

Chapter 4

SME Development in Indonesia with Reference to Networking, Innovativeness, Market Expansion and Government Policy

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March 2008

Tambunan, T. (2008), 'SME Development in Indonesia with Reference to Networking, Innovativeness, Market Expansion and Government Policy', in Lim, H. (ed.), *SME in Asia and Globalization*, ERIA Research Project Report 2007-5, pp.99-131. Available at: <http://www.eria.org/SME%20Development%20in%20Indonesia%20with%20Reference%20to%20Networking%2C%20Innovativeness%2C%20Market%20Expansion%20and%20Government%20Policy.pdf>

Chapter 4

SME DEVELOPEMNT IN INDONESIA WITH REFERENCE TO NETWORKING, INNOVATIVENESS, MARKET EXPANSION AND GOVERNMENT POLICY

Tulus Tambunan

Abstract

In Indonesia, small and medium enterprises (SMEs), firms with less than 100 workers, have historically been the main player in domestic economic activities, especially as the largest employment creator. Typically, SMEs in Indonesia account for more than 90% of all firms in all sectors. These enterprises are concentrated in agriculture, followed by trade, hotel and restaurants as the second and manufacturing industry as the third largest sector. In this latter sector, they are involved mainly in simple traditional manufacturing activities such as wood products, including furniture, textiles, garments, footwear, and food and beverages. Only a small portion of total SMEs are engaged in production of machinery, production tools and automotive components.

There is increasing empirical evidence that SMEs are able to do innovations. It was found in Tegal metalworking industry, for instance, a group of producers who has successfully produced a hand tractor with own design for the domestic market.. This is one example of the ability of small and medium producers in the country to do redesign or reverse engineering. However, lower productivity (as a proxy of innovativeness) in SMEs than in LEs suggest that in general SMEs in Indonesia are less innovated than their larger counterparts

In sectors like agriculture and services, SMEs are more capable to expand their domestic market share than in manufacturing industry. In the latter sector, SMEs have to compete with LEs and increasingly imported goods. In foreign market, SMEs' exports are limited, and their export are mainly wood products, including furniture, food and beverages, tobacco, fertilizers, chemicals and goods made from rubber. The majority of those who do export, they do not export directly, but indirectly through intermediaries such as traders, exporting companies, or trading houses.

The paper argues that existing paradigm of SME development should change, from “the successful SMEs development strategy is marked by the annual increase in number of units” and “SMEs are important because they create employment”, to “the successful SMEs development strategy is marked by the annual increase in number of innovated and productive enterprises”, and “SMEs are important because they generate high value added, export, and they form domestic competitive supporting industries”.

INTRODUCTION

In Indonesia, small and medium enterprises (SMEs), i.e. firms with less than 100 workers, have historically been the main player in domestic economic activities, especially as a large provider of employment opportunities, and hence a generator of primary or secondary source of income for many households. Typically, SMEs in Indonesia account for more than 90% of all firms outside the agricultural sector, and thus the biggest source of employment, providing livelihood for over 90% of the country's workforce, especially women and the young. The majority of SMEs, especially micro enterprises (MIEs) and small enterprises (SEs), are scattered widely throughout the rural area and therefore they may play an important role as a starting point for development of villagers' talents, especially women, as entrepreneurs.

The main aim of this paper is to evaluate recent development of SMEs in Indonesia. It focuses on innovativeness, market expansion, and networking. For this purpose, literature study (i.e. previous case studies on SMEs in Indonesia) and analysis of secondary data on such as number of units, output, export and productivity in these enterprises have been conducted. Also, a small field survey has been conducted to assess how important are networks for SMEs from their own perspectives.

2. OVERVIEW OF SMEs DEVELOPMENT IN INDONESIA

Typically, SMEs in Indonesia account for more than 90% of all firms (Table 1), and they are the biggest employment creator. The majority of SMEs, especially MIEs, which are dominated by self-employment enterprises without hired paid workers, are scattered widely throughout the rural area. MIEs are the most traditional enterprises, generally with low levels of productivity, poor quality products, and serving small, localized markets. There is little or no technological dynamism in this group. The majority of these enterprises eke out bare subsistence. Some of them are economically viable over the long-term, but a large portion is not. Many MIEs face closure or very difficult upgrading especially with import liberalization, changing technology and the growing

Table 1: Total units of enterprises by size category: 1997-2006 (000 units)

Size Category	1997	1998	1999	2000	2001	2003	2004	2005	2006
Σ SEs	39,704.7	36,761.7	37,804.5	39,705.2	39,883.1	43,372.9	44,684.4	47,006.9	48,822.9
Σ MEs	60.5	51.9	51.8	78.8	80.97	87.4	93.04	95.9	106.7
Σ LEs	2.1	1.8	1.8	5.7	5.9	6.5	6.7	6.8	7.2
Total	39,767.3	36,815.4	37,858.1	39,789.7	39,970.0	43,466.8	44,784.1	47,109.6	48,936.8

Source: Menegkop & UKM (various issues).

Table 2: Unit structure of SMEs by sector in Indonesia, 2000, 2005 and 2006 (%)

Sector	2000			2005			2006					
	SE	ME	LE	Σ	SE	ME	LE	Σ	SE	ME	LE	Σ
1.Agriculture	99.99	0.01	0.00	100.0	99.99	0.01	0.00	100.0	99.99	0.01	0.00	100.0
2.Mining	99.61	0.35	0.04	100.0	99.67	0.28	0.05	100.0	99.72	0.23	0.05	100.0
3.Manufacture	99.48	0.45	0.07	100.0	99.42	0.49	0.09	100.0	99.40	0.52	0.08	100.0
4. Elect, gas & water supply	93.19	5.59	1.22	100.0	92.47	6.18	1.35	100.0	92.50	6.14	1.36	100.0
5.Construction	97.57	2.24	0.19	100.0	97.43	2.40	0.17	100.0	97.55	2.26	0.19	100.0
6.Trade, hotel & restaurant	99.54	0.45	0.01	100.0	99.57	0.42	0.01	100.0	99.55	0.43	0.02	100.0
7.Transport & comm..	99.87	0.12	0.01	100.0	99.82	0.16	0.02	100.0	99.81	0.18	0.01	100.0
8.Finance, rent & service	83.42	14.63	1.95	100.0	83.65	14.67	1.68	100.0	85.11	13.37	1.52	100.0
9.Services	99.60	0.38	0.02	100.0	99.66	0.32	0.02	100.0	99.67	0.31	0.02	100.0
Total	99.79	0.20	0.01	100.0	99.78	0.20	0.02	100.0	99.77	0.22	0.01	100.0

Source: Menegkop & UKM (various issues).

Table 3: Unit distribution of SMEs by sector in Indonesia, 2000, 2005 and 2006 (%)

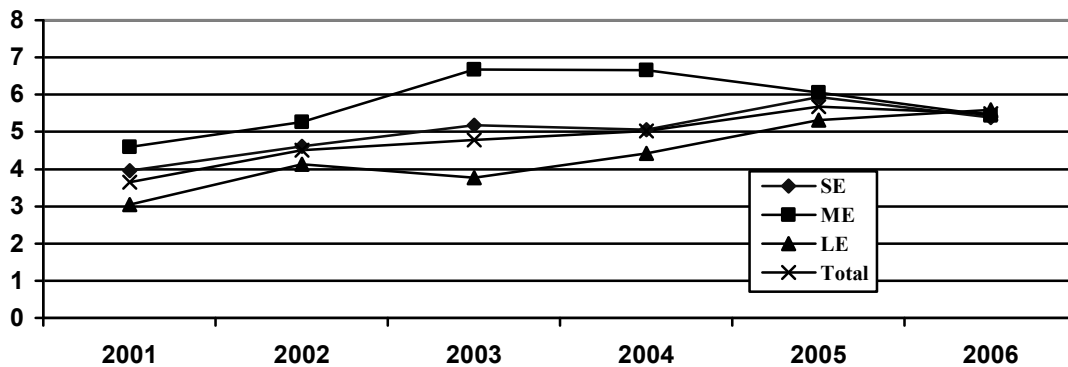
Sector	2000			2005			2006			
	SE	ME	LE	SE	ME	LE	SE	ME	LE	Σ
1. Agriculture	59.23	2.22	1.20	55.86	1.74	0.85	53.68	1.57	0.74	53.56
2. Mining	0.38	0.67	1.18	0.50	0.69	1.60	0.54	0.58	1.67	0.54
3. Manufacture	6.57	14.91	33.57	5.95	14.30	36.98	6.56	15.82	35.47	6.58
4. Elect., gas & water supply	0.03	1.02	3.08	0.03	0.97	2.98	0.03	0.90	2.96	0.03
5. Construction	0.31	3.63	4.42	0.34	4.08	4.30	0.33	3.52	4.41	0.34
6. Trade, hotel & restaurant	24.37	55.36	24.95	25.89	53.38	21.83	27.13	54.03	24.11	27.19
7. Transport & commun.	4.70	2.89	3.88	5.54	4.48	4.67	5.52	4.46	4.47	5.52
8. Finance, rent & service	0.13	11.14	20.60	0.13	11.22	18.06	0.15	10.51	17.68	0.17
9. Services	4.28	8.17	7.12	5.76	9.13	8.72	6.06	8.60	8.50	6.06
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Menegkop & UKM (various issues).

demand for higher quality modern products. However, the existence or growth of this type of enterprise can be seen as an early phase of entrepreneurship development. (Tambunan, 2006).

