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**Intra-regional Trade between China,
Japan, and Korea: Before and After
the Financial Crisis**

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May 2010

Abstract

East Asian economies have been heavily dependent on the U.S. and EU markets, especially for the export of final goods. Therefore, once the financial crisis hit Western economies hard, the East Asian economies lost their major markets. Their production networks then worked to the region's disadvantage and stifled industrial development. This reflects the vulnerability of the East Asian economies which have adopted an export-led growth strategy. Such vulnerability needs to be addressed to prevent future economic crises, as well as to sustain economic growth. This paper examines the trade structure of the three countries—China, Japan, and Korea—before and after the Lehman Shock, and discusses how the three countries should cooperate in addressing imbalances in the trade structure.

Keywords: China, Japan, Korea, trade structure, economic cooperation

JEL classification: F13, F14, F15

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Abstract

East Asian economies have been heavily dependent on the U.S. and EU markets, especially for the export of final goods. Therefore, once the financial crisis hit Western economies hard, the East Asian economies lost their major markets. Their production networks then worked to the region's disadvantage and stifled industrial development. This reflects the vulnerability of the East Asian economies which have adopted an export-led growth strategy. Such vulnerability needs to be addressed to prevent future economic crises, as well as to sustain economic growth. This paper examines the trade structure of the three countries—China, Japan, and Korea—before and after the Lehman Shock, and discusses how the three countries should cooperate in addressing imbalances in the trade structure.

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1. Introduction

The East Asian economies were hit hard by the financial crisis (the Lehman Shock), which originated in the U.S. in September 2008. It has been clearly shown that the major transmission mechanism of the crisis was the regional production networks that have been formed in East Asia. In particular, close production networks have been formed between China, Japan, and Korea (CJK), so the impact of the financial crisis was transmitted to these economies through the production networks, in which China imports intermediate inputs from neighboring East Asian countries such as Japan and Korea, and then assembles them and exports final products to the U.S. and EU markets¹ (Kuroiwa and Kuwamori 2010).

As shown below, the regional production networks, which link together CJK through the trade of intermediate goods, are an integral part of the intra-regional trade in CJK. These increase the share of intermediate goods trade in the region, while the share of consumption goods trade remains disproportionately low. Such trade structure is the result of a trade policy that facilitates the import of intermediate goods but discriminates against that of consumption goods. However, the financial crisis has highlighted the necessity of altering the current trade structure. In fact, as the Lehman Shock revealed, the extremely high dependency of East Asian economies on the U.S. and EU markets has increased their vulnerability to external shocks. The magnitude of the imbalances suggests that it will be extremely difficult to retain the current trade structure.

It is therefore important to examine (1) how the current trade structure of CJK has been formed; (2) what factors have affected the structure; and (3) how the imbalances in the current trade structure can be addressed. The rest of the paper is organized as follows. The paper first examines the changes in the trade structure by stage of production from 1998 to 2007, and then analyzes the changes after the Lehman Shock. The paper also compares the trade structure of CJK with those of

¹ This kind of production network is also called the “triangular trade”.

North America and Europe. Finally, the paper examines the factors behind the current trade structure and presents policy recommendations.

2. Changes in the trade structure before the Lehman Shock (1998–2007)

The current trade structure in CJK has largely been formed since China joined the WTO in 2001. Figures 1-1 to 1-8 show the trade flows by stage of production, i.e. primary goods, intermediate goods (processed goods plus parts and components), capital goods, and consumption goods. The trade data are obtained from the UN Comtrade database for 1998 and 2007, so the trade structure can be compared between before and after 2001.

== Figure 1-1 ==

== Figure 1-2 ==

Figures 1-1 and 1-2 show that CJK (East Asia) has been a very large importer of primary goods such as crude petroleum and mining products, especially from the rest of the world (ROW). In particular, rapid economic growth in China has increased the import demand for primary goods (the figures in parentheses indicate the trade values of China). It has been shown that China's imports of primary goods from the ROW increased from US\$7.9 billion to US\$152.9 billion during 1998–2007, surpassing Japan in 2007.² Simultaneously, CJK imported substantial amounts of primary goods from the U.S., the EU (EU27), and ASEAN (ASEAN6): in 2007, CJK (East Asia) became a net importer of primary commodities from all these countries or regions. In short, CJK has been heavily dependent on other regions for the procurement of primary goods.

² Japan's imports of primary commodities from the ROW in 2007 were US\$ 140.8 billion (UN Comtrade database).

== Figure 1-3==

== Figure 1-4==

Figure 1-3 shows that before China joined the WTO in 2001, the major trade flows of intermediate goods within East Asia were between Japan, Korea and Southeast Asia. This was because at that time Southeast Asia served as an assembly base, using intermediate inputs from Northeast Asia, especially Japan.³ In 2007, the pattern changed dramatically (Figure 1-4). China became a leading assembly base and started to import large amounts of intermediate inputs from Japan and Korea: China's imports of intermediate inputs from Korea increased from US\$9.2 billion to US\$63.1 billion, while those from Japan increased from US\$14.3 billion to US\$73.4 billion. In the meantime, East Asia continued to enjoy surpluses in intermediate goods trade with the U.S., the EU, and the ROW; in particular, China's exports increased very rapidly.

== Figure 1-5==

== Figure 1-6==

The situation of consumption goods trade is in sharp contrast to that of intermediate inputs trade (Figures 1-5 and 1-6). The most remarkable feature in the consumption goods trade is the large trade surplus in East Asia with the U.S., the EU, and the ROW. In particular, China's exports increased at a much faster pace than East Asia's total exports. As a result, China's exports in 2007 respectively accounted for 47%, 52%, and 56% of East Asia's total exports to the U.S., the EU, and the ROW. On the other hand, the only large trade flow of consumption goods within East Asia was

³ Since the mid-1980s, a large number of companies in Japan, Korea, and Taiwan (China) have invested in Southeast Asia, which had become an assembly base in East Asia until being replaced by China.

Japan's imports from China;⁴ the other trade flows were disproportionately small in comparison with the trade flows of intermediate goods (Figure 1.4).

== Figure 1-7==

== Figure 1-8==

The structure of capital goods trade is similar to that of intermediate goods trade (Figures 1-7 and 1-8). As in intermediate goods trade, the major trade flows of capital goods in 1998 were among Japan, Korea and Southeast Asia. In 2007, China overtook Southeast Asia as the main importer of capital goods from Japan and Korea. In the meantime, East Asia continued to enjoy surpluses in capital goods trade with the U.S., the EU, and the ROW. In particular, the surplus of China rapidly increased during 1998–2007.

The trade flows described above clearly demonstrate the current structure of production networks in CJK (East Asia), in which CJK (East Asia) first import large amounts of primary goods, mainly from the ROW; then, China imports intermediate inputs, as well as capital goods, from neighboring East Asian countries, especially Japan and Korea; and finally, China assembles them and exports final products to the U.S. and EU markets.⁵ This trade structure has increased the competitiveness of CJK industries by efficiently utilizing comparative advantages of respective countries, but the structure has also made the CJK economies more vulnerable to external shocks and has become a major transmission mechanism of the financial crisis.⁶

⁴ Japan's imports of consumption goods from China in 2007 stood at US\$ 38.7 billion. Like other East Asian countries, Japan used to have a very low share of consumption goods in total imports. However, in just one decade from the mid-1980s, the share increased from less than 10% to around 30%.

