An Analysis of Japan-Korea FTA:
Sectoral Aspects

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Abstract

Here, we introduce an idea for a Japan-Korea Free Trade Agreement. It is already in the process of being negotiated by the two governments and is expected to be the first FTA established between Northeast Asian countries.

We apply the CGE model using GTAP database ver.5 for the quantitative analysis of the economic effects of the FTA.

We found some positive results as a result of our simulation. In terms of macroeconomic effects, there are some gains in terms of real GDP or equivalent variance. With regard to sectoral effects, we were able to point out some sectors that would benefit from a FTA, such as the ROK's electronic equipment sector.

Key Words

Japan-Korea FTA, Capital Accumulation, Sectoral Effects, Intra-industry Trade

1. Introduction

The idea of a Japan-Korea Free Trade Agreement (FTA) was raised by President Kim Dae-Jung at the Japan-Korea summit meeting with Prime Minister Keizo Obuchi in October 1998. As the first stage of negotiations, The Institute of Developing Economics (IDE), of the Japan External Trade Organization and the Korea Institute for International Economic Policy (KIEP) began research on the economic effects of the Japan–Korea FTA in December 1998 at the request of the two governments. Their reports were released in May 2000. Both of them applied CGE models, which used the database of the Global Trade Analysis Program (GTAP) for quantitative analysis.[1]

As the second stage, the first meeting of the Japan–Korea FTA Business Forum, a gathering of business leaders from both countries, was held in September 2001. The Forum issued a joint statement to the two governments in January 2002, requesting the early conclusion of the FTA. Following this statement, at the Japan-Korea summit meeting in March 2002, Prime Minister Junichiro Koizumi and President Kim Dae-Jung agreed to the establishment of a joint research group that includes government officials, business leaders and academicians.

The Japan-Korea FTA is expected to be the first FTA established between Northeast Asian countries. The unified market will have roughly US$5 trillion of GDP and a population of 170 million.

[1] The results obtained by the two institutes are summarized in Nakajima and Kwon (2001).

In Nakajima and Kwon (2001), we carried out some quantitative analyses on the economic effects of Japan–Korea FTA using the CGE model. In this paper, we have added some new points regarding this topic. Firstly, we applied GTAP database Ver.5, which is based on data for 1997. Secondly, we attempted more precise analyses of the economic effects on sectors, including output and the trade balance.

2. Outlines of models

We applied two types of model for our analysis, as in our previous paper. One is a model for short run effect analysis. This is basically equivalent to the standard GTAP model. The other is a model for long run effect analysis. This model is shown in Warmsley (1998).[2] Here, we have capital stock as an endogenous variable for an analysis of the effects of capital accumulation. On the other hand, it is an exogenous variable in the standard GTAP model. We assume interregional mobility for capital stock at the same time. With some shocks, such as tariff removal, capital stock[3] will move until the change in the rate of return on capital stock becomes equal across all regions.

In Figure 1, we can illustrate the effects of FTA on real GDP. One is the efficiency improvement effect due to the removal of tariffs; the other is the capital accumulation effect. Short-run effects include only the efficiency improvement effect. Long-run effects include both of them.

There are 66 regions and 57 sectors available in the GTAP database ver.5. Aggregations of our model can be found in Table 1. Tariff rates between Japan and ROK are displayed in Table 2. In our FTA simulations, we simply assumed that these rates equal zero.

3. Macroeconomic effects

The macroeconomic effects from the results of our simulation are found in Table 4 and the figures that follow.

Firstly, there is not much change in real GDP in any region in the short-run case. Only the ROK shows a 0.29% increase. In the long-run case, the ROK shows a 1.09% increase. This is the result of capital accumulation. The removal of tariffs causes an increase in the rate of return on capital stock in the ROK, as we can see from Figure 6. Then capital inflow to the ROK occurs, as shown in Figure 7. These effects do not work on a large scale in Japan. Therefore, the increase in real GDP stays at only 0.02%. Other regions show a negative change in the long-run case. This was caused by capital outflow to Japan and the ROK, since capital stock in the world is a zero sum in this model.

