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THE IMPACT OF COMPETITIVENESS ON FIRM GROWTH IN SPECIAL ECONOMIC ZONE: A STUDY OF ELECTRONICS CLUSTER IN BATAM, INDONESIA

ABSTRACT

Special Economic Zones (SEZ) have proven to be a powerful engine in fostering regional economy but also excel the capability of a country. This research aims to investigate some major determinants of electronics firms' growth operating in Batam Island which is considered as the first SEZ in Indonesia. By employing qualitative and quantitative approach, the result of this study shows that there are some macro and micro variables that influence the growth of electronic firms. The macro factors consist of good governance, institutional, human resources, labour, and corruption. The micro factors are size of the firm, efficiency in value chain activities, and innovation.

Key Words: firm growth, human capital, corruption, electronics cluster, free trade zone, foreign direct investment, Batam, Indonesia

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INTRODUCTION

The import substitution policy during Suharto era in 1970s has attracted the inflow of foreign capital in the form of joint ventures and technical co-operations. The Indonesian government switches from import substitution to export-oriented policy during the second half of the 1980s in order to induce vigorous industrial growth and large absorption of foreign direct investments. Indonesia implements a number of concrete measures to promote exports such as creating Export Processing Zones and removing restrictions on foreign capital ownerships. These measures have resulted in the upsurge of export-oriented investments by foreign companies, i.e., foreign assemblers and parts manufacturers.

Since then, electronics industry has been one of the most important manufacturing sectors in Indonesia. It contributes significantly to the growth of GDP and foreign direct investment, and to the reduction of unemployment and poverty. However, global economic crisis in 1997, the riots in 1998, and the emergence of China in the late 1990s have caused some foreign electronics firms to stop their operations in Indonesia. Hence, the proportions of electronics firms operating in Batam have declined from 45% in 1998 to 30% in 2007 (Central Bureau of Statistics, 2008).

The development of Batam Island in Riau Province, Indonesia, starts in 1990s. It is a part of the economic cooperation agreement between Indonesia and Singapore to develop the Riau Province. During its early years, a large number of Singaporean, Japanese, American, and European electronics firms have established operations in Batam, a bonded area which is located approximately 20 km southeast of Singapore. There are many instances in which factories operating in Singapore move to Batam to take advantage of abundant and inexpensive labour. Even when high wages and labour shortage make Singapore unsuitable for manufacturing, all imports and exports are still handled through Singapore. Singapore posits as the international hub of merchandise distribution in ASEAN region

Besides the advantage of low cost labour force, electric and electronics companies come to Indonesia, attracted by Indonesia's potential large market as well. Singaporean companies, together with companies of other nationalities, have formed clusters in industrial parks of Batam. They have become supply centres not only for the ASEAN region but also for Europe and the US. They have greatly contributed to the expansion of Indonesia electric and electronics industry.

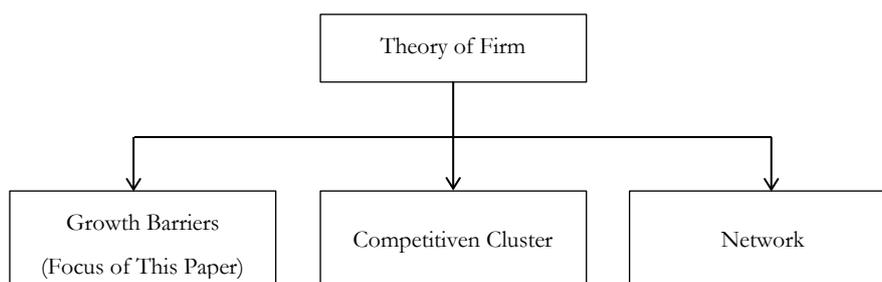
Unfortunately since the year 2000, Singapore and Japanese manufacturing investments in Indonesia have declined. Investments in the electric and electronics sector are no exception (Wahyuni and Ng, 2012). This decline may be attributed to the domestic conditions in Indonesia such as political instability before the Megawati era in 2001, rising labour costs, and uncertain economic outlook. Subsequently, Singaporean and Japanese companies try to reduce costs due to intense competition in the domestic and foreign market, sluggish worldwide demand, and the prolonged recession in the U.S.