⁵ In 2007, the above-mentioned processing trade accounted for 45% of China's total trade (National Bureau of Statistics 2008).

⁶ With the above trade structure, the collapse of the U.S. and European markets due to the financial crisis inevitably affected the Japanese and Korean economies not only directly, but also indirectly through the production networks (i.e. the triangular trade), whereby the slump in Chinese production significantly affected the demand for imports of intermediate goods from Japan and Korea. In fact, Kuroiwa and

However, given the magnitude of the financial crisis, this trade structure may have been seriously affected, and structural changes may appear in the wake of the crisis. To explore this possibility, we further analyze monthly trade statistics.

3. Changes in the trade structure after the Lehman Shock

This section analyzes changes in the trade structure after the Lehman Shock by examining the monthly trade data since January 2008. As in the previous section, trade data should be provided according to stage of production. However, the UN Comtrade database only provides yearly trade data, while respective countries announce monthly trade data according to the HS classification. It is therefore necessary to transform the monthly trade data classified by the HS codes into the BEC format, using the converters provided on the UN website, whereby each item on the 6-digit HS codes (2007 version) corresponds to the BEC code.⁷ This method enables us to analyze monthly trends in the trade statistics.⁸

== Figure 2-1 ==

== Figure 2-2 ==

Figures 2-1 and 2-2 respectively indicate CJK's exports of intermediate goods by destinations and their corresponding shares. Exports to CJK (i.e. intra-regional exports) far exceeded those to the U.S. and the EU. In particular, China as well as ASEAN were major destinations for

Kuwamori (2010) showed that the output of Korea's "Computer and electrical equipment" industry, for example, decreased by US\$ 1,717 million due to the sharp drop in U.S. import demand after the Lehman Shock, and 30.4% of that decline was induced by the triangular relationship with China.

⁷ Each HS code is supposed to correspond to only one BEC code. However, around 50 out of about 5,000 HS items have two corresponding BEC codes. This means that the calculation may involve double-counting for these 50 items.

⁸ For this purpose, this study uses the World Trade Atlas database provided by Global Trade Information Services Inc.

CJK's exports of intermediate goods. Due to the Lehman Shock, however, exports to all destinations plunged until January or February 2009. Simultaneously, the share of exports to CJK continued to decline until rising again in February 2009 (Figure 2-2). It should be noted that this recovery has been led by China, where budgetary stimulus measures helped boost the economy.

== Figure 2-3 ==

== Figure 2-4 ==

The trend in exports of consumption goods presents a very different picture (Figures 2-3 and 2-4). It is clearly shown that CJK's exports of consumption goods to CJK (i.e. intra-regional exports) were significantly lower than those to the U.S. and the EU: exports to CJK were less than half of those to the U.S. before the Lehman Shock. Among CJK, only Japan imported a substantial amount of consumption goods, while import values of China and Korea were relatively low.

Figure 2-3 indicates that CJK's exports of consumption goods to all destinations sharply decreased after the Lehman Shock. Although exports bottomed out in February 2009, they declined again early this year (partly due to seasonal trends). As expected, exports to the U.S. declined the most, while exports to CJK were relatively unchanged, with the exception of the sharp decline in February 2009. As a result, the share of intra-regional exports of consumption goods within CJK, especially Japan, increased significantly after the Lehman Shock, and CJK's dependence on the U.S. decreased temporarily (Figure 2-4). However, with the recovery of U.S. and EU imports, the share of CJK declined again, returning toward the pre-crisis level.

== Figure 2-5 ==

== Figure 2-6 ==

In comparison with exports of intermediate goods, the shares of CJK's exports of capital goods to the U.S. and the EU were relatively high. However, their structures are similar (Figures 2-5 and 2-6). For example, among East Asian countries, China and ASEAN had relatively high export values, while those of Japan and Korea were significantly lower. As for monthly trends, export values to all destinations decreased until January or February 2009. On the other hand, the share of exports to CJK declined for a time, but returned to the pre-crisis level as China's investments recovered.

The impact of the Lehman Shock was substantial, and it initially appeared that certain structural changes had occurred as a result. In particular, the destinations for CJK's exports of consumption goods shifted to CJK (i.e. intra-regional exports increased) temporarily, but as U.S. and EU imports recovered, the share of CJK declined again and returned toward the pre-crisis level. In short, it is still too early to reach conclusions about the direction of the structural changes; further careful observations are required⁹.

4. Comparisons of intra-regional trade

As described above, CJK are expected to reduce their dependency on the U.S. and EU markets to alleviate trade friction and sustain economic growth driven by domestic demand. Figure 3 provides vital information in this regard, comparing the structure of intra-regional trade (i.e. exports plus imports) by region. It is clearly shown that the share of intermediate goods trade in CJK was significantly higher than in the EU and NAFTA, while that of consumption goods trade was

⁹ In addition to the processing trade, intermediate goods as well as primary goods are imported to meet domestic final demand. Especially, the stimulus measures in China may have increased the percentage of imported intermediate inputs which are used to produce final goods in China. If this is the case, even if China's imports of consumption goods did not increase significantly, China's efforts to stimulate domestic demand may have indirectly boosted regional demand in East Asia. However, due to the lack of data, this possibility is not examined in this paper.

significantly lower; ASEAN had an even higher share of intermediate goods trade as well as a lower share of consumption goods trade. Moreover, such trends have accelerated since the end of the 1990s,¹⁰ and as shown in the previous section, signs of structural change are not yet apparent even after the financial crisis. It is therefore necessary to examine the factors affecting the current trade structure and to take appropriate policy measures to address the imbalances in the trade structure.

== Figure 3 ==

5. Factors affecting the current trade structure

The current trade structure is largely the result of trade policies taken by respective countries. The following factors appear to be important as determinants of the current trade structure.

(1) Tariff structure

Table 1 shows effective tariff rates by stage of production for the intra-regional trade in CJK. The table indicates that China, which joined the WTO in 2001, sharply reduced tariff rates during 1998–2007, but it still imposed relatively high tariff rates on consumption goods (17.99% in 2007). Tariff rates on intermediate goods and capital goods were significantly lower than on consumption goods, and this tariff structure in China also existed in Korea and Japan. In summary, consumption goods suffered the heaviest discrimination in CJK, with effective tariff rates on intermediate goods and capital goods being significantly lower than on consumption goods. This tariff structure appears

¹⁰ Figure 3 indicates that: (1) the share of primary goods was very low in CJK and the EU; (2) the share of intermediate goods trade in CJK (and ASEAN) was significantly higher than in NAFTA and the EU, and had been increasing since the end of the 1990s although a larger share of intermediate goods can be observed commonly across the regions; (3) as in (2), the share of capital goods trade in CJK had been increasing until recently, but there was no significant difference between CJK, the EU, and NAFTA in terms of the share of capital goods trade; and (4) contrary to (2), the share of consumption goods trade in CJK (and ASEAN) was significantly lower than in NAFTA and the EU, and had been decreasing since the end of the 1990s.

to have clearly influenced the trade structure where intermediate goods are significant in intra-regional trade, while the intra-regional trade of consumption goods is discouraged by the high tariff rates, as shown in Figure 3.

