Chapter 2

Development and Current Status of Machinery Trade between ASEAN and India

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CHAPTER 2.

DEVELOPMENT AND CURRENT STATUS OF MACHINERY TRADE BETWEEN ASEAN AND INDIA

AYAKO OBASHI

Abstract

The importance of the ASEAN as destination of India's exports of machinery has nearly doubled over the last few years. Meanwhile, the proportion of machinery inthe ASEAN's total imports from India, or India's exports to the ASEAN, has doubled over the last several years though not to the level of the machinery's share for the ASEAN's export side. In relative terms, the ASEAN member states tend to export more machinery parts to and import more finished machinery products from India, compared to two decades ago. In the ASEAN's machinery exports to India, computer parts and accessories and electric integrated circuits are the top two goods. In the ASEAN's machinery imports from India, there was a noticeable surge in the imports of mobile phones in the last several years. Singapore has been a leading exporter and importer in the ASEAN's machinery trade with India, but for the ASEAN's import side, Indonesia has rapidly increased the imports of finished machinery products including mobile phones over the last several years to the level exceeding Singapore in value.

1. INTRODUCTION

This chapter aims at deepening our basic understanding on the development and current status of trade in machinery between the ASEAN member states and India. Bilateral international trade data for the ASEAN and India are examined from variousaspects. Section 2 examines data for the ASEAN's exports to the world by destination and its imports by origin, considering the importance of India as its trading partner. The ASEAN's presence in India's exports to and imports from the world is also considered. Section 3 looks at the ASEAN's exports to and imports from India by industry, with a special interest in machinery. Section 4 focuses on the ASEAN's trade in machinery with India. The ASEAN's machinery exports to and imports from India are broken down by country and by machinery subsector. The final section provides a brief summary of the observed facts on machinery trade between the ASEAN and India and concludes with discussion on the impact of the Nokia's launch of mobile device manufacturing facility in India in 2006 on India's exports of mobile phones to the ASEAN.

2. ASEAN AND INDIA'S EXPORTS TO AND IMPORTS FROM THE WORLD

This section examines data for the total merchandise exports by the ASEAN to the world by destination and its imports by origin to consider the relative importance of India as its trading partner. The same examination is done with the importance of ASEAN in India's total merchandise exports to and imports from the world.

Bilateral export and import data used throughout this chapter are obtained from the United Nations Commodity Trade Statistics Database (UN Comtrade). I have cleaned up raw data obtained from the UN Comtrade as described in Appendix A.1. The ASEAN here includes Indonesia, Malaysia, Philippines, Singapore, Thailand, and Viet Nam. Due to the scarcity of trade data for the period of interest, Brunei, Myanmar, Cambodia, and Laos are excluded from sample. The dataset covers the years 1990, 1995, and 2000-2009.[1]

2-1. By Export Destination and Import Origin

We begin by examining on how important India is as the ASEAN's trading partner, and vice versa. The upper table of Table 1 shows the proportions of India as destination ofthe ASEAN's total exports and as origin of the ASEAN's total imports in 1990, 2000, and 2009. The figures are reported for exports and imports of all commodities, those of manufactured goods, and those of machinery. For the ASEAN's trade in all commodities, the percentage of India as export destination has doubled from 1.6% in 2000 to 3.3% in 2009 while its percentage as import destination also has doubled from 1.0% in 2000 to 2.1% in 2009. A similar rise in the India's share both as the ASEAN's export destination and import origin can be observed for trade in manufactured goods and that in machinery. Nevertheless, India is still of slight importance both in the ASEAN's exports and imports, with its share as destination and origin limited to 2-3% as of 2009.

[1] ASEAN-India FTA which took effect in January 2010 is beyond the scope of my analysis.

Table 1: The Proportions of India/ASEAN as the ASEAN/India's Export Destination and Import Origin

For ASEAN	India as export destination			India as import origin		
	1990	2000	2009	1990	2000	2009
All commodities	1.3%	1.6%	3.3%	0.9%	1.0%	2.1%
Manufactured goods	1.1%	1.3%	2.7%	0.9%	0.8%	1.7%
Machinery	0.9%	1.0%	2.4%	0.3%	0.3%	0.9%

For India	ASEAN as export destination			ASEAN as import origin		
	1990	2000	2009	1990	2000	2009
All commodities	5.4%	6.5%	10.6%	6.3%	11.0%	9.1%
Manufactured goods	5.3%	5.9%	9.2%	5.7%	9.9%	7.5%
Machinery	12.7%	11.6%	19.2%	6.4%	17.1%	9.9%

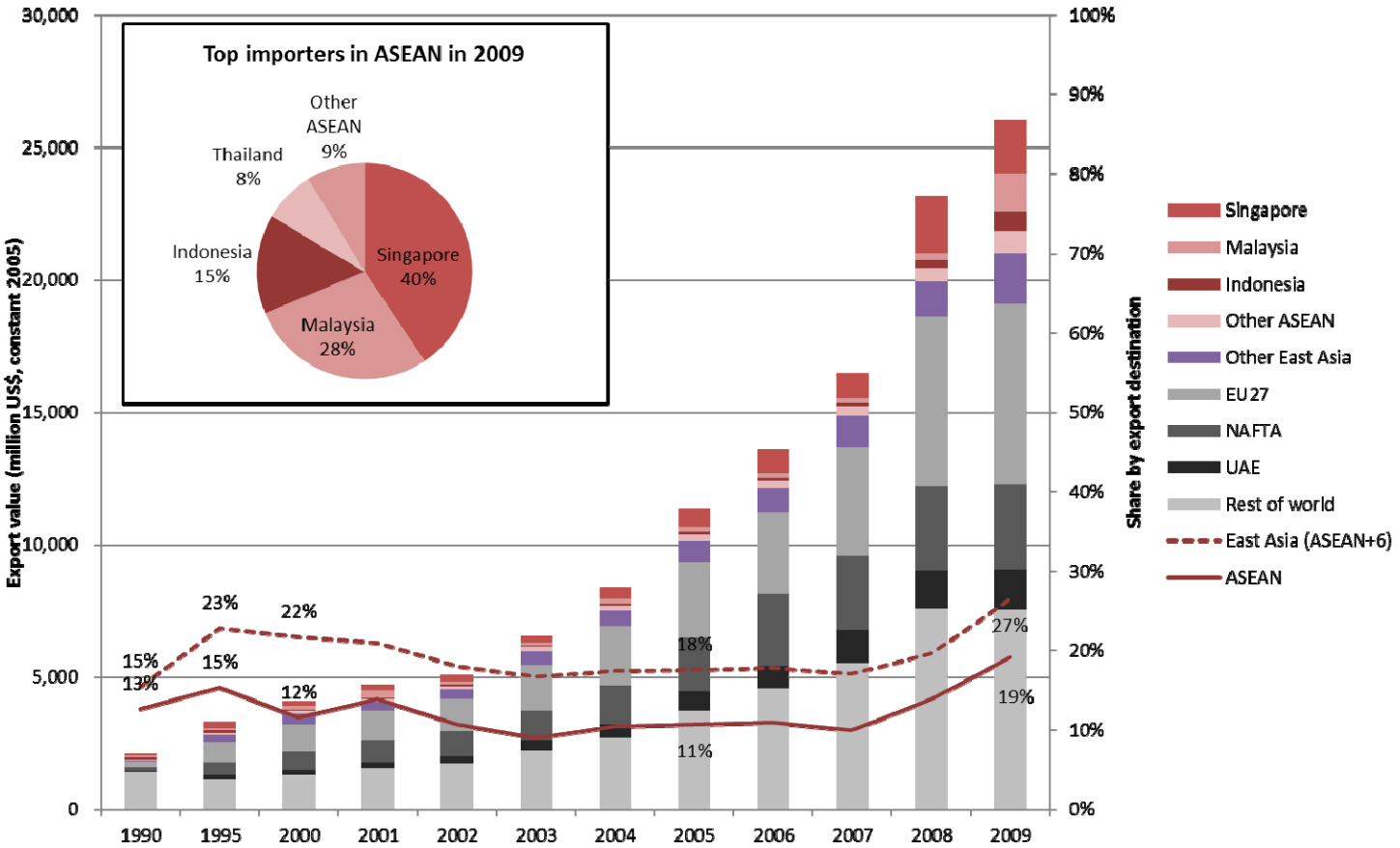
Source: UN Comtrade (export and import statistics for all commodities, manufactured goods (HS28-92), and machinery (HS84-92) reported by the ASEAN member states and India, various versions of the HS classification).

The corresponding figures for the proportion of the ASEAN as India's export destination and import origin are shown in the lower table of Table 1. It is obvious at a glance that the ASEAN becomes relatively more important trading partner for India, compared to the India's importance in the ASEAN's trade. For each of trade in all commodities, that in manufactured goods, and that in machinery, the percentage of the ASEAN as export destination has almost doubled in the last decade though its percentage as import destination has decreased during the same period. The rise in the ASEAN's share as India's export destination is particularly noticeable for exports of machinery. In 2009, about one fifth (19.2%) of India's exports of machinery were destined for the ASEAN member states.

