An East Asian FTA and Japan's Agricultural Policy: Simulation of a Direct Subsidy

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1. Introduction

Traditionally, Japan has assigned the highest priority in its trade policy to multilateral cooperation through the GATT and WTO frameworks, in order to reduce tariffs and other trade barriers. However, the tide of regional economic integration, including various free trade agreements (FTA) throughout the world, was stronger in the 1990s. It has become more difficult for Japan to protect its interests in the field of international trade by means of the WTO system alone.

There has been an obvious change in trade policy in the last few years. Japan's first FTA, with Singapore, which was named the Japan-Singapore Economic Partnership Agreement (JSEPA), came into effect in 2002. The official negotiations on the FTA with Mexico, which is a member of NAFTA, culminated in an agreement in March 2004. Japan has already begun official negotiations on an FTA with the ROK[1]; moreover, official negotiations on bilateral FTAs with three ASEAN member countries – Malaysia, the Philippines and Thailand – began in 2004. We can say that FTAs have now become an essential part of Japan's trade policy.

As the second stage of this, it has been proposed that an East Asian FTA within the ASEAN+3 (Japan, China and the ROK) framework be concluded. Table 1 is a summary of FTA-related developments in East Asia. Both China and Japan have begun preliminary negotiations on an FTA with ASEAN. China has also made an approach to Japan about the possibility of a trilateral FTA among three of the Northeast Asian countries: Japan, China and the ROK. This demonstrates that an East Asian FTA is no longer merely an idea, but a realistic approach.

Issues relating to agricultural products will be a crucial point in these negotiations. The abolition of tariffs and other import barriers to agricultural products are not dealt with in JSEPA, having been left aside as matters to be handled in the new round of WTO talks. However, it is not realistic to expect that potential partners such as ASEAN and China will accept such conditions in an FTA with Japan. Thailand and Vietnam – both members of ASEAN – are major exporters of rice. China's exports of agricultural products, including vegetables, are increasing and causing trade conflicts. An FTA with Japan would be viewed as an opportunity to increase the volume of exports of agricultural products and food to the Japanese market.

On the other hand, the argument has emerged in Japan in recent years that it is necessary to maintain a certain level of domestic agricultural production from the perspective of the multifunctionality of

[1] For details of the Japan-Korea FTA, see Nakajima (2002)

agriculture, including its environment protection effect and its flood control effect. Therefore, in order to facilitate an East Asian FTA and maintain agricultural production, it is necessary to introduce a new agricultural support policy that replaces tariffs and other barriers. Direct income subsidies to producers are known to be a method that minimizes the distortion of markets.

Here, we try to analyze the economic effect of the introduction of direct income subsidies to agricultural sectors in Japan in the event that FTAs were to be concluded between Japan and various East Asian countries. With regard to the method of analysis, we have applied the Computable General Equilibrium (CGE) model maintained by the GTAP[2] database version 5.

2. Outlines of the model

The standard GTAP model we have applied here is a type of CGE model for comparative static analysis. We mainly focus on the short run effects of the removal of tariffs and other barriers by means of the FTA. Therefore, our model does not include the long run effects of an FTA, such as international capital transfer, immigration of labor or the improvement of productivity by means of technology transfer.

66 regions and 57 commodities or sectors are available in the GTAP database version 5. For the purpose of analysis, we have aggregated these to 14 regions and 19 sectors[3]. There are 10 independent East Asian regions – Japan, the ROK, China, Hong Kong, Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam – and 4 aggregate regions. We have used smaller subdivisions of the agricultural and food processing sectors in sectoral aggregation.

3. Results of simulations

(1) Economic effects of an East Asian FTA on member regions

Here we will provide an overview of the economic effects of an East Asian FTA on member regions as the premise for policy analysis. In our main scenario, or simulation 1 (SIM1), the total abolition of import tariffs[4] among the 10 East Asian regions is assumed. The economic effects in member regions are summarized below.

As we can see from Figure 1, all 9 East Asian regions apart from Hong Kong experience a positive change in real GDP. The magnitude of change is largest in Vietnam, which shows a 1.87% gain. However, the changes in other regions are considerably smaller. This is because, as we mentioned above, our model does not include such long-run effects as capital transfer. Therefore, the effect on real GDP is limited to short-run efficiency improvement effects resulting from tariff removal.

Changes in the terms of trade are illustrated in Figure 2. We can see improvements in 8 East Asian regions; in the 2 regions which show a deterioration – China and the Philippines – the import price of manufactured goods increases, while the export price of manufactured goods decreases or increases only

[2] For details of the GTAP database and models, see Hertel (1997) or Kawasaki (1999).

[3] Details of sectoral and regional aggregations are provided in Tables A1 and A2 in the appendix.

[4] In the GTAP database, "tariff rates" includes price differences caused by import quotas and other barriers.

slightly.

Figure 3 shows the equivalent variation, which is an indicator of social welfare. 8 East Asian regions experience a positive result, with Japan obtaining the greatest benefit in the form of an increase of $9.88 billion, followed by the ROK with $5.37 billion. China and the Philippines not only show negative results in the terms of trade, but also show a slight deterioration in their equivalent variation.

Therefore, this simulation shows that an East Asian FTA would have a positive effect for the majority of potential member regions. It also shows that Japan is the largest profit taker in terms of the equivalent variation.

(2) Effects on Japan's agricultural and food processing sectors

Here, we will analyze the effects of an East Asian FTA on Japan's agricultural and food processing sectors. Firstly, we will look at the current level of import and tariff rates as a premise for the simulations.

Table 2 shows Japanese imports by sector and region in 1997 as listed in the GTAP database. Imports of agricultural products and foods from East Asian regions are fairly low. At the same time, there are high levels of imports from NAFTA, which includes the USA and Canada, and the Rest of World, which includes Australia. In the rice sector, there are some imports from China and Thailand but imports from NAFTA and other regions are higher.

