4. Explaining Enterprise Size and its Distribution

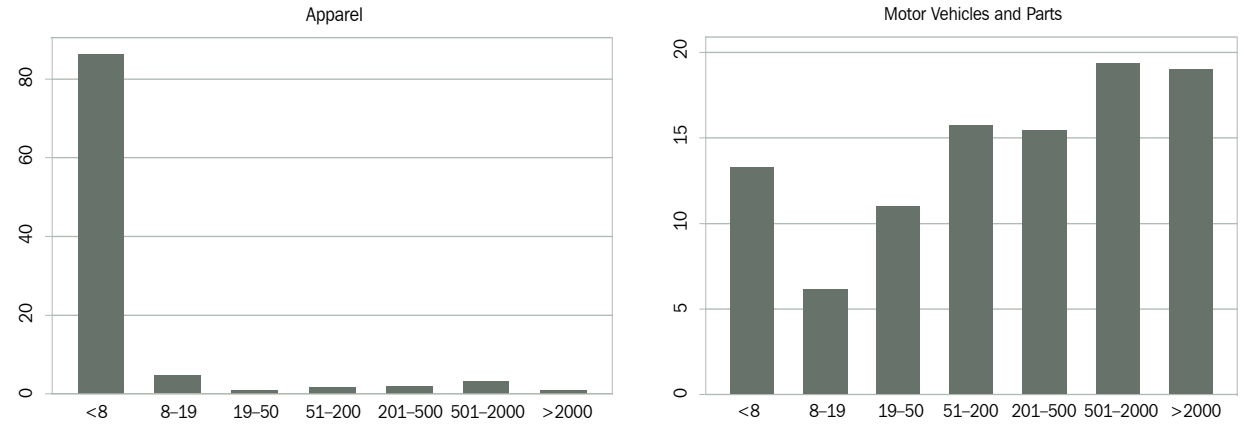
The foregoing discussion indicates that a large amount of nonagricultural employment in many developing Asian economies takes place in the context of small enterprises operating with low productivity and generating relatively low incomes for their owners and workers (especially when we include microenterprises). For purposes of public policy, two related questions are particularly relevant. First, is something keeping small enterprises from becoming larger? Second, how can smaller enterprises become more productive?

An examination of the factors that can explain enterprise size and its distribution are helpful in providing answers to both questions. There is considerable literature, theoretical and empirical, that deals with these factors.[29] We briefly go over some of it, paying special attention to those factors that pertain not only to the relative importance of SMEs in the overall distribution, but also the existence of a missing middle in some economies.

Production technology and industrial composition. Technology used in production is an important driver of enterprise size. To the extent that technology in a given industry is characterized by economies of scale—that is, the average cost of producing each unit of product falls as total output increases—we can expect larger plants and enterprises (as discussed in Box 3.4 previously). In general, the more capital (machines) required in a production process, the greater will be the scope for reaping scale economies and thus the larger the optimum size of enterprises. For example, automobile production requires far more capital per unit of labor than apparel production, and economies of scale are very important to the production process. As a result, the typical automobile plant will be much larger than an apparel plant. This can be seen quite clearly in Figure 4.1, which contrasts the distribution of employment across enterprise size groups in apparel and motor vehicles and parts in India. While there is a mass of employment in very small enterprises in apparel, the situation is very different in motor vehicles. Since total employment in apparel is over 12 times that in motor vehicles and parts (5 million versus 430,000 workers in 2005), this will certainly exert a natural influence on the distribution of employment across size groups in manufacturing as a whole.

Of course, the relationship between production technology and the optimum size of enterprises can be quite complex and one that has changed over time. Box 4.1 describes this in more detail. (Moreover, other factors matter, such as the nature and evolution of transaction costs, as will be made clearer below.)

Figure 4.1 **Distribution of Employment by Enterprise Size-Groups: Apparel vs. Motor Vehicles and Parts (%)**



Note: Enterprise size is measured in terms of number of workers.
Source: As in Box Table 3.1.1.