Equivalent variance is positive in Japan and the ROK and negative in other regions. The scale is larger in the long-run case than the short-run case.

There is an obvious contrast with regard to the effect on terms of trade. There are improvements in Japan and the ROK, or the members of the FTA, and deteriorations in other regions. There is an

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[2] We applied a version with a standard benchmark database and no risk premia.

[3] Here, capital stock means beginning of period capital stock or KB in the GTAP model.

increase in export prices in Japan and the ROK and a decrease in other regions. The magnitude is larger in the short-run case.

There is also an obvious contrast in the trade balance. It grows worse in Japan and the ROK and improves in other regions, except China in the long-run case. The magnitude is larger in the short-run case.

4. Sectoral effects

(1) Composition of exports

Before analyzing the results of the simulation for sectors, we would like to provide overviews of the trade patterns of Japan and the ROK. Figures 8 and 9 show the composition of the exports of the two countries according to the GTAP database.

The composition of exports is similar in both countries. Machinery, including motor vehicles, other transport equipment, electronic equipment, and other machinery and equipment, is a major export of both Japan and the ROK. With regard to areas of difference, textiles and apparel account for a share of the ROK's exports, but are not present in Japan's exports.

In looking at Japan's exports to the ROK and the ROK's exports to Japan, we can point to a common tendency. Motor vehicles are a major export for both. However, the share of exports to each other is very limited. We can explain this partially by trade policy. Until 1999, the ROK had a trade policy called the Import Diversification Program, which discriminated against Japan's exports. On the other hand, Japan's automobile market might be more difficult for ROK's exporters to penetrate than other markets, such as North America. We can also see a similar tendency in the field of other transport equipment, including shipbuilding.

In contrast, the shares of electronic equipment exported to each other are high. These include not only final products, but also intermediate parts. Intra-industry trade between the two countries is already popular in this sector.

Other than above, other unique characteristics are visible in the pattern of trade between the two countries. The share of processed food in the ROK's exports to Japan is high, as is the share of other machinery and equipment in Japan's exports to the ROK. This includes industrial machinery, such as machine tools.

(2) Results of the simulation

Here, we would like to look at the results in the short-run case, in order to examine the direct effects of tariff removal.

Figure 10 illustrates the change in trade balance by sector. In Japan, other machinery and equipment shows the largest trade balance improvement, followed by metal products, other manufacturing products, and electronic equipment. Other sectors show deteriorations.

In the ROK, there is a remarkably large improvement in the processed food sector, followed by the textiles and apparel sector. On the other hand, there is a significant deterioration in the field of other

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machinery and equipment. Metal products, motor vehicles, other transport equipment, and other manufacturing products also show deteriorations.

Figure 11 illustrates the change in value added by sector. The directions of change are almost the same as those in the trade balance. However, there are some exceptions. For example, the trade balance of the ROK's agricultural products sector grows worse, but the value added increases. This is caused by a large increase in production in the ROK's processed food sector. Imports and domestic production of agricultural products increase at the same time.

We can see deteriorations in the trade balance and a decrease in the value added in Japan's motor vehicle and other transport equipment sectors. These are puzzling results, since there are import tariffs on these in the ROK and a FTA will remove them.[4] When we consider the removal of tariffs, the results seem to move in the opposite direction. Changes in the export sales of these two sectors in Japan are shown in Figure 12. Exports to the ROK increase in both sectors, but exports to other regions decrease. The percentage decrease is small, but these regions include NAFTA and the EU, which are major export markets for Japan in these two sectors. Therefore, there are deteriorations in two sectors in total. We can see a change in Japan's export price by sector in Figure 13. Increases of export price are found in the two sectors, but also in other manufacturing sectors, such as electronic equipment or other machinery and equipment. Improvements of the trade balance are seen in these sectors. A crucial point for our results is the elasticity of substitution of imports by origin or ESUBM in GTAP model. As can be seen in Table 5, this is relatively large in the two sectors, compared with other manufacturing sectors.

