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Impact of ASEAN-China Free Trade Area Agreement on ASEAN's Manufacturing Industry

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Abstract

In November 2002 at the ministerial meeting, ASEAN and China signed an agreement to form a free trade area (FTA) by the year 2010. There was an estimation that both regions would gain from FTA deals. However, the rapid growth of China since the early 1990s is seen as a threat to ASEAN's future economic growth. Prior to November 2002, ASEAN had experienced trade and investment diversions, i.e trade and investment in the region had diverted to China. China's relatively lowest cost of production as compared to ASEAN members has decreased the export competitiveness of ASEAN. The strong competition between the regions in the international commodity market and productive foreign capital has produced a great deal of stress ASEAN economies. The main reason for the economic stress is largely attributed to the structure of production and exports of ASEAN and China. Both regions engage in similar sectors of commodities production and exports. There is the factor of homogenity in production and exports in the regions. In the group of countries or regions which have a similar structure of production of commodity and exports, theoretically only countries which have the lowest cost of production will gain in trading. On the other hand, investment diversion happens in two forms: (1) new investments or foreign firms prefer China rather than ASEAN. We should remember that the determinants of inflow of FDI in a country relies on political stability (i.e good political governance, significant institutional reforms such as land reforms, a liberal labours acts, lower cost of production in terms of labour, transportation or any costs related to businesses). Fiscal incentives are the secondary factor. Eventhough ASEAN may offer political stability but it may not offer relatively low costs of production compared to China. In this regard, and theoretically since the main objective of a firms is to make profit, so the firm will only invest in a country which ensures and allows that the firm would make a profits. One of the items looked at by a firm is the lowering of operating costs. Related to the first argument members of ASEAN have experienced re-location of foreign firms which were previoulsy located in the region to China. There were a number of multinational firms, for example Harris, Seagate, National Semi-conductor, Seagate and Siemens which were located in Singapore and Malaysia had moved either their entire or part of production to China. The diversion of trade and investment of ASEAN to China is real. These diversions have explicitly affected terms-of-trade of ASEAN's economies, and have eventually contracted exports income. This paper believes that the ASEAN-China FTA does not promise a total gain to members of ASEAN. This paper does not deny that there are members of ASEAN which may receive a positive economic impact of the FTA but the question is how much will they

gain. This paper will explores what the impact of ASEAN-China FTA on ASEAN's trade and will provide some ideas as to how competitive members of ASEAN are against China.

1.0 ASEAN-CHINA FTA. A Brief Review

The idea to establish a free trade area between ASEAN and China was mooted with the consensus of developing ASEAN+3 at Manila in 1998. Zho Rongji, the Prime Minister of the People's Republic of China (henceforth China), had raised again the idea of an ASEAN-China Free Trade Area (ACFTA) during the ASEAN + 3 meeting in Singapore in November 2000, and at the ASEAN-China Economic Cooperation Meeting in August 2001 (Buszynski, 2001). The proposal was promoted by Singapore although the other ASEAN members were quite reluctant: they favoured a bigger FTA called the East Asian FTA (EAFTA) that would include China, Japan and South Korea. However, at that point, Japan and South Korea were not ready for this (the formation of the EAFTA). ASEAN and China in principle agreed to form a solid economic cooperation in the form of such an agreement. On 4 November 2002, 10 members of ASEAN and China reached an agreement to build the ACFTA (ASEAN-China Free Trade Area) in Phnom Penh, Cambodia. Both regions signed the Framework Agreement on Comprehensive Economic Co-operation. The formal agreement was based on a decision made by ASEAN members and China in 2001 at the Annual ASEAN Summit held in Bandar Seri Bagawan, Brunei. The agreement set the elements and basis for negotiations towards the realisation of an ASEAN-China Free Trade Area by 2010 for the 6 main ASEAN members (Indonesia, Malaysia, Thailand, Singapore, the Philippines, and Brunei) and by 2015 for the 4 new ASEAN members (Cambodia, Laos, Myanmar, Vietnam).

Under the Agreement framework of Comprehensive Economic Cooperation (CEC), tariff reduction or elimination or liberalising trade in goods falls under Article 3 of Trade in Goods. The reduction or elimination of tariffs on listed products was to be gradually implemented. Tariff reduction under the FTA agreement was based on applied MFN rates as of 1 July 2003. In the case of ASEAN members which were not members of WTO, tariff reduction was based on MFN rates applied by China. Also, the Agreement categorised products for tariff reduction into 2 tracks, namely, normal and sensitive. Products listed in the normal track by a member of ACFTA had to reduce or eliminate tariff rates gradually from 1 January 2005 to 2010. This applies to ASEAN-6 (i.e., ASEAN-5 plus Brunei) and China. In the case of the newer ASEAN member states, namely, Cambodia, Laos PDR, Myanmar and Viet Nam (CLMV), the period of tariff liberalisation is from 1 January 2005 to 2015. For these, the starting tariff rates are higher and they have a different period for tariff liberalisation. If there are tariff rates which are still not eliminated, both parties, i.e., members of ASEAN and China, will discuss and mutually agree on a time frame for tariff liberalisation. For products listed in the sensitive track, reduction or elimination of tariff rates are based on mutual agreement between the parties involved.

To accelerate the first phase of the FTA, members of the ACFTA agreed to implement the Early Harvest Programme (EHP), which is an integral part of the ASEAN-China FTA (or CEC). Under the EHP, ASEAN and China had to implement tariff reduction or elimination no later than 1 January 2004. The tariff reduction between 0 to 10 percent. By 1 January 2006, trade between ASEAN and China

should have been under zero tariffs. In other words, goods traded between the regions were free to move across borders.

In relation to trade matters is the tariff on import goods in ASEAN and China before the ASEAN-China FTA was signed. The average tariff rate in China was 2.3 percent in 2000 which was much lower than ASEAN which was at 9.4 per cent. On the other hand, the non-tariff barriers (NTB) rate in ASEAN was 69.1 per cent which was very much higher as compared to China which was 9.2 per cent. ASEAN's economies are more protective in contrast to China. Plans for tariff liberalization and NTB tariffication under the ASEAN-China FTA Framework will definitely result in significant injuries to domestic-oriented and export-oriented industries mainly to ASEAN economies. However, to reduce the industry injury, under the ASEAN-China FTA (ACFTA) framework, ASEAN members have been allowed to take a longer time-frame in cutting trade barriers. This longer time frame is believed to allow members of ASEAN to take the necessary measures to counter or resolve any deterioration either in production or in the exports sectors. If there is a possibility of intense competition from China under the ACFTA how will members of ASEAN ensure that their industries remain competitive?. This is another big issue to entertain. Recently, the Indonesian government had asked the ACFTA secretariat to renegotiate tariff liberalisation. The government realises that the country will face tough competition and the FTA would deteriorate certain major domestic-oriented industries.

2.0 Is China's Econom a Threat to ASEAN's Economy?

China's economy has grew rapidly since the 1990s. The country's real GDP growth during the last decade has averaged about 10 percent, the fastest rate of real GDP growth in the world. The total trade of China in the world economy has increased from 1 per cent in 1980 to 1.70 percent in 1990 and in 2009 the ratio had been recorded at 4.2 percent. In the 1990s, both China and ASEAN achieved high growth rates in foreign trade. From 1991 to 2009, China's foreign trade grew at an average annual rate of 18 percent. China's exports grew threefold from US$62.1 billion in 1990 to US$969.1 billion in 2009, making China the third largest exporter in the world. Whereas foreign trade in ASEAN grew at an average annual rate of 10.2 percent from 1991 to 2009. In the case of ASEAN-China trade relations, ASEAN-China trade grew at an average of 15 percent annually since 1991 to 2009. In the year 2009 total trade was US$233.4 billion in contrast to US$7.9 billion in 1991. China's exports to ASEAN grew from US$4.1 billion in 1991 to US$175 billion in 2009 while its imports from ASEAN grew from US$3.8 billion in 1991 to US$165 billion in 2009. Foreign trade is an important driving force for the economic development of China and ASEAN. But ASEAN countries rely more on the exports sector for economic growth as compared to China and ASEAN seems to be on the losing side. China seems to have more advantage in trading with ASEAN. This paper believes that there will be stiff competition between ASEAN and China, and the competition will be in two aspects: (1) international market penetration, and (2) competition in terms of products.

China's economy is moving up the ladder, expanding at a rapid speed and is in a position to become a major economic house in the world. The rise of China's extreme economic power raises great concern to to members of ASEAN. The

quotations below that were excerpted from Zuiyuan (2006) and Kalish (2005) provide some answers to the threat of China's rapid economic development to ASEAN.

- "*Shunde in the Pearl River Delta, microwave-oven capital of the world, with 40% of global production in a single giant factory*"
- "*Shenzhen makes 70% of the world's photocopiers.*"
- "*Dongguan has 80,000 people working in a single factory making running shoes.*"
- "*Zhongshan is the 'home of the world's electric lighting industry'.*"
- *"In Guangdong, in 2003, solely foreign-invested processing exports accounted for 72.3% of its total processing exports, being 85.4 billion US$; barter terms of trade deteriorated from 1 in 1998 to 0.65 in 2003; value-added in processing exports has been kept at 18%."*
- *"In Suzhou, In 2004, foreign-invested processing exports accounted for 97% of its total processing exports, being 40.3 billion US$; high-tech industry and machinery and electronic industry accounted for 98% and 96%, respectively; value-added in processing exports has dropped from 63.5 in 1998 to 14% in 2004".*
- *China's share of the US electronics market increased from 9.5 percent in 1992 to 21.8 percent in 1999. At the same time, Singapore's share dropped from 21.8 percent to 13.4 percent.*
- *China's output of personal computers went from 4 percent of world production in 1996 to 21 percent in 2000. The ASEAN share dropped from 17 percent to 6 percent.*
- *China's share of hard disk production went from 1 percent in 1996 to 6 percent in 2000, while ASEAN's share fell from 83 percent to 77 percent.*
- *China's share of keyboard production increased from 18 percent in 1996 to 38 percent in 2000 while ASEAN's share fell from 57 percent to 42 percent.*

Both Kalish's (2005) and Zuiyuan's (2006) statements certainly indicate that China's economy is developing very fast. Not only does the country concentrate on low-technology products but it is also moving very fast in high-technology industries or products. Since there are similarities between China's and ASEAN's production in the manufacturing sector and exports, the impressive expansion of China's manufacturing sector seems to adversely affect industries in ASEAN.

Therefore, it was right that politicians-cum-policy makers of ASEAN have voiced their concerns of the impact of China's rapid economic growth on their economies. Former Prime Minister of Singapore and mentor Minister Mr Lee Kuan Yew issued a statement that the overwhelming economic growth of China would somehow

determine the future economic growth of ASEAN. Former Prime Minister of Singapore, Mr Goh Chok Tong, stated that *"Our biggest challenge is....to secure a niche for ourselves as China swamps the world with her high-quality but cheaper products" (Panitchpakdi and Clifford, 2002:103).* He also warned in a national day speech in August, 2001, that the *"China economy is potentially 10 times the size of Japan's. Just ask yourselves, how does Singapore compete against 10 post-war Japans all industrializing and exporting at the same time?" (Panitchpakdi and Clifford, 2002:103)*[1]. Other countries in Asia shared this sentiment, *"What if China is the world's lowest-cost producer of everything," (Panitchpakdi and Clifford, 2002:103).* Even Ross Perot, US Presidential candidate, during his election campaign in 1992, labeled China as a "giant sucking sound" (Lo, 2003:59)[2].

The accession of China to the WTO will integrate China even further into the world economy. As mentioned earlier, the benefit that China will gain by joining the WTO is extraordinary. As estimated by the World Bank, China's entry into WTO will increase its exports share in the world's total exports by about 10 percent by 2020, second after US, and above Japan. In terms of GDP expansion, China will contribute 8 percent of global output by 2020, right after US which will contribute about 19 percent (Panitchpakdi and Clifford, 2002). China is poised to be the world's second largest economy by 2020. Political and Economic Risk Consultancy (PERC) based in Hong Kong surveyed business communities in Asia, and found that 61 percent of the respondents in the Philippines stated that China's entry into WTO would hurt their business; in Malaysia, 45 percent felt the negative effect and 83 percent of the respondents in Viet Nam recorded that the accession of China to WTO was a bad thing for their country (Panitchpakdi and Clifford, 2002). The accession to the WTO and rising competition will very possibly strengthen China's competitive power and restrain other Asian countries' price competitiveness further (Lo, 2003). In a nutshell, it is no wonder that the rising of China's economic power has caused 'a big worry' to Asian countries, particularly ASEAN.