Singapore and Indonesia have been working together to boost the growth and to gain competitive advantage of electronics industry in Batam. This research is trying to investigate the key determinant factors that influence firm growth in Batam. We use qualitative and quantitative firm level data for fifty electronics firms in Batam to answer the following main question: What are the key factors that adversely affect firm growth in Batam?

LITERATURE REVIEW

Firm growth is an important indicator of a thriving economy. In general, the determinants of firm growth can be studied and classified into three dimensions: individual, organizational, and environmental determinants (Baum, 2001). The determinants can also be studied from the aspect of barriers to growth of the firms. To stay focus, this paper is looking more on the barriers to growth electronics firms in Batam area (see Figure 1).

Figure 1: Focus of the Paper



Growth barriers

There are factors that hinder potential growth of companies (Hart, 2000). Such factors are called growth barriers. It is argued that SMEs are more likely to face entry barriers and

growth barriers compare to large enterprises. Commonly addressed barriers for small businesses include institutional barriers and financial barriers.

Institutional barriers are mainly focused on firms' interaction with government such as legal issues, taxation, and government support. Based on consistent results from both theoretical and empirical data, Davidsson and Henreksson (2002) strongly argue that certain institutions intentionally discriminate against SMEs so that they become SMEs growth barrier. It makes sense that SMEs would have a tough period when they face unfavourable tax system, discriminatory regulations, and complicated laws. Financial barriers represent lack of financial resources. It has been argued that credit constraints, lack of external debt, and equity capital are the main obstacles to the growth of SMEs (Becchetti and Trovato, 2002). Evidence suggests that banks are more conservative when they provide loans to SMEs. Because of asymmetric information, SMEs are more likely to be charged relatively higher interest rates and asked for high collateral and loan guarantee. Furthermore SMEs could also face external barriers, internal organizational barriers, and social barriers for examples market position of a firm, access to qualified human capital and access to network.

In the last ten years, several studies have shown that network structure and positions in networks influence firm performance and growth (Wahyuni, 2012) and, finally, market structure (Zeng, 2010). In addition, most researchers agree that networks have to be studied as a distinct organizational solution for the access to outside knowledge sources, the coordination of heterogeneous learning processes by agents endowed by different skills, competencies, access to innovation, and assets (Fund, 2007).

Innovation theory says that belonging to a network will increase the individual firm innovation rate and the strategy theory argues more indirectly that it will increase the firm's competitive advantage and in the long run its profit and survival. Importantly, assumption on the long term benefit for individual firm has only to a limited extent been verified by empirical evidence. The main support has been the argument that if the benefits over time are not positive the firm will leave the network. The network metaphor captures an agglomeration of possible explanations for the benefits to individual firms from structural interaction with other firms. Kuncoro and Wahyuni (2009) argue that structural level can be presented in networks terms through the concept of clusters.

The theory of cluster on firms' growth

Porter (1990) and Best (2001) discuss the most popular notions of cluster. It is thus useful to evaluate the work of Porter and Best on cluster before an alternative framework is developed to study cluster in the electronics industry in Batam.

The critical feature in Porter (1990) competitive cluster defined within a geographical space is critical mass of resources and competences that provides the region with a key position in an economic activity so that it enjoys a competitively supreme position in global markets. The concept has gained significance primarily because of the emphasis on increasing productivity innovation in the embedding firms, and the creation of new firms. High tech clusters are characterized by the agglomeration of firms around renowned science and technology based universities and research labs. Historically emerging clusters were generally driven by critical sectors over the years as tacit knowledge snowballed over from traditional industries. These industries then stimulated the growth of supplier and complimentary economic activities.

The essence of Porter's (1990) model of competitive advantage is the diamond. The diamond consists of: (1) factor conditions; (2) firm strategy, structure and rivalry; (3) demand conditions; and (4) related and supporting industries. National competitive advantage is achieved when particular industries meet the four ingredients above. Because critical technologies (core competencies) drive Porter's competitive clusters, specialization in particular goods and services as the drivers.

Systemic forces have largely driven the establishment of cluster in some locations. For example, the success of software engineers and related firms has convinced a number of high tech companies to set up operations in Bangalore, India. Although developing governments have often promoted Porter type clustering in particular regions on the basis of the identification of industries such as electronics, auto parts, wood-based products, garments, shoes or ceramics, few have retained the same industries in the long term.