It is possible to use fairly different technologies in the production of broadly similar products. Thus, while apparel can be manufactured in small establishments where one or a few tailors work on basic sewing machines, production can also occur in large establishments using sophisticated machines (for example, machines for spreading and cutting cloth). Figure 4.2 allows a comparison of the distribution of employment across size groups in the PRC and India

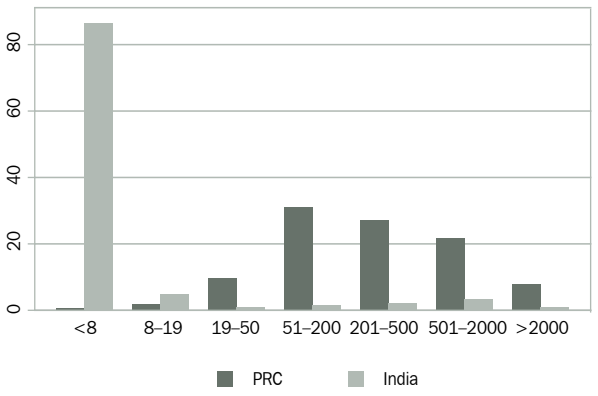
29 See, for example, the detailed survey of manufacturing firms in developing countries by Tybout (2000) in the Journal of Economic Literature. As regards the theoretical literature, an important contribution to neoclassical explanations of enterprise size is that of Lucas (1978), which relies on a differential distribution of entrepreneurial ability across the working population to explain the coexistence of small and large firms in the absence of market failures.

Box 4.1 **Production Technology and Optimum Plant Size**

Optimum plant size, which allows maximum exploitation of scale economies, has clearly increased with the development of mechanized techniques of production. But several developments in recent decades have gone against this trend. First, while optimum plant size continues to be large in heavy industries, and durables such as automobiles, newer industries based on information technology can have smaller optimum size as far as production technologies are concerned. Secondly, it is increasingly understood that the very large optimum size observed in some periods of manufacturing development in today's industrialized countries has been the result of the conscious choice of the production process rather than inherent in the production of the items concerned. In particular, the development of "Fordist" industries of mass production had large optimum size because they were based on "batch processes" employed in the organization of the factory. An argument advanced more frequently in the last few years is that small firms are better able to adapt to changing—and sometimes disruptive—economic circumstances. The 1970s and 1980s produced several shocks demanding a flexible response from industrial firms. According to some authors, traditional mass production units have been less successful in this regard than small establishments based on a modern version of the craft principle that "flexible tasks and machines augment the craftman's skills and ability to produce ever more varied products" (Schmitz 1982:4). The most influential work embodying these ideas is Piore and Sabel (1984). Their paradigm of successful "flexible adjustment" comes from the recent appearance in Italy, Germany, and Japan of a new type of industrial unit: flexible, small, and better able to respond to the challenges of the last two decades than the giant plants of the older industrialized countries, such as the United States.

Source: Mazumdar (1998).

Figure 4.2 **Distribution of Employment by Enterprise Size-Groups in Apparel: India and PRC (%)**



PRC = People's Republic of China
Source: As in Box Table 3.1.1.

for apparel products. Large enterprises account for much more of total employment in apparel in the PRC than in India.[30]

In summary, the size distribution of enterprises in an economy will depend to some extent on the industrial composition of the economy. Since lower income countries will tend to have a composition dominated by simpler to produce products like apparel and footwear, metal products, and furniture—low incomes on average will mean greater demand for these types of products—we can expect a tendency for a concentration of small enterprises in these countries. But the effects of broad industrial composition should not be exaggerated. This is because, we find, the size distribution within the same industry also shows significant variations by country and generally follows the pattern of the aggregate distribution (as in the case of apparel products across India and the PRC described above).

Product market segmentation. To the extent that differences in technology used drive the different distributions of enterprise size, the crucial question is what explains the diversity of technology used *within* countries. Product market segmentation is part of the story behind the co-existence of small and large firms. The larger the proportion of low-income consumers in a country, the greater will be the demand not only for simple items (for example, bicycles rather than cars), but also for relatively low-quality versions of products purchased by both high and low-income consumers (such as soap). The tighter the technology-size-quality relationship, the greater will be the economic distance between small firms producing low quality products with low technology and the larger firms using more advanced technology.

Infrastructure. Poor infrastructure reinforces the effects of product market segmentation. In particular, an underdeveloped transportation network means that there can exist many pockets of small and localized demand, especially in rural areas, which are satisfied by small-scale local production. Moreover, without (reliable) electricity it is hard to see how these enterprises can use anything close to modern methods of production.