Rapid industrial development, including trade expansion in China, particularly in EOIs (Greenaway, Mahabir and Milner, 2008), will in some way affect their growth and further expansion, particularly in ASEAN. Countries such as Malaysia and Singapore rely heavily on the EOI sector rather than DOIs for economic growth and development. Therefore, the impressive development and expansion of EOIs in China have raised a huge concern for ASEAN's future EOI or manufacturing sector development and competitiveness. Whatever is produced and exported by ASEAN is also produced and exported by China. In other words, any country which has a structure of manufacturing activities and exports that is similar to China may lose the international market to this country, and the growth of these particular countries may eventually slow down (Lardy, 2002).

Some argue that exports of China and ASEAN are competitive rather than complementary (Wong and Chan, 2003; Ravenhill, 2006). A study by Lall and Albaladejo (2004) examined China's competitive threat to its East Asian neighbours in the 1990s, and found that the market share losses were mainly in low-technology products. However, the threat from China also exists in high-technology product segments that rely on low-end functions.

The majority of the products which are EOI-based are mainly E&E goods. Most of these goods belong to high and semi-technology industries which are capital intensive. E&E industries are no longer regarded as being labour-intensive, even though the number of workers employed in the industries are high compared to other types of industries such as textiles and consumer non-durable goods. For the expansion of EOIs, ASEAN needs and depends on FDI.

The electrical and electronics (E&E) goods and transport equipment contributed to a large share of the total exports of China. The share of the industries in total exports increased tremendously from 18.1 percent in 1994 to 47.1 percent in 2006. The E&E products comprised more than 30 percent of the total exports in 2006. This sector is regarded as a high-tech sector and some E&E industries have been selected as key industries by several national programmes to promote technological upgrading (Yao, 2008). The E&E sector is related to processing goods which are largely dominated by foreign firms (Zhao, 2007). The contribution of products under apparel and clothing, footwear and travel goods decreased from 41.3 percent in 1994 to 24.6 percent in 2006.

Other groups of products which seem to have contributed quite significantly to exports is basic manufactures. If we look at the classification of exports based on technological level, as shown in Table 1, exports of China before 2000 were largely related to low technology products. In 1992, the share of the total exports was 43.4 percent but this declined drastically to 23.5 percent in 2005. On the other hand, high technology products increased dramatically from 7.0 percent in 1992 to 30.3 percent in 2005, surpassing the contribution of middle high technology and low technology products. The growth of exports of the group soared about 32 percent from 1992 to 2005, followed by middle high technology (about 22 percent) and middle low technology (about 18 percent).

TABLE 1
China: Exports by Technological Level (US$'million)

Classification	Exports		Export Share		Growth Rate
	1992	2005	1992	2005	1992-2005
High Tech	5,972	230,889	7.0%	30.3%	32%
Med-high Tech	14,053	178,568	16.5%	23.4%	22%
Med-low Tech	16,455	144,807	19.4%	19.0%	18%
Low Tech	36,902	178,909	43.4%	23.5%	13%
Non-manufacturing	11,558	28,827	13.6%	3.8%	7%
Total	84,940	761,999	100%	100%	18%

Source: Assche, Hong and Slootmaeker (2008).

As mentioned earlier, there were similarities in the production of goods and exports in ASEAN and China. For instance, excluding Japan, ASEAN and China were major producers of electrical and electronic (E&E) products in East Asia; a high proportion of exports from both regions are from this sector. For example, the total production of E&E goods in China in 1996 was about US$35 billion; this figure increased to US$50 billion in 1999. Meanwhile, in South Korea, production of these goods in 1996 was about US$44 billion, but the value decreased slightly to US$43 billion in 1999. Singapore's total production of these goods also reflected Korea's statistics for both the years. In Malaysia, the total production of E&E goods was much less, with

US$30 billion in 1996; this increased marginally in 1999 to US$34 billion (Atsuo, 2002). Finally, in Thailand, the total production of the sector was very much lower with US$14 billion and US$15 billion in 1996 and 1999, respectively (Atsuo, 2002). So, although in the case of Malaysia and Thailand the production of E&E goods had increased, the increment was lower than in the case of China, who is now one of the world's top producers of mobile phones (12.9 percent of the world total); DVD players (38.8 percent of the world total), VTRs (23.2 percent of the world total), colour TVs (24.6 percent of the world total), air-conditioners (38.7 percent of the world total) and hard-disk drives (6.9 percent of the world total) (Atsuo, 2002).

The trade destinations of China's goods have changed into a new pattern. (Trade destination is crucial when discussing the impact of China on ASEAN because the major trade destinations of both regions are similar). The main markets for Chinese goods were the US, EU, Japan and Asia (East Asia and ASEAN) (see Table 3). According to Greenaway, Mahabir and Milner (2008), China's exports to these countries quadrupled after 1990. China's exports to US decreased from 20.4 percent in 2000 to 16.4 percent in 2007 (Table 2). Although the percentage of exports dropped, the US market remains the single most important export destination for China's products. The share of exports to Japan and EU has decreased, and been offset by the increment in exports to East Asia and ASEAN. Hong Kong is the major destination of China's exports followed by Taiwan and Korea. In aggregate terms, exports to ASEAN more than doubled from 3.7 percent of total exports in 2000 to 8.9 percent in 2007[3]. Table 2 indicates that China and ASEAN have a similar trade destination. According to Kwan (2002), ASEAN countries had to compete more than China (and Japan) for the US market. Also the degree of competition for the US market had increased since the 1990s. ASEAN and other East Asian countries appear to have to put in more effort to compete with China for the international goods market.

TABLE 2
East Asia and ASEAN: Direction of Exports (% of total)

	Asia		PRChina		Japan		United States		Europ. Union		Other	
	2000	*2007*	*2000*	*2007*	*2000*	*2007*	*2000*	*2007*	*2000*	*2007*	*2000*	*2007*
East Asia	**25.9**	**27.3**	**11.7**	**14.1**	**11.4**	**7.2**	**21.8**	**14.4**	**15.2**	**13.5**	**13.9**	**23.4**
PR China	32.9	33.1	-	-	16.3	7.4	20.4	16.4	16.1	14.6	14.3	28.6
H. Kong	10.2	10.2	34.1	48.4	5.5	4.5	23.0	13.8	15.5	12.8	11.8	10.3
Taiwan	38.2	31.9	2.9	25.3	11.2	10.8	23.6	10.8	15.2	10.8	8.8	10.5
S. Korea	23.8	21.4	10.2	21.2	11.3	6.9	20.9	11.2	13.7	12.6	20.2	26.8
ASEAN	**37.4**	**41.2**	**3.7**	**8.9**	**12.6**	**9.4**	**18.2**	**12.2**	**14.4**	**11.1**	**13.7**	**17.2**
Indonesia	33.1	37.1	4.2	8.1	22.1	18.1	13.0	9.4	13.7	10.0	13.7	17.3
Malaysia	40.3	40.9	2.9	8.5	12.3	7.8	19.5	16.6	13.3	11.2	11.7	15.0
Philippines	30.5	34.6	1.6	10.9	13.4	14.7	27.3	16.3	16.5	16.5	10.7	7.0
Singapore	44.1	51.2	3.8	9.5	7.3	4.9	16.7	9.1	13.5	10.1	14.7	15.2
Thailand	30.8	33.5	3.9	9.5	14.2	10.6	20.5	12.6	15.7	11.5	15.0	22.3

Source: Asian Development Bank (2009).

3.0 ASEAN-China Trade Relations

Trade between China and ASEAN has grown at a rapid pace. From 1995 to 2007, the trade between the two regions had grown more than 20 percent on average. ASEAN total trade to China has increased from 2.2 percent in 1995 to 10.6 percent in 2007. However in trading ASEAN lose to China, bilateral trade favour China (Table 6). China has become one of the major trade partners not only to ASEAN as a group but also to individual members of ASEAN. For instance, China is the fourth largest trade partner for Malaysia and Singapore and the third for Thailand. ASEAN's trade with Japan and the US remains higher (Table 3), but it is anticipated that the the ACFTA would make China the biggest market for ASEAN.

TABLE 3

ASEAN International Trade in the World and with China (US million)

	1995	2000	2004	2005	2006	2007
ASEAN - World						
Export	296,696.7	410,140.6	569,369.3	648,147.0	750,707.8	862,050.0
Import	318,554.8	348,960.2	502,478.5	576,742.4	654,097.8	754,006.0
Total Trade	615,251.5	759,100.8	1,071,847.8	1,224,889.4	1,404,805.7	1,616,056.0
ASEAN - China						
Export	6,200.9	14,178.9	41,351.8	52,257.5	65,010.3	77,929.2
Import	7,129.7	18,137.0	47,714.2	61,136.0	74,950.9	93,286.3
Total Trade	13,330.6	32,315.9	89,066.0	113,393.6	139,961.2	171,215.5
Share of China						
Export	*2.1*	*3.5*	*7.3*	*8.1*	*8.7*	*9.0*
Import	*2.2*	*5.2*	*9.5*	*10.6*	*11.5*	*12.4*
Total Trade	*2.2*	*4.3*	*8.3*	*9.3*	*10.0*	*10.6*
Growth (%)						
Export	*16.9*	*47.8*	*42.3*	*26.4*	*24.4*	*19.9*
Import	*23.8*	*47.1*	*56.0*	*28.1*	*22.6*	*24.5*
Total Trade	*20.5*	*47.4*	*49.3*	*27.3*	*23.4*	*22.3*

Note: 1) Exclude Lao PDR (prior to 2003) and Viet Nam (prior to 2004), as well as Cambodia (prior to 2000), and Myanmar (prior to 1999); data is not available

2) Figure for 2007 is still preliminary; Lao PDR trade data 2007 is not available; Brunei Darussalam trade 2007 country breakdown is not available

The main products that ASEAN exported to China were HS-85, that is, E&E equipment. Exports of these products of the total exports to China in 2001 were 21.34; this increased to 34.26 percent in 2006. The main ASEAN exports to China belonged to the HS-85 group of products; The second highest product that ASEAN exported to China was HS-84 (nuclear reactors, boilers and machinery); the exports from this category in 2001 comprised 22.95 percent of the total exports to China, but declined to 16.85 percent in 2006. HS-27 (mineral fuels, oils, and distillation) is also regarded as one of the major ASEAN exports to China, but with this, too, there was a decline from 11.24 percent of total exports in 2001 to 10.78 percent in 2006. It is obvious that the rapid expansion of the Chinese economy had increased the demand for energy products. Other important products under ASEAN-China exports were

HS-39 (plastics), HS-40 (rubber), HS-29 (organic chemicals) and HS-15 (vegetables, fruits and nuts).

ASEAN's major imports from China were HS-85 (electrical equipment) and HS-84 (nuclear reactors, boilers and machinery). Imports of HS-85 in 2001 amounted to 29.72 percent of total imports from China and in 2006 the ratio increased to 36.45 percent. For HS-84, imports in 2001 comprised more than one-fifth (21.66 percent) of total imports; this rose slightly to 23.25 percent in 2006. The main imports of ASEAN from China were products which belonged to HS-84 and HS-85. Those belonging to HS-27 (mineral fuels, oils and distillation) were also considered as main import items in the ASEAN-China trade. The imports of the products (HS 27) in 2001 were 5.5 percent of total imports from China; however, the figure dropped slightly to 4.1 percent in 2006.

Tables 4A, 4B and 4C indicate 10 main commodities of the exports and imports under ASEAN-China's trade relationship. The total exports of these commodities amounted to about US$45.25 billion or 86.6 percent of the total exports of ASEAN-China in 2005. Just a year later, in 2006, the amount rose to US$56.34 billion or 86.7 percent of the total trade and in 2007 it increased to US$63.35 billion which was about 81.3 of the total trade. In terms of percentages, the exports fell from 86.7 percent in 2006 to 81.3 percent in 2007. The main exports of ASEAN to China for the years 2005 through 2007 were HS 85, HS 84 and HS 27. HS 85 consisted of electric machinery, equipment and parts; sound equipment and television equipment. The share of this commodity (HS 85) was about 29.4 percent of the total exports of ASEAN-China in 2005. It rose slightly to 32.9 percent in 2006 before dipping to 28.4 percent in 2007. HS 84 comprised nuclear reactors, boilers, machinery and mechanical appliances, and parts thereof. The share of this commodity was about 19.1 percent of ASEAN-China's total exports in 2005, but it dropped by about 3 percent to 16.0 percent and 16.1 percent in 2006 and 2007, respectively. HS 27 consisted of mineral fuels, mineral oils & products of their distillation; bitumin substances and mineral wax. The share of this commodity dropped steadily from about 14.2 percent of ASEAN-China's total exports in 2005 to 12 percent in 2006 and 10.6 percent in 2007.