== Table 1 ==

== Table 2 ==

Table 2 compares the tariff rates on four major consumption goods, i.e. “food and beverages”, “apparel”, “electric appliances”, and “passenger cars”. It is shown that Japan imposed lower tariff rates on these commodities than China and Korea: Japan’s overall tariff rate on consumption goods was also lower (6.53% in 2007: Table 1). It is therefore understandable that only Japan imported relatively large amounts of consumption goods from CJK. It should be noted, however, that Japan as well as Korea raised tariff rates on some commodities during 1998–2007.¹¹

(2) Trade promotion

The other factor which affects the trade structure is trade promotion. In East Asia, export-oriented industries which are involved in the processing trade have received preferential treatment. In the case of China, for example, imported inputs (raw materials, semi-finished goods, parts and components) are exempted from custom tariffs¹²: moreover, imports of goods by foreign invested firms as part of the initial investment (mainly equipment and machinery) are exempted from custom duties (Gaulier, Lemoine and Ünal-Kesenci, 2007).

¹¹ During 1998–2007, Japan increased the tariff rates on “foods and beverages” and “apparel”, while Korea increased the tariff rates on “food and beverages”. Specifically, these two countries raised the tariff rates in the years around 2001 (TRAINS database: UNCTAD), apparently in defense against the surge in imports from China.

¹² Korea has used the duty drawback system to promote its export since it was instituted in 1975.

Although other factors such as technological progress, factor endowment, and economic structure do matter,¹³ the above-mentioned tariff structure, in tandem with the trade promotion, encourages imports of intermediate inputs and capital goods. In addition, since many foreign invested firms in China are from neighboring East Asian countries such as Japan and Korea, they tend to increase imports from these countries. Regional production networks in CJK have been strongly affected by these policy incentives. Although the production networks have helped strengthen the export competitiveness of CJK industries, they have disproportionately increased the share of trade in intermediate goods.

6. Policy Implications

The East Asian economies have been heavily dependent on the U.S. and EU markets, especially regarding the export of final goods. Therefore, once the Western economies went into a tailspin, the East Asian economies lost their major markets, and their production networks then worked to the region's disadvantage and stifled industrial development. This reflects the vulnerability of the East Asian economies, which have adopted an export-led growth strategy. Such vulnerability needs to be addressed to prevent future economic crises, as well as to sustain economic growth. The governments of CJK therefore should make coordinated efforts to tackle these challenges. Specifically, the following issues which concern economic cooperation and integration between the three countries, should be given special attention.

(1) Deepening market integration

¹³ For example, production of some machinery (parts and components) may require sophisticated technology and/or a relatively large volume of production. If this is the case, it may increase the shares of imports in capital goods (intermediate inputs) for less developed countries like China or smaller economies like Korea vis-à-vis Japan.

The intra-regional trade of final goods, especially consumption goods, is not very active in CJK. CJK's intra-regional export of consumption goods is significantly lower than exports to the U.S. and the EU, and such high dependency on the U.S. and EU markets has changed little even since the financial crisis (Figure 2-4). In CJK, only Japan is a major importer of consumption goods, but its tariff rates on consumption goods are still relatively high in comparison with other commodities. The situation of Korea is similar to that of Japan. On the other hand, China imports large amounts of intermediate goods, but its imports of consumption goods are disproportionately low.

CJK are strongly encouraged to increase the intra-regional trade of final products, especially consumption goods. This would give consumers in CJK a greater choice of products and raise levels of welfare through the integration of the consumption goods market. To achieve this, it is crucial to change the current tariff structure and remove non-tariff trade barriers. In this respect, FTAs are instrumental in removing both tariff and non-tariff barriers.

(2) Building cross-border infrastructure

Market integration is greatly promoted by building transport infrastructure such as roads, railways, and ports across borders. The construction of infrastructure will also boost domestic demand in East Asia and thus help to address the macroeconomic imbalances which are a root cause of the trade imbalances with the U.S. and the EU. Since many East Asian countries have strong economic growth potential, investment can yield a higher rate of return than in developed countries. To boost investment, however, the public sector needs to play a leading role. In East Asia, the economic corridors in the Greater Mekong Sub-region (GMS) have attracted great interest from investors. These have been followed by other notable projects, such as the ASEAN Highway Network Project and the Singapore-Kunming Rail Link Project. Furthermore, ERIA has recently proposed the East Asia Industrial Corridor Development which connects East Asia and India through a highway

network and sea route.

CJK can assist the above efforts in two ways. First, CJK can contribute to establishing regional financial mechanisms which would provide long-term capital for CJK as well as the rest of East Asia. For example, CJK are expected to help build the Asian bond markets: bond markets play a vital role in raising funds for medium- to long-term investment, but only a few countries in East Asia have well-developed bond markets. Secondly, CJK should cooperate in developing cross-border transport infrastructure in East Asia. Such infrastructure, in tandem with FTAs, will significantly reduce transport costs across borders and thus facilitate the market integration of East Asia. Their production networks will also be strengthened by the increased efficiency of transportation and logistics.

(3) Boosting consumption

In response to the financial crisis, respective countries have actively introduced policy measures to stimulate domestic demand. In the medium to long term, however, boosting spending on consumption is the most crucial. The various factors which affect consumption include the social security system, rapidly aging society, urbanization, income distribution, and the growing middle-class.

Although these issues are mostly related to domestic policies or institutions, many of them seem to be shared by CJK. It is therefore recommended that CJK pool their knowledge and experience to solve these problems effectively.

To summarize, first, an integrated market in CJK should be formed by removing tariff and non-tariff trade barriers. Cross-border transport infrastructure is also instrumental in creating an integrated market in addition to a well-functioning production platform. Finally, the integrated

market should be expanded by appropriately stimulating domestic demand in respective countries.

CJK should join forces to tackle these challenges.

Reference

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Figure 1-1 Trade flows
(Primary goods / 1998)

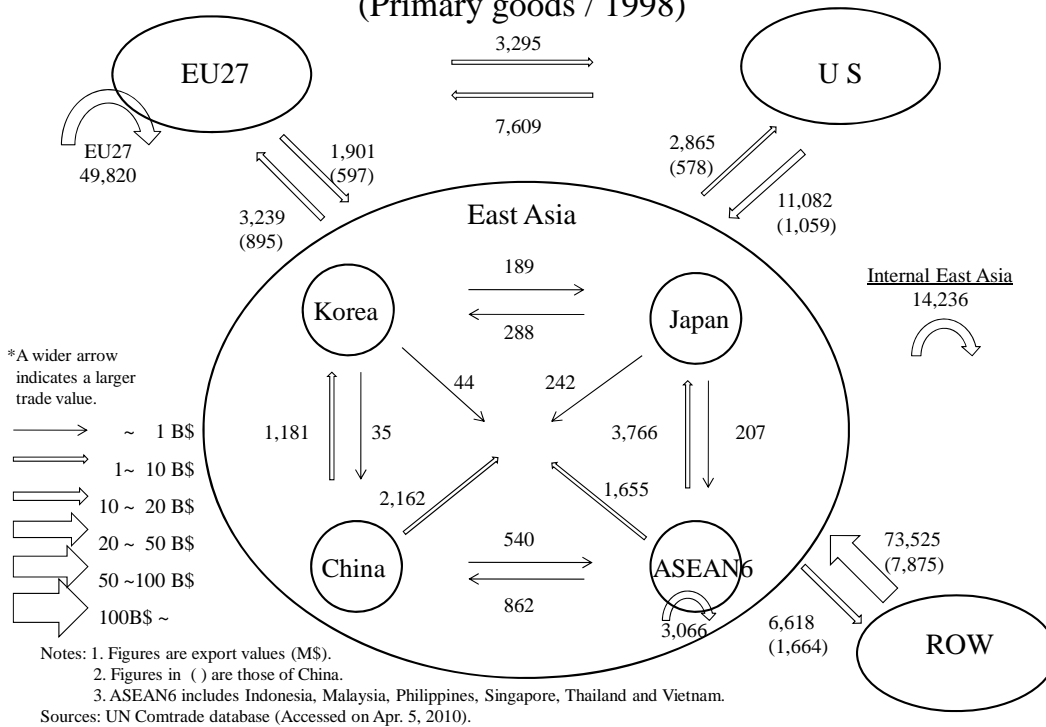


Figure 1-2 Trade flows
(Primary goods / 2007)

