# Chapter 5

# Fragmentation of Electronics and Textile Industries from Indonesia to CLMV Countries

**Siwage Dharma Negara**
The Indonesian Institute of Sciences (LIPI)

March 2010

**This chapter should be cited as**
Negara, S. D. (2010), 'Fragmentation of Electronics and Textile Industries from Indonesia to CLMV Countries', in Banomyong, R. and M. Ishida (eds.), *A Study on Upgrading Industrial Structure of CLMV Countries*. ERIA Research Project Report 2009-7-3, Jakarta: ERIA. pp.158-220.

# CHAPTER 5

# FRAGMENTATION OF ELECTRONICS AND TEXTILE INDUSTRIES FROM INDONESIA TO CLMV COUNTRIES

***Siwage Dharma Negara***[1]

**Abstract**

The electronics and textiles industries are illustrative of the development of Indonesia's manufacturing sector. The two industries experienced ups and downs due to changes in government industrial policy, which, in turn, was made in response to changes in the external environment. In recent years, these industries faced intense competitive challenges both in the domestic and the international markets. This study examines the development of the electronics and textiles industries in Indonesia and assesses the possibility of fragmentation or relocation of some or all parts of production-process activities to other low-labor-cost countries, especially Cambodia, Laos, Myanmar, and Vietnam (CLMV). Results from a small-scale survey find that profit is the main factor for firms in Indonesia to relocate to CLMV countries. Most respondent firms considered Vietnam as one prospective destination for fragmentation due to its relatively strong investment incentives, infrastructure, and access to market. In contrast, CLM countries were perceived to be less attractive compared with Vietnam due to their relatively less

[1] I would like to thank the survey team consisting Inne Dwiastuti, Umi Karomah, Purwanto, Lia Listiani, and Dhani Darmawan for their excellent contribution. This study is part of a big study project titled "Upgrading Industrial Structure in CLMV Countries" under the ERIA research project on the "Comprehensive Asian Development Plan," sponsored by IDE-JETRO, Japan.

favorable business climate. For firms to consider moving to CLM countries, the latter needs to offer more than just lower wages. CLM countries need to provide better infrastructure, better investment incentives, and a more competitive business climate to enable firms to operate efficiently.

Key words: Fragmentation, Electronics, Textile, Garment, ASEAN, CLMV

## INTRODUCTION

Since the beginning of the 1990s, trade and foreign direct investment (FDI) patterns in Southeast Asia have changed considerably. Ando and Kimura (2005) observed a gradual shift from the north-south trade pattern toward trade concentration in East Asia. They find considerable development of intense transactions in parts and components among East Asian countries, particularly in line with division of labor in the production process. Export-oriented or network-forming-type FDI has been replacing import-substituting-type FDI. In addition, there is significant development of international production networks (IPN) amplified with growing fragmentation in production activities.

Specifically, the electronics industry was mentioned in Kimura (2007) as a good example of an industry that is suited to fragmentation strategy. In this sector, production processes are well diversified and service link cost, including communication and transportation costs, is low such that the industry can benefit from diversity in location advantages. In contrast to the electronics industry, the textiles industry is characterized by strong economies of scale in production and high service link cost. This latter sector

may not be suited for fragmentation. Examining these two sectors would be of particular interest to add to the empirical stylized facts on the phenomenon of fragmentation.

In Indonesia, the electronics and textiles industries are illustrative of the development of the country's manufacturing sector. The two industries experienced ups and downs due to changes in government industrial policy, which was designed to respond to changes in the external environment. The industries face intense competitive challenges both in the domestic and the international markets. Particularly, Thee and Pangestu (1998) mentioned that both the textiles and electronics industries are confronted with quite different situations. For instance, the textiles industry, including the garment industry, needs to acquire technological capabilities to increase productivity and maintain export competitiveness against other lower-cost countries such as China, India, Bangladesh, and Vietnam. The electronics industry, on the other hand, needs to invest in learning and in sustaining foreign technology linkages to adapt to very dynamic global production and process innovations. Therefore, the latter requires firms' deeper integration into the international production network.

The fragmentation of the electronics and textile industries may be triggered by increased global competition, which motivates firms to relocate part or all of their production-process activities. The motivation could be due to factors such as market expansion, the need to find local resources, the need to increase efficiency, or any combination of these. In particular, for Indonesia, the rise in labor cost in the post-reform era has made labor-intensive industries like textiles and garments become less competitive compared with other low-labor-cost countries such as China, India, Bangladesh, and Vietnam. In addition, the labor regulations in Indonesia have been

perceived as too rigid for firms to make adjustments in the midst of weakened global demand. Therefore, firms are likely to consider moving in order to obtain access to cheaper labor and more flexible labor regulations.

This study examines the development of the electronics and textiles industries in Indonesia and assesses the possibility of fragmentation or relocation of some or all parts of their production-process activities to other low-labor-cost countries—Cambodia, Laos, Myanmar, and Vietnam (CLMV). This study aims to answer the question of why would firms in Indonesia make the decision to relocate some or all of their production activities to CLMV countries or not at all. What factors need to be present in CLMV countries for these Indonesian firms to consider moving? And finally, in terms of set-up cost, operation cost, and service link cost, is relocation to CLMV countries reasonable from the viewpoint of Indonesian firms?

The finding shows that profit is the main factor for firms in Indonesia to relocate to CLMV countries. Most respondent firms consider Vietnam as an attractive destination for fragmentation or relocation. Vietnam offers not only strong investment incentives through tax holidays but also better infrastructure. Meanwhile, firms believe that it currently remains too risky to invest in CLM countries due mainly to the less favorable business climate there. CLM countries need to offer more than just lower wages in order to attract FDI. It is also important for CLM countries to improve the quality of infrastructure, provide strong investment incentives as well as a more competitive business climate to enable firms to operate efficiently.

This report is organized as follows: the next two sections provide a brief historical development of the electronics and textiles industries in Indonesia. The third section

examines the survey findings and assesses the firms' decision to relocate to CLMV countries. The last section concludes and provides some policy recommendations.

# 1. HISTORY, INDUSTRIAL STRUCTURE, AND CURRENT SITUATION OF THE ELECTRONICS INDUSTRY IN INDONESIA

## 1.1. Brief History of the Electronics Industry in Indonesia[2]

The history of the electronics industry in Indonesia can be traced back to the 1950s with the pioneering work of PT Transistor Radio Mfg. Co. (now known as PT National Panasonic Gobel Indonesia) as the first domestic producer of transistor radios. The early 1960s became a new beginning for Indonesia's electronics industry with the first production of black-and-white television. At that time, most, if not all, electronic products in the country were imported.

In a bid to boost the development of the local electronics industry, the government in the early 1970s banned imports of television sets and radio receivers in the form of completely built-up (CBU) products.[3] Indonesia's electronics industry was developed starting with the Original Equipment Assemblies (OEA) system, which took advantage of the country's low labor cost. OEA was operated in the form of the semi-knockdown (SKD) production method, which installs components to become a TV set, for instance.

[2] See Thee and Pangestu (1998) for detailed history and development of the technological capabilities of the electronics and textile and garment industries in Indonesia.

[3] The period 1971-1985 is considered as the import substitution phase, when local industries were protected by both quantitative restrictions and tariffs. The quantitative restrictions included the launch of a 'negative list' whereby the import of prescribed items was banned to protect domestic component industries. In addition, the government restricted the import of electronic goods and electrical appliances only for domestic assemblers linked to a foreign principal (Thee and Pangestu, 1998: 222-223).

However, since SKD was later perceived to have low value added, the government encouraged the industry to upgrade its production method from SKD to a completely knockdown (CKD) system. In relation to this, imports of products in CKD form were regulated with low import duty to boost the local assembly industry.

Around the 1970s, the government launched a policy to stimulate joint ventures between domestic investors and foreign companies. The policy resulted in some initial flow of FDI from Japanese and European multinational companies. Japanese companies, like National and Sanyo, and European companies, such as Grundig, Philips, and ITT, established branches in the country. These companies focused on the production of import-substitution products. By 1973, there were about 15 companies operating both as sole agents of foreign brands (*Agen Tunggal Pemegang Merk* or ATPM) and as producers of local brands. Some of the sole agents of foreign brands were PT Yasonta as the sole agent of Sharp television; PT Sanyo Industries Indonesia as the assembler of radio, television, and household electrical appliances under the Sanyo brand of Japan; PT National Gobel as the assembler of radio, television, and household electrical appliances under the National brand of Japan; and PT Asia Electronics Corp. as the assembler of radio and television under the Grundig brand of Germany. Despite those companies selling foreign brands, a few domestic electronics companies with local brands were also established such as PT Galindra Electric Ltd and PT Telesonic as an assembler of radio, television, and tape recorder.

From 1973 onward, the type of products expanded significantly beyond just radio, television, and tape recorder. In 1978, the government issued what was called the "deletion program," setting the schedule for producers to use local components to reduce dependency on imported components. The regulation was expected to encourage

more local electronics producers to become component makers. In addition, the government invited some electronics producers to invest in component production. Some of the producers such as PT National Gobel responded to the call by building production facilities for speakers. Other companies produced mechanical parts, transformers, and cables. The deletion program was later abandoned to coincide with a series of deregulation measures launched by the government in various sectors of trade and industry in the mid-1980s. Since then, the program to speed up the process toward full manufacturing in the electronics industry has been held back.

The mid-1980s was considered a new chapter in the development of the local electronics industry. The introduction of several deregulation measures, which marked the shift from import substitution toward an export-oriented policy, has encouraged both joint ventures and local electronics producers to increase their consumer electronics exports.[4] By 1985, the number of electronics companies increased to 58. In addition, several new brands of electronics entered the market including Toshiba (assembled by PT Wily Antariksa Electronics), ITT (assembled by PT Alfa Intone Internasional), Pioneer (assembled by PT Adab Alam Electronics), Belna (assembled by PT Ben Elektronik Nasional), Polytron (assembled by PT Hartono Istana Electronics), and Intel (PT Panggung Elektronik).

The 1997 Asian financial crisis dealt a big blow to the electronics industry in Indonesia. A number of domestic and foreign companies were forced to stop operations. The industry suffered a sharp decline in domestic demand during the peak of the crisis in 1998 and 1999. The setback was caused by sudden drop of household purchasing

[4] Thee and Pangestu (1998: 226) explain that domestic firms shifted towards exports because of increased competition in the domestic market after export-oriented companies were given official permission to sell some of their output in the domestic market.

power. With the dramatic depreciation of the rupiah, the price of electronic products increased significantly. Since the demand for consumer electronic products is income elastic, a small increase in prices leads to a dramatic fall in demand. Interestingly, the total value of electronics market did not change much in terms of the rupiah. This means that the decline in production has been more than compensated for by an increase in prices following the fall of the rupiah. Another interesting phenomenon is that Indonesia's electronics exports increased following the dramatic fall of the rupiah. This boost in exports has helped the industry recover faster than expected.[5]

Unfortunately, the quick recovery of the domestic market did not contribute to revival of the local electronics industry. On the contrary, the growing market drew large imports that served another blow to the country's industry, producing products for the lower segment of the market. An electronics producers association (GABEL) estimated that illegal imports, mainly from China, accounted for around 30% to 40% of the total domestic market.[6] Due to uncontrollable illegal imports, several local producers were forced to stop operation or become traders. The latter found it more profitable to import products from China to be sold on the local market with their own brands.

A year before the 1997 Asian financial crisis, PT Tabung Gambar Indonesia and PT Goldstar Display Devices Indonesia set up a factory producing cathode ray tubes (CRTs) for televisions. In the same period, other factories, such as PT Sharp Semiconductor Indonesia, PT NEC Semiconductor Indonesia, and PT Panasonic Semiconductor Indonesia opened factories producing active components, mainly semiconductor devices and integrated circuits (ICs).

[5] The competitive gain of electronics exports was only short-lived as high domestic inflation rate finally eroded the international relative price difference. Basri and Hill (2008) show that Indonesia's real effective exchange rate (REER) appreciated by almost 50% during the period 2001-2008.

[6] Based on an interview with GABEL in late October 2009

In the early 2000s, a new era for the TV industry started with technological breakthroughs that included CRT technology, plasma display panels (PDP), and liquid crystal display (LCD) technologies. From then on, the TV market began to be dominated by plasma and LCD TV sets, and consumers slowly moved away from conventional CRT TV sets. Due to high demand for LCD TVs in Indonesia, several principals (e.g., Sharp, Toshiba, Panasonic, LG, and Samsung) have decided to make Indonesia their production base for LCD TVs. In 2005, PT LG Electronics Indonesia (LGEI) opened a production facility for LCD TVs with a capacity of 50,000 units of LCD TVs per month. Similarly, PT Panasonic Gobel Indonesia started producing LCD TVs in January 2007 with a production capacity around 50,000 units of LCD TVs and plasma TVs per month. Around 60% to 90% of television components needed in the country are still imported. LG imports the panels of its LCD TVs from South Korea while about 30% to 40% of the components are procured locally. Panasonic imports its LCD panels from Japan. Toshiba imports most of its components (more than 90%) from Japan and Taiwan.

Currently, the television market is no longer dominated by Japanese and Korean technologies. PT Changhong Elektronik Utama of Sichuan Changhong Electronics Co., Ltd, known as the top producer of television sets in China, has entered the market. Although its market share in Indonesia is still small, Changhong is already the fourth-largest producer of plasma TV panels elsewhere after Panasonic, LG, and Samsung. In a bid to boost its TV sales, Changhong has come out with a number of new models of plasma and LCD TVs for the high-end market.