The total imports of the 10 main commodities in 2005 were about US$46.78 billion or 76.6 percent of the total imports of ASEAN-China. In 2006, the amount was US$57.05 billion or 76.1 percent of the total trade, and in 2007 the amount increased to US$69.06 billion, which was about 74.1 percent. In terms of percentages, the imports fell from 76.1 percent in 2006 to 74.1 percent in 2007. The main imports of ASEAN from China in 2005, 2006 and 2007 were also from the same three categories, namely HS 85, HS 84 and HS 27. HS 72 became an additional category. HS 85 comprised about 31.1 percent of the total ASEAN-China imports in 2005. This figure rose to 33.4 percent in 2006 before dipping to 29.8 percent in 2007. HS 84 made up about 23.1 percent of the total imports in 2005. This fell slightly to 22.2 percent in 2006 and fell again to 21.7 percent in 2007. HS 27's share of the commodity was about 6.3 percent in 2005. This, too, dropped slightly to 4.5 percent in 2006 and 4.2 percent in 2007. Finally, HS72, which comprised iron and steel, contributed to 5.6 percent of the share of the total imports in 2005. The figure rose slightly to 5.7 percent in 2006, and still higher to 7.2 percent in 2007.

Table 4A

ASEAN-China Exports and Imports: Top Ten Commodities, 2005 (US$'million)

HS Code	EXPORTS: Description	Value	Share (%)
85	Electric machinery, equipment and parts; sound equipment; television equipment	15,376	29.4
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	10,005	19.1
27	Mineral fuels, mineral oils & products of their distillation; bitumin substances; mineral wax	7,407	14.2
39	Plastics and articles thereof	2,906	5.6
40	Rubber and articles thereof	2,583	4.9
29	Organic chemicals	2,535	4.9
15	Animal or vegetable fats and oils and their clevage products; prepared edible fats; animal or vegetable waxes	1,837	3.5
44	Wood and articles of wood; wood charcoal	1,036	2.0
90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments/apparatus; parts & accessories	925	1.8
74	Copper and articles thereof	637	1.2
Total	***10 Commodities***	**45,247**	**86.6**
Total	***All Commodities***	**52,257**	**100.0**
HS Code	**IMPORTS: Description**	**Value**	**Share (%)**
85	Electric machinery, equipment and parts; sound equipment; television equipment	19,130	31.3
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	14,109	23.1
27	Mineral fuels, mineral oils & products of their distillation; bitumin substances; mineral wax	3,849	6.3
72	Iron and steel	3,413	5.6
73	Articles of iron or steel	1,339	2.2
90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments/apparatus; parts & accessories	1,216	2.0
39	Plastics and articles thereof	1,007	1.6
71	Natural or cultured pearls, precious or semiprecious stones, precious metals and metals clad therewith and articles thereof; imitation jewelry; coin	947	1.6
28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes	926	1.5
29	Organic chemicals	846	1.4
Total	***10 Commodities***	**46,782**	**76.6**
Total	***All Commodities***	**61,099**	**100.0**

Source: www.aseansecratariat.org

Table 4B

ASEAN-China Exports and Imports: Top Ten Commodities, 2006 (US$'million)

HS code	EXPORTS: description	Value	Share (%)
85	Electric machinery, equipment and parts; sound equipment; television equipment	21,412	32.9
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	10,389	16.0
27	Mineral fuels, mineral oils & products of their distillation; bitumin substances; mineral wax	7,823	12.0
40	Rubber and articles thereof	4,561	7.0
29	Organic chemicals	3,181	4.9
39	Plastics and articles thereof	3,161	4.9
15	Animal or vegetable fats and oils and their clevage products; prepared edible fats; animal or vegetable waxes	2,599	4.0
74	Copper and articles thereof	1,147	1.8
90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments/apparatus; parts & accessories	1,076	1.7
44	Wood and articles of wood; wood charcoal	990	1.5
Total	10 Commodities	**56,340**	**86.7**
Total	All Commodities	**65,010**	**100.0**
HS code	**IMPORTS: description**	**Value**	**Share (%)**
85	Electric machinery, equipment and parts; sound equipment; television equipment	25,004	33.4
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	16,630	22.2
72	Iron and steel	4,293	5.7
27	Mineral fuels, mineral oils & products of their distillation; bitumin substances; mineral wax	3,388	4.5
73	Articles of iron or steel	1,854	2.5
90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments/apparatus; parts & accessories	1,467	2.0
39	Plastics and articles thereof	1,375	1.8
29	Organic chemicals	1,071	1.4
28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes	1,048	1.4
55	Manmade staple fibres, including yarns & woven fabrics	922	1.2
Total	10 Commodities	**57,053**	**76.1**
Total	All Commodities	**74,951**	**100.0**

Source: www.aseansecratariat.org

Table 4C

ASEAN-China Exports and Imports: Top Ten Commodities, 2007 (US$' million)

HS code	EXPORTS: description	Value	Share (%)
85	Electric machinery, equipment and parts; sound equipment; television equipment	22,122	28.4
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	12,555	16.1
27	Mineral fuels, mineral oils & products of their distillation; bitumin substances; mineral wax	8,225	10.6
40	Rubber and articles thereof	5,138	6.6
15	Animal or vegetable fats and oils and their clevage products; prepared edible fats; animal or vegetable waxes	4,457	5.7
29	Organic chemicals	3,658	4.7
39	Plastics and articles thereof	3,548	4.6
74	Copper and articles thereof	1,418	1.8
26	Ores, slag and ash	1,201	1.5
90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments/apparatus; parts & accessories	1,026	1.3
Total	10 Commodities	**63,348**	**81.3**
Total	All Commodities	**77,894**	**100.0**
HS code	**IMPORTS: description**	**Value**	**Share (%)**
85	Electric machinery, equipment and parts; sound equipment; television equipment	27,829	29.8
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	20,249	21.7
72	Iron and steel	6,674	7.2
27	Mineral fuels, mineral oils & products of their distillation; bitumin substances; mineral wax	3,871	4.2
73	Articles of iron or steel	2,792	3.0
39	Plastics and articles thereof	1,806	1.9
90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments/apparatus; parts & accessories	1,705	1.8
29	Organic chemicals	1,482	1.6
28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes	1,461	1.6
31	Fertilizers	1,190	1.3
Total	10 Commodities	**69,059**	**74.1**
Total	All Commodities	**93,243**	**100.0**

Source: www.aseansecratariat.com

As shown above, major exports of ASEAN to China were E&E products. The exports increased by more than 50% from 21.3 percent in 2001 to 34.3 percent in 2006. Exports of machinery came next, but the exports decreased from 23 percent in 2001 to 17 percent in 2006. Other major exports were mineral products, plastics, rubbers, chemicals & allied industries and vegetable products. Major imports of ASEAN from China comprised E&E products as well as machinery. Imports of the former in 2001 were about 30 percent; this increased to 36.5 percent in 2006. Imports of the latter (machinery) comprised 22 percent in 2001 and increased marginally to 23.3 percent in 2006. Other important imports were metal products, where the imports increased from 7.3 percent in 2001 to 10.3 percent in 2006. The structure of exports and imports shows E&E products and machinery dominate the intra-trade between ASEAN-China.

The main ASEAN exports of products to China belonged to the manufacture of E&E products, machinery and petroleum products. For the E&E industries, the exports to China were 22.8 percent of total exports in 2001; this increased to 35.7 percent in 2006. Exports of machinery in 2001 amounted to 24.1 percent, but dropped to 17.5 percent in 2006. In the case of the petroleum industry, exports in 2001 comprised about 11.8 percent of the total exports but the ratio declined slightly to 11.2 percent in 2006. Other important industries that contributed to ASEAN exports to China were basic chemicals and allied products, plastics, rubber, and food.

ASEAN imports from China by manufacturing industries. Major imports were from industries related to the manufacture of E&E products, general purpose machinery and basic iron and steel. Imports of goods under the E&E industries in 2001 amounted to about 31.8 percent; this increased to 38.1 percent in 2006. Imports of machinery in 2001 comprised about 22.9 percent; the ratio increased slightly to 24.2 percent in 2006. Other important industries that contributed to ASEAN imports from China were the manufacture of basic iron and steel, basic chemicals and other chemical-related products, and petroleum products.

Tables 5 and 6 show exports of ASEAN-5 to China based on product classification (refer to Appendix 1 for information on goods listed under each industrial product cluster). Table 5 shows that most of the exports of ASEAN-5 to China were labour-intensive products (LIP) and non-durable consumer products (NDCP). Between 2001 and 2006, LIP exports of ASEAN-5 to China were, on average, about 44 percent of total exports, while NDCP exports were slightly less (about 43.2 percent). Exports of capital or technology-intensive products (TIP) accounted for about 5.5 percent during this period, durable consumer goods about one percent, capital goods about 3.81 percent, labour-intensive intermediate products (LIIP) about 0.06 percent and capital-intensive intermediate products, about 1.5 percent. Table 6 shows imports of ASEAN-5 from China. LIP goods from China for the period 2001-2006 were, on average, about 40 percent of total imported products from China. Like the exports, imports of NDCP products from China were slightly less, that is, about 38 percent for the same period. Imports of TIP products were about 9.2 percent, durable consumer products about 2 percent, capital goods about 5.6 percent, LIIP about 1.3 percent, and CIIP about 3.2 percent.

Tables 7 and 8 were derived for further comparison and discussion on the trade structure of ASEAN-5 and China. The tables show China's trade in the world

according to industrial product classification. They also indicate that ASEAN-5 may face high competition in certain classes of industrial products, and quite strong competition with China in the LIP and NDCP groups. China's exports of LIP to the world increased from 30.75 percent in 2001 to 34.48 percent in 2006. For NDCP, the exports increased from 25.82 percent in 2001 to 30.44 percent in 2005, before the figure declined to 29.91 percent in 2006. Exports of TIP declined from 18.04 percent in 2001 to 14.66 percent in 2006. Exports of durable consumer goods for the period 2001-2006 were about 2.30 percent on average, capital goods about 6.00 percent, LIIP about 4.23 percent, and CIIP about 8 percent.

The pattern of China's imports from the world was almost the same as the country's exports to the world. China's major imports were LIP and NDCP products, both comprising about 35 and 36 percent, respectively, for the period 2001-2006. TIP comprised about 13 percent of the total imports for this period. The import of capital goods on average was about 9 percent, durable consumer products about 2 percent, LIIP a mere 0.1 percent and CIIP about 3.9 percent. The pattern of exports and imports of ASEAN-5 and China based on product classification was not much different. As stated earlier, the table indicated that ASEAN-5 may face tough competition with China in terms of both LIP and NDCP.

TABLE 5
ASEAN Exports to China By Industrial Product Classification (%)

Product Classification	2001	2002	2003	2004	2005	2006
Labour Intensive Product	43.22	43.30	43.17	44.04	44.62	44.09
Capital/Technology-Intensive Products	5.97	6.02	6.31	5.47	4.71	4.82
Non-durable Consumer Products	43.41	43.29	43.20	44.02	44.91	44.61
Durable Consumer Products	1.22	1.14	0.84	0.85	0.70	1.06
Capital Goods	3.80	4.03	4.66	3.99	3.62	3.92
Labour-intensive Intermediate Products	0.06	0.07	0.07	0.06	0.05	0.05
Capital-intensive Intermediate Products	2.32	2.15	1.75	1.58	1.39	1.45
TOTAL	100.00	100.00	100.00	100.00	100.00	100.00

TABLE 6
ASEAN Imports from China, By Industrial Product Classification (%)

Product Classification	2001	2002	2003	2004	2005	2006
Labour Intensive Product	39.11	40.83	41.20	40.45	40.16	39.81
Capital/Technology-Intensive Products	9.93	8.33	8.00	8.77	9.27	9.57
Non-durable Consumer Products	37.36	39.15	39.33	38.63	38.67	38.26
Durable Consumer Products	2.41	1.95	1.94	1.69	1.85	2.24
Capital Goods	5.49	4.72	4.45	6.35	6.83	7.05
Labour-intensive Intermediate Products	1.40	1.29	1.51	1.30	0.93	0.90
Capital-intensive Intermediate Products	4.30	3.74	3.58	2.81	2.29	2.16
Total	100.00	100.00	100.00	100.00	100.00	100.00

TABLE 7
CHINA Exports to the World By Industrial Product Classification (%)

Product Classification	2001	2002	2003	2004	2005	2006
Labour Intensive Product	30.75	32.50	33.97	34.50	34.69	34.48
Capital/Technology-Intensive Products	18.04	16.40	15.10	14.63	14.44	14.66
Non-durable Consumer Products	25.82	27.52	29.23	30.07	30.44	29.91
Durable Consumer Products	2.55	2.40	2.35	2.27	2.24	2.40
Capital Goods	5.61	5.39	5.15	6.14	6.38	7.16
Labour-intensive Intermediate Products	5.49	5.23	4.92	4.46	4.29	4.45
Capital-intensive Intermediate Products	11.74	10.55	9.28	7.92	7.52	6.95
Total	100.00	100.00	100.00	100.00	100.00	100.00