A combination of a lack of firm level drive, a lack of the requisite human capital and high tech institutions to stimulate innovation have often undermined the capacity of such clusters to enjoy sustainable differentiation and division of labour. These are also the prime reasons for stagnation that has characterized export processing zones and industrial estates in developing economies

Frontier cluster (high tech clusters in Porter's notion and any dynamic cluster in Best's definition) are characterized by innovation. The focal point of innovation in a dynamic cluster is essentially the interdependent and interactive flow of knowledge and

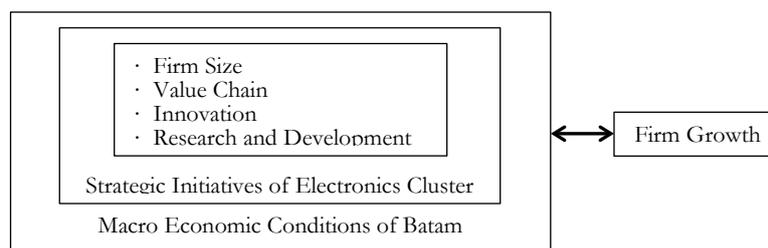
information among people, enterprises and institutions. It must include coordination between the critical economies and technological agents across value chains that are needed in order to turn an idea into a process, product or service on the market.

The long term objective of government policy in most efficiently governed industrial estates and Export Processing Zones (EPZ) has been to ensure sustained increase in labour force participation, and wages so that the broader objectives of poverty alleviation and human development are met. Without a policy to ensure learning and innovation, increased integration in the global economy undermined the capacity of these regions to compete against rising wages, the emergence of new sites such as China, and to meet the rising technological requirements of their industries (e.g., electronics). Lall (2001) clearly states that economies that failed to develop their technological capabilities became losers in the globalization process.

RESEARCH MODEL

Based on the above literature review we develop a model of firm Growth. From Figure 2 we can see that electronic firm growth in Batam is highly dependent on three categories of factors. The first category is related with the internal variable of firms such as firm size, effective value chain, innovation, research and development. The second layer relates to the electronics cluster strategic initiatives. The last layer is the macroeconomics condition of Batam. The Macro Economic Conditions of Batam consist of: (1) Man power and labour factor, (2) Institutional factor, (3) Governance factor, (4) Business Environment factor, and (5) Physical Infrastructure factor.

Figure 2: The Research Model



METHODOLOGY

The methodology of this study consists of qualitative and quantitative approach. The first part is qualitative research by using focus group discussions and in-depth interview with

the following resource persons: (1) selected business owners in Batam, (2) business associations, and (3) central and local government representatives. The purpose of qualitative research is to get more insight about investors' perspectives on Batam electronics companies.

The second part of this study is quantitative research/a field survey utilizing structured questionnaires directed to selected companies in the electronics cluster in Batam, Indonesia.

Unit of analysis

Our dataset consists of a unique firm level survey questionnaire of fifty electronics firms in Batam, Indonesia. The main purpose of the survey is to find out the perceived importance and satisfaction level of certain key issues affecting performance and growth of electronics firms in Batam. Thus the survey includes many questions on the nature of governance, institution, and human capital obstacles to growth, as well as corruption issues. General information on firms is more limited, but the survey includes data on numbers of employees, sales, industry, growth, competitors and certain key challenging issues faced by the firms surveyed. The survey also gives information on ownerships, whether they are exporter or something else and whether they have received subsidies from national or local authorities. Consistency and transparency of policy implementation is also examined.

The selection of companies is based on the following criteria: (1) the existing electronics firm operates in Batam for more than three years, (2) it is located in industrial parks (for practical reason of ease of coordination), (3) it has a minimum investment of US\$100,000, and (4) it employs at least fifty workers. If a company refuses to participate in the survey, it will be replaced by another electronics company which is not located in the industrial parks.

Interviewers' training and fieldwork process

To get deeper understanding on some important variables of the research, we send some trained interviewers to help the respondent fill in the questioner and also to raise some in depth questions. First, we trained interviewers on interview techniques and they needed to understand the meaning of all the questions in the questionnaire. The questionnaire packages were hand-delivered to the selected respondents and follow up was done within a week.