Part of the reason why the television market is booming is that the government has offered fiscal stimulus, including the abolition of the luxury sales tax for electronic

goods and direct customs control in the red lane in order to support the development of the local electronics industry. After the removal of luxury taxes for electronics in the first quarter of 2003, sales of electronic products grew 6% annually. The reason behind this drive is that previous luxury taxes, because of poor law enforcement and corrupt tax/custom officials, have constrained domestic production but encouraged rampant smuggling.

In retrospect, Indonesia has been quite unsuccessful so far in developing close connections with the international production network. This failure stems from various factors, including an unfavorable investment climate, low labor productivity, poor security, rampant smuggling, and poor infrastructure. The closure of Sony Electronics Indonesia in May 2003 after operating locally since 1991 should actually serve as a warning to the domestic electronics industry. Ironically, Indonesia never seems to learn from its past policy failures. As Booth (1998) argues, Indonesia has missed the opportunity to be part of the semiconductor production network with the relocation of Fairchild and NSC in 1986 due to an unfavorable investment policy that discouraged automation in semiconductor factories. On these two occasions, the companies' drive for efficiency by scaling down their labor force received negative reactions from society and the government, both of which were against any retrenching. These two stories should serve a lesson that it is not very difficult for multinational companies to relocate their electronics production to another place that offers a better environment (e.g., better incentives and facilities, lower production cost). Sony Electronics Indonesia moved to Malaysia and Thailand because these two countries offered a more favorable business environment.

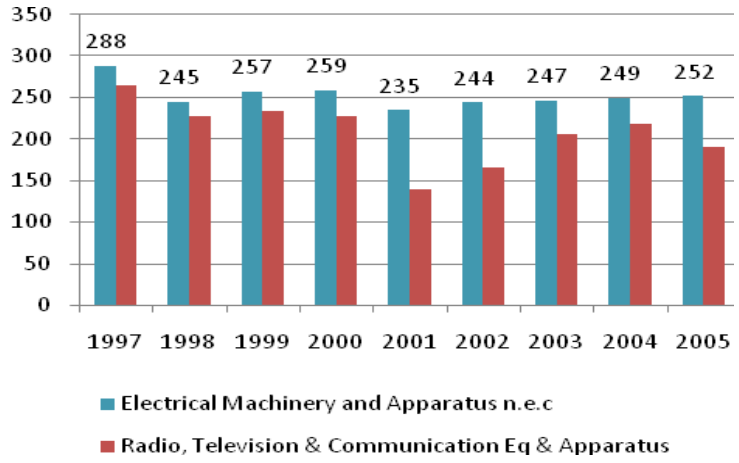
### 1.2. Structure of the Electronics Industry

The electronics industry can be classified into three categories: consumer electronics (e.g., audio, video, television, air conditioner, refrigerator, and washing machine); industrial electronics (e.g., office equipment, data processors, and telecommunication); and components electronics. Indonesia's consumer electronics industry has been relatively well developed. It uses easily available technology and machines that are also commonly used in other manufacturing industries (e.g., injection-molding machines, inserting machines, dipping machines, press machines, steel roll-forming equipment, other machine tools). The relatively simple technology requirements of the consumer electronics industry has made the relocation of consumer electronics factories relatively easy. The industrial electronics industry has experienced significant development supported by the booming communication and telecommunication sector.

The weakest segment in the electronics industry is the components industry. This supporting industry remains relatively underdeveloped, causing high dependency on imported components. Local component makers are still limited in terms of number and product innovation. Majority of domestic component makers produce low-technology components, such as plastic, rubber, and metal parts; passive components; mechanical parts, such as speakers, transformers, heat sinks, jointing cables, flyback transformers, and printed circuit boards (PCBs).

In terms of number of firms, output, and employment, the electronics industry in Indonesia is relatively small compared with the textiles industry. According to a survey of large and medium-sized manufacturing companies conducted by Statistics Indonesia

**Figure 1: Number of Medium and Large Electronics Firms Based on the Manufacturing Survey 1997-2005**



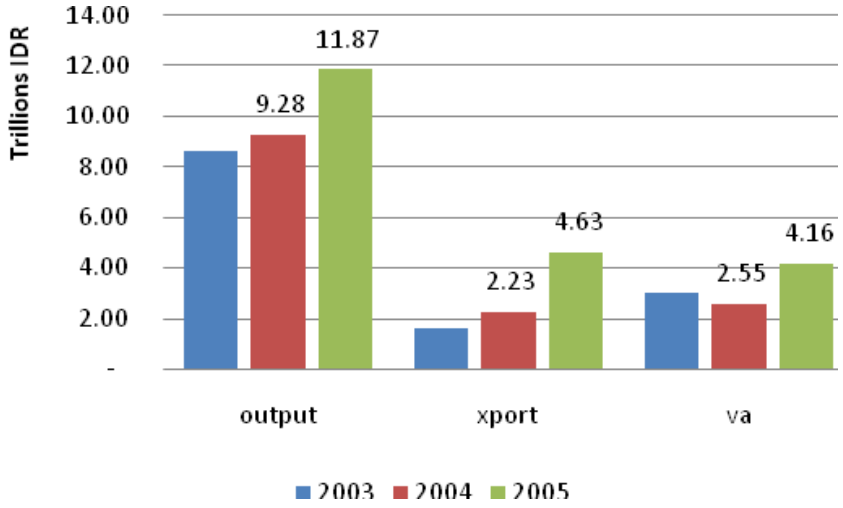

*Source*: Annual Medium and Large Manufacturing Survey BPS.

(BPS), there were less than 500 firms operating in the electronics industry[7] in 2005 (see Figure 1).

In 2005, the electronics industry produced output valued at IDR 12 trillion (approximately US$1.25 billion), of which about 40% or IDR 5 trillion (approximately US$0.52 billion) was exported. These large and medium-sized electronics firms produced mostly lower-technology electronic products. This is predictable given its high proportion of unskilled labor in its total labor input. About 90% of its total labor input is classified as operators. (See Figure 2 and Figure 3.)

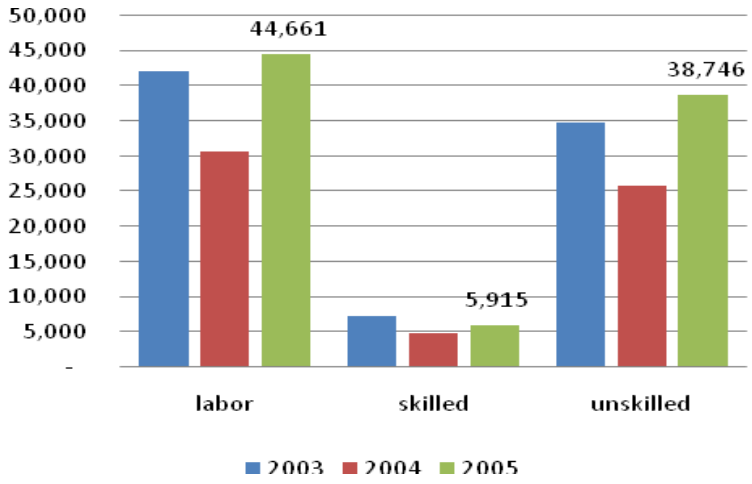
[7] This figure is likely to be undervalued due to under-reporting and missing data. Moreover, it does not include small-scale firms. The BPS survey only includes firms that employ at least 20 workers. Nonetheless, in contrast to the textile industry, this number is very small.

**Figure 2: Number of Output, Export, and Value Added in the Electronics Industry Based on the Manufacturing Survey 2003-2005**




*Source*: Annual Medium and Large Manufacturing Survey BPS.

**Figure 3: Number of Employment in the Electronics Industry Based on the Manufacturing Survey 2003-2005**




*Source*: Annual Medium and Large Manufacturing Survey BPS.

The electronics industry is dominated by assembly operations with simple modification-of- production capability. Only a small number of companies have the capability for basic modification, design, and engineering innovation. Viewed from the point of production structure, most electronics firms are highly dependent on imported components and parts. Sole agents of foreign brands import components and parts from the principal. Even local brand producers mostly import their main components and parts. This marks the failure of the country's efforts to develop its supporting industry since the late 1970s.

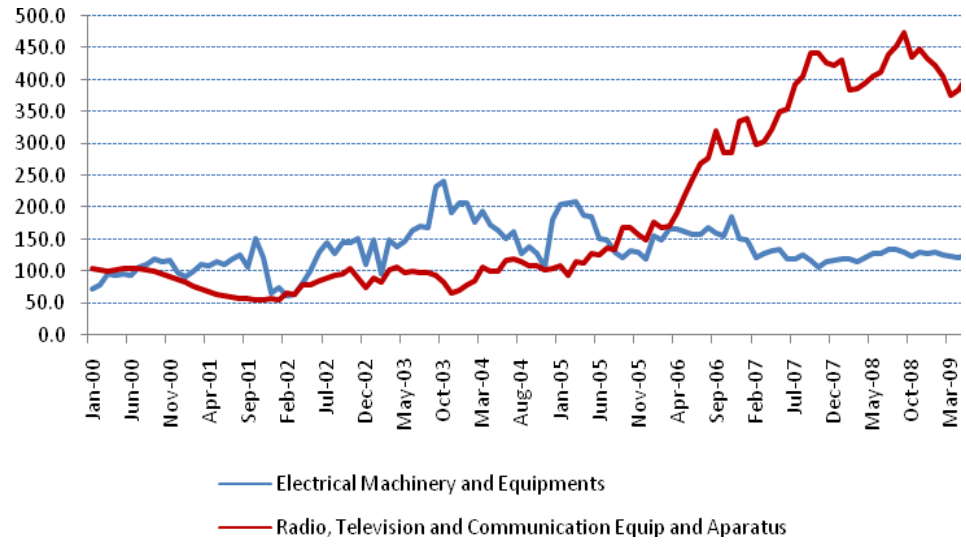
### 1.3. Current Situation of Indonesia's Electronics Industry

Indonesia has a huge potential for the electronics market. The value of the domestic consumer electronics market in 2008 was estimated at about IDR 29 trillion (approximately US$3.1 billion). Indonesia's Chamber of Commerce projected the domestic demand for TV sets to reach IDR 11.2 trillion (approximately US$1.2 billion) in 2010. In addition, the total domestic demand for air conditioners, refrigerators, and washers is estimated to reach approximately IDR 9.2 trillion (approximately US$ 1 billion) in 2010.[8]

Figure 4 indicates that there has been a sharp increase in demand for TV sets and communication equipment since the second quarter of 2006. In fact, there has been an increased demand for LCD TVs and plasma TVs both domestically and worldwide since 2005. Meanwhile, the production of other electrical machinery and equipment has been relatively stagnant.

[8] US$1=IDR 9,500

**Figure 4: Monthly Electronics Industrial Production Index, January 2000 – June 2009**




*Source*: Monthly survey of selected firms (medium and large manufacturing establishments) BPS.

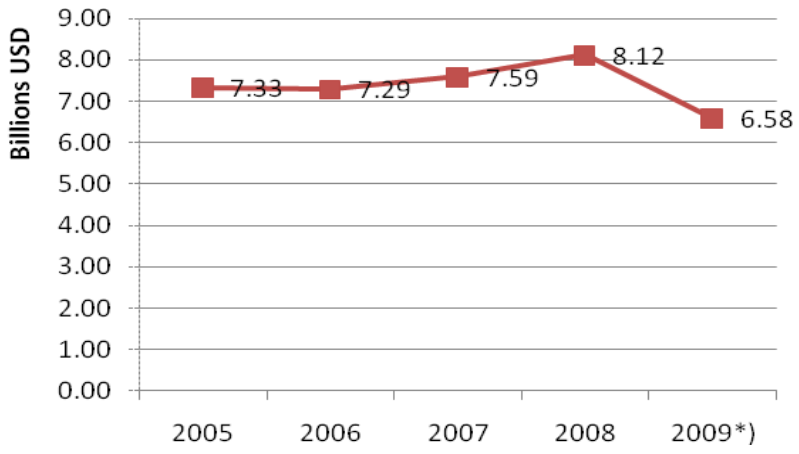
The rate of growth of TV sales in Indonesia is among the highest when compared to other electronic appliances. Cost efficiency of television sets have also improved considerably due mainly to three factors. First, the number of components in a television set has decreased significantly, which has led to shorter assembly lines. Second, there has been a vast increase in automation, which was pioneered by Japanese firms. This has dramatically decreased the cost of labor in production. Finally, the logistic cost for imported TVs is relatively low compared to that of other electronic products, such as refrigerators and washers.

Despite the huge market potential, however, the production capacity of the electronics industry has not been fully utilized. The country's production capacity for

electronic products is more or less the same as in 1997. Therefore, the market does not require expansion of production capacity yet. The low-capacity utilization in the electronics industry is partly contributed by low household purchasing power. Consumers are sensitive to changes in price as indicated by market revival when cheap products from China began to enter the domestic market. Domestic electronics producers, especially the ones operating in the lower segment of the market, suffered the worst setback as they could not compete with cheap imported products mainly from China.

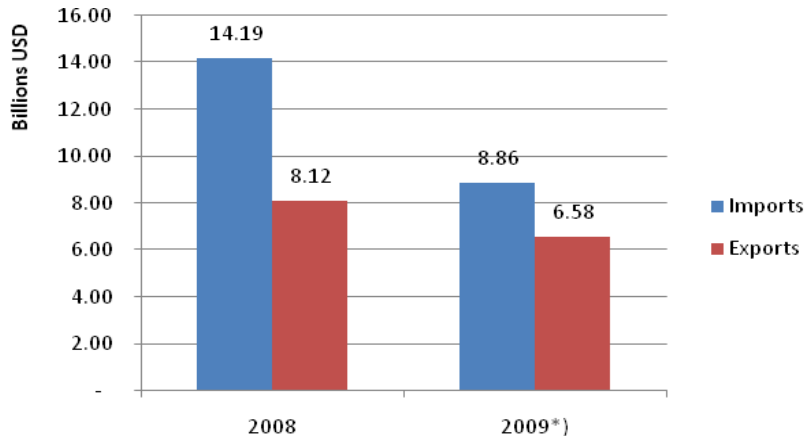
Electronics exports were affected by the global financial crisis as can be seen by the decline in electronics exports from US$8.12 billion in 2008 to only US$6.58 billion in the last quarter of 2009 (Figure 5). In fact, complete trade data incorporating imports

**Figure 5: Export value of electrical machinery, sound recorders, TVs, etc., 2005-October 2009**




*Note*: *) Period of January-October.
*Source*: BPS via CEIC and World Bank.

