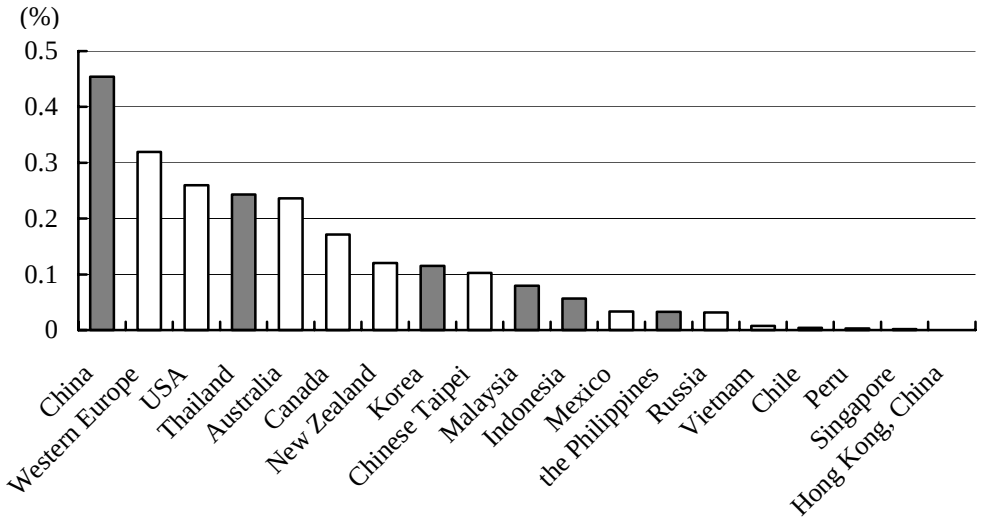
Table 6-B: The Macroeconomic Impact of an FTA
- The Impact on Asian Countries -

(%, *: Million US dollars)

	China	Korea	Indonesia	Malaysia	Philippines	Thailand
Real GDP	3.06	2.45	3.01	5.07	3.03	20.09
Export Volume	9.88	4.18	4.68	5.31	5.16	25.79
Import Volume	10.72	4.70	6.27	5.24	4.87	23.75
Trade Balance*	-336	-706	-398	-88	-504	487
Equivalent Variation*	19,713	8,930	5,704	3,310	1,867	23,047
Capital Stock	4.65	3.76	5.38	6.21	4.71	23.30