Figure 1 provides a snapshot of the trend in India's exports of machinery by destination in the years 1990, 1995, and 2000-2009. In the stacked bar chart of export values, each export destination country/region is shown in a different color. The solid line chart shows the proportions of the ASEAN as India's export destination, and the dashed line chart shows the corresponding percentages of the East Asian region as a whole, i.e. ASEAN+6.[2] The solid line chart demonstrates that the ASEAN's share as destination of India's machinery exports leaped in just two years. The ASEAN's share of India's machinery exports hovered around 10% from 2002 to 2007 and has doubled form 10.0% in 2007 to 19.2% in 2009. More interestingly, the rise in the East Asia's share of India's machinery exports during the period 2007-2009 was attributed to the increasing importance of the ASEAN as export destination. India has become to export more machinery to the ASEAN member states rather than to China or other East Asian countries. In 2009, the ASEAN's share as destination of India's machinery exports was 19.2%, which was almost three fourth of the percentage of East Asia as a whole (26.5%).

[2] ASEAN+6 consists of the ASEAN member countries, China, Japan, Republic of Korea, India, Australia, and New Zealand.

Figure 1: India's Machinery Exports by Destination

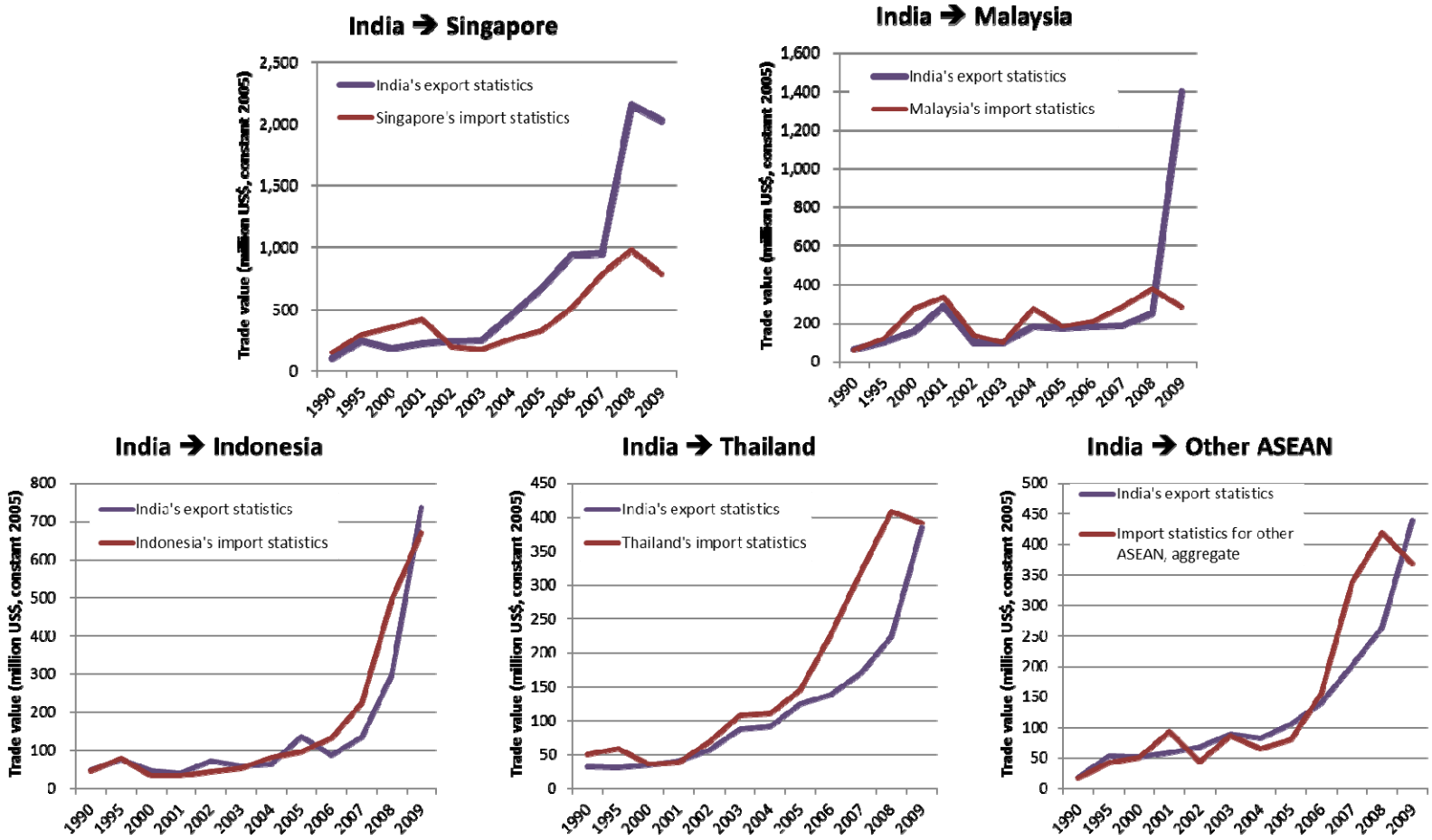


Source: UN Comtrade (export statistics for machinery industry (HS84-92) reported by India, various versions of the HS classification.

Among the ASEAN member states, Singapore has been a major destination country of India's exports of machinery throughout the period of interest except the year 2001, followed by Malaysia and Indonesia. The top destinations in the ASEAN in 2009 are shown in the pie chart in the upper left part of Figure 1. In 2009, 40.6% of India's machinery exports to the ASEAN were destined for Singapore, 28.1% for Malaysia, 14.8% for Indonesia, and the rest for Thailand and other countries.

It should be noted that there was a noticeable surge in India's exports of machinery to Malaysia from 2008 to 2009. Being curious about this surge, we look into the ASEAN's importance in India's machinery exports by comparing data obtained from India's export statistics and the mirror data from the ASEAN's import statistics in Figure 2. The blue line charts show the values of India's machinery exports to the ASEAN member states reported in India's export statistics. The red line charts show the corresponding values of the ASEAN member states' machinery imports from India reported in the ASEAN member states' import statistics.

Figure 2: India's Machinery Exports to the ASEAN Member States: Comparison of Export Statistics with Import Statistics



Source: UN Comtrade (export and import statistics for machinery industry (HS84-92) reported by India and the ASEAN member states, various versions of the HS classification).

In the UN Comtrade database, imports are generally reported on the basis of cost, insurance and freight (c.i.f.), while exports are reported on a freeon board (f.o.b.) basis. This tends to make import values higher than the corresponding export values; however, for Singapore, the export value has exceeded the import value since 2003, and the gap between the values has been widening especially in the last few years. Such a counterintuitive trend is also observed for Malaysia, which has experienced a sudden surgein the export value, unlike in the import value, from 2008 to 2009. The fact that the values reported in export statistics are higher than those reported in import statistics cannot, it seems, be explained only by the differences in the time of recording. Singapore and Malaysia may be recorded as (immediate) destination at India's customs because the ultimate destination market cannot necessarily be specified at the time of export, which leads to the higher values reported in export statistics. In other words, it appears that Singapore and Malaysia have become more important for India as entrepôt trade base.[3] In addition, firms located in special economic zones (SEZ) in India would tend to overstate the values of their exports to be awarded special tax privileges.

3. ASEAN'S EXPORTS TO AND IMPORTS FROM INDIA

This section looks at the ASEAN's total merchandise exports to and imports from India by industry, with a special interest in machinery. Excluding the possible effects

[3] Further discussion on the role of Singapore and Malaysia as enterpôt trade base for India is beyond the scope of this chapter, because of the scarcity of data for re-exports and re-imports. Some of machinery goods exported from India to Singapore or Malaysia may be consumed locally and others may be re-exported back to India, to other ASEAN member states, or to other parts of the world.

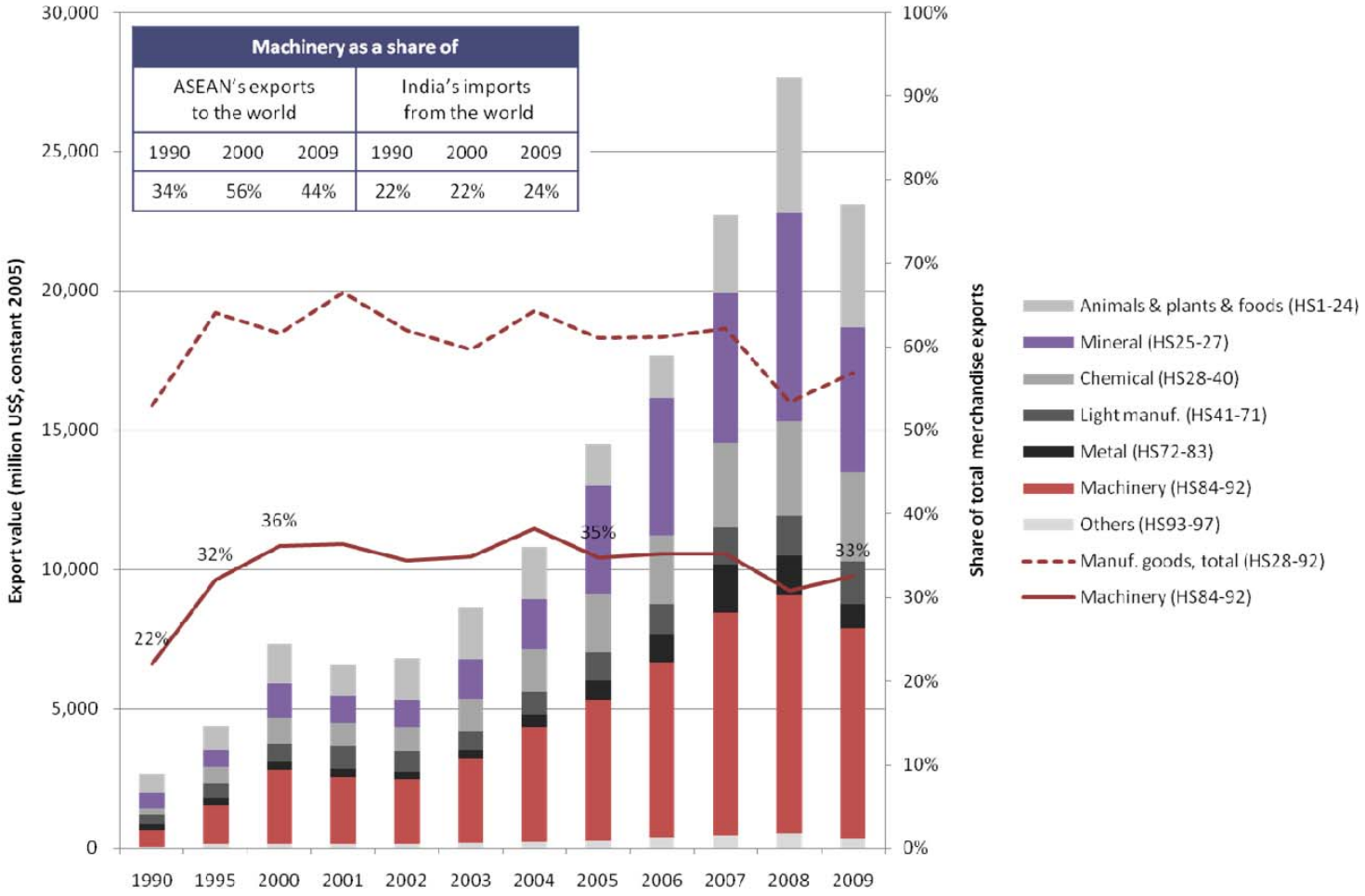
of primary commodity price increases, the section further considers the proportions of machinery in the ASEAN's trade in manufactured goods with India.