The ROK's electronic equipment sector is another puzzling case. Its trade balance improves, but, at the same time, other machinery sectors deteriorate. We can see a change in the ROK's export price by sector in Figure 14. Electronic equipment is the only sector that shows a decrease in export prices. This is caused by the removal of import tariffs. As mentioned before, electronic equipment accounts for a high share of exports from Japan to the ROK. The removal of tariffs could reduce the prices of intermediate parts from Japan for the sector.

5. Conclusion

Our analysis resulted in a positive message about a Japan-Korea FTA.

In terms of macroeconomic effects, we saw a certain increase in the ROK's real GDP in the long-run case. On the other hand, gains for Japan were limited in scale, in terms of real GDP. However, both countries benefit in terms of equivalent variance.

With regard to sectoral effects, there were some unique cases, such as the ROK's electronic equipment sector, where the removal of tariffs reduces costs in the sector. This suggests that an increase in intra-industry trade will enlarge the static effects of the FTA.

With regard to the method of analysis, the elasticity of substitution of imports played a crucial role in

[4] Rates of tariffs are found in Table 1.

the export sales of Japan’s motor vehicle and other transport equipment sectors. Further empirical study into this area is perhaps advisable.

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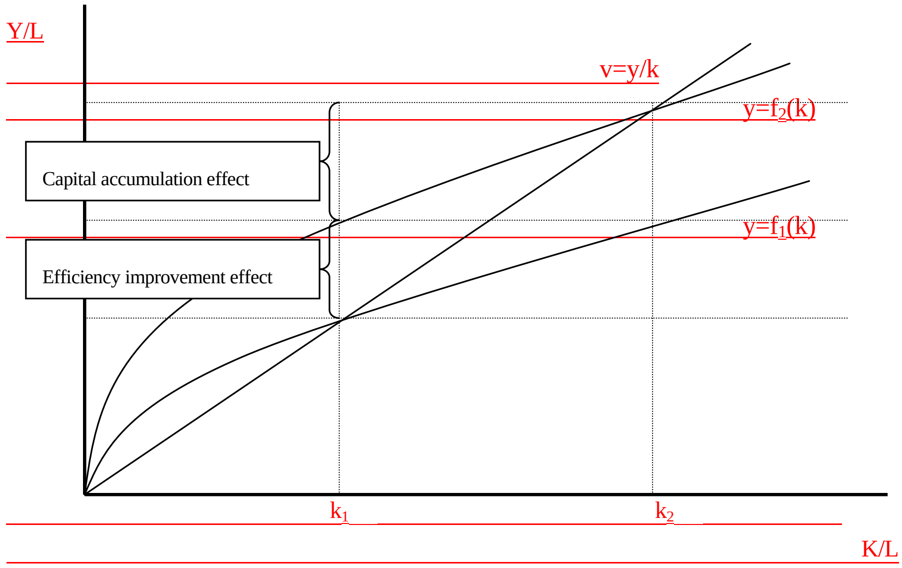
Figure 1: Illustration of Effects on Real GDP



Source: Tsutsumi (2000)

Table 1: Aggregation of Regions and Sectors

Regions	Sectors
8 regions: Japan, ROK, China, Asian NIES, ASEAN, NAFTA, EU, Rest of World	17 sectors: Agricultural products, Fishery products, Forest products, Mineral resources, Processed food, Textiles and wearing apparel, Metal products, Motor vehicle, Other transport equipment, Electronic equipment, Other machinery and equipment, Other manufacturing products, Energy, Transport, Communication, Finance, Other services

Note: Asian NIES are Taiwan and Hong Kong. Singapore belongs to ASEAN.