TABLE 8
CHINA Imports from the World By Industrial Product Classification (%)

Product Classification	2001	2002	2003	2004	2005	2006
Labour Intensive Product	32.33	34.06	34.33	35.56	35.93	36.00
Capital/Technology-Intensive Products	14.96	13.92	14.05	13.05	12.56	12.07
Non-durable Consumer Products	33.68	34.96	34.86	35.72	36.18	36.53
Durable Consumer Products	2.66	2.12	1.90	1.92	1.88	2.20
Capital Goods	9.92	9.63	10.51	9.77	9.69	9.38
Labour-intensive Intermediate Products	0.22	0.19	0.16	0.15	0.15	0.13
Capital-intensive Intermediate Products	6.23	5.11	4.17	3.84	3.62	3.69
Total	100.00	100.00	100.00	100.00	100.00	100.00

Based on above descriptions there were a few arguments regarding ASEAN-China trade matters. Firstly, Chinese and ASEAN economies are competing with each other. Since the structure of trade for ASEAN-China is similar so China and ASEAN are competing in the same goods. Although China's rapid economic growth and expansion is welcomed by most members of ASEAN, the growing Chinese economy (power) has produced a negative impact on ASEAN. China produces most of the manufactured goods that are exported by members of ASEAN, from electronics, furniture, automobiles and motorcycles to fruits and vegetables (Shen, 2003). In Thailand, farmers are despairing as they cannot sell their own produce anymore because of the low-priced Chinese vegetables that invade the markets in rural towns and cities in the country. Malaysian and Indonesian workers are also complaining about jobs being lost to Chinese workers due to closures of enterprises that are losing orders to China. Increased Chinese textile exports since 2005 to Cambodia and Vietnam have started to displace local producers in the two countries. The strong interest by the ASEAN elite (politicians) to deepen economic ties with China is not shared by farmers and small businesses that fear the competitive advantage of China in churning out low-priced goods.

Secondly, China has been trading with ASEAN for more than three decades; however, since 1995 the trade between these regions has grown by leaps and bounds. China's imports from ASEAN have increased significantly and ASEAN has become one of the major sources of imports to China (Table 3). The ASEAN have also benefited by expanding exports of agricultural and agro-processing goods to China (Greenaway, Mahabir and Milner, 2008). China has increasingly been a

central player in production networks, including electronics and machinery, and has sourced its supply of capital goods and components from these countries. Although China provides benefits to ASEAN, the loss of trade diversion received by ASEAN is not fully compensated (Greenaway, Mahabir and Milner, 2008).

4.0 ASEAN-China FTA. Its Impact on ASEAN's Manufacturing Industry

This section will provide an analysis of the impact of ACFTA on ASEAN's manufacturing industries. However, in order to facilitate a better understanding this paper purposely simplified the analysis by only taking into account five major members of ASEAN, namely, Indonesia, Malaysia, the Philippines, Singapore and Thailand. Known as the ASEAN-5, they have been selected because they are main players in the regionalisation of ASEAN. The method used to analyse the impact of ACFTA on ASEAN is by utilising various measurements of trade specialisation indices which are export intensity index (EII), import intensity index (MII), intra-industry trade (IIT) index, and revealed comparative advantage (RCA)[3].

4.1 ASEAN-China Trade in World

As discussed widely in the previous sections, the trade between ASEAN (ASEAN here refers to ASEAN-5) and China has grown significantly. Exports of manufactured goods on average are about 10 percent such as electrical and machinery products. The major exports of ASEAN to China based on the manufacturing industry are rubber products in which the industry exported about 18.5 percent in 2006 (Table 9A) . This is followed by the industry of electrical and electronics with exports of 17.63 percent in 2006; plastic product exports at about 15.6 percent in 2006; products of wood, cork, straw and plaiting materials exports in 2006 at about 13.2 percent; basic chemicals exports in 2006 about 12.4 percent; and food exports in 2006 at about 10.4 percent. Other significant industries that export goods to China are beverages; non-ferrous; machinery; petroleum product; footwear, leather, luggage; scientific equipments; and metal products. ASEAN's major imports from China are from the industries of wearing apparel except fur apparel in which the imports in 2006 was about 33 percent (Table 9B). This is followed by the electrical and electronic industry with imports in 2006 at about 28.4 percent; furniture imports about 26.4 percent in 2006; textiles import in 2006 at about 21.4 percent; footwear, leather, luggage imports in 2006 about 19.2 percent; machinery imports in 2006 at about 17.4 percent; basic iron and steel imports in 2006 about 15.8 percent; tobacco products imports in 2006 at about 15.4 percent and metal products imports in 2006 was about 13.6 percent.

Another way of looking at the structure of trade is by looking at exports and imports of products according to industrial products classification, i.e whether the products are labor intensive or capital intensive as mentioned earlier and as shown in Table 10A and Table 10B. By industrial product classification, ASEAN exports are concentrated in labour-intensive intermediate products, capital-intensive intermediate products, non-durable consumer products and capital/technology-intensive products. However, the structure of ASEAN's imports from China by this classification shows a different picture. It seems that ASEAN relies quite heavily on Chinese goods. All of the categories under the classification, percentage of the imports to ASEAN imports

TABLE 9A

ASEAN Exports to China/ASEAN Total Export By Manufacturing Industry (%)

Manufacturing Industry	2001	2002	2003	2004	2005	2006
Manufacture of food	5.13	6.43	7.88	9.23	8.46	10.44
Manufacture of beverages	2.49	3.17	4.02	5.27	7.33	9.80
Manufacture of tobacco products	1.78	0.23	0.34	0.32	0.48	1.83
Manufacture of textiles	4.59	5.62	6.44	6.90	6.54	6.13
Manufacture of wearing apparel except fur apparel	0.14	0.20	0.26	0.39	0.47	0.51
Manufacture of footwear, leather, luggage, and related products	2.53	5.65	7.12	6.42	4.76	7.04
Manufacture of products of wood, cork, straw and plaiting materials	10.38	12.46	13.84	12.28	14.00	13.15
Manufacture of paper and paper products	7.92	9.32	8.95	7.71	7.35	6.91
Printing and service activities related to printing	0.61	0.99	0.88	0.99	1.07	1.42
Manufacture of petroleum products	4.94	7.00	8.00	8.54	7.44	7.29
Manufacture of basic chemicals and other products	8.37	11.36	10.49	11.12	11.20	12.39
Medical and Pharmaceutical Products	4.61	5.84	4.79	4.00	2.08	0.99
Manufacture of rubber products	8.05	8.54	12.72	13.63	14.60	18.48
Manufacture of plastic products	11.66	14.06	14.05	15.39	15.74	15.64
Manufacture of glass products and non-metallic mineral products	1.44	2.58	2.93	2.92	2.00	2.00
Manufacture of basic iron and steel	4.38	6.58	9.82	5.52	6.99	3.87
Manufacture of non-ferrous metals	6.42	7.96	10.29	9.84	8.37	9.72
Manufacture of metal products	3.96	4.50	4.70	5.34	6.28	6.81
Manufacture of general purpose machinery	4.68	5.10	6.53	7.80	9.42	8.95
Manufacture of electrical and electronics	9.95	10.29	13.74	13.33	12.02	17.63
Manufacture of scientific equipment	3.74	5.48	6.13	6.03	6.92	6.93
Manufacture of transport equipment	1.93	2.07	1.81	2.35	2.32	3.77
Manufacture of furniture	0.52	0.59	0.69	0.71	0.84	1.15
Other Manufacturing Industries	0.52	0.61	0.73	1.05	1.40	2.95
TOTAL	4.18	5.33	6.56	7.37	8.18	8.99

TABLE 9B

ASEAN Imports from China/ASEAN Total Imports By Manufacturing Industry (%)

Manufacturing Industry	2001	2002	2003	2004	2005	2006
Manufacture of food	6.26	9.64	9.32	5.11	5.04	5.66
Manufacture of beverages	1.95	2.44	3.09	1.85	1.60	3.70
Manufacture of tobacco products	11.21	9.32	10.79	13.03	16.76	15.36
Manufacture of textiles	11.09	14.48	17.18	16.95	19.27	21.36
Manufacture of wearing apparel except fur apparel	18.81	22.25	27.14	30.38	30.08	32.98
Manufacture of footwear, leather, luggage, and related products	10.37	10.30	11.78	13.84	16.77	19.20
Manufacture of products of wood, cork, straw and plaiting materials	2.59	3.20	3.61	4.81	5.70	7.76
Manufacture of paper and paper products	3.34	3.99	4.96	5.26	6.76	8.88
Printing and service activities related to printing	1.52	1.93	2.02	2.96	3.99	4.59
Manufacture of petroleum products	2.77	3.06	3.82	3.20	3.43	2.49
Manufacture of basic chemicals and other products	6.35	6.91	6.90	7.88	8.45	9.43
Medical and Pharmaceutical Products	2.39	2.03	2.30	2.51	2.11	2.27
Manufacture of rubber products	4.87	5.32	5.53	6.65	6.98	8.07
Manufacture of plastic products	3.38	4.35	4.95	5.27	6.31	7.53
Manufacture of glass products and non-metallic mineral products	3.85	5.12	6.46	7.52	6.55	7.71
Manufacture of basic iron and steel	4.39	5.17	5.65	10.83	13.40	15.79
Manufacture of non-ferrous metals	9.53	9.27	7.57	8.19	8.62	10.69
Manufacture of metal products	8.24	10.66	11.82	12.06	12.25	13.61
Manufacture of general purpose machinery	6.89	11.29	13.34	13.76	15.57	17.39
Manufacture of electrical and electronics	11.23	15.81	12.41	16.88	24.10	28.44
Manufacture of scientific equipment	5.04	6.70	6.57	7.47	8.38	9.10
Manufacture of transport equipment	1.61	1.77	2.35	1.84	3.28	4.39
Manufacture of furniture	13.81	17.50	19.45	22.48	25.07	26.40
Other Manufacturing Industries	20.39	24.90	30.75	32.45	33.34	36.85
TOTAL	5.58	7.11	7.92	9.01	10.00	11.02

TABLE 10A
ASEAN Exports to China/ ASEAN Exports to the World (%)

Industrial Product Classification	2001	2002	2003	2004	2005	2006
Labour Intensive Product	2.71	3.66	4.45	4.61	5.05	5.00
Capital/Technology-Intensive Products	3.40	4.55	5.45	5.79	5.48	5.80
Non-durable Consumer Products	4.06	5.22	5.69	5.79	6.38	5.95
Durable Consumer Products	2.82	3.63	4.61	4.48	5.51	4.77
Capital Goods	2.59	3.24	3.93	4.04	4.88	4.69
Labour-intensive Intermediate Products	4.00	4.95	6.25	6.48	6.72	6.36
Capital-intensive Intermediate Products	4.82	6.31	6.90	6.80	6.55	6.25

TABLE 10B
ASEAN Imports from China/ ASEAN Imports from the World (%)

Industrial Product Classification	2001	2002	2003	2004	2005	2006
Labour Intensive Product	11.45	12.81	15.08	17.03	17.60	18.88
Capital/Technology-Intensive Products	12.03	13.16	15.42	16.74	17.83	19.55
Non-durable Consumer Products	8.98	9.78	10.23	10.63	12.09	13.06
Durable Consumer Products	9.33	10.92	12.87	14.99	14.97	15.55
Capital Goods	11.57	12.86	15.19	17.21	17.40	18.36
Labour-intensive Intermediate Products	6.38	7.91	8.25	9.12	10.22	11.52
Capital-intensive Intermediate Products	9.33	10.05	9.69	10.78	10.75	12.63

from the world are more than 11.5 percent. ASEAN's import from China was about 19 percent of goods that belong to capital/technology-intensive products in 2006. This was followed by goods under labour intensive products with the amount of imports at about 19 percent in 2006. Meanwhile, imports of capital goods in 2006 was at about 18.4 percent.

4.2 ASEAN-China Intra-Trade

The discussion in the above sub-section looks at the position of ASEAN-China trade in the world economy. Based on Table 11A and 11B, the main ASEAN exports of products to China belong to the manufacture of electrical and electronics, manufacture of machinery and manufacture of petroleum products. For electrical and electronics industries, the exports to China were 22.8 percent of total exports in 2001 and it increased to 35.7 percent in 2006. Export of machinery in 2001 was 24.1 percent however the ratio declined to 17.5 percent in 2006. In the case of the petroleum industry, export of the industry in 2001 was about 11.8 percent of the total exports but the ratio declined to 11.2 percent in 2006. Other important industries that contribute to ASEAN exports to China are the manufacture of basic chemical and products; manufacture of plastic, manufacture of rubber, and manufacture of food. Table 20B show imports of ASEAN from China by manufacturing industries. Major imports of ASEAN from China are the manufacture of electrical and electronics, manufacture of general purpose machinery and manufacture of basic iron and steel. Imports of goods under electrical and electronics industries in 2001 was about 31.8 percent and it increased to 38.1 percent in 2006. Import of machinery product in 2001 was about 22.9 percent and the ratio increased to 24.2 percent in 2006. Other important industries that contribute to ASEAN imports from China are the

manufacture of basic iron and steel, manufacture of basic chemicals and other products, and manufacture of petroleum products.