Infrastructure deficiencies probably take their biggest toll on enterprises in South Asia. Based on the new round of WBES data (surveys carried out between 2003–2006),

30 A question that arises is why firms of different sizes seem to coexist in the same broad product line. One reason is to be found in the diversity in quality of the product. While there are certainly exceptions, it is generally the case that higher-quality products require greater mechanization and more tasks. Accordingly, the optimal size of the enterprise increases.

problems with electricity are the most commonly identified "major or severe" constraint on the operation and growth of firms in four out of 20 economies for which data is available. Of these, three are from South Asia, Bangladesh, India, and Sri Lanka, the fourth from Lao PDR.

Objective indicators, as opposed to perceptions of enterprise managers, also indicate that poor infrastructure takes a toll on enterprise growth (and therefore influences firm size). South Asian enterprises, for example, experience more days per year of power outages than in East Asia, as seen in Table 4.1. Even the cost of power in South Asia constrains firms, at $0.16 per kilowatt hour, nearly twice East Asia's $0.09 per kilowatt hour.

Table 4.1 **Power Outages**

East and Southeast Asia		
	Average Number of Days (in the past year)	**Average Number of Hours (duration)**
small	6.17	4.31
medium	6.72	4.57
large	6.48	4.17
South Asia		
	Average Number of Days (in the past year)	**Average Number of Hours (duration)**
small	109.80	4.57
medium	146.21	7.80
large	179.15	4.61

Notes: East and Southeast Asia includes Cambodia, People's Republic of China, Indonesia, Republic of Korea, Lao People's Democratic Republic, Malaysia, Philippines, Thailand, and Viet Nam; South Asia includes: Bangladesh, India, Pakistan, and Sri Lanka.
Source: Authors' using World Bank Enterprise Survey (WBES) database.

While large firms (200 or more workers), appear to experience more days without publicly provided power, they are better able to protect themselves with private generators. The survey results show that 88% of large enterprises in South Asia own or share a generator, compared with only 39% of small firms.

Credit constraints. Credit constraints are potentially one of the most important factors influencing firm size. In particular, they can be especially pernicious in reinforcing the effects of other constraints on firm size and growth. For example, the lack of finance can prolong the use of outdated technology, thereby trapping an entrepreneur in the production of a low-quality product and restricting his or her market to the low-end segment. Moreover, they may be especially important in explaining the missing-middle size distribution. This is because credit constraints are likely to be particularly binding for small and even medium-sized enterprises—groups that do not have sufficient resources of their own to fund their projects, nor the collateral to access bank credit. Given the importance of credit constraints, especially for small and medium-sized enterprises, we discuss this issue in much greater detail later in this chapter.

Coordination failures and learning-related externalities. As noted above, part of the reason for a size distribution characterized by many small firms has to do with industrial composition. In particular, the greater the importance of traditional products in total production, the more prevalent will be employment in small enterprises. As economies develop, they diversify into the production of new goods and services, which will often require larger enterprises than would the production of traditional products. In the context of this process, factors such as coordination failures and learning externalities can impede the process of diversification, or structural transformation. Coordination failures take place when the return to one investment depends on whether or not another has been made. The effects of poor quality infrastructure noted above, in fact, are one special case of a coordination failure. But there can be many others—something discussed in more detail later in this chapter. Learning externalities—which emerge due to the non-rival and non-excludable nature of much knowledge—can affect firm size through their tendency to lead to under investment in the generation of knowledge. This may take place through many different channels. For example, enterprises may decide not to invest in training workers because competitors may simply poach them: this may lead to under investment in training and keep firms from adopting more modern technologies and expanding. Hausmann and Rodrik (2003) stress a related but different mechanism: in moving away from the production of traditional goods, firms need to invest to learn which of the possible new goods and services would be most profitable in their local contexts. The problem is that once a "first mover" has made the requisite investments and zeroed in on a particularly profitable product line, others can join in without incurring the initial learning costs. Once again, the move from traditional to modern products can be stymied. Box 4.2 describes some consequences of the difficulties associated with learning what one is good at producing.

Transactions costs. The relevance of transactions costs—costs that arise during an economic change—to firm size is their influence on decisions about whether to carry out a set of tasks within the firm or to rely on the market. For example, should a manufacturer of cars also produce the brakes for its cars, or can it instead enter into an agreement with a manufacturer of car brakes to supply them? The decision will clearly have a bearing on the size of the firm. Indeed, the importance of large firms in Korean industry, employment, and exports relative to Taipei,China in the 1970s and 1980s has been attributed in part to the higher costs of market transactions in Korea compared to Taipei,China (Levy 1991). Box 4.3 describes Levy's detailed analysis of the size structure of the footwear industry in Korea and Taipei,China and his conclusion

