

DETERMINANTS OF FRAGMENTATION IN MANUFACTURING INDUSTRIES: A CASE STUDY OF THE ELECTRONICS AND TEXTILE INDUSTRIES IN INDONESIA

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ABSTRACT

In recent years, electronics and textiles industries have faced intense competitive challenges in the domestic and international markets. These two industries have to cut their costs of production to remain competitive with similar industries in other countries that have lower costs of production, especially China. This paper examines the determinants of the fragmentation of Indonesia's manufacturing industries to countries with low labour costs, especially Cambodia, Laos, Myanmar and Vietnam (CLMV). Results from a small-scale survey show that profit is the key factor for firms relocating to the CLMV countries. Vietnam is perceived to be a better prospective destination for fragmentation because of its relatively strong investment incentives, infrastructure and access to markets. In contrast, CLM countries were perceived to be less attractive compared with Vietnam because of their relatively less favourable business climate. For fragmentation to CLM countries to be worthwhile, that is, for firms to operate efficiently, these countries need to provide better infrastructure, better investment incentives and a more competitive business climate.

Keywords: Fragmentation, Electronics, Textiles, Garments, ASEAN, CLMV

JEL classification: J400, L140, F000

I. 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 that trade concentration in East Asia is marked by considerable development of a high volume of transactions in parts and components among East Asian countries. This trade pattern is in line with the production-process division of labour in which export-oriented or

network-forming-type FDI has been replacing import-substituting-type FDI. There is also significant development of international production networks (IPN), which are amplified by the growing fragmentation in production.

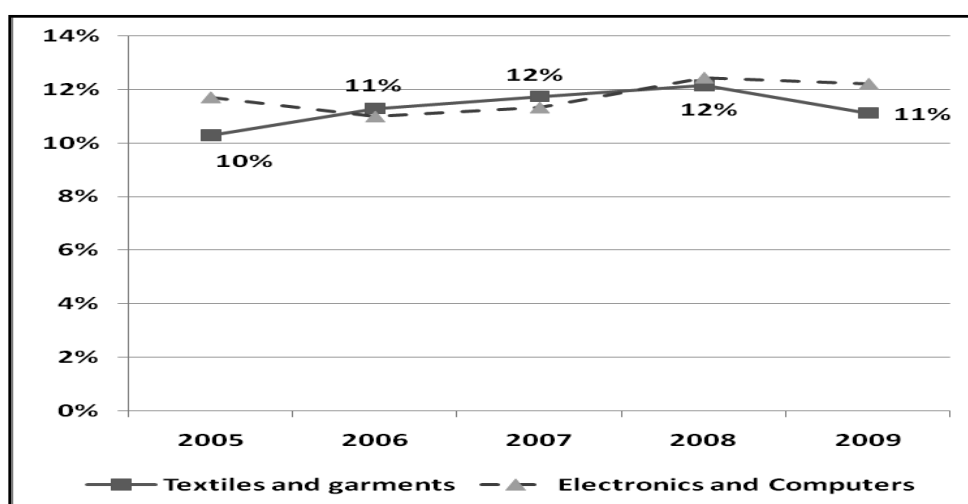
Fragmentation of industries may be triggered by increased global competition, which motivates firms to move some, part or all of their production to other locations. The motivation could be from factors such as the need to expand markets, to find and use local

resources, to increase efficiency or any combinations of these. Kimura (2007) argues that the electronics industry is a good example of an industry that is inclined to fragmentation strategies. In this sector, production processes are well diversified and service-link costs, including communication and transport costs, are low, such that the industry can benefit from diversity of location. In contrast, the textiles industry is characterised by strong economies of scale in production and high service-link costs. The textiles sector might not be suited to fragmentation. Examining these two sectors (electronics and textiles) would be of particular interest: it would lead to additional empirical data on the phenomenon of fragmentation in the manufacturing industries around the world.

Indonesia's electronics and textiles industries exemplify the development

of the country's manufacturing sector. These two industries have experienced ups and downs because of changes in government industrial policies that were a response to changes in the external environment. At present, the industries face intense competition in the domestic and in the international market. Figure 1 indicates how in 2009 the share of these two industries declined relative to total national exports.

For Indonesia, the rise in labour costs in the post-reform era has made labour-intensive industries like textiles and garments less competitive compared with other countries that have low labour costs, such as China, India, Bangladesh and Vietnam (Manning and Roesad, 2007). In addition, labour regulations in Indonesia has been perceived as too rigid to allow firms to make adjustment in the midst of weakening global demand (OECD,



Source: BPS via CEIC and World Bank

Figure 1. Share of Textiles and Garments, and Electronics and Computer Exports to Total National Exports

2008; World Bank, 2009a). Therefore, it is reasonable for firms to consider moving to other locations or to other countries in order to reduce labour costs and to benefit from more flexible labour regulation.

This paper examines the current situation of the electronics and textiles industries in Indonesia and assesses the possibility for fragmentation of some or all parts of their production to other low-labour-cost countries, that is, Cambodia, Laos, Myanmar and Vietnam (henceforth abbreviated to CLMV). The objective is to understand why firms might make the decision to relocate some or all of their production activities. What are the necessary conditions that the CLMV countries must meet before firms to consider moving? And finally, in terms of set-up costs, operation costs and service-link costs, is fragmentation to the CLMV countries a reasonable strategy from the viewpoint of the firms?

The findings of the survey show that profit is the main factor for firms that consider relocating to the CLMV countries. Most of the firms surveyed considered Vietnam to be a likely location for fragmentation. Vietnam is recognised as offering not only strong investment incentives through tax holidays but also better infrastructure. However, firms also considered that relocating to CLM countries to be quite risky mainly because of less favourable business climates in those countries. Firms considered that CLM countries need to offer more than just lower wage rates to attract foreign direct

investment. It is also important, they said, for CLM countries to improve the quality of their infrastructure, provide strong and effective investment incentives and a more competitive business climate in the form of political, legal and regulatory certainty for foreign investment.

The next section of this paper discusses the current situation of the electronics and textiles industries in Indonesia. The third section examines the survey findings and provides an assessment of firms' considerations to relocate to one or more of the CLMV countries. The last section is the conclusion and provides some policy recommendations.

II. INDUSTRIAL STRUCTURE AND CURRENT SITUATION

2.1 Structure of the Electronics Industry

The electronics industry in Indonesia can be classified into three subclasses: consumer electronics (for example, audio, video, television, air conditioners, refrigerators and washing machines); industrial electronics (for example, office equipment, data processors and telecommunication equipment); and electronics components. The consumer electronics industry is relatively well developed compared with the other two subclasses. The technology used in the consumer electronics industry is easily available and uses similar equipment to that used in many other manufacturing sectors. Because of its relatively simple technology, fragmentation of

consumer electronics manufacturing is relatively easy.

The industrial electronics industry has experienced significant development, which has been supported by the boom in the computer, communication and telecommunications markets. The weakest segment of the electronics industry is the components industry. This supporting industry remains relatively underdeveloped and marked by a high dependency on imported components. Local components makers are still limited in terms of number of components they produce and their ability to innovate. Most domestic components makers produce low technology components.