Table 3 shows Japan's tariff rates on imports from member regions. As we can see from the table, tariff rates are set at a high level in the agricultural and food processing sectors. The highest rate is in the rice sector, at 409% for all regions. The rate in dairy products is the next highest, at 287%.

Secondly, we will look at the results of simulation 1, which shows that the abolition of tariffs under an FTA would result in a drastic decrease in the price of imports. As we can see from Figure 4, the agricultural and food processing sectors recorded high decreases. The greatest decrease is in the price of rice, which experiences a drop of 70.7%. This is caused not only by the high tariff rate, but also by the potential export capacity of East Asian regions. This is also evident from a comparison with the relatively small price decrease in the dairy products sector, which also has a high tariff rate.

These price decreases obviously caused an increase in imports, as shown in Figure 5. The increase in the rice sector is remarkably high, at 898.0%. Other than this, there were relatively high increases in the following sectors: dairy products 94.9%, other food products 43.1%, and fruit and vegetables 37.8% . In terms of the change in the trade balance, other food products showed the largest deterioration, with rice experiencing the next largest, as shown in Figure 6.

The increase in imports in the agricultural and food processing sectors causes a decrease in domestic production. Figure 7 illustrates the change in value added by sector. All agricultural and food processing sectors recorded a decrease, the largest being 19.7% in the rice sector. In addition, the raw milk sector showed a decrease in value added. As there is no import tariff on imports from East Asian regions in this sector, it cannot have been directly affected by the abolition of the tariff. However, the removal of the tariff in the dairy products sector caused a decrease in the demand for domestic untreated milk as a raw material.

The decrease in domestic production in the agricultural and food processing sectors would inevitably cause a decrease in employment in these sectors. Figures 8 and 9 show the change in the employment of skilled and unskilled labor. All sectors recorded a negative change for both skilled and unskilled labor; the change was less than 20% in the case of the rice sector.

As simulation 1 suggested, an East Asian FTA will have negative effects on production and employment in Japan's agricultural and food processing sectors.

(3) Alternative policy simulations

As outlined above, an East Asian FTA will inevitably have a negative effect on Japan's agricultural and food processing sectors, even though it will provide macroeconomic benefits for the majority of East Asian regions, including Japan. In this section, we would like to introduce alternative policy scenarios which would allow a certain level of domestic production to be maintained in those sectors[5].

As we saw above, the rice sector will suffer the greatest damage from tariff removal. This sector accounts for a major part of Japan's agricultural production, so we will introduce two alternative scenarios concerning this sector.

In simulation 2 (SIM2), we have maintained Japan's import tariff on rice in order to support domestic production. Here, we have deliberately assumed a change in only one sector, in order to identify the direct effect of the policy change. Other than that, simulation 2 is identical to simulation 1.

In simulation 3 (SIM3), we have assumed a direct production subsidy for the rice sector. The rate of subsidy is set at a level that will minimize the reduction of value added[6]. Other than on that point, simulation 3 is identical to simulation 1.

The results of simulations 2 and 3 show that there is not much change in domestic production or employment in Japan's rice sector, as shown in Figures 7, 8 and 9. On the other hand, the equivalent variation for Japan decreased from $9,880 million in simulation 1 to $7,347 million in simulation 2 and $8,257 million in simulation 3.

This result can be explained entirely by the resource allocation effect, as shown in the analysis of the factors involved in equivalent variation in Table 4. This effect is largest in simulation 1, which simply assumes tariff removal. In simulation 2, which maintains the tariff in the rice sector, the domestic price of rice does not decrease and the resource allocation effect becomes the smallest of all three simulations. On the other hand, there was a certain increase in imports and a decrease in domestic price in simulation 3. Therefore, the resource allocation effect is larger than that in simulation 2.

On the other hand, the contribution of changes in the terms of trade to the equivalent variation is larger in simulations 2 and 3 than in simulation 1. The increases in Japan's rice imports in simulations 2 and 3 are smaller than that in simulation 1. Accordingly, the increase in the world rice export price is minimized. As a result of this, Japan's terms of trade improve more than in simulation 1, as shown in Figure 2. This can be described as a case in which the results of the simulation demonstrate Japan's

[5] This does not mean that these scenarios are consistent with WTO rules or politically acceptable for potential FTA partners. These are just hypothetical assumptions made in order to analyze the effects of a policy change.

[6] The rate has been calculated to be 61%.

influence as a “large country” in the context of trade theory relating to the US market.

Thus, in terms of the change in social welfare, simulation 3 – the introduction of a production subsidy in the rice sector – can be considered to be the second-best policy choice.

4. Outstanding issues concerning our analysis

In this section, we have analyzed the effects of an East Asian FTA on Japan’s agricultural and food processing sectors. We have concluded as a result of limited analysis that the introduction of a direct subsidy in rice sector is the second-best policy alternative. However, we recognize that our approach is not sufficiently accurate to function as the foundation for forming real policies.

Firstly, according to WTO rules, agricultural subsidies must satisfy the condition of what is described as the “decoupling policy”, which means decoupling the value of the subsidy from the value of production and pay to producers as compensation for income. The purpose of this policy is to minimize the distortion to product markets. If Japan introduces a new agricultural subsidy, it will be necessary to satisfy this condition. However, the production subsidy in our simulation is proportional to production and not consistent with the “decoupling policy”, so we must make improvements with regard to this point.

Secondly, the Japanese government has begun to consider introducing a new agricultural subsidy that targets only farms above a certain size, with the aim of enlarging the scale of farms. In considering the land accumulation effect of this new subsidy, we must introduce the productivity improvement effect into our simulations.

We would like to introduce these improvements into our future research into FTAs and Japan’s agricultural policy.