Box 4.2 **Why Incentives for Self-Discovery Can Be Weak**

Inadequate incentives to invest in learning can be one reason firms fail to diversify into new, nontraditional activities. In their recent paper, Hausmann and Rodrik (2003) begin by noting the considerable uncertainty about the costs of operations associated with new activities. For example, while an entrepreneur in Bangladesh contemplating a new activity knows his or her comparative advantage would most probably lie in labor-intensive manufacturing, it is by no means immediately apparent which of thousands of potential products holds promise. This uncertainty is simply a reflection of the difficulty in mastering production of new goods or mastering more efficient production processes. As Box 7.2 suggests, gaining mastery can be a costly exercise.

Nevertheless, once a pioneering firm has mastered production of a new product or production process, domestic imitation is likely. Case studies indicate that the turnover of skilled workers and/or managers at the pioneering firm is probably one of the most important channels through which this happens.

To the extent that the diffusion of the relevant information does take place, the extra normal profits of the pioneering firm will be bid away. If this happens rapidly—as when diffusion is easy—the incentives to gain mastery over the new activity are diminished right from the start. In the language of economics, the pioneering firm generates an informational externality for which it is not compensated. In this way, incentives to invest in learning may be dampened. Thus, low-income countries may be producing too few high-productivity goods, and incomes are lower than otherwise. In this setting, policies that encourage entrepreneurship and investment in new activities ex-ante, but push out unproductive firms and sectors ex-post, may be able to foster industrial growth and transformation.

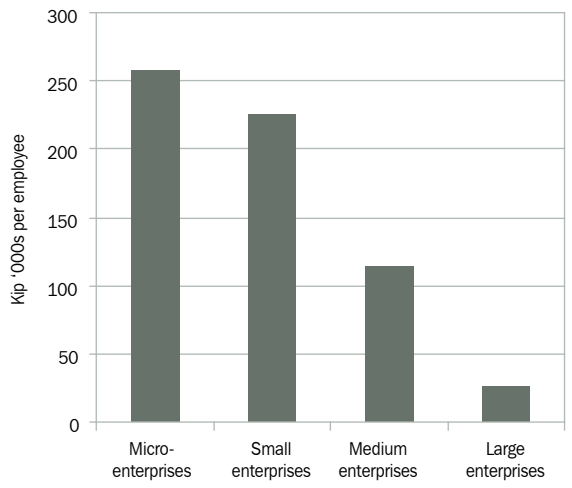
Source: Hausmann and Rodrik (2003).

that different transaction costs in the two economies in the 1970s seem to best explain why Korean footwear producers tended to be much larger than their counterparts in Taipei,China.

Regulations and economic policies. There are various ways, direct and indirect, in which business regulations and economic policies more generally can influence enterprise size and its distribution. To begin with, a number of regulations apply to enterprises beyond a certain threshold size. For example, many aspects of the labor code kick in once employment is above some preset level. Similarly, in many cases enterprises below a certain size are either exempt from paying tax or are in effect outside the purview of the tax system. In these cases, small enterprises may face incentives to remain small at the margin.

On the other hand, certain aspects of regulation may represent an extra burden for smaller enterprises as compared to larger enterprises because of their limited human and financial resources in complying with regulations (especially having a smaller revenue base over which to spread costs of compliance). This can be seen quite clearly in the ADB (2009c) study on Lao PDR, which notes that the burden of business regulatory costs falls disproportionately on small enterprises (Figure 4.3). On an employee basis, business compliance costs are much higher in smaller firms than medium and large-sized firms. This arises because of a fixed cost component in business compliance costs. The corresponding compliance cost per employee increased from Kip (KN) 27,214 for enterprises with 10 or more employees to KN 225,338 for enterprises with 4 to 10 workers and KN 258,442 for enterprises with employees between 1 and 4. This burden becomes a barrier to the formalization and growth of small enterprises.

Figure 4.3 **Business Compliance Costs ***



Notes: * Compliance costs per employee of the three main types of permission required: enterprise registration, operational permission and tax certificate. Microenterprises defined as businesses with number of employees between 1 and 4; small firms with number of employees between 5 and 9; medium-sized firms with number of employees between 10 and 99 and large firms with number of employees 100 or more.

Source: ADB (2009c).