Indonesia's electronics industry is dominated by companies that assemble components; work that requires little modification of plant and equipment. A small number only of companies are capable of basic modification, design and engineering innovation (Thee and Pangestu, 1998). From the point of view of production structure, most of the electronics firms are highly dependent on imported components and parts. Sole agents for foreign brands imported components and parts from their overseas principal. Most local-brand producers usually import their main components and parts. This state of dependence marked the failure of the country's effort since the late 1970s to develop its supporting industries.

Indonesia has been quite unsuccessful in developing close connections to the international production network. This failure stems from various

factors: an unfavourable investment climate, low labour productivity, rampant smuggling and poor infrastructure among others. The closure of Sony Electronics Indonesia in May 2003, after operating since 1991, should serve as a warning to the domestic electronics industry. Sony Electronics Indonesia moved to Malaysia and Thailand because these two countries were thought to offer a more favourable business environment. Indonesia seems never to have learnt from its past policy failures. Booth (1998) argues that Indonesia missed opportunities to be part of the semiconductor production network when Fairchild and National Semiconductor relocated in 1986 because of unfavourable Indonesian investment policies that discouraged automation in semiconductor factories. On these two occasions, the companies' demand for efficiency by scaling down their labour forces, were not met because of the negative reaction from politicians and from the government, which were against any retrenching. These two instances should serve as a lesson: for multinational companies, it is not very difficult to relocate electronics manufacturing to other places that offer better commercial environments (incentives, better facilities and lower production costs).

2.2 Current situation of the electronics industry

Indonesia is a big market for electronics goods. Figure 2 illustrates the sharp increase in demand for TV and communication equipment since 2005,

especially demand for LCD and plasma TV products. Meanwhile, the production of other electrical machinery and equipment has been relatively stagnant.

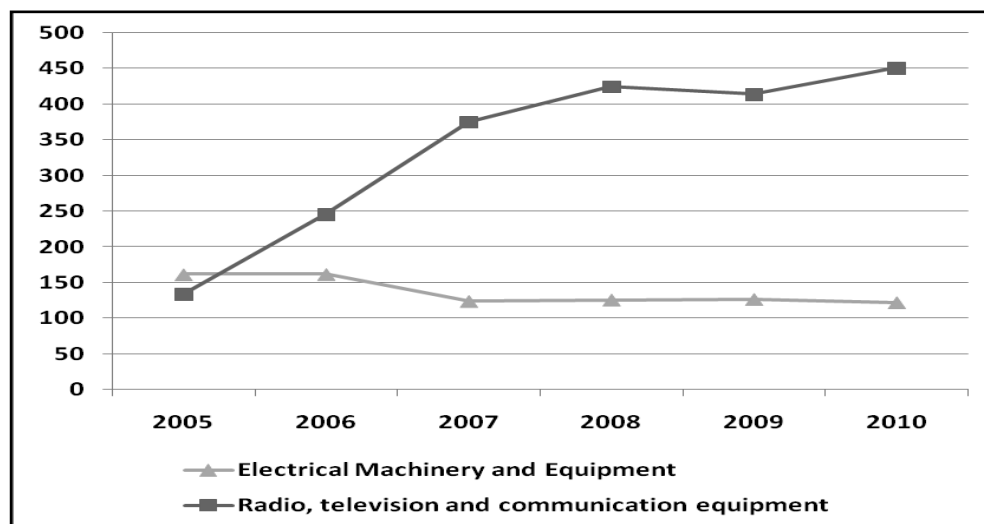
The rate of growth of TV sales in Indonesia, when compared with other electronics appliances, is among the highest in the world. Despite the huge market potential, however, the production capacity of the electronics industry has not been fully utilised. This low capacity utilisation is partly a result of low household purchasing power. Consumers are sensitive to change in price; evidence for this sensitivity is indicated by the market revival when cheap products from China began to enter the domestic market. The domestic electronics producers, especially those operating at the lower end of the market, suffered worst because they could not compete

with cheap imported products, mainly from China.

Figure 3 shows that Indonesia has experienced a trade deficit in electronics. In 2008, the deficit in the electronics trade reached USD3.5 billion. In 2009, the trade deficit was much smaller, about USD600 million; imports had decreased significantly because of the global financial crisis but exports remained relatively constant (see Figure 3).

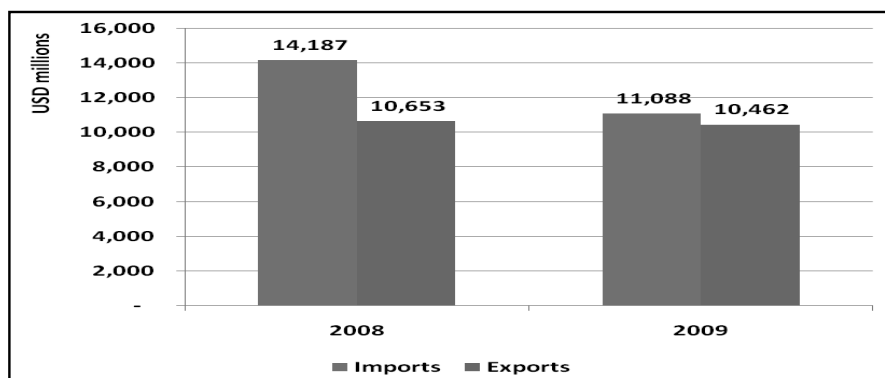
Figure 4 shows major electronics exports from Indonesia. During the period 2005 to 2009, video, audio recorder and electronics parts were the main electronics exports from Indonesia.

Figure 5 shows that the share of electronics in total manufacturing exports has been relatively constant at about 28% over the period 2005 to 2009.



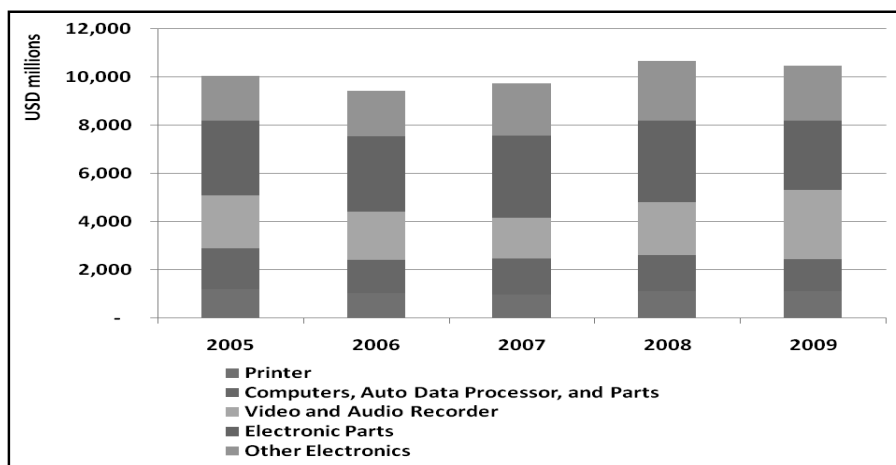
Source: BPS via CEIC

Figure 2. The Boom in Demand for Television and Communication Devices (Industrial Production Index, 2000=100)