**Figure 6: Trade Deficit in the Electronics Sector**




*Note*: *) Period of January-October.
*Source*: BPS via CEIC and World Bank.

from all areas in the country, including data from the bonded zones,[9] show that Indonesia has a trade deficit in this sector. In 2008, the deficit in electronics trade reached US$6 billion. In 2009, the trade deficit was expected to be smaller at about US$2 billion (Figure 6).

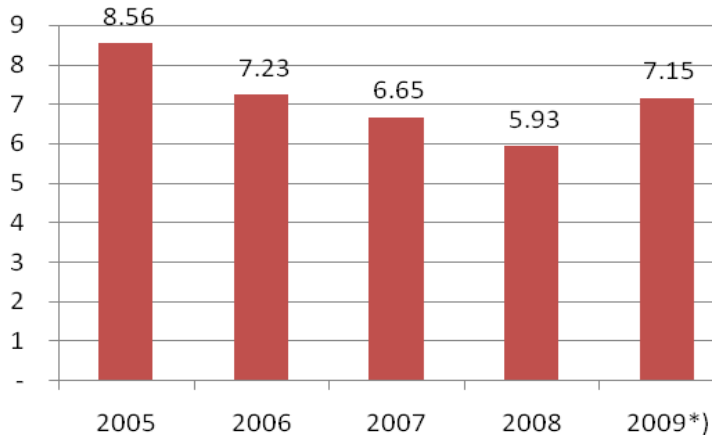
Another interesting phenomenon is that the share of electronics exports of the total manufacturing exports has been continuously declining from 8.56% in 2005 to 5.93% in 2008. In the period 2004-2005, electronics exports, which were valued at US$7.1 billion, still ranked second after textiles out of total manufacturing exports valued at US$48.7 billion. In 2006, steel, machinery, and automotive components exports overtook electronics exports as the second-largest contributor to the country's

[9] A bonded zone is an area of a country where some normal trade barriers such as tariffs and quotas are eliminated and bureaucratic requirements are lowered in hopes of attracting new business and foreign investments. BPS started recording import data in the bonded zone starting January 2008, while in the past it was not counted in the country's import value.

manufacturing exports. Since then, the significance of electronics exports has been reduced. In 2008, it ranked only fifth out of total manufacturing exports valued at US$88.4 billion. Due to a worldwide rise in commodity prices in 2007-2008, particularly in the price of crude palm oil (CPO), the structure of Indonesia's exports changed. During the commodity boom period, exports of the CPO industry emerged as the country's major export revenue earner, surpassing even the textile industry. Indeed, the textile industry has to face its declining importance as the country's export revenue earner due to various domestic obstacles. This is discussed in the next section.

Interestingly, after the drop of in commodity prices since the last quarter of 2008, exports of electronics fell less quickly than the exports of CPO. The latter was affected significantly by the price factor. Meanwhile, the value of electronics exports have been

**Figure 7: Share of the Electronics Exports of the Total Manufacturing Exports (in percentage)**




*Note*: *) Period of January-October.
*Source*: BPS via CEIC and World Bank.

less affected, which made its share of total manufacturing exports jump to 7.2% in the period of January-October 2009 (Figure 7). This phenomenon shows that the structure of Indonesia's exports is determined mainly by its comparative advantage as a country rich in natural resources. It is still highly dependent on products such as CPO, coal, copper, and rubber and less dependent on high-technology exports.[10] This corroborates the study of Coxhead and Li (2008), which found that due to Indonesia's relative resource abundance, the country's effort to diversify its production and trade has been somewhat impeded. Indonesia remains sluggish in developing its skills-intensive manufacturing exports, which constrains it from achieving sustained higher growth rate.

# 2. HISTORY, INDUSTRIAL STRUCTURE, AND CURRENT SITUATION OF THE TEXTILE AND GARMENT INDUSTRIES IN INDONESIA

## 2.1. Brief History of the Textile and Garment Industries in Indonesia

The modern textile industry in Indonesia began in 1970 when Japanese investors entered the upstream (spinning and synthetic fiber production) industry. During the period 1970-1985, the industry grew sluggishly, its low production output merely enough to fulfill domestic demand in lower-middle market segment. This period was known as the import-substituting period during which the government policy was to develop local industries by shutting out external competition.

In 1986, the textile and garment industries benefited from a favorable investment climate that fostered considerable growth. The end of the oil boom period in 1983

[10] According to information from the Ministry of Industry, about 60% of Indonesia's total manufacturing exports consist of low-technology type of products.

forced the government to shift its policy and focus instead on manufacturing exports. In the late 1980s, a significant number of Korean and Taiwanese garment firms entered the industry.[11] The coming of these foreign companies changed the orientation of Indonesia's textile and garment industries towards exports and transformed them into manufacturers of high-quality products for the upper market segment. During the period 1986-1997, textile and garment exports grew rapidly and became the strategic industry. Garments, in particular, gained importance as the top nonoil export commodity in addition to textiles.[12]

After the 1997 Asian financial crisis, the textile and garment industries entered a difficult period. Production and exports were highly volatile, and the industry faced financial difficulty as the banking sector collapsed and liquidity became a problem. Before the crisis, around 40% of bank lending was channeled to the manufacturing industry, particularly textiles and garments manufacturing. After the crisis, only around 10% to 15% was provided to the whole manufacturing industry. This trend has persisted up to now.

The period of 2003-2006 was characterized by rehabilitation and normalization for most of the manufacturing industry since the country was adapting to a new social and political environment. There were efforts to revitalize the textile industry through some fiscal incentives; however, these efforts did not prosper due to financing difficulties and an unfavorable investment climate. The latter was due partly to the

[11] This period was marked by the relocation of labor-intensive manufacturing industries, especially garment industries from the newly industrialized economies (NIEs) of East Asia--South Korea, Taiwan, and Hong Kong--in order to supply the unutilized import quota in the major markets (U.S. and the European Union) and make use of the strong comparative advantage of Indonesia's low labor cost at that time (Thee, 2009: 566).

[12] Athukorala (2006: 178) mentioned that the expansion of manufacturing exports played a pivotal role in Indonesia's rapid economic growth from the late 1980s to the early 1990s.

controversial Labor Law No. 13/2003, which was perceived to favor workers over employers (see Manning and Roesad 2007). Despite outcries from the employers' association, it turned out that it is politically difficult to amend said law. The proposal to restrict the right to strike, loosen the minimum wage provisions, allow employers to discipline workers, phase out severance pay for dismissed workers, and reduce required payouts was met with massive rallies by thousands of workers.

In mid-2007, the textile and garment industries started to restructure and replace outdated machinery and equipment. A long-standing restraint on banking loans to the textile industry hampered investment in the sector, which worsened the technology level and lowered productivity. But realizing the strategic position of the textile industry in the economy, the government introduced a subsidy program of US$27 million to modernize the ageing textile industry.

### 2.2. Structure of the Textile and Garment Industries

The textile industry in Indonesia can be distinguished into three subsectors. The first subsector is the upstream industry consisting of synthetic fiber makers. This subsector is highly capital intensive and large scale in nature. The second subsector is the midstream industry consisting of the spinning industry (yarn), which is relatively capital intensive and large scale in nature, and the weaving industry (fabric), which is relatively labor intensive. The third subsector is the downstream industry consisting of the highly labor-intensive garment industry (Table 1).

Compared to the electronics industry, Indonesia's textile and garment industries are considered well established and already involve vertical integration from the highly specialized upstream fiber production to the labor-intensive finished garments. The

**Table 1: Profile of Textile and Garment Firms in Indonesia**

| | Products | Type of Technology | Market orientation | Main Player |
|---|---|---|---|---|
| Fiber | Natural fiber<br>Synthetic fiber | High | Domestic (75%)<br>Exports (25%) | Foreign: Japan, India, Austria |
| Spinning | Yarn | High | Domestic (70%)<br>Exports (30%) | Foreign: Japan, India<br>Domestic |
| Weaving | Fabric | Low | Domestic (75%)<br>Exports (25%) | Domestic |
| Garment | Apparel | Low | Domestic (15%)<br>Exports (85%) | Foreign: South Korea, Hong Kong, Taiwan |

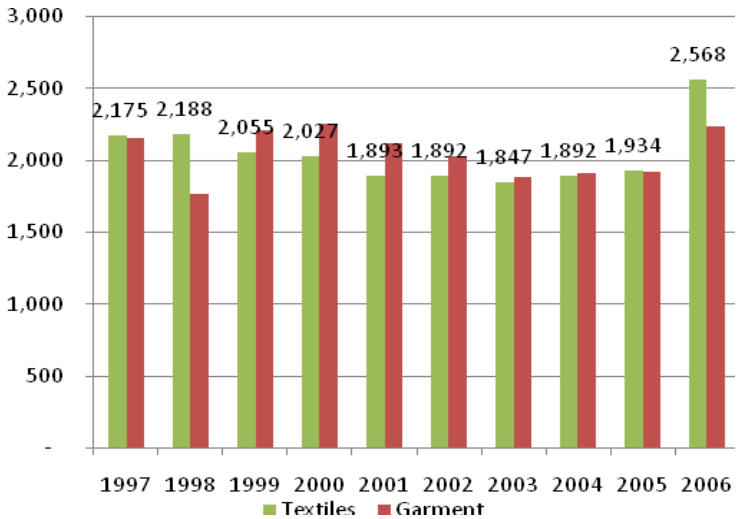
*Source*: Ministry of Industry 2007.

industry has also developed a strong domestic and international distribution network through years of building working relationships.

Based on data from the Indonesian Synthetic Fiber Makers Association (APSyFI),[13] Indonesia is one of the ten largest producers of synthetic fibers in the world, with a total production capacity of 500,000 tons of polyester staple fiber; 825,000 tons of polyester filament yarn; and 30,000 tons of nylon filament yarn. In Asia, Indonesia is ranked sixth after Taiwan, Korea, China, India, and Japan in terms of synthetic fiber production. The products are mostly sold domestically with an annual sale of approximately IDR 3 trillion to 4 trillion (US$ 315-420 million). According to the Indonesian textile association (API), exports of synthetic fiber from Indonesia reached US$445 million in 2008, with Europe as the main destination.

[13] APSyFI represents 14 synthetic fiber manufacturers in Indonesia.

**Figure 8: Number of Medium and Large Textile and Garment Firms Based on the Manufacturing Survey 1997-2005**




*Source*: Annual Medium and Large Manufacturing Survey BPS.

The BPS survey of large and medium-sized manufacturing firms indicate that there were nearly 5,000 firms operating in the textile and garment industries in 2005 (see Figure 8).

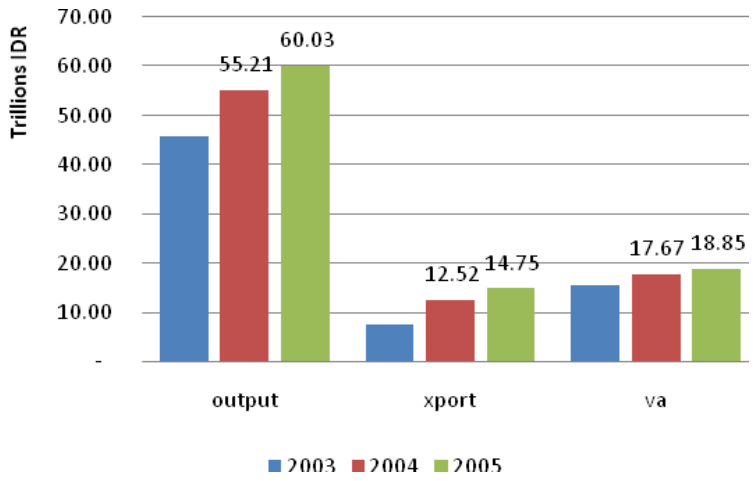
In 2005, the combined output of the textile and garment industries was valued at IDR 60 trillion (approximately US$6.25 billion), of which a quarter, or IDR 15 trillion (approximately US$1.6 billion), was exported. Indonesia's textile producers have been able to continue exporting despite rising competition from other low-cost producers partly because of the quota system in the U.S. and Europe. When the quota system was abolished in 2005, Indonesia's textile industry faced increased competition from China, India, Pakistan, Bangladesh, Vietnam, and Thailand. These countries have been

investing in new machinery and technologies to position themselves strategically in the world market.

In contrast, Indonesia's textile industry is ageing. According to API, around 60% of the installed textile and garment machines are more than 15 years old (API 2009). The technology is obsolete, thus negatively affecting productivity, efficiency, and quality. Approximately 800 out of more than 4,000 textile companies need to replace their old machinery. In short, Indonesia's textile industry needs to revitalize its production facilities through restructuring, reinvesting, and updating existing machines and equipment.

The industry so far plays a bigger role in job creation than in the creation of value added. The low value added of the textile industry can be attributed to its high import

**Figure 9: Number of Output, Export, and Value Added in the Textile Industry Based on the Manufacturing Survey 2003-2005**




*Source*: Annual Medium and Large Manufacturing Survey BPS.