3-1. By Industry: All Commodities

A snapshot of the trend in the ASEAN's total merchandise exports to India in the years 1990, 1995, and 2000-2009 is provided in Figure 3. The stacked bar chart shows export values by industry, each industry is represented by a different color.[4] The solid line chart shows the proportions of machinery in the ASEAN's total merchandise exports to India, and the dashed line chart shows the corresponding percentages of manufactured goods including machinery. A substantial portion of the ASEAN's total merchandise exports to India has been accounted for by machinery throughout the period of interest. As shown by the solid line chart, the machinery's share has hovered around 35% over the last decade. In 2009, one third (32.6%) of the ASEAN's total merchandise exports to India were accounted for by machinery. Meanwhile, machinery goods constituted more than half of the ASEAN's exports of manufactured goods to India, which accounted for 56.8% of the total merchandise exports.

[4] The industry classification applied throughout this chapter is explained in Appendix A.1.

Figure 3: Industry Composition of the ASEAN's Total Merchandise Exports to India



Source: UN Comtrade (export statistics for all commodities reported by the ASEAN member states, various versions of the HS classification).

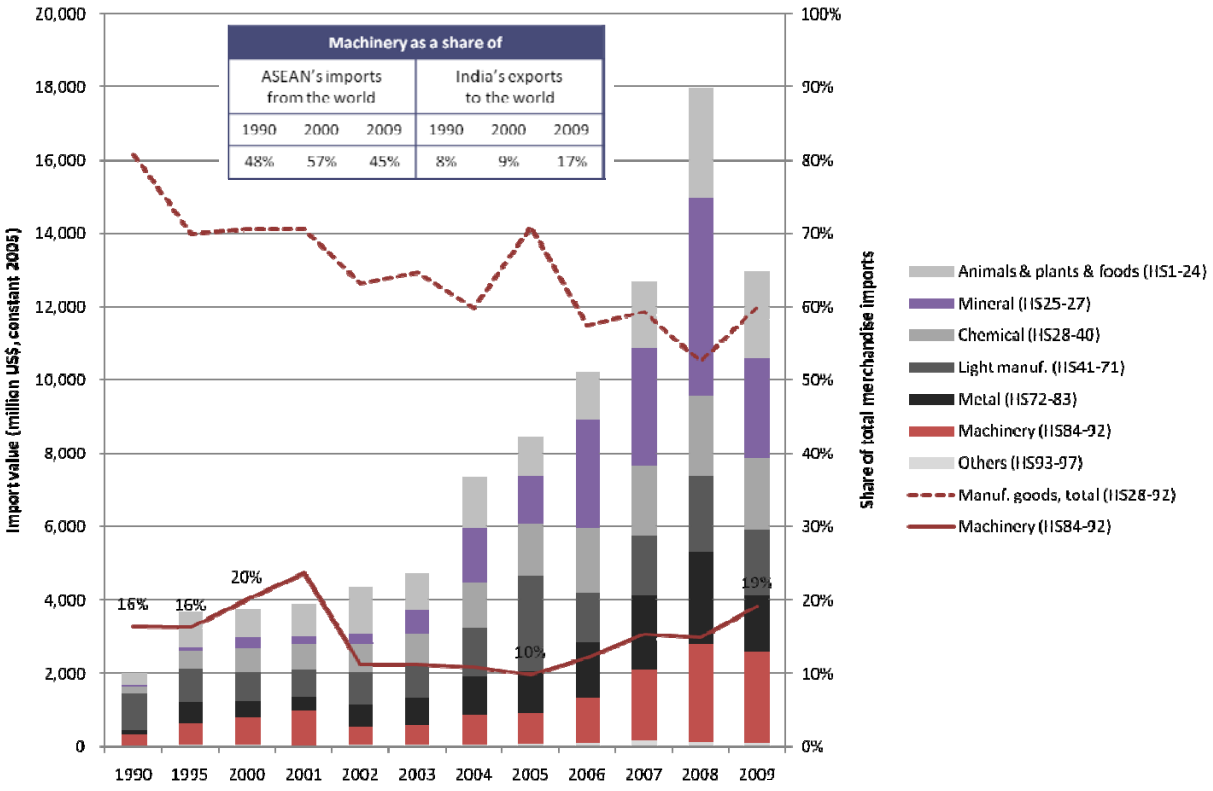
For a reference, the table in the upper left part of Figure 3 shows the proportions of machinery in the ASEAN's total merchandise exports to the world and those in India's total merchandise imports from the world in 1990, 2000, and 2009. The machinery's share in the ASEAN's exports to India is limited compared to the ASEAN's exports to the world, but is higher than in the India's imports from the world. In 2009, the machinery's share in the ASEAN's exports to India (32.6%) was at the level intermediate between the ASEAN's exports to the world (44.0%) and the India's imports from the world (24.0%).

Due to crude oil price increases, the ASEAN's exports of minerals and mineral products to India have increased largely in terms of value since 2004. Likewise, reflecting the worldwide food price increases since 2007, there was a significant increase in the value of the ASEAN's exports of animals, plants, and foods to India. In spite of the increased export values of minerals and mineral products and that of animals, plants, and foods, it is noteworthy that the ASEAN's machinery exports to India have increased continuously since 2002, after internet bubble, and the machinery's share has remained steady at around 35%.

Figure 4 provides a snapshot of the trend in the ASEAN's total merchandise imports from India, following the same format as Figure 3. The proportion of machinery in the ASEAN'stotal merchandise imports from India reached a peak at 23.7% in 2001 in times of internet bubble. After hovering around 11% for a few years, the machinery's share has doubled from 9.8% in 2005 to 19.3% in 2009.In the face of crude oil price increases and worldwide food price increases, the ASEAN's imports of machinery from India have increased significantly after internet bubble, at a pace exceeding the increase in the imports of other industries. In 2009, one fifth (19.3%) of

the ASEAN's total merchandise imports from India were accounted for by machinery though the machinery's share is still limited compared to the ASEAN's export side. Machinery goods constituted one third of the ASEAN's imports of manufactured goods from India, which accounted for 60.0% of the total merchandise imports.

Figure 4: Industry Composition of the ASEAN's Total Merchandise Imports from India



Source: UN Comtrade (import statistics for all commodities reported by the ASEAN member states, various versions of the HS classification).

Compared to the ASEAN's export side, the proportion of machinery in the ASEAN's total merchandise imports from India is far below the machinery's share in the ASEAN's imports from the world, but is slightly higher than in India's exports to the world. In 2009, the machinery's share in the ASEAN's imports from India (19.3%) was less than half that in the ASEAN's imports from the world (45.5%), but was slightly

above that in India's exports to the world (16.9%).

