The Direction of Economic Exchange and Cooperation among Japan, South Korea and North Korea

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Ⅰ. INTRODUCTION

During a long period, economists have debated the virtues and vices of foreign trade, and the subjects have focused on economic welfare gains or losses-through trade. Hence, the debates on a trade are mostly limited within the economics areas. But, on the other hand, a few political economists and international political scientists have long been interested in the influence of trade, which is on economic activity of nations, on conflicts and/or cooperation between nations. Within the scientists who are interested in non-economic effects of trade, the dependency school of thought and neo-Marxists envisions conflict accompanying expanded international trade, and realist theorists have traditionally recognized trade as irrelevant to conflict or cooperation between nations. But liberals, functionalists, and neo-functionalists argue that trade promotes peace and economic welfare. The "peace through trade" hypothesis suggested by Kant, Montesquieu, Bentham is that states who trade extensively with each other seldom fight wars with each other. This classic, liberal thesis is based on a twofold idea : the existence of comparative advantages accrued from the difference of resource endowments enables both countries to increase their own welfare through trade. Loss of existing trade, because of trouble or conflict, would imply potential welfare losses. Hence, trade and foreign investment reduce the incidence of conflict between countries. And, a side effect of trade is improved communication between the inhabitants of the trading states. This reduces the chances of misunderstanding and foster cultural and institutional mechanisms capable of mediating conflicts of interest that do arise. Ultimately, the recognition of mutual benefits through cooperation serves to foster peace.

In recent years, the "peace through trade" hypothesis has generated enormous interest among international economic and political scholars with two viewpoints. First, since most nations in the world have trend to be interested in economic gains rather than ideological confrontation as coldwar ended, nations weight more with reconciliations and cooperation than with military confrontation between countries. Secondly, during the Coldwar period nations had sought for 'negative peace 'which is a status of absence of war. So, nations had regarded national military security as of great importance. But, after an end of coldwar, nations search for 'positive peace' which is an absence of structural violence. Thereafter, they attach great important to collaborations between nations as well as member of society. But, Northeast Asia is, contrary to the global tendency of reconciliations and cooperations in the post-coldwar era, still remaining at coldwar ages. And this coldwar structure hinders Northeast Asian nations from the regional economic cooperation, which is progressing rapidly in other regions. However, it is possible to give many

reasons for the insecure situation of Northeast Asia, North Korea's national strategy based on the military forces can be counted as a decisive one. North Korea's militaristic policy to survive is not caused from the outer military threat but from the internal economic crisis. North Korea has long have autarlic and outdated Stalinist planning economy. Also it has insisted on its juche economy which is in practice a self-reliance and closed systems. So the country is based on the industrial policy that emphasizes on the development of industries oriented toward domestic markets. But, because of natural conditions, small scale and low development economy from birth, North Korea had imported essential materials including petroleum and advanced technologies from foreign economies. So it is a fact that North Korean economy had been heavily depend on outer economies, mainly Eastern European countries including Soviet Union. However, as the coldwar ended, the North Korea lost its base of support in the international community. With its long-standing rigidity, insularity, and inefficiency veiled by the regime's juche ideology, the collapse of communist bloc leads North Korea immediately to the economic crisis which feeds the anticipation of regime's collapse. Also, as the coldwar ended, the North experienced massive and swift changes in international politics ; the demise of the Soviet Union, the collapse of the Eastern European socialist countries , and South Korea's establishment of diplomatic relations with Russia and China. But, making matters worse, the North Korean regime has brought about its international isolation by refusal of participation in the global changes : i.e., instead of adaption himself to new global circumstances, the North turned his regime to a wartime management system and simplified the chain of military commend. Additionally, the regime is inspiring both civilians and soldiers with patriotism and hostility toward outsiders as a way to rescue his state from its disastrous situation.

However , although North Korea has strengthened its military acts as guarantor of the regime, the leaders of the North now perceive that it has no choice but to approach the United States, the only super power, for its regime to survive. Also the North realizes that the most realistic way to deliver his regime from its fatal collapse is to pursue economic aid from the advanced capitalist nations and economic interaction with international community. Therefore, the North deliberates to normalize its relations with South Korea and Japan. And recently, several signes such as the 'Summit Talks' between South and North Korea in June of 2000 are emerging that North Korea may be willing to devise a policy of opening and gradual reform within the limits of a certain amount of control, as was done initially by the Chinese government. On the other hand, Northeast Asian nations including the United States recognize that North Korea is the core of fragile security in Northeast Asia and the immediate causes of a crisis facing the North Korean regime are decreasing economy and food supply difficulties. Hence, the nations agree that trade and economic cooperations between North Korea and other Northeast Asian nations are the most efficient way to set up a longstanding steady peace in the region.

