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Working Paper

The role of training in fostering cluster-based micro and small enterprises development

WIDER Working Paper, No. 2012/99

Provided in Cooperation with:

United Nations University (UNU), World Institute for Development Economics Research (WIDER)

Suggested Citation: Sonobe, Tetsushi; Otsuka, Keijiro (2012) : The role of training in fostering cluster-based micro and small enterprises development, WIDER Working Paper, No. 2012/99, ISBN 978-92-9230-565-9, The United Nations University World Institute for Development Economics Research (UNU-WIDER), Helsinki

This Version is available at:

<http://hdl.handle.net/10419/80984>

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Economics Research

Working Paper No. 2012/99

The Role of Training in Fostering Cluster-Based Micro and Small Enterprises Development

Tetsushi Sonobe* and Kejiro Otsuka*

November 2012

Abstract

While it has been increasingly recognized that efficient management holds the key to the development of micro and small enterprises in developing countries, we know very little about the managerial capacity of business owners and managers in these countries. In order to explore whether we can nurture managerial capacity, this paper reviews case studies of industrial clusters in Asia and sub-Saharan Africa, including randomized control trials of management training. We found that the management training is effective in many cases, which renders support for the foreign aid policy that pays due attention to enhancement of managerial capacity.

Keywords: managerial capacity, entrepreneurship, innovation, micro and small enterprises, industrial clusters, management training

JEL classification: L25, L26, O14, O31

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This study has been prepared within the UNU-WIDER project 'Foreign Aid: Research and Communication-ReCom', directed by Tony Addison and Finn Tarp.

UNU-WIDER gratefully acknowledges specific programme contributions from the governments of Denmark (Ministry of Foreign Affairs, Danida) and Sweden (Swedish International Development Cooperation Agency—Sida) for ReCom. UNU-WIDER also gratefully acknowledges core financial support to its work programme from the governments of Denmark, Finland, Sweden, and the United Kingdom.

ISSN 1798-7237

ISBN 978-92-9230-565-9

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1 Introduction

It has been increasingly recognized that entrepreneurship holds the key to industrial development in developing countries (World Bank 2012). Indeed, a significant number of studies find that productivity and profitability vary greatly across enterprises, even in the same industry in the same country, and that a large part of the variation can be accounted for by the difference in management practices.¹ In the past, foreign aid and government policies have not paid enough attention to the critical role played by entrepreneurship (e.g., Sievers and Vandenberg 2007). Identifying and supporting high-potential entrepreneurs may be the key to the success of industrial development.

Entrepreneurship is the capacity to introduce new ideas into practice and to manage enterprise operations efficiently. Innovation here does not necessarily mean scientific discovery or engineering invention but the Schumpeterian creation of a new combination of production resources and new ideas to increase profits (Schumpeter 1934). In the context of developing economies, innovation includes borrowing technology or learning from abroad. The first introduction of products and production processes from developed countries into a developing country, and the first adoption of management practices that may be common in developed countries but are novel in developing countries, are considered to be innovations.

Despite its importance, we know little about the entrepreneurship of business owners and managers in developing countries.² Why are firms there less able to innovate and manage than their counterparts in developed countries? How can their entrepreneurship be nurtured? The purpose of this paper is to explore these questions by reviewing our case studies of industrial clusters in Asia and sub-Saharan Africa (SSA). These studies include randomized controlled trials of management training. We highlight cluster-based industrial development because low-income countries should have a comparative advantage in labour-intensive manufacturing industries, which are characterized by the dominance of micro and small enterprises (MSEs) located in industrial clusters.³ In other words, we are interested in cultivating entrepreneurship that will foster cluster-based MSE development since such development will be conducive to reducing poverty and income equality and crucial for inclusive growth.⁴ In Asia and Latin America, there are a large number of industrial clusters.⁵ Clusters are not uncommon in SSA (McCormick 1999; Sonobe et al. 2009, 2011a).

Our basic premise is that learning from abroad, as well as adopting and spreading technology, are essential elements of industrial development. It is easy to assume that technology

¹ See, for example, Bloom and Van Reenen (2007, 2010), Bloom et al. (2010, 2011), Bruhn (2010), and Syverson (2011).

² In this paper we refer to owners or other ultimate decision makers of enterprises as business owners and managers to avoid confusion between entrepreneurs and entrepreneurship. The term entrepreneur is used to denote owners and managers with varying entrepreneurial skills.

³ We define an industrial cluster simply as the localization of firms producing similar and related products (e.g., final products and parts).

⁴ Our approach is consistent with the theoretical proposition of Rodriguez-Clare (2007) that the best industrial policy entails the direct promotion of industrial clusters in the sector in which the country has a comparative advantage.

⁵ As reported by Huang and Bocchi (2008), Long and Zhang (2011), Sonobe and Otsuka (2006), and Schmitz and Nadvi (1999).

transfers will be automatically achieved once a developing country succeeds in attracting foreign direct investments (FDIs), but according to the economics literature that is often not the case. FDI will have little impact on the development of local indigenous industries if local businesses have little capacity to learn from abroad, to assimilate and adopt borrowed technologies. This is why this paper discusses managerial and innovative capacities, and the role of training in improving these capacities.