In 2005, there was a noticeable surge in the proportion of manufactured goods in the ASEAN's total merchandise imports from India, which was attributed to a sharp increase in Singapore's imports of light manufactured goods from India. To be more precise, Singapore sharply increased imports of non-industrial diamonds (jewelry) worked but not mounted or set (No. 7102.39 in the HS 1996 classification) from India in 2005. And then in 2006, Singapore's imports of jewelry from India returned to the same level as in 2004.[5] Interestingly, Singapore's jewelry exports to the UAE increased sharply only in 2005 while neither India's jewelry exports to the worldnor Singapore's jewelry imports from the world experienced such a sharp increase. It appears that India shipped jewelry to Singapore in order to supply to the ultimate destination market of the UAE only in 2005 though we cannot examine such a possibility becausedata for re-exports by Singapore are not available.[6]

3-2. Machinery as a Share of Trade in Manufactured Goods

Excluding the possible effects on the trade values of crude oil price increases and worldwide food price increases, this subsection further examines relative importance of machinery in trade between the ASEAN and India, by focusing on exports and imports of manufactured goods. The solid line charts in Figures 3 and 4 are modified and combined into Figure 5. The blue bold line chart shows the proportions of machinery in the ASEAN's exports of manufactured goods to India, and the blue thin line chart

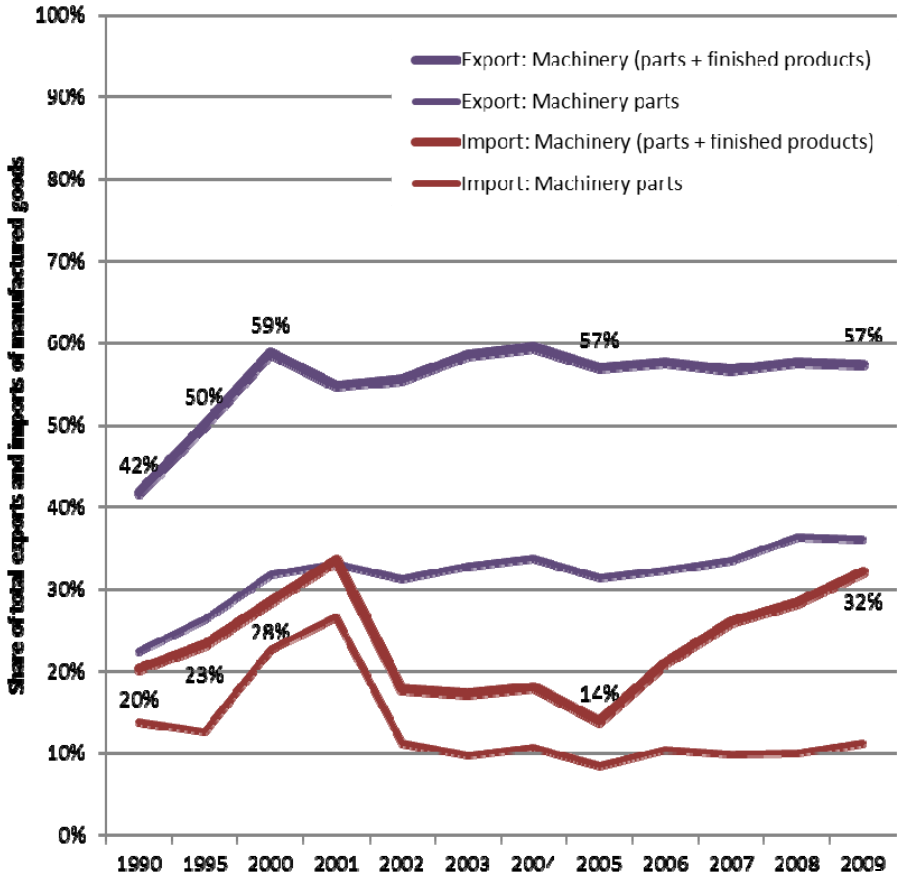
[5] Due to the scarcity of the quantity data, we cannot evaluate the effects of diamond price increases. Also, the surge in Singapore's jewelry imports from India was not the result of the India-Singapore Comprehensive Economic Cooperation Agreement (CECA) because Singapore's MNF tariff on goods classified under the category No. 7102.39 had already been zero before its effectuation.

[6] Note, however, that India's jewelry exports to the UAE rather increased in 2005.

shows the percentages of machinery parts only.[7] Machinery as shown by the blue bold line includes both machinery parts and components and finished machinery products. The red line charts show the corresponding percentages for the ASEAN's imports of manufactured goods from India.

[7] For the details on the definition of machinery parts and components, see Appendix A.1.

Figure 5: Machinery as a Share of Total Exports and Imports of Manufactured Goods: The ASEAN's Exports to and Imports from India



Machinery as a share of (figures in parenthesis are for parts)					
ASEAN's manuf. exports to the world			India's manuf. imports from the world		
1990	2000	2009	1990	2000	2009
53%	69%	62%	33%	30%	40%
(27%)	(43%)	(40%)	(21%)	(15%)	(17%)

Machinery as a share of (figures in parenthesis are for parts)					
ASEAN's manuf. imports from the world			India's manuf. exports to the world		
1990	2000	2009	1990	2000	2009
60%	70%	63%	11%	11%	24%
(32%)	(50%)	(41%)	(6%)	(6%)	(9%)

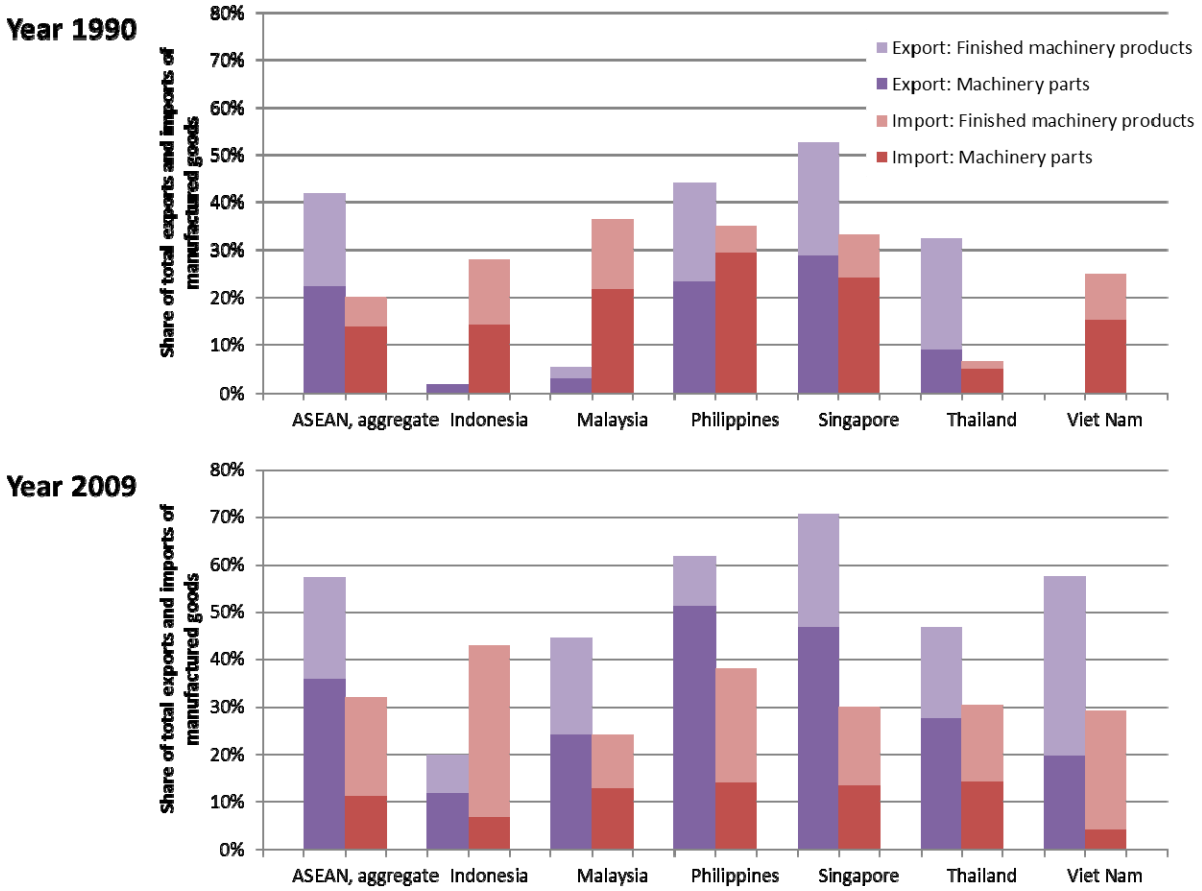
Source: UN Comtrade (export and import statistics for manufactured goods (HS28-92) reported by the ASEAN member states, various versions of the HS classification).

In the ASEAN's exports of manufactured goods to India, the proportion of machinery parts has increased gradually especially in the last several years while the percentage of machinery as a whole has hovered around 57% over the last decade. In 2009, 57.4% of the ASEAN's exports of manufactured goods to India were accounted for by machinery, and about two third of those, 36.1% of the exports of manufactured goods were machinery parts. For the ASEAN's import side, the increase and decrease in the machinery's share in times of internet bubble were largely due to those in the percentage of machinery parts. More noteworthy is a rapid increase in the machinery's share since 2005 as a turning point.[8] Meanwhile, the percentage of machinery parts has remained steady over the last several years. Since the gap between the bold and thin lines equals to the percentage of finished machinery products, the ASEAN has significantly increased relative importance of its imports of finished machinery products from India. The percentage of finished machinery products has quadrupled from 5.4% in 2005 to 20.9% in 2009.

The increased relative importance of machinery parts in the ASEAN's exports of manufactured goods to India and that of finished machinery products for the ASEAN's import side are common features shared among the ASEAN member states. Figure 6 shows the proportions of machinery in the ASEAN member states' exports and imports of manufactured goods to and from India in 1990 and 2009. The blue stacked bars indicate the percentages of machinery in the exports of manufactured goods to India for each ASEAN member state, and the red bars show the import side. For both the red and blue bars, the dark colored portions represent the percentages accounted for by machinery parts and the light colored portions for finished machinery products.

[8] Note that Singapore's jewelry imports from Indiasurged in 2005, which pushed down the percentage of machinery in the ASEAN's imports of manufactured goods from India.