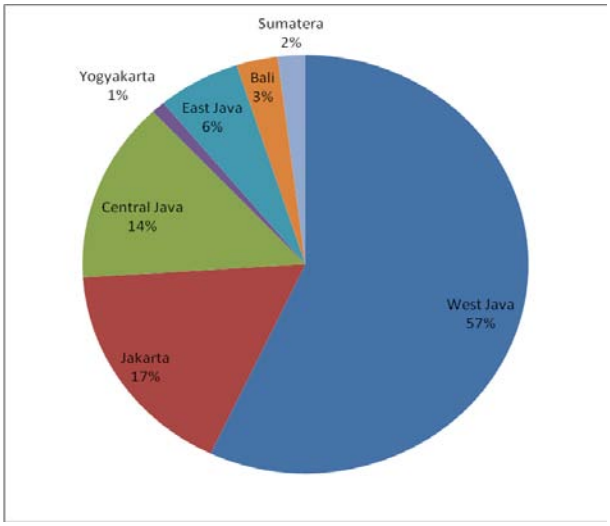
**Figure 10: Number of Employment in the Textile Industry Based on the Manufacturing Survey 2003-2005**


*Source*: Annual Medium and Large Manufacturing Survey BPS.

content. This means that the industry has been unsuccessful in creating backward linkages to the local supporting industry. It is also characterized by a high proportion of unskilled labor to its total labor input; about 90% of its total labor input is classified as operator (See Figure 9 and Figure 10).

Figure 11 shows that textile and garment manufacturing firms are concentrated mainly in Java; 95% of the textile industry is located in this area. West Java accounts for almost 60% of the textile and garment manufacturing firms. This phenomenon can be traced back to the founding of the industry in the late 1920s. It started with a cottage industry in Majalaya, West Java, producing traditional woven and knitted products, such as sarong, long cloth, and scarves.

**Figure 11: Distribution of Textile and Garment Manufacturing Firms by Region, 2007**



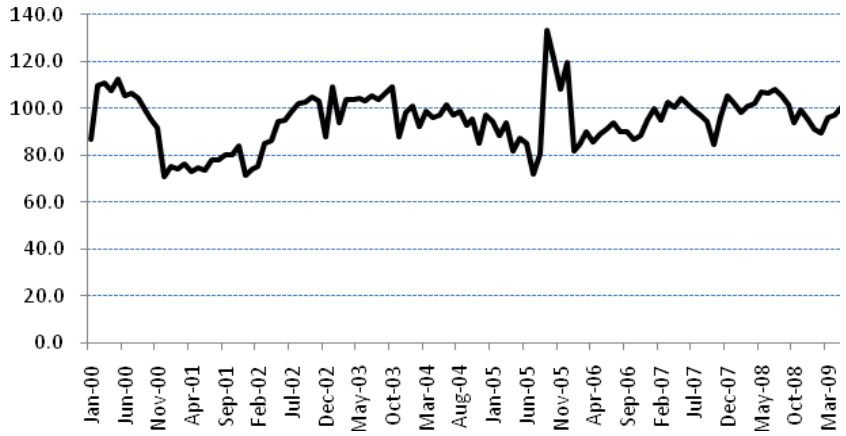

*Source*: BPS.

## 2.3. Current Situation of Indonesia's Textile and Garment Industries

According to the World Trade Organization's (WTO) 2008 international trade statistics, Indonesia's textile exports in 2007 were valued at US$3.83 billion, accounting for 1.6% of total world textile exports. In addition, Indonesia's garment exports in 2007 were valued at US$5.9 billion, accounting for 1.7% of total world garment exports. The United States, Europe, and Japan absorbed the bulk of the exports.

In its June report, the World Bank (2009a) reported that even though the textile industry was affected by the global economic downturn, Indonesia's garment exports experienced strong and sustained growth in 2008. Textile production fell in December 2008; however, quarterly data show a revival in 2009. In addition, despite weaker global financial conditions, Indonesia is still receiving considerable FDI in the textile

**Figure 11: Monthly Textiles Industrial Production Index, January 2000–June 2009**




*Source*: Monthly survey of selected firms (medium and large establishments) BPS.

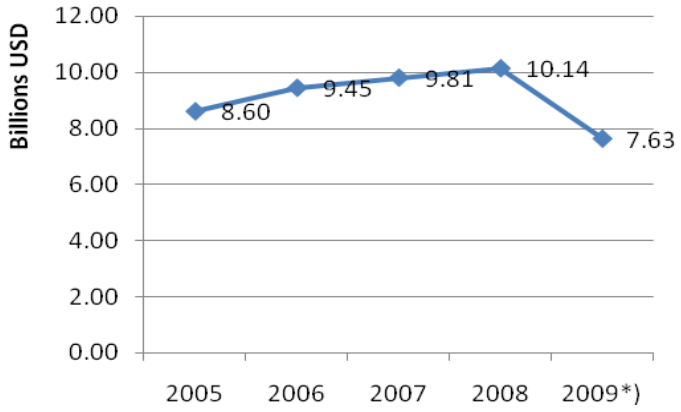
and garment sector. Figure 11 indicates that there was a quick revival of textile industrial production after the market was hit by the global financial crisis.

Like electronics exports, textile exports have also been affected by the global financial crisis as can be seen by the decline in textile exports from US$10.14 billion in 2008 to only US$7.63 billion in the last quarter of 2009 (Figure 12).

While Indonesia is experiencing a trade deficit in the electronics sector, it is still posting a trade surplus for the textile sector. In 2008, the trade surplus in the textile sector reached US$5 billion. The trade surplus for 2009 is expected to be smaller at about US$4 billion (Figure 13).

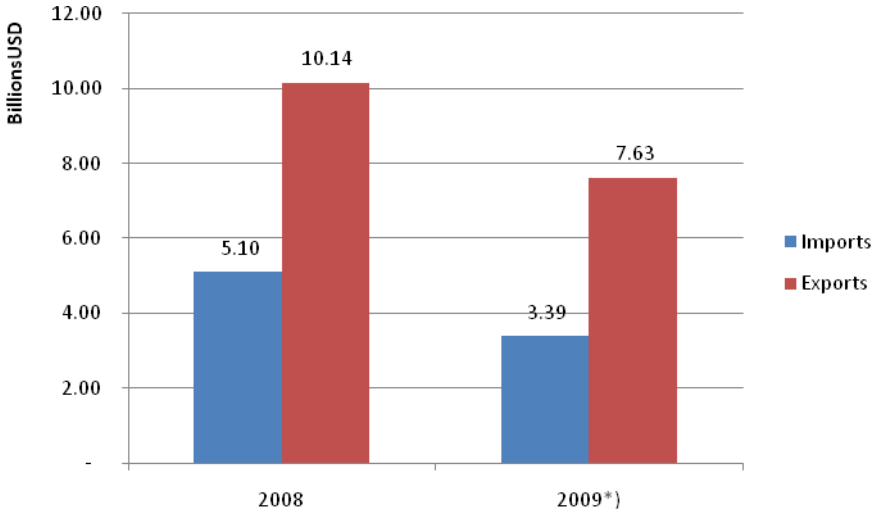
Figure 14 shows the declining share of textile exports in total manufacturing exports. In 2001, textiles and garments accounted for 16.5% of total non-oil exports. This share has been continuously declining since then. In 2009, exports of textiles and garments accounted for less than 9% of total nonoil exports. Like exports of electronics,

**Figure 12: Export value of textiles, 2005-October 2009**



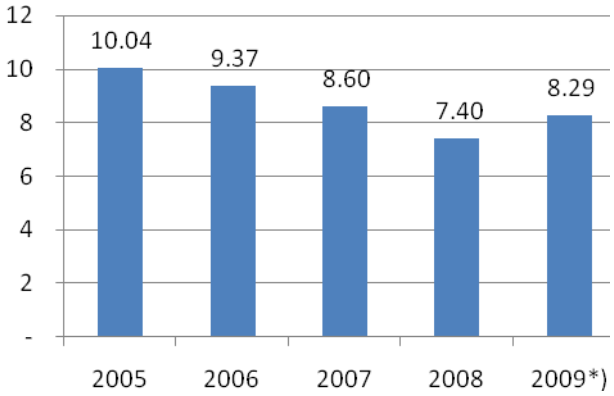

*Note*: *) Period of January-October.
*Source*: BPS via CEIC and World Bank.

**Figure 13: Trade Surplus in the Textile and Garment Sector**




*Note*: *) Period of January-October.
*Source*: BPS via CEIC and World Bank.

**Figure 14: Share of Textile and Garment Exports of Total Manufacturing Exports**




*Note*: *) Period of January-October.
*Source*: BPS via CEIC and World Bank.

the declining share of textile exports is partly caused by the increase in exports of commodities such as CPO and coal. These commodities became significant export revenue earners for the country, especially during the period of booming commodity prices in 2007 and the first semester of 2008. As commodity prices slumped, the share of textile exports in total manufacturing exports increased in 2009.

Along with the global economic downturn, the demand for Indonesia's textile exports has also decreased. At the same time, competition among suppliers has become tighter. Indonesia has lost nearly a quarter of a million jobs since September 2008 (World Bank, 2009b). Many companies are scaling down their operation and reducing their employees because of decreased orders. Cognizant of this worrying situation, the government has prioritized the textile industry's development. It has provided various fiscal incentives and a subsidy program to help revitalize old machinery to support the

industry. Local textile and garment producers, however, raised their concern about the implementation of a free trade agreement (FTA) with China that took effect in January 2009. The FTA has created fear that local producers will be swept from the market due to the flood of cheap Chinese textiles and garments.

## 3. Fragmentation and Relocation to CLMV: A Survey

### 3.1. Survey Method

This study conducted semi-structured interviews with policymakers, associations, chief executive officers (CEOs), and managers in the electronics and textile and garment industries in Indonesia. The aim was to obtain information on the present situation and competitive environment in said industries. Business associations were asked to introduce target respondent firms that have either relocated some or all of their production blocs to other countries or are likely to relocate to other countries. In accordance with the information gathered from the business associations, the target respondent firms were contacted for further interview. The respondent firms consist of medium-sized and large firms employing more than 200 workers. The choice of sample was quite reasonable since small firms are perceived to be less likely to relocate to other countries.[14] Furthermore, the respondent firms already include local, foreign, and joint-venture firms (Table 2).

The interviews were conducted to cover three main issues. The first issue was information on the firms' cost structure. The components of interest are labor cost; transportation; electricity; imported parts, components, and raw materials; local parts,

[14] Aswicahyono, Hill, and Narjoko (2007) find that larger firms with bigger assets are more likely to relocate to other countries considering the required high set-up cost.

**Table 2: List of Respondents**

| | |
|---|---|
| Association | Electronics Association (GABEL): 38 members<br>The Indonesian Textile Association (API): 1,118 members<br>Taiwan Economic and Trade Office (TETO) |
| Policy maker | Investment Coordinating Board (BKPM) |
| Electronics Firms | 3 Korean-owned firms<br>1 Japanese-owned firm<br>1 Joint Venture (Singapore majority)<br>3 Domestic-owned firms |
| Textile Firms | 1 Japanese-owned firm<br>5 Domestic-owned firms |
| Garment Firms | 1 Joint Venture (Taiwan minority)<br>2 Domestic-owned firms |

*Source*: Survey results.

components, and raw materials; and other cost elements. The second issue was information on business climate. This mainly tried to uncover firms' perception of the current global competitive challenge. In particular, the firms were asked whether intense competition in the domestic or exports markets has forced them to experience or to consider relocating some or all of their production blocs to other countries. The interviews also tried to obtain other information such as average wage for workers, level of educational attainment of workers, and quality of infrastructure. The third issue concerned information on fragmentation and relocation. The objective was to obtain firms' perception of CLMV countries and to ask whether firms would consider CLMV countries as their destination for fragmentation and relocation conditional on a set of information about business climate in CLMV countries. The interviews also asked firms' perception on determinants of fragmentation or relocation to other areas.

### 3.2. General details of the firm respondents

In total, the survey team interviewed eight electronics firms, six textile firms and three garment firms. The electronics firms consisted of three Korean-owned companies, one Japanese company, one joint venture, and three locally owned companies. Most textile and garment firms are locally owned. There is only one foreign (Japanese) textile company in the sample. Most of the electronics firms are located in the industrial zone. In contrast, most of the textile and garment firms are located outside the industrial zone.

**Table 3: Respondent Firms' Size**

| | | Annual sales (million USD) | Total asset (million USD) | Number of employee |
|---|---|---|---|---|
| **Electronics 8 Firms** | **Max** | 193.58 | 361.37 | 1,134 |
| | **Min** | 40.74 | 28.74 | 600 |
| | **Average** | 108.02 | 129.79 | 894 |
| **Textile 7 firms** | **Max** | 89.47 | 187.62 | 4,887 |
| | **Min** | 4.89 | 41.52 | 479 |
| | **Average** | 31.52 | 158.15 | 1929 |
| **Garment 3 firms** | **Max** | 46.11 | 141.58 | 5,926 |
| | **Min** | 0.03 | 41.22 | 1,200 |
| | **Average** | 22.31 | 51.51 | 1,884 |

*Source*: Survey results.

Table 3 shows that, on average, the electronics firms interviewed are less labor intensive than the textile and garment firms. The average annual sales of the electronics firms are also significantly larger than the textile and garment firms'. This may be due to the fact that most of the selected electronics firms are multinational companies, which may endow them with better global networking.

**Table 4: Firms' Cost Structure**

| | Electronics | Textile | Garment |
|---|---|---|---|
| Labor force | 6.8 | 5.91 | 6.59 |
| Imported parts, comp. & raw | 73.25 | 30.18 | 55.64 |
| Local parts, components & raw | 8.8 | 28.32 | 3 |
| Transportation | 1 | 3.62 | 2.3 |
| Electricity | 1.38 | 5.17 | 5.03 |
| Other energies | - | 13.44 | 16.74 |
| Depreciation on machinery | 1.50 | 8.97 | 8.63 |
| Other elements | 7.23 | 4.4 | 2.1 |

*Source*: Survey results.

