

Firm and Group Dynamics in the Small and Medium Enterprise Sector in Indonesia

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ABSTRACT. This paper discusses the role of clusters and subcontracting as factors in the evolution of small and medium firms in Indonesia during the last quarter century. It is argued that a number of such firms have become successful exporters of rattan furniture, wood furniture and garments on the strength of subcontracting relationships with foreign investors and buyers as well as agglomeration economies achieved by clustering in selected locations. Examples are provided to show that clustered enterprises are more likely to be in the exports business and to adopt product and process innovations as compared to more dispersed firms. Public policy support for fostering subcontracting links and cluster formation is also discussed.

1. Introduction

Developing countries value small and medium enterprises (SMEs) for several reasons. Viewed in static terms, the main argument is that SMEs, on average, achieve decent levels of productivity, especially of capital and all factors taken together (that is, total factor productivity), while also generating relatively large amounts of employment. It is thus better on the productivity front than micro-enterprise and better on the employment-generating front than large enterprise.

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In dynamic terms, the sector is viewed as being populated by firms most of which have considerable growth potential. Though the great majority of micro-enterprises tend not to graduate from micro to a larger size category (Liedholm and Mead, 1999), many SMEs will grow significantly without exiting this broad size category. Other firms may eventually become large; this is the “seed-bed for large firms” function of SMEs.

Apart from the process of firm growth, it is important that SMEs achieve rising productivity over time through both investment and technological change. Large enterprises in developing countries achieve productivity increases to a great extent simply by borrowing from the shelf of technologies available in the world. For SMEs as a group it is not so evident that processes such as foreign direct investment, technology licensing, joint ventures, and access to engineering and other advances will provide the productivity increases needed. As capital becomes less scarce and the range of technologies available expands in the world, SMEs need productivity increases if they are to maintain or increase their contribution to overall development.

A third aspect of the dynamics of the SME sector that distinguishes it from larger enterprise is the high entry and exit rates. The process of rapid turnover raises a set of issues about possible impacts on the economic efficiency of the sector and about policies that may curtail such efficiency losses as are associated with it.

Finally, it is often argued that one advantage of SMEs is their flexibility, relative at least to larger firms. This is construed by some as a plus in industries and economies that, for whatever reason, face rapidly changing market conditions, including sharp macroeconomic downturns such



as those that have bedevilled most of the countries of East Asia over the last few years.

This paper undertakes a selective review of evidence from Indonesia on the SME manufacturing sector, with emphasis on these issues of firm dynamics. Section 2 reviews the role and growth records of the SME sector in recent times, in the context of overall economic development. Section 3 looks at selected factors affecting the productivity, competitiveness, and survival of Indonesian SMEs, including their involvement in clusters and subcontracting activities. Section 4 takes a special look at Indonesian SMEs in the more open economy that has been evolving over the last couple of decades. Section 5 reviews Indonesian response to the economic crisis of the last couple of years. Section 6 provides a discussion of public policy support for subcontracting and cluster formation.

2. Trends in the SME sector of Indonesia

Indonesia has achieved a strong and widely applauded growth and development performance since the late 1960s, that is, until the crisis set in during 1997. Average GDP growth was 6.8 percent over 1970–1997, with per capita income rising at 4.7 percent. Industrialization proceeded apace, with manufacturing output growing at an average of 12.4 percent per year, first under an import substituting industrialization (ISI) policy and then, since 1986, an increasingly open economy strategy. Since 1970 manufacturing rose from 10.3 percent of GDP (current prices) to 25 percent in 1996, while the employment share of the sector rose from 7.8 percent in 1971 (World Bank, 1980, p. 122) to 12.6 percent in 1996.¹ While average labor productivity in the economy as a whole was rising at about 3.9 percent, that in manufacturing was increasing at 7.3 percent. The role of manufacturing products in total exports jumped dramatically, from 4 percent in 1984 to 48 percent in 1992, with the absolute level (current dollars) having risen by 8–9 fold from 1.8 billion to 16.1 billion dollars (Hill, 1997, p. 41). These included both labor intensive products whose competitiveness lay in the country's low wages and other products that relied on natural resources and special policy support.

Manufacturing in Indonesia remained dynamic

in the 1990s up until the crisis, which began in 1997. Enabling macro and regional economic policies, including the development of financial, trade, and physical infrastructures, contributed to the growth of medium and large industry. In some industries this growth has been at the expense of small enterprise, as in the cases of bamboo weaving and palm sugar processing (Sandee and Rietveld, 2000). In other industries small firms have done well (Hill, 1996).

Structural change under growth

During the New Order period under Suharto, Indonesia experienced a rapid rise of large-scale manufacturing. Enormous factories have become prominent in Jakarta, Surabaya, Medan, Bandung, and Semarang, as well as along main trunk roads throughout Java. To an important extent, large-scale manufacturing in Indonesia is characterized by its concentration on labor-intensive assembly, and it is increasingly oriented toward export markets. In spite of the impressive growth of large-scale manufacturing, the relative importance of the small-scale sector has not declined greatly. According to Hill (1992, p. 249), the principal explanation of the latter's resilience is its "ability to exploit market niches, to concentrate on activities not characterized by economies of scale, to serve particular markets not of commercial interest to larger firms, and to produce goods not easily adapted to mass production technologies." Clustering is an additional factor that may explain the resilience of small-scale industries. A main feature of industrial organization in Indonesia, and in particular Java, is the tendency for small-scale industrial enterprises to group together by geography and by economic subsector. Clustering offers agglomeration economies that allow small-scale industries to participate profitably and competitively in wide trade networks. The resilience of the small-scale industry sector reflects the fact that small enterprises have not been static during Indonesia's long period of economic growth. There is ample evidence of their technological upgrading as a necessary condition to "stay on board" during the growth years (Sandee and others, 1994; Sandee, 1995; van Diermen, 1997).

The small firm's continuing role as the locus of most employment in Indonesia's manufacturing

TABLE I
Size composition of Indonesian manufacturing establishments, 1986 and 1996

Year	Size of establishment (number of workers)	Number of establishments	Employment (thousands of workers)	Percent of employment	Average size of establishment (number of workers)
1986	<5	1,422,593	2,700.1	52.4	1.95
	5–19	98,129	787.7	14.9	8.03
	20 and up	12,902	1,728.7	32.7	134.0
	20–99	10,008	(400.3)	(7.57)	[40.0]
	100 and up	2,894	(1,328.4)	(25.13)	(459.0)
	Total	1,533,624	5,286.5	100.0	3.45
1996	<5	2,501,585	4,878.1	48.6	1.95
	5–19	228,987	1,831.9	18.2	8.0
	20 and up	28,798	3,329.5	33.2	115.6
	20–99	22,283	(891.3) (779.9)	(8.88) (7.77)	[40.0] [35.0]
	100 and up	6,509	(2,438.2) (2,549.6)	(24.32) (25.43)	(374.6) (391.7)
	Total	2,759,370	10,039,549	100.0	3.45

[] Assumed.

() Deduced based on the assumed figures.

Note: Figures are available from the 1986 and 1996 sources for the whole category of establishments with 20 or more workers. For the category 20–99 it is possible to make an approximate estimate of average size, based on the size distribution usually observed. For 1986 our best estimate is 40 workers. When this estimate has been made it is then possible to deduce the average size of the category 100 and up, together with the rest of the figures shown in round parentheses in the 1986 panel. For 1996, the average size of establishments with 20 or more workers is less than in 1986; 40 would thus seem to be an upper limit estimate of the average size within the 20–99 category; if it is the true figure, then the leftward of the two estimates in round parentheses for the other categories where estimates are made is the implied figure. As a lower limit to likely average size within the 20–99 category we have chosen 35 workers; were it the true figure then the rightward set of figures in round parentheses would hold.

Source: The 1986 and 1996 industrial censuses.

structure is reflected in the fact that as of 1996 nearly half of all workers were found in units of under five workers and two-thirds in ones of under 20 (Table I). About a quarter were found in establishments of 100 or more workers and probably close to a fifth in those of over 500 workers.² Labor productivity, however, is much greater in larger plants with the result that though the very small (“household”) sector has nearly half of the employment it probably generates only 9–10 percent of output³ while plants of 100 (500) and up generate about 70 percent (46 percent) of that output.⁴ The labor productivity gap thus appears to be one of the largest observed among developing countries (Berry and Mazumdar, 1991). As of 1974–1975 the striking aspect of these gaps in Indonesia was not so much that between small establishments (5–19 workers) and the medium/large range but that between household workers and everyone else.⁵

Other notable features of Indonesian manufacturing are its widespread dispersion in rural areas

and the already noted prevalence of clusters, where about half of manufacturing employment was located according to Sandee (1995, p. 10). Clusters are important in absolute and relative terms in most major categories. There is not much variance in average firm size within most clusters; usually there are two to three workers, with the main reliance on family labor. Some more dynamic clusters do use considerable paid labor. Rural industry is characterized by its instability (Klapwijk, 1997) and the low incomes it generates. World Bank (1985) argues that the returns to labor (per man hour) are substantially lower (as much as 70 percent) in activities outside the rice labor market. On the basis of this somewhat unusual characteristic of the rural wage and income structure this source concluded that there was a labor surplus in many Javanese villages but that there did exist mechanisms that prevent such surplus from bidding down the agricultural wage rate. Whatever the labor market mechanisms involved, rural industry is frequently associated

with low earnings. Low-income urban dwellers seem more typically to opt for trade and services.