Figure 6: Machinery as a Share of Total Exports and Imports of Manufactured Goods: The ASEAN Member States' Exports to and Imports from India



Source: UN Comtrade (export and import statistics for manufactured goods (HS28-92) reported by the ASEAN member states, various versions of the HS classification).

By comparing the stacked bars between the years 1990 and 2009, it is apparent that each of the ASEAN member states has increased relative importance of its exports of machinery parts to and its imports of finished machinery products from India, with the exception of Malaysia's imports. In addition, the proportions of machinery as a whole have increased simultaneously for the ASEAN member states' exports to and imports from India in the last two decades, with the exception of Malaysia and Singapore's imports.

4. ASEAN'S MACHINERY EXPORTS TO AND IMPORTS FROM INDIA

Focusing on the ASEAN's trade in machinery with India, this section looks into the ASEAN member states taking part in the machinery exports to and imports from India. The section also breaks down the ASEAN's machinery exports to and imports from India by machinery subsector.

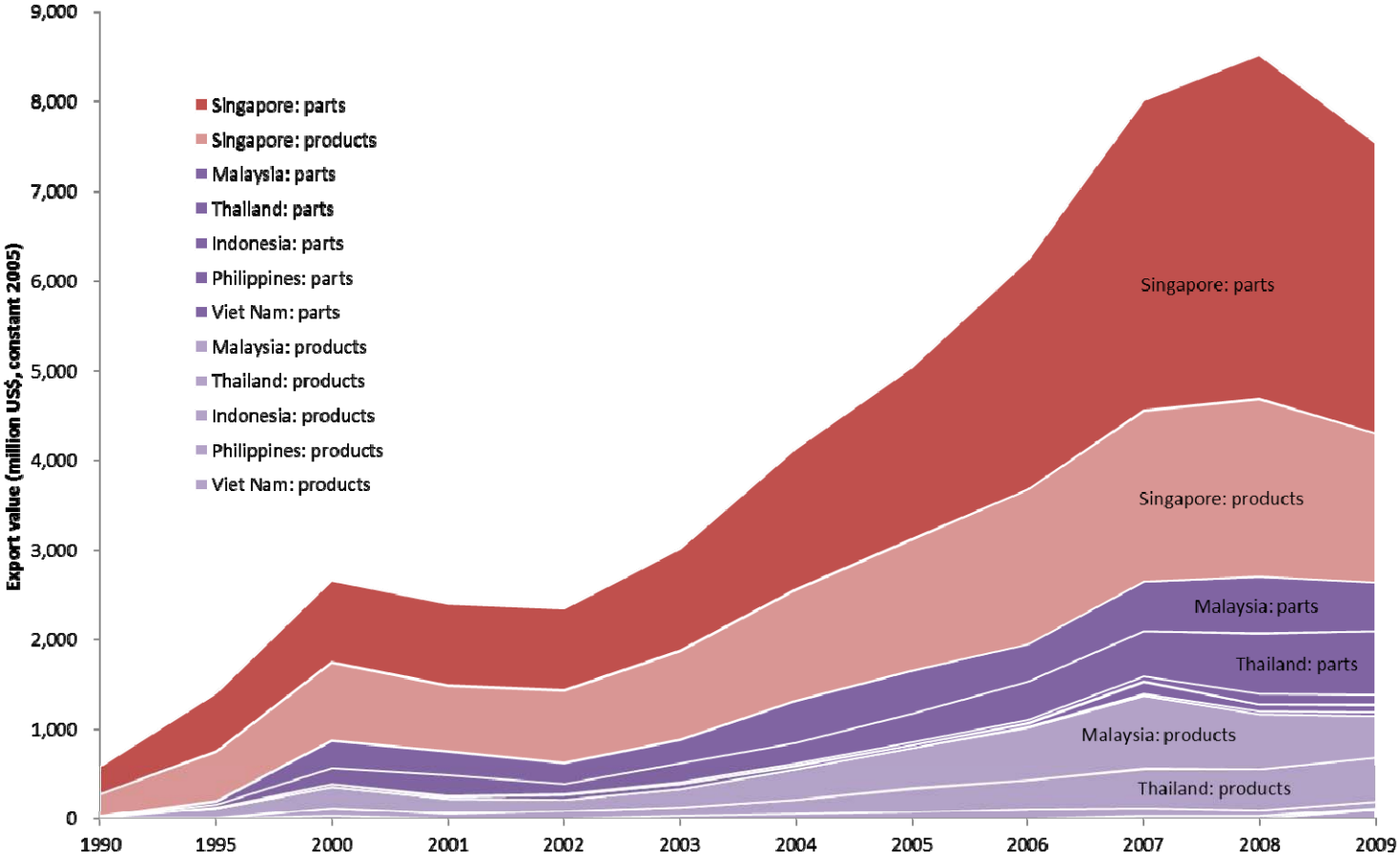
4-1. By Country and Type of Goods

Figure 7 overviews the trend in the value of the ASEAN's exports of machinery to India by country and by the type of goods, i.e. machinery parts and components and finished machinery products. The dark colored portions, regardless of blue or red, represent the export values of machinery parts and components and the light colored portions for finished machinery products. The area chart indicates that Singapore has been a leading exporter in the ASEAN's machinery exports to India over the last two decades, with a significant increase in the export value of machinery parts in the last several years. Singapore is followed by Malaysia and Thailand. There were noticeable

increases in the export values of both machinery parts and finished machinery products for those two countries since 2002. The machinery exports by other ASEAN member states to India are negligible amount of value.

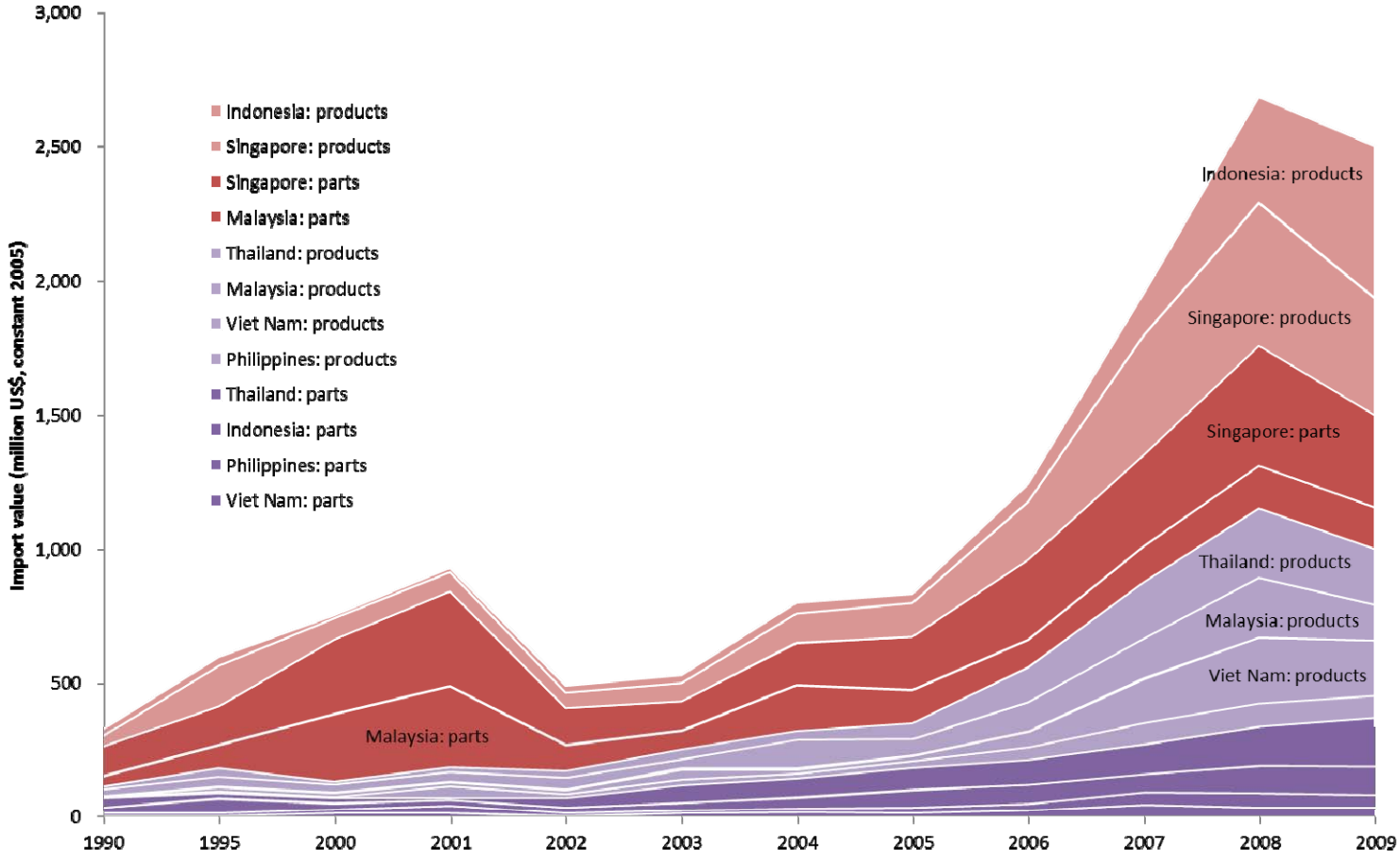
Figure 8 provides the area chart for the ASEAN's imports of machinery from India by country and by the type of goods. As in the export side, Singapore has been a leading importer in the ASEAN's machinery imports from India over the last two decade. It should be noted, however, that Indonesia's imports of finished machinery products from India has increased rapidly since 2006 and exceeded Singapore in value in 2009. Not only Indonesia but also Singapore, Thailand, Malaysia, and Viet Nam have experienced the increase in the import value of finished machinery products since 2005-2006. In contrast, the import values of machinery parts have remained largely unchanged for all the ASEAN member states, except that the parts imports by Singapore and Malaysia increased and decreased in times of internet bubble.