In this paper we investigate how important and how satisfied a firm perceived certain key factors to the growth and performance of the company. To analyse the effect of perceived obstacles on firm growth, we surveyed by means of questioners and interview, how important and how satisfied a firm perceive certain important factors such as corruption, human resources problems, etc. These problems are likely to become a barrier for the company growth. The entrepreneur may require political skills as well as business skills to run a growing business. In addition to studying the governance, human capital and institutional obstacles, the survey data enable us to discover whether firms perceive some obstacles as important.

Clusters in this paper is defined as a regionally networked set of economic agents (firms and institutions) i.e., localized systems connecting all critical economic agents necessary to drive learning, innovation and competitiveness (Best, 2001). Clusters here are considered to produce the most synergies when all requisite institutions are linked to drive learning, innovation, and competitiveness, and when economic agents are horizontally connected (interdependent interface is important). Cluster can generate an effective network if all participants are equally embodied in policy formulation.

RESULTS AND DISCUSSIONS

The result of this study will be divided into three parts: the barriers to growth, the strategic initiative of clusters, and microeconomic conditions of electronics industry in Batam.

The growth barrier of electronics industry in Batam

Some foreign companies initially regarded Indonesia as an investment destination linked with regional production network in Malaysia or some other countries, but they reconsider this view due to the deterioration of investment climates in Indonesia. Impediments to investment include political instability, lack of supporting industries, absence of tax holidays and other incentives, and non-transparency of the tax system and customs clearance procedure (Otorita Batam, 2008).

At present, Indonesia still has export competitiveness in terms of the exchange rate level, natural resources, labour and other fixed costs, as well as potentially large markets. This is showed during our interview with Toshiba (one of the largest television producers in Indonesia) who said that they wanted to increase investment in Indonesia and have decided to develop Indonesia as production base for ASEAN. For this purpose, they

planned to relocate production facilities from a number of other countries to Indonesia in the year 2008. Besides Toshiba, several other electric and electronics firms such as Schneiders electric and Panasonics have also established their own research and development centres in Batam.