Table 2: Tariff Rates between Japan and the ROK

(%)

	Japan	ROK
Agricultural products	36.3	51.9
Forest products	4.7	2.3
Fishery products	6.8	11.7
Mineral resources	0.0	2.6
Processed food	42.1	44.8
Textiles and wearing apparel	10.4	8.0
Metal products	2.1	7.3
Motor vehicle	0.0	8.0
Other transport equipment	0.0	2.8
Electronic equipment	0.0	8.0
Other machinery and equipment	0.3	7.9
Other manufacturing products	3.9	7.5

Source: GTAP database Ver.5

Table 3: Base Data (1997)

Millions of U.S. Dollars

	GDP	Exports	Export Share	Imports	Import Share	Trade Balance
Japan	4,255,524	506,278	5.6%	418,249	3.8%	88,029
ROK	445,503	162,516	10.1%	158,518	18.1%	3,997

Source: GTAP database Ver.5

Note: Trade data include services.

"Export Share" refers to share of exports to the ROK or JAPAN as a share of total exports.

"Import Share" refers to share of imports from the ROK or JAPAN as a share of total imports.

Figure 2: Change in Real GDP

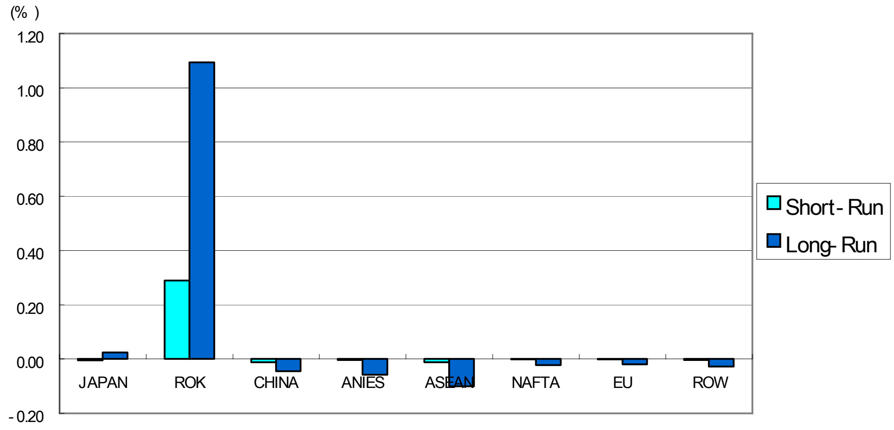


Figure 3: Equivalent Variance

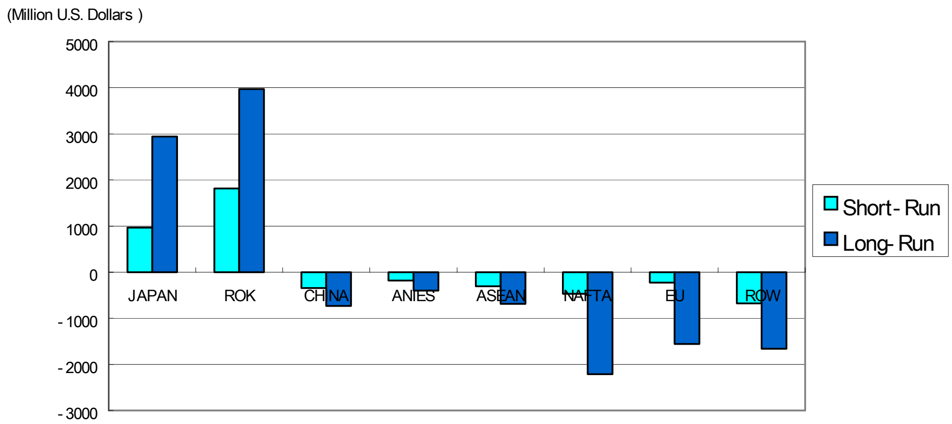


Figure 4: Change in Terms of Trade

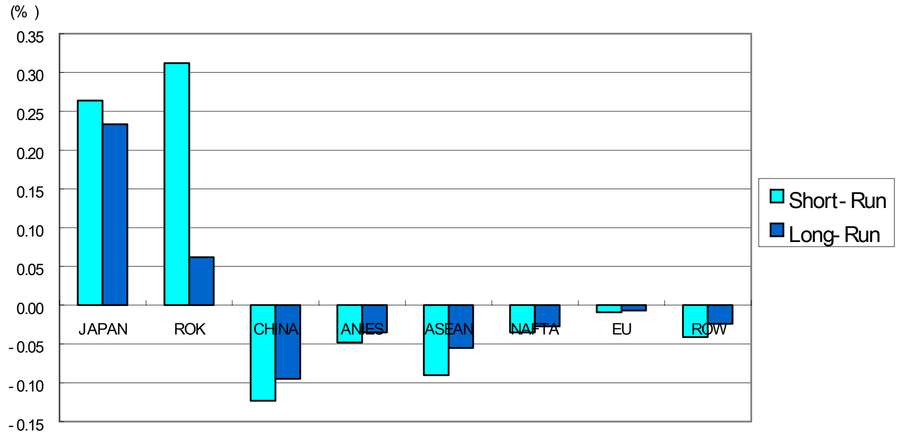


Figure 5: Change in Trade Balance