Based on Table 12A and Table 12B, the major exports of ASEAN-China under the industrial product classification are non-durable consumer products, durable consumer products, labour-intensive intermediate products and labour-intensive products. Exports of products of non-durable consumer classification in 2001 was 28.4 percent of the total exports to China and the ratio increased slightly to 28.6 percent in 2006. For durable consumer products, the exports had increased marginally from 20.6 percent in 2001 to 21.2 percent in 2006. The labour-intensive intermediate products had also increased marginally from 19.6 percent to 20.9 percent in 2001 and 2006, respectively. The structure of imports of ASEAN-China based on the industrial product classification seem to be similar with the exports. The major imports under the industrial product classification are non-durable consumer products, durable consumer products, labour-intensive intermediate products and labour-intensive products. Imports of products of non-durable consumer classification in 2001 was 25.6 percent of the total imports from China and the ratio increased to 26.3 percent in 2006. For durable consumer products, the exports had increased marginally from 21.5 percent in 2001 to 22.3 percent in 2006. The labour-intensive intermediate products had also increased marginally from 20.1 percent to 21.2 percent in 2001 and 2006, respectively.

Based on what has been discussed so far, we can state that the structure of ASEAN and China's exports and imports are basically similar. Both concentrate in similar groups of products. It seems that ASEAN and China have intra-trade in the sector of electrical and electronics products, machinery and petroleum products. Based on industrial product classification it seems that both countries have intra-trade in groups of products under non-durable consumer products, durable consumer products, labour-intensive intermediate products and labour-intensive products. Most of them are electricals and electronics (hereafter E&E) and belong to those groups. In the preceeding sub-chapters, further analysis has been done by estimating or calculating specialization indices in order to show if there are (1) similar trends or structure of trade and concentration of exports and imports, (2) any intra-trade or inter-trade between ASEAN and China's exports-imports and (3) any specialization or gain in trade based on RCA indices.

TABLE 11A

ASEAN Exports to China of ASEAN-5 Total Export By Manufacturing Industry (%)

Manufacturing Industry	2001	2002	2003	2004	2005	2006
Manufacture of food	5.47	6.29	6.44	6.68	4.94	5.54
Manufacture of beverages	0.12	0.12	0.13	0.16	0.20	0.26
Manufacture of tobacco products	0.16	0.01	0.01	0.01	0.01	0.04
Manufacture of textiles	2.10	1.89	1.62	1.47	1.18	0.89
Manufacture of wearing apparel except fur apparel	0.17	0.16	0.15	0.18	0.17	0.17
Manufacture of footwear, leather, luggage, and related products	0.33	0.42	0.34	0.24	0.15	0.19
Manufacture of products of wood, cork, straw and plaiting materials	5.84	5.38	4.32	3.09	2.93	2.51
Manufacture of paper and paper products	1.96	1.75	1.21	0.86	0.70	0.61
Printing and service activities related to printing	0.04	0.03	0.02	0.02	0.03	0.03
Manufacture of petroleum products	11.81	12.44	12.38	11.56	11.97	11.19
Manufacture of basic chemicals and other products	6.73	8.07	7.80	7.56	6.33	6.14
Medical and Pharmaceutical Products	0.24	0.19	0.13	0.12	0.12	0.08
Manufacture of rubber products	3.37	3.19	4.51	4.63	4.42	6.28
Manufacture of plastic products	6.96	6.93	5.97	6.27	6.12	5.33

Manufacture of glass products and non-metallic mineral products	0.69	0.97	0.92	0.76	0.50	0.45
Manufacture of basic iron and steel	1.30	1.56	2.24	1.36	1.54	0.89
Manufacture of non-ferrous metals	1.97	1.77	1.94	2.09	1.71	2.30
Manufacture of metal products	0.33	0.28	0.26	0.29	0.30	0.31
Manufacture of general purpose machinery	24.11	19.84	18.75	19.65	21.06	17.50
Manufacture of electrical and electronics	22.84	24.94	27.47	29.68	32.39	35.68
Manufacture of scientific equipment	2.29	2.74	2.42	2.17	2.04	1.85
Manufacture of transport equipment	0.97	0.84	0.77	0.96	1.00	1.52
Manufacture of furniture	0.16	0.14	0.12	0.11	0.11	0.12
Other Manufacturing Industries	0.07	0.06	0.05	0.06	0.07	0.13
TOTAL (US$'billion)	***14.28***	***19.12***	***27.49***	***36.91***	***47.22***	***60.55***

TABLE 11B

ASEAN Imports from China of ASEAN-5 Total Imports By Manufacturing Industry (%)

Manufacturing Industry	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Manufacture of food	3.45	4.42	3.71	1.70	1.36	1.37
Manufacture of beverages	0.08	0.09	0.10	0.05	0.04	0.09
Manufacture of tobacco products	0.88	0.49	0.41	0.37	0.37	0.26
Manufacture of textiles	4.49	3.92	3.61	2.74	2.37	2.14
Manufacture of wearing apparel except fur apparel	4.28	3.90	4.11	3.54	2.72	2.84
Manufacture of footwear, leather, luggage, and related products	0.76	0.54	0.49	0.46	0.47	0.46
Manufacture of products of wood, cork, straw and plaiting materials	0.37	0.34	0.33	0.38	0.36	0.42
Manufacture of paper and paper products	0.59	0.53	0.57	0.51	0.55	0.62
Printing and service activities related to printing	0.06	0.05	0.05	0.06	0.07	0.07
Manufacture of petroleum products	5.81	4.94	5.95	4.73	5.93	4.23
Manufacture of basic chemicals and other products	6.15	5.04	4.52	4.84	4.38	4.26
Medical and Pharmaceutical Products	0.22	0.15	0.16	0.14	0.12	0.12
Manufacture of rubber products	0.65	0.55	0.52	0.53	0.50	0.57
Manufacture of plastic products	1.74	1.80	1.80	1.69	1.71	1.87
Manufacture of glass products and non-metallic mineral products	1.55	1.58	1.87	1.92	1.66	1.60
Manufacture of basic iron and steel	3.18	3.03	3.08	6.16	7.35	7.04
Manufacture of non-ferrous metals	3.55	2.56	1.80	2.01	1.89	2.86
Manufacture of metal products	0.96	0.93	0.92	0.82	0.76	0.79
Manufacture of general purpose machinery	22.88	28.13	28.89	26.00	25.43	24.17
Manufacture of electrical and electronics	31.76	30.94	30.76	35.69	36.18	38.14
Manufacture of scientific equipment	2.70	2.65	2.51	2.72	2.47	2.43
Manufacture of transport equipment	1.60	1.22	1.54	1.00	1.59	1.96
Manufacture of furniture	0.69	0.71	0.72	0.70	0.68	0.67
Other Manufacturing Industries	1.60	1.50	1.56	1.22	1.05	1.02
TOTAL (US$'billion)	***16.68***	***22.55***	***27.97***	***39.87***	***51.87***	***64.65***

TABLE 12A

ASEAN Exports to China of ASEAN-5 Total Exports (%)

Industrial Product Classification	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Labour Intensive Product	13.15	13.89	14.15	14.31	14.51	15.45
Capital/Technology-Intensive Products	3.61	3.49	3.10	2.74	2.24	2.11
Non-durable Consumer Products	28.35	28.35	28.56	28.64	28.64	28.64
Durable Consumer Products	20.56	20.07	20.14	20.60	21.38	21.19
Capital Goods	5.17	5.09	4.66	4.24	3.97	3.33
Labour-intensive Intermediate Products	19.61	19.09	19.41	20.12	21.04	20.89
Capital-intensive Intermediate Products	9.55	10.02	9.97	9.35	8.23	8.39
Total	***100***	***100***	***100***	***100***	***100***	***100***

TABLE 12B
ASEAN Imports from China of ASEAN-5 Total Imports (%)

Industrial Product Classification	2001	2002	2003	2004	2005	2006
Labour Intensive Product	16.29	15.43	15.42	15.75	15.62	16.02
Capital/Technology-Intensive Products	4.31	3.89	3.68	3.22	3.19	3.26
Non-durable Consumer Products	25.58	25.91	26.04	26.21	26.39	26.31
Durable Consumer Products	21.50	22.65	22.92	22.40	22.40	22.25
Capital Goods	5.80	5.23	5.26	5.30	5.07	4.81
Labour-intensive Intermediate Products	20.05	21.30	21.44	21.13	21.29	21.18
Capital-intensive Intermediate Products	6.46	5.59	5.23	5.99	6.04	6.17
Total	***100***	***100***	***100***	***100***	***100***	***100***

4.3 ASEAN – China Export Intensity Index

The Export Intensity Index (EII) on manufacturing industries resembled what was mentioned above. For manufacturing industries, the EII recorded for the manufacture of beverages and medical and pharmaceutical products show that the values had decreased since 2004, including the manufacture of paper and paper products. However, for E&E products, the EII values were more than 2.00, that is, ranging from 2.00 to 2.88 (Table 13).

EII based on industrial product classification showed mixed trends and was inconsistent (Table 14). High values of EII were shown by durable consumer products, capital goods, labour-intensive products and non-durable consumer products. Goods such as raw materials that are primary commodities have not been included in the exercises. Also, some of the goods appear twice or more in classifying products according to industrial products group. There have been high values of some of the classifications that have emerged since 2005. This means that after the ACFTA was signed in November 2001, members of ASEAN, particularly the five main members, have actively captured the Chinese market. Most of the goods exported to China by ASEAN-5 were linked to primary commodities and consumer products.

4.4 ASEAN-China Import Intensity Index

The calculated ASEAN-China imports intensity index (MII) shows that it is consistent or parallel with the structure of EII values. As in EII, values for ASEAN exports to China, E&E products and machinery MII values were low: the MII values for the products ranged from 0.70 to 1.87 (Table 15). MII on manufacturing industries showed a slightly new picture. For instance, the manufacture of tobacco products and medical and pharmaceutical products recorded high values of MII. In contrast to the EII for manufacturing industries, the MII for the manufacture of E&E was high. The values of MII for the industries in 2001 were calculated at about 2.99 and the values for 2006 were about 4.60. This indicates that China intensively exported products of E&E to ASEAN rather than vice-versa. In the case of MII by industrial product classification, the values calculated from 2001-2006 for the 7 categories show that the trend was quite consistent (Table 16). However, in general, the values decreased for all the categories. This decreasing trend indicates that Chinese products or producers were penetrating fewer ASEAN markets.