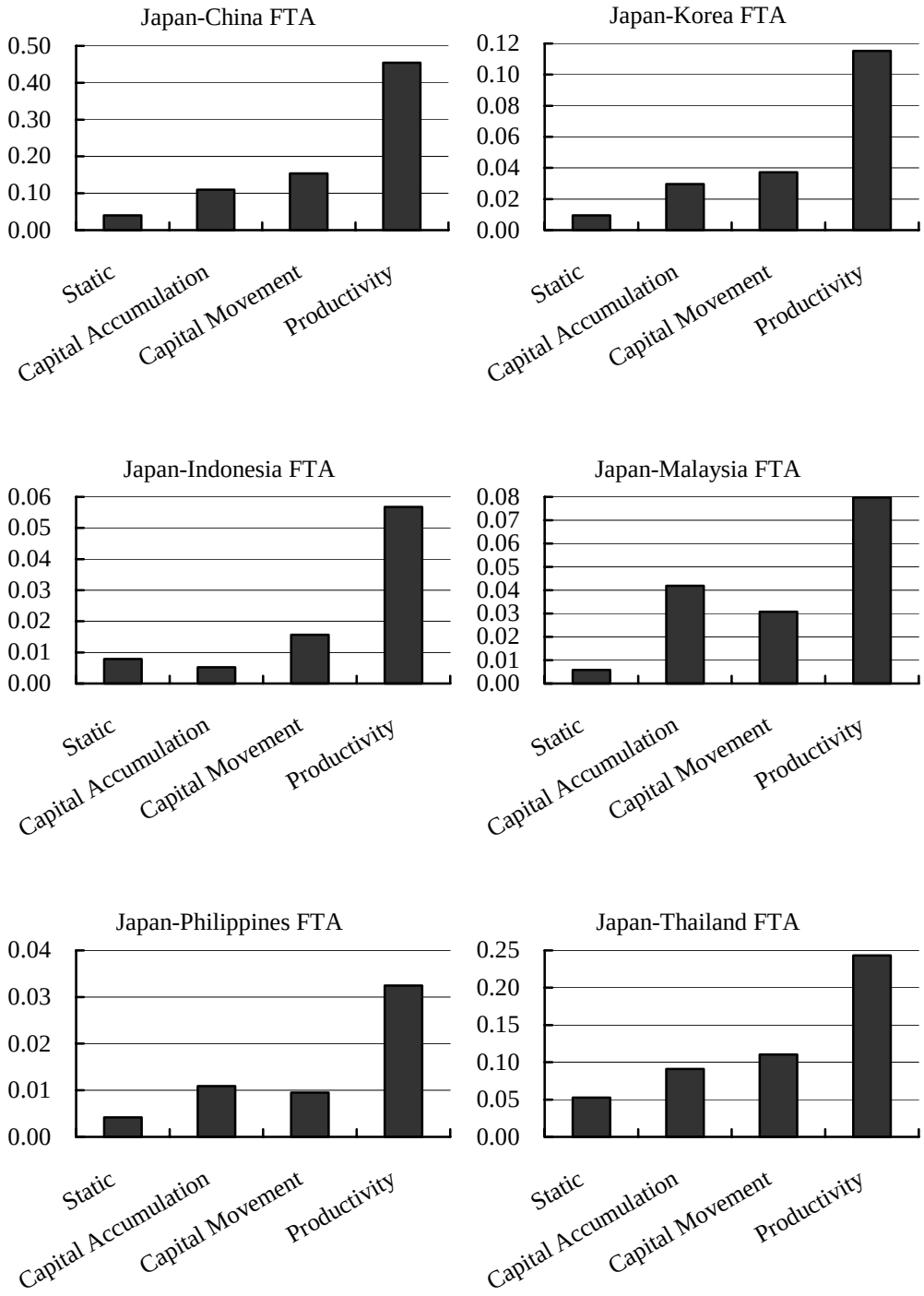
Source) Author's simulation

Chart 4: The Impact of Japan's Bilateral FTAs on the Japanese Economy



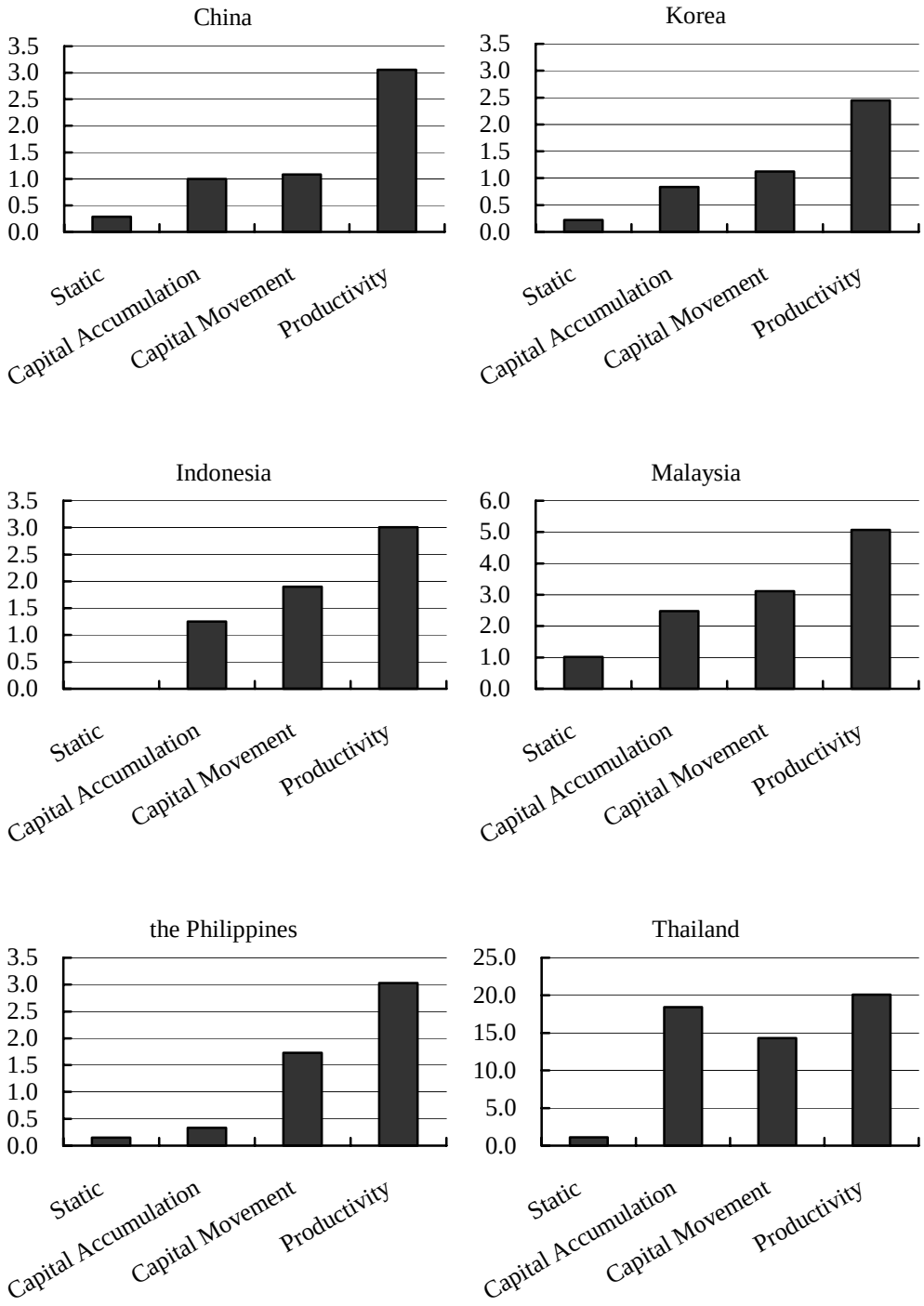
Note) Figures are changes in real GDP.
Source) Author's simulation

Chart 5-A: Sensitivity to Model Structures
- The Impact on the Japanese Economy -



Note) Figures are percentage changes in real GDP in Japan.
Source) Author's simulation

Chart 5-B: Sensitivity to Model Structures
- The Impact on Asian Countries -



Note) Figures are percentage changes in real GDP in Asian countries.
Source) Author's simulation

Table 7-A: Changes in the Sectoral Trade Balance in Japan

(Million US dollars)

	China	Korea	Indonesia	Malaysia	Philippines	Thailand
Grain	-327	42	47	21	21	357
Meat	-788	-346	25	-15	3	-313
Other Primary Industry	-833	-48	-46	-37	-238	42
Mining	-117	-65	-74	-26	-4	-57
Processed Food	-2,379	-776	-1,163	-274	-237	-1,982
Textiles & Apparel	2,568	-237	-67	-122	0	-34
Leather	-1,231	-229	-145	-36	-17	-53
Chemicals	1,213	726	170	-85	59	640
Metal	725	673	311	157	73	608
Transport Equipment	1,496	-1,261	1,681	2,824	637	2,127
Other Machinery & Equipment	2,884	2,435	-196	-1,332	5	-162
Other Manufacturing	69	-56	-220	-193	-13	-14
Construction	-269	-74	-28	-69	-23	-94
Trade and Transport	-1,512	-402	-141	-448	-143	-535
Other Private Services	-1,117	-283	-115	-273	-89	-396
Public Services	-383	-100	-40	-94	-34	-134

Table 7-B: Changes in the Sectoral Trade Balance in Asian Countries

(Million US dollars)