Significantly, the *quality* of the legal system—in terms of the administration of justice and enforcement of legal verdicts—can also matter since, at a practical level, regulations matter most when they are administered and enforced. For example, a recent study from Mexico using data on the distribution of enterprise size finds that Mexican states with more effective legal systems have larger firms (Laeven and Woodruff 2008). Moreover, this result is particularly important for proprietorships, where risk is concentrated on a single owner, as opposed to corporations.

Box 4.3 **Transaction Costs and the Size of Firms: Evidence from the Republic of Korea and Taipei,China**

As is well known from comparisons of the development experience in Republic of Korea (Korea) and Taipei,China, in the 1970s and early 1980s large firms played an more important role in generating jobs in the manufacturing sector and exports in Korea. This is certainly true for the footwear industry, as may be seen from Box Figure 4.3.1, which contrasts the share of value added accounted for by enterprises/establishments of different size. The differences in size structure seem to have translated into a number of other differences as well, including a greater propensity for entrepreneurs in Taipei,China to set up new firms, engage much more often in subcontracting, produce a broader mix of footwear products, and rely more often on independent export traders.

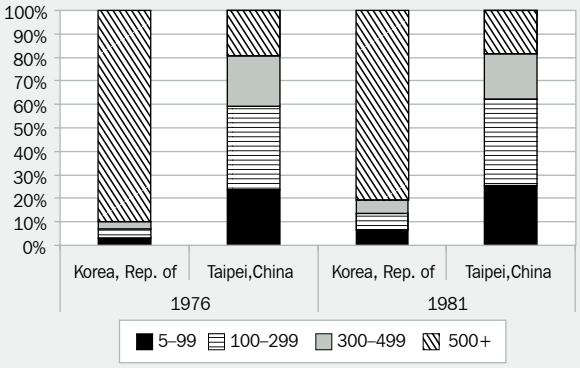
What explains the different role of large and small firms across these two economies? Since the footwear industry was very export-oriented in both cases—in 1984 90% of total footwear production was exported in Taipei,China, and around 70% in Korea—product market segmentation cannot be the explanation. Levy (1991) also rules out economies of scale associated with different product mixes. For example, he notes that the production techniques used in footwear "lasting" across the two economies relied on assembly lines where efficiency gains through greater division of labor were pretty much exhausted once around 50 workers worked on a single line. Levy also notes that while Korea's industrial policies did provide benefits to large firms in industries such as shipbuilding and automobiles, there is no evidence of firms being targeted in the footwear industry.

According to Levy the greater reliance on small firms, subcontracting, and export traders in Taipei,China as compared to Korea, especially in the 1970s to early 1980s, reflects the different relative costs of undertaking market transactions versus hierarchical transactions. (As the relative cost of market transactions in Korea declined over the 1980s, smaller firms became progressively more important.)

Source: Levy (1991).

Levy argues that the reason for these differential relative costs is found in differences in the initial conditions across the two economies as they set out on a path of export-oriented industrialization. In particular, Taipei,China not only had a higher proportion of its economically active population engaged in commerce, it also had deeper roots in trading activities. Taipei,China also seems to have had an approach to governance that was more suspicious of centralized hierarchies. Levy points out that these differences provide a more compelling reason why large-scale hierarchies could operate better in Korea and why market-based transactions would be less costly in Taipei,China. More generally, the Korean experience seems to point to the fact that large firms were promoted as "efficient institutional substitutes for transactionally costly markets".

Box Figure 4.3.1 **Value Added in the Footwear Industry in the Republic of Korea and Taipei,China by Size of Enterprise, 1976 and 1981**



Note: Enterprise size is measured in terms of number of workers.
Source: Levy (1991).

More directly, particular aspects of industrial policy can be important in influencing enterprise size and its distribution. Perhaps the most famous example of this in the literature comes from India's policy, starting in the late-1960s, of "reserving" the production of a variety of industrial products for small enterprises by restricting the expansion of large firms already producing the reserved products and barring the entry of new large producers. The list of items reserved for "small-scale industries" covered 47 products in 1967 and expanded to over 1,045 products by the early 1990s (RGICS 2006). (Since 1997, the policy has undergone significant revision, with a steady decline in the number of reserved products. By October 2008, there were only 21 products reserved for small-scale enterprises.)