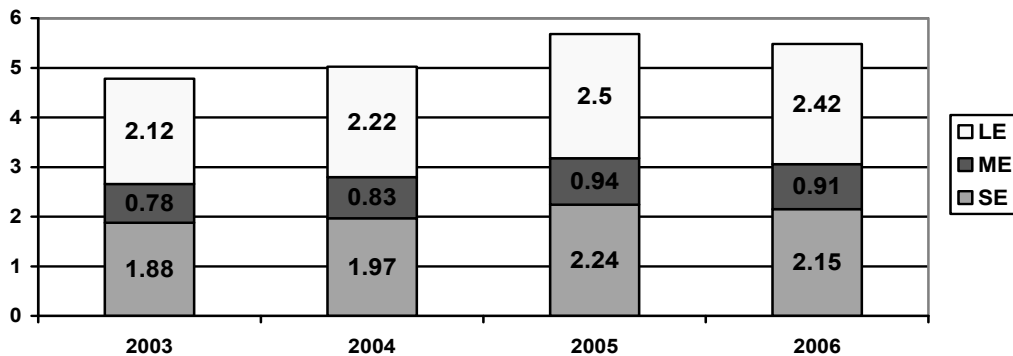
The unit structure of SMEs by sector indicates that the majority of enterprises in all sectors are from the category of SME with almost 100 percent in agriculture (Table 2). Whereas, the distribution of SMEs by sector shows that Indonesian SMEs are concentrated in agriculture, followed by trade, hotel and restaurants as the second and manufacturing industry as the third largest sector (Table 3). In this latter sector, they are involved mainly in simple traditional manufacturing activities such as wood products, including furniture, textiles, garments, footwear, and food and beverages. Only a small portion of total SMEs are engaged in production of machinery, production tools and automotive components. This is generally carried out through subcontracting systems

Figure 1: Output growth rates of SEs, MEs and LEs, 2001-2006 (%)



Source: Menekop & UKM (various issues).

Figure 2: GDP growth contribution by size of firms, 2003-2006 (%)



Source: National Agency for Statistics (BPS)

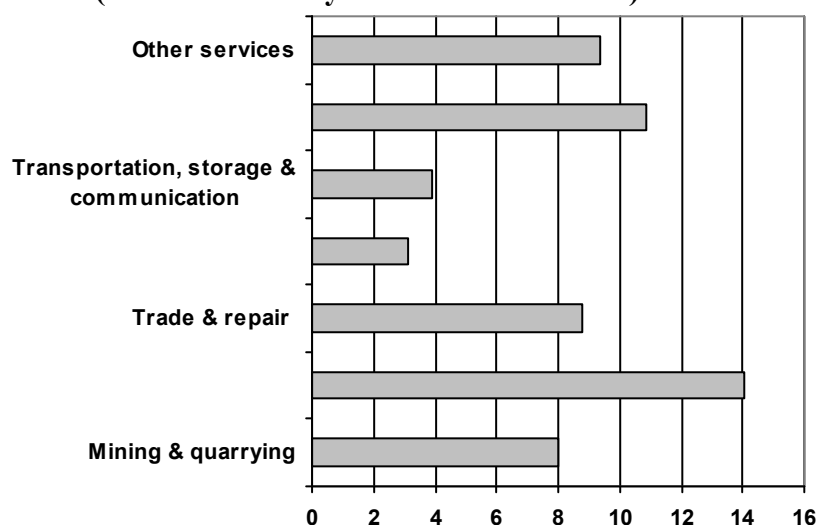
with several multinational car companies such as Toyota and Honda. This structure of industry reflects the current technological capability of Indonesian SMEs, which are not yet as strong in producing sophisticated technology-embodied products as their counterparts in other countries such as South Korea, Japan, and Taiwan.

With respect to output growth, the performance of SMEs is relatively good as compared to that of LEs (Figure 1). SMEs' contribution to the annual GDP growth is also higher than that of LEs (Figure 2).

3. INTERNAL AND EXTERNAL NETWORKS

The Integrated Business Survey on SEs and MIEs (SUSI; BPS) provide some data on SMEs' networks in Indonesia. It shows that in 2004, from more than 16 million firms covered by the survey, about 91.7% of them (15,725,192 units) have no partnership with others. However, the rate varies by sector. In the manufacturing industry, the rate of those having partnership is the highest at 14.02%. Whereas, from total firms doing partnership (1,420,052 units), the majority of them are found in the trade and repair sector (54.35%), followed by manufacturing industry (26.37%). Procurement of raw materials or inputs is the most favorite type of partnership, followed by marketing and financing (Figure 3).

Figure 3: Firms doing partnership by sector, 2004
(% of total surveyed firms in the sector)



Source: BPS (SUSI)

Being member of a cooperative is also a form of network, and this survey shows that only 2.91% of total firms in the sample (499,506 units) are members of cooperative. Again, the rate also varies by sector with financial intermediate, real estate, ownership and business services as the biggest sector (11.45%), followed by transportation, storage and communication. However, from total firms being members of cooperative, the sector with the highest rate is trade and repair (47.56%), followed by transportation, storage and communication (14.89%).

Another source of data on SMEs' networks is from the National Survey on SEs and MIEs in manufacturing industry (BPS). This survey has questions on the Foster Parent (FP) program. In this national program introduced by the government in 1992 all state-owned enterprises and big private companies (LEs) are requested to assist SMEs through a partnership with capital, training, technical assistance, marketing, procurement of raw material, and many others.¹ The survey shows that from total SEs and MIEs surveyed, i.e. 235,851 and 2,406,058 units respectively, only 22.35% and 11.10% respectively have partnerships with LEs through this program. Within SEs and MIEs having partnership, the majority are MIEs (83.51%).

One important type of networks are subcontracting production linkages between SMEs and LEs. The Indonesian government's efforts to promote subcontracting are reflected by its special policies on subcontracting and local content. Legislation regulating local content and subcontracting in the Indonesian engineering industry dates back to 1976 when Ministerial Decree No.307 was announced specifying a 4-year program for the deletion of specified parts from the imported CKD packs for commercial motor vehicles. This decree was soon followed in 1977 by a similar decree applying to motorcycles and scooters. Subcontracting regulations were first introduced in the 1981 motorcycle decree which specified whether each nominated component could be made "in-house" (by the assembler), or must be made "out-house" (by a subcontractor). By January 1985 decrees on the local content of simple types of machine tool were announced. It is therefore not surprising that vertical inter-firm linkages and subcontracting networks in Indonesia have proliferated in the automotive industry, and to a lesser extent in the machinery industry. Generally speaking, the overwhelming emphasis of the deletion program decrees has been on local content, with subcontracting requirements forming only a minor part.

Further, in order to strengthen the industrial structure, during Repelita IV (five year plan), the government issued several measures to create horizontal and vertical industrial linkages involving SMEs and LEs. Although the role of especially SEs in manufacturing industry at that time was quite insignificant as measured by total value added and volume of production, Repelita IV stipulated that the role of SEs within Indonesia's manufacturing industry needs to be enhanced by developing MEs and LEs which should in turn stimulate the development of SEs in the industry through subcontracting linkages (MoI, 1985).

Prior to the first attempt to regulate subcontracting activities in the manufacturing industry as part of the deletion program, a system whereby LEs acted as parent companies in subcontracting arrangements with small and medium scale subcontractors was in operation. By 1980 there were some 30 big companies involved in what had become known as the Foster Parent system. Nine of these companies belonged to the engineering subsector (MoI, 1985): P.T. Krakatau Steel; P.T. Astra International (Toyota, Daihatsu, Honda, Komatsu); P.T. Kubota Indonesia; P.T. Semarang Makmur; P.T. Indonesia Steel Tube Works, Ltd.; P.T. Boma Bisma Indra, Surabaya; P.T. Rheem, Jakarta; Perusahaan Galangan Kapal, Palembang; and P.T. Krama Yudha Tiga Berlian (Mitsubishi).

In the last 5 to 10 years, many studies have been conducted explicitly or implicitly on the importance of subcontracting as a means for LEs/MNCs to transfer technology to SMEs in Indonesia. For instance, IMG Consultants Pty Ltd (Sydney) together with PT. Unecona Agung (Indonesia) conducted a survey on some of the above mentioned big companies and their subcontractors (MoI, 1985). They argued that SMEs can only get involved when the technology embodied in the parts is sufficiently simple to be mastered by an inexperienced and unsophisticated organization. Their findings show two best-developed subcontracting networks, namely those organized by P.T. Agrindo in Surabaya and P.T. Kubota Indonesia in Semarang. The first company manufactures agricultural machinery, mainly rice huskers and millers, in a very crowded factory shared with sister companies which, amongst other things, assemble small Mitsubishi diesel engines. The second company assembles small Kubota diesel engines competitive with the Mitsubishi and Yanmar products.