TABLE 13

ASEAN - China Export Intensity Index by Manufacturing Industry

Manufacturing Industry	2001	2002	2003	2004	2005	2006
Manufacture of food	1.63	2.15	1.90	1.71	1.71	2.23
Manufacture of beverages	6.35	8.73	10.23	10.94	10.65	11.35
Manufacture of tobacco products	1.37	0.20	0.26	0.29	0.34	1.09
Manufacture of textiles	0.44	0.53	0.58	0.58	0.55	0.49
Manufacture of wearing apparel except fur apparel	0.13	0.18	0.24	0.37	0.45	0.48
Manufacture of footwear, leather, luggage, and related products	0.38	0.84	0.99	0.81	0.60	0.84
Manufacture of products of wood, cork, straw and plaiting materials	1.53	1.68	1.75	1.52	1.63	1.43
Manufacture of paper and paper products	2.15	2.31	2.38	2.16	2.30	2.38
Printing and service activities related to printing	0.41	0.76	0.75	0.86	0.88	0.97
Manufacture of petroleum products	1.74	2.18	2.08	1.90	1.65	1.40
Manufacture of basic chemicals and other products	1.77	2.01	1.67	1.49	1.43	1.59
Medical and pharmaceutical products	5.46	7.97	6.52	5.91	2.76	1.21
Manufacture of rubber products	2.20	2.12	2.52	2.55	2.63	2.53
Manufacture of plastic products	1.40	1.59	1.55	1.56	1.56	1.52
Manufacture of glass products and non-metallic mineral products	0.92	1.46	1.42	1.33	0.86	0.77
Manufacture of basic iron and steel	0.68	0.89	1.04	0.75	0.97	0.74
Manufacture of non-ferrous metals	0.92	1.01	1.13	0.99	0.80	1.02
Manufacture of metal products	2.08	1.98	1.69	1.68	1.77	1.76
Manufacture of general purpose machinery	0.97	0.85	0.91	1.01	1.29	1.20
Manufacture of electrical and electronics	2.88	2.30	2.55	2.00	2.34	2.02
Manufacture of scientific equipment	0.73	0.81	0.60	0.46	0.47	0.46
Manufacture of transport equipment	1.32	1.35	0.88	1.22	1.26	1.53
Manufacture of furniture	1.30	1.29	1.07	1.01	1.38	1.79
Other manufacturing Industries	0.55	0.61	0.63	0.84	1.08	2.15
TOTAL	0.99	1.09	1.11	1.14	1.24	1.29

TABLE 14

ASEAN - China Export Intensity Index by Industrial Product Classification

Industrial Product Classification	2001	2002	2003	2004	2005	2006
Labour Intensive Product	1.57	1.79	3.79	1.45	15.34	6.44
Capital/Technology-Intensive Products	0.82	0.98	1.02	1.04	1.12	1.21
Non-durable Consumer Products	1.28	1.61	1.52	1.34	14.85	5.95
Durable Consumer Products	2.29	2.53	5.94	1.84	25.84	10.16
Capital Goods	1.92	2.15	4.61	1.85	18.66	7.91
Labour-intensive Intermediate Products	1.17	1.17	1.14	1.09	1.06	0.98
Capital-intensive Intermediate Products	1.48	1.78	1.73	1.51	1.44	1.22

TABLE 15

ASEAN - China Import Intensity Index by Manufacturing Industry

Manufacturing Industry	2001	2002	2003	2004	2005	2006
Manufacture of food	1.64	2.26	2.08	1.32	1.10	1.19
Manufacture of beverages	1.23	1.65	2.40	1.36	1.31	2.26
Manufacture of tobacco products	5.76	4.27	4.66	5.73	7.44	6.66
Manufacture of textiles	1.23	1.37	1.43	1.28	1.24	1.21
Manufacture of wearing apparel except fur apparel	0.98	1.08	1.21	1.26	1.12	1.07
Manufacture of footwear, leather, luggage, and related products	0.62	0.56	0.58	0.65	0.74	0.92
Manufacture of products of wood, cork, straw and plaiting materials	0.70	0.73	0.77	0.90	0.91	1.03
Manufacture of paper and paper products	2.17	2.33	2.44	2.34	2.28	2.34
Printing and service activities related to printing	0.77	0.81	0.85	1.05	1.22	1.17
Manufacture of petroleum products	1.84	2.05	2.42	2.13	2.63	2.34
Manufacture of basic chemicals and other products	1.80	1.84	1.70	1.79	1.66	1.67
Medical and pharmaceutical products	3.77	3.80	4.54	5.10	3.82	4.20
Manufacture of rubber products	1.47	1.40	1.35	1.33	1.11	1.06
Manufacture of plastic products	0.91	1.04	1.12	1.13	1.14	1.23
Manufacture of glass products and non-metallic mineral products	1.01	1.15	1.38	1.45	1.07	1.17

Manufacture of basic iron and steel	1.06	1.17	1.18	1.65	1.75	1.59
Manufacture of non-ferrous metals	3.24	2.66	1.82	1.65	1.68	1.87
Manufacture of metal products	0.98	1.12	1.09	0.95	0.86	0.87
Manufacture of general purpose machinery	1.69	1.87	1.56	1.36	1.34	1.35
Manufacture of electrical and electronics	2.99	3.76	2.02	2.34	3.12	4.60
Manufacture of scientific equipment	1.24	1.47	1.24	1.19	1.01	0.99
Manufacture of transport equipment	1.24	1.33	1.34	0.92	1.31	1.44
Manufacture of furniture	1.34	1.39	1.38	1.40	1.33	1.24
Other manufacturing Industries	1.05	1.09	1.26	1.26	1.14	1.17
TOTAL	1.15	1.26	1.21	1.24	1.22	1.21

TABLE 16

ASEAN - China Imports Intensity Index by Industrial Product Classification

Industrial Product Classification	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Labour Intensive Product	4.30	3.66	4.65	6.73	3.81	2.59
Capital/Technology-Intensive Products	2.17	2.04	2.14	1.83	2.06	2.06
Non-durable Consumer Products	2.39	2.85	3.66	2.07	2.89	1.86
Durable Consumer Products	5.50	4.55	6.17	10.12	4.72	2.61
Capital Goods	4.38	3.70	4.90	7.68	3.93	2.45
Labour-intensive Intermediate Products	1.37	1.40	1.22	1.14	1.12	1.14
Capital-intensive Intermediate Products	1.80	1.99	1.99	1.89	1.68	1.77

4.5 ASEAN-World Intra-Industry Trade (IIT) Index

ASEAN-World IIT index based on manufacturing industries reflect what has been mentioned above (Table 17). The industries that show high values of IIT are the manufacture of beverages; manufacture of tobacco products; manufacture of textiles; manufacture of footwear, leather, luggage, and related products; manufacture of paper and paper products; printing and service activities related to printing; manufacture of petroleum products; manufacture of basic chemicals and other products; manufacture of plastic products; manufacture of glass products and non-metallic mineral products; manufacture of non-ferrous metals; manufacture of general purpose machinery; manufacture of electrical and electronics; and manufacture of scientific equipment. As expected by this study, calculations of IIT are high and close to unity for electricals and electronics (E&E) and scientific equipment. Petroleum and chemical industries have recorded high values of IIT. Contribution of petroleum and chemical are high in Indonesia and Malaysia and this is the main reason as to why the values of IIT are high for those industries. Also as expected IIT values for textiles and clothing are low. IIT value for textiles is also decreasing. ASEAN IIT by industrial product classification is given in Table 18. Durable consumer products and labour-intensive intermediate products are the two industrial products which have recorded high values of IIT. This reflects that most of the goods which ASEAN exports to the world economy consist of durable consumer and intermediate products. In the case of E&E which is included in these categories there is basically intra-firm trade and the main contributors of E&E growth in the region are multinational firms or investments. In general, products of E&E contain high components or parts. So it may be true that the trade between ASEAN and the world in the E&E sector are either in the form of components or final products.

TABLE 17

ASEAN - World Intra-Industry Trade Index By Manufacturing Industry

Manufacturing Industry	2001	2002	2003	2004	2005	2006
Manufacture of food	0.754	0.712	0.663	0.664	0.673	0.656
Manufacture of beverages	0.966	0.935	0.982	0.978	0.960	0.988
Manufacture of tobacco products	0.982	0.995	0.968	0.998	0.977	0.962
Manufacture of textiles	0.983	0.976	0.916	0.901	0.857	0.849
Manufacture of wearing apparel except fur apparel	0.372	0.411	0.422	0.431	0.422	0.445
Manufacture of footwear, leather, luggage, and related products	0.795	0.909	0.937	0.975	0.995	0.985
Manufacture of products of wood, cork, straw and plaiting materials	0.457	0.446	0.464	0.506	0.498	0.464
Manufacture of paper and paper products	0.911	0.912	0.931	0.970	0.965	0.919
Printing and service activities related to printing	0.840	0.974	0.971	0.929	0.806	0.850
Manufacture of petroleum products	0.987	0.965	0.988	0.918	0.917	0.918
Manufacture of basic chemicals and other products	0.831	0.905	0.946	0.988	0.996	0.987
Medical and Pharmaceutical Products	0.639	0.539	0.562	0.649	0.980	0.840
Manufacture of rubber products	0.542	0.492	0.424	0.404	0.411	0.363
Manufacture of plastic products	0.996	0.994	0.930	0.919	0.866	0.876
Manufacture of glass products and non-metallic mineral products	0.991	0.984	0.971	0.972	0.952	0.989
Manufacture of basic iron and steel	0.519	0.511	0.583	0.573	0.535	0.650
Manufacture of non-ferrous metals	0.827	0.810	0.877	0.889	0.918	0.906
Manufacture of metal products	0.757	0.753	0.826	0.850	0.824	0.849
Manufacture of general purpose machinery	0.858	0.861	0.868	0.895	0.891	0.863
Manufacture of electrical and electronics	0.915	0.946	0.989	0.963	0.932	0.933
Manufacture of scientific equipment	0.989	0.966	0.991	0.955	0.953	0.967
Manufacture of transport equipment	0.607	0.669	0.777	0.821	0.896	0.917
Manufacture of furniture	0.323	0.330	0.348	0.368	0.380	0.415
Other Manufacturing Industries	0.829	0.834	0.818	0.802	0.824	0.808
TOTAL	0.849	0.862	0.862	0.865	0.869	0.866

TABLE 18

ASEAN -World IIT Index By Industrial Product Classification

Industrial Product Classification	2001	2002	2003	2004	2005	2006
Labour Intensive Product	0.700	0.701	0.724	0.739	0.731	0.722
Capital/Technology-Intensive Products	0.742	0.746	0.776	0.788	0.772	0.765
Non-durable Consumer Products	0.736	0.734	0.758	0.772	0.786	0.755
Durable Consumer Products	0.815	0.804	0.815	0.823	0.821	0.805
Capital Goods	0.723	0.727	0.753	0.769	0.767	0.764
Labour-intensive Intermediate Products	0.827	0.842	0.856	0.869	0.854	0.851
Capital-intensive Intermediate Products	0.749	0.742	0.765	0.771	0.770	0.751
TOTAL	0.756	0.757	0.778	0.790	0.786	0.773

4.6 China-World Intra-Industry Trade (IIT) Index

IIT values by manufacturing industries in China show quite interesting results with some contradictions to the above two classifications. Industries that recorded high values, i.e. near to unity are the manufacture of food; manufacture of tobacco products; manufacture of textiles; manufacture of rubber products; and manufacture of electrical and electronics (Table 19). Again our expectation that China's IIT in the world economy for the clothing/apparel industry shows a very low value. Table 20 shows China's IIT by industrial product classification. The table shows on average IIT values for all categories of the product range from 0.494 to 0.664. Only industrial labour-intensive intermediate products which include E&E products and capital-intensive intermediate products display quite high values of above 0.600.

In the case of IIT of ASEAN-5 it has recorded high values mostly in the manufacturing sectors and also by industrial product classification. This means that ASEAN depends on the external market for trade. However, in the case of China only a few industries exhibit high values of IIT such as E&E. By industrial product classification most of the cluster offer a median level of IIT. This suggests that most of the manufacturing sector relies on the domestic market. This may be true given that the size of the Chinese economy is about 1.3 billion which is larger than ASEAN-5 by more than 5 times.

TABLE 19
China-World Intra-Industry Trade Index By Manufacturing Industry

Manufacturing Industry	2001	2002	2003	2004	2005	2006
Manufacture of food	0.945	0.868	0.989	0.783	0.916	0.970
Manufacture of beverages	0.407	0.398	0.461	0.520	0.726	0.699
Manufacture of tobacco products	0.819	0.719	0.768	0.725	0.833	0.901
Manufacture of textiles	0.949	0.978	0.924	0.918	0.836	0.799
Manufacture of wearing apparel except fur apparel	0.114	0.106	0.096	0.090	0.078	0.068
Manufacture of footwear, leather, luggage, and related products	0.581	0.550	0.525	0.545	0.516	0.580
Manufacture of products of wood, cork, straw and plaiting materials	0.637	0.673	0.677	0.732	0.779	0.845
Manufacture of paper and paper products	0.578	0.584	0.688	0.761	0.945	0.877
Printing and service activities related to printing	0.866	0.708	0.659	0.571	0.547	0.544
Manufacture of petroleum products	0.648	0.608	0.551	0.463	0.431	0.333
Manufacture of basic chemicals and other products	0.814	0.773	0.757	0.718	0.765	0.815
Medical and Pharmaceutical Products	0.856	0.823	0.795	0.824	0.821	0.780
Manufacture of rubber products	0.879	0.893	0.815	0.890	0.993	0.935
Manufacture of plastic products	0.610	0.632	0.644	0.637	0.696	0.740
Manufacture of glass products and non-metallic mineral products	0.605	0.583	0.609	0.599	0.556	0.552
Manufacture of basic iron and steel	0.775	0.748	0.669	0.942	0.966	0.684
Manufacture of non-ferrous metals	0.593	0.615	0.623	0.661	0.658	0.766
Manufacture of metal products	0.370	0.385	0.412	0.405	0.401	0.395
Manufacture of general purpose machinery	0.906	0.987	0.923	0.874	0.783	0.738
Manufacture of electrical and elctronics	0.957	0.959	0.988	0.972	0.993	0.981
Manufacture of scientific equipment	0.885	0.795	0.667	0.632	0.714	0.744
Manufacture of transport equipment	0.967	0.956	0.942	0.962	0.822	0.872
Manufacture of furniture	0.082	0.079	0.097	0.094	0.071	0.065
Other Manufacturing Industries	0.116	0.104	0.113	0.115	0.106	0.103
TOTAL	0.730	0.741	0.727	0.734	0.730	0.709

TABLE 20
China- World IIT Index By Industrial Product Classification

Industrial Product Classification	2001	2002	2003	2004	2005	2006
Labour Intensive Product	0.521	0.515	0.528	0.532	0.511	0.500
Capital/Technology-Intensive Products	0.559	0.569	0.595	0.600	0.574	0.563
Non-durable Consumer Products	0.568	0.578	0.580	0.603	0.588	0.603
Durable Consumer Products	0.527	0.521	0.521	0.512	0.507	0.494
Capital Goods	0.529	0.505	0.517	0.534	0.525	0.523
Labour-intensive Intermediate Products	0.634	0.657	0.625	0.639	0.634	0.631
Capital-intensive Intermediate Products	0.565	0.590	0.616	0.650	0.643	0.664
TOTAL	0.557	0.562	0.569	0.581	0.569	0.568

4.7 ASEAN-China Intra-Industry Trade (IIT) Index

The figures in Table 17 and Table 19 are consistent with calculated IIT index by manufacturing industries for ASEAN-China (Table 21). The manufacture of general purpose machinery; manufacture of electrical and electronics, manufacture of

scientific equipment, manufacture of transport equipment, manufacture of beverages, manufacture of tobacco products, and, manufacture of paper and paper products recorded IIT index close to unity. ASEAN concentrates in these industries as well as China. The manufacture of textile and clothing also recorded high values of IIT. Table 31 shows ASEAN-China IIT index by industrial product classification. The cluster of industrial products of labour intensive and non-durable consumer products also recorded high values of IIT. E&E are labour intensive. Beverages, tobacco, textile and clothing, as well as paper are non-durable consumer products. This study had expected that there would be a high IIT index produced under durable consumer goods, however the values recorded are below 0.500.