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Table 1: FTA-Related Developments in East Asia

Year	Month	Details
2001	November	China and ASEAN begin preliminary negotiations regarding an FTA
	December	China accedes to the WTO
2002	January	Japan signs its first FTA with Singapore (JSEPA)
	November	Japan and ASEAN agree to begin preliminary negotiations regarding an FTA in 2003 China and ASEAN agree to remove tariffs by 2004 on specific items, including agricultural products, ahead of the conclusion of an FTA China proposes a trilateral FTA to Japan and the ROK ASEAN requests the ROK to begin FTA negotiations
2003	December	Japan and the ROK begin negotiation for an FTA
2004	January	Japan and Malaysia begin negotiation for an bilateral FTA
	February	Japan begins negotiations for bilateral FTAs with Thailand and the Philippines

Figure 1: Change in Real GDP

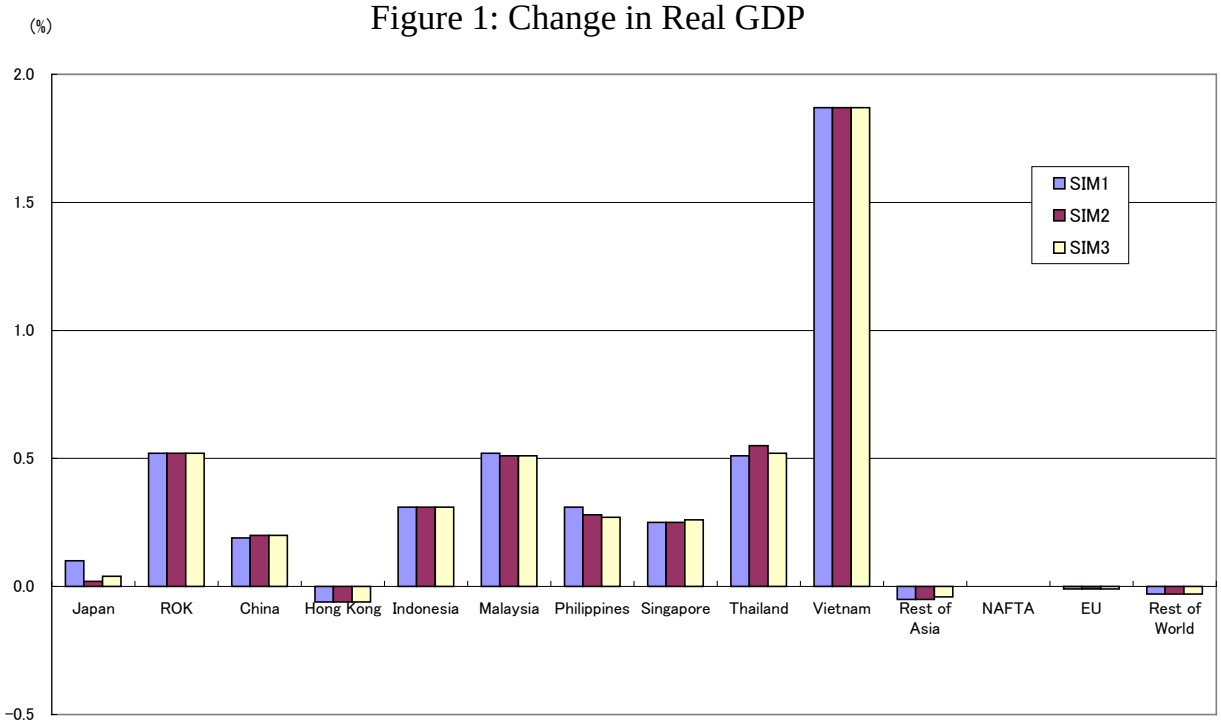


Figure 2: Change in Terms of Trade

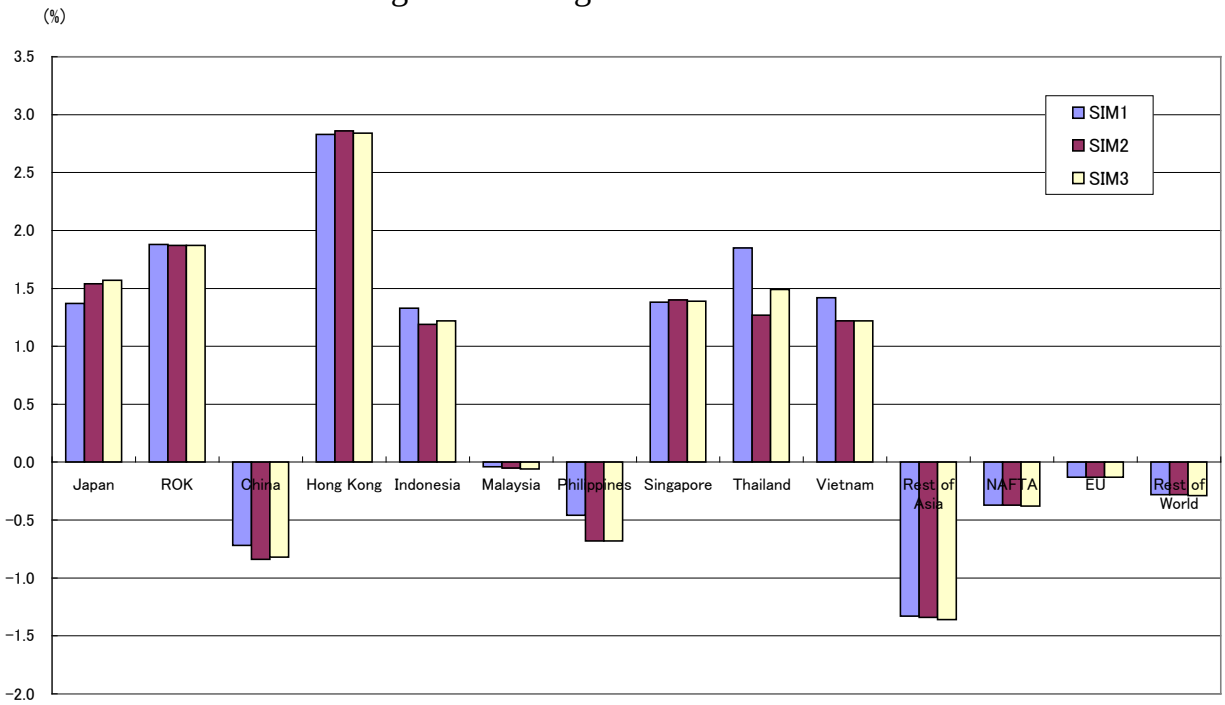


Figure 3: Equivalent Variation

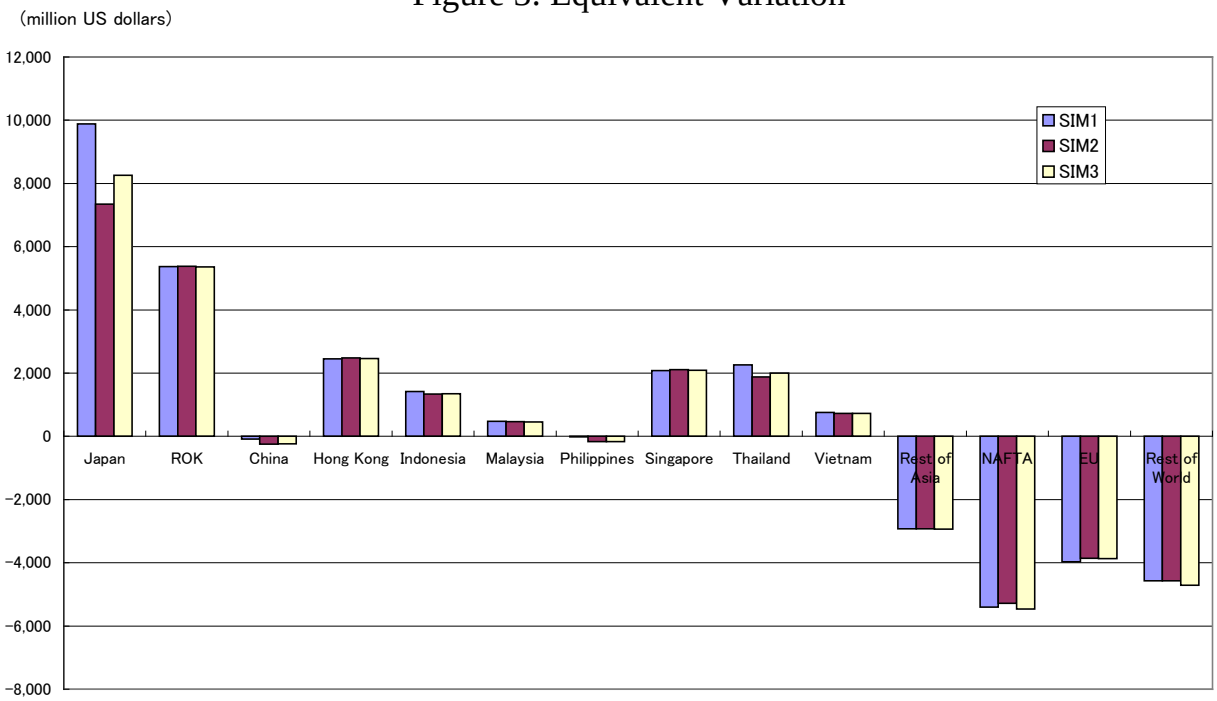


Table 2: Japan's Imports by Sector and Region (1997) (million US dollars)

	ROK	China	Hong Kong	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam	Rest of Asia	NAFTA	EU	Rest of World	Total
Rice	3	44	0	12	3	2	0	66	1	10	126	2	90	358
Cereal grains	0	61	0	4	0	0	0	0	0	4	4,006	41	514	4,630
Vegetables and fruits	68	471	0	8	0	267	0	31	3	91	1,082	65	538	2,625