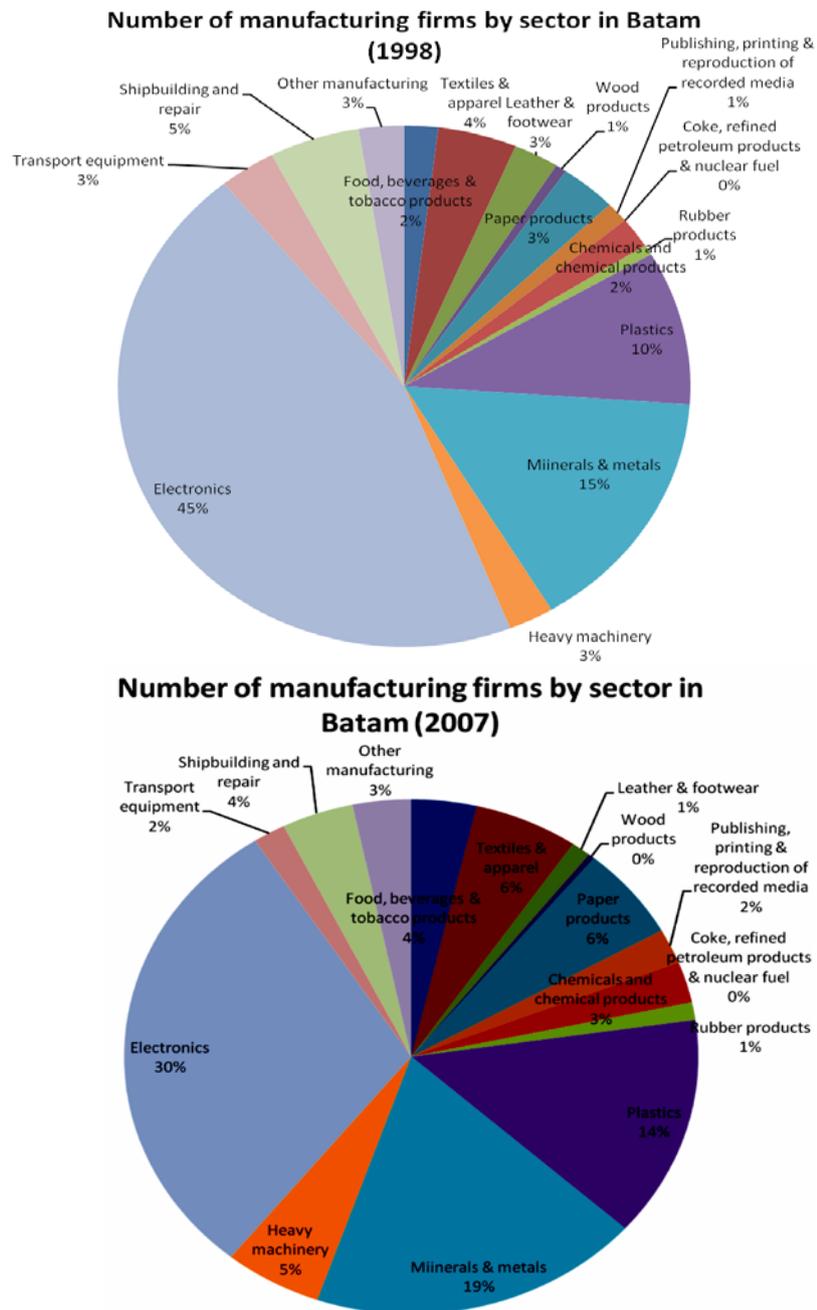
While Japanese investment is slowing down, Korean investment is picking up. Large Korean conglomerates, including the LG Group, have overcome an economic crisis of their own and are now actively constructing production factories in Indonesia. This move is also attracting small and medium-sized Korean manufacturing companies to build their production facilities in Indonesia (Indonesian Investment Coordinating Board, 2008). Not only Korean companies, many Japanese firms including Sanyo Electric Co. Ltd., Victor Co. of Japan, Toshiba Corp., and Matsushita Electric Industrial Co. Ltd. are even shifting the production of digital consumer products to Indonesia.

Nevertheless, most of those factories are only production based. Their headquarters are mostly located in Singapore. As shown by the following quote of GM an electronic company in Batamindo Industrial Park gathered during in-depth interview, “Singapore is expensive, but we choose to operate in Singapore because the productivity of Singapore is higher than Batam. If in 2009 the productivity does not increase, we will close our fabrication in Batam.”

From the above quote it is clear that there are some determinant variable that influence the productivity and the growth of company. At first, it is interesting to see the number of manufacturing firms in Batam throughout the years. We can see in Figure 3 that the percentage of electronics firms decreased from 45% in 1998 to 30% in 2007.

From our in-depth interview it was revealed that this situation was triggered by at least two factors: (1) economic crisis in 1997, (2) the exodus of some electronics companies to China. This situation provides a lesson to us that we have to be alert with the macro-economic situation as well as the possibility of firm migration from our country to other countries. Providing a friendly policy of investment and strengthening cluster development might be a smart solution to prevent this painful migration.

Figure 3: Proportions of Manufacturing Sectors in Batam in 1998 and 2007



Source: Central Bureau of Statistics (2008)

From macroeconomic condition our respondent opinions towards several key factors in Batam can be explained as follows:

Governance factors

Overall, the respondent firms attach relatively high importance to governance (4.69 of maximum 5), but the overall level of satisfaction with governance factor is low (2.91 of 5) (see Table 1). Specifically, companies have shown relatively low satisfaction levels (dissatisfied) with governance factors such as interpretation consistency of regulations by government officials, proper coordination between provincial and central government (mean scores: 2.6-2.7), and corruption free business environment.

**Table 1: Perceived Importance and Satisfaction of Macro Factors with BBK
(maximum score of 5)**

Factors	Importance	Satisfaction
Manpower and Labor	4.37	2.93
Institutional	4.67	3.06
Governance	4.69	2.91
Business Environment	4.32	3.28
Physical Infrastructure	4.71	3.40
Overall Competitiveness	4.55	3.16

On policy side, Indonesian government apparently has not clearly spelled out the position of the electric and electronics industry in the nation's overall industrial development. "At present Indonesia does not have a comprehensive or clear master plan for the electronics industry" (interview with the manager of Otorita Batam). "Free Trade Zone (FTZ) regulations unclear status makes us worried about our business" (interview with Sekupang Makmur Abadi).