Opinions have been divided on the likely impact of economic growth on these low-income jobs in rural industry. Rising rural incomes are likely to generate more than proportional increases in demand for goods and services of household enterprises, but beyond a certain income level people begin switching to the more standardized products of larger firms, which are less likely to be found in rural settings. Urbanization and the expectation that demand would shift from their low-quality products has led to the prediction that rural industry will tend to decline.

As noted, the last couple of decades have seen very rapid growth of manufacturing output: at about 11.3 percent per year (1975–1996), with both employment (6.1 percent) and labor productivity (4.9 percent) contributing strongly to this output growth.⁶ Very significant changes have occurred in the composition of output by branch and in the share of output being exported. In the light of such growth and change, it is perhaps surprising that the size structure of the sector has shifted only marginally. The large labor productivity gaps by size appear to have remained (although the lack of clearly comparable output figures from the 1996 manufacturing census make this judgement somewhat speculative for the period since the mid-1980s)⁷ but not widened, implying that significant investment and technological upgrading has occurred across the full size spectrum. Employment growth has been rapid in all the size categories, and industrial concentration has tended to decline somewhat. Evidence on firm-level growth is very limited, but considerable dynamism has clearly characterized certain groups of firms.

Over the intercensal period 1974/1975–1986, the broad size structure of employment remained virtually unchanged. Employment grew at 5.6 percent per year on average with establishments of under five workers retaining about 55 percent of the total labor force, based on the population census definition, which focuses on the main activity of the person. There seems also to have been little change within the medium-large (M/L) group, although the data presented by Hill (1998, p. 71) show some jumpiness. Over the next intercensal period (1986–1996), unadjusted figures

indicate that manufacturing employment was growing even faster, at about 6.6 percent per year, and again only a modest change seems to have occurred in size structure. Table I suggests that establishments of over 100 workers retained their 25 percent share, those of under five dropped a bit from 52.4 to 48.6 percent, while the middle range from 5 to 99 workers gained from 22.5 percent to about 26–27 percent.⁸

The failure of the larger establishments to increase their share of total employment (assuming these figures are roughly accurate)⁹ flies in the face of considerable belief that concentration has increased in many branches of industry and overall. It confirms Bird's (1999) conclusion, based on an analysis of 102 industries over 1975–1993, that there has been a long-run downward trend. The simple average four-firm concentration ratio declined from 64 percent to 54 percent and the percentage of industries characterized as highly concentrated fell from 39 percent to 28 percent.

Clearly comparable figures on labor productivity are not available to permit an accurate measure of trends since 1986. The average for all manufacturing seems to have been about 4.5 percent over this decade. Data on establishments referred to as “small business” and defined (for the manufacturing sector) as being without legal entity and/or employing fewer than 20 persons show this group to have labor productivity about one-thirteenth that of the other (medium and large) establishments in 1996 (Saleh *et al.*, 1999, Table VI). If the same productivity gap held between plants of fewer than 20 workers and those with 20 and up, then labor productivity increase over 1986–1996 for those with fewer than 20 workers would have been about 2 percent per year. It seems likely, however, that the 1996 productivity gap between plants of fewer than 20 workers and those with more was a bit lower (than 13 to 1), in which case the labor productivity growth of the plants with fewer than 20 workers may have been as fast as 4 percent per year or even a bit more. In any case there appears little doubt that productivity growth in the smaller establishments was substantial. Whether it matched or even exceeded that in the M/L range cannot yet be ascertained.

It is accepted that total factor productivity

(TFP) better measures the relative efficiency of SME firms and their advances over time than does labor productivity. A number of studies in various countries have used this indicator to assess relative efficiency across size categories.¹⁰ Unfortunately, TFP is harder to measure than is labor productivity, owing to imprecision in the figures on capital (and human capital as well). The questionable quality problems of the Indonesian data have steered some analysts away from its use. There have, nevertheless, been a few analyses of how TFP has changed over time in the M/L sector as a whole, the most recent and perhaps the most accurate of which is Timmer's (1999, p. 87). He reports that TFP fluctuated without trend over 1975–1983 and then rose by about 6 percent per year over 1983–1995, for a 20-year average increase of 2.8 percent per year. By 1995 TFP was at 176 percent of the 1975 level, with labor productivity at 220 percent of it. The figures indicate that capital input accounted for 60 percent of the output growth over this period, labor for just 18 percent, and TFP growth for 22 percent. No TFP estimates have to our knowledge been undertaken by size category of establishments. It seems likely, however, that the quite marked improvements that

have characterized the M/L sector since the mid-1980s have been shared by the smaller establishments in that group and perhaps by small firms as well.

Growth of total employment results both from creation of new firms (minus the exit of existing ones) and from the employment growth of existing firms. Though no organized information is available to permit a disaggregation between these two sources, scattered evidence illustrates the fact that firm growth is important. Steel (1993, p. 15) notes that there was considerable graduation into the larger size categories over 1975–1990. Whereas, in 1990, 63.7 percent of all M/L employment was located in establishments with 500 or more workers, only 28.8 percent of the initial year employment of this set of establishments was found in that size range.¹¹ Hill (1998, p. 71) presents somewhat similar information for three size categories. In 1990, whereas the 500 and up category accounted for 65.7 percent of total value added, firms created in that size range accounted only for 41.7 percent of it (Table II). More directly related to our concerns here, establishments currently in the small and medium range (20–99 workers) produced only 7.0 percent of valued

TABLE II
Size distribution of manufacturing value added in Indonesia, by current establishment size and by initial year establishment size, 1977–1991

Year	Current year size group (by number of workers)			Initial year size group (by number of workers)		
	20–99	100–499	500+	20–99	100–499	500+
1977	9.0	24.2	66.8	15.9	35.8	48.2
1978	8.8	25.2	66.1	16.7	34.3	49.1
1979	8.1	25.7	66.3	18.9	36.1	45.0
1980	7.3	25.0	67.7	20.3	33.6	46.1
1981	6.6	23.8	69.6	20.9	31.9	47.2
1982	6.9	25.1	68.1	23.1	32.4	44.5
1983	6.4	23.3	70.3	23.7	30.0	46.3
1984	6.4	22.7	70.8	25.4	28.8	45.8
1985	12.0	30.3	57.6	27.3	28.6	44.2
1986	8.4	27.3	64.3	27.5	28.3	44.2
1987	7.4	27.0	65.7	25.7	29.3	45.0
1988	9.1	28.6	62.3	27.3	30.8	42.0
1989	7.6	27.4	65.0	26.0	30.7	42.3
1990	7.0	27.3	65.7	25.4	32.9	41.7
1991				25.4	36.4	38.3

“Initial year” refers to the shares of establishments based on their size distribution at the commencement of the data series (1975) or when the establishment commenced operations.

Source: Hill (1997, p. 71).

added, but those created in that range produced 25.4 percent. Hence, those who had graduated up from this size category accounted for a hefty 18.4 percent of output, more than twice what firms currently in the size range were producing. With the passage of time this ratio has risen (from under 2 in 1977 to 3.6 in 1990). More important, the share of all value added by establishments of 20 workers and up that comes from those starting in the 20–99 range rose from 15.9 percent in 1977 to 25.4 percent in 1990.

Further evidence on the growth trajectories of firms comes from the study of SME exporters by Berry and Levy (1999). These firms were doubtless atypically capable of growth because of their success in breaking into export markets and are thus better thought of as giving a feel for how fast growth can be under those circumstances. The 32 rattan firms interviewed began operations with an average of 136 workers and had 377 by date of sample in 1992, by which time their average age was about 10 years. The 34 garment firms started with an average of 218 workers and had 1,109 by date of sample.¹² Some of these firms had begun with very few workers; seven of the rattan firms began with an average of 5.7 workers and had expanded to an average of 270 by time of survey, and eight garment firms that started with an average of 4.6 wound up with 167. Still, a lower share of this Indonesian sample of exporting SMEs had started small (defined by number of workers) than in a comparable study of SME exporters from Colombia (Berry and Escandon, 1999, p. 173). This could be consistent with the two sets of firms having comparable initial levels of capital, however, since wages are higher in Colombia and the labor/capital ratio therefore lower.