So, the purpose of this study is to find the direction of trade and economic cooperations among Japan, South Korea and North Korea. For the purpose, we estimate the individual commodity group's competitiveness of Japan, South Korea, and North Korea during the period of 1980-1998. And based on the estimates, we analyze the trade and economic cooperations' direction among Japan, South Korea, and North Korea. In addition, we investigate the triangular trade and economic cooperations of the three countries.

Ⅱ. ANALYSIS

Although the principle goes far beyond the explanation provided by Ricardo who only observed differences in labor productivity, the main basis for international specialization remains the principle of comparative advantage. The concept of comparative advantage and competitiveness are quite different in reality. Competitiveness is seriously disturbed and any analysis based on it is highly inadequate when instability of exchange rate produces large disequilibria in circumstance like the present. This is why explanation of international specification has increasingly to take into account some measures of comparative advantage. In this case, the comparative advantages concerned are those that are 'revealed' by the results of international trade.

As in this field,the major innovation is due to Balassa(1965), who proposed using a ration of relative export structure. To avoid problems that might arise when using data on the absolute size of trade flows, one can transform these data to obtain measure of the structure of trade. Therefore, one creates, for each product i, examining whether its share of exports of country j is greater or less than that of the world as a whole. If the export flows are denoted by X, this given variable x_{ij}, which gives the proportion of country j's export conducted in commodity i ;

$$x_{ij} = x_{ij} / \sum_{n=1}^{N} X_{nj}$$

Because x_{ij} gives the share of country j's export that is in commodity i, one naturally compares x_{ij} with the analogous measure for the world as a whole. The resultant measures have an average value all countries of unity. Thus, define

$$x_{ij} = \left(x_{ij} / \sum_{n=1}^{N} X_{nj} \right) / \left(\sum_{t=1}^{T} X_{it} / \sum_{n=1}^{N} \sum_{t=1}^{T} X_{nt} \right)$$

or

$$x_{ij} = \left(x_{ij} / \sum_{t=1}^{T} X_{it} \right) / \left(\sum_{n=1}^{N} X_{nj} / \sum_{n=1}^{N} \sum_{t=1}^{T} X_{nt} \right)$$

The flows ΣX_{ij} and $\Sigma\Sigma X_{nt}$ correspond to the total exports of the reference zone which could be the whole world or simply the more restricted set of comparable countries, for commodity i and for all commodities, respectively. This method results in the elimination of the influence of macroeconomic factors affecting both X_{ij} and ΣX_{nt}.

The variables defined at above equations are referred by the name 'Revealed Comparative Advantages'(RCAs). The variable x_{ij} measures the share of country j's exports that are in commodity i relative to the share of world exports that are in commodity i. Therefore, x_{ij} shows the export success in commodity i of country j relative to the rest of the world. No doubt the same reasons account for the popularity of the RCAs and similar measure in the empirical trade literature.

The basis of the study is the relation between the trade performance of a country and the characteristics of its domestic economy. A particular revealed comparative advantage(RCA) summarizes the trade performance of a composite good comprising several three-digit SITC commodities. If some composite goods might include products whose production needs capital intensively, then the relevant RCAs measure the effect of capital on trade performance.

The definition of the RCAs is

$$x_{id} = \left(\sum_{n \in N_i} X_{nd} / \sum_{n=1}^{N} X_{nd} \right) / \left(\sum_{n \in N_i} \sum_{t=1}^{T} X_{nt} / \sum_{n=1}^{N} \sum_{t=1}^{T} X_{nt} \right)$$

where X_{id} is the amount of exports of commodity i by a country, T is the number of countries included in the analysis, N is the total number of commodities, and N_i is the set of indices of

commodities having a particular property. The measure that x_{id} is larger than x_{jd} indicates that a country has the larger endowment of some composite of the factors used intensively in the production of commodity i than that of commodity j. In a multi-commodity and multi-factor world, we can conclude the positive relation between the RCAs and resource endowment in production. Given that the RCAs give probabilistic information, we can proceed to organize the information in the manner least likely to give erroneous conclusions. To make correct conclusions more likely, we should ensure that goods have been approximately aggregated when constructing RCAs. Hence measurement from using RCAs for aggregate goods are more reliable than those from using information on individual goods (Balassa & Bauwens ; 1988, Lafay ; 1992).