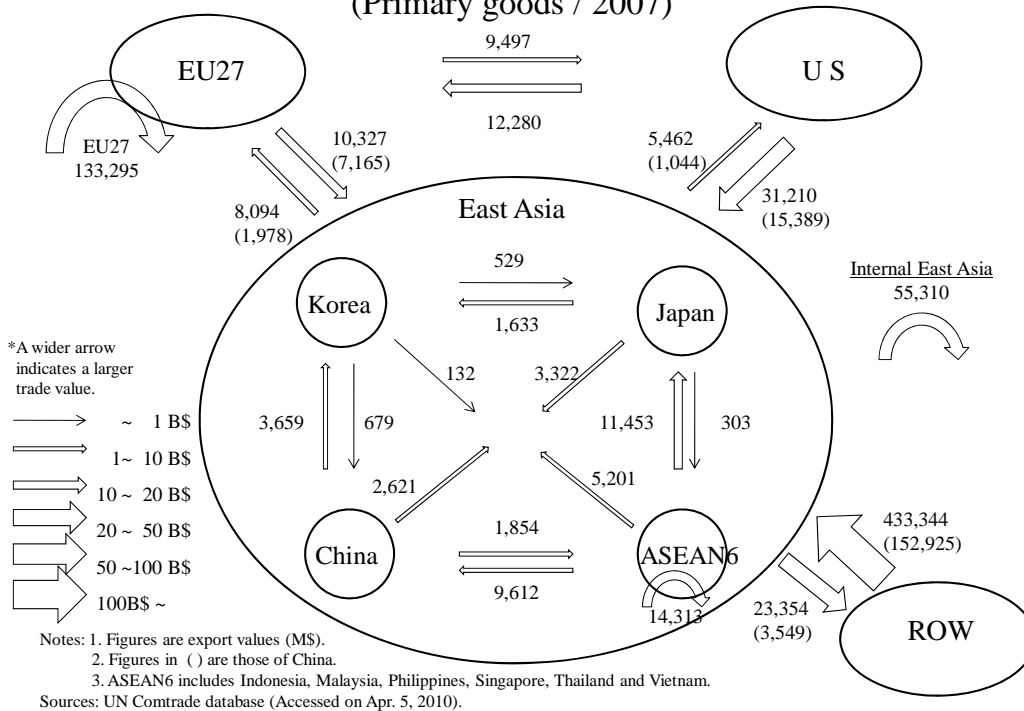


Figure 1-3 Trade flows
(Intermediate goods / 1998)

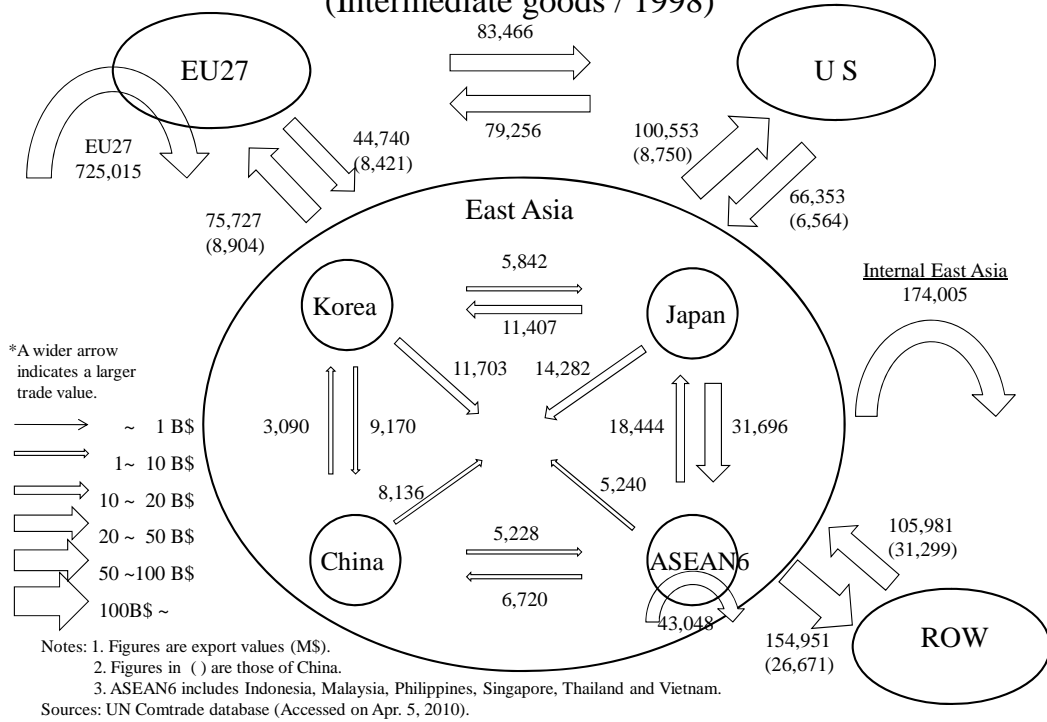


Figure 1-4 Trade flows
(Intermediate goods / 2007)