	China	Korea	Indonesia	Malaysia	Philippines	Thailand
Grain	1,312	-45	370	82	13	1,058
Meat	1,726	883	-26	-3	-18	838
Other Primary Industry	1,139	-12	-79	-35	415	-388
Mining	-405	5	-632	-96	-10	-20
Processed Food	3,983	1,888	2,025	242	319	3,675
Textiles & Apparel	2,232	352	-100	80	36	-88
Leather	1,509	483	136	1	15	-63
Chemicals	-1,538	-465	-364	-70	-87	-856
Metal	-950	-212	-249	28	-51	-202
Transport Equipment	-4,700	-614	-714	-823	50	-2,300
Other Machinery & Equipment	-3,739	-1,410	112	336	120	-728
Other Manufacturing	-302	-152	76	277	-74	-281
Construction	-17	-2	-2	0	-11	-11
Trade and Transport	-196	-258	-389	1	-129	-451
Other Private Services	-22	-377	-104	-18	-575	-127
Public Services	-33	-66	-59	-1	-14	-55

Source) Author's simulation

Table 8-A: Changes in Sectoral Production in Japan

(%)

	China	Korea	Indonesia	Malaysia	Philippines	Thailand
Grain	-2.50	-0.32	-0.94	-0.30	-0.16	-3.97
Meat	-3.05	-1.54	0.15	-0.08	0.03	-0.60
Other Primary Industry	-1.34	-0.15	-0.15	-0.09	-0.35	-0.06
Mining	-0.41	-0.15	0.26	-0.19	-0.01	-0.04
Processed Food	-0.57	-0.22	-0.30	-0.06	-0.03	-0.37
Textiles & Apparel	4.54	-0.20	-0.04	-0.14	0.03	0.06
Leather	-9.95	-1.74	-1.24	-0.34	-0.09	-0.03
Chemicals	0.36	0.18	0.06	0.00	0.02	0.19
Metal	0.30	0.30	0.17	0.09	0.04	0.28
Transport Equipment	0.38	-0.67	0.75	1.25	0.27	0.89
Other Machinery & Equipment	0.22	0.33	-0.05	-0.26	-0.02	-0.11
Other Manufacturing	0.07	-0.03	-0.09	-0.09	0.00	0.00
Construction	0.02	0.01	-0.01	0.02	0.00	0.00
Trade and Transport	-0.06	-0.02	0.00	-0.02	0.00	0.01
Other Private Services	-0.05	-0.01	-0.01	-0.01	0.00	0.00
Public Services	-0.04	0.00	-0.01	0.01	0.00	0.00

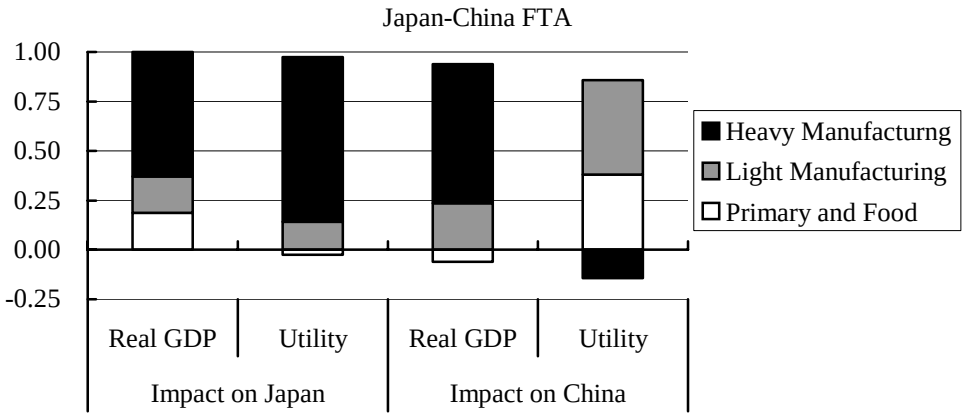
Table 8-B: Changes in Sectoral Production in Asian Countries