There are also several qualifications for using the RCA to measure the competitiveness of exports among nations. First, the degree of product aggregation may affect the numerical values of the RCA[1]. Moreover, RCA cannot be used to indicate product differentiation within similar product groups. Grossman (1982) found that imports from developed countries tend to be 'upmarket' goods, but the same product groups supplied by developing countries are 'downmarket'

Table 1
Grouping of Commodities for RCAs by Revision 1, Revision 2 and Revision 3

Product Group		Revision 1	Revision 2	Revision 3
Resource-intensive industry	Nonferrous metals	681-89	681-89	681-89
	Furniture	821	821	821
	Resource-based products	611-13, 621, 629, 631-33, 641-42, 661-67	611-13, 621, 625, 628, 633-35, 641-42, 661-67	611-13, 621, 625, 628, 633-35, 641-42, 661-67
Labor-intensive industry	Textiles	651-57	651-59	651-59
	Clothing	841-42	842-48	841-48
	Footwear	851	851	851
	Miscellaneous products	812, 831, 862-64, 891-99	761-64, 812, 831, 882-83, 885, 892, 894-899	761-64, 811-813, 831, 882-83, 885, 891-92, 894-899
Capital-intensive industry	Chemicals	512-15, 521, 531-33, 541, 551, 553-54, 561, 571, 581, 599	511-16, 522-24, 531-33, 541, 551, 553-54, 562, 572, 582-85, 591-92, 598, 893	511-16, 522-25, 531-33, 541-42, 551, 553-54, 562, 571-75, 579, 581-85, 591-93, 597-98, 893
	Metal manufactures	671-79, 691-98	671-79, 691-97, 699	671-79, 691-97, 699
	Nonelectrical machinery	711-12, 714-19	711-14, 718, 721-28, 736-37, 741-45, 749, 751-52, 759	711-14, 718, 721-28, 731, 733, 735-37, 741-49, 751-52, 759
	Electrical machinery	722-29	716, 771-76, 778	716, 771-76, 778
	Transport equipment	731-35	781-86, 791-93	781-86, 791-93
	Precision instruments	861	871-874, 881, 884	871-74, 881, 884

Source : Revision 1 : P. C. Y. Chow and M. H. Kellman(1993), *Trade-The Engine of Growth in the East Asia, Oxford University Press*, P. 22.
Revision 2 : United Nations(1975), *Standard International Trade Classification, Revision 2*, U. N., New York.
Revision 3 : United Nations(1986), *Standard International Trade Classification, Revision 3*, Statistical Papers Series M No. 34/ Rev. 3 U. N., New York.

goods[2].

The product classification used in this paper is the three-digit SITC product category, which covers more than 100 manufactured products, and conceptually includes all manufactured trade. Whereas the analyses performed were calculated at this level of disaggregation, the tables present a more highly aggregated grouping of 3 industry groups or 13 product groups[3]. Table 1 shows the details of the aggregation of these 13 product groups. In the table, the second, third and fourth columns are the list of the SITC codes of goods included in the composite good. We convert the data published by Revisions 2 and 3 into Revision 1 for the consistency of commodity classification.

All the Japanese and South Korean data used in this paper were obtained from *Yearbook of International Trade Statistics(vol. 2 : trade by commodity)* annually issued by United Nations, Department of Economic and Social Affaires, Statistics Division. We, also, use the data of world trade from the same books.

Researchers of North Korean economy are, however, faced with the lack of statistical data and information. North Korea did not provide any trade data from mid-1960s. But as all foreign trade interaction involve two countries, any given foreign trade transaction is likely to be reported by both, or either country. The trading partner countries of North Korea, also, have provided their trade performance with North Korea. Hence, the trade measures for North Korea can be assembled from the reports of her trading partener countries.

Since most countries report their own trade data to the United Nations, a individual commodity data for North Korean trade are available only from the United Nations. This study uses trade data of North Korea at three-digit levels of UN standard International Trade Classification(SITC), Revision 1.