Figure 7: Exporter Country Composition of the ASEAN's Machinery Exports to India



Source: UN Comtrade (export statistics for machinery (HS84-92) reported by the ASEAN member states, various versions of the HS classification

Figure 8: Importer Country Composition of the ASEAN's Machinery Imports from India



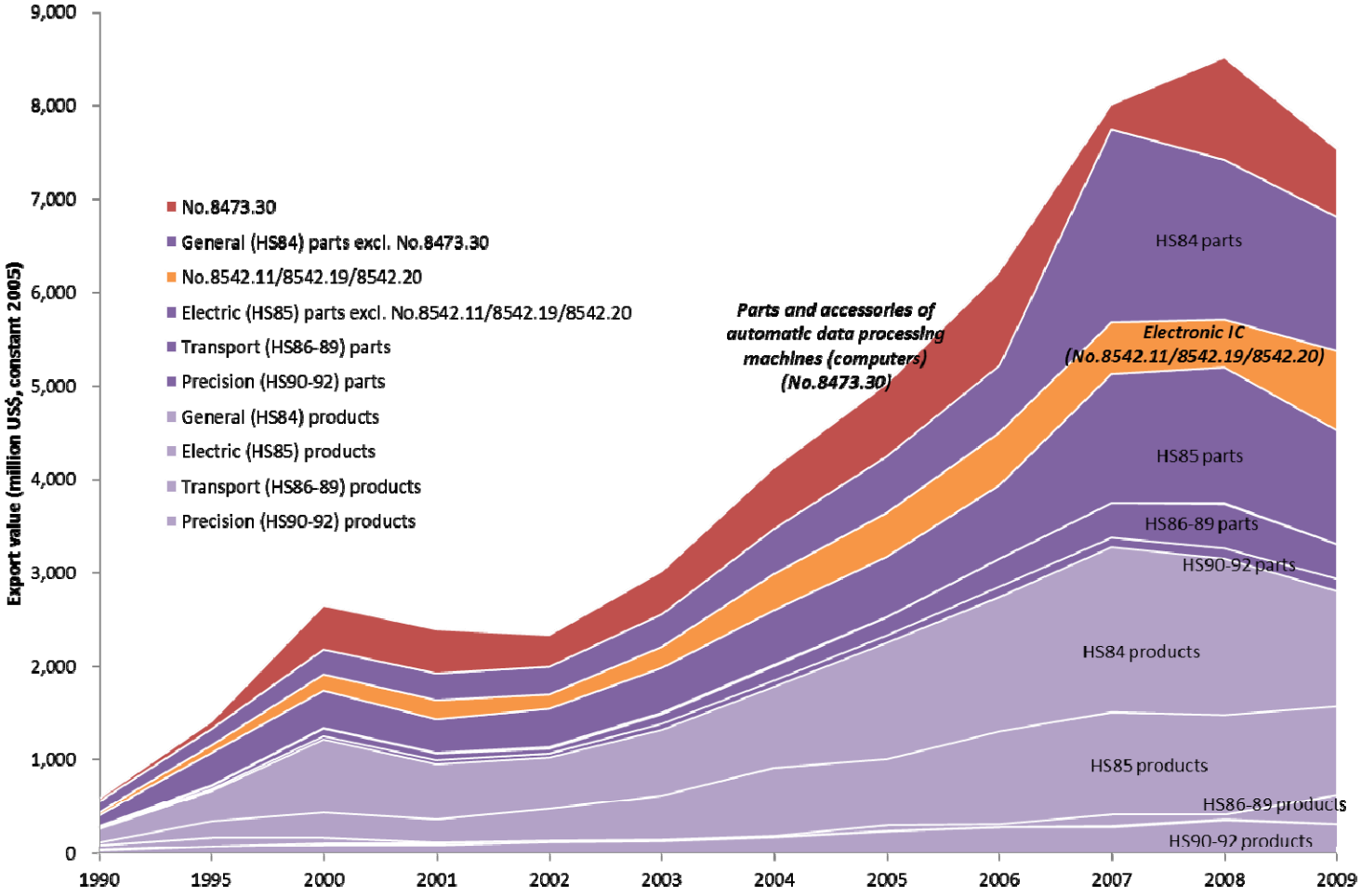
Source: UN Comtrade (import statistics for machinery (HS84-92) reported by the ASEAN member states, various versions of the HS classification).

4-2. By Sector and Type of Goods

As with Figure 7, the area chart of Figure 9 also shows the trend in the value of the ASEAN's exports of machinery to India, but by machinery subsector and by the type of goods.[9] The dark colored portions are machinery parts and components, and the light colored portions are finished machinery products, as before. Machinery is divided into four subsectors, namely, general machinery (HS84), electric machinery (HS85), transport equipment (HS86-89), and precision machinery (HS90-92) sectors. The export values of goods classified under the particular HS commodity codes are excluded from relevant subsectors and are highlighted as independent areas in order to look into the trend in the ASEAN's machinery exports to India.

[9] To examine changes in the commodity composition of exports over time, ideally we would like to use trade data based on a single constant commodity classification, which enables us not to concern about the censoring issue emerging from the complicated mergers and branching of codes due to the update of classification. For this area chart, I therefore used export statistics reported according to the HS 1992 classification, the oldest version. The same applies to Figure 10.

Figure 9: Product Composition of the ASEAN's Machinery Exports to India



Source: UN Comtrade (export statistics for machinery (HS84-92) reported by the ASEAN member states, the HS 1992 classification)

General machinery sector (HS84), followed by electric machinery sector (HS85), has been dominant in the ASEAN's exports of machinery to India and has increased constantly since 2002, after internet bubble. Behind this dominance of general machinery sector, the commodity code No. 8473.30 (parts and accessories of computers) has ranked first in the export value at the HS 6-digit level throughout the sample period except the year 1990, in which No. 8473.30 ranked second after No. 8471.93 (computer data storage units, which are classified as finished products).[10] For the electric machinery sector, electronic integrated circuits have been major exported goods. In the area chart, I united three commodity codes of No. 8542.11, 8542.19, and 8542.20 into an orange portion labeled as electronic integrated circuits.[11] Unlike with general machinery and electric machinery sectors, transport equipment (HS86-89) and precision machinery (HS90-92) sectors are still limited to negligible amount in value, regardless of parts or finished products.

For further reference, Table 2 looks at the details of major machinery goods exported by the ASEAN member states to India in 2009. Goods are listed in descending order of value by country, and the list focuses on the HS 6-digit commodity codes, each of which accounts for more than 10% of the country's machinery exports to India. Only Singapore, Malaysia, and Thailand are included in the list because, as is clear from Figure 7, the other ASEAN member states are negligible in the ASEAN's

[10] No. 8473.30 is defined as "parts and accessories of the machines of the heading No. 84.71, i.e. automatic data processing machines (computers)." More specifically, No. 84.71 is defined as "automatic data processing machines and units thereof; magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, not elsewhere specified or included."

[11] No. 8542.11, 8542.19, and 8542.20 is defined as monolithic integrated circuits, digital; monolithic digital integrated circuits, except digital; and hybrid integrated circuits; respectively. Although electronic integrated circuits are classified under the heading No. 85.42 regardless of the version of the HS classification, there have been complicated mergers and branching of codes at the 6-digit level. I united the three codes so as to avoid possibly misclassified data due to confusion over the changes in the commodity classification.

total machinery exports to India. For the leading exporter, Singapore, electronic integrated circuits (No. 8542.11/8542.19/8542.20) and parts and accessories of computers (No. 8473.30) ranked first and second, respectively, and the top two goods accounted for one fourth of Singapore's machinery exports to India. The leading goods were computer parts and accessories for Malaysia and electric integrated circuits for Thailand, which suggests that there is the compartmentalization of machinery subsectors between the two countries.

Table 2: Major Machinery Exports from ASEAN to India (2009)

Country	HS codes in the HS 1992 classification	Commodity description	Type	Value (million US$, constant 2005)	Share of the country's machinery exports to India
Singapore	No. 8542.11 /8542.19	Electronic IC	Parts	692	14%
	No. 8473.30	Parts and accessories of automatic data processing machines (computers)	Parts	501	10%
Malaysia	No. 8473.30	Parts and accessories of automatic data processing machines (computers)	Parts	186	19%
	No. 8471.20	Digital computers with CPU and input-output units	Products	115	11%
	No. 8540.11	Color cathode-ray television picture (including video monitor)tubes	Parts	105	10%
Thailand	No. 8542.11 /8542.19	Electronic IC	Parts	129	11%
	No. 8408.20	Engines, diesel, for motor vehicles of Chapter 87	Parts	117	10%