3. Productivity growth and the role of clusters, subcontracting, and “strategic alliances”

Labor productivity at the firm level rises owing to increased capital per worker and to technological change. At the level of the industry or of manufacturing an additional factor usually tending to raise labor productivity is the reallocation of resources toward higher productivity groups of firms. TFP rises as a result of technological change and this reallocation of resources to more

productive firms (i.e., to just two of the three factors that explain rising labor productivity).

Raising productivity by technological upgrading (in the broadest sense to include not just better machinery but also improvements in workplace organization, inventory handling, product design, etc.) is achieved through a variety of mechanisms. It is accepted that most small firms will be less able to handle this process successfully on their own than will larger ones. Accordingly, much attention has been given to the possible roles of subcontracting and clustering as arrangements that make such advances more easily accessible to small firms, and to collective support systems, including those of the public sector and of private associations. The Japanese experience is viewed as the paradigm for the importance of subcontracting in creating the conditions for a major SME role in a strong and internationally competitive manufacturing sector. Italy's export-oriented clusters have become a model for the role of clusters in competitive export activities. These two phenomena are of course not limited to export settings, though they may have their most impressive manifestations there.

Indonesia's clusters and exports

What are the sources of rising productivity in Indonesia's SMEs? As was discussed, the evidence suggests that although absolute levels of labor productivity in most SMEs remain quite low¹³ levels have been rising significantly over the last couple of decades. Probably productivity has risen at rates not far from those of the larger firms for which the data referred to above clearly confirm substantial improvements.

There are no general data on the sources of productivity gains of SMEs or their relative importance in Indonesia. But some suggestions do emerge from the few studies available. In their analysis of sources of technological capability for exporting SMEs in rattan furniture, Jepara wood furniture, and garments (three important export industries in which SMEs play significant roles), Berry and Levy (1999, p. 50) highlight several points:

1. Private channels have been the dominant mechanisms for acquiring such capability in all three sectors.

2. Subcontracting is pervasive in all three industries and has been crucial to harnessing traditional skills for export production, especially in Jepara.
3. Employment of expatriates is an especially powerful mechanism for acquiring technological capability in the rattan and garment sectors, but this practice is concentrated disproportionately among *non-pribumi* entrepreneurs who have the advantage of being embedded in an extended (ethnic) community that transcends national boundaries.
4. Collective support mechanisms (public sector and private associations) have played only a limited role overall; they have been more important to the smaller *pribumi* firms but their overall value has been limited by pervasive institutional weaknesses.

These case studies illustrate the range of mechanisms at work in the process of technology upgrading. Much of it involves ideas coming from the outside, but on-the-job learning by both employees and the entrepreneur are rated very highly as well (Berry and Levy, 1999, pp. 51, 59).¹⁴ A considerable shifting of relevant skills among firms also occurs when employees are hired from one to another.

Foreign buyers are the most important single source of outside technological support in all three industries (true also of marketing). This reflects both the importance of strong mutual interest in raising productivity for this process to be successful and the fact that the buyer's product preferences and specifications have implications for the technological capability that a firm needs. Expatriate employees were second most important in rattan and garments, two industries in which there had been dynamic activity in the East Asia region for some time before Indonesia's sudden emergence as a significant producer.¹⁵ As was noted, however, their importance was much greater to *non-pribumi* entrepreneurs than to the *pribumis*. Equipment suppliers were moderately useful, especially to the (few) *pribumi* entrepreneurs in the garment sector. Similar firms provided considerable information in the garment industry, especially to the *pribumi* entrepreneurs, and the technical literature mattered to a fair number of firms.

On the other side of the ledger, private consultants were of limited importance, as were the public sector providers, the industry associations, and the "foster parents."¹⁶ This said, however, the fact that none of these last sources is by itself widely cited as important to firms' technological advances does not mean that they are unimportant when taken together. Different sources matter to different firms, so each is cited by a few firms, and their total significance may be greater than might at first appear. Moreover, collective sources (public and private nonprofit) have clearly been more important to firms that started smaller and to those run by *pribumi* entrepreneurs. The latter suggests that rather than concluding that such sources are not necessary, ways should be found to make them better in the future than in the past.¹⁷ Doing so requires recognition of what such collective sources can do best and how they can best do it. It is important that collective providers not try to do too much, nor to replace private mechanisms when these have real potential.

The authors point to the merits of "light touch" public support/intervention, which focuses on bringing private actors together, facilitating their contacts, and the like. One of the best examples of this, most directly relevant to the marketing needs of the surveyed rattan SMEs but also surprisingly relevant to technological learning, is support for fairs, both in-country and abroad (where it involves subsidizing trips to those fairs). Private consultants appear destined to play only a marginal role for the foreseeable future, although here too this is not grounds for writing them off, but simply for keeping their limited potential role in perspective.

Unfortunately, it is not possible to say to what degree the above findings on sources of technological advance in SMEs in three exporting industries can be generalized to the majority that have weaker or no links to exporting. The role of foreign buyers would of course be absent and the benefits and density of subcontracting very probably less. We suspect that technological improvement is on average slower in the domestic market-oriented SMEs¹⁸ because these important sources of technology are weak and because the achievement of export capacity is likely to require a higher-than-average level of performance. But we believe that most of the same sources of gains

are at work in the broader universe of firms as well, that their relative importance is probably rather similar, and that the policy conclusions reached on the basis of the study of exporting SMEs is also more generally applicable.

Subcontracting has played a central role in the successful integration of SMEs into dynamic manufacturing sectors in countries such as Japan and Korea, where it has been a major vehicle for the achievement of rising and eventually high levels of productivity in those firms. This role is clearly less in Indonesia at this time, but at the same time not inconsiderable. The issue is how its role will evolve in future. Its prevalence in the exporting SMEs studied by Berry and Levy (1999, pp. 53–55) is encouraging. Three quarters of rattan furniture exporters were subcontracting principals, with half of these subcontracting complete orders and 80 percent specific tasks. Quality maintenance involves technical assistance to the subcontractors. One function of in-house capacity among Jepara exporters is to demonstrate quality control and to spin off new capable subcontractors. Subcontracting is encouraged by large export orders, fluctuating orders, and the risks associated with a heavy investment by a single firm in such circumstances, as well as by the lower costs that subcontractors can often achieve. Kinship, friendship, or former business contacts also encourage subcontracting.

Meanwhile, the striking importance of clusters of small firms in Indonesia, in both rural and urban areas, suggests that membership in a cluster has a significant influence on a firm's productivity.¹⁹ The general literature on clusters has focused on sources of static productivity gains, such as economies of scale in purchase of raw materials or machinery, sale of output, or spread of risk associated with demand fluctuations.²⁰ More recently, it has also taken account of the dynamic advantages of this structure, as with sharing in R&D expenditures, diffusion/sharing of information on new designs, processes, products, etc. (Sverrisson, 1993; Schmitz, 1995). Klapwijk (1997, p. 167) argues that a conducive socio-cultural milieu sustaining trust and reciprocity, an active involvement of traders, and strong government initiative at the local level may be at work in central Java to render rural industrial clusters (RICs) a fertile seedbed for technological change and thus

a positive factor in rural industrialization. Some clusters reflect collaboration among a number of extended families that have a long history of cooperation and coexistence.

The main difference between clustered and dispersed rural industry in Indonesia²¹ is that the clustered industry is primarily oriented to markets outside its own community (Poot and others, 1990, p. 194). Products are on average less perishable or local-taste specific. Examples in Indonesia are batik; leather and products (including footwear); some food processing activities (e.g., coconut, sugar); wood working (e.g., carving), bamboo and rattan; bricks and tiles; pottery and some metal products, such as agricultural tools; and iron wares.

Technological change is more likely when the clusters are linked to urban or international markets. Klapwijk (1997) suggests that only those RICs that specialize in the production of discrete products in small batches to customers' orders are likely to survive in the long run. This limits the prospects to such sectors as clothing, footwear, mechanical engineering, and furniture, with a high need for flexibility at the shop floor and where economies of scope do not inhibit the division of tasks among several enterprises. Though many rural clusters will not survive as development moves along, there are interesting examples of successful upgrading, finding of new market niches, etc. Subcontracting arrangements often link such rural industries to nearby urban or even international markets (Weijland, 1994). Section 4 below provides some details on the cases of wooden furniture from Jepara and garments from Bali.

There is increasing empirical evidence that small firms that are parts of clusters are in a better position to adopt innovations when compared with their dispersed counterparts. Sandee's (1995) study of five roof tile clusters in central Java province (the heartland of small-scale cottage industry (SSCI) in the country) illustrates several of the elements at work. 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 adap-

tation that encompasses changes in processes of production, in patterns of interfirm 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, 1995, p. 170).²² Female producers, however, had very little chance to do so. Their firms were usually taken over by men as the technological shift proceeded. Access to credit was a general constraint on adoption and was felt especially acutely by female producers. The fact that innovation adoption requires a more intensive involvement of both producers and workers may also militate against women, given their other (household) responsibilities (Sandee, 1995, p. 179).