Other crops	34	437	0	168	32	4	26	108	38	159	2,777	260	1,870	5,914
Meat and animal products	9	201	1	7	5	1	4	16	6	186	2,396	178	1,505	4,515
Raw milk	0	1	0	0	0	0	0	0	0	3	0	6	16	27
Natural fibers	0	17	0	3	0	6	0	0	0	43	277	3	321	671
Meat products	254	612	2	1	2	1	0	362	4	304	1,384	1,028	371	4,326
Dairy products	1	1	0	0	1	1	5	1	0	1	273	283	575	1,143
Other food products	1,061	2,213	201	998	382	252	161	1,733	425	1,424	5,668	2,853	5,315	22,688
Aglicultual Products and Foods	1,431	4,058	204	1,202	425	536	196	2,316	477	2,227	17,990	4,717	11,117	46,896
Forestry	2	71	0	13	443	2	9	31	3	25	1,566	45	1,517	3,727
Fishing	383	447	32	134	34	18	46	22	21	257	291	137	784	2,606
Minerals	1,858	3,359	7	5,446	1,667	381	396	250	565	817	4,822	1,918	42,423	63,931
Textiles and Apparel	1,423	13,458	263	706	267	173	39	609	629	1,427	1,360	3,752	1,041	25,147
Chemical products	1,399	2,233	47	479	584	125	542	1,011	33	1,219	8,339	8,481	2,769	27,263
Metals	2,481	2,167	49	578	288	157	193	411	17	1,341	2,607	1,834	9,184	21,308
Machinery	5,223	11,531	696	1,016	4,101	2,842	5,437	4,009	96	6,136	32,704	19,225	2,841	95,855
Other manufacturing products	1,019	7,321	196	3,016	1,564	257	177	1,039	305	2,343	8,945	5,922	4,034	36,138
Services	1,028	1,634	1,062	941	732	340	1,271	1,207	138	2,552	25,594	41,512	21,878	99,890
Total	16,843	48,071	2,635	14,013	10,190	5,054	8,379	12,250	2,462	19,188	114,317	89,859	104,198	447,481