P.T. Agrindo uses SMEs (mostly SEs) extensively as its subcontractors to machine components for its agricultural machinery. The company provides detailed specifications for each component and trains the owners of these SMEs to produce parts to specification, often providing the necessary materials, and even the machine tools and gauges in some cases. They carry out 100 percent inspection on incoming parts and claim to have almost no assembly problems. The use of subcontractors allows the company to concentrate on its own task in-house and achieve high output from its subcontractors. P.T. Kubota Indonesia has also achieved higher local content than Mitsubishi and Yanmar for similar engines, and most of the local content is attributed to many SMEs as its subcontractors in the Semarang and Klaten areas of Central Java.²

However, industrial development in Indonesia did not follow the same pattern as in Japan. On the contrary, the local content policy resulted in a vertically integrated production system within LEs. The Asia Foundation (TAF, 2000) argues that the lack of success of this policy in creating strong interdependence between SEs, MEs and LEs was largely due to the government's excessive interference, aimed at replacing the market mechanisms.³ Similarly, Thee (1990(b), 1997) argues that such production linkages did not develop smoothly during the New Order era because of market distortions and the lack of skills and low technological capabilities of local firms, especially SMEs.⁴

Although the mandatory deletion programs during the New Order era were largely unsuccessful in developing viable domestic supplier firms, successful private-led subcontracting networks did arise in some industries, with the evidence showing that these arrangements did successfully facilitate technological capacity building. For example is the case of PT Astra International or often called Astra Group, the Indonesia's largest integrated automotive company. Astra Group has been able to develop many SMEs into efficient and viable suppliers. As a result of the rigorous training which Astra Group provided to local suppliers with potential, overtime, these suppliers were able to produce a wide range of parts and components for cars and motorcycles according to the strict quality standards set by Astra Group, and also to meet its strict delivery schedules. In 2006, Astra Group has subcontracting linkages with 502 companies, including 171 SEs and 334 MEs.

The author has conducted a study on SMEs in metalworking industry in Tegal in the district of Tegal (*Kabupaten Tegal*), hereinafter Tegal. Tegal is part of the provincial government of Central Java located at the northern shore near the north coast of West Java on key trucking and rail routes. Tegal is among few areas in Indonesia with a long history of development in the metalworking industry clusters. It has been a metalworking center since the mid-1800s when it was the locus of several sugar processing factories and related enterprises including locomotive repair shops and metal processing factories. The industry continued, thriving particularly under the New Order's massive infrastructure and development agenda. In the beginning of the 1980s, as many FDIs, especially in the manufacturing industry, already entered the country, the first subcontracting activity started between local producers and a foreign affiliate company (Kubota), sparking government activity to develop the metal working industry.

The Tegal metalworking industry has about 30,029 workers out of 118,820 workers or approximately 25 % of total workers employed in the district's industrial sector. Based on information from Regional Office of Industry and Trade in Tegal, in 2006 there are around 2,811 metal workshops in the district, or about 10% of the total number of local enterprises in non-farm sectors.

Most of Tegal's metal workshops rely on the same basic metalworking technologies, e.g. casting, cutting, bending, drilling or stamping depending on product, machining, welding, and finishing (painting or electronic plating depending on product, and assembly). Most of the metal products are final consumer goods; metal craft, kitchenware, building fixtures, furniture, accessories and agricultural machinery and tools (sickle, shovel). Industrial goods range from various small items (nuts, bolts, washers, locks, hinges, door handles, some automotive components and ship parts) to hydrant pumps, hand tractor, coffee bean peeler and rice dryer. They have business linkages with some LEs through subcontracting, wholesale distributors mainly in Jakarta, housing developer in the region. Also the Tegal cluster links with other metalworking SME communities in Ceper (about 180 km to the south) and furniture producers in Jepara (about 100 km away to the East). Their comparative advantage has been in filling small orders for simple metal products or components. The small size of workshops gives them greater flexibility and Tegal's abundant cheap labor can

outweigh the productivity advantages of more capital-intensive production. There is often intense price competition between workshops.⁵

According to the size of production and level of production sophistication, there are two types of workshops in the Tegal metalworking industry: MEs and LEs as a modern type of metal workshops, and SEs as a traditional type of workshop. In addition, there are two types of subcontractors: workshops which receive orders for metal components directly from big companies such as FDI-based companies, state-owned companies or private firms outside the district, called *inti*, and workshops which do subcontracting arrangements with the *inti* workshops, called *plasma*. The first type of subcontractors consists mainly of MEs and some LEs and *plasma* workshops are dominated by SEs. Especially large *inti* workshops with total employees up to 100 men derive a majority of their income from sub-contracting work. There are several large foreign affiliate companies which subcontract work to Tegal metal workshops, including PT Komatsu Indonesia Tbk, PT. Daihatsu, and some divisions of the Astra Group such as PT. Sanwa and PT. Katshusiro. These companies often source metal components from several parts of the country, mostly in West Java. Among these companies, the most prominent one is PT Komatsu Indonesia Tbk (say from now on KI) which is a subsidiary of a Japanese company that has established subcontracting production linkages with Tegal metal workshops since 1998.⁶ This company produces various equipments for construction and mining activities under the global trademark of Komatsu, such as hydraulic excavators, bulldozers, motor graders, frames and related components, steel cast products as well as off-highway dump tracks.

Plasma workshops usually hire cheap, unskilled labor or use family members (mainly men) as unpaid workers (helpers) and the owner passes basic metalworking skills on to his employees, leaving the technical capacity of the workshop highly dependent on the technical capacity of the owner. *Inti* workshops often sub-contract part of their production to *plasma* workshops.

Local workshops which have no subcontracting businesses with other firms manufacture entirely for the wholesalers and retailers or sell their products directly to local consumers. Many wholesalers and retailers purchase goods from Tegal metal workshops for resale in stores in cities in the country.

It was found, however, that not all local producers/workshops can easily establish subcontracting relations with these foreign companies (say LEs). To become subcontractors, local firms must have attained a certain level of technical and managerial capacity. They must prove that they have the capacity to produce high quality components and meet the stringent delivery times. An audit determines if they have the required machinery, manpower, facilities, legal standing and use of ISO standards. After that, then they are requested to produce a sample component from provided technical drawings. According to KI's *inti* workshop owners interviewed, before an agreement is signed, KI often ask for a trial run of the mass production process, subjecting the output to quality control tests. If they could produce a certain product item on a regular schedule and consistent quality, they would then be granted a license for manufacturing different product items, thereby expanding their product lines. In the last 2 years, many suppliers have been tested through a few initial batch orders, but, in the end, only four local enterprises were able to meet KI's satisfaction; two of them were included in the sample. Larger and more modern metal workshops are more likely to adopt new technologies in their bid to become subcontracting *inti* to LEs.

After winning a contract, an *inti* subcontractor has access to a significant level of technical training. According to a sub-contractor of KI, trainings directly addressed the technical needs of the workshop in meeting the production requirements of KI. Indonesian experts from the Jakarta Komatsu office leading the training used a teaching style that clearly delivered the necessary knowledge and emphasized practical application, with 90 percent of training time spent in hands-on experience. Trainers also help the workshop identify problems and troubleshoot.

During the survey, it was found that those who failed to become subcontractors, lack of capital, limited skill, and no access to information appeared to be the three most important constraints. They did not have enough money to purchase the required machinery and to hire many workers (generally, SEs are self-employment units without helpers or hired workers). They often use second-hand or homemade equipment. If they hire workers, often low-skilled workers with little or no experience and rely on shop owner's technical knowledge. Since many SE owners built their expertise through working in small shops and rarely have formal academic training, they have difficulties reading technical drawings and instead rely on copying samples, leading to less accurate

output. So, they lack the technical ability to produce complicated components with the precision required by LEs. Also, due to lack of information and no skill, they did not know how to meet ISO standards. They said that from the government they could not expect too much. The government did give some information, but they need direct assistance too.

Though less direct, the subcontracting system does provide some market opportunities for smaller workshops to benefit from the virtuous circle affecting *inti* capacity building. Subcontracting *plasma* gain from the incentive to produce higher quality for a higher price with technical coaching from *inti* clients in their own virtuous circle. *Inti* respondents for auto components, for instance, turn to *plasma* workshops to produce 10–15 percent of their orders from LEs, usually components of components or basic parts made more cheaply in small workshops while still passing the quality control requirements of LEs. Often soft loans are provided by *inti* to *plasma* to help them acquire new machines capable of higher quality output. *Inti* and *plasma* involved in subcontracting are more likely to use government sponsored facilities such as the UPT (i.e. technical service unit, including lab.), especially to test the quality of materials. They are more able to offset lab usage costs through the higher price paid by LEs for quality parts.

However, according to the owners of these two KI's *inti* workshops, the training does not seek to develop their capability to rise beyond their capacity as low-cost production centers for selected components. Moreover, KI does help them gain the capacity to manufacture component parts, but there has been little interest in upgrading from specialized parts manufacture to manufacture and assemblage of finished products.

For workshops who were rejected by KI (or other LEs) as *inti* subcontractors, the only source of technology or knowledge is from retail suppliers, or from *inti* subcontractors if they have subcontracting linkages as *plasma*, *plasma*, or they depend largely on un-targeted, irregularly publicized government programs, which may not be suit their needs. Some interviewed MIE owners who sell their products only to retail market said that strong competition among retail suppliers inhibits knowledge transfer and, instead, encourages production of low-quality, inexpensive products.

It was also found that inter-firm linkages inside this Tegal cluster exist to a certain extent. Notably, producers in the Tegal metal working industry have a tradition

of collaboration as indicated by the important role of recently initiated by Takaru cooperative. This cooperative specially established by producers in the cluster to stimulate strategic alliance among them. However, from the interviews, it appears that in general knowledge transfer among small workshops is often contingent on personal networks and conditioned by competition. Especially, among workshops producing for the retail market competition sometimes becoming “unhealthy” which has opposite effects, inhibiting knowledge diffusion among them.