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, p. 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.

Sandee also studied two clusters where institu-

tional support was the driving force behind adoption. The success of Karanggeneng motivated the government to intervene in these other clusters, and its involvement was more direct since the producers and buyers had not yet demonstrated the degree of interest shown in Kananggeneng. These institution-driven innovation processes suffered from too little involvement by other actors; and when government support dried up, the innovations came to a standstill. The process has been hampered by difficulties in gaining access to press-tile markets, so adopters have tended to stick with traditional tiles and much of their press-tile capacity is under-utilized (Sandee, 1995, p. 171). Sandee concludes that the government has focused too much on the supply side of the innovation adoption process while underestimating the need to link clusters to more dynamic markets prior to the introduction of such change.

In all the cases Sandee studied, the government has contributed to innovation by improving the environment for tile production. Government assistance programs tend to be oriented to the provision of technical and financial assistance to single enterprises. This may be cost effective in clusters where initial impacts trickle down but otherwise less so. Most rural tile producers only know about alternative technologies in general terms, but not in enough detail to have a good feel for the benefit/cost ratio of upgrading. Rural clusters would benefit from regular but simple training programs by the government in which the sharing of information on the more advanced technologies figures prominently. Perhaps assistance programs should operate through longer-run links with selected producers rather than as in the present one-shot system. More general policies, such as those in the credit area, also affect market conditions. The larger tile firms have favorable access to the KYUK program, and smaller rural firms would benefit from the abolition of such preferential treatment because these smaller firms typically lack the credit needed to establish or expand their business (Sandee, 1995, p. 180). And the central role of buyers and others in adoption raises seldom-considered policy options.

4. Export success of Indonesian SMEs

As economies turn outward it becomes more important for any group of firms to be able to gain export markets or to compete effectively with imports that no longer have to jump high protectionist fences. It has been widely accepted that for SMEs to succeed on the export front (how they do in competing with imports must be judged differently) SMEs must have some way to lower transactions costs, which tend to have an important fixed cost component. Subcontracting is one route, whether with larger scale manufacturers or with commercial intermediaries. Berry and Levy (1999) reported that it was common among medium-sized exporters in rattan, Jepara furniture, and garments.

The second recognized route is by reaping the advantages of clustering. All studies show that export-oriented small clusters operate in buyer-driven commodity chains requiring continuous upgrading and adaptability, which in turn requires a professional interaction on tailor-made product specifications between buyers and producers (Knorringer, 1998). The buyers provide an effective "assistance package."

Van Diermen (1997) and Cole (1998) show how small enterprises penetrate export markets via buyer-driven trade networks, in the cases of Jepara (carved wooden furniture, see Appendix 1) and Bali (garments, see Appendix 2). In both cases there are brokers, agents, and traders that function as intermediaries between international buyers and small-scale producers. Foreigners have played an important role in modernizing the Jepara furniture industry and linking it to global markets (Schiller and Martin-Schiller, 1997), as well as in the case of Bali garments.

Indonesia's small industry (establishments of 5–19 workers) seems to have shared nicely in the manufactured export boom of recent years. The absolute level of direct exports rose from US\$137 million in 1983 to 2.1 billion in 1992 (Hill, 1998, p. 49), and its share of such exports increased from 10 to 13.2 percent, after reaching 17.3 percent in 1987. As with larger industry, the main items are garments, textiles, and footwear, together accounting for 60 percent. This growth has been achieved substantially by finding niche markets and adapting costs and quality to market demand

(Thee, 1993). A significant and no doubt rapidly increasing share of SME output has been exported indirectly through subcontracting arrangements.

5. Response to crisis

Indonesia has suffered a severe economic setback over the last couple of years, with GDP falling by some 13–15 percent in 1998 alone. How has the SME sector responded? What does its response tell us about the sector and its potential? What policy instruments are pertinent to this situation?

It has often been argued that one of the advantages of many SMEs is their flexibility, and related capacity to, for instance, weather storms, shift from product to product, expand and contract easily. SMEs may therefore be expected to do relatively better under volatile macro conditions than large firms producing more standardized products, where reorganizations of the assembly line take time (Sandee et al., 1998, p. 3). Sunk costs are lower in smaller firms and labor-capital struggles are less frequent, another source of flexibility. At the same time it is often argued that SMEs are the first victims of macro-economic crises such as this one. The issue is important for several reasons. First, a flexible SME sector, able to adjust smoothly to severe shocks, is clearly a major plus as a country tries to mitigate the effects of those shocks and to avoid large increases in poverty. Also, even if many SMEs show impressive agility in general, certain types of shocks might destroy firms with good longer run potential, raising the question of what policy instruments might help to avoid that outcome. Finally, it is to be expected that any given macroeconomic crisis will affect different SMEs in different ways, and that appropriate policies to support SMEs will vary widely according to how those firms are placed in the economy.

When the recent crisis in Indonesia led to a major devaluation, it raised the potential profitability of exporting industries such as Jepara furniture, while many domestically oriented industries were under strain owing to weakening local demand. Best placed are industries that export a lot or compete with imports and at the same time do not rely heavily on raw material imports or imported machinery and equipment. Jepara is such a case. Worst off are those relying on domestic

demand and not competing with imports (which the devaluation will help to cut out) but drawing heavily on imports of material or capital goods.

These various effects are apparent in Indonesia. van Diermen and others (1998, p. 32) report that some SME groups such as Jepara and the traditional batik cloth weaving industry in Central Java have been doing well. Nails, latches, and door bolts are now produced locally rather than imported as before, in spite of the quality disadvantage vis-à-vis the imports. In some export cases some of the potential benefits to the Indonesian firms are negotiated away by foreign buyers. While the currency devalued by 60 percent in real terms (80 percent in nominal terms) the textile and garment industries' international buyers have insisted on discounts of 20–40 percent, so the rupiah price increases are less than might be expected (van Diermen and others, 1998, p. 24). Also foreign banks' unwillingness to accept Indonesian banks' letters of credit has reduced the benefits to exporters (van Diermen and others, 1998, p. 40). At the negative end of the spectrum is the demise of *tahu* producers in West Java and small clove cigarette (*kretek*) producers in Central Java, in both cases caused by a steep rise in the price of inputs. Another example of small-scale enterprises in distress are those garment producers (often operating in subcontracting networks) who depend on a steady flow of imported cloth and other raw materials.

There is no doubt that SMEs have fared very differently according to the sector. Unfortunately, though considerable evidence has been built up on trends in selected industries, on the broader question of how well the SME sector as a whole has been able to defend itself and maintain its income levels against the effects of the crisis, one can only guess at this point. Susenas surveys provide useful data on employment trends, but the country's statistical apparatus is not up to the task of identifying short-run earnings trends in the cottage and small-scale sectors. Earnings levels can only be reasonably well gauged when an economic census (or sometimes a population census) is done. There is nonetheless a widespread impression that small-scale enterprises have been weathering the crisis better than larger companies (Cameron, 1999). Two distinct interpretations of the resilience of small-scale firms in the current

period of economic distress have been highlighted. First, a recent paper by Jellinek and Rustanto (1999) argues that there has been an unprecedented upsurge of the small-scale sector, with new economic opportunities in blacksmith communities, for furniture makers, fishing, agricultural tools, brick and tile making, and small-scale vending activities. They report that cottage industries almost completely destroyed over the past 20 years are finding it hard to keep up with the new orders. They judge that the economic crisis offers renewed opportunities to a small-scale sector that was gradually losing ground during the New Order. In this view, a policy correction, mainly through the depreciation of the rupiah, has created growth prospects for "communal-capitalist systems currently being created by the people themselves." A second view is that many small-scale enterprises have been performing well in recent decades, even though they often faced considerable discrimination, especially relative to the opportunities enjoyed by the conglomerates (Poot, 1997). Being less reliant on formal markets and formal credit funds, small-scale enterprises are able to respond quicker and more flexibly to sudden shocks than can their larger counterparts.

We now turn to a brief review of available evidence on this issue. The second view of the pre-crisis period appears much more consistent with the statistics reviewed above. Nonetheless, both may offer insights into the events of the crisis period itself. Among recent studies of the impact of the crisis Hill (1999) reports that the manufacturing sector has contracted at about the economy-wide average (–15 percent) since its outbreak, though there are differences between export-oriented and local market activities. He concludes that every sector has shed labor, with the exception of agriculture, and that the biggest decline has occurred in manufacturing.²³ Both Hill and Cameron (1999) feel that small-scale enterprises are weathering the crisis better than larger companies, because they are less reliant on formal markets and less reliant on now far more costly borrowed funds.