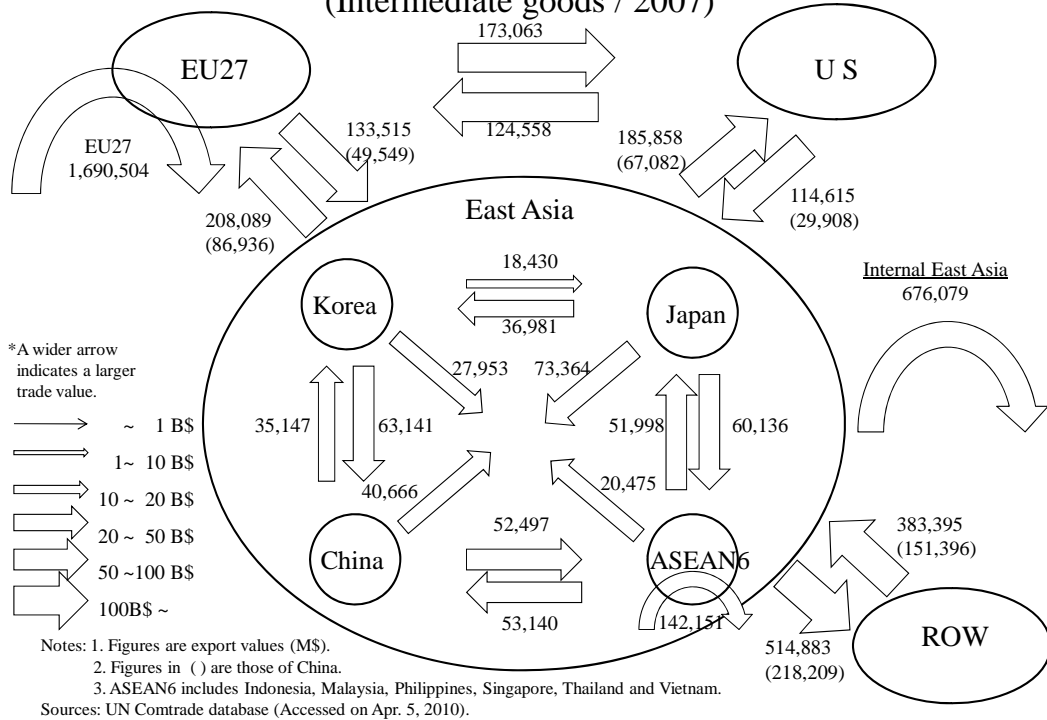


Figure 1-5 Trade flows
(Consumption goods / 1998)

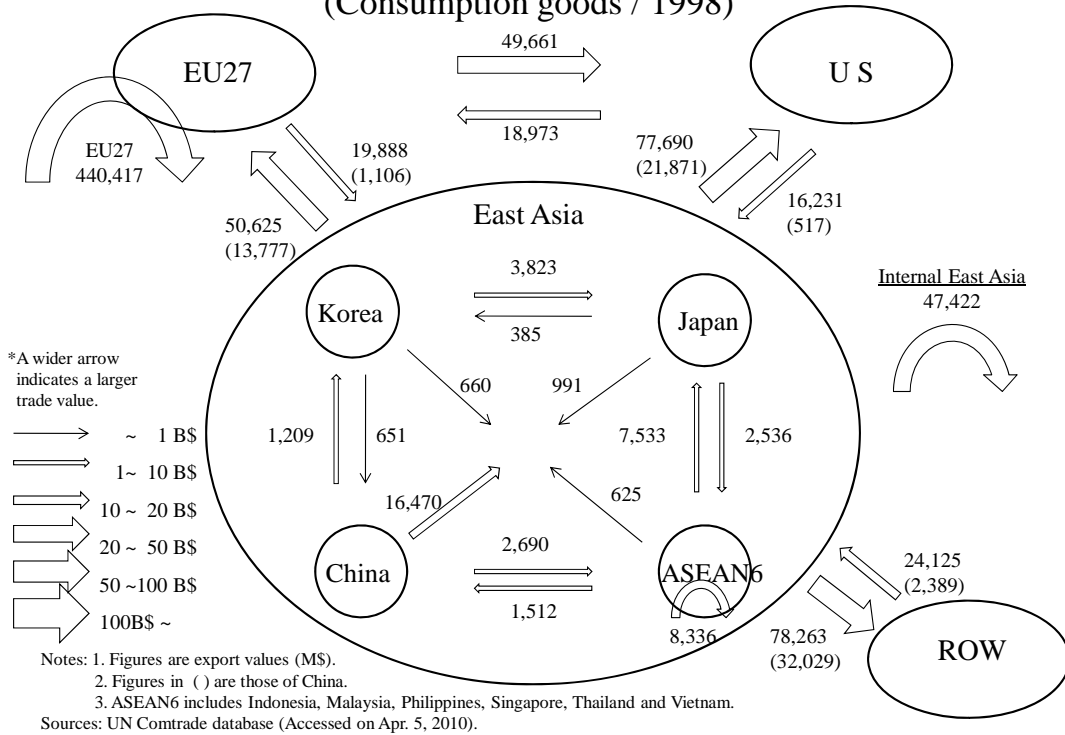


Figure 1-6 Trade flows
(Consumption goods / 2007)

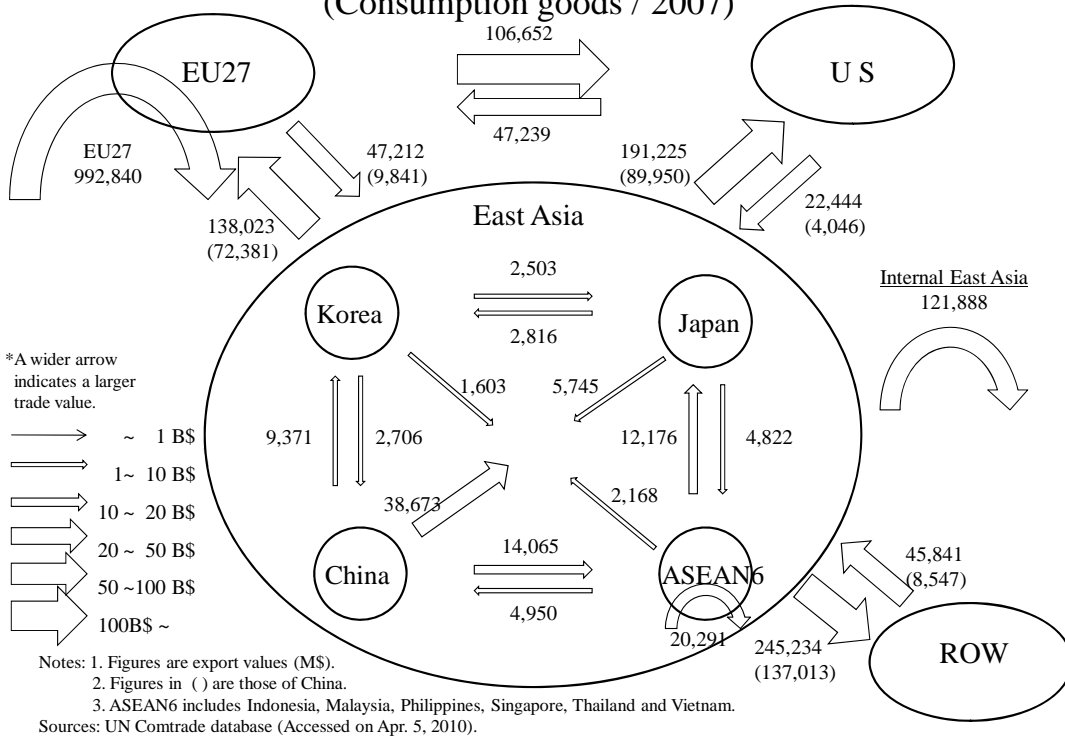


Figure 1-7 Trade flows
(Capital goods / 1998)