On average, dependency on imported parts, components, and raw materials reaches about 70% of the total cost structure of the electronics firms surveyed. In contrast, textile and garment firms are relatively less dependent on imported components and raw materials. For textile, some firms use cotton extensively as a raw material, almost 90% of which is imported. There are some textile firms that use polyester (synthetic fiber), much of which is locally sourced. For garments, the import content is still above 50% (Table 4).[15] This finding actually corroborates several studies on the weakness of the domestic supporting industries in providing parts, components, and raw materials needed by the industry.[16] Firms find that it is easier and cheaper to import those inputs rather than trying to procure them domestically. Only some big textile and garment companies have the capacity to source the materials domestically since they have an integrated production line from fiber to final textile products. However, most raw materials, like cotton, are still imported.

[15] Gunawan and Siregar (2009:21) reported that the import content levels of electronics, clothing, textiles, and footwear in manufactured exports are between 35% to 85%.

[16] See for examples Thee and Pangestu (1998), Kuncoro (2006), and Narjoko (2007)

Labor cost contributes around 6% to 7% of total production cost in the electronics, textile and garment firms interviewed (Table 4). Interestingly, for the textile and garment firms, which are mostly located outside the industrial zone, energy cost is more of a concern since frequent power shortages have forced them to build their own power generators using gas or coal. The depreciation cost of the machinery is also much higher for the textile and garment industries. The survey revealed that most firms procure cheap machinery from China and India and operate them at full capacity before replacing them with new machines. However, once again, the main constraint to continuous production is the supply of electricity from the state-owned electricity company (PLN).

Most electronics firms interviewed reported that they never experienced blackouts in the last six months (Table 5). Their electricity is continuously supplied by a privately managed electricity generator within the industrial zone. In contrast, most textile and garment firms complained about frequent blackouts that occur once or twice monthly. These firms rely on PLN for their electricity supply. It is important to note that the price for the continuous supply of electricity in the industrial zone is more than double the electricity charge of PLN.

**Table 5: Information on Business Climate**

| Average | | Electronics | Textile | Garment |
|---|---|---|---|---|
| **Export Ratio (% of output)** | | **55.8** | **47.02** | **57.75** |
| **Blackouts per month (frequency)** | | **1-2 (in 6 months)** | **1 – 2 (in 1months)** | **1 – 2 (in 1months)** |
| **Blackout length (minutes)** | | **> 30** | **>30** | **>30** |
| **Turnover ratio per month (%)** | | **1.7** | **0.75** | **1.8** |
| **Transportation mode** | | **Airplane, Ship, Truck** | **Airplane, Ship, Truck** | **Airplane, Ship, Truck** |

*Source*: Survey results.

**Table 6: Customs Clearance**

| Import | | Export | |
|---|---|---|---|
| **Time for customs clearance (hour)** | **Payment (USD)** | **Time for customs clearance (hour)** | **Payment (USD)** |
| **1-120** | **25-350** | **1 - 2** | **50-300** |

*Source*: Survey results.

**Table 7: Wage level of Worker (USD per month)**

| Type of worker | Electronics | | | Textile | | | Garment | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Max** | **Min** | **Average** | **Max** | **Min** | **Average** | **Max** | **Min** | **Average** |
| **Operator** | 214 | 107 | 160 | 130 | 100 | 120 | 130 | 100 | 120 |
| **Manager**[*)] | 1,077 | 536 | 838 | 520 | 300 | 360 | 520 | 300 | 360 |
| **Engineer** | 536 | 320 | 426 | 500 | 150 | 250 | 500 | 150 | 250 |

*Note*: [*)] Middle Manager.
*Source*: Survey results.

For customs clearance, it was revealed that the time taken is longer for imported goods than for exported goods (Table 6). In several cases, import customs clearance takes a maximum of 120 hours. Firms mentioned that the Trade Ministry Regulation No. 56/2008 has identified certain goods that can be imported. The implementation of this regulation has resulted in stricter customs inspection.

In terms of wage level, electronics firms reported relatively higher salary for each type of worker compared with the salary of workers in the textile and garment firms (Table 7). One possible explanation for this wage differential is that most of the electronics firms interviewed are foreign multinational companies, and they tend to pay higher salaries than their local counterparts. This finding is not new as some previous

**Table 8: Education Level of Worker (% of total employee)**

| | | Education Level | | | | | |
|---|---|---|---|---|---|---|---|
| | | Elementary School | Middle High | High School | Vocational School | College/ Univ. | Grad. School |
| Operator | Electronics | 0.43 | 2.03 | 59.28 | 30.83 | 7.45 | 0 |
| | Textile | 2.5 | 10 | 55 | 27 | 5.33 | 0 |
| | Garment | 0 | 6.3 | 38 | 49 | 6.67 | 0 |
| | Average | 0.98 | 6.11 | 50.76 | 35.61 | 6.48 | 0 |
| Manager | Electronics | 0 | 0.66 | 4.28 | 24.01 | 68.93 | 2.13 |
| | Textile | 0 | 0 | 3 | 5.5 | 90 | 1.7 |
| | Garment | 0 | 0 | 0 | 1.7 | 77 | 22 |
| | Average | 0 | 0.22 | 2.43 | 10.4 | 78.64 | 8.61 |
| Engineer | Electronics | 0 | 1.31 | 4.38 | 1.04 | 88.9 | 4.38 |
| | Textile | 0.67 | 6 | 8.67 | 21 | 64 | 0.3 |
| | Garment | 0 | 0 | 25.3 | 33 | 41 | 0 |
| | Average | 0.22 | 2.44 | 12.78 | 18.35 | 64.63 | 1.56 |

*Note*: *) Middle Manager.
*Source*: Survey results.

studies have reported that foreign multinational firms, on average, pay a higher salary than local firms.

In terms of educational level, majority of the operators in the firms surveyed are, on average, high school and vocational school graduates (Table 8). About 60% of operators in electronics firms and 55% of operators in textile firms are high school graduates. Meanwhile, about 50% of operators in the garment firms are vocational school graduates. Majority of the vacancies in managerial and engineer positions are filled by university graduates. Interestingly, quite a significant proportion of engineer positions in garment firms are filled by high school (about 25%) and vocational school (33%) graduates.

### 3.3. Key Issues

The survey team also asked about the major issues faced by the firms in relation to their business operation. Several key issues revealed by the associations and confirmed by the firms during the interview are as follows.

#### *3.3.1. Limited bank financing*

Most domestic-owned firms revealed the difficulty in obtaining credit from banks. During the golden era of the manufacturing industry in the late 1980s, about 40% of banks' credit was allocated to the manufacturing industry. The firms interviewed say that the situation is very much different today. Only less than 15% of banks' credit is lent to the sector. High commercial interest rates are a serious obstacle for the manufacturing industry. At the time of the interview, commercial interest rates in Indonesia were at 14%, while interest rates in China were only about 6%. There is widespread public perception that banks are reluctant to provide financing to the so-called "sunset industries," which include the textiles, garments, and footwear industries. These sectors are considered by most banks to be unprofitable and thus do not get easy access to credit lines. The difficulty in obtaining bank credit has contributed to the firms' low investment in new machinery and equipment. In contrast to the plight of domestic-owned firms, financing does not seem to be an issue or cause for concern for foreign-owned firms. Foreign-affiliated companies usually have stronger capital and technological support from their principals. In addition, they also have better international networks.

*3.3.2. Energy supply bottleneck*

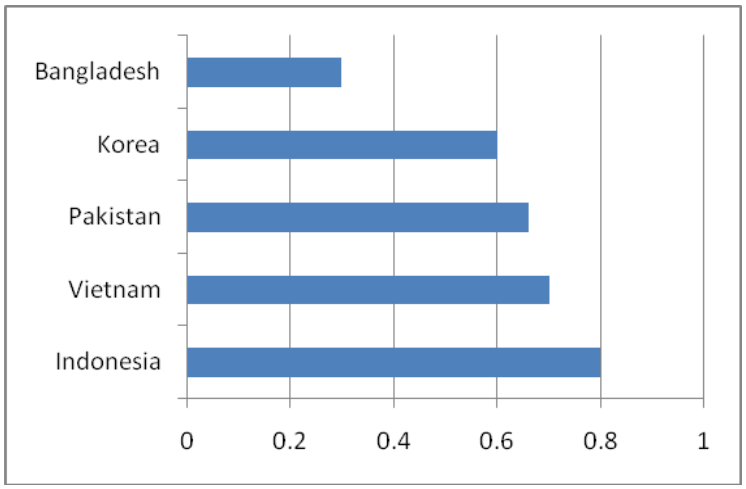
Local firms criticized the management of the energy sector, electricity in particular. Firms found it ironic that even though Indonesia is rich in energy resources, it faces a serious energy crisis. They believe that the energy crisis is caused by improper management, not the lack of energy resources. The state-owned electricity company (PLN) has an exclusive mandate to manage the supply and distribution of electricity for the whole country. However, it failed to provide sufficient investment and maintenance for worn-out transformers, which caused frequent power outages, especially during the last quarter of 2009.[17] This electricity shortage is very detrimental to the manufacturing industry, especially the textile and garment industries, which are mostly located outside the industrial zone. While these industries expect a continuous supply of electricity from PLN, API revealed that the supply of electricity is limited to only 300 days per year. For the remaining 60 days, firms have to procure their electricity from other sources, including investing in their own generators.

According to API,[18] the price of electricity in Indonesia is relatively more expensive compared with other countries that are not rich in energy resources (Figure 15). This shows that the monopoly of PLN over the electricity supply has cost the country dearly in terms of high economic costs. The association suggested that the government should dismantle PLN's monopoly and encourage the private sector to invest in the energy sector to help the country avoid future electricity crises.

[17] The interview was conducted in the days following a fire in an electricity substation in Cililitan, East Jakarta. This fire later caused blackouts in a wide swath of Jakarta during the period October-December 2009.

[18] Based on an interview with Mr. Ade Sudrajat, vice chairman of the Indonesian Textile Association (API), 22 January 2010.

**Figure 15: Comparison of Electricity Base Tariff in Several Countries (USD/kwh)**




*Source*: API 2009.

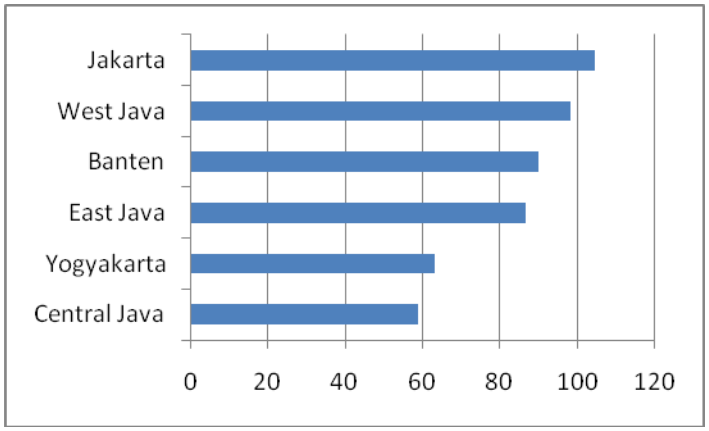
*3.3.3. Labor market inefficiency*

The interviewees stressed that firms have felt pressured by Indonesia's regulated labor market to scale down their operations, especially in the face of the global market downturn. Many perceive the policy governing the Indonesian labor market in the post-crisis era as too rigid. In particular, many employers regard Labor Law No. 13/2003 as a block to the expansion of labor-intensive industries in Indonesia. Said law and its implementing regulations have made it more expensive to fire workers, thereby creating uncertainty for business operations (Manning and Roesad 2007; OECD 2008). The latter is a result of the high severance pay firms are required pay fired workers. In the meantime, firms have responded by hiring more contract workers. In the long run, this may discourage firms from training workers.

Another problem with the labor law is the lack of clarity on how the minimum wage should be determined. According to API, the minimum wage is determined based

on the minimum living needs in the districts. The national statistical agency (BPS) conducts market surveys thrice yearly. The survey provides data on variations in the cost of living in different regions across the country. In 2008, the minimum wage in Jakarta and West Java were US$104.6 and US$98.1, respectively. Meanwhile, the minimum wage in Yogyakarta and Central Java were US$63 and US$58.81, respectively (see Figure 16). The relatively high wage in West Java has resulted in several factory relocations to Central Java, as in the case of garment firms. Another reason why firms move to Central Java is that workers in this area are perceived by employers as being more loyal than workers in West Java, which has a high turnover ratio. The union is also perceived to be not as strong in Central Java compared with the one in West Java. For some industries, the high wage variation could become a problem due to the high cost involved in setting up a new factory in another region at a time when the demand situation is unfavorable. Consequently, the relocated plant may lose

**Figure 16: Minimum Wage Differential Across Major Industrial Areas (USD/month)**




*Source*: BKPM, Nov 2008.

its competitiveness because of required adjustments in the new location.

One major concern of the industry in relation to the determination of the minimum wage is that aspects of labor productivity have not been seriously considered in the wage formula. Firms have to pay the minimum wage even though the productivity level of workers is below the required standard. API cited a report from the International Labor Organization (ILO), which noted that Indonesia's labor productivity is ranked 59th, far below the labor productivity of its competitors. In comparison, Thailand's labor productivity is ranked 27$^{th}$; Korea, 29$^{th}$; and China, 31$^{st}$. Given this condition, it is likely that Indonesia's labor-intensive industries will lose to China's in the wake of the ASEAN-China Free Trade Agreement (AC-FTA).