TABLE 21
ASEAN -China Intra-Industry Trade By Manufacturing Industry

Manufacturing Industry	2001	2002	2003	2004	2005	2006
Manufacture of food	0.812	0.898	0.925	0.881	0.890	0.885
Manufacture of beverages	0.969	0.991	0.997	0.987	0.985	0.974
Manufacture of tobacco products	0.994	0.935	0.948	0.961	0.956	0.938
Manufacture of textiles	0.770	0.816	0.822	0.894	0.847	0.833
Manufacture of wearing apparel except fur apparel	0.804	0.827	0.855	0.867	0.867	0.866
Manufacture of footwear, leather, luggage, and related products	0.815	0.819	0.780	0.812	0.869	0.869
Manufacture of products of wood, cork, straw and plaiting materials	0.909	0.904	0.862	0.844	0.859	0.853
Manufacture of paper and paper products	0.851	0.880	0.900	0.931	0.974	0.979
Printing and service activities related to printing	0.962	0.931	0.901	0.929	0.911	0.843
Manufacture of petroleum products	0.904	0.897	0.889	0.904	0.914	0.899
Manufacture of basic chemicals and other products	0.901	0.896	0.884	0.877	0.871	0.792
Medical and Pharmaceutical Products	0.978	0.942	0.890	0.912	0.916	0.888
Manufacture of rubber products	0.525	0.495	0.456	0.558	0.608	0.617
Manufacture of plastic products	0.901	0.893	0.870	0.861	0.853	0.856
Manufacture of glass products and non-metallic mineral products	0.827	0.807	0.784	0.748	0.666	0.678
Manufacture of basic iron and steel	0.883	0.906	0.890	0.753	0.740	0.733
Manufacture of non-ferrous metals	0.935	0.933	0.874	0.860	0.877	0.897
Manufacture of metal products	0.831	0.846	0.830	0.846	0.833	0.832
Manufacture of general purpose machinery	0.965	0.940	0.981	0.995	0.996	0.983
Manufacture of electrical and electronics	0.937	0.919	0.959	0.955	0.935	0.944
Manufacture of scientific equipment	0.947	0.962	0.955	0.957	0.954	0.970
Manufacture of transport equipment	0.979	0.946	0.889	0.977	0.964	0.970
Manufacture of furniture	0.907	0.885	0.871	0.852	0.864	0.864
Other Manufacturing Industries	0.818	0.832	0.837	0.841	0.835	0.839

TABLE 22
ASEAN -China IIT By Industrial Product Classification

Industrial Product Classification	2001	2002	2003	2004	2005	2006
Labour Intensive Product	0.8145	0.7596	0.8333	0.8274	0.8573	0.8600
Capital/Technology-Intensive Products	0.5438	0.5889	0.6993	0.5753	0.5108	0.5111
Non-durable Consumer Products	0.8389	0.7794	0.8561	0.8495	0.8790	0.8854
Durable Consumer Products	0.4798	0.5051	0.4536	0.4889	0.4062	0.4855
Capital Goods	0.6011	0.6603	0.8334	0.5781	0.5274	0.5501
Labour-intensive Intermediate Products	0.0527	0.0644	0.0637	0.0615	0.0738	0.0759
Capital-intensive Intermediate Products	0.5030	0.4991	0.5006	0.5337	0.5803	0.6269

4.6 ASEAN- China – Revealed Comparative Advantage (RCA) Index

Another index that could describe specialization in international trade is the revealed comparative advantage (RCA) index. Since the IIT index may not show if a country will gain competitive advantage in trading, therefore this study employs or utilizes an alternative index to display competition in trading between ASEAN and China.

Based on the manufacturing classification as exhibited in Table 23 ASEAN has competitive advantage in the manufacture of food, manufacture of products of wood, cork, straw and plaiting materials, manufacture of rubber products, manufacture of general purpose machinery and manufacture of electrical and electronics. Manufacturing firms of E&E recorded a high value of RCA compared to other industries. It seems that members of ASEAN, especially ASEAN-5, specialize and depend on the E&E industry. By industrial product classification, as depicted in Table 24 ASEAN has a high value of RCA index in durable consumer products which include E&E products. The value for the cluster range from 5.830 to 6.331. Other clusters which recorded RCA index above unity are capital/technology intensive products, capital goods, labour-intensive intermediate products and capital-intensive intermediate products (recorded RCA value of above unity from 2003 onwards). In the world economy, ASEAN gains competitive advantage in durable consumer products.

In the case of China its competitive advantage position in the world economy is given in Table 25 and Table 26. China's RCA index by manufacturing industries as shown in Table 25 indicates that the country gains competitive advantage in the manufacture of textiles, manufacture of wearing apparel except fur apparel, manufacture of footwear, leather, luggage, and related products, manufacture of metal products, manufacture of electricals and electronics and manufacture of furniture. Based on industrial product classification, high values of RCA are recorded in cluster durable consumer products. The index range from 4.760 to 5.902. Other cluster which have recorded high values of RCA index are labour-intensive Intermediate products and capital-intensive Intermediate products.

The evaluation of RCA for ASEAN and China in the world economy suggests that ASEAN will face competition from China in the sectors of E&E, foods, and textiles and clothing. Based on the industrial products cluster, ASEAN may face tough competition from China under durable consumer products. This to some extent confirms studies done by Sanjay Lall and Greenaway etl .

TABLE 23

ASEAN RCA Index By Manufacturing Industry

Manufacturing Industry	2001	2002	2003	2004	2005	2006
Manufacture of food	1.240	1.398	1.415	1.506	1.436	1.492
Manufacture of beverages	0.300	0.278	0.303	0.342	0.360	0.387
Manufacture of tobacco products	0.982	0.925	0.739	0.802	0.798	0.767
Manufacture of textiles	0.750	0.720	0.695	0.719	0.758	0.743
Manufacture of wearing apparel except fur apparel	0.991	0.873	0.792	0.775	0.730	0.717
Manufacture of footwear, leather, luggage, and related products	0.580	0.447	0.373	0.358	0.352	0.351
Manufacture of products of wood, cork, straw and plaiting materials	1.536	1.508	1.377	1.268	1.251	1.319
Manufacture of paper and paper products	0.581	0.573	0.522	0.530	0.547	0.596
Printing and service activities related to printing	0.539	0.408	0.419	0.458	0.582	0.581
Manufacture of petroleum products	0.948	0.932	0.938	0.829	0.886	0.869
Manufacture of basic chemicals and other products	0.620	0.682	0.857	0.889	0.837	0.846
Medical and Pharmaceutical Products	0.102	0.070	0.069	0.082	0.187	0.279
Manufacture of rubber products	1.790	1.974	2.214	2.372	2.347	2.879
Manufacture of plastic products	0.740	0.769	0.806	0.856	0.898	0.884
Manufacture of glass products and non-metallic mineral products	0.623	0.610	0.622	0.588	0.661	0.636
Manufacture of basic iron and steel	0.343	0.338	0.375	0.388	0.380	0.427
Manufacture of non-ferrous metals	0.618	0.589	0.626	0.715	0.745	0.717
Manufacture of metal products	0.350	0.344	0.389	0.428	0.423	0.447
Manufacture of general purpose machinery	1.352	1.338	1.230	1.237	1.258	1.243
Manufacture of electrical and electronics	2.632	2.638	2.675	2.661	2.468	2.300
Manufacture of scientific equipment	0.664	0.722	0.692	0.702	0.649	0.658
Manufacture of transport equipment	0.163	0.161	0.211	0.239	0.295	0.312
Manufacture of furniture	0.921	0.915	0.833	0.812	0.802	0.750
Other Manufacturing Industries	0.529	0.511	0.513	0.518	0.477	0.485
Total	0.809	0.805	0.805	0.822	0.820	0.848

TABLE 24

ASEAN RCA Index By Industrial Product Classification

Industrial Product Classification	2001	2002	2003	2004	2005	2006
Labour Intensive Product	0.649	0.661	0.653	0.647	0.634	0.634
Capital/Technology-Intensive Products	1.309	1.289	1.296	1.296	1.306	1.303
Non-durable Consumer Products	0.175	0.168	0.166	0.163	0.167	0.164
Durable Consumer Products	5.951	5.893	6.196	6.329	6.331	5.850
Capital Goods	1.400	1.351	1.312	1.273	1.260	1.223
Labour-intensive Intermediate Products	1.882	1.778	1.661	1.713	1.789	1.917
Capital-intensive Intermediate Products	0.909	0.953	1.144	1.308	1.409	1.567

TABLE 25

China RCA Index By Manufacturing Industry

Manufacturing Industry	2001	2002	2003	2004	2005	2006
Manufacture of food	0.777	0.734	0.662	0.516	0.542	0.507
Manufacture of beverages	0.342	0.273	0.205	0.195	0.155	0.187
Manufacture of tobacco products	0.403	0.388	0.359	0.316	0.278	0.258
Manufacture of textiles	1.899	1.904	1.869	1.845	1.924	1.974
Manufacture of wearing apparel except fur apparel	3.978	3.677	3.459	3.340	3.318	3.450
Manufacture of footwear, leather, luggage, and related products	3.530	3.378	3.240	3.037	2.885	2.403
Manufacture of products of wood, cork, straw and plaiting materials	0.744	0.746	0.694	0.721	0.749	0.809
Manufacture of paper and paper products	0.327	0.310	0.319	0.317	0.371	0.429
Printing and service activities related to printing	0.422	0.435	0.375	0.401	0.409	0.442
Manufacture of petroleum products	0.312	0.264	0.241	0.209	0.160	0.118
Manufacture of basic chemicals and other products	0.746	0.679	0.622	0.608	0.629	0.626
Medical and Pharmaceutical Products	0.138	0.100	0.082	0.071	0.071	0.062

Manufacture of rubber products	0.651	0.627	0.572	0.625	0.703	0.738
Manufacture of plastic products	0.779	0.748	0.678	0.648	0.676	0.678
Manufacture of glass products and non-metallic mineral products	0.808	0.804	0.728	0.732	0.765	0.742
Manufacture of basic iron and steel	0.895	0.813	0.759	0.932	0.971	1.136
Manufacture of non-ferrous metals	0.624	0.633	0.648	0.693	0.635	0.642
Manufacture of metal products	1.805	1.759	1.711	1.805	1.810	1.783
Manufacture of general purpose machinery	0.825	1.044	1.282	1.364	1.389	1.394
Manufacture of electricals and electronics	1.845	1.934	2.028	2.154	2.264	2.079
Manufacture of scientific equipment	0.859	0.820	0.822	0.875	1.033	1.034
Manufacture of transport equipment	0.283	0.248	0.279	0.289	0.320	0.350
Manufacture of furniture	2.148	2.234	2.172	2.228	2.331	2.388
Other Manufacturing Industries	4.130	4.145	3.838	3.652	3.672	3.567
Total	1.171	1.148	1.106	1.103	1.123	1.112

TABLE 26
China RCA Index By Industrial Product Classification

Industrial Product Classification	2001	2002	2003	2004	2005	2006
Labour Intensive Product	0.788	0.776	0.736	0.722	0.710	0.720
Capital/Technology-Intensive Products	1.050	1.047	1.073	1.090	1.108	1.107
Non-durable Consumer Products	0.472	0.449	0.413	0.378	0.360	0.355
Durable Consumer Products	4.760	4.966	5.553	5.799	5.902	5.484
Capital Goods	0.982	1.004	1.061	1.067	1.079	1.061
Labour-intensive Intermediate Products	3.845	3.670	3.348	3.348	3.295	3.235
Capital-intensive Intermediate Products	1.045	0.973	0.976	1.116	1.174	1.271

5.0 Conclusion and Policy Implications

The free trade agreement between ASEAN and China (ACFTA) which was inked in November, 2002, has been said to be a bold move in integrating ASEAN's and China's economies. The ACFTA has since then been believed to be a momentum for further integration in the region, being assumed to be the initial stage for the ASEAN+3 FTA, i.e., an FTA between ASEAN and China, Korea and Japan.