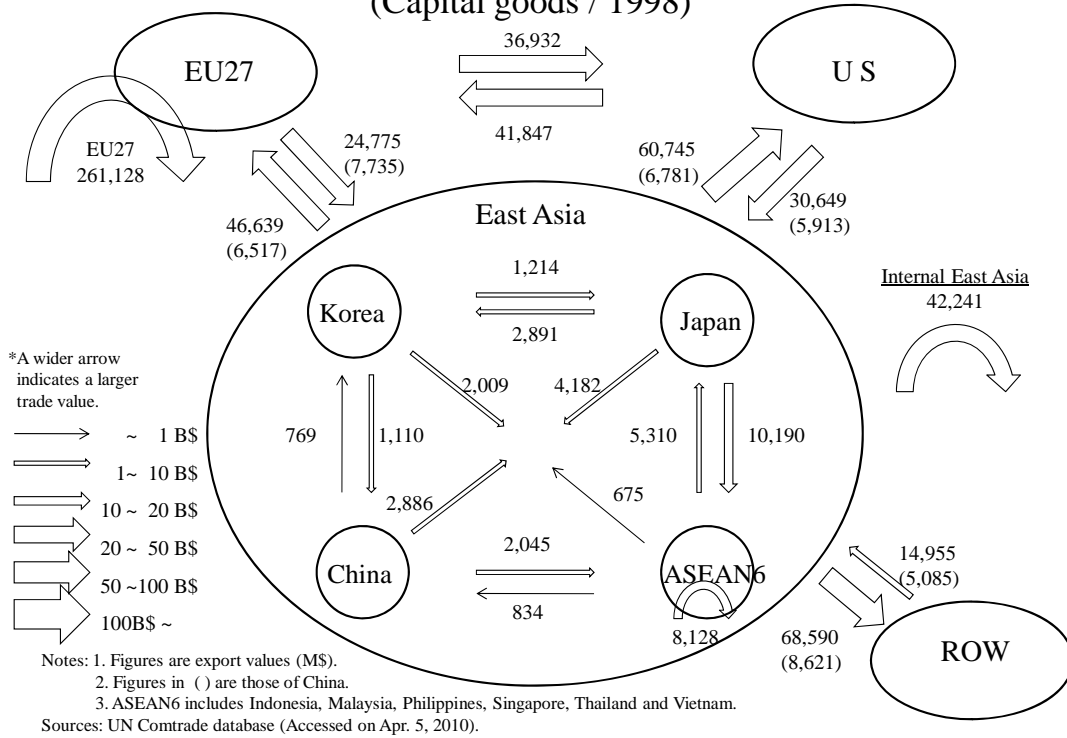
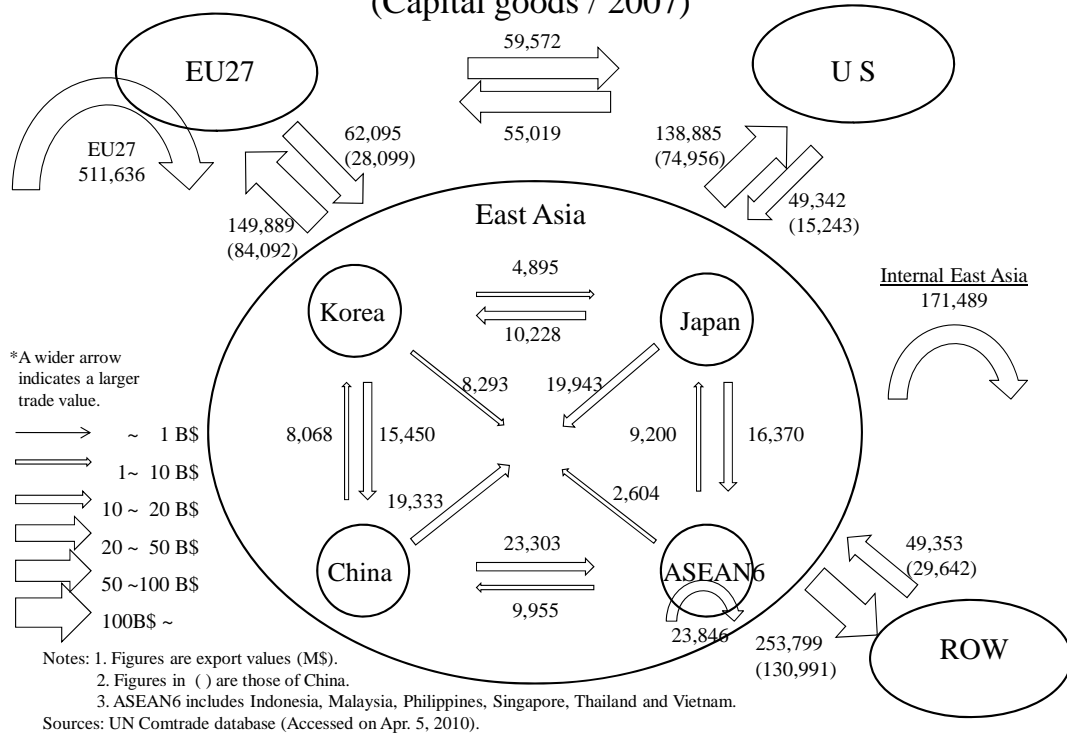
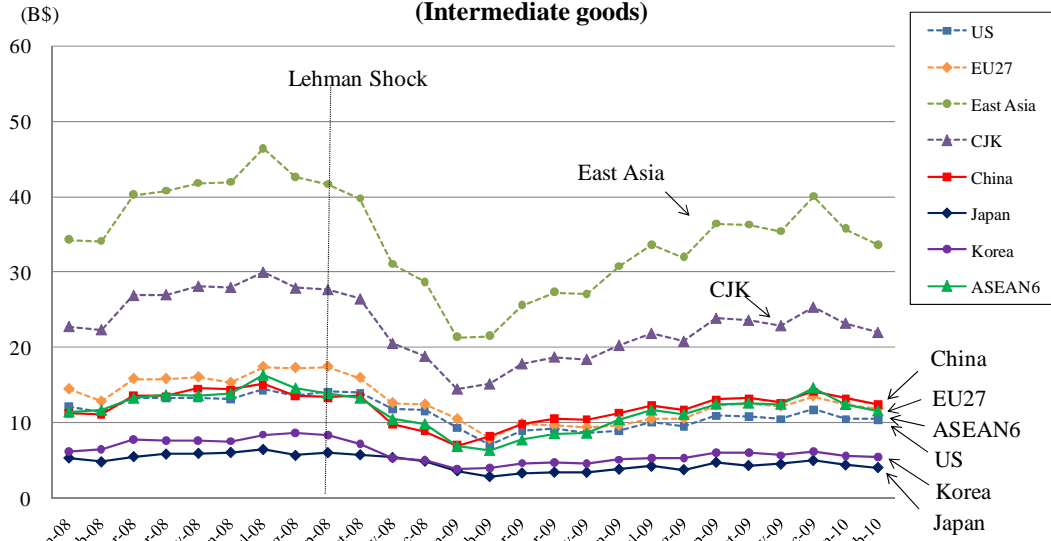


Figure 1-8 Trade flows
(Capital goods / 2007)