Source: GTAP Database Version 5

Table 3: Japan's Tariff Rates on Imports from Various East Asian Regions

	ROK	China	Hong Kong	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Rice	409.0	409.0	409.0	409.0	409.0	409.0	409.0	409.0	409.0
Cereal grains	22.0	30.8	137.3	20.8	20.2	20.4	111.8	20.2	20.2
Vegetables and fruits	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9	44.9
Other crops	24.0	37.9	22.4	22.2	22.1	25.1	22.1	22.5	23.9
Meat and animal products	17.8	9.5	27.3	10.2	6.3	23.5	7.5	8.6	5.1
Raw milk	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Natural fibers	54.5	43.6	2.7	3.8	0.0	0.0	12.5	21.0	1.0
Meat products	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2
Dairy products	287.0	287.0	287.0	287.0	287.0	287.0	287.0	287.0	287.0
Other food products	37.0	37.6	38.0	38.9	16.4	35.7	32.7	47.5	38.1
Forestry	4.7	2.9	2.0	0.6	0.1	4.5	2.4	4.2	1.1
Fishing	6.8	5.5	2.4	3.3	3.8	3.0	2.9	4.2	3.6
Minerals	2.9	−0.6	1.0	−0.5	−0.4	0.4	3.1	1.8	−2.0
Textiles and Apparel	10.4	11.6	13.0	8.3	5.9	11.8	11.4	9.5	11.7
Chemical products	2.6	2.7	2.9	2.5	2.0	2.7	2.0	1.2	3.2
Metals	2.1	1.1	0.3	0.4	1.3	0.3	0.3	0.9	0.3
Machinery	0.1	0.3	0.3	0.2	0.0	0.3	0.0	0.1	0.7
Other manufacturing products	7.5	7.5	3.3	7.0	5.4	4.0	2.5	2.7	6.3