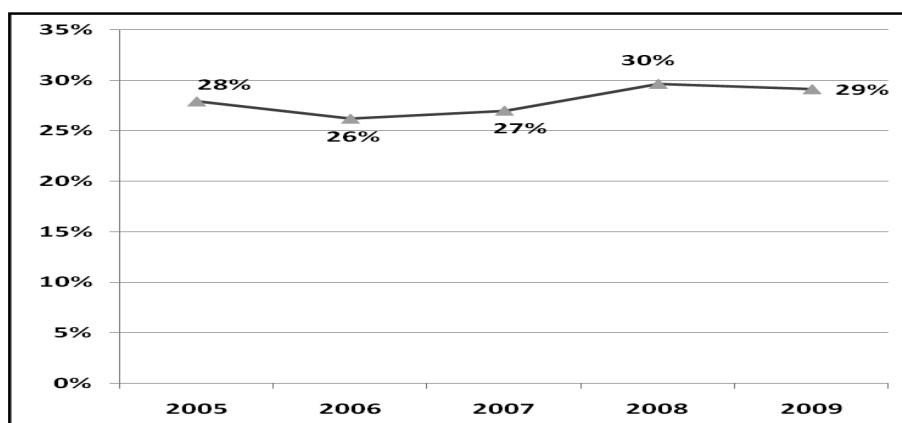
Source: BPS via CEIC and World Bank

Figure 3. Trade Deficit in the Electronics Sector



Source: BPS via CEIC and World Bank

Figure 4. Composition of Electronics Exports



Source: BPS via CEIC and World Bank

Figure 5. Electronics Exports as A Share of the Total Manufacturing Exports

2.3 Structure of the Textiles and Garments Industries

The textiles industry in Indonesia has three subsectors. First, the upstream industry comprises synthetic fibre makers, and is an industry that is highly capital-intensive and large-scale. Second, the midstream industry comprises the spinning industry (yarn), which is relatively capital-intensive and large-scale, and the weaving industry (fabric), which is relatively labour-intensive. Third, the downstream industry comprises the garments industry, which is highly labour-intensive (Table 1).

Compared with the electronics industry, Indonesia's textiles and garments industries are considered well established and have already achieved vertical integration with the highly specialised upstream fibre production and with the labour-intensive finished garments industries. Besides, the industry has developed a strong domestic and international distribution network through years of cooperation.

Indonesia is one of the ten largest synthetic fibre producers in the world, with total production capacities

of 500,000 tons for polyester staple fibre, 825,000 tons for polyester filament yarn, and 30,000 tons for nylon filament yarn.¹ In Asia, Indonesia is ranked sixth after Taiwan, Korea, China, India and Japan in terms of synthetic fibre production. The products are mostly sold domestically with an annual value of around IDR3 to 4 trillion. According to the Indonesian Textiles Association (API), synthetic fibre exports from Indonesia reached USD445 million in 2008, with Europe being the main exports destination.

The textiles and garments industry entered a difficult period after the 1997 Asian financial crisis. Production and exports were highly volatile and the industry faced financial difficulties caused by the banking sector collapse, and liquidity became scarce. Before the crisis, around 40% of bank lending was channelled to the manufacturing industry, particularly textiles and garments manufacturing. After the crisis, around 10 to 15% only was provided to the whole of manufacturing industry.

¹ Based on data from the Indonesian Synthetic Fiber Makers Association (APSyFI).

Table 1. Profile of Textiles and Garments Firms in Indonesia

	Products	Type of technology	Market orientation	Main player
Fibre	Natural fibre Synthetic fibre	High	Domestic (75%) Export (25%)	Foreign: Japan, India, Austria
Spinning	Yarn	High	Domestic (70%) Export (30%)	Foreign: Japan, India Domestic
Weaving	Fabric	Low	Domestic (75%) Export (25%)	Domestic
Garments	Apparel	Low	Domestic (15%) Export (85%)	Foreign: South Korea, Hong Kong, Taiwan

Source: Ministry of Industry

The long restriction of bank lending to the local textiles industry has hampered investment in that sector. The consequence of this is that technology has not been upgraded and productivity has fallen. The industry is aging and often regarded as a 'sunset industry'. According to the Indonesian Textiles Association (API), around 60% of the installed textiles and garments machines are more than 15 years old (API, 2009). The technology is obsolete, thus negatively affecting productivity, efficiency and quality. About 800 of more than 4000 textiles companies need to replace their old machinery. In short, Indonesia's textiles industry needs to revitalise its production facilities through restructuring, reinvesting and updating machinery and equipment.

The industry plays a key role in job creation. It has a high proportion of unskilled labour in its total labour input (about 90% of its labour force are classified as operators according to BPS Industrial Statistics). In order to invigorate the textiles industry, the government introduced a subsidy program of USD27 million in 2007 to modernise the aging textiles industry. However, this program has stagnated because of slow and uncertain budget disbursement.

In addition, the industry also suffers from the controversial labour law 13 of 2003. This labour law is perceived as favouring workers over employers (see Manning and Roesad, 2007). Despite outcries from employer association, it turns out that it is politically difficult to amend this labour law.

Proposals 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 were responded to with massive rallies by thousands of workers.

2.4 Current Situation of the Textiles and Garments Industries

Figure 6 shows the composition of textiles and garments exports from Indonesia for the period 2005 to 2009. In 2009, Indonesia's textiles exports were valued at USD3.9 billion, accounting for 1.6% of total world textiles exports. In the same year, Indonesia's garments exports were valued at USD5.9 billion, accounting for 1.7% of total world garments exports. Most textiles and garments exports are to the United States, Europe and Japan, and have been affected significantly by the global financial crisis.

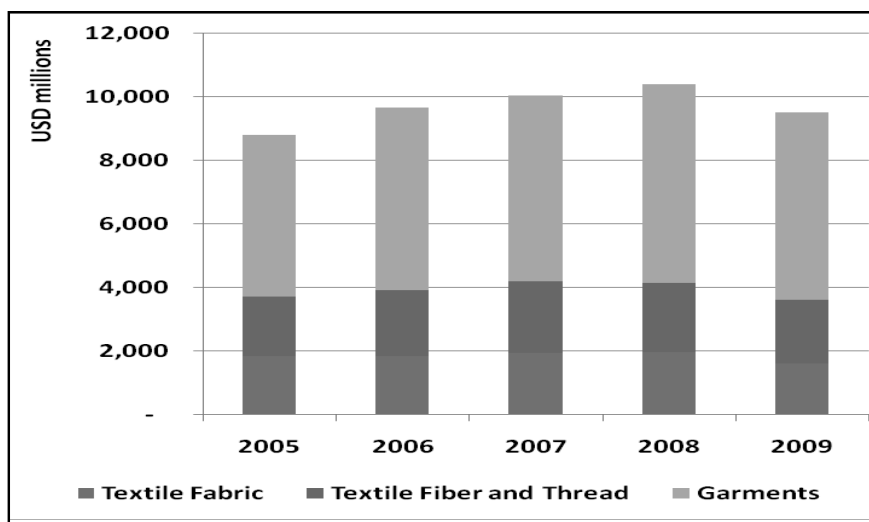
Indonesia has a trade surplus for the textiles and garments trade. In 2009, the trade surplus in the textiles and garments sector reached USD5.3 billion (see Figure 7) but many forecasters have predicted that the trade surplus in this sector will decline as Indonesia enters the full implementation of the ASEAN–China Free Trade Area (ACFTA).