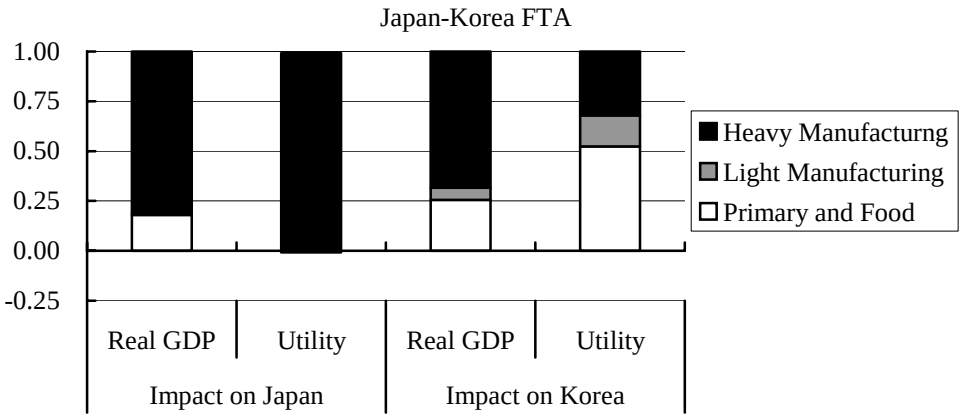
(%)

	China	Korea	Indonesia	Malaysia	Philippines	Thailand
Grain	3.06	0.94	2.52	1.99	0.58	23.13
Meat	2.43	13.11	-0.37	0.22	-0.55	17.11
Other Primary Industry	1.89	0.48	0.56	0.64	2.94	-0.22
Mining	-2.07	-2.45	-4.14	-1.52	-2.58	-8.17
Processed Food	5.15	7.50	8.76	2.49	2.06	24.91
Textiles & Apparel	2.34	1.40	-1.21	2.90	1.57	-0.84
Leather	4.79	10.91	3.06	4.31	3.22	-2.08
Chemicals	-0.99	-0.37	-2.19	-0.63	-0.44	-2.72
Metal	-2.89	-1.01	-4.13	-1.06	-1.11	-4.64
Transport Equipment	-14.64	-1.29	-20.72	-30.19	1.82	-29.37
Other Machinery & Equipment	-2.37	-1.30	1.00	2.35	3.56	-0.38
Other Manufacturing	-0.79	-0.34	-0.11	2.77	-2.81	-1.58
Construction	0.82	0.55	0.93	0.94	-0.11	3.40
Trade and Transport	-0.38	-0.21	-0.60	0.58	-0.16	-0.13
Other Private Services	-0.37	-0.23	-0.24	0.48	-2.97	0.62
Public Services	-0.09	-0.08	-0.60	-0.29	0.39	0.07