Various surveys have attempted to measure the social and economic impact of the crisis, focusing especially on how it has affected poverty, education, and health (Wetterberg et al., 1999; Poppele et al., 1999; Cameron, 1999). They generally

report that urban areas have been hit harder than rural ones. They also report that both the urban and rural areas of Java have been hit hard relative to other regions, the impact on rural areas being related to the relatively high density of urban-rural linkages on Java as a consequence of which urban economic distress trickles down to rural areas. The surveys estimate also that unemployment rates for 1998 were up to some 6 percent, substantially below earlier forecasts of massive unemployment flowing from such a major economic downturn. This suggests that workers who have lost their jobs in the formal sector have been able to find alternative (possibly part-time) employment in the informal sector.

The most general statistical evidence on trends in the labor market comes from the large annual Susenas survey (corresponding to the month of January, in the middle of the rainy season when agricultural activity is likely to be most prominent). Comparison of the figures for 1995, 1997, and 1998 shows little change in the structure of employment by job position.²⁴ The "paid workers" category continued to dominate manufacturing employment (of persons 10 and up) with about two-thirds of the total, including both the so-called formal and informal branches of manufacturing. This category gained a couple of points at the expense of the unpaid worker category.²⁵ Self-employment of people who run their own business, with or without workers, has remained virtually constant at a quarter of the total. However, between 1997 and 1998, those with their own business but no workers moved up a couple of points while those with temporary or unpaid workers dropped the same amount, possibly reflecting the effects of shrinking businesses. This latter shift was apparent both in urban and in rural areas, and has characterized the economy as a whole, not just manufacturing. Since some self-employment trade and service activities have a "last resort" character, it is likely that the adjustment process has involved a shift into these.

A few surveys have focused more specifically on the impacts of the crisis on SMEs. The Akatiga Foundation of Bandung monitored the performance of 800 small-scale entrepreneurs in four provinces during 1997–1998, reporting that 28 percent of the producers showed improved per-

formance while the remainder lost or saw no significant change. Export-oriented small firms did better than domestic counterparts. Moreover, small-scale enterprises in Java suffered more than on other islands of the archipelago and those in urban areas more than their rural counterparts. The survey identified various coping strategies by small-scale entrepreneurs to deal with economic adversity, including working at lower profit margins and lowering labor costs (Akatiga Foundation, 1999). The study reports also that the social safety net programs of the Indonesian government have given rise to an upsurge of micro-enterprises, especially in sectors characterized by low entry barriers.

Musa's (Musa and Priatna, 1998) survey on access to credit for small and medium enterprises during the crisis, based on a sample of some 300 firms in eight provinces and various sectors, reports that self-finance has remained the main source of funds for investment and working capital. More than 75 percent of small firms were fully reliant on their own funds to finance business activities and fewer than 13 percent had access to formal finance, with the number declining slightly since the outbreak of the crisis.²⁶ The limited exposure of small-scale business activities to borrowed funds from the formal sector is presumably one of the factors explaining the resilience of these activities during the current period of economic distress. The main coping mechanisms of the sampled firms include the use of cheaper inputs to replace expensive (imported) materials and the downsizing of the labor force. Of respondents, 80 percent have seen their business shrink (though only 21 percent report laying off workers); in 12 percent of cases it stayed constant and 8 percent have achieved an increase, the latter occurring mainly in those activities that export and have limited need for imported materials.

Timberg (1999, p. 12) also concludes that the overall immediate effect of the monetary crisis on SMEs and the financial institutions that serve them has been relatively mild. However, he feels that some of the ensuing changes in financial institutions might have stronger negative effects, in particular the increased conservatism of lenders and the enhanced role of the foreign bank owners who have less feel for Indonesian SMEs. Accordingly,

he recommends consideration of some measures to counter those changes.

Scattered evidence from surveys undertaken by the Ministry of Cooperatives and Small and Medium Enterprise Development²⁷ taken together with the cited Susenas data and with basic economic logic leave little doubt that the SME sector has on balance felt some negative impact from the crisis. The crisis creates pressure for firms to adopt adjustment strategies to cut costs and to redirect output to new market opportunities whenever possible. The Susenas evidence to the effect that there have been no major changes in the structure of manufacturing employment suggest only modest job loss in small-scale firms. Either most firms have been able to cope without major reductions in their workforce or the creation of new firms has offset such reduction. Of course, the picture may become different if economic recovery does not come soon, and more drastic adjustment strategies may be needed.

A look at specific industries helps to identify the range of effects from the crisis. There is evidence of rapid growth and employment generation in the small-scale furniture industry, especially in Jepara but also in North Sulawesi (Sandee et al., 1998; Jellinek and Rustanto, 1999; Akatiga Foundation, 1999). This industry exemplifies an economic activity that uses domestic inputs and has plenty of export potential. Large and small firms in the furniture industry are developing long-term linkages to overcome the present insecure environment. Foreign actors play an important role as intermediary between domestic production networks and international buyers and also contribute to easing the credit constraint caused by the collapse of the Indonesian banking system. Policy has contributed positively to the transition through the development of the provincial harbor to accommodate container transport, the simplified procedures for foreign investors, and the improved facilities for clearing exports. As for the impact of the recent events on the smaller enterprises, some of those already engaged in exporting (usually indirectly) are being pressured by contractors and large firms to sign long-term contracts; some may become disguised wage labor. The fast growth has produced greater standardization and a stricter division of labor and tasks among firms. Prior to the crisis the small firms had access to various

trade networks. Sandee wonders whether these changes will diminish the overall flexibility of the industry and have a negative effect on regular quality upgrading, which has been the norm in the past and will remain very needed in future.

The experience in the construction materials sector contrasts considerably with that of furniture, as befits its nontradable character. Wiradi (1998) reports that brick making in certain villages in West Java has collapsed as a consequence of the substantial decline in urban building activities. Sandee (1998), however, found that tile and brick makers in specific villages of Central Java maintained pre-crisis production levels through a gradual replacement of urban markets by rural ones. This replacement was fuelled by the relatively good condition of farmers in the area and the channeling of funds from the social safety net programs into rural building activities (Sandee, 1999).

Another small-scale manufacturing activity that has suffered much from the crisis is copper handicrafts (Sandee, 1998). Producers in a mountain village in Central Java were known for their modern designs that were popular throughout Java, especially in the urban areas. They occasionally export, but their trade networks remain embryonic. The industry is partially dependent on imported inputs and has suffered much from the substantial price increases. The shrinkage of urban demand has forced many firms to downsize. However, recently production has recovered slightly owing to increased rural demand, leading to a production shift back to traditional products such as those kitchen utensils that are popular in rural areas. These products have a much higher local content than do the modern designs. The outbreak of the crisis has not thus far enabled producers to develop export networks.

Evidence on the resilience and successful adjustment of some types of small-scale enterprises suggests the importance of clusters. For instance, the furniture, roof tile, cloth weaving, and metal casting industries are all examples of agglomerations of firms that operate in the same subsector. In all these cases, clusters consist of both small and large firms that compete and collaborate. Joint action and external economies appear to be key factors that explain the successful adjustments of the small-scale firms in such clusters.

6. Public policy support for subcontracting and clusters

The main agent for SME promotion is the Ministry of Industry. Up to early 1994 most programs were formulated, monitored, and executed by the Directorate General of Small Industries. The directorate in Jakarta handles policy formation, administration, and training of the provincial and regency offices of the ministry. These officers, attached to all *Kabupaten* (regencies) in the country, are responsible for the execution and monitoring of the programs. Many extension workers are experts in the field of small business development and are well aware of the specific constraints and prospects for local small enterprise, though frequently without the resources to deliver assistance in accord with their ideas. The combination of its being free to the client and the enormous size of the nationwide target group²⁸ means that this technical (nonfinancial) assistance must be provided at relatively low average cost. Some extension workers have also played a successful intermediate role in linking small firms to larger businesses or to the banking sector.

The size of the target group has resulted in a pattern of "one-shot services" to small firms, with little possibility of providing follow-up, given the many firms that have not received any assistance at all. The typical assistance package consists of a one or two day training course on such topics as entrepreneurship, bookkeeping, marketing, and management. Most of the programs do not have a clear budget and are dependent for their resources on the creativeness of the staff at the various levels in raising funds from the private sector, banks or other sources (including foreign nongovernmental organizations (NGO)) (Santee, 1995, p. 153). This situation implies the absence of a clear budget by which plans can be translated into concrete projects. Over the years, most departments have been able to secure some foreign funding for specific programs and projects that made it possible to formulate assistance packages encompassing more than one-shot interventions and brief training courses. Such foreign donor sponsored interventions have been the exception. Foreign donors concentrate their efforts on the training programs of the Ministry, so the scope of its activities varies over time.