Institutional factor

The backwardness of Indonesia's tax management has a very serious negative impact on the production of foreign companies. A large number of problems need quick attentions and solution. It is the way in which the tax system is actually implemented, rather than the system itself that causes serious problems. As shown by the following quote: "The interpretation and implementation of tax rules and regulations by the tax officers have

caused serious problems to companies” (interview with the directors of electronics companies in Batamindo Industrial Park).

To correct this problem, radical reforms is urgently required. A clear and transparent tax codes, and the consistency of its implementation on the grounds are urgently needed. A review of relevant organizations and their functions are needed urgently and government needs to pay serious attentions and reforms in this area. Otherwise, it would deteriorate the investment climates and investors’ confidence. The following quote shows the grievance of investors: “The system in Indonesia makes things done slower” (interview with a top executive in Batamindo Industrial Park).

For example: many visa applicants enter Indonesia for technology transfer to launch new products or to support production start-up. On the other hand, the Indonesian government fails to understand the present situation of global competition, especially ever-shortening product cycles in the electric and electronics industry in recent years. Foreign companies are forced to wait for nearly a month to transfer technology because of the slow procedure in getting working visa. Consequently, it leads to loss of opportunity.

Smuggling is also a serious problem in Indonesia. Because Indonesia consist of many large and small islands, it is easy to smuggle undeclared goods from and to anywhere. It is suspected that the custom officials often collude with smugglers. Because smuggled goods do not pay any taxes i.e., import duties, value-added tax, income tax, and luxury tax, their prices are lower than those goods produced and sold legally. The smuggled goods may drive domestically produced goods out of the markets.

In addition, due to the central government tightened fiscal policy to repay debt, the government cut subsidies for petroleum fuels and raised electricity tariffs again in the month of July 2010. The government needs to lower the costs of productions in order to make Indonesia to be an attractive and competitive place for manufacturing bases.

Labour factors and human resources development factors

The result of this study shows that investors have a relatively low satisfaction with manpower and labour factor. They are dissatisfied with labour factors such as labour regulations and labour unions (mean score 2.8).

Since the year 2000, investment climate in Indonesia has deteriorated due to the problems in such areas: labour problems, rising costs, public safety and order, and rampant smuggling. Labour unions were legalized after the collapse of the Suharto

government. Labour unions at the national level are now organizing company level labour unions to a labour movement, which is becoming increasingly serious problems for firms operating in Indonesia. Labour unions frequently launch protests to resist worker discharges and employers' instruction to "stay home" until they are called. Protests are used a means of demanding wage increases. As workers are now free to voice any opinions (reasonable or unreasonable), they are taking up even minor issues causing more problems.

The cost of doing business in Indonesia has raised since the year 2000 due to the increases in the mandatory minimum wages publicly regulated charges. Although the mandatory minimum wages had been kept at relatively low levels during and immediately after the economic crisis, the system was changed in the year 2000 from the power of central government to the power local or district government (autonomous) i.e., from the one in which the central government sets the mandatory minimum wages for each province to the one in which provincial governors and mayors have the power to set minimum wages provided that they are above the mandatory minimum wages set by the central government. Consequently, there was an increase in minimum wages of about 20% in 2002, and decrease to below 7% in 2003. "It is difficult to meet the company's objectives and manpower's objectives" (interview with Jacob of Batamindo Industrial Park).

Lack of supporting industries

Indonesia depends heavily on imported parts and materials for assembly in the electric and electronics industry. It also lacks the capacity to supply metal molds. Recently, some parts and materials in plastics and press work have become available because of the entry of some big players. Korean and Singaporean companies have begun to produce metal dies for the casing of TV sets. Indonesia can synergize with Singaporean and Korean companies to empower the electric and electronics industry in Indonesia.

The strategic initiatives of Batam electronics clusters

From the results of the survey, we know Batam has done well over the past ten years. Some of the electronics clusters i.e., Batamindo Industrial Park and some others have attracted a lot of foreign direct investments, contributing significantly to exports and reduced unemployment and poverty in Indonesia.