The World Bank (2009b) has reported that even though the textiles industry was affected by the global economic downturn, the industry was still able to sustain its volume of exports in 2009. However, textiles pro-

duction fell slightly in 2009. Figure 8 indicates a significant drop in industrial production in the garments industry after 2006. However, textiles industrial production has been relatively stable over the same period.

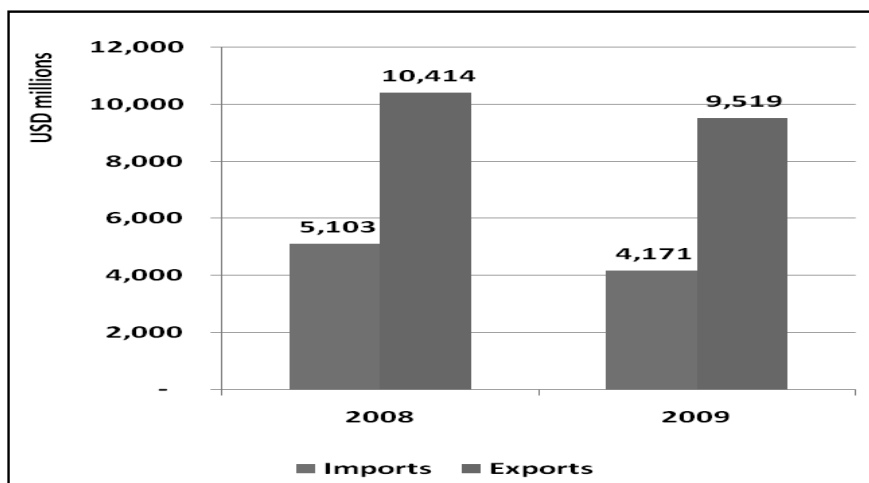
Figure 9 shows the declining share of textiles out of total manufacturing

exports in 2009. The demand for Indonesia's textiles exports has decreased in line with the global economic downturn. At the same time, competition among suppliers has become tighter. Since September 2008, it has been reported that nearly a quarter of a million jobs have been lost in Indonesia



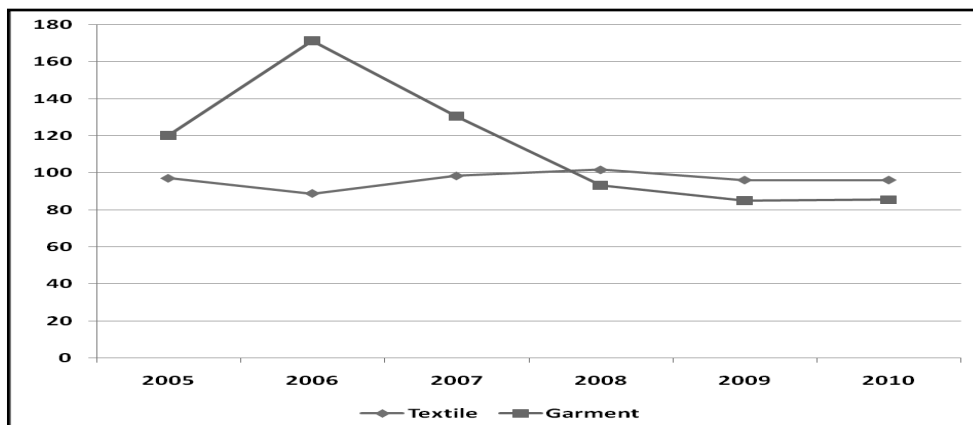
Source: BPS via CEIC and World Bank

Figure 6. Exports Value of Textiles and Garments, 2005–09



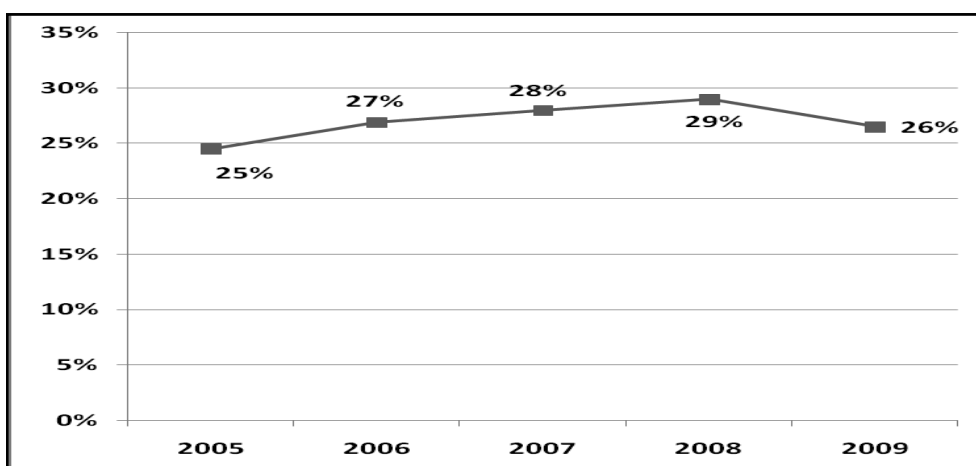
Source: BPS via CEIC and World Bank

Figure 7. Trade Surplus in the Textiles and Garments Sector



Source: BPS via CEIC

Figure 8. Textiles and Garments Industrial Production (Index, 2000=100)



Source: BPS via CEIC and World Bank

Figure 9. Share of Textiles and Garments in Total Manufacturing Exports

(World Bank, 2009c). There are many companies scaling down their operations and reducing the number of their employees because of decreased orders.

Even though the government has provided subsidies for companies to reinvest in new machinery and has provided fiscal incentives to support the industry, there is still concern by

the local textiles and garments producers that these measures will not be enough to allow them to compete against Chinese products. The implementation of ACFTA, effective since January 2010, has created massive fear that the local producers will be swept from the market because of a flood of cheap Chinese textile and garment imports.

III. DETERMINANTS OF FRAGMENTATION: A SURVEY

3.1 Survey Method

For this study, semi-structured interviews were arranged with policy makers, industrial and business associations, CEOs and managers in the electronics, textiles and garments industries in Indonesia (Table 2). The intention was to get information on the present situation and competitive environment in the various industries. Business associations were asked to introduce the survey team to firms that have relocated some or all of their production blocs to other countries or are likely to do so. In accordance with the information gathered from the business associations, the selected firms were contacted for interview. The firms selected for the sample were medium and large firms, employing more than

200 workers. Selecting such firms for the sampling is arguably quite reasonable because small firms are perceived to be less likely to relocate to other countries.² Furthermore, the surveyed firms include local, foreign and joint-venture firms.

The interviews were to cover three main issues. First, information on the firms' cost structure. The cost components the survey team was interested to learn more about were for labour; transport; electricity; imported parts, components and raw materials; local parts, components and raw materials; and other cost elements. Second, the interviews were to get information on business climate. The team tried to discover firms' perceptions on the

²Aswicahyono, Hill, and Narjoko (2007) find that larger firms, with bigger (more assets?) assets, are more likely to relocate to other countries because they can meet the required high set-up costs.