Source: GTAP Database Version 5

Figure 4: Price of Imports in Japan

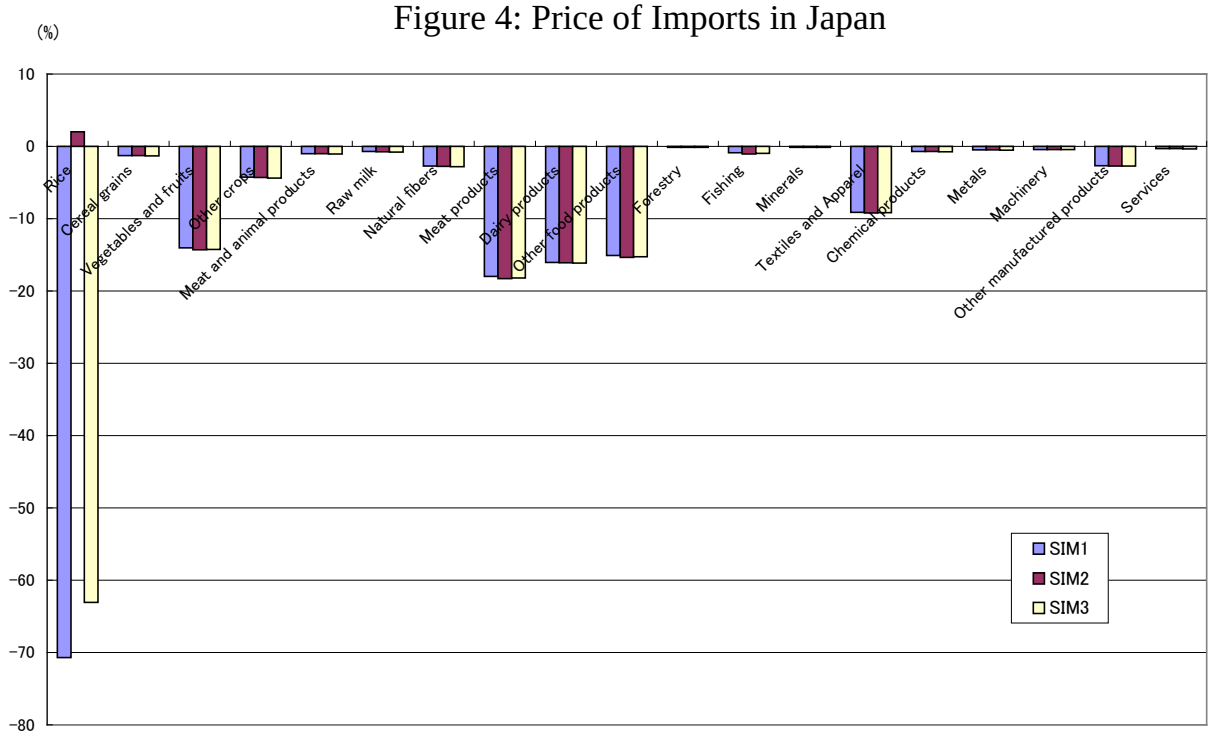


Figure 5: Change in Imports by Sector in Japan

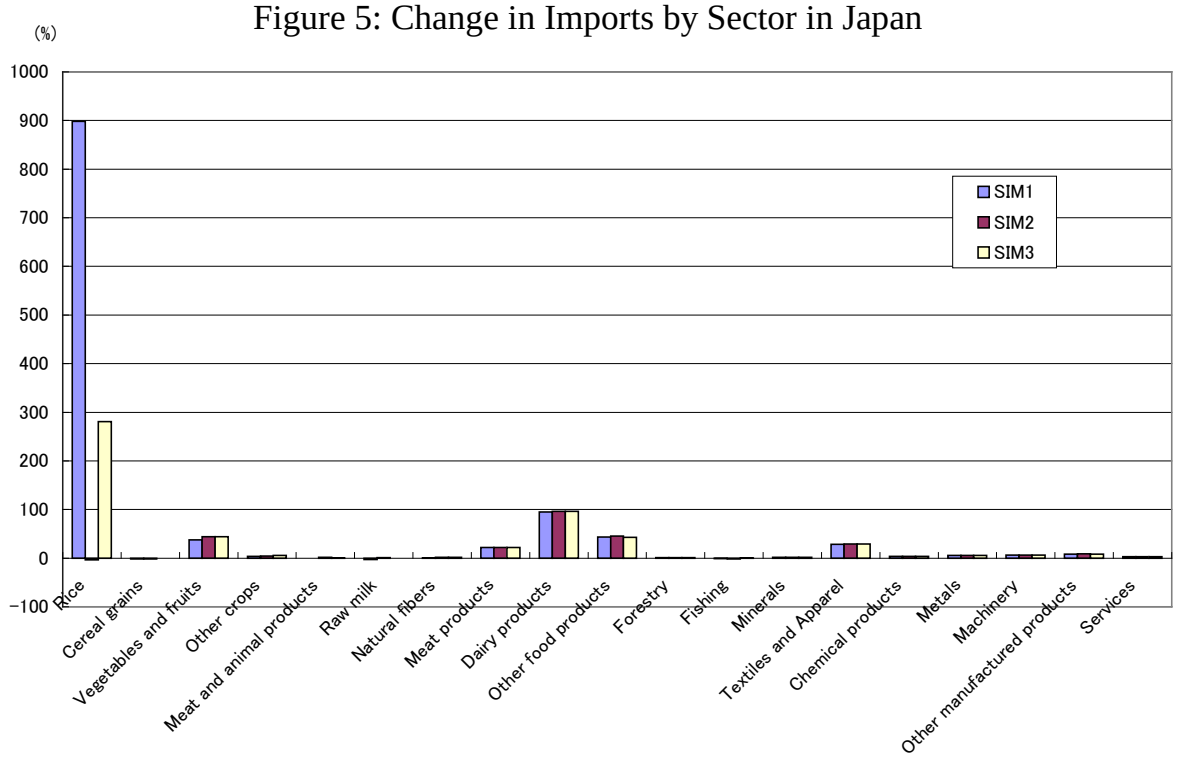


Figure 6: Change in Trade Balance by Sector in Japan

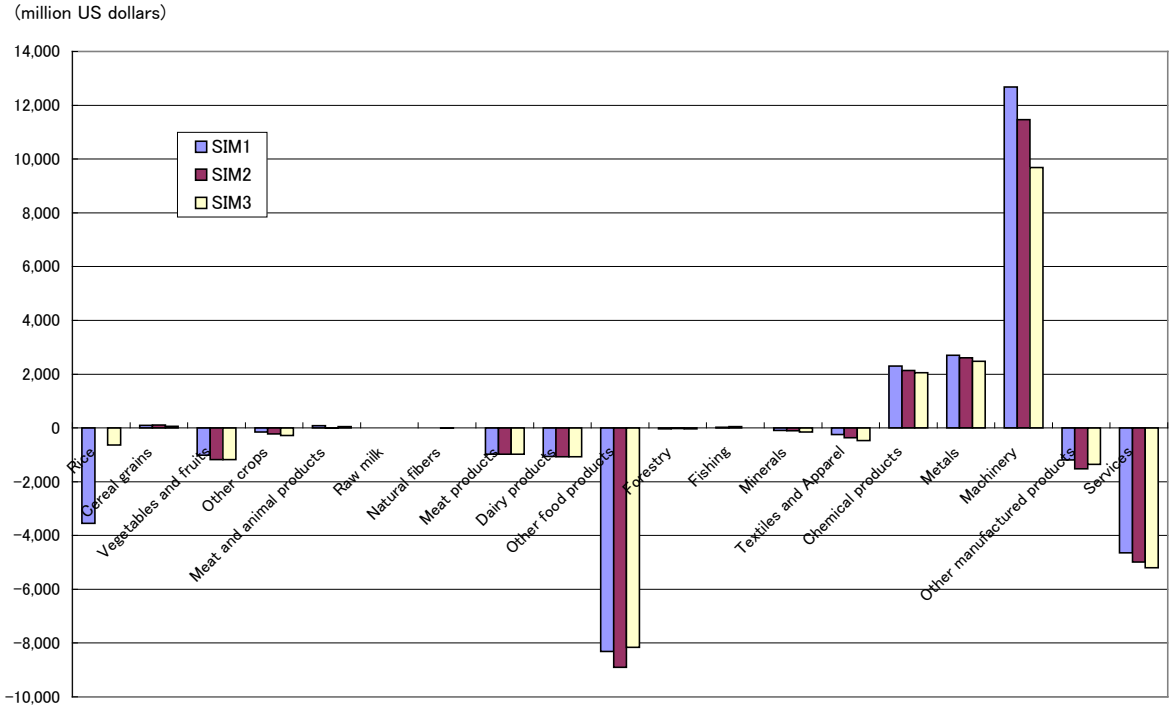