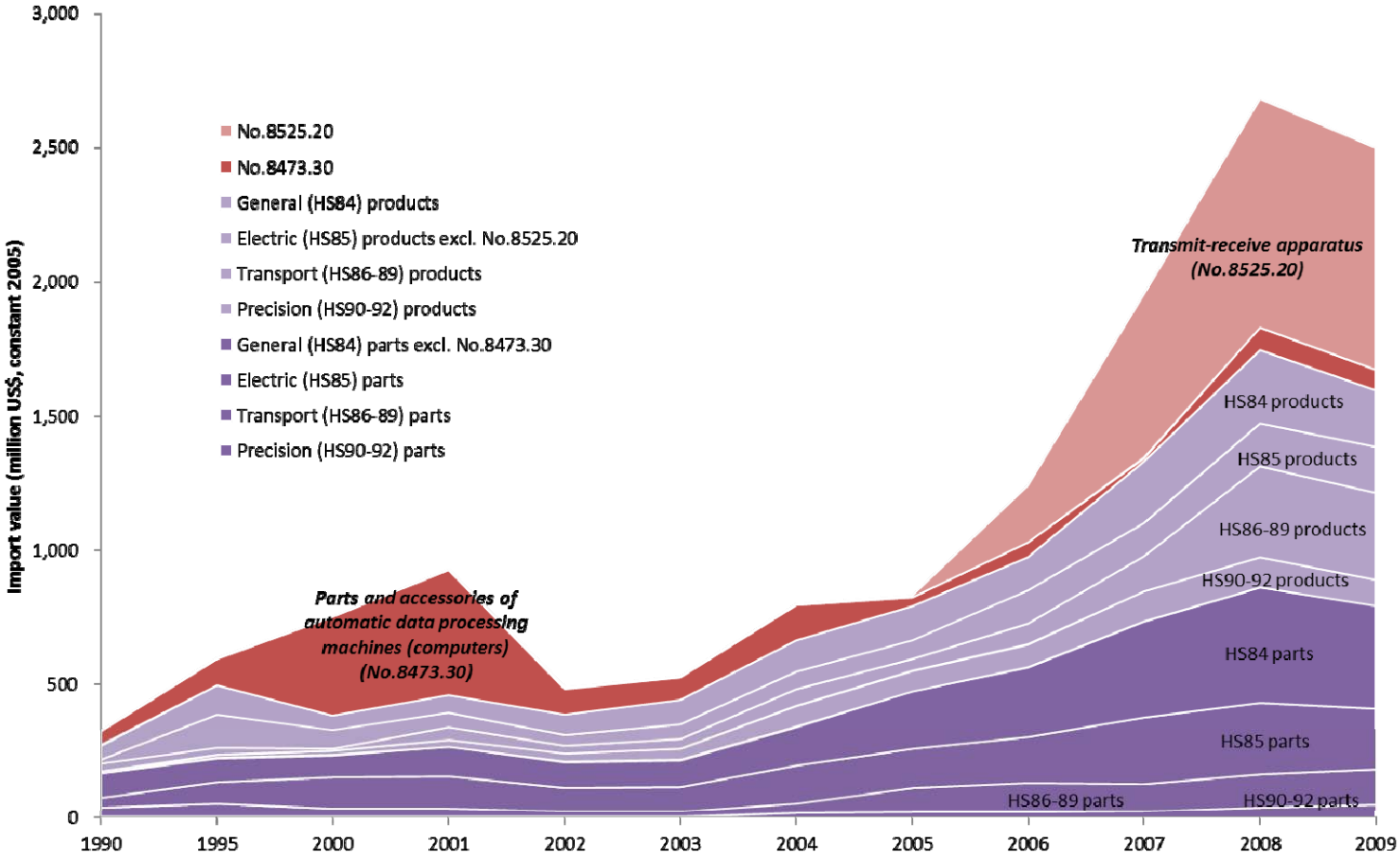
Note: No goods classified under the category No. 8542.20 are exported by Singapore or Thailand to India in 2009

Source: UN Comtrade (export statistics for machinery (HS84-92) reported by the ASEAN member states, the HS 1992 classification).

Figure 10 corresponds to Figure 8 and shows the trend in the value of the ASEAN's imports of machinery from India by machinery subsector and by the type of goods. There are two noticeable changes in the ASEAN's machinery imports from India in the last two decades. First, the increase and decrease of the ASEAN's machinery imports from India in times of internet bubble were due solely to the increase and decrease in the imports of parts and accessories of computers (No. 8473.30). Combined with the observed fact from Figure 8, it appears that Singapore and Malaysia engaged in these increased and decreased imports of computer parts and accessories. Second, the increase in the ASEAN's imports of finished machinery products from India since 2005 was due largely to a dramatic increase in a single commodity code of No.8525.20 (transmit-receive apparatus), which includes mobile phones.[12] Besides the surge in the imports of mobile phones, the ASEAN's imports of finished products of transport equipment (HS86-89) from India have increased significantly in the last few years.

[12] No. 8525.20 is defined as "transmission apparatus incorporating reception apparatus," which includes telephones for cellular networks or for other wireless networks (No. 8517.12 in the HS 2007 classification, the latest version), i.e. mobile phones.

Figure 10: Product Composition of the ASEAN's Machinery Imports from India



Source: UN Comtrade (import statistics for machinery (HS84-92) reported by the ASEAN member states, the HS 1992 classification)

The details of major machinery goods imported by the ASEAN member states from India in 2009 are provided in Table 3. Transmit-receive apparatus including mobile phones (No.8525.20) ranked first for all the non-negligible importers, namely, Singapore, Indonesia, Thailand, Malaysia, and Viet Nam. In particular, more than half (56.6%) of Indonesia's machinery imports from India were accounted for by mobile phones. Similarly, mobile phones constituted a substantial portion of the machinery imports by Viet Nam, Thailand, and Singapore. Besides mobile phones, large-scale vehicles were highly ranked, such as diesel powered trucks (No. 8704.23) for Singapore, dump trucks (No. 8704.10) for Indonesia, and cargo vessels (No. 8901.90) for Viet Nam.

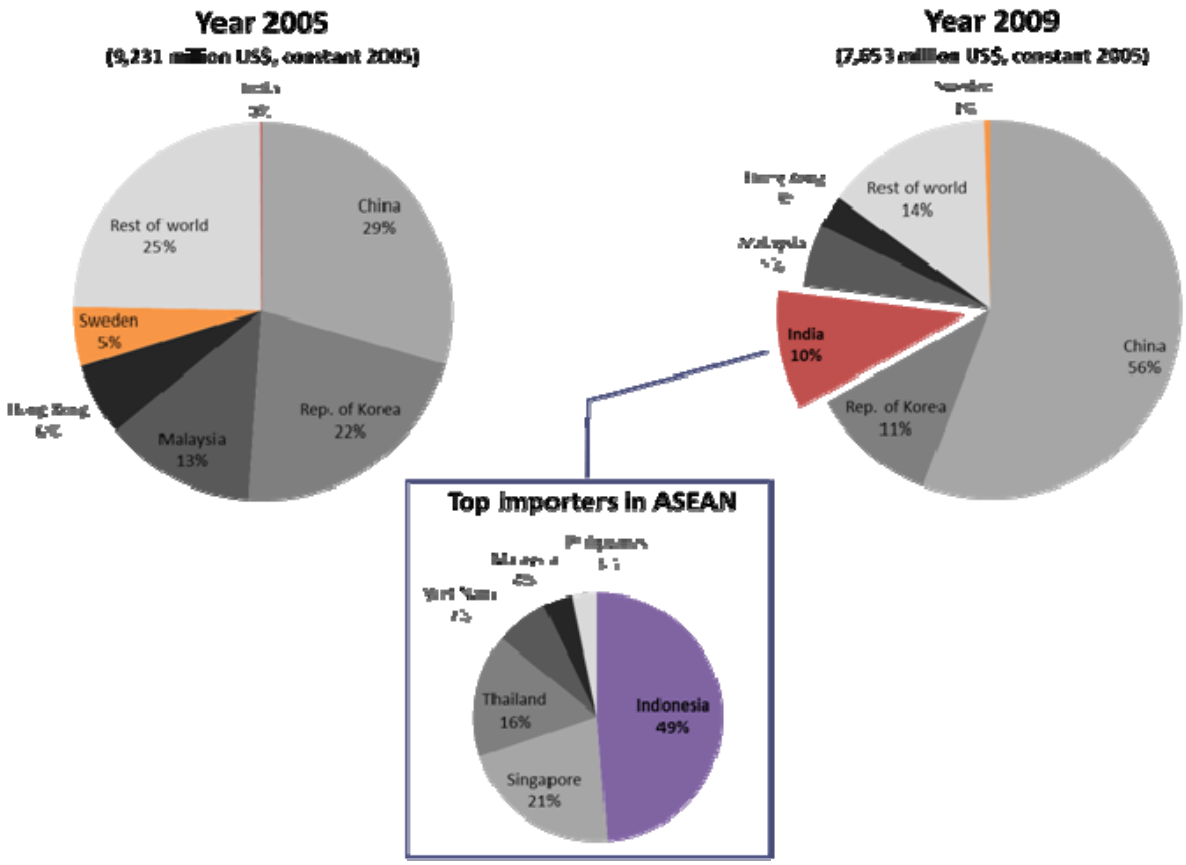
The surge in the ASEAN's imports of transmit-receive apparatus including mobile phones from India is further examined in Figure 11. From the ASEAN's perspective, the proportion of India as origin of its imports of mobile phones has increased sharply from 0.1% in 2005 to 10.2% in 2009. And in 2009, almost half (48.8%) of the ASEAN's mobile phones imports from India were destined for Indonesia, followed by Singapore (21.0%) and Thailand (16.1%). Piecing together these observed facts, it would appear that Nokia India has greatly affected the surge in the ASEAN's mobile phones imports from India.