Table 2. List of Respondents

Associations	Electronics Association (GABEL): 38 members The Indonesian Textiles Association (API): 1118 members Taiwan Economic and Trade Office (TETO)
Policy maker	Investment Coordinating Board (BKPM)
Electronics firms	Korean owned: 3 Japanese owned: 1 Joint venture (Singapore majority): 1 Domestic owned: 3
Textiles firms	Japanese owned: 1 Domestic owned: 5
Garments firms	Joint venture (Taiwan minority): 1 Domestic owned: 2

Source: Survey results

current global competitive challenge; in particular, whether intense competition in the domestic or the exports markets has forced firms to relocate or to consider relocating some or all of their production blocs to other countries.

The interviews also tried to obtain other information, such as the average wage and educational attainments of workers and the quality of infrastructure. Third, the team wanted information on determinants of fragmentation. The objective was to obtain firms' perception of the CLMV countries, whether the firms consideration of the CLMV countries as their destination for fragmentation is conditional on a set of information about business climate in the CLMV countries. The interviews also asked firms' for their assessment of the determinants of fragmentation to areas other than the CLMV region.

3.2 General Details of the Sample Firms

In total, there were eight electronics firms, six textiles firms and three garments firms interviewed. The set of electronics firms comprised three Korean-owned companies, one Japanese company, one joint-venture company and three Indonesian-owned companies. Most textiles and garments firms are domestic-owned companies. There was only one foreign (Japanese) textiles company in the sample. Most of the electronics firms are in the industrial zone. On the contrary, most of the textiles and garments firms are outside the industrial zone.

Table 3 shows that on average the electronics firms interviewed are less labour-intensive than the textiles and garments firms. The average annual US dollar value of sales of the electronics firms interviewed was also significantly larger than those of the textiles and garments firms. The explanation is that most of the selected electronics firms are multinational companies, which arguably have better global networking.

On average, dependency on imported parts, components and raw materials is about 70% of the total cost structure of the electronics firms surveyed. To a lesser extent, the dependency on imported components and raw materials is relatively less for the textiles and garments firms. Of the textiles companies, some use cotton extensively as their raw material and almost 90% is imported. There are some textiles firms that use polyester (a synthetic fibre) and most of their raw material is procured domestically. For garments, the imported content is still above 50% (Table 4).³ This finding corroborates several studies on the weakness of the domestic supporting industries, in particular, those providing parts, components and raw materials needed by the industry.⁴ Firms find that it is easier and cheaper to import those inputs rather than procure them domestically. There are some big textiles and garments companies that have the

³ Gunawan and Siregar (2009:21) reported that the import content for electronics, clothing, textiles, and footwear manufactured exports is between 35 and 85%.

⁴ See, for examples, Thee and Pangestu (1998), Kuncoro (2006) and Narjoko (2007)

Table 3. Characteristics of the Surveyed Firms by Size and Industrial Sector

		Annual sales (USD million)	Total assets (USD million)	Number of employees
Electronics	Max.	193.58	361.37	1134
	Min.	40.74	28.74	600
Textiles	Max.	89.47	187.62	4887
	Min.	4.89	41.52	479
Garments	Max.	46.11	141.58	5926
	Min.	0.03	41.22	1200

Source: Survey results

Table 4. Firms Cost Structure

	Electronics (%)	Textiles (%)	Garments (%)
Labour force	6.8	5.91	6.59
Imported parts, components and raw materials	73.25	30.18	55.64
Local parts, components and raw materials	8.8	28.32	3
Transport	1	3.62	2.3
Electricity	1.38	5.17	5.03
Other energy costs	-	13.44	16.74
Depreciation on machinery	1.50	8.97	8.63
Other elements	7.23	4.4	2.1

Source: Survey results

capacity to get their supplies of materials domestically because they have an integrated production line from fibre to final product. However, most raw materials, like cotton, are still imported.

Labour costs are around 6 to 7% of total production costs for those electronics, textiles and garments firms that were interviewed (see Table 4). It is interesting that for the textiles and garments firms, which mostly are outside the industrial zone, the cost of energy is more of a concern because frequent power cuts have forced them

to build their own gas or coal power generators. The depreciation cost of machinery is also much higher for the textiles and garments industries. The survey revealed that most firms procure cheap machinery from China and India and operate it at full capacity to make it break even before replacing it with the new machinery. However, once again the main constraint for full and continuous production is the supply of electricity from the state-owned electricity company (PLN).

Most electronics firms reported that they had never had a blackout in the previous six months (see Table 5). Their electricity is continuously supplied by a privately managed electricity generator in the industrial zone. In contrast, most textiles and garments firms rely for their electricity supply on PLN and complained about frequent blackouts once or twice a month. It is important to note that the price for a continuous supply of electricity from privately owned electric power companies in the industrial zone is more than double the electricity charge of PLN.

For customs clearance, it was revealed that the time taken is longer for imported goods than for exported goods. In some cases, it takes up to 120 hours for a customs clearance for imported goods (Table 6). Firms mentioned that

the Trade Ministry regulation 56 of 2008 has identified particular goods that may be imported. The implementation of this regulation has resulted in stricter customs inspections.

In terms of wages, the electronics firms reported relatively higher salaries for each type of worker compared with the salaries of workers in the textiles and garments firms (Table 7). One possible explanation of this wage differential is that most of the electronics firms interviewed are foreign multinational companies and they tend to pay higher salaries than do their local counterparts. This finding is not new; some previous studies have reported that foreign multinational firms on average pay higher salaries than local firms.

Table 5. Information on Business Climate

Average	Electronics	Textiles	Garments
Export ratio (% of output)	55.8	47.02	57.75
Blackouts (frequency)	1 to 2 (every 6 months)	1 to 2 (each month)	1 to 2 (each month)
Blackout length (minutes)	>30	>30	>30
Turnover rate per month (%)	1.7	0.75	1.8
Transport mode	Aircraft, Ship, Truck	Aircraft, Ship, Truck	Aircraft, Ship, Truck

Source: Survey results

Table 6. Customs Clearance

Imports		Exports	
Time taken for customs clearance (hours)	Payment (USD)	Time needed for customs clearance (hours)	Payment (USD)
1 to 120	25 to 350	1 to 2	50 to 300

Source: Survey results

In terms of education, on average, most of the operators in the firms surveyed are high school and vocational school graduates. The electronics and textiles firms mostly employed high school graduates for operator jobs, about 59% and 55% respectively. Meanwhile, the garments firms mostly employed vocational school graduates for operator jobs (49%). For managerial and engineer positions, most positions are held by university graduates. It is interesting that quite a significant proportion of those who work as engineers in the garments firms are high

school and vocational school graduates, about 25% and 33% respectively (Table 8).