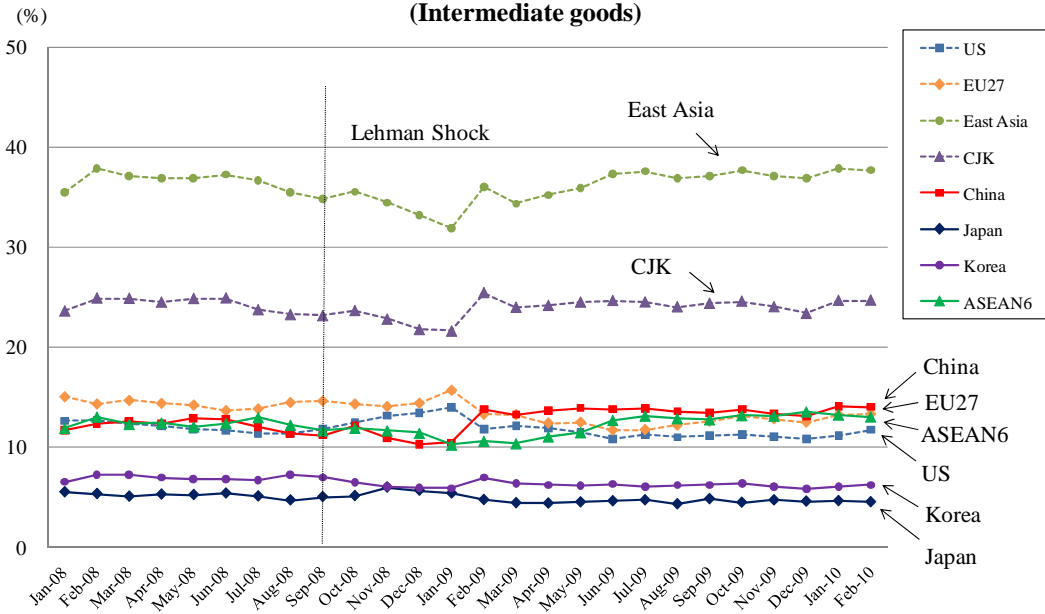


**Figure 2-1 Export value of CJK by destination
(Intermediate goods)**



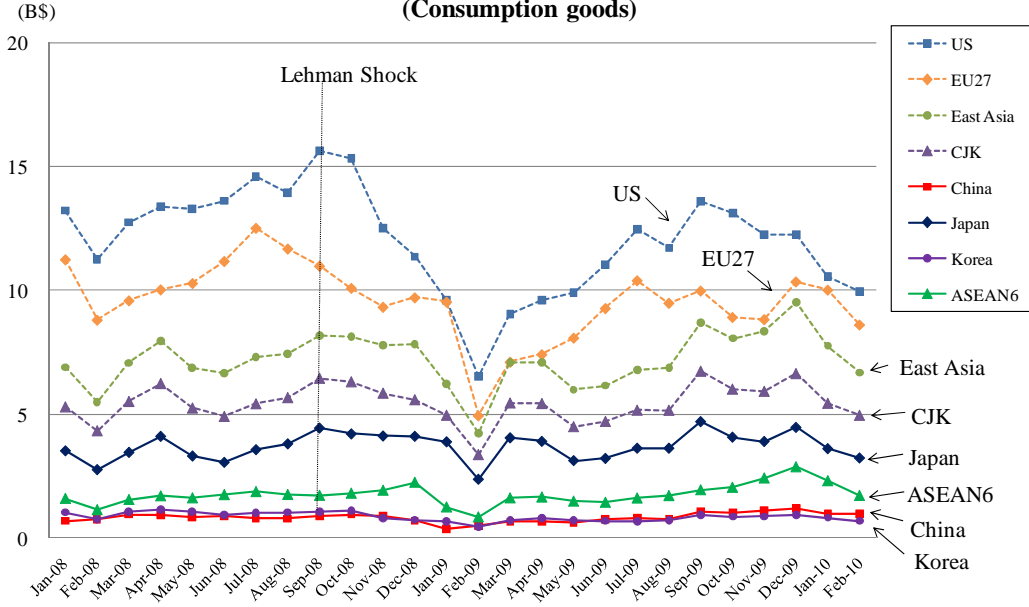
Note : 1. East Asia includes Japan, China, Korea and ASEAN6 (Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam).
 2. Each type of goods is calculated using the BEC format. Primary goods: BEC code 111, 21 and 31; Processed goods: BEC code 121, 22 and 32; Parts and components: BEC code 421 and 53; Capital goods: BEC code 41 and 521; Consumption goods: BEC code 112, 122, 51, 522, 61, 62 and 63.
 3. Not seasonally adjusted.
 Source : Global Trade Information Services Inc. "World Trade Atlas" database (Accessed on Apr. 9, 2010).

**Figure 2-2 Share of export value of CJK by destination
(Intermediate goods)**



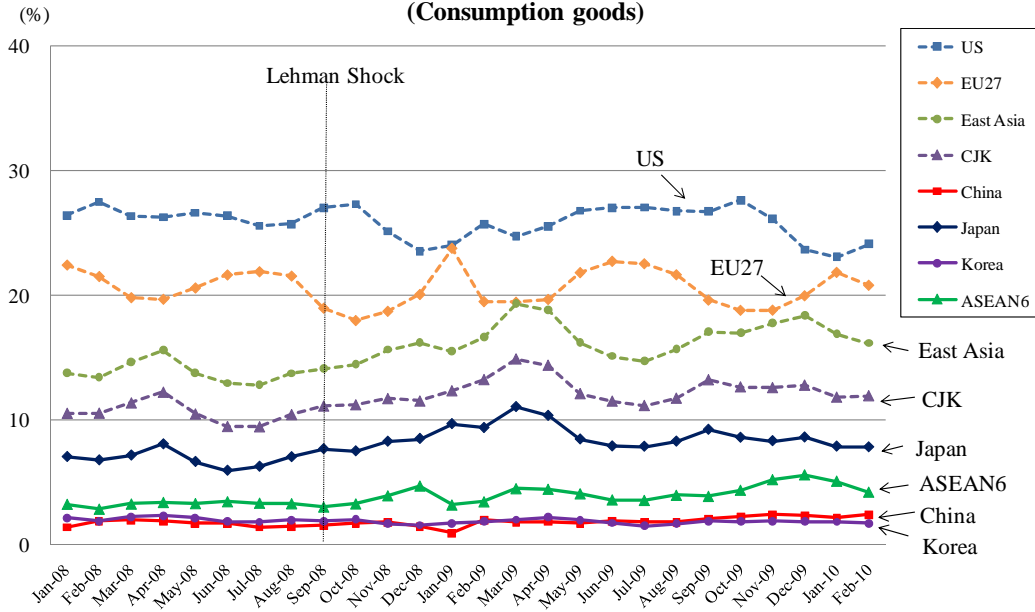
Note and Source : Same as Figure 2-1.

**Figure 2-3 Export value of CJK by destination
(Consumption goods)**



Note and Source : Same as Figure 2-1.

**Figure 2-4 Share of export value of CJK by destination
(Consumption goods)**



Note and Source : Same as Figure 2-1.