Foreign investment started to decline in 2007. Investment in Batam totalled US\$13.08 billion of which 36% was contributed by foreign investors (Indonesian Investment Coordinating Board, 2008). Batam's cumulative investments and yearly investments from 1992 to 2007 also indicated the importance of foreign investments in Batam (Central Bureau of Statistics, 2008). Export value has grown from US\$2.4 billion in 1995 to US\$5.2 billion in 2006, surviving a period of lower level of exports from 2001 to 2004 of around US\$3.8 billion to US\$4 billion. It has reached US\$6.1 billion in 2007.

The largest industry operating in Batam is electronics and computer related components and parts manufacturing such as audio and video equipment, automotive parts and printed circuit board (PCB). Consumer electronics is growing up in recent years. Big players are shifting their production to Batam, Indonesia due to abundant labour supply at affordable costs. In 2007, the industrial sector has contributed the most in the private investment segment i.e., 59% of total private investment; the trade and service sector contributed 15%.

In terms of the proportion of manufacturing firms by sector in Batam between 1998 and 2007, the largest sector was electronics (45% in 1998 decline to 30% in 2007), the second was minerals and metals (15% in 1998 grow to 19% in 2007), and the third was plastics (10% in 1998 grow to 14% in 2007). The three sectors were growing since 2001. The electronics sector reached peaked in the year of 2004, declined in 2005, and maintain about the same number from 2005 up to now (Central Bureau of Statistics, 2008).

Besides attracting significant foreign direct investment, the electronics cluster in Batam helps reduce unemployment level in Indonesia. In terms of the proportion of workers in the manufacturing firms by sector in Batam, the three largest sectors were electronics (73% in 1998 decline to 55% in 2007), plastics (7% in 1998 increase to 8% in 2007), and shipbuilding and repair (6% in 1998 decline to 2% in 2007). The total number of workers employed in the electronics sector reached the highest in 1999, declined sharply in the year of 2001, and grew steadily to peak in the year of 2005 (Central Bureau of Statistics, 2008).

Electronics sector shrinks from 78% in 1998 to 53% in 2007 in terms of the proportion of output of the manufacturing sector in Batam. Most companies in our study reveal that the government strategic direction for electronic industry is somehow unclear for them. Proactive strategy in fostering electronic industry to a higher level (e.g., joint R&D, collaboration with universities/research institutes, incentives, etc.) has not yet widely disseminated to the industry.

Microeconomic conditions

Several micro economic condition that affect competitiveness and firm growth are: firm size, value chain activities, innovation, and R&D. Two of the most important micro-economic conditions identified in this research that could enhance competitiveness and growth of the electronics firms in Batam, Indonesia are innovation and value chain activities by different sizes of companies.

Innovation and research & development

Innovation is very important for firms to stay competitive in electronics industry. Without innovation, the firms will lose in competing with others. Some big players in consumer electronics firms set up their own R&D centres in Batam. Practices of innovation and R&D collaborations are a way for companies to enhance their level of competitiveness (see Table 2).

Table 2: Practice of Innovation and R&D Collaborations in Electronics Firms in Batam

Practice of innovation and R & D collaborations	Those indicated "yes"	
	Number of firms	Proportion of firms (%)
Use technology licensed from a foreign owned company	92	81.4
Conduct own R&D at BBK SEZ	42	37.5
Conduct own R&D at another location of parent company	39	34.5
Collaborate with companies from Indonesia in R&D	20	17.9
Collaborate with companies from the investing country in R&D	29	25.9

Value chain activities, growth (investment plans of companies) by company size

Table 3 and 4 show the growth of all BBK manufacturing companies by company size, both in the last 3 years, and in the next 3 years. Majority of large-sized manufacturing companies were (are) more aggressive in expanding their operations, upgrading their machinery and equipment and adding other value-chain activities. Medium-sized manufacturing companies seem lesser inclined to develop new markets, develop a major new product (service) line in BBK, and upgrade an existing product (service) as compared to small and large sized manufacturing companies