The two main foci of the Ministry's efforts are the linking of small industries to larger private and state firms and the provision of support to clusters. One of the main aims of the first type of programs is to ease the marketing constraints faced by small industries (e.g., by inducing large firms to set up subcontracting linkages under which the small firms supply inputs through putting-out systems). It also involves the use of some profits of state enterprises to provide financial assistance to develop linkages between small and large firms. These programs aimed at networking assume that the principal growth constraint for small-scale industries is their limited access to markets. The ministry also supports the participation of small firms in national and international trade fairs with trips being financed by large firms.

The second main activity of the ministry is a specific project (BIPIK) designed for clustered small industry (*sentra industri*), set up with foreign sponsorship in the late 1970s and taken over fully by the government in the 1980s. Cluster formation is an explicit aim of the BIKIP program (Klapwijk, 1997, p. 65). Enterprises in the *sentra* are encouraged to form cooperatives. The Indonesian government has long recognized the importance of agglomerations of small-scale industrial enterprises operating in the same sub-sector, and there is awareness that such clusters may be highly effective entry points for the provision of assistance, reaching a large number of producers at low costs through targeted interventions. The cluster development program gives high priority to stimulating innovation. It is believed that, without process and product innovations, the majority of small industry clusters will not be able to adjust to structural changes in the dynamic Indonesian economic environment. The program consists of courses provided by extension workers and the introduction of new equipment to demonstrate to the producers the advantages of technological change. Occasionally, new equipment is donated to certain producers at the end of the course in the hope that they will learn to use it and that there will be others who purchase it themselves. The program's budget is limited; typically, approximately US\$1000 per cluster is available for training and donation of equipment. Similar to the other forms of assistance, it is nonrecurring, given the fact that so many clusters have not yet received

any assistance. Sandee and others (1994) estimated that in 1993 some 28 percent of the 4,250 clusters in the province of Central Java had received assistance so far. Like all such programs, this one has suffered in its implementation from a lack of finance and of qualified personnel. Klapwijk (1997, p. 65) reports that the extension officers generally have little technical or business experience, and training or other technical facilities have been largely provided according to the direction of central planners, rather than having been adapted to local needs (Sandee and others, 1994). Where it can collaborate with other entities the BIPIK can achieve more.

There is surprisingly little insight into the effectiveness of the different programs, but a general impression that they have not matched the overall challenge. Participation rates of small enterprises in those government programs present in Central Java are low: 6.6 percent for the subcontracting program, which links small firms to large government and private firms, and 3.8 percent for the cited BIPIK training program, which focuses on clusters (Sandee, 1995, p. 155). Most programs target a certain number of small producers to receive assistance. Thus the share of clusters reached is much higher than that of firms. As of 1991, BIPIK's participation in support of the clusters in various industries ranged from under 20 percent for food processing and handicrafts to 80 percent for metal-working, whose clusters are often linked to large firms through subcontracting (Sandee, 1995, p. 160). Textiles/leather are also high at 50 percent, reflecting the fact that they feature prominently in the country's export diversification strategy. BIPIK gives priority to clusters with real business opportunities, and, since it does not do separate business opportunities assessments for each cluster, it tends to repeat successes where possible. This strategy is implicit in its targets for coverage of clusters each year and its modest budget. Given the objective of wide coverage there is virtually no opportunity to return to previously attended clusters. Training within a cluster is directed at dynamic male producers (correlated with size), who are presumably expected to diffuse what they learn. Projects are aimed at producers and not at the other actors in the production or marketing chain.

The success and effectiveness of the assistance

programs is typically measured by whether the annual outreach targets have been achieved, though the growth of the small enterprise sector in terms of number of units and of employment is viewed as an indicator that service provision is bearing fruit. Quality is often deficient, and many sessions seem to involve a lot of theory and not much on the actual running of the business. On the other hand, programs sponsored by foreign NGOs are usually well enough funded, are tailored to the needs of the target groups and better monitored, and generally include attention to marketing issues and a credit component. Though these programs are presumably more successful in terms of benefits per client firm, they are relatively expensive. There is need for nationwide programs, which means the key is to strengthen the existing ones.

On the basis of his visits to and time spent with extension officers Klapwijk (1997, p. 68) concludes that, though problems of funds and competence remain, the local extension offices of the ministry have become the prime nodes of the implementation of the package of programs aimed at small industry promotion and that the ministry does act as an intermediary among the other numerous parties involved. Formal enterprises are dealt with individually and cottage clusters through the *sentra*, while dispersed cottage enterprise is left out. Officers mediate with banks and with large enterprises, engage in marketing, etc. For banks trying to meet their obligations, the local extension office is the natural starting point. The same is true for the cottage group looking for any particular service. In some *sentra* the officers have been directly responsible for the cluster by introducing new industries as alternatives to the earlier more marginal activities. In all of the *sentra* visited, attempts had been made to form cooperatives or at least entrepreneur's associations. The effort has been successful in only a few cases, as where a cooperative started to alleviate poverty developed into a putting-out system. More generally the BIPAK programs probably do have the effect of raising awareness of the benefits of collaboration. In many cases the co-ops are dormant, usually because they do not fulfil clear needs of the group (Klapwijk, 1997, p. 71).

Some degree of interfirm cooperation between entrepreneurs occurred in most of the *sentra*

visited. Sometimes the cooperation was dense, often involving order sharing and subcontracting and sometimes a degree of specialization among firms. BIPIK has sometimes used “motivators,” dynamic producers from certain clusters. In the roof tile case these motivators were invited to Jakarta to learn about new production techniques and marketing strategies. Often an expert from the private sector is hired as tutor. Occasionally BIPIK has established a technical service center in a cluster, where producers can get access to expensive and heavy machinery (Sandee, 1995, p. 160). (Appendix 3 provides additional information on the Cluster Development Program in Indonesia.)

Appendix 1: The case of Jepara: An example of a large cluster

Jepara is a very large cluster, employing over 40,000 permanent workers in more than 2,000 small enterprises and 100 large and medium ones scattered across 80 villages (Sandee and others, 1998, p. 3). About 30 percent of the value added is directed toward the domestic market, mainly supplied by small and medium producers where the technology is relatively basic. This is a craft industry little changed over the years and occupies 70 percent of the cluster’s workforce. Domestic demand has risen rapidly since the mid-1980s. Producers can now more often produce for stock without bearing the risk of changing consumer tastes (Sandee and others, 1998, p. 4). The export industry benefited from the improvement of the provincial harbor in Semarang, which facilitated door-to-door container transports, from improved credit facilities, and from greater participation of foreign traders and producers in the industry. A major breakthrough was participation in a trade fair in Bali in 1989.

Jakarta-based furniture producers used to buy Jepara’s furniture. They have gradually been replaced by professional intermediaries who place large orders for sale in the west. A few foreign companies have taken up production in the cluster to better control quality. Most foreigners are active as partners of Indonesians, and this partnership permits a legal way to get around tax problems that frustrate foreign firms. The top 10 firms control 50 percent of exports, so this segment is much more concentrated than the domestic one. Foreigners may account for as much as 25 percent of exports. The industry is known for its rapid and successful imitation of product lines that are popular in the west. Jepara’s exports are aimed at the low-income segment of the markets in the countries to which they go, and competition is rising from China, Vietnam, and Cambodia.

Small firms are mainly subcontractors. They get advance payments to finance production. There are now multi-layered subcontracting relationships in the cluster, and it has large numbers of mobile skilled craftsmen who offer services to the highest bidder and have in recent years been overwhelmingly employed by joint ventures or foreign firms that offer

the highest wages. Over 1989–1996, when the number of enterprises went up by 3.5 times or so, average size jumped from 12.4 to 15 workers. Registered foreigners rose from 20 to 154, and others are unregistered. Value per cubic meter almost doubled, indicating an increase in average quality.

Regional and local government agencies have created an increasingly enabling environment through various infrastructure projects, harbor improvements, and one-stop facilities to curtail bureaucratic delays. The regional government has promoted participation of producers in trade fairs, especially helpful to exports. A specific academy has been created where technical and management training is provided. Basic technical skills and general lessons on the regional furniture industry have been introduced into the primary curriculum.²⁹ Government agencies and NGOs have played a limited role in providing technical assistance to the industry, and most of the technical assistance has come from private channels.

Appendix 2. The case of Bali’s exports

Bali has several export industries based on strategic business alliances, including garments, silver jewelry, wood carving, quilting, leather products, bamboo furniture, ceramics, stone carving, and textiles (Cole, 1998, p. 257). All of the export industries compete internationally on the basis of highly flexible small-batch production, quick turnaround times, and a capacity for rapid adjustment to new designs. The ability to develop new designs and methods that have no roots in traditional Balinese culture shows in every case.