Figure 2-5 Export value of CJK by destination (Capital goods)

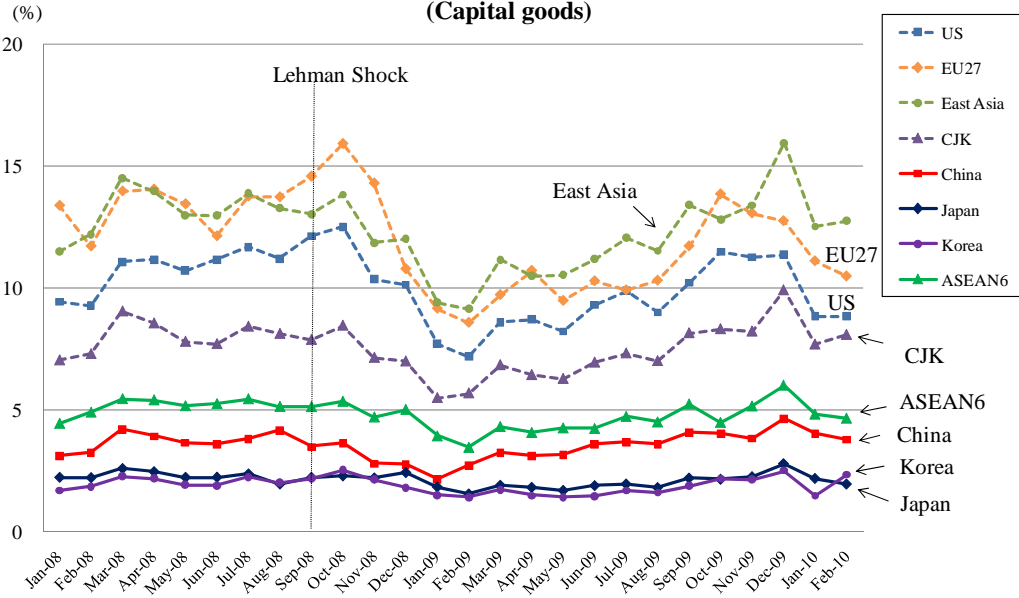


Figure 2-6 Share of export value of CJK by destination (Capital goods)

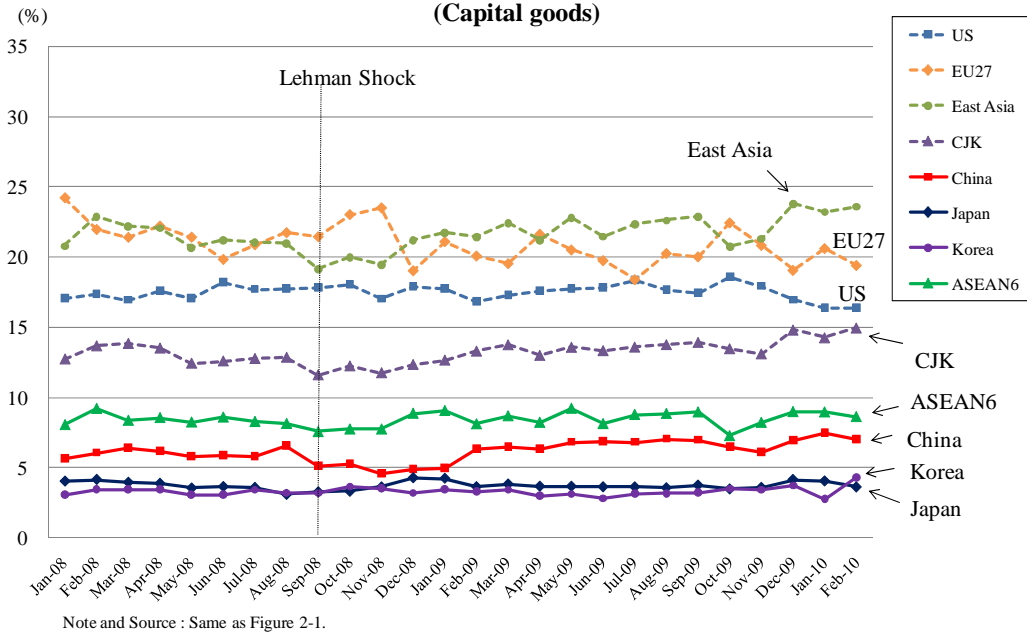
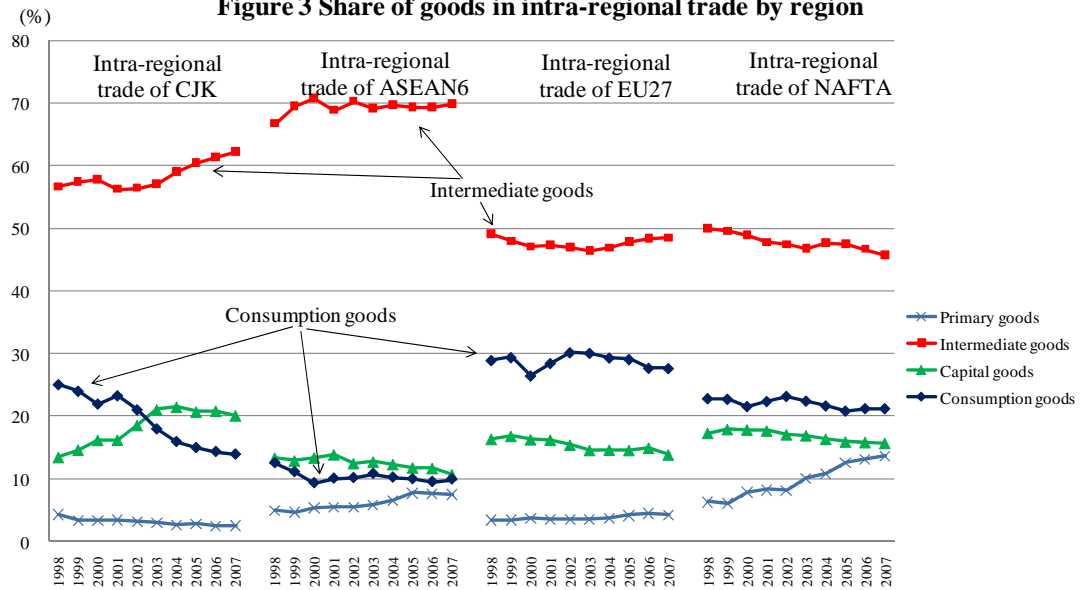


Figure 3 Share of goods in intra-regional trade by region



Note: 1. Intra-regional trade includes both exports and imports among member countries.

2. Calculated by BEC classification; US dollar basis.

Source: UN, "Comtrade" database (Accessed on Apr. 8, 2010).

Table 1 Tariff rates on goods by stage of production (Unit : %)

	Consumption goods		Intermediate goods		Capital goods	
	1998	2007	1998	2007	1998	2007
China	34.40	17.99	14.72	6.14	15.28	6.35
Japan	5.07	6.53	0.33	0.40	0.00	0.00
Korea	11.65	11.70	6.47	4.21	7.46	3.78

Note: 1. The effectively applied tariff rate for the other two partners.

2. The rate of Korea is for 1999 because of data availability.

Source : TRAINS database, UNCTAD

Table 2 Tariff rates on individual commodities of consumption goods (Unit : %)

	Food and beverages		Apparel		Electric appliances		Passenger cars	
	1998	2007	1998	2007	1998	2007	1998	2007
China	25.72	18.46	33.05	15.28	36.96	24.10	81.66	25.00
Japan	7.48	9.01	6.00	9.40	0.00	0.00	0.00	0.00
Korea	16.83	29.00	12.80	10.39	8.00	7.74	8.00	8.00

Note: 1. The effectively applied tariff rate for the other two partners.

2. The rate of Korea is for 1999 (not 1998) because of data availability.

3. Each item includes the following codes:

Passenger cars: HS8703; Electric appliances: air conditioners

(HS841510), refrigerators (HS841821, 22, 29 for 1998, HS841821, 29 for 2007),

washing machines (HS845011, 12, 19) and television sets (HS852812, 13 for 1998,

HS852871, 72, 73 for 2007); Apparel: HS61, 62; Food and beverages: BEC112, 122.

Source : TRAINS database, UNCTAD