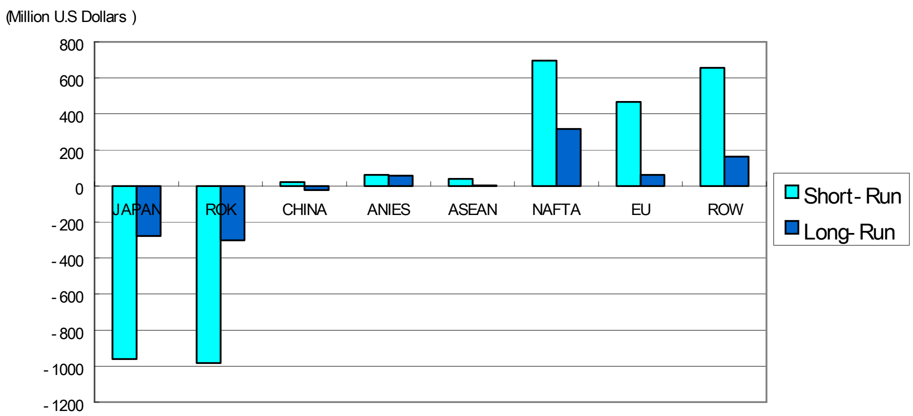


Figure 6: Change in Curent Net Rate of Return on Capital Stock

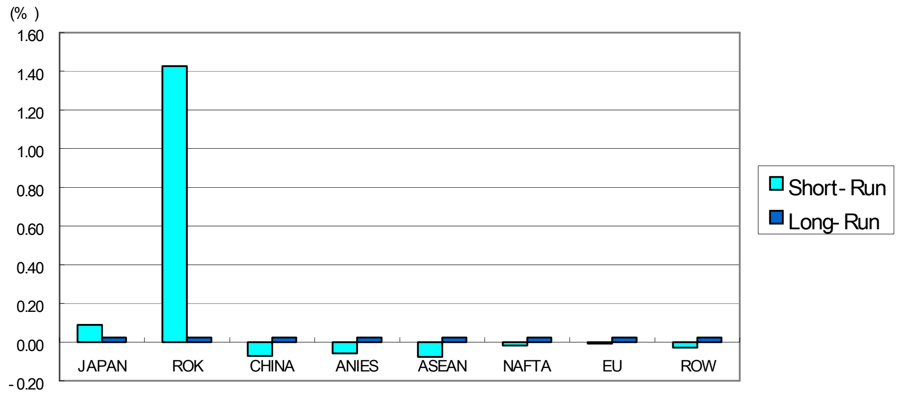


Figure 7: Change in Beginning of Period Capital Stock

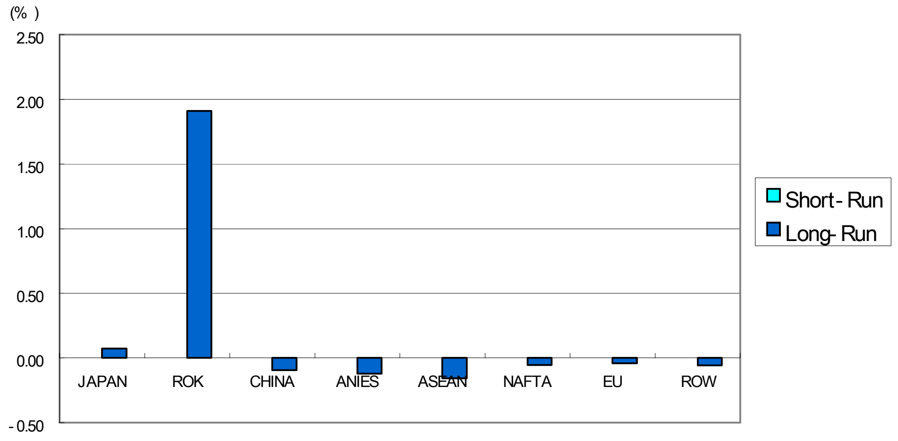


Figure 8: Composition of Japan's Exports by Sector

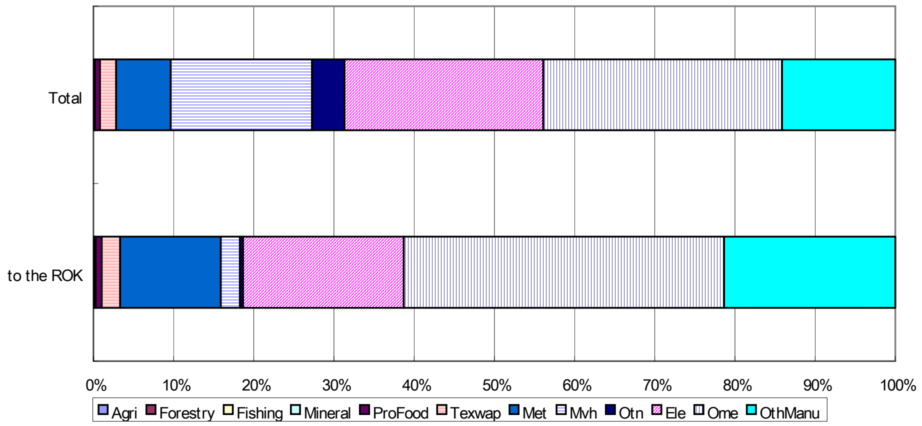


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Figure 9: Composition of the ROK's Exports by Sector

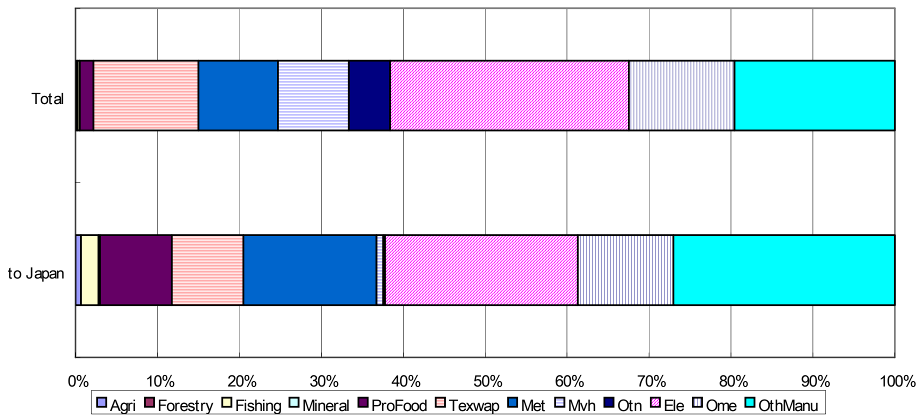

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Figure 10: Change in Trade Balance by Sector (Short-Run)