Firms also raised their concern on the shortage of skilled and trained manpower. With respect to the skills needed, skills training and productivity development are mostly conducted by companies. Skills training would not be a problem for big companies, which usually have skills development programs. However, small and medium-sized companies may find it difficult to obtain skilled, highly productive workers. Firms suggested that the government and universities should play a bigger role as supplier of skilled labor to the industry.

*3.3.4. Poor logistic infrastructure*

Some firms raised concerns on the quality of logistic infrastructure, traffic jams, and delay in customs clearance. Indonesia needs to improve its logistics system in order to make its products more competitive against foreign imports. Compared with other ASEAN countries, the cost for terminal handling in Indonesia is very expensive (Table 9). According to a World Bank (2008) report, the cost to send a forty-foot container

**Table 9: Terminal Handling Charge (THC)**

**(US$)**

| Country | 20 feet (USD) | 40 feet (USD) | Shipment per hour (unit) |
|---|---|---|---|
| Indonesia | 95 | 145 | 35 |
| Malaysia | 88 | 133 | 50 |
| Vietnam | 50 | 80 | NA |
| Thailand | 78 | 126 | 75 |

*Source*: NYK Line, Apindo, and USAID-Senada.

from Padang to Jakarta is roughly US$400. However, it would cost only US$175 to send the same forty-foot container to Singapore. Firms see the high cost and inefficiency in the domestic distribution channels as the major constraint preventing Indonesia from being more integrated with international production networks of higher value-added products. In addition, licensing and government-regulated pricing provide disincentives to invest in better services and restrict competition between domestic sea and land freight companies. The restrictions on foreign investment in the logistics sector only worsen the situation by restricting access to new technology.

Logistic service in Indonesia is, in fact, not only relatively more expensive but also less efficient (slower) compared to other ASEAN countries. Even worse, importers need to pay an extra cost of about US$70 per twenty-foot equivalent unit (TEU) for transferring goods from ports in Malaysia or Singapore to ports in Indonesia. This is why Indonesia ranks poorly in the World Bank's global logistic performance index (Table 10). The index shows that Indonesia is behind the Philippines and Vietnam in terms of logistic infrastructure. It is only ranked better than CLM countries.

Obviously, the high cost of port in Indonesia is a serious constraint for the competitiveness of its manufacturing exports. In addition to more expensive cost of

**Table 10: International Logistic Performance Index**

| International LPI Rank Out of 150 countries | Country | LPI | Customs | Infrastructure | International shipments | Logistics competence | Tracking & tracing | Timeliness |
|---|---|---|---|---|---|---|---|---|
| 27 | China | 3.49 | 3.16 | 3.54 | 3.31 | 3.49 | 3.55 | 3.91 |
| 29 | Malaysia | 3.44 | 3.11 | 3.5 | 3.5 | 3.34 | 3.32 | 3.86 |
| 35 | Thailand | 3.29 | 3.02 | 3.16 | 3.27 | 3.16 | 3.41 | 3.73 |
| 44 | Philippines | 3.14 | 2.67 | 2.57 | 3.4 | 2.95 | 3.29 | 3.83 |
| 53 | Vietnam | 2.96 | 2.68 | 2.56 | 3.04 | 2.89 | 3.1 | 3.44 |
| **75** | **Indonesia** | **2.76** | **2.43** | **2.54** | **2.82** | **2.47** | **2.77** | **3.46** |
| 118 | Lao PDR | 2.46 | 2.17 | 1.95 | 2.7 | 2.14 | 2.45 | 3.23 |
| 129 | Cambodia | 2.37 | 2.28 | 2.12 | 2.19 | 2.29 | 2.5 | 2.84 |
| 133 | Myanmar | 2.33 | 1.94 | 1.92 | 2.37 | 2.01 | 2.36 | 3.29 |

*Source*: Logistic Performance Index 2010, World Bank.

handling containers (THC), Indonesia's exporters also face a more burdensome transaction process. Transactions in ports across Indonesia are conducted using US dollars, while in other countries the same transactions can be done using the local currency.

*3.3.5. Rampant smuggling*

API estimated the domestic textile market to be worth IDR 70 trillion (approximately US$7.42 billion) in 2009. However, API reported that the share of local textile producers in the national market has declined from 65% in 2008 to 50% in 2009. About 30% to 40% of textile products in the domestic market is believed to be illegally imported. The influx of illegal imported textile products mainly from China is blamed

for the decline in the market share of domestic firms.[19]

It is worth noting that both the textile and electronics industries are plagued by the problem of illegal imports. Local production controls only about 30% to 35% of the domestic electronics market. An estimated 35% of electronic products in the domestic market are smuggled goods. The remaining share, about 30%, consists of legal imports.[20]

Low, or even zero, import duties imposed on Chinese, Japanese, and Korean products are believed to have encouraged the influx of textile imports and reduced the size of smuggled products. From the previous 5%, import duties on Chinese textiles have been abolished since the implementation of the AC-FTA in January 2009. In the case of Japan, almost all of the Indonesian textile tariff lines, particularly the sophisticated ones, already have zero import duties because of the Indonesia-Japan Economic Partnership Agreement (IJ-EPA).

*3.3.6. Weak supporting industry*

The respondent firms revealed that their high dependency on imported intermediate inputs is due mainly to the lack of supporting industries in the country. Local supporting industries are not well developed. Therefore, both the electronics and textile industries depend on external sources for their parts, components, and main raw materials. In the electronics industry, local content of raw materials and components is estimated to be about 30%. However, main components are still imported. According to the Association

[19] According to Indotextile, a textile research center sponsored by SENADA and USAID, textile imports were valued at US$1.05 billion in the first quarter of 2009, slightly down compared with US$1.22 billion in the same period of 2008 and US$1.23 billion in the last quarter of 2008.

[20] Interview with GABEL, October 2009

of Electronics Firms (GABEL), currently more than 70% of the components needed by the industry have to be imported.

### 3.4. Fragmentation to CLMV Countries and Challenges for CLMV Countries

There are several reasons why firms decide to relocate to other countries. One critical reason is profit. If a firm can make a profit in a certain country, including the CLMV countries, then the firm will consider moving. An owner of a domestic electronics firm mentioned that his firm would be willing to move if there is a high probability of making higher profits in the CLMV countries. Higher profit could be achieved either through a bigger market, less costs, or a combination of those.

Another reason for relocation is to sustain their business. One domestic textile firm owner said that his business, like many other textile and garment companies, is currently suffering from serious electricity shortage since PLN cannot guarantee continuity of supply for the whole year. The electricity supply is rationed to cover only 300 days per year due to poor distribution. This means his business, and many others as well, need to find an alternative electricity supply, which is often more expensive. According to the textile association, some firms have relocated to China.[21] Some are still considering moving in order to sustain or expand their production.

Regarding firms' preferred destination for relocation, it is important to note that firms perceive Vietnam as being in a different league compared with CLM countries. Firms distinguish the former as being slightly more attractive than CLM countries as an

[21] Some firms have moved back to Indonesia because the Chinese government attempted to relocate their companies from the coastal area to the inland part of China. The firms argued that the location disadvantage (far from the ports) would make it unprofitable for them to do business in that area. Another reason why the firms moved away from China is due to the rapid increase in wages, especially in China's coastal areas.

investment destination. Therefore, if they were to relocate, they regard Vietnam as a potential destination. Other attractive countries for fragmentation and relocation are China and India. Many of the respondent firms perceived these two countries as offering a bigger market, a better investment climate, and better infrastructure.

Despite various issues mentioned by the firms about the poor investment climate in Indonesia, the study found that most firms operating in Indonesia, which were interviewed in 2009, are not considering relocation to CLM countries due to several considerations.[22]

*3.4.1. Macroeconomic stability*

Interviews with a representative of a Taiwanese business office (TETO) in Indonesia revealed that majority of Taiwanese firms in Indonesia consider Indonesia as being quite successful in maintaining its macroeconomic stability. The country's GDP growth is relatively strong in the region; the economy grew by 4.5% in 2009. Inflation rate was less than 5% in 2009. The exchange rate is relatively stable against other major currencies. Therefore, business people are confident that Indonesia's economy will grow even stronger in the future. This makes Indonesia's market very promising, with an expected increase in its per capita GDP. Meanwhile, Vietnam has difficulty controlling its inflation rate. A high inflation rate is very detrimental to business and makes a country an investment risk. Other CLM countries are considered much smaller than Vietnam in term of per capita GDP. Therefore, for most market-seeking

[22] It is important to note that due to small sampling, the results of the survey should be taken cautiously.

companies, CLM countries are not quite attractive as fragmentation or relocation destinations.

*3.4.2. Political stability*

Most firms interviewed said that Indonesia currently has a solid political platform after the Democrat Party's and SBY's landslide victory in the 2009 parliamentary and presidential elections. The cabinet ministries were perceived to have a good balance between politicians and professionals. In addition, the democratic government is perceived to be more open to business interests. In contrast, countries like Cambodia and Myanmar are considered to be highly politically unstable. In particular, Myanmar's military regime is perceived to be too risky to do business with. This causes investors to stay away from the country.

*3.4.3. Infrastructure, natural resources, and manpower*

Despite much evidence of infrastructure bottlenecks faced by the firms operating in Indonesia, most firms perceive the quality of infrastructure in CLM countries to be inferior to Indonesia's. Countries like Laos are considered to be too isolated and too far from the ports. This location disadvantage will create additional costs for firms that export their products.

Most firms interviewed considered Indonesia as a resource-rich country, which makes it relatively easy to look for raw materials. But they also raised concerns that Indonesia tends to export most of the raw materials needed by the domestic industry in order to get quick revenue. Nevertheless, firms considered CLMV countries as having less natural resources compared with Indonesia.

In terms of manpower, Indonesia is perceived as having the largest pool of manpower, larger even than CLMV countries. It is relatively easy for firms to obtain additional workers. The only concern is that firms cannot easily fire workers due to the costly severance pay mandated by the labor regulation. However, firms can hire more contract workers and limit the hiring of full-time workers. In addition, some firms encourage their workers to handle several tasks in order to increase productivity. For instance, in the textile industry, one worker is assigned to operate 3 to 10 machines.

*3.4.5. Openness of the economy*

Firms mentioned that the openness of the economy is one of the advantages of investing in Indonesia. With basically no significant tariff and nontariff barriers, it is easy for firms to procure parts, components, and raw materials. Firms mentioned that the AC-FTA provides an opportunity for firms to import raw materials from China at even lower cost. This makes them optimistic that they will be able to further reduce production cost. Meanwhile, firms regarded CLMV economies as being relatively less open compared with Indonesia.

*3.4.6. Principal global strategy*

Foreign firms operating in Indonesia said that the decision to relocate some parts or all parts of the production process is the principal's strategic decision. Most foreign firms are export oriented, fully benefiting from the global supply chain. Therefore, the decision for a firm's fragmentation will be dependent on the principal's global strategy.

The survey on the respondent firms' perception revealed that wage is still the main determinant for fragmentation or relocation for both electronics and textile firms (Table

11 and Table 12). For electronics firms, port and market is the second most important determinant for relocation, while population and income level is the third. Meanwhile, textile firms perceived land price and energy price as the second and third most

**Table 11: Electronics Firms' Perception of Determinants to Fragmentation**

| | Score | Rank |
|---|---|---|
| **Wage of Workers** | 2.63 | 1 |
| **Access to Port and Market** | 2.75 | 2 |
| **Population & Income Level** | 3.00 | 3 |
| **Land Price** | 4.50 | 4 |
| **Electricity or Energy Price** | 5.13 | 5 |
| **Education Level of Workers** | 7.00 | 6 |
| **Incentives like Tax Holidays** | 7.38 | 7 |
| **Water Price for Industrial Use** | 7.88 | 8 |

*Note*: The score is the averaged value of the ranks, and the rank was given in accordance with the value of scores.

*Source*: Survey results.

**Table 12: Textile Firms' Perception of Determinants to Fragmentation**

| | Score | Rank |
|---|---|---|
| **Wage of Workers** | 1.86 | 1 |
| **Land Price** | 2.86 | 2 |
| **Electricity or Energy Price** | 3.43 | 3 |
| **Incentives like Tax Holidays** | 5.29 | 4 |
| **Education Level of Workers** | 5.71 | 5 |
| **Access to Port and Market** | 5.86 | 6 |
| **Water Price for Industrial Use** | 6.43 | 7 |
| **Population & Income Level** | 7.43 | 8 |

*Note*: The score is the averaged value of the ranks, and the rank was given in accordance with the value of scores.

*Source*: Survey results.

important determinants for relocation, respectively.

Overall, on average, firms ranked wage level, land price, and access to port and market as the top three most important factors for fragmentation or relocation to other countries (Table 13). In terms of CLMV countries, only Vietnam was regarded as a

**Table 13: Summary of Respondent Firms' Perception of Determinants to Fragmentation**

| | Score | Rank |
|---|---|---|
| **Wage of Workers** | 2.27 | 1 |
| **Land Price** | 3.73 | 2 |
| **Access to Port and Market** | 4.20 | 3 |
| **Electricity or Energy Price** | 4.33 | 4 |
| **Population & Income Level** | 5.07 | 5 |
| **Education Level of Workers** | 6.40 | 6 |
| **Incentives like Tax Holidays** | 6.40 | 7 |
| **Water Price for Industrial Use** | 7.20 | 8 |

*Note*: The score is the averaged value of the ranks, and the rank was given in accordance with the value of scores.
*Source*: Survey results.

potential destination for fragmentation or relocation. Firms perceived Vietnam's investment climate as relatively better than other CLM countries. The Vietnamese government has provided strong tax incentives to investors. In addition, Vietnam has invested more on infrastructure and has a bigger market size compared with CLM countries.