4. INNOVATIVENESS

Formally, innovation is considered to be the successful development and application of new knowledge. In the literature, the concept of innovation is mostly based on Schumpeter’s definition, i.e. as a new combination of the factors of production. However, the expression of innovation varies among scholars. For instance, for Edquist (2004), innovation in process is about how things are produced, while innovation in product is about what is produced. According to Jang (2007), in the present knowledge based economy, the Schumpeter’s definition can be rephrased as a new combination of knowledge. So, he argues that there must be some relationship between the types of knowledge, i.e. codified and tacit knowledge (both analytical and synthetic) and types of innovation, i.e. product and process. As stated in Fagerberg (2004), another way to classify innovation is focus on its process. In this manner, he classifies innovation as “radical” or “incremental”.

In Indonesia there is also increasing empirical evidence that SMEs that are parts of clusters are in a better position to adopt innovations when compared with their dispersed counterparts.⁷ For instance, Sandee’s (1994, 1995, 1996) studies of roof tile clusters in central Java province. Through the 1980s the demand for roof tiles increasingly shifted toward urban areas, where customers pay more attention to quality. This meant that upgrading was important to retain or increase demand. As a result, some clusters have stagnated and others have grown through a process of technological change or adaptation that encompasses changes in processes of production, in patterns of inter-firm cooperation, in employment conditions, and in the marketing of new output.

The range of experiences has been wide. In two cases (Mayong Lor and Klepu) the process was demand driven. The buyers, agents from urban building material shops, largely took care of the financial, technical, and marketing sides of the adoption and competed with each other to do so, a reflection of the expanding urban demand for press tiles. The pioneer adopters of the hand-press technology were young males who had used it elsewhere in rural Java. Since its introduction in the early 1970s, virtually all of the producers in these clusters have adopted the technology.

In producer-driven clusters such as Karanggeneng, networks of producers are at the heart of the process of technology upgrading. Producers organize to finance new equipment, share indivisible capital, and gain access to new markets. In buyer-driven clusters, collaboration among producers and traders obviates the need to form such producer networks. Urban building material shops play a key role in assuring demand but also provide loans for purchase of presses and renting out mixers. In both cases, innovation trickles down among an increasing number of producers. Diffusion is stimulated by the growing involvement of suppliers, *while the government principally contributes by improving the environment* (Sandee 1995: 170). In the producer-driven clusters, pioneer adopters remain the most important actors by stimulating innovation adoption by those producers whom they can trust and control, especially relatives. Urban building material shops get involved through establishing relationships with the pioneer adopters.

From Klapwijk's (1997) study, also on SMEs in rural central Java, it appears that an active involvement of traders and strong government initiative at the local level may be at work in central Java to render SME clusters in rural areas a fertile seedbed for technological change and thus a positive factor in rural industrialization. However, Berry et al, (2002) argue that technological change or innovation is more likely when the rural clusters are linked to urban or international markets.

Sandee's (1994, 1995, 1996) studies of a number of roof tile clusters in different areas in central Java also come with evidence of innovation in SMEs. Through the 1980s the demand for roof tiles increasingly shifted toward urban areas, where customers pay more attention to quality. This meant that upgrading was important to retain or increase demand. As a result, some clusters have stagnated and others have grown through a process of technological change or adaptation that encompasses

changes in processes of production, in patterns of inter-firm cooperation, in employment conditions, and in the marketing of new output. The range of experiences has been wide. In two cases (Mayong Lor and Klepu) the process was demand driven. The buyers, agents from urban building material shops, largely took care of the financial, technical, and marketing sides of the adoption and competed with each other to do so, a reflection of the expanding urban demand for press tiles. The pioneer adopters of the hand-press technology were young males who had used it elsewhere in rural Java. Since its introduction in the early 1970s, virtually all of the producers in these clusters have adopted the technology.

Sandee, *et al* (2002) provide a comprehensive review on two main important SME clusters of metal casting industries producing components and spare parts with subcontracting activities with LEs, namely the metal casting in Ceper, Klaten in Central Java and in Cibatu village in the Sukabumi regency. The first cluster is well-known in Indonesia. It is an active cluster since the colonial period and with a long history producing cooking utensils for local and nearby markets. The cluster encompasses a variety of metal casting firms ranging from SEs that produce basic utensils for local market to MEs that work exclusively on order from national big companies such as the railway and car-manufacturing firms. Recently, Ceper has been concentrated on the production of both final and intermediate products. Final products include household equipment and agricultural tools while main intermediate products are components for LEs through subcontracting production linkages. By late 2001 the cluster counted 332 production units that together employed 3875 workers. The cluster is spread out over several villages in the Batur district of the Klaten regency. The second cluster can be deemed as a typical example of a metal casting cluster that has gradually expanded its product range. Presently, the cluster manufactures agricultural equipment, household items and various products for military needs. Few firms make samurai swords and export them via traders to Japan. Besides samurai swords, other handicrafts produced in the clusters are also exported, and Japan is an important export market. An increasing number of firms producing spare parts and intermediate inputs are involved in subcontracting production relationships with LEs outside Sukabumi, mainly in the Jakarta area.

His study suggests that SME in clusters with strong inter-firm linkages and external networks with traders, inputs suppliers and LEs (including FDI) through subcontracting linkages are more able to improve their technology or to do innovations in product or production process than individual SMEs in dispersed locations. From their findings, Berry et al. (2002) also see that membership in a cluster has a significant influence on a firm's productivity and its ability to do innovations. This is simply because through inter-firm cooperation in a cluster, it is easier and cheaper for a firm to get information on new technologies or new methods of production and to carry out necessary steps to improve the quality of their products. However, they argue that technological change or innovation is more likely in rural clusters when the clusters are linked to urban or international markets.

The case of Tegal metalworking industry, as discussed before (see Section Networking), also show some innovation activities inside the cluster. As explained before, there are several large foreign affiliate companies which subcontract work to Tegal metal workshops, including PT Komatsu Indonesia Tbk, PT. Daihatsu, and some divisions of the Astra Group such as PT. Sanwa and PT. Katshusiro. These companies often source metal components from several parts of the country, mostly in West Java. Among these companies, the most prominent one is PT Komatsu Indonesia Tbk (say from now on KI) which is a subsidiary of a Japanese company that has established subcontracting production linkages with Tegal metal workshops since 1998.⁸ This company produces various equipments for construction and mining activities under the global trademark of Komatsu, such as hydraulic excavators, bulldozers, motor graders, frames and related components, steel cast products as well as off-highway dump tracks. Two most successful local *inti* subcontractors to KI, which included in the survey are, PT. Prima Karya and PT. Karya Paduyasa. These companies able to do some innovations (see box).

In general, the technical capability of the Tegal metal industry has derived from a long history of family experience in metalworking or similar industries. With accumulated technical knowledge of over 20 years, since the first subcontracting activity started in the district, sparking government activity to develop the metal working industry, they are now capable of producing various kinds of agricultural and

BOX: Profiles and Histories of Two *Inti* suppliers to KI.

PT Prima Karya:

This company specializes in making parts and components for heavy equipment, and it was formally incorporated in 1983, beginning operations with the manufacture of spray cans and agriculture machinery such as hand tractors. Currently, the company has 50 employees, of which about more than 50% of them are high school graduates or under and two are university graduates. The company's first experience as a subcontractor started in 1985, as it won a contract with a large local conglomerate for manufacturing large quantities of 'coffee peeler' machines (but, the contract was later terminated due to the economic crisis in 1997/98). Currently, the company is one of the *inti* suppliers for KI, and also succeeded in becoming one of the prime local suppliers for Natra Raya (NR), an affiliate of U.S. Caterpillar, which came to Tegal in search of potential suppliers. It has managed to expand its product lines to more than 100 items supplied to KI and to NR on a regular basis. Total turnover in 1999 was Rp650 million per year and increased continuously though slightly in recent years. The company virtually was a manufacturer of heavy equipment parts, including engine tools, dashboards, and forklift parts. It expanded its operations to include the manufacture of pumps, agriculture equipment, parts for scales and door railings for sale to the general market. These jobs were merely incidental orders received along with the routine work the company did for KI and NR. Prospects for growth are extremely favourable. However, the company is chronically short of working capital because of the arrangement whereby payments are made only after the final products are manufactured and delivered.

The company has a great innovative capability. The fact that the company was able to advance from making relatively simple products to supplying metal components with higher grades of precision on a consistent basis demonstrates its ability to learn and increase its skills. This ability is largely attributable to the owner who has been vigilant in solving on-site technical problems. According to the owner, being accepted as a prime KI supplier was his company's first milestone, a role which requires in advance the ability to translate technical drawings and to work toward the final product. Another prerequisite fulfilled by PK as a prime KI supplier was a level of quality that ensured that no rejects were classified as fatal ones; the company was able to correct defects easily and ship the products back to KI.

The company reached the second milestone when it was presented with the challenge of supplying a large complex piece associated with engine hoods. Making the first sample proved to be quite difficult using the inappropriate machinery available at the time. Even with several days help by an expert from KI, the company was still unable to produce a satisfactory sample according to specifications. After several trials driven forward by the persistence of the owner, PK finally sent the finished sample to KI at the end of the week. Approval was achieved not long afterwards.

All jigs and fixtures that allow assemblage and welding on a consistent basis are built by the company itself. Much of the machinery is developed in house, such as large bending and pressing machines, with up to 70% local contents. This level of accomplishment demonstrates the experience and skills the company acquired, largely in tacit or unspoken form, as it overcame each major challenge. One of the benefits obtained by working with KI is the opportunity to send employees to be trained at KI's facility in Jakarta.