Table 2 through 4 indicate the RCAs of Japan, South Korea and North Korea in the world market for selected years from 1980 to 1998. To better understand the results summarized in the tables, it is important to realize that an exporting country is said to have a revealed comparative advantage in

Table 2
Revealed Comparative Advantages of Japan

Product Group		1981	1985	1990	1995	1998
Resource-intensive industry	Nonferrous metals	0.487	0.452	0.318	0.446	0.549
	Furniture	0.253	0.222	0.153	0.109	0.084
	Resource-based products	0.836	0.715	0.510	0.514	0.539
Labor-intensive industry	Textiles	1.577	1.146	0.588	0.529	0.538
	Clothing	0.220	0.198	0.061	0.037	0.031
	Footwear	0.095	0.056	0.023	0.028	0.018
	Miscellaneous products	3.233	3.091	1.828	2.084	2.105
Capital-intensive industry	Chemicals	0.692	0.591	0.525	0.924	0.928
	Metal manufactures	2.660	2.032	1.020	1.068	1.107
	Nonelectrical machinery	1.604	1.678	1.431	2.748	2.619
	Electrical machinery	2.486	2.276	1.905	2.233	1.972
	Transport equipment	2.993	2.599	1.758	1.822	1.840
	Precision instruments	2.134	1.782	1.807	1.970	1.803

Source: Authors calculations from various issues of *Yearbook of International Trade Statistics (vol. 2: trade by commodity)*

a product whenever its RCA is greater than unity. Such a RCA indicates that the exports of the country are more highly concentrated in that product than are the imports of the world.

In 1980s, Japan had a comparative advantage in textiles, miscellaneous products, and capital-intensive industry except chemical products. However, in 1990s, the product groups in which Japan enjoyed a comparative advantage were nonelectrical machinery, miscellaneous products,

Table 3
Revealed Comparative Advantages of South Korea

Product Group		1981	1985	1990	1995	1998
Resource-intensive industry	Nonferrous metals	0.203	0.220	0.261	0.422	0.843
	Furniture	0.329	0.392	0.369	0.179	0.142
	Resource-based products	1.661	0.802	0.616	0.596	0.670
Labor-intensive industry	Textiles	4.756	3.192	2.794	3.294	3.117
	Clothing	8.127	5.695	3.361	1.212	0.998
	Footwear	8.323	6.725	6.979	1.444	0.806
	Miscellaneous products	1.937	1.821	1.452	2.260	1.786
Capital-intensive industry	Chemicals	0.615	0.369	0.365	0.985	1.047
	Metal manufactures	2.614	2.232	1.650	1.388	1.570
	Nonelectrical machinery	0.131	0.257	0.366	1.013	1.041
	Electrical machinery	2.172	1.825	2.421	2.825	2.319
	Transport equipment	0.798	1.975	0.871	1.131	1.248
	Precision instruments	0.424	0.255	0.330	0.507	0.761

Source: Authors calculations from various issues of *Yearbook of International Trade Statistics (vol. 2: trade by commodity)*

Table 4
Revealed Comparative Advantages of North Korea

Product Group		1981	1985	1990	1995	1998
Resource-intensive industry	Nonferrous metals	5.331	2.397	2.368	1.702	
	Furniture	0.115	0.025	0.012	0.333	
	Resource-based products	2.366	2.133	0.492	0.499	
Labor-intensive industry	Textiles	1.326	0.501	0.228	1.167	
	Clothing	1.224	2.937	4.123	6.720	
	Footwear	0.826	0.317	1.250	1.325	
	Miscellaneous products	0.130	0.157	0.098	1.010	
Capital-intensive industry	Chemicals	0.260	0.283	0.134	0.425	
	Metal manufactures	2.772	4.235	1.467	1.985	
	Nonelectrical machinery	0.089	0.779	0.161	1.825	
	Electrical machinery	0.104	1.205	0.340	1.864	
	Transport equipment	0.037	0.032	0.026	0.512	
	Precision instruments	0.039	0.068	0.044	0.917	

Source: Authors calculations from various issues of *Yearbook of International Trade Statistics (vol. 2: trade by commodity)*

electrical machinery, transport equipement, presion instruments and metal manufactures. Japan experienced the change in the pattern of its comparative advantage since mid-1980s. The significant phenomenon is steady decline of her competitiveness in capital intensive industry except nonelectrical machinery and chemicals after South Korea and North Korea adopted more innovative methods to manufacture these products in the world.