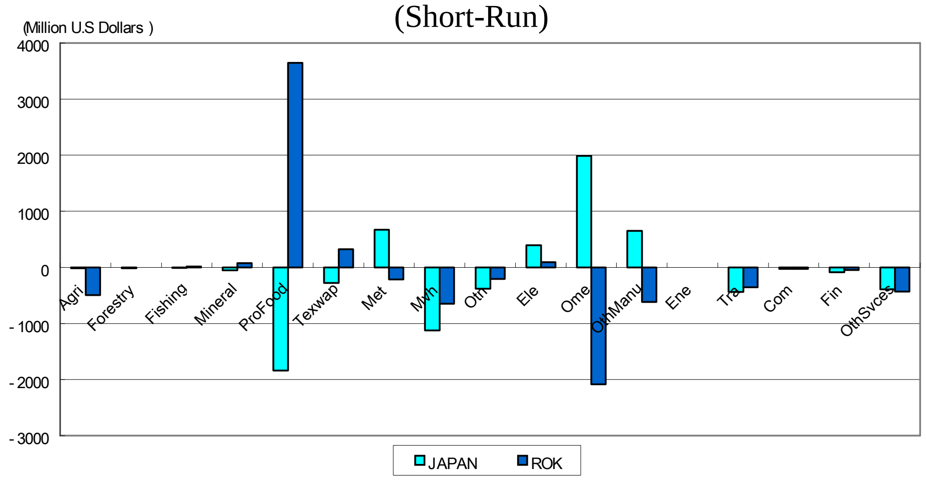

Figure 11: Change in Value Added by Sector (Short-Run)

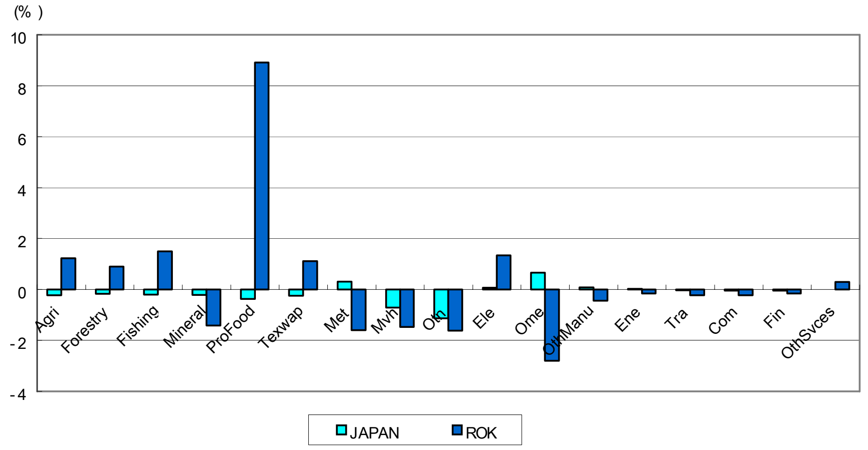

Figure 12: Change in Export Sales of Japan's Two Sectors (Short-Run)

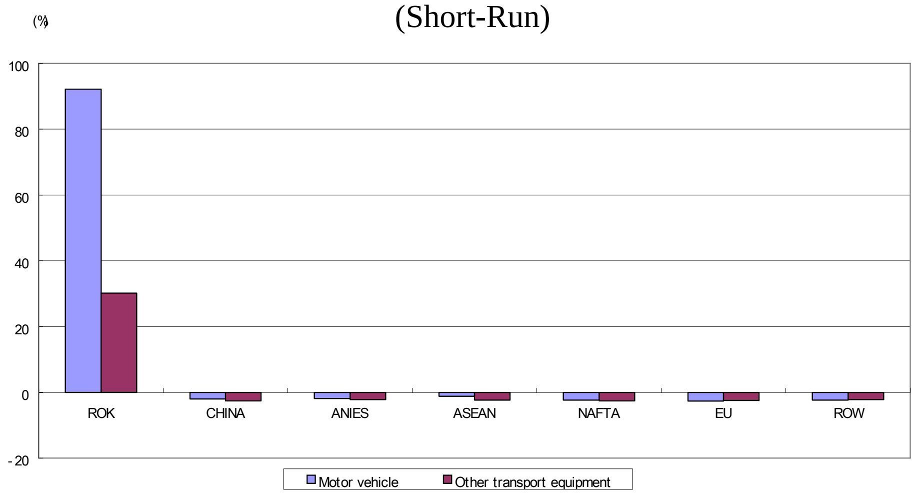

Figure 13: Change in Japan's Export Prices (Short-Run)