BOX (continued)

PT. Karya Paduyasa

The company has three plants, each with a specific production objective, namely for: (i) casting, principally hydrants and fire monitors; (ii) incidental job orders, usually in small lots; and (iii) a stamping process especially for large parts and automotive components. It began by making textile equipment and parts in Jakarta in the 1950's. After the company moved to Tegal, it diversified into making agriculture tools and machinery. While rapidly diversifying its product base, it improved its productive capability. Among the important achievements of the company was the development of the casting capability to produce hydrants. Hydrant manufacturing was driven by government contract. At the peak of production, the company made around 200 units per month.

One major milestone for the company was to be selected as one of the few local prime suppliers for heavy equipment for KI and NR. BOX (continued)

Furthermore, because of its ability to deliver the products in timely fashion with consistent acceptable quality, KP's base of product lines in the heavy equipment business expanded rapidly. However, the company manufactures less items as compared to that of PT Prima Karya for both KI and NR.

Recently, a sign of positive growth emerged as hydrant orders began to increase to 10-20 per month, with a similar increase in orders from KI and NR. However, because of the arrangement under which payments are sent only after the final products are manufactured and delivered, the company suffers from shortages of working capital, especially after the substantial layoff of workers.

The company has ample facilities for metalworking operations, which range from casting to welding to finishing. What is more impressive, however, is the company's ability to make an increasingly complex range of products as it acquires experience over time. As noted previously, this ability was a key factor in being chosen as one of the regular suppliers of KI and NR. The company's most recent accomplishment was its expansion into the manufacture of automobile components for an automaker. This move was soon followed by the construction of a plant dedicated to the stamping process. The company equipped the plant with its own dies and fixtures, and also set up a small crane to make a large heavy bottom piece for a tractor. It manufactures many of the machines and tools it uses in this plant. Its dedication to efficiency is also demonstrated by its efforts to minimize waste from paint spraying by constructing six large fans directed at a pool of water to capture paint droplets. The stamping plant's overall facilities are well organized and maintained.

Finally, the company devotes considerable attention to skill development. It provides incentives to employees to participate in various training activities at other locations by covering their travel and accommodation expenses.

Source: own survey and some written information from Iman and Nagata (2002),

industrial machinery as well as automotive and ship components . However, the quality of most of their products is low. Only in a few firms whose core businesses cater to such as KI does the need for consistent product quality become a concern. In such firms, the

ability to translate technical drawings and to manufacture products according to listed or drawn specifications is actively developed (Iman & Nagata 2002).

Tegal metal industry's main external technology providers are LEs, mostly foreign affiliate companies such as KI to their subcontractors (i.e. *inti* workshops), and to a lesser extent, local government. *Inti* subcontractors supply heavy equipment components to KI. Some domestic retail market suppliers also act as knowledge providers by informing metal workshops about consumer preferences, demand, and new innovations. One workshop owner interviewed stated that the retailers created new products and commissioned them from the local small workshops. While for KI, quality is the first priority, retailers generally emphasize low cost over quality. For small workshop owners (mostly from MIE category) who have no subcontracting links with KI, wholesale/retail market is their only choice to have business linkages. They sell to this market a limited range of simple final products, i.e. pulleys, ship windows. While these retailers may demand a sample product, there is much less emphasis on precision. Or, if they are lucky they can become *plasma* for KI's existing *inti* subcontractors.

It was also found that a group of producers has produced a hand tractor with own design for the domestic market. The production of this hand tractor involves 17 firms producing different parts. The Takaru cooperative organizes, assembles and performs quality control checks. The latter requires certification process and this has to be conducted by other institutions including government research laboratory. This is one example of the ability of producers in this cluster to do redesign or reverse engineering.

Unfortunately in Indonesia there are no national data on indicators of innovativeness in SMEs such as the percentage of total SMEs having ISO certificates or spending on R&D. As presented in Table 4, the Enterprise Survey 2007 from the International Finance Corporation (IFC) and the World Bank provides information on these two indicators in many countries, including Indonesia. But, no distinction is made between SMEs and LEs.

Alternatively, differences in productivity in different sizes of enterprises can be used as a proxy of innovativeness in SMEs. Table 5 presents labor productivity, measured by the ratio of total output value at constant prices in 2000 to total workers employed, in SEs, MEs and LEs. It may suggest that the larger the size of enterprises the more capable they are to do innovations, either in products or processes.

Table 4: Innovation at enterprises level in Selected Asian Countries

Country	ISO certificate ownership (%)	Spending on R&D (% sales)
Bangladesh (2002)	..	0.36
Cambodia (2003)	2.78	5.21
China (2003)	35.92	2.10
India (2006)	22.50	0.77
India (2002)	..	0.80
Indonesia (2003)	22.13	..
Korea (2005)	17.56	0.26
Lao PDR (2005)	3.27	..
Malaysia (2002)	31.43	1.38
Mongolia (2004)	19.46	2.14
Pakistan (2002)	17.01	0.98
Philippines (2003)	15.79	0.80
Sri Lanka (2004)	..	0.00
Thailand (2004)	44.63	0.25
Vietnam (2005)	37.84	2.21

Source: International Finance Corporation (IFC) and the World Bank (Enterprise Surveys 2007, World Bank Group, Private Sector Resources)

Table 5: Labor productivity and its annual growth by size of enterprises, 2003-2006

Year	Productivity (000 Rp)			Growth in productivity (%)		
	SE	ME	LE	SE	ME	LE
2003	7,942	64,358	222,857	-0.29	4.22	-0.45
2004	8,510	68,027	232,040	7.16	5.70	4.12
2005	8,721	68,603	240,017	2.48	0.85	3.44
2006	8,970	68,393	240,251	2.85	-0.31	0.10

Source: Mengkop & UKM

5. MARKET EXPANSION: DOMESTIC MARKET AND EXPORT

5.1 Domestic market

Since there are no data available on domestic market share of SMEs, as compared to those of LEs and imported goods, the output structure by size of enterprises can be used as an alternative indicator. As shown before (see Table 6), agriculture has always been the key sector for SEs, as they produce around 86 to 87 percent of total output in the sector. Given that SEs' exports on agricultural commodities are not significant and imported agricultural commodities can be assumed not so large, then it can easy to conclude that a larger part of domestic market for agricultural commodities is supplied by SEs.

Table 6: Structure of GDP by size of enterprises and sector, 2000-2006 (%)

Sec*	2000			2001			2002			2003			2004			2005			2006			
	SE	ME	LE	SE	ME	LE	SE	ME	LE	SE	ME	LE	SE	ME	LE	SE	ME	LE	SE	ME	LE	Σ
1	86.5	9.0	4.5	87.1	8.7	4.2	87.6	8.4	4.1	87.5	8.5	4.0	87.4	8.6	4.1	87.3	8.6	4.1	86.8	8.9	4.3	100
2	5.6	2.7	91.8	6.2	2.8	90.9	8.3	3.2	88.4	9.2	3.5	87.3	8.5	3.3	88.3	7.0	3.0	90.0	8.2	3.2	88.6	100
3	13.3	12.6	74.2	15.6	12.4	73.9	13.7	12.6	73.7	13.9	12.6	73.6	13.3	12.2	74.5	12.7	11.6	75.8	12.5	11.3	76.3	100
4	0.6	8.9	90.5	0.6	8.1	91.4	0.6	9.1	90.3	0.6	8.4	91.1	0.5	7.4	92.0	0.5	7.6	91.9	0.5	7.6	91.9	100
5	44.6	21.8	33.7	44.8	21.8	33.4	44.3	21.8	33.9	44.6	21.8	33.6	44.0	21.7	34.3	44.3	21.8	33.9	44.2	21.8	34.0	100
6	74.8	21.5	3.8	74.4	21.8	3.9	75.8	20.5	3.7	75.2	21.0	3.8	74.9	21.2	3.9	75.7	20.7	3.7	76.1	20.3	3.6	100
7	34.8	25.3	39.9	35.2	26.2	38.6	32.8	24.9	42.3	32.0	24.9	43.1	29.1	24.4	46.5	28.8	24.0	47.2	29.8	23.5	46.7	100
8	18.0	47.2	34.8	18.1	46.7	35.3	17.9	47.3	34.8	17.2	46.7	36.1	17.2	47.0	35.8	17.0	47.0	36.1	16.7	46.9	36.4	100
9	36.8	7.6	55.5	36.7	7.6	55.8	39.4	7.9	52.7	38.9	7.8	53.3	38.9	7.8	53.3	40.8	8.2	51.1	40.2	8.0	51.8	100
GDP	38.9	15.8	45.3	39.0	15.8	45.2	40.8	16.2	43.1	40.5	16.3	43.2	39.2	16.2	44.6	37.8	15.7	46.5	37.7	15.6	46.7	100

Note: * = code of sector, see Table 2 or Table 3.

Source: National Agency for Statistics (BPS)

Table 7: Exports of SMEs and LEs, 2000-2006 (billion rupiah)

Sector**	2000		2001		2002		2003		2004		2005		2006	
	SME	LE	SME	LE	SME	LE	SME	LE	SME	LE	SME	LE	SME	LE
(1)	8,396	428	9,014	553	9,772	962	8,480	537	8,715	882	11,535	1,038	12,663	1,079
(2)	657	74,491	981	89,811	685	79,542	584	77,829	639	92,823	1,140	132,107	1,621	153,874
(3)	66,395	357,136	70,852	377,040	76,834	339,086	68,033	337,773	86,194	414,954	97,663	471,249	107,916	501,171
Total	75,449	432,054	80,847	467,404	87,290	419,590	77,097	416,139	95,548	508,658	110,338	604,395	122,200	656,124

Note: * = code of sector, see Table 2.