Particularly, in the case of CLM countries, firms perceived that the wage level and the land price in those countries are not significantly lower than that in Indonesia. More important, firms also perceived infrastructure quality in CLM countries to be not much better than (or even worse than) that in Indonesia. Given these perceptions, it would be

difficult to attract Indonesia's firms to relocate to CLM countries without further incentives.

Aside from Vietnam, firms also mentioned China, India, and Bangladesh as their favorite place for business expansion. They consider China and India's markets as significant and their supporting industries quite strong. Meanwhile, Bangladesh has preferential access to the U.S. textile market.

In view of the possibility of developing an industrial corridor involving Indonesia and CLMV countries, at least one of the preconditions has actually been there, i.e., the existence of the logistic backbone. For instance, the shipping lines connecting Tanjung Priok and Sihanouk Ville; Tanjung Priok and Ho Chi Minh; and Tanjung Priok and Yangon have been operated by several shipping companies (Table 14). However, in order to develop a truly active cross-border fragmentation (taking advantage of geographical diversity and the countries' development stages), several other factors need to exist. For instance, the service link cost for connecting fragmented production blocks should be low enough to overcome the geographical distance. Currently, the service link cost remains high (Table 14). In addition, its reliability and frequency still need to be improved. From the supply side, this can be done by improving logistic infrastructure, providing tax incentives, improving customs procedures, encouraging foreign capital participation in logistic services, and so on. Meanwhile, the demand side is also important. CLMV countries have preferential access to the U.S. and the EU markets which could be an important pull factor for Indonesia's investment, e.g., in the textile and garment sectors. In this case, a potential industrial corridor consisting of Indonesia, Cambodia, and Vietnam could possibly be formed depending on the fulfillment of certain minimum requirements mentioned above. Finally, both Indonesia

and CLMV countries also need to improve their marketing strategy on location advantages by developing, for instance, special economic zones that are supported by a favorable investment climate.

**Table 14: Distance, Time, and Cost of Shipping Line**

| Route | Shipping Line | Average Cost US$/km by Container's Size | | Distance (km) | Days |
|---|---|---|---|---|---|
| | | 20 | 40 | | |
| Jakarta - Sihanouk | Jakarta – Tj. Pelepas | 315 | 484 | 920 | 1 |
| | Tj. Pelepas – Kuantan | 91 | 139 | 265 | 8 |
| | Kuantan – Sihanouk | 245 | 376 | 715 | 1 |
| | **TOTAL** | **650** | **1,000** | **1,900** | **10** |
| Jakarta – Ho Chi Minh | Jakarta – Ho Chi Minh | 400 | 600 | 1,900 | 4 |
| | **TOTAL** | **400** | **600** | **1,900** | **4** |
| Jakarta – Yangon | Jakarta – Singapore | 225 | 482 | 900 | 1 |
| | Singapore – Yangon | 475 | 1,018 | 1,900 | 10 |
| | **TOTAL** | **700** | **1,500** | **2,800** | **11** |

*Source*: Survey results.

## 4. CONCLUSION

According to the firms' perception, the decision to conduct fragmentation or relocation to CLMV countries is dependent on the profitability of such a strategy. All respondent firms considered Vietnam as not being in the same league as CLM countries. They perceive Vietnam as a potential target destination for fragmentation or relocation. Vietnam is also considered to have a better investment climate, offer more attractive incentives, provide better infrastructure, and have a bigger market than CLM countries. The respondent firms currently believe that that it remains too risky to invest in CLM countries due mainly to their less favorable business climate.

The primary concerns of the respondent firms in assessing potential locations for fragmentation or relocation are macroeconomic stability, political stability, infrastructure, openness to trade, and the firm's own global strategy. In view of this, CLM countries need to offer more than just lower wages in order to attract FDI from other countries, including Indonesia. They need to build investors' confidence to take a risk in investing in their countries by providing better infrastructure, strong incentives, and a favorable business climate that will enable firms to operate efficiently. CLM countries need to implement trade and investment reforms to provide better flow of goods and services. Policy measures are needed to effectively remove various constraints for the development of international production networks. All of these are the necessary conditions for promoting inward FDIs which are crucial for upgrading the industries in CLMV countries.

Finally, these findings are based on a small-scale survey of firms' perceptions. This type of survey is always prone to the problem of firms' limited knowledge on CLMV countries. It is important to interpret the results cautiously. Further examination involving larger samples is recommended to fully understand firms' behavior and perception in order to offer more substantial and essential policies for CLM countries.

## REFERENCES


Ando, Mitsuyo and Fukunari Kimura (2005) "Global Supply Chains in Machinery Trade and the Sophisticated Nature of Production/Distribution Networks in East Asia." Mimeo. Website link: http://www.coe-econbus.keio.ac.jp/data/DP2005-015.pdf.

Athukorala, Prema-Chandra (2006) "Post-crisis export performance: The Indonesian experience in regional perspective", *Bulletin of Indonesian Economic Studies*, 42: 2, 177 — 211

Aswicahyono, H., H. Hill, and D.A. Narjoko (2007) "Beyond Stabilization: Reinvigorating Indonesian Manufacturing," paper prepared for the Conference Policy Research Forum of the Australia Indonesia Governance Research Project, Jakarta, December 3, 2007.

Basri, M. Chatib and Hill, Hal (2008) "Indonesia – Trade Policy Review 2007." *The World Economy*

Booth, Anne (1998) *The Indonesian Economy in the Nineteenth and Twentieth Centuries: A History of Missed Opportunities*. Basingstoke: Macmillan and New York: St. Martin's Press.

Coxhead, Ian and Li, Muqun (2008) " Prospects for skills-Based Export Growth in a Labour-Abundant, Resource-Rich Developing Economy." *Bulletin of Indonesian Economic Studies*, 44: 2, 209 — 238.

Dunning, J. and Peter Robson (eds.) (1988) *Multinationals and the European Community*, Oxford, Blackwell.

Gunawan, Anton H. and Siregar, Reza (2009) "Survey of recent Developments." *Bulletin of Indonesian Economic Studies* 45:1, 9-38.

James, William E., David J. Ray, and Peter J. Minor (2003) "Indonesia's Textiles and Apparel: The Challenges Ahead." *Bulletin of Indonesian Economic Studies*, 39 (1): 93-103.

Kimura, Fukunari. (2005) "International Production/Distribution Networks and Indonesia." *Developing Economies*, XLIII-I, (March): 17-38.

—— (2006) "International Production and Distribution Networks in East Asia: Eighteen Facts, Mechanics, and Policy Implication." *Asian Economic Policy Review*, Vol. 1, Issue 2 (December): 326-344.

—— (2007) "The Mechanics of Production Networks in Southeast Asia: The Fragmentation Theory Approach. " *IDE Kuroiwa Project on "Economic Integration in Southeast Asia: Location of Industries, Production Network (or value chain) and Development Strategy"*, March 2007, Mimeo. Website Link: http://hermes-ir.lib.hit-u.ac.jp/rs/bitstream/10086/14338/1/wp2007-8a.pdf

Kuncoro, Ari (2006) "Firm Structure, Conduct and Competitiveness in Indonesian Manufacturing: Before and After the 1998 Economic Crisis." *Economics and Finance in Indonesia*, Vol.54 (2): 139-173.

Manning, Chris and Kurnya Roesad (2007) "The Manpower Law of 2003 and Its Implementing Regulations: Genesis, Key Articles and Potential Impact." *Bulletin of Indonesian Economic Studies*, 43(1): 59-86.

Narjoko, Dionisius A. (2007) "The Determinants of Industrial Agglomeration in Indonesia." Eria Research Paper. Mimeo. Website link: http://www.eria.org/research/images/pdf/PDF%20No.3/No.3-1-Indonesia.pdf (Accessed October 16, 2009)

OECD (2008) *Indonesia Economic Assessment.* OECD Economic Survey, Vol. 2008/17, July 2008.

Tamamura, C. (2002) "Structural Changes in International Industrial Linkages and Export Competitiveness in the Asia-Pacific Region." *ASEAN Economic Bulletin*, v19(1): 52-82.

Thee, Kian Wie (2009) "The Development of Labour –intensive Garment Manufacturing in Indonesia." *Journal of Contemporary Asia,* 39 (4): 562-578.

Thee, Kian Wie and Mari Pangestu (1998) "Technological Capabilities and Indonesia's Manufactured Exports." In *Technological Capabilities and Export Success in Asia,* Eds. Dieter Ernst, Tom Ganiatsos, and Lynn Mytelka: 211-265.

World Bank (2009a) *Indonesia Economic Quarterly: Weathering the Storm.* World Bank, Jakarta, June.

—— (2009b) *Indonesia Economic Quarterly: Clearing Skies.* World Bank, Jakarta, June.

World Trade Organization (2008) *International Trade Statistics 2008.* Website link: http://www.wto.org/english/res_e/statis_e/its2008_e/its2008_e.pdf. (Accessed January 7, 2010).

# ANNEX 1: LIST OF FIRMS

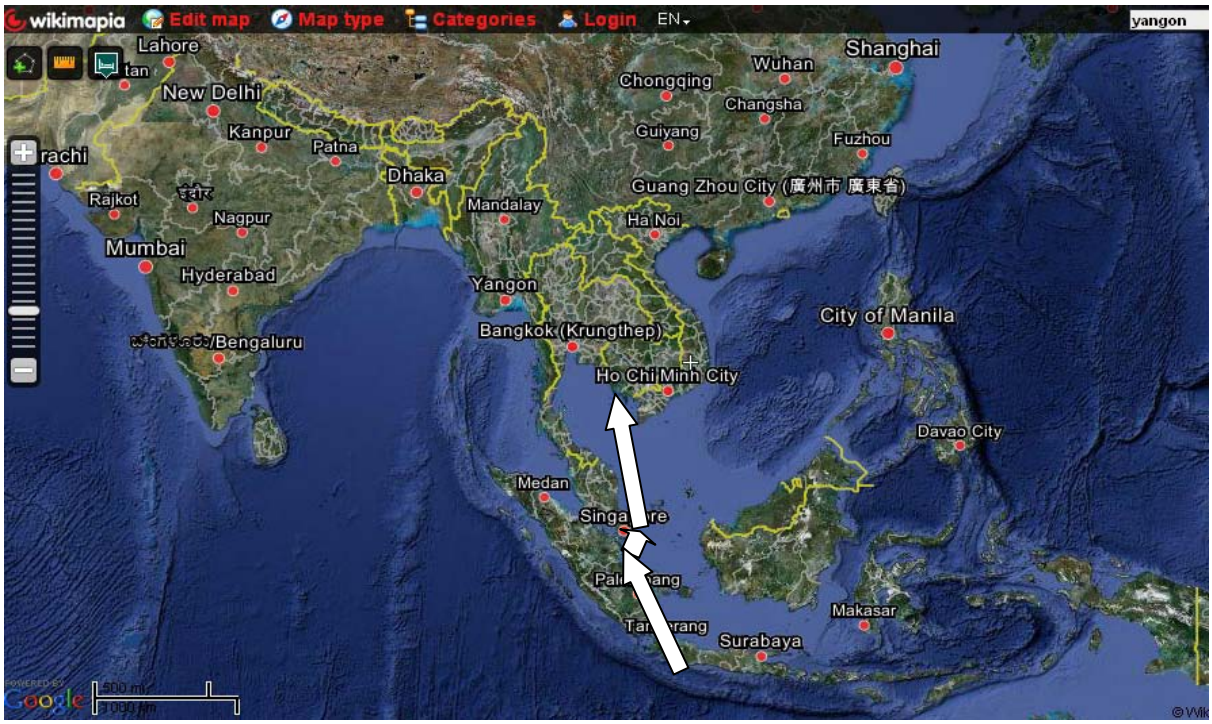
| No | Firm | Year of establish-ment | Ownership | Main Product | Location | No of Employees | Total Sales | Export as proportion of total production |
|---|---|---|---|---|---|---|---|---|
| | | | | **ELECTRONICS** | | | | |
| 1 | **HI** | 1982 | 100% Domestic | Electric Motor (E-moto), Audio (Pioneer) | Bekasi (Industrial Zone) | 600 | USD 23.7 mill | 50% |
| 2 | **LPD** | 1996 | 100% Foreign (Korea) | TV color picture Tube | Bekasi (Industrial Zone) | 638 | USD 175 mill | 60% |
| 3 | **PEC** | 1970 | 100% Domestic | Color TV, Audio cassette tape, TV stand, Plastic injection, and CD replication. | Jakarta (office)<br><br>Surabaya (Factory) | 1134 | IDR 400 bill | 52% |
| 4 | **SEI** | 1991 | 100% Foreign (Korea) | TV, camera, Camcorder, Monitor, home appliances | Bekasi (Industrial Zone) | 900 | USD 174.2 mill | 60% |
| 5 | **LGEI** | 1990 | 100% Foreign (Korea) | TV, Audio, Video, home appliances | Bekasi (Industrial Zone) | 1050 | USD 195.7 mill | 70% |
| 6 | **SEI** | 1989 | 100% Foreign (Japan) | TV, camera, home appliances, water pump | Bekasi (Industrial Zone) | 789 | USD 182 mill | 75% |
| 7 | **DMI** | 1990 | 100% Domestic | TV, washing machine, home appliances | Bekasi (Industrial Zone) | 1100 | USD 41.17 mill | 70% |
| 8 | **PEI** | 1994 | Joint Venture (Singapore 51%) | Printer Component | Bekasi (Industrial Zone) | 973 | USD 38.7 Mill | 10% |
| | | | | **TEXTILE** | | | | |
| 1 | **AP** | 1977 | 100% Domestic | Manufacturing product textile | Tangerang, outside SEZ and Bekasi in Industrial Area M2000 | 4,887 | IDR 846.3 bill | 80% |
| 2 | **PI** | 1974 | 100% Domestic | Spinning, Knitting, Twisting | Bandung, Underdeveloped Industrial Area | 2,038 | IDR 769.76 bill | 34% |
| 3 | **UNI** | 1971 | 100% Foreign (Japan) | Manufacturing product textile from spinning, weaving, dyeing, finishing | Bogor | 760 | IDR 49.12 bill | 24% |
| 4 | **AL** | 1980 | 100% Domestic | Polyester filament woven fabric | Cibinong | 786 | IDR 46.48 bill | 4% |
| 5 | **HA** | 1973 | 100% domestic | Spinning, finishing and printing | Bandung | 594 | IDR 11.4 bill | 90% |