Source) Author's simulation

Chart 6: The Impact of Sectoral Trade Liberalization





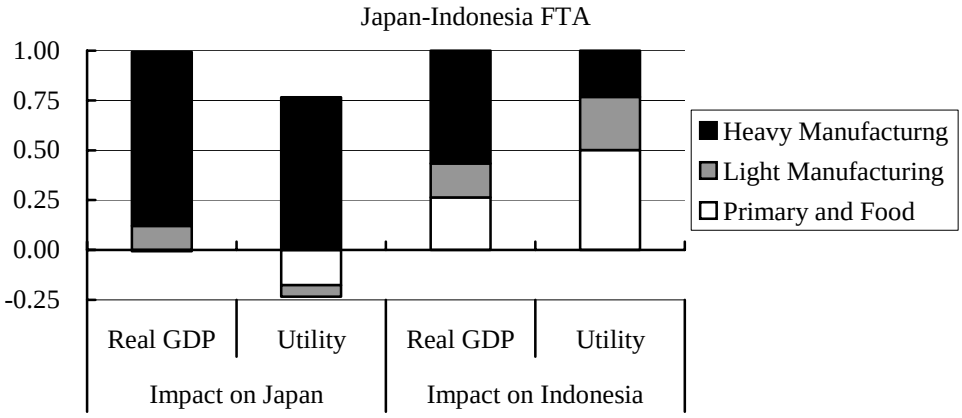
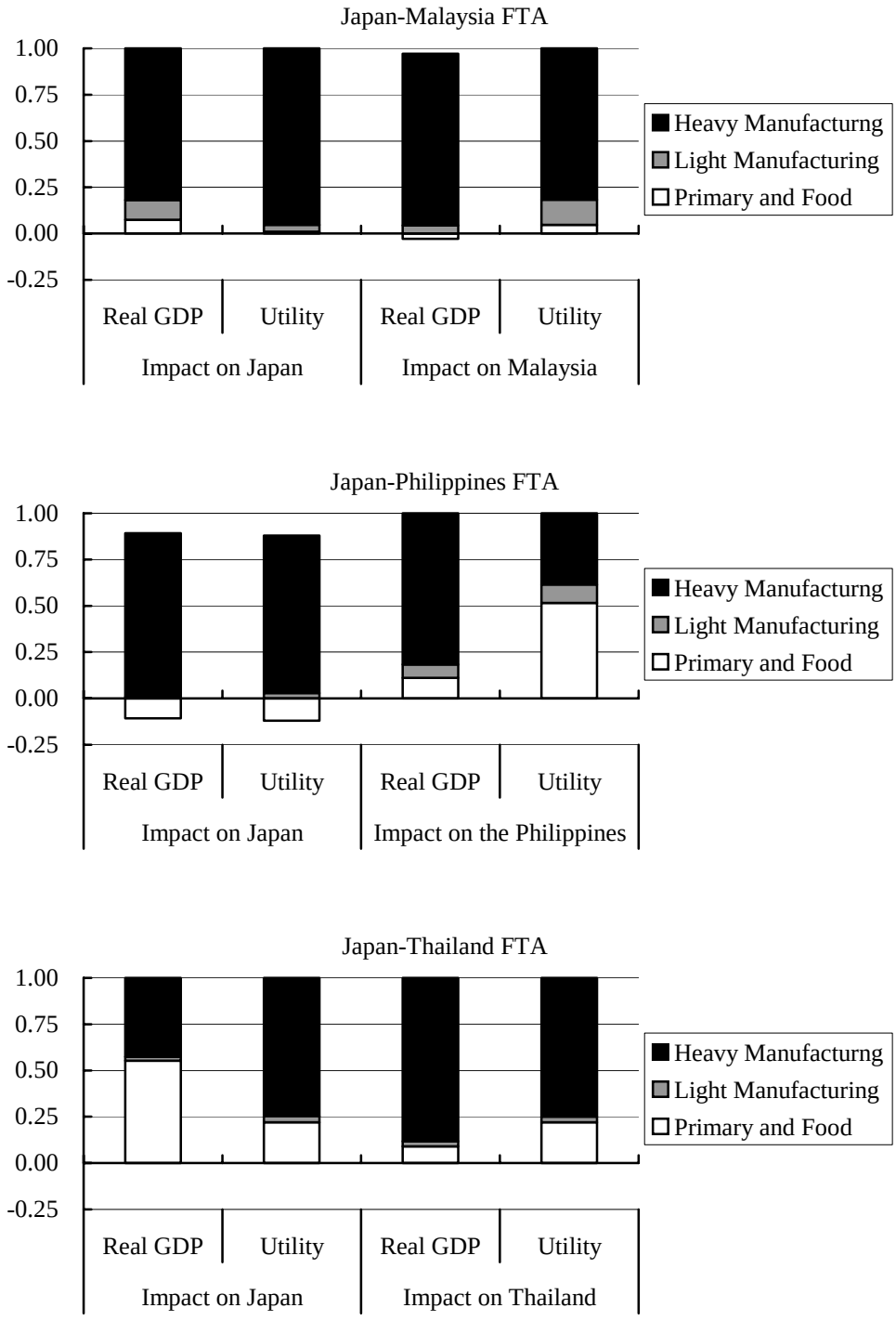


Chart 6: The Impact of Sectoral Trade Liberalization (cont.)



Source) Author's simulation

Table 9: The Impact of Trade Liberalization among Japan, China and ASEAN Countries

(%)

	Japan-China	Japan, ASEAN	China, ASEAN	Japan, China, ASEAN
Japan	0.45	0.38	-0.07	0.79
China	3.06	-0.27	0.97	3.68
Singapore	-0.34	4.53	5.64	5.66
Indonesia	-0.26	3.66	1.92	4.08
Malaysia	-0.42	9.27	6.78	10.79
the Philippines	-0.27	3.96	2.79	4.67
Thailand	-1.06	25.75	10.13	27.16
Vietnam	-0.59	13.71	11.88	19.65
Word	0.09	0.22	0.10	0.34