Figure 7: Change in Value Added by Sector in Japan

Figure 8: Change in Employment of Skilled Labor by Sector in Japan

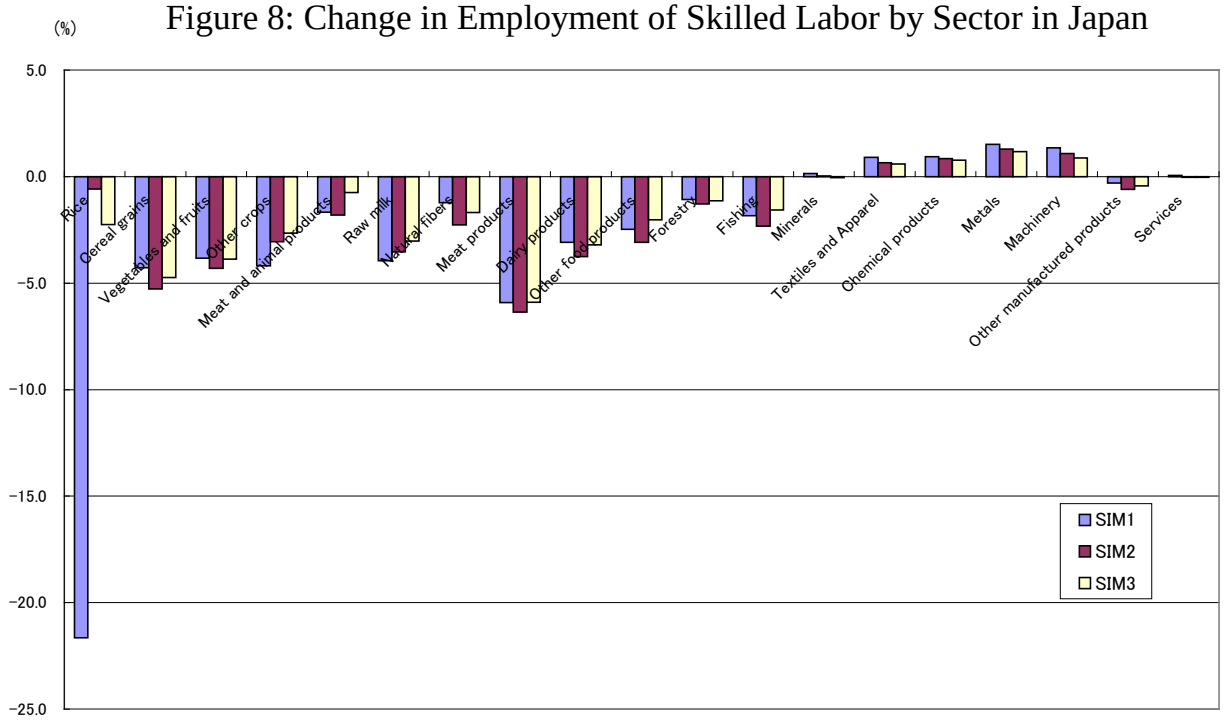


Figure 9: Change in Employment of Unskilled Labor by Sector in Japan

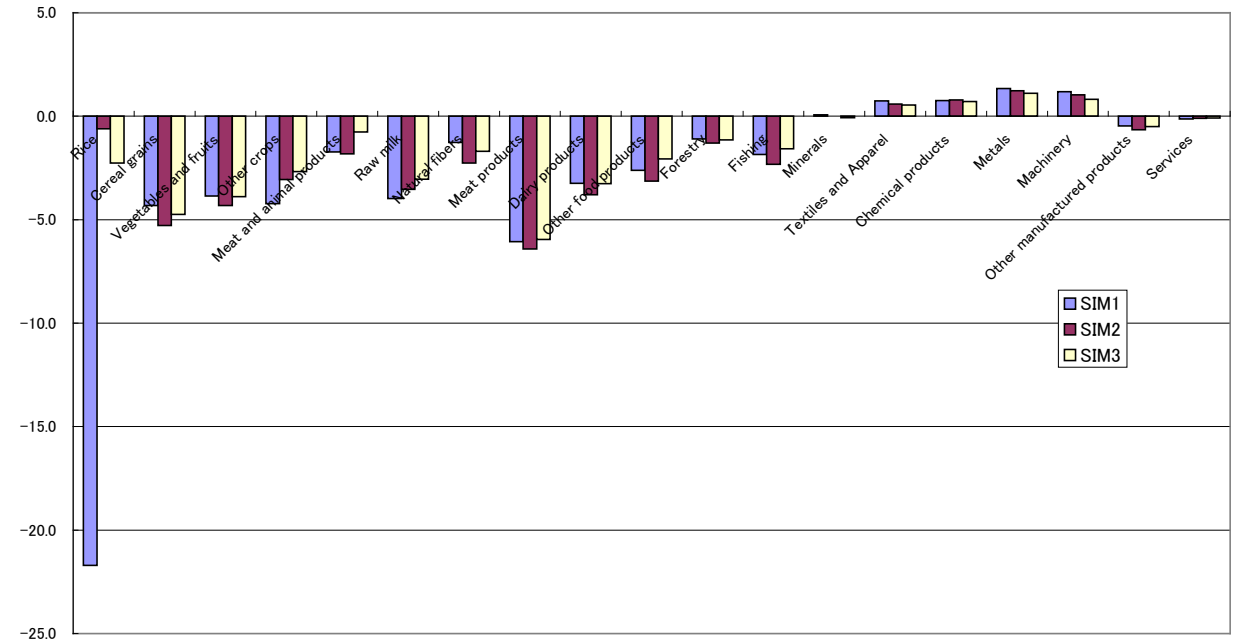
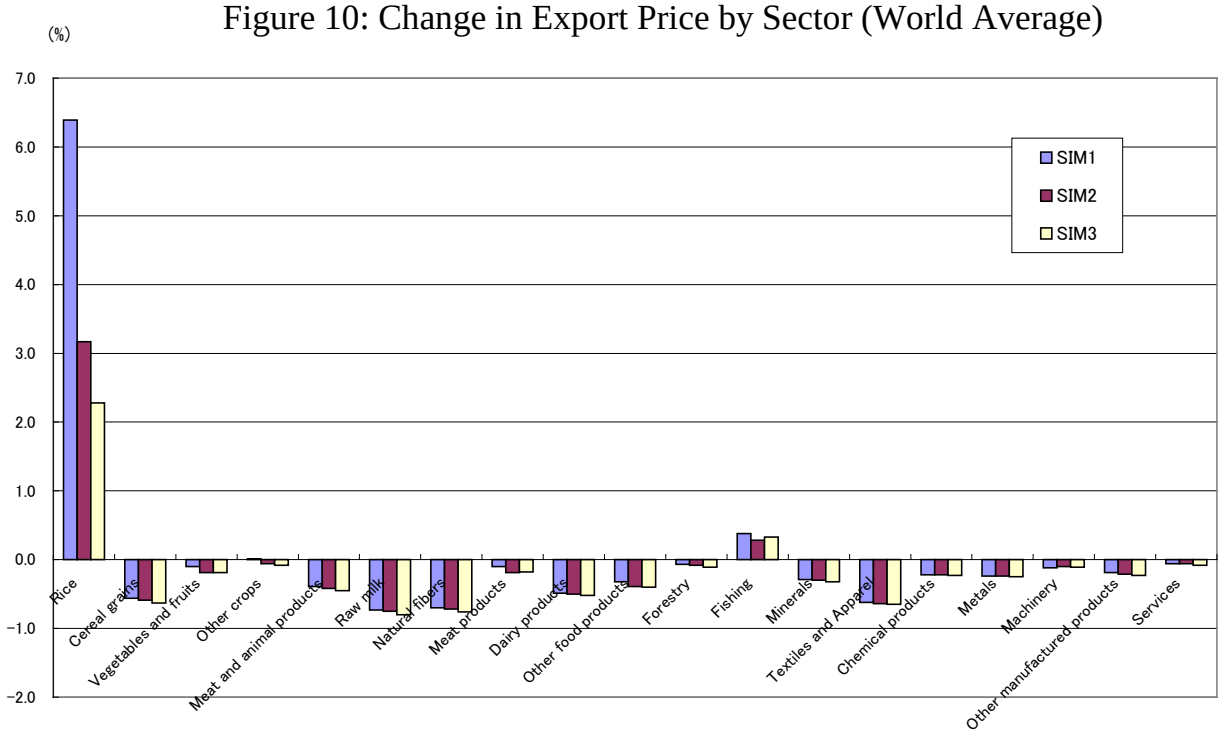