In 1980s, South Korea was found to have a comparative advantage in labor-intensive industry (especially clothing and footwear) and metal manufactures, electrical machinery in capital intensive industry. In 1990s, the product groups in which South Korea had a comparative advantage were textiles, miscellaneous products in the labor-intensive industry. Since 1990, South Korea has a revealed comparative advantage in the product groups which are generally classified as capital-intensive products except precision instruments. South Korean competitive positions have changed since 1980. South Korea experienced a continuous decline of her competitiveness in clothing, footwear, metal manufactures as North Korea manufactured these products. The most important reason of this decline is the increasing labor costs in the South Korea from mid-1980s. Capital-intensive products except metal manufactures have been steady increasing because of the heavy industry restructuring policy by Korean government. One may generalize that the South Korea has successfully upgraded her exports from labor-intensive products to more technology-intensive products in 1990s.

Table 4 shows North Korea's RCAs in which North Korea had a comparative advantage in nonferrous metals, resource-based products, textiles, clothing and metal manufactures in 1980s. However, in 1990s, a comparative advantage in nonferrous metals, labor-intensive industry especially clothing and footwear, metal manufactures and electrical machinery characterized North Korea. It is evident that in this period, the revealed comparative advantages of the North Korea lay in these product groups which are generally classified as labor-intensive products. Among them, clothing and footwear are the two major product groups in which North Korea has enjoyed her comparative advantage. The most significant phenomenon is a sharp and continuous growth of her competitiveness in these two labor-intensive products and electrical machinery. The important reason of growth is North Korea's price competitiveness because of her lower labor costs. For resource-intensive industry, North Korea, however, has lost her competitiveness.

Ⅲ. THE DIRECTION OF ECONOMIC EXCHANGE AND COOPERATION

For obtain the direction of economic exchange and cooperation among three countries, the calculated RCAs in these countries will be used as a specialization or a division of production. The higher the RCAs, the more specialized is the export. Table 5 shows the product groups of Japan, North Korea and South Korea in which they enjoyed a comparative advantage in 1981 and 1998. We could classify two different patterns as specialization in producing of a product group of a country and production cooperation among three countries.

In first pattern, there is an export specialization in producing some products by each country ; Japan's specialization, South Korea's specialization, North Korea's specialization.

- as comparative advantage in preciion instruments characterized only Japan, she gains from trade by specialization in this product group.
- when only South Korea specialzes in producing the chemicals for which she enjoys a comparative advantage, she will gain from exports.

Table 5
Comparative advantage in 1981 and 1998

Product Group		Japan		South Korea		North Korea	
		1981	1998	1981	1998	1981	1995
Resource-intensive industry	Nonferrous metals	N	N	N	N	O	O
	Furniture	N	N	N	N	N	N
	Resource-based products	N	N	O	N	O	N
Labor-intensive industry	Textiles	O	N	O	O	O	O
	Clothing	N	N	O	N	O	O
	Footwear	N	N	O	N	N	O
	Miscellaneous products	O	O	O	O	N	O
Capital-intensive industry	Chemicals	N	N	N	O	N	N
	Metal manufactures	O	O	O	O	O	O
	Nonelectrical machinery	O	O	N	O	N	N
	Electrical machinery	O	O	O	O	N	O
	Transport equipment	O	O	O	O	N	N
	Precision instruments	O	O	N	N	N	N

Note : O indicates the presence of revealed comparative advantage, N its absence.
Source : Authors calculations from Tables 2-4.

- nonferrous metals, clothing and footwear in labor -intensive industry are the products in which only North Korea has enjoyed a comparative advantage. We show that she can gain if she specializes in producing these product groups.
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Second pattern is production cooperation between two countries ;

- a vertical production relation between South and North Koreas in textiles. Two Koreas gain from trade if South Korea manufactures technology-intensive textiles and North Korea produces relative labor-intensive textiles or semi-skilled textiles.
- a vertical division of production between Japan and South Korea in transport equipment and nonelectrical machinery. In these product groups, Japan's RCAs declined steadily, as those of South Korea have grown. Japan exports the high-technology products and South Korea manufactures the semi-technology products. In nonelectrical machinery, though the South Korea began to have a comparative advantage since 1995, the gap between two countries is still significant.

All three countries were found to share a comparative advantage in miscellaneous products, metal manufactures and electrical machinery. Among them, metal manufactures are the major product group in which North Korea has enjoyed her comparative advantage since 1985. Japan and South Korea will change their strategy that they may concentrate their efforts for other capital-intensive industry. In electrical machinery, Japan specializes in the high-technology products and South and North Korea produce the semi-technology and the low-technology products respectively.