While it is obvious such a policy would have implications for the distribution of firm size in an industry, a host of other (less blunt) policies can also influence size distribution. And they can do so in ways which do not compromise as much on efficiency and incentives to grow among small enterprises, as the Indian policy of reservation seems to have done. Box 4.4 describes policies used to encourage small and medium enterprises in Korea. The policy intervention seems to have done a much better job generating dynamism among small enterprises than the Indian policy. For example, Kim and Nugent (1994) carried out a sample survey which showed that most SMEs began with fewer than 50 workers, but many had grown to more than 200 workers, an indication of the high level of success of the support policies (see Mazumdar 2003 for further details). Indeed, an important aspect of the Korean policy differentiating it from the small-scale reservation policy in India, is its emphasis on the *development* rather than the *protection* of small enterprises. Along with neighboring Japan, Korea defined the SME sector as enterprises with less than 300 workers. The support policies encouraged growth of small units within this limit. As our later

discussion on finance and technology-related issues will emphasize, there are clear limits to which very small firms can access finance or adopt new and more productive technologies. By contrast, the Indian policy of reserving certain industrial products for small enterprises defined thresholds in terms of the value of fixed assets in plant and equipment, translating into a far smaller number of workers. For example, using a recent enterprise survey and the corresponding asset limit (10 million rupees in 2000) used to define small-scale enterprises, average employment turns out to be 62 workers per firm.

Summing up, we have covered a number of factors that can influence enterprise size and its distribution. Of course, country context and circumstances will determine which ones are more relevant for any given country. The remainder of this chapter focuses on those factors that are widely believed to be particularly constraining for SMEs in virtually all developing countries and how policy interventions have tried to deal with them in developing Asia.

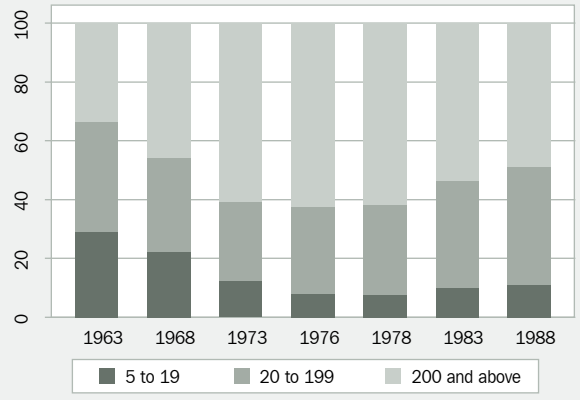
Box 4.4 **Fostering Small Enterprises in the Republic of Korea**

An important example of the direct impact of industrial policy on the size structure of manufacturing comes from two divergent phases of Korean industrialization. In the first phase, prior to the 1980s, Korean industrial policies favored the promotion of large firms. Large firms and conglomerates like the *chaebol* were favored with fiscal, financial, and tariff incentives. The tie-up between industry and banking interests helped the conglomerates enjoy subsidized credit facilities while the tie-up with the government tilted fiscal and trade incentives towards large firms. The result is to be seen in the spectacularly divergent trend in the size structure of manufacturing in Taipei,China and Korea. In the mid-1960s Taipei,China had a larger share of large (500+) units than Korea (35% against 26%). But by 1976 Korea's share of employment in large units had peaked at 45% while the share for Taipei,China was down to 26%. Abe and Kawakami (1997, pg.338) provide evidence to show that the difference in the evolution of the size structure of manufacturing in Taipei,China and Korea had little to do with the export experience of manufacturing in the two economies. Their summary of the evidence is that "both economies represent successful cases of export-oriented industrialization. But the export drive in Korea has been borne mainly by non-SMEs while in Taipei,China it has been carried out by the SMEs."

The Korean policy of favoring large-scale units shifted in the latter half of the 1970s, when the government embarked on a policy of encouraging SMEs—partly in response to a concern for escalating wage costs in large firms. The support schemes for the SMEs came through three major avenues: (i) specialized financial institutions and funds catering to the SMEs; (ii) government-supported venture capital companies that financed technologically based SMEs; and (iii) credit guarantee facilities.

The impact is seen in the dramatic change in size structure (Box Figure 4.4.1). Between 1976 and 1988 the share of employment in establishments employing 200 or more workers had shrunk from a little over 60% to around 50% while establishments with between 20 and 199 workers, especially, expanded their share of employment by more than 10 percentage points. Furthermore, this dramatic change in the size structure was achieved without any dramatic reduction in the productivity differential between small and large firms—which seems to have remained unchanged at around 1:3 (Mazumdar 2003).

Box Figure 4.4.1 **Manufacturing Establishment Size Distribution in the Republic of Korea**



Note: Establishment size is measured in terms of number of workers.
Source: Nugent (1996).

Source: Mazumdar (2003).