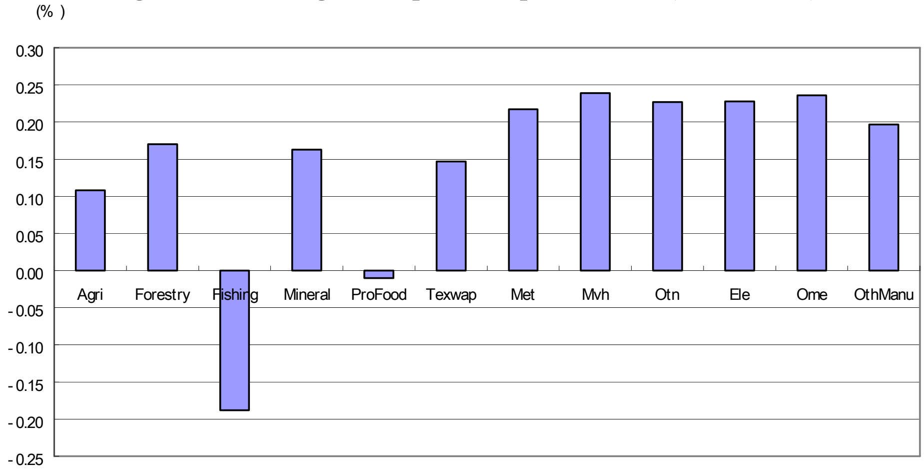

Figure 14: Change in the ROK's Export Prices (Short-Run)

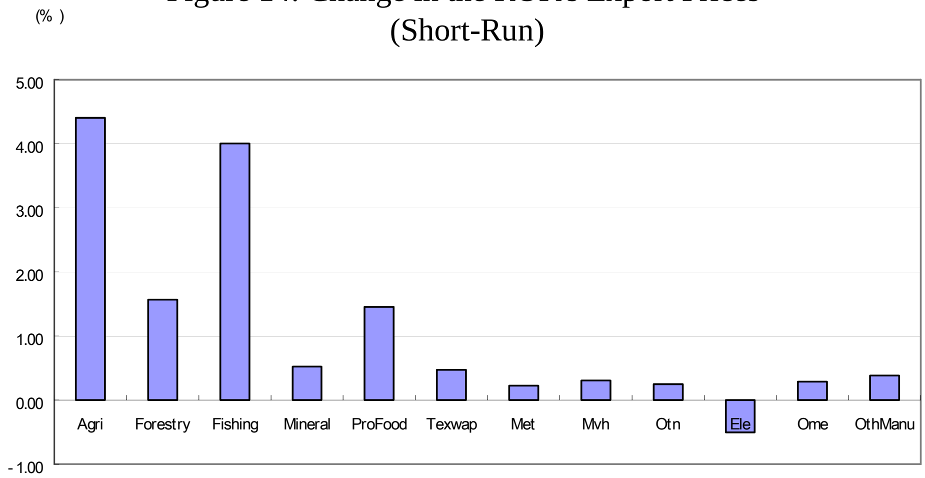

Table 5: Elasticity of Substitute of Imports (ESUBM)

Agricultural products	4.52
Forest products	5.60
Fishery products	5.60
Mineral resources	5.60
Processed food	4.73
Textiles and wearing apparel	6.31
Metal products	5.60
Motor vehicle	10.40
Other transport equipment	10.40
Electronic equipment	5.60
Other machinery and equipment	5.60
Other manufacturing products	4.55

Source: GTAP database Ver.5

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