**Table 3: Value Chain Activities of Companies Expanding in the Past Three Years
(reported by company sizes)**

Value chain activities	Small companies (less than 200 employees)		Medium companies (200 to 999 employees)		Large companies (1,000 or more employees)	
	No.	%	No.	%	No.	%
Scale down its operations	7	21.0	5	8.8	4	16.0
Expand its operations	13	39.4	35	61.4	17	68.0
Maintain the same level of operations	13	39.4	17	29.8	4	16.0
Remove operations	1	3.0	1	1.8	1	4.0
Relocate operations	3	9.1	0	0.0	2	8.0
Upgrade machinery and equipment	22	66.7	35	61.4	16	64.0
Develop new markets	16	48.5	14	24.6	12	48.0
Develop a major new product	10	30.3	9	15.8	11	44.0
Upgrade existing products	14	42.4	10	17.5	10	40.0
Add other value-chain activities	18	54.5	27	47.4	14	56.0

Majority of small manufacturing companies were (are) concentrating on upgrading their machinery and equipment, adding other value-chain activities, developing new markets, upgrading an existing product (service) line, and developing major new product (service) line.

**Table 4: Value Chain Activities of Companies Expanding in the Next Three Years
(reported by company sizes)**

Value chain activities	Small companies (less than 200 employees)		Medium companies (200 to 999 employees)		Large companies (1000 or more employees)	
	No.	%	No.	%	No.	%
Scale down its operations	3	9.1	2	3.5	2	8.0
Expand its operations	16	48.5	38	66.7	18	72.0
Maintain the same level of operations	14	42.4	17	29.8	5	20.0
Remove operations	2	6.1	0	0.0	0	0.0
Relocate operations	2	6.1	0	0.0	0	0.0
Upgrade machinery and equipment	24	72.7	35	61.4	17	68.0
Develop new markets	19	57.6	21	36.8	14	56.0
Develop a major new product	15	45.5	12	21.1	11	44.0
Upgrade existing products	18	54.5	9	15.8	10	40.0
Add other value-chain activities	19	57.6	27	47.4	17	68.1

CONCLUSIONS

We investigate several key factors affecting the growth of electronics industry in Batam, Indonesia. This paper discusses the macroeconomic conditions, the effect of strategic initiatives of clusters, and the microeconomic conditions in Batam. The macroeconomic conditions look at the perceived importance and satisfaction of firms surveyed in the areas of governance, institutions, human resources, and corruption. We learn that corruption affects firm performance and growth. We also see the respondent firms attach relatively high importance to institutional, governance and infrastructure factors. The overall level of satisfaction with the various competitiveness factors is relatively low (3.16 out of 5 maximum score). The firms reported relatively higher satisfaction levels with infrastructure and business environment factors, and relatively lower satisfaction with labour and governance factors (both with average score of less than 3).

This paper also examines the effect of strategic initiatives of clusters. We find that it helps reduce unemployment and poverty of the nation. Finally, we examine the microeconomics factors that influence the growth of electronics industry in Batam. Utilizing a comprehensive and detailed survey data of fifty electronics firms in Batam, we investigate the obstacles reported by the firms. The data also allows us to differentiate based on firm size, since it covers small and medium-sized enterprises in Batam. We find that human capital and innovation are regarded as very important but not contented. Companies have to employ engineers from Malaysia, India, or other parts of the world. To solve the shortage of skilled employees or professionals, Indonesia can synergize with Singapore. Indonesia can send workers to be trained in Singapore polytechnic schools or other institute of technical educations. Singapore definitely can help Indonesia to build capable human resource pools. Some of the big players' top executives are Indonesian trained by the companies they are working for.

Electronics industry is an industry that needs innovation. Without innovations the products of the electronics firms will be outdated and vanquished in global competition. Realizing the importance of innovation, some of the big players of electronics companies in Batam have set up their own Research and Development centers. We also find that business networks and contacts is the most important form of business relationships, even more important than physical linkages.

From the survey, we conclude there are three factors that need serious attentions: (1) labour and human capital issues, (2) regulations transparency and their enforcements, (3) good corporate governance practices. Indonesia actually has the capacity to be a good

place for manufacturing base i.e., electronics industry, but the government has to provide a clear vision, mission and grand strategy for the industry. If the key areas are not improved, very soon Indonesia will lose its competitiveness to its neighboring countries.

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