Note) Figures are changes in real GDP.
Source) Author's simulation

Chart 7: The Decomposition of Welfare Gains

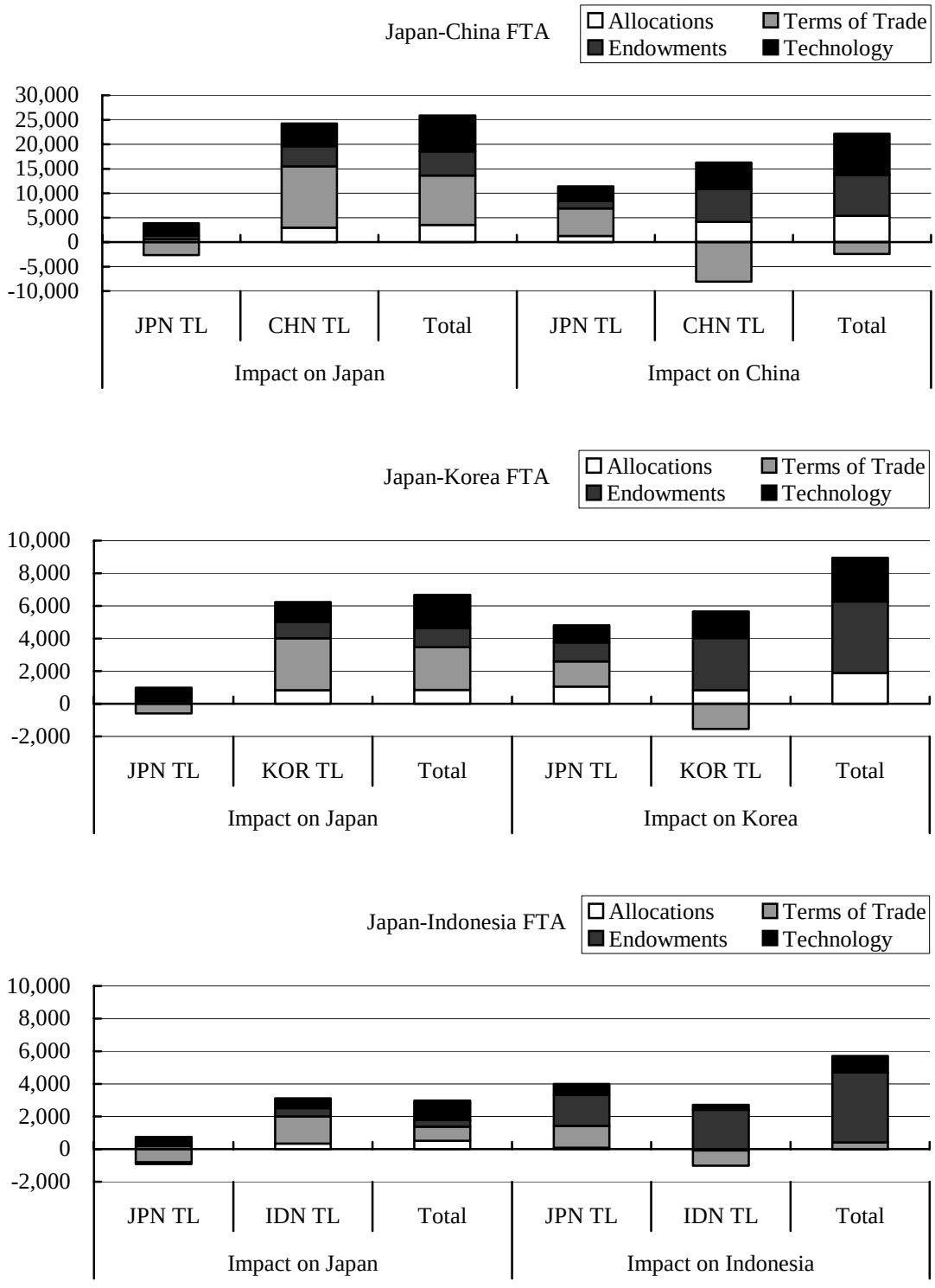
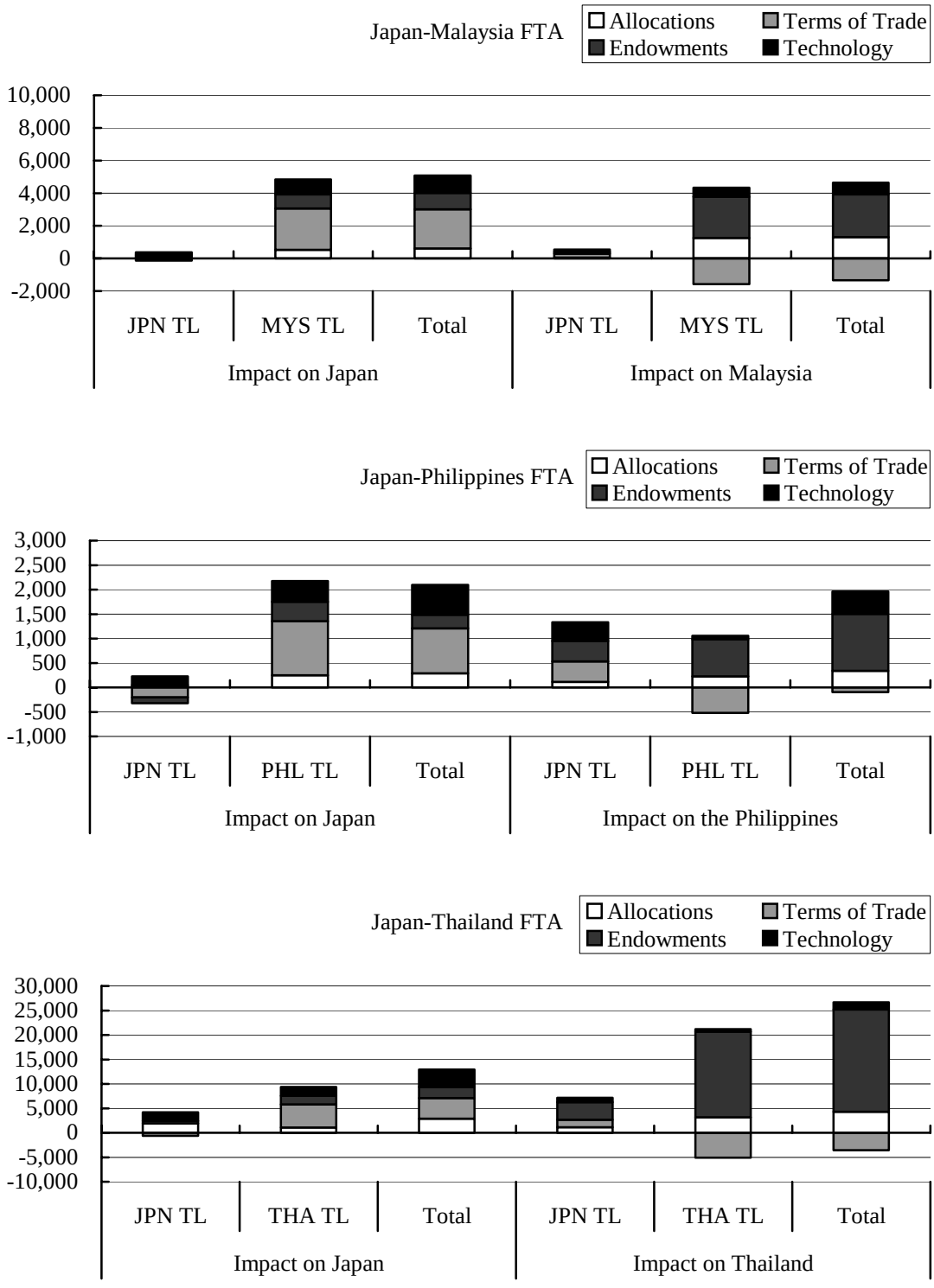


Chart 7: The Decomposition of Welfare Gains (cont.)



Note) Figures are contributions to changes in equivalent variation in million US dollars.
Source) Author's simulation