Although the ACFTA was hailed by many groups at the international level, including ASEAN and China, the agreement has caused some uneasiness among members of ASEAN. The concern over China's rapid economic development and the strength of its economic muscles even before the FTA agreement has raised great concern among members of ASEAN due to the impact on their future economic growth. Since China's economy has grown at a rapid pace, the country has been labelled as a new economic dragon in the world economy; this is actually scary news for ASEAN.

The huge market, ample low cost labour including other types of cost of productions, a reliable stock of human capital and attractive investment incentives and benefits offered by the Chinese government has attracted a huge pool of investments from foreign firms to major industrial zones across China. The threat is even greater since most of the products produced and exported by China were also produced and exported by ASEAN. This has resulted in a huge competition since the two regions' production and exportable goods, namely E&E products and textile and clothing, were substitutes and complementary goods. Therefore, both regions have to compete with each other in the world market in general, and in East Asia specifically. Then the question arises as to what the rationale is for ASEAN signing an FTA

agreement with China if the country may cause economic 'damage' to them (ASEAN). Thus the purpose of this paper was to investigate whether ASEAN would stand to suffer losses in being part of ACFTA.

China's economy has grown rapidly since the 1990s. The main reasons for the very impressive economic progress were its open-economy policy which has been implemented since 1978, and which implanted economic liberalisation policies, the role of FDI in the development of manufacturing industries in labour-intensive and high-technology industries, and the devaluation of the Yuan against the US$. The involvement of foreign enterprises in China's industrialisation has developed some key economic progress, largely in the E&E industries. Foreign firms have been involved in (re)structuring industrial activities, mainly by focusing on the E&E sector in China. More than 55 percent of the export growth is related to the activities of foreign firms. One of the major contributions of foreign firms on China's economic development is that the country has been proclaimed as the world's centre for producing various types of E&E appliances and devices.

ASEAN's main manufacturing sectors were E&E as well as textile and clothing industries. A considerable amount of economic resources in ASEAN have been devoted to the former, particularly in the case of Malaysia and Singapore. Since China has also concentrated in the same manufacturing sectors, there has been an overlap in industrial sectors. It appears that since the 1980s, China has been producing and exporting whatever ASEAN produced and exported. In a nutshell, the structure of production and exports in the E&E sector seems to be similar between ASEAN and China. This has actually caused stiff competition between the two regions in the international commodity market and for foreign capital.

Some have argued that the rapid economic development of China, particularly in the manufacturing activities, have benefitted ASEAN rather than providing tough competition. According to the ADB's Annual Report (2007), trade between ASEAN and China in the E&E sector have been in the form of network production, in which members of ASEAN produced intermediate products and China acted as a base for assembling the final product of the sector. The network production-trade incidences only exist in a group of countries or in a region where there is a similar structure of production and exports. The main agents of such activities or linkages between production and trade are foreign firms. Such relationships between the production and trade that are contributed largely by foreign capital are famously known as the "flying geese model". Since China appeared on the world economic radar in the early 1980s, as discussed widely in Chapters 3 and 4, the country has become the main location of foreign or multinational (MNC) firms. ASEAN, because of certain circumstances, such as cost of production and political stability or governance, is no longer a potential location of MNC firms.

Trade between ASEAN and China has increased since 1995; however, the trade has favoured China rather than ASEAN. Based on the exports and imports structures between the two regions, it can be seen that both regions traded mostly in the same categories of products. Based on HS 2 digit classification, the main items in the ASEAN-China trade were HS85 and HS84. Although there was a network type of trading between the nations, as mentioned earlier, the question now is who gains in that type of trade.

Based on the trade performance indices, namely, the IIT, EII, MII and RCA indices, it can generally be assumed that China may gain or receive the most benefits from the ACFTA deal. The main reason, as indicated by all the trade performance indices, is that most of the goods produced and exported by ASEAN were mainly manufactured goods that were similar to China's production and export of manufactured goods. Based on the trend of trade performance indices, there has been trade interdependence between ASEAN and China in certain products, particularly in E&E products. This was demonstrated by the IIT values calculated for ASEAN members against China. The IIT value for the ASEAN-China trade for certain products, namely E&E, was quite high. This indicates that there was intra-trade industry or intra-firm trade between ASEAN members and China in the E&E sector.

Related to above points, the main question that arises is whether the current growth model that contributed to and accelerated significant economic performance in ASEAN needs to be considered. The export-led growth (ELG) based on FDI in the E&E industries and in low-cost labour industries, be it labour intensive or capital intensive, should be reviewed thoroughly. In general, all developing countries are pursuing the ELG model for economic growth and development. There will be a huge congestion in terms of production of similar goods, and this could, subsequently, kill the competitiveness of the older or existing industries. The new-comers, such as the African countries and Central Asia, will increase competition further in the world economy by reducing export prices, mainly in terms of US dollars.

If there is an international crisis such as the falling demand for EOI goods, most countries relying on the sector will be affected and subsequently inflow of future FDI will drop. Foreign firms may reconsider either expanding operations, increasing investments or closing down factories and moving to locations which offer cheaper costs. In terms of production costs, Singapore and Malaysia no longer seem to be in the radar of foreign firms. According to JETRO, which studied Japanese firms in East Asia including China, it has been stated that Malaysia and Singapore are attractive locations but not reliable since the cost of production is (getting) high. Most Japanese firms now favour China for locating factories. However, since late 2009, China has also begun facing escalating production costs, mainly with regard to rentals and wages; this has driven many foreign firms to move from the coastal to central regions which offer a lower cost of production.

ASEAN has to look at a different direction or draft new strategies for the strengthening of the manufacturing industry and to outline future economic development policies for future economic growth. The world economy is getting increasingly complex, and traditional economic measures are incapable of dealing with crises emerging from these new kinds of complexities. Countries, particularly developing economies, should be focused and specific rather than broad-based in promoting or re-structuring the manufacturing industries. Therefore, for Malaysia, the economic development policy should promote industries that can produce a competitive or comparative (trade) gain to the country. Also, the policy should address how to counter or reduce threats of price competitiveness from Chinese goods in the world market. This is because since China's economy syndromes and international production linkages are formed by foreign firms' activities in the region,

these have affected economic performance; thus, new development strategies are badly needed. The new strategies, in terms of focusing on niche industries or sectors, are what the country can offer to be the best in the international market by looking at other types of industries in which local resources can be utilised efficiently and optimally, improving economic facilities such as transportation, logistics, and communication in order to lower costs of production and enhance human capital skills. For ASEAN, the members need to enhance and be committed to economic cooperation such as quickly establishing the ASEAN Economic Community to counter the China factor in the future and for the benefit of their people.

The establishment of ACFTA is most welcomed by East Asian communities. The FTA sounds very impressive, but its exact cost to the members which are uncompetitive is unknown. Definitely, there are members of the pact who will gain and members who will lose. If the cost is too high for some members, the FTA committee should construct a mechanism which can compensate the losses to the losing member. This is vital to ensure stability and harmonisation of the group. The ACFTA could become a large free trade arrangement in the world, but if some members of the pact experience too many losses it will dent the significance and attractiveness of the pact.

As this studies indicated that there would be competition between ASEAN and China. By signing the ASEAN-China FTA, ASEAN expect to hedge trade losses with China. Maybe this is ASEAN strategy in dealing with China's economy threat on them. However, we do not sure whether the plan is workable or not. This is a "big" question to answer. There will be many answers, yes, no and uncertain. Therefore, one of the main tasks of this paper is to offer by answering the question.

In general, all members of ACFTA are developing countries. An FTA which integrates industrialised and developing countries such as NAFTA and EU are different. The pattern of trade, investment, employment or income distribution of both FTAs will be different. Usually, developing countries compete among themselves in trading and they struggle to get a bigger bite of the international market besides attracting foreign capital. Foreign capital and the international goods market are the major sources of economic growth for a developing country.

Footnote

1. This statement also appeared in Lloyd-Smith (2001).
2. The statement was delivered since he felt nervousness over China's economic performance that will decelerate NAFTA's performance.
3. Formula for export intensity index (EII), import intensity index (MII), intra-industry trade (IIT) index and revealed comparative index (RCA) as follow:

The intensity index of ASEAN exports to country I_{ij}^{x} is defined as:

$$I_{ij}^{x}(X_{ij} / X_i)[M_j(M_w - M_i)]$$

where X_{ij} = ASEAN's exports to country j
X_i = ASEAN's total exports to the world
M_i = Country j's total imports from the world
M_w = Total world imports

M_i = ASEAN's total imports from the world

The intensity index of ASEAN imports from country I_{ij}^{M} is defined as:

$$I_{ij}^{M}(M_{ij} / M_i)[X_j(X_w - X_i)]$$

where M_{ij} = ASEAN's imports from country *j*
M_i = ASEAN's total imports from the world
X_i = Country *j's* total exports to the world
X_w = Total world exports
X_i = ASEAN's total exports to the world

The IIT index was proposed by Grubel and Lloyd in 1975. Their work has been used in numerous studies for calculating trade or industry competitiveness. The formula of the IIT index for a product category is given by the following equation:

IIT = 1- {(X+M) – (I X-M I) / (X+M)}

Where (X + M) is the value of gross trade and |X – M| is the absolute value of inter-industry trade, while the numerator of the equation measures intra-industry trade as the net value of total trade remaining after net exports, or net imports are subtracted. The net value of total trade is given in the form of a proportion of the value of total trade.

This paper uses the RCA formula Balassa's version. The formula reads as follows:

$$RCA = (X_{ij} / X_{nj}) / (X_{it} / X_{nt})$$

where X is exports, subscript *i* is a country, *j* is a commodity or industry, *t* is a set of commodities (or industries) and *n* is a set of countries. RCA estimates a country's exports of a commodity (or industry) relative to its total exports and to the corresponding exports of a set of countries. The RCA index takes a value between 0 and +∞. A country is said to have a revealed comparative advantage if the value exceeds unity. If RCA is less than unity, the country is said to have a comparative disadvantage in the commodity or product or industry.

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APPENDIX 1

Industrial Product Classification – Based on HS 2 Digit Code

Labor-Intensive Product	25, 41, 42, 43, 44, 45, 48, 49, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 68, 69, 70, 71, 73, 74, 76, 81, 82, 83, 85, 87, 92, 93, 94, 96, 97
Labor-Intensive Intermediate Product	25, 41, 42, 43, 44, 45, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 63, 68, 69, 70, 71, 73, 74, 76, 81, 82, 83
Capital/Technology Intensive Products	11, 25, 28, 29, 30, 31, 32, 33, 34, 35, 36, 38, 39, 40, 48, 49, 68, 69, 70, 71, 72, 73, 74, 75, 76, 78, 79, 80, 81, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 95
Durable Consumer Product	25, 48, 49, 68, 69, 70, 71, 73, 74, 76, 81, 82, 83, 84, 85, 90, 91, 92, 93, 94, 95, 96, 97
Non-Durable Consumer Products	33, 34, 39, 42, 43, 48, 49, 51, 52, 53, 53, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 71, 72, 83, 87, 91, 93, 95, 96, 97
Capital Goods	73, 74, 76, 81, 82, 83, 84, 85, 87, 90, 91
Capital-Intensive Intermediate Products	11, 25, 28, 29, 30, 31, 32, 33, 34, 35, 36, 38, 39, 40, 48, 68, 69, 70, 71, 72, 73, 74, 75, 76, 76, 78, 79, 80, 81, 91

Source: Ministry of International Trade and Industry, Government of Japan, *White Paper on International Trade 1986*, pp.405-406.

Note. (1) In MITI, 1986, the code in SITC 2 digit. Based on the code, this study re-organized the clusters by matching with HS 2 digit.

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