Finally, there are two products (furniture and resource-based products) for which no comparative advantage among three countries were indicated.

Ⅳ. CONCLUSION

As the North Korean leaders now perceive that

North Korea needs a gradual reform of her foreign trade policy, the North tends to improve its relation with South Korea and Japan in the field of international trade. In 2000, the North Korea's foreign trade were worth $ 1,970 million that China and Japan's trade share was 48%. North Korea's foreign trade with South Korea sharply increased accounting for 21.6% of total trade with $ 425 million which is the highest volume since the mid-1960s. As a result, North Korea's trade concentrated Northeast Asian nations.

Employing the 'Revealed Comparative Advantages'(RCAs) which were proposed by Balassa(1965), this paper found the direction of trade and economic cooperations among three Northeast Asian nations : Japan, South Korea and North Korea. Whereas the product classification is the three-digit SITC product category, which covers more than 100 manufactured products and includes all manufactured trade, the tabular presentations are given a more highly aggregated grouping of 3 industry groups or 13 product groups.

Major findings of RCAs in this paper are as follows. First of all, the structure of export commodities of Japan has substantially shifted away from textiles and capital-intensive products to more technology-intensive ones. As Japan experienced a continuous decline of her competitiveness of most of the product groups, only nonelectrical machinery tends to increase a comparative advantage. Secondly, for many labor-intensive products, South Korea has lost her revealed comparative advantage. In other words, her own relative degree of production concentration in these products is lower than the relative concentration in imports of world market. Further, the South Korea has clearly gained comparative advantage in relatively high-technology products. Finally, in the mid-1990s, North Korea enjoys a comparative advantage for many labor-intensive products especially clothing and footwear because of her lower labor costs.

From the calculated RCAs in these nations, an export specialization of a certain product group of a country and an economic cooperation among three countries were found. In first pattern, so called specialization, Japan and South Korea gain from trade by specialization in precision instruments and chemicals respectively. North Korea will specialize in nonferrous metals, clothing and footwear. In economic cooperation, South Korea and North Korea shared the production of textiles using a vertical production relation. As Japan and South Korea have enjoyed their comparative advantage in transport equipment and nonelectrical machinery, they produce these products by a vertical division-Japan produces the high-technology products and South Korea exports semi-technology products. All three Northeast Asian countries were found to have a comparative advantage in miscellaneous products, metal manufactures and electrical machinery.

Notes

1) The RCA from disaggregated trade data such as five-or six-digits of SITC product classification would be substantially different from more aggregated data such as one -or two-digit product classifications.

2) Exports of Korean Hyundai's and Japanese Toyota's cars are classified as the same product group by the SITC category, yet they are aimed at two different segmented markets in the importing countries.

3) Though Chow and Kellman(1993, p. 22) aggregate 13 product groups, these groups would be categorized 3 intensive industries ; Resource-intensive industry, Labor-intensive industry and Capital-intensive industry.

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The Direction of Economic Exchange and Cooperation among Japan, South Korea and North Korea

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The purpose of this study is to find the direction of trade and economic cooperations among Japan, South Korea and North Korea. Employing the 'Revealed Comparative Advantages', this paper found the direction of trade and economic cooperations among three Northeast Asian nations. The product classification used in this paper is the three-digit SITC product category during the period of 1980-1998.

Major findings of RCAs in this paper are as follows. First of all, the structure of export commodities of Japan has substantially shifted away from textiles and capital-intensive products to more technology-intensive ones. Secondly, for many labor-intensive products, South Korea has lost her revealed comparative advantage and South Korea has clearly gained comparative advantage in relatively high-technology products. Finally, in the mid-1990s, North Korea enjoys a comparative advantage for many labor-intensive products especially clothing and footwear because of her lower labor costs.

From the calculated RCAs in these nations, Japan and South Korea gain from trade by specialization in precision instruments and chemicals respectively. North Korea will specialize in nonferrous metals, clothing and footwear. In economic cooperation, South Korea and North Korea shared the production of textiles using a vertical production relation. As Japan and South Korea have enjoyed their comparative advantage in transport equipment and nonelectrical machinery, Japan produces the high-technology products and South Korea exports semi-technology produts. All three Northeast Asian countries were found to have a comparative advantage in miscellaneous products, metal manufactures and electrical machinery.