Source: Menegkop & UKM

The second important sector for this enterprises category is trade, hotel and restaurant with their annual share ranging from 74 to 76 percent. MEs, on the other hand has the largest output contribution in finance, rent & service at around 46 to 47 percent, followed by transportation and communication with a share ranging from the lowest 23.47 per cent in 2006 to the highest 26.22 percent in 2001. In manufacturing industry, both SEs and MEs are traditionally not so strong as compared to LEs.

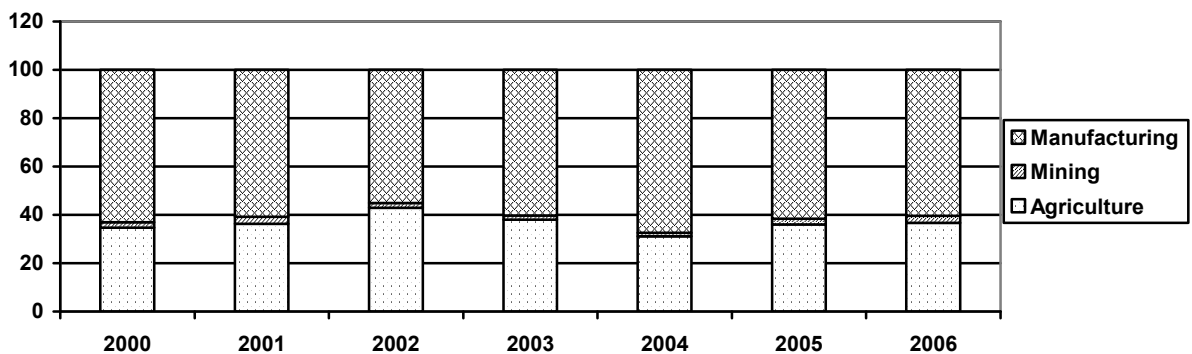
Overall, in sectors like agriculture, finance, rent and services, transportation and communications, SMEs are more capable to expand their domestic market share than in manufacturing industry. In the latter sector, SMEs have to compete with LEs and increasingly imported goods.

5.2 Export growth

In Indonesia, historically, export of SMEs are limited, although their export increases on average per year. As presented in Table 7, in 2000, total exports of these enterprises amounted to Rp75,448.6 billion and went up by more than 50 per cent to Rp.122,199.5 billion in 2006.

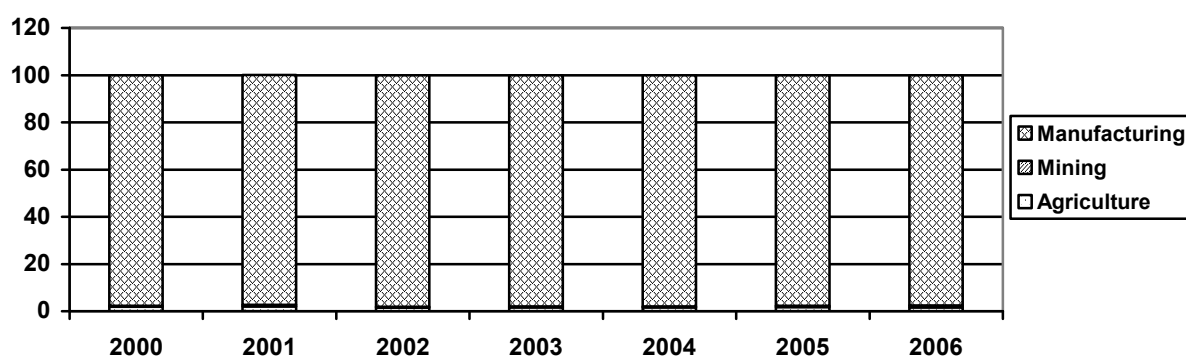
Table 7 shows that the majority of SMEs' export came from the manufacturing industry. Interestingly, the share of MEs' export originated from this sector is much higher than that of SEs (Figures 4A and 4B). This significant gap may suggest that in the manufacturing industry, the ability of MEs to export is higher than that of SEs. The difference can be explained by differences in such as access to capital and market information, skills, promotion facilities, and external networks. Naturally, MEs are in a

Figure 4A: Distribution of SEs' Export Value by Sector, 2000-2006 (%)



Source: Menekop & UKM

Figure 4B: Distribution of MEs' Export Value by Sector, 2000-2006 (%)



Source: Menegkop & UKM

better position than SEs for all these factors, which are crucial in determining the successful of a firm in doing export.

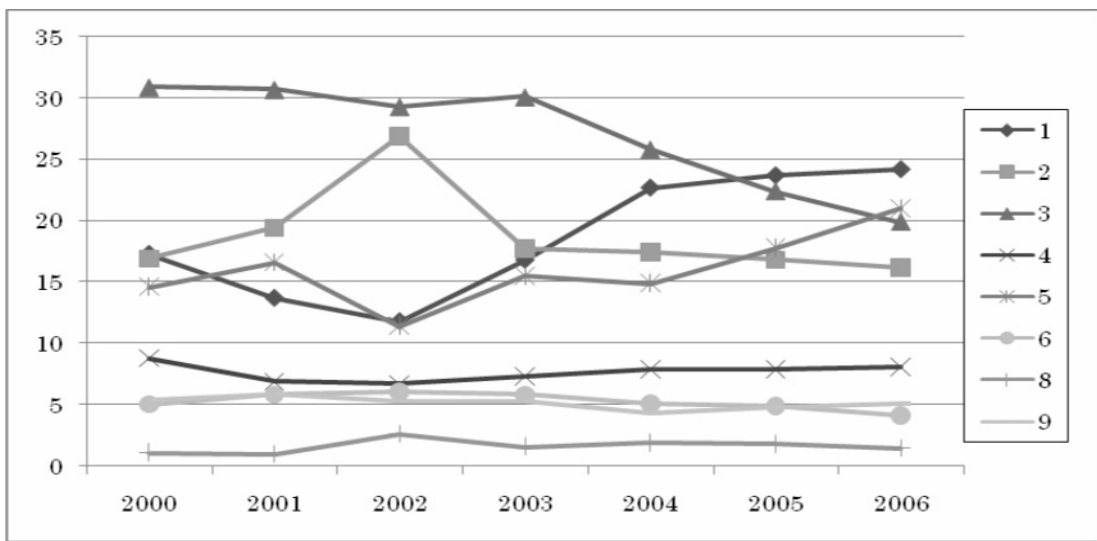
However, the share of SMEs in total export of manufacturing industry is much smaller than that of their larger counterparts. Within the group, MEs performed much better than their smaller counterparts. The share of SEs never reached 10 percent. In 2000 it was only 3.15 percent and slightly decreased to 3 percent in 2006. While during the same period, the export share of MEs was 12.53 percent and improved to 14.72 percent. Previously, such as Hill (1997, 2001), Tambunan (2006b), and Thee (1993) argue that, although on average per year the export contribution of SMEs in Indonesia's total manufacturing export is relatively small as compared to that of their larger counterparts, they seem to have shared nicely in the manufactured export boom in the 1980s and 1990s. Thee (1993) concludes that from the point of view of technology and adaptability, export growth of SMEs in manufacturing industry has been achieved substantially by finding niche markets and adapting costs and quality to market demand.

Further, from 9 industrial groups at two digit level within the manufacturing industry, i.e. food, beverages and tobacco (1); textile, leather and footwear (2); wood products (3); paper and publication (4); fertilizer, chemicals and rubber products (5); semen and non metal mining (6); basic metal, steel and iron (7); transportation means, machinery and its equipments (8); and others (9), SEs' exports are concentrated in wood products, including furniture, although recently their share declined and passed by exports of food, beverages and tobacco and fertilizers, chemicals and goods made from

rubber. SMEs do not export goods made from steel and iron (Figure 5). Whereas, MEs' exports are more or less equal distributed among the groups of industry; although their share in wood products went down constantly (Figure 6).

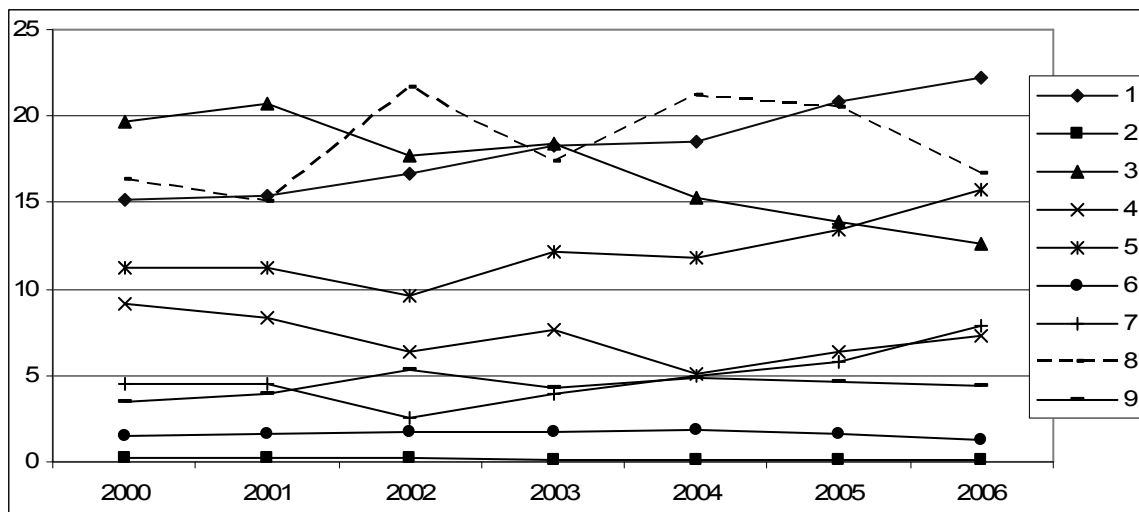
Data from BPS on SEs and MIEs in the manufacturing industry show that in 1999 from a total of 2,505,692 SEs and MIEs, only 0.36 percent of them did export, and it increased

Figure 5: SE's export of manufactured goods by industry, 2000-2006 (%)



Source: BPS

Figure 6: ME's export of manufactured goods by industry, 2000-2006 (%)



Source: BPS

to 0.79 percent of a total of 2,679,241 SEs and MIEs in 2004. So, the export intensity within this group has increased during that period. But, the ratio varies between SEs and MIEs. In 1999, the percentage was respectively 0.46 and 0.35 for MIEs and SEs, and the ratio changed significantly in 2004: 0.64 and 2.3, respectively. This indicates that SEs, i.e. better managed and organized units of production, are in a better position than MIEs in capturing increasing export opportunities generated by the reforms. However, not all of those involved in export activities are fully export oriented, in the sense that many of them only export small portions of their total products. In 1999, SEs and MIEs exported 80 percent or more of their total production are less than 50 percent, and increased to about 68 percent in 2004. The percentage, however, varies between SEs and MIEs.