3.3 Firms Perceptions of Determinants of Fragmentation

The survey revealed that labour costs are still the main determinant for fragmentation for electronic and for textiles firms (see Table 9). Electronics firms rank access to ports and markets and, next, population and income level as the second and third most important

Table 7. Wage Rates of Workers (USD per Month)

	Electronics industry		Textiles industry		Garments industry	
Type of worker	Min.	Max.	Min.	Max.	Min.	Max.
Operator	107	214	100	130	100	130
Manager*	536	1077	300	520	300	520
Engineer	320	536	150	500	150	500

Note: * Middle manager

Source: Survey results

Table 8. Education Level of Workers (% of Total Employees)

		Education					
		Elementary School	Middle High	High School	Vocational School	College or Univ.	Graduate School
Operator	Electronics	0.43	2.03	59.28	30.83	7.45	0
	Textiles	2.5	10	55	27	5.33	0
	Garments	0	6.3	38	49	6.67	0
Manager*	Electronics	0	0.66	4.28	24.01	68.93	2.13
	Textiles	0	0	3	5.5	90	1.7
	Garments	0	0	0	1.7	77	22
Engineer	Electronics	0	1.31	4.38	1.04	88.9	4.38
	Textiles	0.67	6	8.67	21	64	0.3
	Garments	0	0	25.3	33	41	0

Note: * Middle manager

Source: Survey results

Table 9. Electronics Firms' Perception of Determinants for Fragmentation

	Electronics		Textiles and Garments	
	Score	Rank	Score	Rank
Wages of workers	2.63	1	1.86	1
Access to ports and markets	2.75	2	2.86	2
Population and income level	3.00	3	3.43	3
Land price	4.50	4	5.29	4
Electricity or energy prices	5.13	5	5.71	5
Education level of workers	7.00	6	5.86	6
Incentives (e.g., tax holidays)	7.38	7	6.43	7
Price of water for industrial use	7.88	8	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.

determinants for fragmentation. In contrast, textiles firms perceived land price and energy price as the second and third most important determinants for fragmentation.

Do firms consider fragmentation to CLMV as a future strategy? The answer to this question is relative and based on firms' perceptions of advantage. There are several reasons why firms decide to go along the fragmentation road. One critical reason is profit: if a firm can make profit in a particular country, then it will consider fragmentation, including to the CLMV countries. One domestic electronics firm owner mentioned that his firm would be willing to move if there were a high probability of making greater profits in one of the CLMV countries. Higher profits could be achieved through bigger markets, lower costs, or both.

Another reason for fragmentation is to assure the longevity of their business. The owner of one domestic

textiles firm said that his business, like many other textiles and garments companies, currently suffers from a serious electricity supply shortage because PLN cannot guarantee continuity of supply for the whole year. The electricity supply is rationed to only 300 day per year because of poor distribution. This has meant that his business, and many others as well, need to find other electricity supplies, which are often more expensive. According to the Textiles Association, this problem of power supply has caused some firms to relocate to China.⁵ Some are still considering whether to move in order to sustain or expand their production.

⁵ Some firms have moved back to Indonesia because the Chinese government attempted to relocate their operations from the coastal area to inland China. The firms argued that the disadvantage of an inland location (far from the ports) would deny them profitability. Another reason why firms move from China is that there has been a rapid increase in wages there, especially in China's coastal regions.

Regarding firms' destination when they are contemplating fragmentation, it is important to note that many firms perceived Vietnam to be in a different league compared with the CLM countries. They regard Vietnam as being equally or slightly more attractive for investment as Indonesia. Therefore, if they choose to relocate, Vietnam is regarded as a more promising destination. Other countries that are of attraction for fragmentation are China and India. Most of the surveyed firms perceived these two countries as providing bigger markets, better investment climates, and better infrastructure.

Despite various issues mentioned by the firms about a poor investment climate in Indonesia, the study found that most firms (of those interviewed in 2009) operating in Indonesia did not consider fragmentation to CLM countries for several reasons.⁶ These are macroeconomic stability; political stability; infrastructure, natural resources and manpower; openness of the economy; and principal global strategy. Each of these in turn is discussed below.

Macroeconomic stability

Interviews with a representative of the Taiwanese Business Office (TETO) in Indonesia revealed that most Taiwanese firms in Indonesia considered that Indonesia has been quite successful in maintaining its macroeconomic stability. The inflation rate at the time of

the interviews was less than 5 percent. GDP growth is relatively strong in the region (economic growth was 4.5% in 2009) and the exchange rate 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 markets is very promising with an expected increased in per capita GDP. Meanwhile Vietnam has difficulty in controlling its inflation rate. The high inflation is very detrimental to business and makes it too risky to invest in that country. Other CLM countries are considered much less attractive than Vietnam in terms of per capita GDP. Therefore, for most companies looking for larger markets, CLM countries are not quite as attractive as a fragmentation destination.

Political stability

Most firms interviewed said that Indonesia at present has a solid political foundation after the Democrat Party's and President SBY's landslide victory in the 2009 parliamentary and presidential elections. The 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 such as Cambodia and Myanmar are considered to be highly unstable politically. In particular, the Myanmar political regime is perceived to be too risky for doing business and this causes investors to stay away.

⁶ It is important to note that because of the small size of the sample population, the results of the survey should be taken cautiously.

Infrastructure, natural resources and manpower

Despite evidence of infrastructure bottlenecks hampering firms operating in Indonesia, most firms believe the quality of infrastructure in CLM countries to be inferior to Indonesia's. A country like Laos is considered to be too isolated and manufacturing locations too far from the ports. Locational disadvantage creates additional costs for firms that export their products.

Most firms interviewed considered Indonesia a resource-rich country, which makes it relatively easy to obtain raw materials. But the firms were concerned that Indonesia tends to export most of the raw materials needed by domestic industries in order to raise revenue in the short term. Nevertheless, firms considered the CLMV countries to have fewer natural resources compared to Indonesia.

Indonesia is perceived to have a larger supply of manpower than the CLMV countries. It is relatively easy for firms in Indonesia to employ additional labour. Their only concern is that they cannot easily dismiss workers because labour regulations make generous severance payments mandatory. However, firms can hire more contract workers and limit the number of full-time workers. In addition, to increase productivity, some firms encourage their workers to be multiskilled, that is, they are able to handle several tasks. For instance, in the textiles industry, one worker might be assigned to operate three to ten different machines.

Openness of the economy

Firms mentioned that the Indonesia's open economy is one of the advantages of investing there. With basically no significant tariff or other barriers, it is easy for firms to procure parts, components and raw materials. Firms mentioned that the ASEAN–China Free Trade Area (ACFTA), which became effective in 2009, provides an opportunity for firms to import raw materials from China at lower cost. This is a reason for optimism by firms; that they are able to reduce production costs further. Firms, the interviews revealed, regarded the CLMV economies as relatively less open Indonesia's.

Principal global strategy

Foreign firms operating in Indonesia said the decision to relocate some or all parts of their production is determined by their principal strategic decision. Most foreign firms are export-oriented and their intentions are to maximise the benefits from their global supply chain. Therefore, the decision for a firm's fragmentation will be dependent on its principal global strategy.

Of the CLMV countries, only Vietnam is regarded as a potential destination for companies with a need for fragmentation. Firms perceived that Vietnam's investment climate is better than other CLM countries: the Vietnamese government has provided strong tax incentive to investors. In addition, Vietnam has invested more on infrastructure and is a bigger market compared with CLM countries.

Firms contended that wage levels and land prices in the CLM countries are not significantly lower than in Indonesia. More important, firms also perceived that infrastructure quality in CLM countries is not much better than (perhaps worse than) in Indonesia. With all these perceptions, and without further incentives, it would be difficult to persuade Indonesian firms to relocate to CLM countries.

Despite Vietnam's attractions, firms said that China, India and Bangladesh are their favoured destinations for business expansion. As potential markets, China and India are significant and their supporting industries are quite strong. Bangladesh has the advantage of preferential access to the US textiles market.