A number of positive social characteristics are of special interest. (1) Most production is based on thousands of rural village work groups and small/micro enterprises networked through small and medium scale assembly/finishing firms. (2) There has been a rapid growth of indigenous entrepreneurship, especially in the assembly/finishing firms. (3) Capital for expansion is largely self-financed through retained earnings, while until the 1990s working capital was largely covered by down-payments from foreign buyers. (4) There have been no specific government subsidies or protection; that is, the successes were neither planned nor anticipated by government. With the provincial government focusing on agriculture and tourism, the initial stages of this development went all but unnoticed by the state (Cole, 1998, p. 258).³⁰

Garments are a typical case, including the fact that there are no roots in local indigenous craft production. Production activity started around 1975 and hit a peak at around US\$160–185 million around 1994. The success was built on simple foot-treadle sewing machines and part-time seasonal rural village labor.

It was necessary to compete for quotas with larger Indonesian producers with advanced technologies and based in the main centers. There was a sharp rise in unit values from \$1 around 1982 to \$3 per kilogram around 1986, reflecting rapid quality and design improvements. Achieving this in a context where there were many new entrants each year constituted an impressive performance.

Initial conditions appeared far from propitious. Labor was cheap, but the Balinese were averse to factory work (they still are) and had no garment-making skills. Labor laws made it

difficult to employ more than 40–50 workers on one site (Cole, 1998, p. 262). There was no modern management, no experience in international markets, capital was scarce, and there were few paved roads and little running water or electricity. One important plus was the new international airport.

Nearly all the experts were convinced that not only did Bali have no future in manufacturing, but also that encouragement of anything other than traditional crafts would destroy the island's cultural heritage and thus undermine the sustainability of tourism. It did have a handful of "Balinized Chinese" with experience in the tourist retail trade, a group of low-budget tourists living for extended periods in Bali, the nearby airport, and an untapped market for cheap beach wear in Australia. The situation had a fair amount in common with the Jepara case, though of course the latter was built on skills.

Old Javanese sarongs and embroidered *kebaya* (traditional blouses) were popular with tourists. Some retailers started collecting these used items and then began producing low quality facsimiles in small traditional tailor shops. Foreign buyers induced an expansion of output by down payments, gifts of machines, etc. Then the Australian entrepreneurs and their local counterparts copied new-wave designs. Quality control was still minimal. The mushrooming demand led to a putting-out system, which evolved into a set of full-scale subcontracting networks. Skilled tailors were in short supply, and many of the new recruits were young women who would return to their villages after a stint. Producers enticed these women to continue to work in their villages and provided machines. Clusters of workers grew up around these trained women. The local representative of the ministry of trade played an important role in streamlining the processing of small-batch exports. What took 5–7 days in Surabaya took just 24 hours here. And the governor of Bali decided, on the advice of this representative, not to close down the Australian entrepreneurs after getting complaints that they were illegally engaging in business. This gave a degree of freedom to operate, unheard of at that time elsewhere in Indonesia.

Over time the foreigners moved out of day-to-day involvement and into more purely managerial roles. Returns for the dozen or so mainly foreign entrepreneurs who innovated were enormous, but they took much risk and suffered severely in the 1980 recession (they were unaware of business cycles) while trying to shield their local producers from its effects. The rather shocked local producers were still heavily dependent on individual alliances with foreigners for production assistance and access to foreign markets. But they were ready for a new set of foreign buyers with a more sophisticated set of business, production, and design skills. Many of these were American tourists looking for entrepreneurial opportunities.

Higher value designs required much precisely targeted consultation tailored to a firm's needs. These new "buyer-consultants" were willing to work for months with the producer firms, attracted by high returns and the pleasant setting of Bali, though there were high risks because before any sales could be closed the full up-front costs had to be borne. Few foreigners had more than a couple of good years in a row before a bad one or a collapse, while the producers could steadily improve their scale and production efficiencies with minimal risks.

Despite the heavy involvement of the buyers, rejection

rates at the last stage were still in the 20–30 percent range, tolerable because the rejects could be dumped on the local market.³¹ When a firm's skills outgrew the first buyer-consultant it often moved up to a higher value one. Many innovative designs and techniques were pioneered during this period. New buyer-consultants with higher valued designs poured in as the reputation improved.

"Knocking off" the design innovations of competitors became a serious problem. Among the various responses to this problem was the use of distant work groups to help keep the new design a secret. By the mid-1980s the ability to handle dispersed production made it possible to move into East Java with its virtually unlimited labor supply. This dispersion improved the income distribution implications of the industry. As the Chinese entrepreneurs relied more on the putting-out system, they had to depend on go-betweens, middle managers who were almost always *pribumis*. When orders exceeded demand, rather than go to a competitor the firm would typically pass orders to these intermediaries, and sometimes the buyer-consultant would offer to help them to set up their own manufacturing operations. As a result the share of value-added generated by *pribumi* entrepreneurs rose from almost nothing in 1977 to nearly 50 percent in 1987.

A group of linked industries eventually took off as well, with the foreign buyers again involved in advising (Cole, 1998, p. 267). The packer-shippers were one such important industry. They were expert at cutting through the Indonesian bureaucracy and eventually the thorny problem of U.S. and European import restrictions.

Around the mid-1980s the first expansion phase petered out, and a different growth process took its place. The returns to buyer consultants, which had apparently been quite high, were squeezed at this time (Cole, 1998, p. 270). The immediate cause of the exit of many American buyer-consultants in 1985 was the new set of immigration officials and the bribes they sought. Though these officials were transferred the next year, considerable damage had been done. Possibly material quality problems also started to limit this growth process. The large textile producers in Bandung and Jakarta responded poorly to the needs of the Bali exporting sector. Their greater attention to the needs of the large Java garment exporters led to some spill-over benefits in the form of a greater variety and better quality of textiles. The Bali industry had some access to imports, though this was limited by tariffs and the nonoperability of the duty-drawback system for small firms: high bureaucratic costs, delayed and short-changed refunds, and lack of public knowledge about it.

With no more exciting new designs paving the way, the retail prices of Bali items in importing countries began to fall, but order volumes were increasing and discount retailers were in the act (Cole, 1998, p. 272). Quality control now eroded, and the Bali garments acquired a reputation for poor quality. Large buyers began to insist on release of letters of credit payments on arrival and inspection in the importing country rather than at point of shipment as before. Several Bali-based producers tried to shift to large factory production to control quality decline and address bigger orders. But this did not lead to a new cycle of rising unit values, probably because of the increase in unit costs related to more expensive machinery, capital investment in construction, and a permanent labor force

that could not be laid off seasonally. The shift toward a larger batch low information limited service industry was reflected in the fact that by the early 1990s Bali was increasingly in competition with other low wage countries (China, Vietnam, and the Philippines) and large factory producers in Indonesia. Whether the dispersed production system would allow another wave of innovation as the base for a new growth phase is unclear. The experience of Italy seems to demonstrate that it is not a total obstacle.

Another dynamic cluster has been the coppersmiths in Desa Tumang, where firms with more than 50 workers co-exist with numerous household enterprises (Sandee and Rietveld, 2000). The firms with more than 50 workers use faxes to communicate with national and international customers and call on the household enterprises when orders exceed their capacity. The household enterprises produce basic utensils for sale at local markets (i.e., a different market segment from the large ones). Though operating in different market segments, their simultaneous presence leads to efficiency gains. But the majority of clusters here are dormant or embryonic, located in rural areas, producing items for poor rural consumers. There is virtually no paid labor and few synergies because most operate independently. Sometimes firms cluster for proximity to a resource or to cut transaction costs of buyers, though most of these items are not of much interest to urban traders.³²

Appendix 3. Cluster development program in Indonesia

A survey undertaken by Sandee and others (1994) to assess the effectiveness of the cluster development program found that assistance is relevant and helpful in the case of dynamic clusters. Such clusters evince a demand for technical and also financial assistance to accommodate growth processes that have been put on track by producers and buyers. Thus traders frequently requested that producers in a woven cloth cluster shift to new designs in high demand. Such sales prospects stimulated producers to participate in training courses organized by the cluster development program of the ministry.

Such successes notwithstanding, the reviews by Sandee and others (1994) and Sandee (1998) found that the cluster development program was not effective in bringing about technological change in the majority of clusters in Indonesia. This majority can be labeled "dormant" or "embryonic" and are located in rural areas and produce basic products for poor local consumers but of little interest to urban traders. These clusters consist of so-called cottage enterprises, where the average number of workers per enterprise does not exceed five, and paid workers are virtually absent. The clusters are "pockets of poverty" with limited collaboration among firms. Current assistance programs, which consist of supply-side measures, are not effective in promoting small enterprise development in embryonic clusters. Interestingly, these clusters are presently very much the focal point of broadened assistance programs in Indonesia that aim at poverty alleviation. Poor rural industry clusters are considered effective entry points for new programs.

Available evidence suggests, however, that broadening

supply-side measures have not been very effective in fostering small enterprise development. There is a need to develop strategies that aim at linking producers in dormant or embryonic clusters to markets. Visits to buyers, retailers and wholesalers, and markets and fairs may be useful to establish new trade networks that are outlets for new products.