Table 3: Major Machinery Goods Imported by the ASEAN Member States from India in 2009

Country	HS codes in the HS 1992 classification	Commodity description	Type	Value (million US$,constant 2005)	Share of the country's machinery imports from India
Singapore	No. 8525.20	Transmit-receive apparatus, including mobile phones	Products	163	21%
	No. 8704.23	Diesel powered trucks weighing > 20t	Products	77	10%
Indonesia	No. 8525.20	Transmit-receive apparatus, including mobile phones	Products	379	57%
	No. 8704.10	Dump trucks designed for off-highway use	Products	72	11%
Thailand	No. 8525.20	Transmit-receive apparatus, including mobile phones	Products	125	32%
	No. 8708.40	Transmissions for motor vehicles	Parts	58	15%
Malaysia	No. 8525.20	Transmit-receive apparatus, including mobile phones	Products	30	11%
Viet Nam	No. 8525.20	Transmit-receive apparatus, including mobile phones	Products	101	42%
	No. 8901.90	Cargo vessels other than tanker or refrigerated	Products	75	31%

Source: UN Comtrade (import statistics for machinery (HS84-92) reported by the ASEAN member states, the HS 1992 classification).

Figure 11: Top Import Origins of the ASEAN's Imports of Transmit-receive Apparatus (No.8525.20)



Source: UN Comtrade (import statistics reported by the ASEAN member states, the HS 1992 classification)

Nokia set up its mobile device manufacturing facility (Nokia Telecom SEZ Park) in Chennai, India, in January 2006. Nokia was the first global telecom company to launch a manufacturing plant for mobile phone handsets in India. Initially aimed to serve the demands of the rapidly growing India's domestic market, approximately half of the current production of the Nokia's Chennai facilities consumed domestically and the rest is exported to 100 countriescovering six continents.[13] Indonesia has been

[13] On May 5, 2011, Nokia announced that its manufacturing facility at Chennai has achieved production of 500 million mobile phone handsets after five years of its operations. Nokia's Chennai facility is based on the Nokia's global standards and can manage the production of all types of Nokia's handsets from low-end to high-end phones. For more information, see the webpage of

ranked as one of the top 10 major markets of Nokia, in terms of net sales, in spite of the fact that Nokia has no mobile device manufacturing facility in Indonesia. On another front, in Indonesia, Nokia has the largest market share, about 60%, for mobile phone sales.

5. CONCLUSION

This chapter has overviewed the development and current status of trade in machinery between the ASEAN and India. The observed facts are summarized as follows. First, the relative importance of the ASEAN as destination of India's exports of machinery has nearly doubled over the last few years; in 2009, almost one fifth of India's machinery exports were shipped to the ASEAN. Second, the proportion of machinery in the ASEAN's total imports from India has doubled over the last several years though not up to the level of the machinery's share for the ASEAN's export side. The increase in the machinery's share was due solely to the increased imports of finished machinery products by the ASEAN from India. Meanwhile, in the ASEAN's exports to India, the proportion of machinery parts has gradually increased over the last decade. Third, the ASEAN member statescentering on Singapore have become to export more machinery parts including computer parts and accessories and electric integrated circuits to India. On the other hand, the ASEAN member states have significantly increased imports of finished machinery products including mobile phones from India in the last several years, which is especially true for Indonesia and

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Nokia India:http://www.nokia.co.in/about-nokia/company/manufacturing-in-india.

Singapore.

What is interesting about the last point is that the Nokia's launch of mobile device manufacturing facility in India appears to greatly affect the volume of transactions between India and the ASEAN member states. The global production strategy of a single company could shape trade patterns between two countries with weak trade relationships. Such a Nokia's impact on the ASEAN's machinery imports from India would suggest that developing economies like India ultimately need to take serious and effective measures to attract foreign firms in order to enhance trade relations with other countries. Indeed, on its webpage, Nokia India announced high expectations regarding investment climate in Chennai. Due to the availability of skilled labor, support from the state government, and the existence of good logistics connections, Chennai was selected as the location for the Nokia's manufacturing facility. In addition to having a great impact on India's exports of mobile phones to the ASEAN, the Nokia's launch of mobile device manufacturing facility appears to serve as the catalyst for industrial development in Chennai. Other electronic manufacturing companies have announced to plan to invest in Chennai since the Nokia's launch. In the meantime, the Nokia Telecom SEZ Park houses five global component suppliers as of May 2011, creating employment opportunities exceeding 25,000. Domestic component suppliers and service providers are also expected to take part in and gain benefit from this emerging industrial agglomeration.

APPENDIX

A1. Data description

I used international trade data, obtained from the UN Comtrade online database, at the 6-digit level of the Harmonized System (HS) commodity classification, which is the most detailed disaggregated level of trade data that is both internationally comparable and publicly available. At the HS 6-digit level, since the annual data below $500 (current US$) are not reported before 2000, trade flows below $500 are treated as if there was no trade at all for all the years in the sample. After the cutoff value of $500 is applied, all trade data are deflated by the consumer price index (CPI) in the United States to obtain a constant dollar series. Versions of the HS classification vary by country and by year (see Table A1). Basically, I used data based on the latest version of the HS classification as reported in the UN Comtrade.

As for the Philippines' exports and imports in 1990 and 1995 and Viet Nam's exports and imports in 1990, 1995, and 2009, I used mirror data with appropriate modification. For example, to estimate the value of bilateral imports by the Philippines, the observed value of the corresponding bilateral exports by the trade counterpart is multiplied by 1.05. The multiplier 1.05 is employed as a proxy to adjust export values on an f.o.b. basis to import values on a c.i.f. basis, following Ando (2006).

As for the industry classification, the HS 2-digit tariff lines are classified into seven broad categories. The aggregated seven industries include animals, plants, and foods (HS1-24); minerals and mineral products (HS25-27); chemicals and chemical products (HS28-40); light manufactured goods (HS41-71); metals and metal products (HS72-83); machinery (HS84-92); and other products (HS93-97). The details of the industry

classification are summarized in Table A2. Manufactured goods range from HS28 to HS92.

Table A1: Versions of the HS Classification Employed by the ASEAN Member States and India

	1900	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Indonesia	HS1992	HS1992	HS1996	HS1996	HS1996	HS1996	HS1996	HS1996	HS1996	HS1996	HS1996	HS1996
Malaysia	HS1992	HS1992	HS1996	HS1996	HS2002	HS2002	HS2002	HS2002	HS2002	HS2002	HS2002	HS2007
Philippines	..	..	HS1996	HS1996	HS1996	HS1996	HS1996	HS1996	HS1996	HS2002	HS2002	HS2002
Singapore	HS1992	HS1992	HS1996	HS1996	HS2002	HS2002	HS2002	HS2002	HS2002	HS2007	HS2007	HS2007
Viet Nam	..	..	HS1996	HS1996	HS1996	HS1996	HS2002	HS2002	HS2002	HS2002	HS2007	..
Thailand	HS1992	HS1992	HS1996	HS1996	HS2002	HS2002	HS2002	HS2002	HS2002	HS2007	HS2007	HS2007
India	HS1992	HS1992	HS1996	HS1996	HS1996	HS2002	HS2002	HS2002	HS2002	HS2002	HS2002	HS2007

Source: UN Comtrade

Table A2: Industry Classification based on the HS Classification

Category of industry	Subcategories
Animals, plants and foods (HS1-24)	Live animals; edible products of animal origin (HS1-5)
	Live plants; edible vegetables and fruits; vegetable products (HS6-14)
	Animal or vegetable fats and oils (HS15)
	Edible preparations; beverages; tobacco (HS16-24)
Minerals and mineral products (HS25-27)	
Chemicals and chemical products (HS28-40)	Chemicals and chemical products (HS28-38)
	Plastics and articles thereof; rubber and articles thereof (HS39-40)
Light manufactured goods (HS41-71)	Raw hides and skins; leather and articles thereof; fur skins and fur products (HS41-43)
	Wood and articles thereof; wood charcoal; cork and articles thereof; straw and esparto products (HS44-46)
	Pulp, paper, and paperboard and articles thereof; products of printing industry (HS47-49)
	Textile fibers; yarn; textile and woven fabrics; articles of apparel and clothing accessories (HS50-63)
	Footwear; headgear; umbrellas and sticks (HS64-67)
	Articles of stone, plaster, cement, asbestos and mica; ceramic products; glass and glassware (HS68-70)
	Natural or cultured pearls, precious or semi-precious stones (HS71)
Category of industry	Subcategories
Metals and metal products (HS72-83)	
Machinery (HS84-92)	Machinery and mechanical appliances and parts thereof; electrical machinery and equipment and parts thereof (HS84-85)
	Vehicles and parts thereof; aircraft, spacecraft, and parts thereof; ships, boats and floating structures (HS86-89)
	Optical, photographic, cinematographic, measuring, checking, precision, medical instruments; clocks and watches and parts thereof; musical instruments and parts and accessories thereof (HS90-92)
Other products (HS93-97)	Arms and ammunition and parts and accessories thereof (HS93)
	Miscellaneous manufactured articles (HS94-96)
	Works of art, collectors‘ pieces and antiques (HS97)

Source: UN Comtrade

Machinery here includes all the goods classified as part of general machinery (HS84), electric machinery (HS85), transport equipment (HS86-89), and precision machinery (HS90-92) sectors. For this product group, we grouped the HS commodity codes into parts and components and finished products. As for the definition of machinery parts and components applied here, see Kimura and Obashi (2010). Kimura and Obashi provide the lists of machinery parts and components at the HS 4-digit and 6-digit levels for various versions of the HS classification, which are the modified versions of the list originally proposed by Ando and Kimura (2005).

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