In view of the possibility of developing an industrial corridor involving Indonesia and CLMV countries, at least one of the conditions has been met, that is, the logistic backbone. For instance, the shipping lanes connecting Tanjung Priok and Sihanouk Ville;

Tanjung Priok and Ho Chi Minh; and Tanjung Priok and Yangon have been used by several shipping companies.⁷ However, to develop a truly active cross-border fragmentation (taking advantage of geographical diversity and countries' development stages), there are several other requirements. For instance, the service-link cost for connecting fragmented production blocs should be low enough to overcome the costs associated with geographical distance. Currently, service-link costs remain high (see Table 10). In addition, their 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. The demand side is also important: CLMV countries have preferential access to the US and the EU markets, which could be an important pull factor for

⁷ Yangon is the name of the city formerly known to English speakers as Rangoon.

Table 10. Distance, Time, and Cost of Shipping

Route	Shipping lane	Average cost by container size (USD/km)		Distance (km)	Days
		20-foot	40-foot		
Jakarta–Sihanouk	Jakarta–Tj. Pelepas	315	484	920	1
	Tj. Pelepas–Kuantan	91	139	265	8
	Kuantan–Sihanouk	245	376	715	1
	Total	650	1000	1900	10
Jakarta–Ho Chi Minh	Jakarta–Ho Chi Minh	400	600	1,900	4
	Total	400	600	1900	4
Jakarta–Yangon	Jakarta–Singapore	225	482	900	1
	Singapore–Yangon	475	1018	1900	10
	Total	700	1500	2800	11

Indonesian investment, for example, in the textiles and garments sectors. In this case, a potential industrial corridor comprising Indonesia, Cambodia and Vietnam could possibly evolve depending on the fulfilment of the minimum requirements mentioned above. Finally, Indonesia and the CLMV countries also need to improve their marketing strategies to ensure that the advantages they offer in terms of location are appreciated by investors and by companies: they might, for example, develop special economic zones that are supported by a conducive investment climate.

3.4 Key Issues

The survey asked about major issues faced by firms in relation to their business operation. Several key issues revealed by the trade and business associations and confirmed by the firms during the interview are as follows (without any particular order).

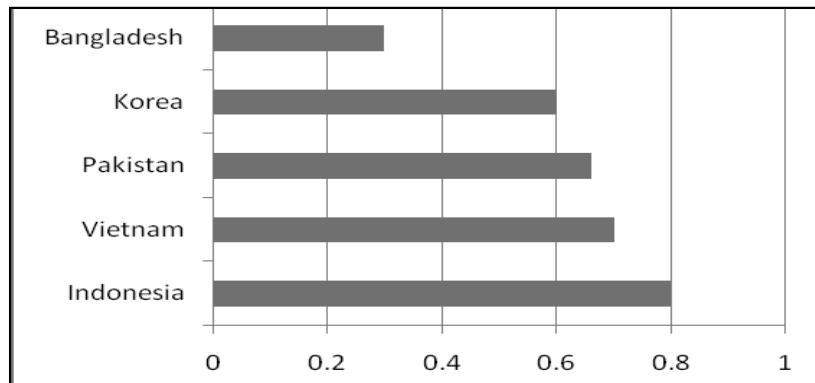
Bank financing

Most domestic Indonesian-owned firms admitted to the difficulty in obtaining bank credit. During the golden era of manufacturing in the late 1980s, about 40% of bank credit was allocated to manufacturing industry. Today, the situation is very much different. According to the firms interviewed, less than 15% of bank lending is to the manufacturing sector. High commercial interest rates have become a serious obstacle for the manufacturing industry. At the time of the interviews, commercial interest rates in Indonesia had reached

14 percent; in China at that time interest rates were about 6 percent. There is a widespread public perception that banks are reluctant to provide financing to the so-called ‘sunset-industries’ and these include the textiles, garments and footwear industries. These are considered by most banks to be no longer profitable and thus do not get easy access to bank credit schemes. The difficulty in obtaining bank credit has contributed to the low investment in new machinery and equipment. In contrast with the domestic firms, financing does not seem to be a concern for foreign-owned firms. The reason is that foreign-affiliated companies usually have a stronger capital and technological support from their principals. In addition, they also have better international networking.

Energy supply

Local firms criticised the management of the Indonesian domestic energy sector, in particular electricity. The firms said that even though Indonesia is a country rich in energy resources, it faces a serious energy crisis. They said that the energy crisis has been caused by improper management not 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 has not provided sufficient funds for investment and for the maintenance of the worn out transformers; this has resulted in frequent shortages of electricity supply to consumers, especially



Source: API 2009

Figure 10. Comparison of Electricity Base Tariff in Several Countries (USD/Kwh)

during the last quarter of 2009.⁸ This electricity shortage is very detrimental for manufacturing, especially the textiles and garments industries, most of which are outside the industrial zone. These industries rely on a continuous supply of electricity from PLN. However, as revealed by the Indonesian Textiles Association (API), the supply of electricity is limited to 300 days per year. For other days, firms have to satisfy their electricity needs from other sources, which might mean investing in their own generator.

According to API, compared with other countries that are not rich in energy resources, the price of electricity in Indonesia is higher (see Figure 10).⁹ This shows that the PLN's monopoly has cost the country dearly in terms of economic efficiency. The association

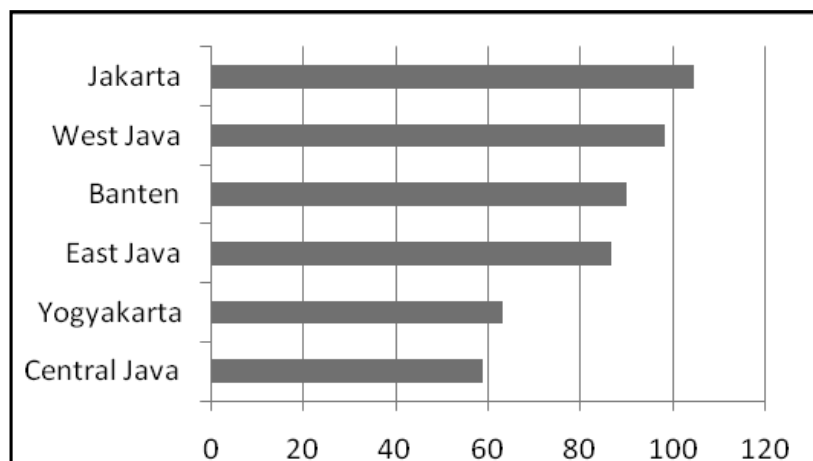
suggested that the government should abolish PLN's monopoly and encourage more investment from the private sector in energy, thus avoiding future electricity shortages and unreliability.

Labour market inefficiency

It was repeatedly stated in the interviews that the regulated labour market in Indonesia has been a constraint when firms want to scale down operations, especially in the face of a global market downturn. The policy governing the Indonesian labour market, in the wake of the economic crisis, is perceived by many to be too rigid. In particular, the labour law 13 of 2003 has been blamed by many employers for hampering the expansion of labour-intensive industries in Indonesia. The law and its administrative regulations have made it expensive to dismiss workers and this creates uncertainty for business operations (Manning and Roesad, 2007; OECD, 2008). The uncertainty is a result of the high severance payments required when firms dismiss workers. Firms have responded to this legal and

⁸ The interview period was coincident with the period after the fire in an electricity substation in Cililitan, East Jakarta, which caused blackouts in most Jakarta areas during October and December 2009.