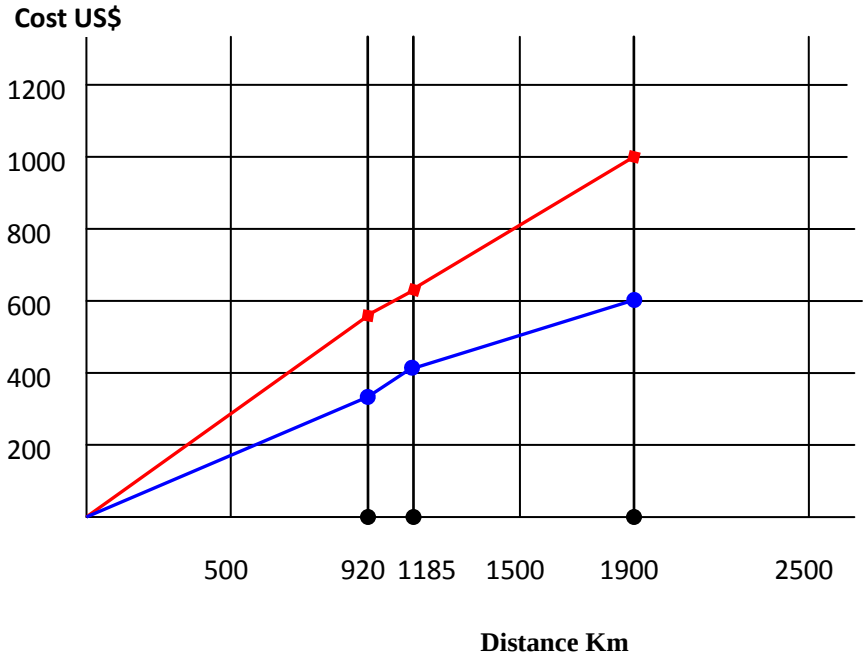
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6 | **PF** | 1987 | 100% Domestic | Weaving and knitting, including finishing and printing | Bandung, Underdeveloped Industrial Area | 3,525 | IDR 355.16 bill | 87% |
| **GARMENT** | | | | | | | | |
| 1 | **EST** | 1974 | Domestic dominant and joint venture with Taiwan company (PT. KAHATEX) | Texturized yarn, twisted yarn, nylon filament yarn, woven and knitted fabric in nylon, polyester and garment | Bogor, Jakarta, Tangerang. Non industrial area | 1,200 | IDR 137 bill | 52.20% |
| 2 | **PBT** | 1980 | 100% Domestic | Garment, jacket and T-shirt | Tangerang, Underdeveloped Industrial Area | 5,926 | IDR 240.98 bill | 32.58% |
| 3 | **PPEB** | 1989 | 100% Domestic | Garment, Jacket | Tangerang, Underdeveloped Industrial Area | 4,039 | IDR 244.76 bill | 88.97% |

*Source*: Survey results

# ANNEX 2: ROUTING TO CLMV (LOGISTIC SURVEY RESULTS)

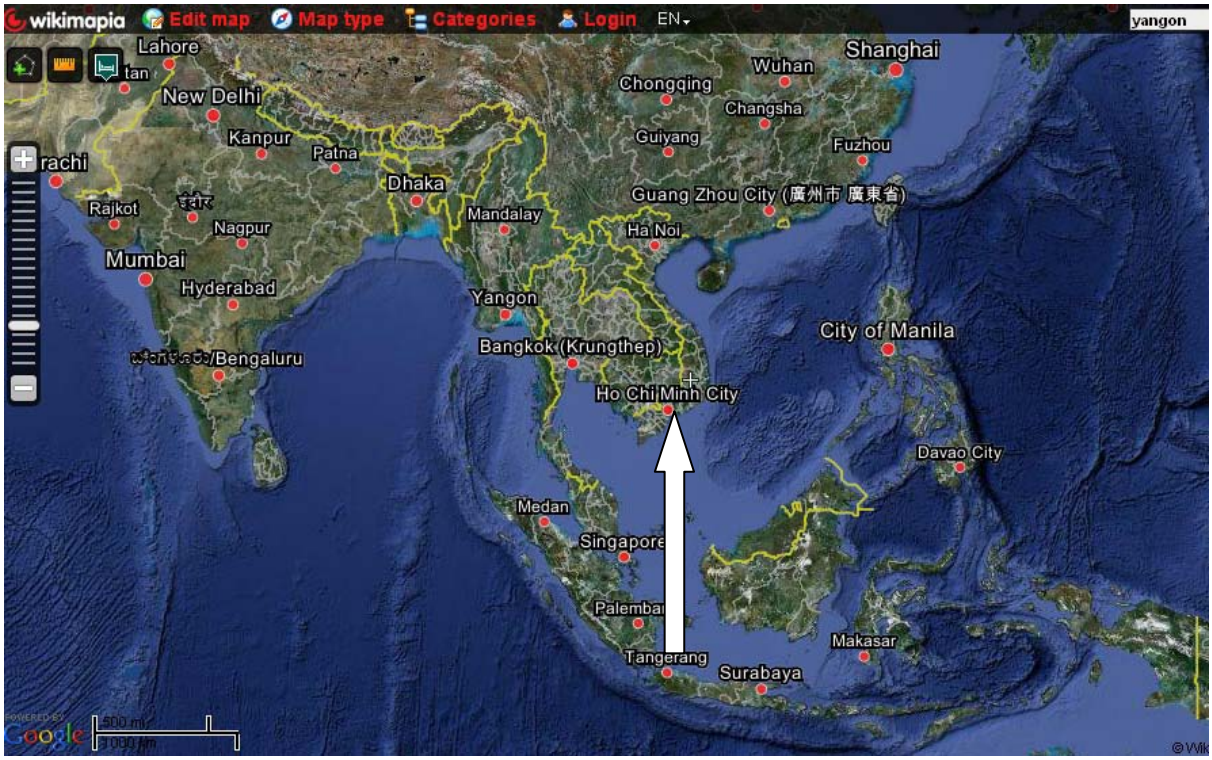
**Jakarta – Tanjung Pelepas – Kuantan – Sihanouk**

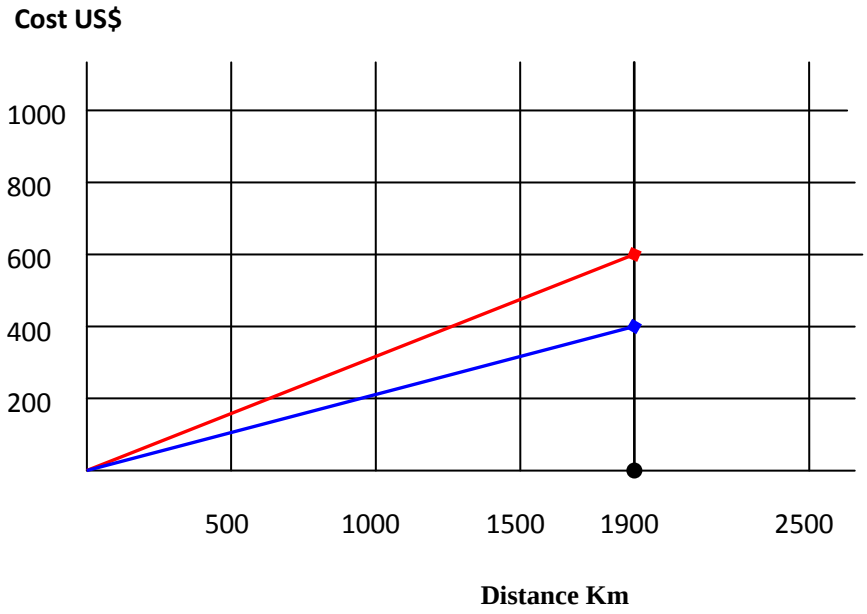





**Blue line = cost for size 20**

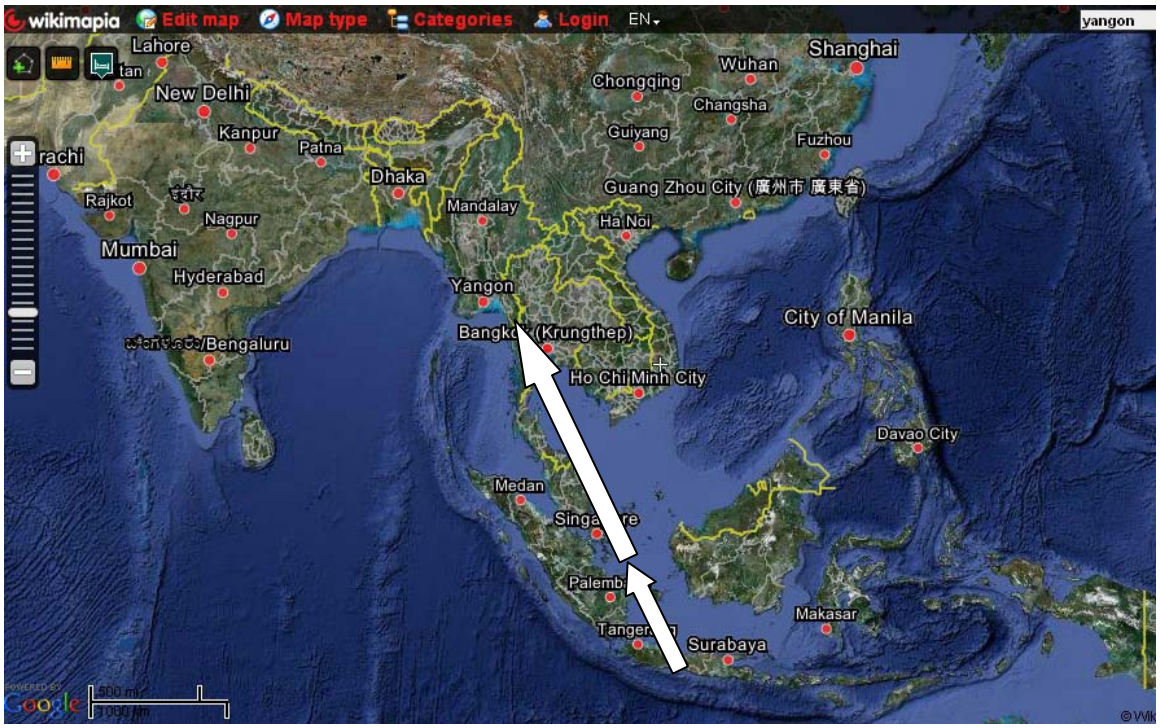
## Jakarta – Ho Chi Minh

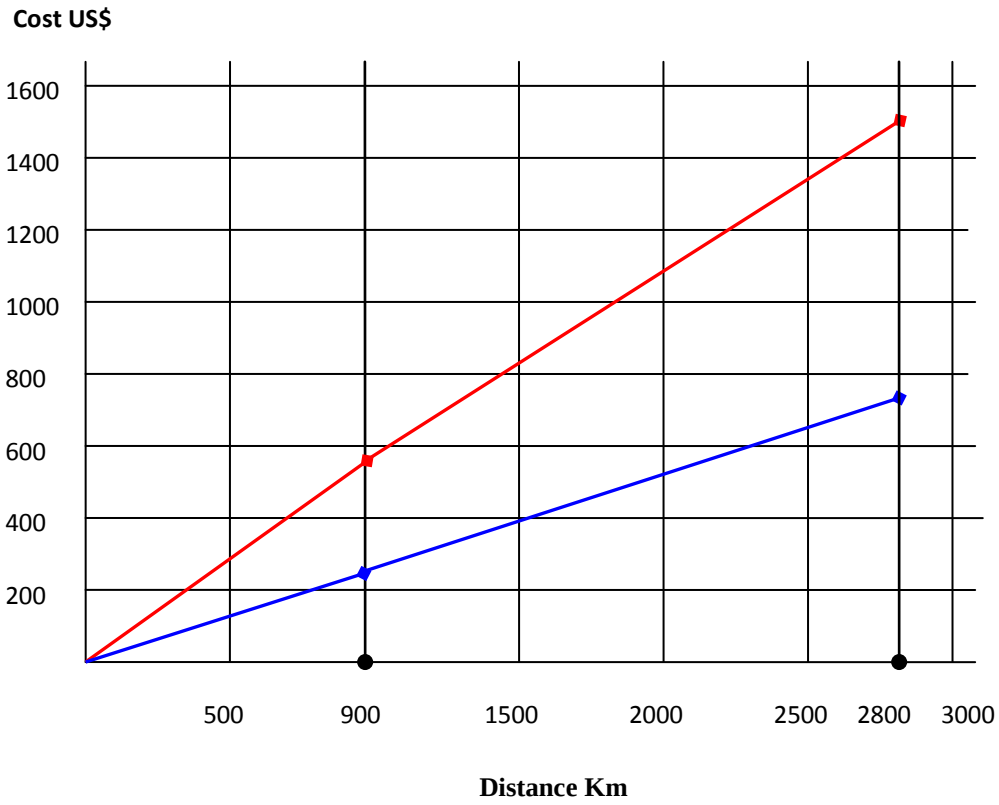



**Blue line = cost for size 20**

**Jakarta – Singapore - Yangon**






**Blue line = cost for size 20**