Table 4: Decomposition of Contribution to Equivalent Variation

	SIM1	SIM2	SIM3
Resource Allocation Effect	4,065	777	1,581
Changes of Capital Goods Price	−1,172	−1,242	−1,262
Changes in Terms of Trade	6,987	7,812	7,937
EV (Total)	9,880	7,347	8,257

Figure 10: Change in Export Price by Sector (World Average)



Appendix

Figure A1: Production Structures of GTAP Models

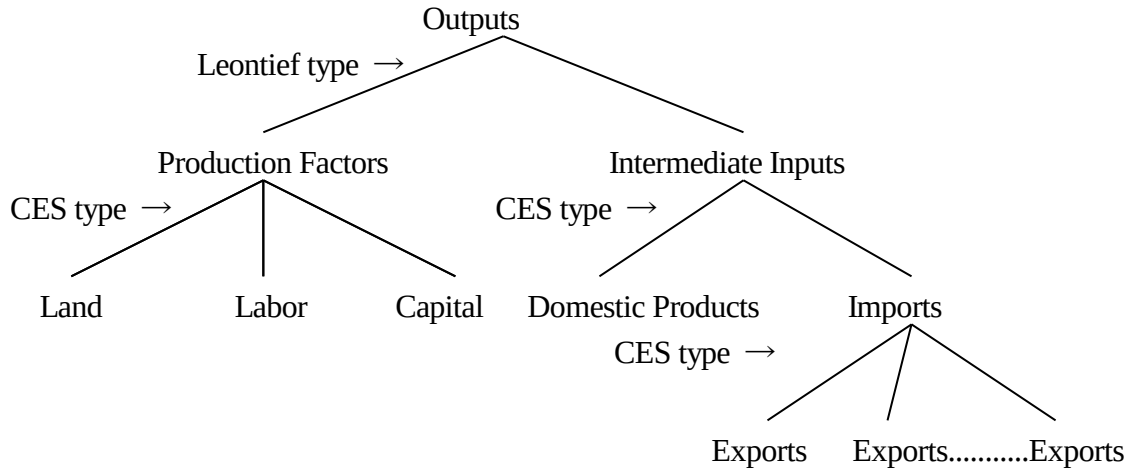


Table A1: Aggregation of Regions

Regions	Original regions
Japan	Japan
ROK	Korea
China	China
Hong Kong	Hong Kong
Indonesia	Indonesia
Malaysia	Malaysia
Philippines	Philippines
Singapore	Singapore
Thailand	Thailand
Vietnam	Vietnam
Rest of Asia	Taiwan; Bangladesh; India; Sri Lanka; Rest of South Asia
NAFTA	Canada; United States; Mexico
EU	Austria; Belgium; Denmark; Finland; France; Germany; United Kingdom; Greece; Ireland; Italy; Luxembourg; Netherlands; Portugal; Spain; Sweden
Rest of World	Australia; New Zealand; Central America, Caribbean; Colombia; Peru; Venezuela; Rest of Andean Pact; Argentina; Brazil; Chile; Uruguay; Rest of South America; Switzerland; Rest of EFTA; Hungary; Poland; Rest of Central European Assoc; Former Soviet Union; Turkey; Rest of Middle East; Morocco; Rest of North Africa; Botswana; Rest of SACU (Namibia, RSA); Malawi; Mozambique; Tanzania; Zambia; Zimbabwe; Other Southern Africa (Ang, Maur); Uganda; Rest of Sub-Saharan Africa; Rest of World

Table A2: Aggregation of Sectors

Sectors	Original classifications
Rice	Paddy rice; processed rice
Cereal grains	Wheat; other cereal grains
Vegetables and fruits	Vegetables, fruit, nuts
Other crops	Oil seeds; sugar cane, sugar beet; other crops
Meat and animal products	Cattle, sheep, goats, horses; other animal products; meat: cattle, sheep, goats, horses
Raw milk	Raw milk
Natural fibers	Plant-based fibers; wool, silk-worm cocoons
Meat products	Meat products
Dairy products	Dairy products
Other food products	Vegetable oils and fats; sugar; other food products; beverages and tobacco products
Forestry	Forestry
Fishing	Fishing
Minerals	Coal; oil; gas; other minerals; petroleum, coal products; other mineral products
Textiles and Apparel	Textiles; apparel
Chemical products	Chemicals, rubber, plastic products
Metals	Ferrous metals; other metals; metal products
Machinery	Motor vehicles and parts; other transport equipment; electronic equipment; other machinery and equipment
Other manufactured products	Leather products; wood products; paper products, publishing; other manufactured goods
Services	Electricity; gas manufacture & distribution; water; construction; trade; other transport; sea transport; air transport; communications; other financial services; insurance; other business services; recreation and other services; public administration, defense, health &, education; dwellings