There are at least two main reasons that many export-oriented SMEs in Indonesia could not conduct export activities directly. First, there are institutional and business constraints where SMEs cannot solve, due to (i) they do not have strong direct access to export market or no access to information on export market opportunities and requirements; (ii) they are not able to adjust to rapid changes in export market; (iii) high risk in payment and shipment; (iii) time lag in the payment, while the small exporters/producers need daily cash flow very badly; and (iv) high cost for direct export activity. Second, financial problem due to (i) capital owned by SME is limited, especially to investment capital; and (ii) lack of support from financing and guarantee institution to SME (Urata, 2000; Tambunan, 2006b).

Another important feature of the export-oriented SMEs in Indonesia is that the majority of those who do export, they do not export directly, but indirectly through intermediaries such as traders, exporting companies, or trading houses. Traders or trading companies usually collect products from or give orders to, regularly or irregularly, many producers. As an example, BPS data from Census of Small and Cottage Industry in 1996, show that with respect to the number of enterprise, the share of small exporters who did direct export was only 0.19 percent, while those who did indirect exports was 99.81 percent. In terms of export value, the share of those who did direct and indirect export was 0.98 and 99.02 percent respectively. Based on his own field survey on SMEs in a variety of industrial groups, Urata (2000) provides, however, a rather different figure.

6. POLICY IMPLICATION

The Indonesian government has advocated the importance of small and medium enterprises (SMEs) in many official statements. It has formulated and implemented various types of policies and measures aimed at the development of the SME sector. Almost all known types of government intervention to promote the development of SMEs have been tried at one time or another. These include subsidized credit, such as credit for small farmers and village cooperatives (KUD), small-scale credit (KIK, KMKP, KUK), and credit for village units (KUPEDES); development of small rural development banks (BKD); human resource development trainings such as in production technique, general management (MS/MUK), management quality systems ISO-9000, and entrepreneurship (CEFE, AMT); providing total quality control advice, technology and especially internet access (WARSI) and advisory extension workers, subsidized inputs, facilitation, setting up of Cooperatives of Small-Scale Industries (KOPINKRA) in clusters, development of infrastructure, building special small-scale industrial estates (LIK), partnership program (the Foster Parent scheme), Small Business Consultancy Clinics (KKB); establishment of the Export Support Board of Indonesia (DPE), establishment of common service facilities (UPT) in clusters, and implementation an incubator system for promoting the development of new entrepreneurs.

However, despite of all these efforts, Indonesian SMEs still face a number of problems which make them still difficult to performance as good as their larger counterparts in e.g. productivity, quality of products, and export, and to compete with imported goods. So, this study comes with the following policy implications:

- 1) The government indeed has a key role to play by facilitating or supporting capacity building in SMEs, especially SEs and MIEs so these enterprises can become subcontractors. The technological and managerial gaps between MNCs or LEs and their SME subcontractors or, within SMEs, between MEs, on one hand, and SEs and MIEs, on the other, can be bridged through capacity building. Within SMEs, MEs are more developed and better organized or managed than SEs and MIEs. So, MEs

are more ready as subcontractors than SEs and MIEs. Consequently, without government support for SE and MIEs, the subcontracting opportunities from the presence of MNCs or provided by domestic LEs will only open to MEs.

- 2) As said before, the government supports for SMEs have been in various forms, ranging from a variety of special credit schemes to technical assistance and various types of training and skill upgrading. The emphasis, however, has been given too much on financial aspect; much less attention has been given on technology development, innovation capability and skills development. This paradigm should change. The focus should be on the “hardware” of the capacity building, namely skills and technology upgrading. Capital or credit is indeed important, but, it is not the hardcore of the problem facing many SMEs in Indonesia: i.e. low competitiveness due to their low technology and skill capability. They need to be trained and assisted technically, and when they already have the knowledge and they are going to buy computers or new machines or production tools, then the government can help them by providing funds through a special scheme.
- 3) The existing paradigm of SME development should change, from “the successful SMEs development strategy is marked by the annual increase in number of units” and “SMEs are important because they create employment”, to “the successful SMEs development strategy is marked by the annual increase in number of innovated and productive enterprises”, and “SMEs are important because they generate high value added, export, and they form domestic competitive supporting industries”.
- 4) Networks between SMEs and R&D institutes or universities are still less important compared to networks with LEs through subcontracting. This may indicate that in Indonesia R&D institutes or universities are not yet so important as a source of technology development, skill upgrading or innovation activities in SMEs. So, in efforts to support capacity building in SMEs, the government should promote closer integration between R&D institutes and universities and SMEs by facilitating their effort to build strong networks. The government can encourage the involvement of R&D institutes and universities in local SMEs’ capacity building in their own district by providing a variety of facilities, ranging from a special fund scheme to finance R&D activities carry out by SMEs together with R&D institutes or

universities, tax facilities and “attractive” awards to the most active R&D institutes in supporting SMEs.

- 5) Globalization and trade and investment liberalization should also give opportunities to local SMEs to integrate into global production network. Subcontracting is one thing to facilitate this. To develop into highly competitive supporting industries or vendors supplying certain parts of global products is another way. For this too, the government has a very important role to play to support this development, not only through special designed schemes but also indirectly through creating “easy doing business” environment.

NOTES

¹ For example, with respect to marketing, the parent companies provided promotion facilities such as trade exhibitions and study tours for the supported enterprises or acted as a trading house. With respect to technology, the parent companies provided the supported enterprises with financial assistance for the purchase of new machines or provided them technical trainings or technicians during the innovation process.

² Studies on subcontracting between SMEs and LEs in Indonesia include Harianto (1996), Thee (1985, 1990a,b, 1997), Sato (1998, Supratikno (1998), Urata (2000), TAF (2000), Aswicahyono, *et al.* (2000), Berry and Levy (1999), Sandee *et al.* (2000), and Hayashi (2002a,b,c).

³ The economic rationale behind the local content policy was to create a captive market for domestic products in order to increase the economic scale of production and thereby to increase efficiency. However, government interference went too far. The government decided which products were to get priority in this policy, and introduced fiscal incentives in line with the type of priority recipient products. The determination of priorities does not always appear to have been on economic considerations, such as SMEs’ capacity for investment and absorption of technology

⁴ See for example SRI International (1992), Harianto (1993), Kitabata (1988), Sato (2000), Supratikno (2001), and JICA (2000).

⁵ Pantjadarma (2004) made a general assessment of the level of sophistication of the production facility in the *sentra* which was based on a capability to utilize high-precision equipment such as computer numerical control (CNC) machine for production, degree of order and cleanliness of the plants. Although, it is an imprecise technique, it provides some insights to the level of technological capabilities of the firms. It was observed that majority of firms are not “modern” enough. Also, only a few that has entered the export market. Nonetheless, as he concludes, it has sufficient technological capabilities to serve domestic market.

⁶ In the current domestic Indonesian market, KI occupies the first rank with a 40% share of sales and is playing an indispensable role in the localization of production. KI also fulfills a crucial role in Komatsu’s international business strategy, it serves as a construction machinery production base along with Komatsu’s facilities in the U.S., Brazil, Germany and the U.K., and conducting global sourcing with other production bases (Iman and Nagata, 2002).

⁷ More empirical studies shown in Sandee *et al.* (1994), Van Dierman (1997), Tambunan (1994, 2000), Supratikno (2002a), and Knorrington and Weijland (1993).