⁹ Based on an interview on 22 January 2010 with Mr Ade Sudrajat, Vice-Chairman of the Indonesian Textiles Association (API).



Source: BKPM, Nov 2008

Figure 11. Minimum Wage Differential Across Major Industrial Areas (USD/Month)

regulatory handicap by hiring more contract workers. However, in the longer run this practice might discourage firms from training workers.

There is significant variation in the minimum wage in different regions across the country because of variations in the cost of living. In 2008, the minimum wage in Jakarta and West Java was USD104.60 and USD98.10 respectively. At that time the minimum wage in Yogyakarta and Central Java was USD63 and USD58.81 respectively (see Figure 11). The relatively high wages in West Java have resulted in several garments factory relocations to Central Java. Another reason why firms move to Central Java is that workers in this area are believed by employers to be more loyal than workers in West Java (where companies have higher labour turnover rates). The union in Central Java is also not regarded to be too militant compared with the one in West Java. For some

industries, the large wage variation could become a problem because of the high cost involved in setting up a new factory in another region when demand for their goods is not favourable. Consequently, the relocated plant may lose its competitiveness because of the cost of required adjustments in the new location.

One major concern of the garments industry in relation to the determination of the minimum wage is that aspects of labour productivity have not been seriously considered in the wage-fixing formula. Firms have to pay the minimum wage even though the productivity of workers is below the required standard. API cited an ILO report, which noted that labour productivity in Indonesia is ranked 59th, far below the labour productivity ranking of its competitors. In comparison, Thailand's labour productivity is ranked 27th; Korea, 29th; and China 31st. Given these rankings, it is likely

that Indonesia's labour-intensive industries will lose to China's in the wake of ACFTA.

Firms also raised their concerns about shortages of skilled and trained manpower. With respect to the skills needed, currently, skills training and labour-productivity development is mostly conducted by the companies themselves. For big companies that have skills-development programs, it is not a problem. However, small and medium companies will find it more difficult to obtain skilled and highly productive labour. Firms suggested that the government and universities should play a bigger role as suppliers of skilled labour to the industry.

Poor logistic infrastructure

Some firms raised concerns about the quality of logistic infrastructures, road traffic congestion and delays in customs clearance. Indonesia needs to improve its logistics system to make its products more competitive against foreign imports. Compared with other ASEAN countries, cargo-handling charges at ports in Indonesia are very high (see Table 12). A World Bank (2008b) report says that the cost of sending a forty-foot container from

Padang to Jakarta is roughly USD400, however sending it to Singapore is only USD175. The high costs and inefficiencies in the domestic distribution channels are seen by firms to be the major constraint that prevents Indonesia from integrating more effectively with international production networks of higher value-added products. In addition, licensing and government-regulated pricing are disincentives to invest in better services and they work to restrict competition between domestic sea and land freight companies. The restrictions on foreign investment in the logistics sector only worsens the situation by restricting access to new technology.

Logistic services in Indonesia are not only relatively more expensive but also less efficient (slower) compared with other ASEAN countries. Worse, importers need to pay extra, about USD70 per twenty-foot equivalent unit (TEU), for transferring goods from ports in Malaysia or Singapore to ports in Indonesia. This is why Indonesia has been ranked poorly in the World Bank's global logistic performance index (see Table 13). The index shows that Indonesia lags behind the Philippines and Vietnam in terms

Table 12. Terminal Handling Charges

Country	20-foot container (USD)	40-foot container (USD)	Shipments 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

Table 13. International Logistics Performance Index

International LPI rank (Out of 150 countries)	Country	LPI	Customs	Infrastruc- ture	International shipments	Logistics competence	Tracking and tracing	Timeli- ness
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

of logistic infrastructures. It is ranked higher than CLM countries only.

The high port costs in Indonesia are a serious constraint on the competitiveness of its manufactured exports. In addition to the greater terminal handling charges (THC) for containers, Indonesia's exporters also face a burdensome financial transaction process. Transactions in ports across Indonesia are in US dollars; in other countries similar transactions can be made with local currency.

Rampant smuggling

The Indonesian Textiles Association (API) estimated the domestic textiles market to be worth IDR70 trillion (approximately USD7.42 billion) in 2009. However, they reported that the national market share for local textiles producers declined from 65% in 2008 to 50% in 2009. About 30 to 40% of the textiles products in the domestic market are suspected to be illegal imports.

The influx of illegal imported textiles products mainly from China is blamed for the decline in market share of the domestic firms.¹⁰

In addition to competition from illegal imports, the influx of textiles imports has been encouraged by low or even zero import duties on Chinese, Japanese and Korean products. Import duties on Chinese textiles have been abolished since the implementation of ACFTA in January 2010, the rate was 5% previously. With imports from Japan, almost all of Indonesian textiles tariff lines, particularly the sophisticated ones, were already zero because of the Indonesia–Japan Economic Partnership Agreement (IJ–EPA). It is worth noting that not just the textiles industry but the electronics industry

¹⁰ According to Indotextile, a textile research centre sponsored by SENADA and USAID, textiles imports were valued at USD1.05 billion in the first quarter of 2009, slightly down compared to USD1.22 billion in the same period of 2008 and USD1.23 billion in the last quarter of 2008.

as well has to contend with illegal imports. In the electronics market, local production supplies about 30 to 35% of the domestic market. An estimated 35% of electronics products in the domestic market are smuggled goods. The remaining share, about 30%, is legal imports.¹¹

Weak supporting industry

Firms revealed that their high dependency on imported intermediate inputs is due mainly to lack of supporting industry in the country. Local support industries are not well developed. Therefore, the electronics and the textiles 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 of Electronics Firms (GABEL), currently more than 70% of the components needed by the industry have to be imported.

IV. CONCLUSION

A firms' decision on fragmentation to the CLMV countries is dependent on the profitability of such strategy. All the surveyed firms considered that the CLM countries were not in the same league as Vietnam, which is perceived as a promising destination for fragmentation. Vietnam is considered to have a better investment climate, offer more attractive incentives, pro-

vide better infrastructure and have a bigger market than the CLM countries. The CLM countries were thought by firms to have less favourable business climates and the investment risks to be too high.

The factors that are of prime concern to the firms that were interviewed are macroeconomic stability, political stability, infrastructure, openness to trade, and their global strategy. In view of this, CLM countries need to offer more than just lower wage rates to attract foreign direct investment from other countries, including Indonesia. They need to build investors' confidence by providing better infrastructure, strong financial incentives and a conducive business climate that will enable firms to operate efficiently. CLM countries need to implement trade and investment reforms that will allow a better flow of goods and services. Policy measures are needed to remove various constraints for the development of the international production networks. All of these are the necessary conditions for promoting inward FDI, which is 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 subject to the problem of a firms' limited knowledge of the CLMV countries. It is important to interpret the results cautiously. Further examination involving larger samples is recommended to fully understand firms' behaviour and perception in order to offer more substantial and effective policies for CLM countries.

¹¹ Interview with GABEL, October 2009.

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