The experience in Indonesia of one of the authors (Sandee) points to the importance of increasing the mobility of producers in dormant clusters. Purchasing a car with limited funds allows producers from several clusters to become aware of new business opportunities elsewhere. Such insights may significantly increase the impact of technical and financial assistance to be provided after producers are aware of the existence and convinced of the accessibility of more rewarding trade networks.

A major challenge for advocates of the introduction of business development services in Indonesia will be the design and provision of sustainable services to these dormant clusters. The clusters are the centre of the state's *pembinaan* strategy and the core of the people's economy. Government assistance will be there for years to come, and it is highly relevant to assess whether it is possible to render it more effective.

Notes

¹ Based on adjusted population census figures for 1971 (World Bank, 1980, p. 122) and data from ILO (1997, p. 126) for 1996.

² Judging from the distribution of employment in the medium and large establishments as reported for example by Steel (1993).

³ Berry and Mazumdar (1991, p. 49) report a household share of 11 percent for 1986 and 6.8 percent for the small category (5–19 workers).

⁴ Based on an estimate of a bit over 80 percent from plants of 20 workers and up and the 1985 breakdown by size among plants in that range provided by Hill (1997, p. 71).

⁵ The labor productivity per man day gap of nearly 5:1, according to some estimates, between workers in plants of five to nine workers and household workers must be interpreted with care, however. Possibly days worked are misleading for this group. But the data leave little doubt that the gap is big.

⁶ Employment growth estimates are approximations, given the problems involved in measuring employment in the cottage sector. Here we use the 5.6 percent per year estimate reported by Hill (1997, p. 48) for the intercensal period 1975–1986 and the census numbers themselves to estimate the growth over 1986–1996 (Table I).

⁷ Nothing can yet be said about productivity on the basis of the 1996 census since no value added figures have been published at time of writing.

⁸ The average number of workers per establishment increased only very marginally from 3.4 to 3.6 workers. Unless the average number of workers fell in one or both of the household and the small categories, it must have fallen in the large/medium category, from 134 in 1986 to just 111 in 1996. There are some arguments to suggest that average size would have fallen in each category rather than only in the large/medium one, since employment was growing very fast

so there must have been a great number of new firms. By using the census figures on firms without legal entity, we can see that the average for those with less than five workers was 1.95. We would expect that the inclusion of the few very small firms with legal entity would increase this figure very marginally, perhaps to as much as 2. Thus a very low number here does not seem possible and 2 seems in the appropriate range. The 1986 figure was also 1.95 (Table I). By using also the same average for the 5–19 establishments leaves us with the conclusion that the average size of those with 20 workers and up fell considerably over this decade, from about 134 to about 116. Assuming the same average of 40 for the 20–99 category (a guess in both years) the average of the 100 and up category would fall from 459 in 1986 to just 375 in 1996. If the average of the 20–99 category had fallen to 35 by 1996 (which seems extreme), then the top category would still have fallen to 392. Note that this contrasts with what one would have expected on the basis of Steel's (1993) estimates for the first part of this period, more precisely for 1985–1990, during which period he believed that this category (5–99 workers) was the slowest growing. Possibly the early 1990s were very different from the late 1980s, or possibly his estimates were off base for the latter period. He interprets his high estimate of growth in household sector employment as related in part to a structural shift from rural self-employment to urban wage employment, which drives the increasing share of manufacturing employment which is paid, noting that the substantial growth of household employment is contrary to speculation that it is in decline.

⁹ Note that Hill's estimate of total employment in 1986 was 6.11 million, contrasted with the census figure of 5.29 million. If the upward adjustment based on the population census figures for 1996 is smaller than in 1986, then the growth rate will have been less than the 6.6 percent just cited.

¹⁰ Given the high turnover and the pattern of change at the firm level among SMEs, any static comparisons among such firms or between them and other groups such as micro-enterprise and large enterprise must be interpreted with caution. It is to be expected that there will be a wide range of productivity and efficiency levels among SMEs in most industries at most points of time. Some are recently created and are still operating at modest efficiency levels. Some will never succeed and will soon exit. Others are very efficient and may be growing fast as a result. In industries where most firms are either small or medium at creation, comparisons of average efficiency between the SME sector and the large enterprise sector must be interpreted with great care.

¹¹ Steel (1993, p. 18) also provides upward and downward graduation rates of firms over 10 years by size at creation. These reveal significant movement in both directions. For most size categories the likelihood of graduating upward is not too different from that of moving to a lower category, except for the top one, which by definition has only downward movement. These figures alone do not permit any assessment of whether the "representative" establishment shrinks or grows. They probably tend to understate the net upward movement.

¹² Unpublished data from the surveys.

¹³ Whether this is also true for TFP is much harder to say.

¹⁴ All statistical results from this study are based on firms'

responses to a questionnaire designed to elicit their views on the relative importance of various sources of technological capability.

¹⁵ In both cases the rapid growth of output and exports from Indonesia has been the result of market interventions. Prior to the mid-1980s raw rattan was exported to Taiwan and the Philippines, the main rattan furniture producers. The take-off in Indonesia followed the banning of such exports. In the case of garments the fact that neighboring countries had fulfilled their quotas under the Multifibre Agreement and were suffering rising wages made Indonesia an interesting supply platform.

¹⁶ An Indonesian plan referred to in Section 6.

¹⁷ Collective sources of technological advance are more important in other countries that have dealt successfully with the institutional challenges to making them effective.

¹⁸ This view is consistent with the results reported by Sjöholm (1999), though his results are not by themselves persuasive given the methodological limitations of the study.

¹⁹ Note that subcontracting and clustering are not mutually exclusive; a good deal of the former can go on in the context of the latter. We separate them in the discussion here partly because they are different phenomena and partly because the literature tends to focus on one or the other.

²⁰ There appears to be a considerable gap in gross output between cottage enterprises in clusters and those not so located (70 percent overall), especially in textiles. However, the differential varies widely by industry (it is negative in a couple of cases) and could be due to differences in average number of workers or in the products produced as well as to productivity gains associated with clustering (Klapwijk, 1997, pp. 61–62). The data are not comparable between rural industrial clusters (RICs) and all cottage industry, since RICs sometimes include large enterprises in the cluster. Still, the low average establishment sizes suggest that the bulk of workers are in quite small establishments.

²¹ Klapwijk (1997) defines RIC as having at least five industrial enterprises, producing similar goods and located in a rural area or small town, with the enterprise average size under five workers. This contrasts with the use of the term to refer to the shift of large and medium industry from urban to rural settings, based in part on the thinking of the International Labor Office about rural industrialization in developed countries.

²² As several authors have pointed out, traders may be so dominant that individual producers do not have much to say about the process (Cawthorne, 1995; Knorringa, 1996).

²³ Susenas data report a smaller decline in manufacturing employment but we are not in a position to assess the comparability of the figures used.

²⁴ At time of writing we did not have data on structure of employment by sector. Total manufacturing employment was recorded at 377,959 (1995), 376,048 (1997), and 373,158 (1998) persons, respectively. As the number of observed households went up slightly throughout the period 1995–1998, this may indicate that manufacturing employment in Indonesia has actually declined since the outbreak of the crisis.

²⁵ It may be that these survey findings covering 1997–1998 are still too early and that more substantial shifts will be visible only in later years.

²⁶ As expected, financing has become more difficult than before, with a sharp decrease in loans from outside parties. Suppliers have stopped giving a grace period. The average loans outstanding for these firms have fallen from Rp. 65M before the crisis to 26.5M as of March 1998, as previous loans are repaid and no new ones are available; 36 percent of respondents have been late with an instalment. Before the crisis the ratio of collateral to loan averaged 100–200 percent; now it is over 200 percent.

²⁷ See Tambunan (1999).

²⁸ The Ministry of Industry's definition of small enterprise, which includes about 95 percent of all enterprises, involves ownership by an Indonesian and a total asset value not exceeding Rp 600M, excluding land and buildings. This contrasts with the Central Statistical Office's definition of 5–19 workers for small and under five workers for cottage. Many firms with up to 100 workers and some with more do not exceed the Ministry's capital limit (Sandee and Rietveld 2000).

²⁹ Hill (personal communication), however, questions whether the state monopoly on wood supply has been favorable for a sustainable exploitation of forests; rather, he suspects that serious problems of input supply may be just around the corner. The constant harassment of foreigners in the cluster by the authorities may also redound negatively even to the welfare of Indonesians.

³⁰ When, in the mid-1980s, the Ministry of Industry provided some sporadic assistance in the form of worker training, the impact was negligible because the total effort was small relative to the size of the industry by that time. In any case, it did not address the real challenge, which was new flows of high quality information.

³¹ Whereas the lower quality Jepura furniture is sold in the domestic market, the Bali garment rejects tend to go to the tourist market.

³² On the limited efficiency gains, see Nadvi and Schmitz (1994) and Weijland (1994).

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