⁸ In the current domestic Indonesian market, KI occupies the first rank with a 40% share of sales and is playing an indispensable role in the localization of production. KI also fulfills a crucial role in Komatsu’s international business strategy, it serves as a construction machinery

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REFERENCES

- Aswicahyono, Haryo, M. Chatib Basri, and Hal Hill (2000), "How Not to Industrialise? Indonesia's Automotive Industry", *Bulletin of Indonesian Economic Study* 36, no. 1: 209-41.
- Berry, Albert, and Brian Levy (1999), "Technical, Financial and Marketing Support for Indonesia's Small and Medium Industrial Exporters", in *Fulfilling the Export Potential of Small and Medium Firms*, ed. B. Levy, A. Berry and Jeffrey B. Nugent. Boston: Kluwer Academic Publishers.
- Berry, Albert., E. Rodriguez and Henry Sandee (2002), "Firm and Group Dynamics in the Small and Medium Enterprise Sector in Indonesia", *Small Business Economics* 18, no.1-3:141-161.
- Edquist, C. (2004), "Systems of Innovation Perspectives and Challenges", in *The Oxford Handbook of Innovation*, ed. Fagerberg, J., Mowery, D. and R. Nelson. Oxford: Oxford University Press.
- Fagerberg, J., Mowery, D. and R. Nelson (eds.)(2004), *The Oxford Handbook of Innovation*, Oxford: Oxford University Press.
- Hariato, Farid (1993), "Study on Subcontracting in Indonesian domestic firms", mimeo, Jakarta: PEP-LIPI.
- Hariato, Farid. (1996), "Study on Subcontracting in Indonesian Domestic Firms," in *Small-scale Business Development and Competition Policy*, ed. M. Pangestu. Jakarta: Centre for Strategic and International Studies.
- Hayashi, Mitsuhiro (2002a), "The Role of Subcontracting in SME Development in Indonesia: Micro-Level Evidence from the Metalworking and Machinery Industry", *Journal of Asian Economics* 13, no 1: 1-26.
- Hayashi, Mitsuhiro (2002b),"SME Development and Subcontracting in Indonesia: A Comparison with Japan's Historical Experience", mimeo. Canberra: School of Economics, Faculty of Economics and Commerce, Australian National University.
- Hayashi, Mitsuhiro (2002c)," Development of SMEs in the Indonesian Economy", mimeo. Canberra: School of Economics, Faculty of Economics and Commerce, Australian National University.
- Hill, Hal (1997), *Indonesia's Industrial Transformation*, Singapore: Institute of Southeast Asian Studies, and Sydney: Allen and Unwin.
- Hill, Hal (2001), "Small and Medium Enterprises in Indonesia: Old Policy Challenges for a New Administration", *Asian Survey* 41, no. 2: 67-80.
- Iman, M. S. and Nagata, A. (2002), "Institutional Coordination Problem. An Obstruction to Promotion of Industrial Backward Linkages", mimeo. Japan: School of Knowledge Science Japan Advanced Institute of Science and Technology, Tatsunokuchi.

- Jang, Jae-Hong (2007), "Regional Innovation System and the Policy Practice –The Korean Case–", mimeo, Seoul: Korea Institute for Industrial Economics and Trade.
- JICA (2000), "Study on Inter-firm Linkages and Financial Needs for the Development of Small and Medium Scale Manufacturing Industry in Indonesia", Study Report. Jakarta: Japan International Cooperation Agency in cooperation with PT Kami Karya Nusantara.
- Kitabata, T. (1988), "Report on the Subcontracting System in the Indonesian Machinery Industries", Study Report. Tokyo: Japan International Cooperation Agency (JICA).
- Knorringa, Peter and Weijland, H. (1993), "Subcontracting - the incorporation of small producers in dynamic industrial networks", *Gender, Small-scale Industry and Development Policy*, eds. I.S.A. Baud and G.A. Bruijne. London: Intermediate Technology Publications.
- Klapwijk, Martin (1997), "Rural Industry Clusters in Central Java, Indonesia. An Empirical Assessment of their Role in Rural Industrialization", Tinbergen Institute Research Series No.153. Amsterdam: Vrije Universiteit.
- MoI (1985), "Subcontracting and Local Content Policies", Engineering Subsector Study, Report No.5, May, Jakarta: Directorate General of Machinery and Basic Metal Industry, Ministry of Industry.
- Pantjadarma, Derry (2004), "The Potential Role for An ICT Entrepreneur in Accelerating SME Development in Indonesia: The Case of the Metal Working Industries in Tegal", *Journal of International Business and Entrepreneurship Development* 2, no.2 (Special Issue): 17-24.
- Sandee, Henry (1994), "The Impact of Technological Change on Interfirm Linkages. A Case Study of Clustered Rural Small-Scale Roof Tile Enterprises in Central Java", in *Flexible Specialization. The Dynamics of Small-Scale Industries in the South*, eds. P.O. Pedersen, A. Sverrisson, and M.P. van Dijk. London: Intermediate Technology Publications.
- Sandee, Henry (1995), "Innovation Adoption in Rural Industry: Technological Change in Roof Tile Clusters in Central Java, Indonesia", unpublished PhD dissertation. Amsterdam: Vrije Universiteit.
- Sandee, Henry (1996), "Small-Scale and Cottage Industry Clusters in Central Java: Characteristics, Research Issues, and Policy Options", paper presented at the International Seminar on Small Scale and Micro Enterprises in Economic Development Anticipating Globalization and Free Trade, November 4-5. Salatiga: Satya Wacana Christian University.
- Sandee, Henry, P. Rietveld, Hendrawan Supratikno, and P. Yuwono (1994), "Promoting Small Scale and Cottage Industries. An Impact Analysis for Central Java", *Bulletin of Indonesian Economic Studies* 30, no. 3: 115-142.
- Sandee, Henry, Roos Kities Andadari and Sri Sulandjari (2000), "Small Firm Development during Good Times and Bad: The Jepara Furniture Industry", in *Indonesia in Transition: Social Aspects of Reformasi and Crisis*, eds. C. Manning and P. van Dierman. Canberra: Indonesia Assessment Series,

- Research School of Pacific and Asian Studies, Australian National University, and Singapore: Institute of Southeast Asian Studies.
- Sandee, Henry, B. Isdijoso, and Sri Sulandjari (2002), *SME clusters in Indonesia: An analysis of growth dynamics and employment conditions*, Jakarta: International Labor Office (ILO).
- Sato, Yuri (1998a), "The transfer of Japanese management technology to Indonesia", in *Indonesia's Technological Challenge*, eds. Hill, Hal and Thee Kian. Canberra: Research School of Pacific and Asian Studies, Australian National University, and Singapore: Institute of Southeast Asian Studies.
- Sato, Yuri (1998), "The Machinery Component Industry in Indonesia: Emerging Subcontracting Networks," in *Changing Industrial Structures and Business Strategies in Indonesia*, ed. Sato, Y. Tokyo: Institute of Developing Economies.
- Sato, Yuri (2000), "Linkage Formation by Small Firms: The Case of a Rural Cluster in Indonesia", *Bulletin of Indonesian Economic Studies*, 36(1):137-66.
- SRI International (1992), "Technology Development Plan for Indonesia's Engineering Industries", draft final report for the Ministry of Industry, Republic of Indonesia, Jakarta.
- Supratikno, Hendrawan (1998), "Competitive Strategy, Production Organization and Inter-firm Collaboration: A Case Study of Subcontracting Arrangements in Three Manufacturing Firms in Indonesia", unpublished PhD thesis, Amsterdam: Vrije Universiteit.
- Supratikno, Hendrawan (2001), "Subcontracting Relationship in Indonesian Manufacturing Firms", *Gadjah Mada International Journal of Business*, 3(2): 115-127
- Supratikno, Hendrawan (2002), "The Strategies of Cluster Upgrading in Central Java", A Preliminary Report to Depperindag, Salatiga.
- Sutton, John (1998), *Technology and Market Structure*, MIT Press.
- Urata, Shujiro (2000), "Policy Recommendations for SME Promotion in Indonesia," report to the Coordination Ministry of Economy, Finance and Industry, Jakarta.
- TAF (2000), "Strategic Alliances and Development of Small and Medium-Scale Enterprises in Indonesia", Final Report, May, Jakarta: The Asia Foundation.
- Tambunan, Tulus T.H. (1994), *The Role of Small-Scale Industries in Rural Economic Development. A Case Study in Ciomas Subdistrict, Bogor District, West Java, Indonesia*, Amsterdam: Thesis Publishers.
- Tambunan, Tulus T.H. (2000), *Development of Small-Scale Industries during the New Order Government in Indonesia*, Aldershot: Ashgate.
- Tambunan, Tulus (2006), *Development of Small and Medium Enterprises in Indonesia from the Asia-Pacific Perspective*, Jakarta: LPFE-USakti.
- Thee Kian Wie (1985), "Kaitan-Kaitan Vertikal Antar Perusahaan dan Pengembangan Sistem Subkontraktor di Indonesia: Beberapa Hasil Studi Permulaan (Vertical Inter-firm Linkages and the Development of Subcontracting System in Indonesia: Some Case Studies)," *Masyarakat Indonesia* 12, no.3: 219-31.

- Thee Kian Wie (1990a), "Indonesia: technology transfer in the manufacturing industry", in *Technological Challenge in the Asia Pacific Economy*, eds. Hadi Soesastro and Mari Pangestu. Sydney, Allen & Unwin.
- Thee Kian Wie (1990b), "Prospects for Cooperation in Technology", in *Cooperation in Small and Medium-Scale Industries in ASEAN*, eds. Kim Seung Jin and Suh Jang Won. Kuala Lumpur: Asian and Pacific Development Centre.
- Thee Kian Wie (1993), "Industrial Structure and Small and Medium Enterprises Development in Indonesia", EDI Working Paper. Washington, D.C.: World Bank.
- Thee Kian Wie (1997), "The Development of the Motor Cycle Industry in Indonesia", in *Waves of Change in Indonesia's Manufacturing Industry*, eds. Mari E. Pangestu and Yuri Sato. Tokyo: Institute of Developing Economies (IDE).
- Van Dierman , Peter (1997), *Small Business in Indonesia*, Aldershot: Ashgate Publishing.