Altenburg and Meyer-Stamer (1999) find that a number of industrial clusters in Latin America are ‘survival clusters’ producing generally low-quality products and selling them predominantly to domestic markets. Yoshino (2011) finds that most industrial clusters in SSA are also survival clusters, where firms are barely breaking even. Why do these firms fail to innovate? Possibly because of unfavourable business environments, such as bad governance, poor infrastructure, and inadequate financing. Or, they may not possess much entrepreneurship. The former is important but, we believe the latter is crucial. There are cases in which clusters have successfully grown despite unfavourable business climates. This paper explores how that happens. We begin by asking how business owners and managers who are not entrepreneurs dare to start their businesses.

To answer this question, Section 2 describes how cluster-based MSEs in various industries developed in different countries in Asia and Africa. We find that many owners and managers come to feel keenly their lack of managerial and innovative capacities, as their clusters become survival clusters. Section 3 begins by discussing the possible reasons why they cannot improve these skills and what government and foreign aid can do to support training, awareness campaigns, and other efforts to nurture entrepreneurship. We then review the results of management training experiments, including our own, to see whether entrepreneurship can be taught and how management training programmes can be improved in future. Section 4 contains concluding remarks.

2 Managerial and innovative capacities of MSEs

In this section, we use the results of our observational studies to discuss why managerial and innovative capacities are not important initially but assume importance later in the process of industrial development.

Our arguments in this paper are based mainly on our 19 case studies of cluster-based industrial development in Asia and Africa, which are listed in Table 1. Of these case studies, 8 cases (cases 6, 8, 10, 14, 15, 16, 17, and 19) involved experiments, of which 5 experiments (cases 6, 10, 14, 16, and 19) were randomized controlled trials. Discussion of the results of these experiments is deferred to the next section.

2.1 Selection of the cases

We conducted the 19 case studies over nearly 15 years without a long-run study plan specifying which industrial clusters should be studied based on random selection from a list of clusters. This is because they are mostly informal and, hence, there was no list from which we chose study sites. The number of clusters is unknown, especially in SSA. It is likely that SSA has many more clusters and entrepreneurs than governments and researchers recognize.

Most would be survival clusters.⁶ The 19 clusters that we studied are not representative of industrial clusters in Asia and Africa, and they are more likely to be focused on dynamically growing rather than survival clusters. Nonetheless, they cover a variety of MSE clusters in Asia and Africa.

All these clusters have been voluntarily and spontaneously formed by private firms without much assistance from the government, including the four cases in China. Thus, the China case studies are comparable to the others. The studies of four industrial clusters in Japan and Taiwan, China are also comparable because they were developed before these countries became highly industrialized. Table 2 reports the major characteristics of these clusters in terms of the number of firms, average employment size of firms, average schooling years of entrepreneurs, and whether their products were exported. The industrial clusters in SSA (cases 8-10, 15-17, and 19) can be as large as their Asian counterparts in terms of the number of firms within a cluster, but the firms' employment sizes tend to be smaller in SSA.

The clusters in the first group (i.e., cases 1 to 10) were initiated by pioneering businesses that produced imitations of imported goods without any help from the government or foreign firms. The development of the second group of clusters (cases 11 to 17) was based on foreign technologies brought in by FDI, state-owned firms (SOEs), or foreign artisans who migrated from southern Europe and ran home-based businesses.⁷ In the third group (cases 18 and 19), the clusters came into existence thanks to training programmes provided by foreign firms and international organizations. Consistent with the Heckscher-Ohlin theorem, the initial products of these clusters, as shown in the parentheses in the last column, tended to be labour-intensive items. This tendency is clearer in the first group than in the second and third groups (cases 18 and 19).

Indeed in the first group, new industries emerged as main products or activities shifted to take advantage of existing institutions, infrastructures, and technologies.⁸ In Kumasi, Ghana (case 10), for example, metalwork firms, such as lathe turners, welders, and casting foundries, are clustered where thousands of car repair garages are concentrated. These garages need a lot of metal processing services and also provide an abundant supply of scrap metal from disabled cars that cannot be repaired. The metalwork firms provide repair services but also manufacture a variety of metal products, such as corn mill machines, wheelbarrows, and cash safes (see, e.g., Sonobe et al. 2011b). Among tailors in Addis Ababa and Nairobi (cases 8 and 9), those who made money and won the buyers' trust expanded their businesses from tailoring into the factory or workshop production of ready-made garments. In cases 1, 4, 5, 7, 13, and 15, a number of owners and managers started as traders and then diversified their businesses into manufacturing. Such former traders tend to be high-performers, which may reflect the importance of management and marketing skills to manufacturing firms in developing countries.

⁶ We have found that the number of business people operating in our study sites in SSA has not been captured by statistical and tax authorities. We have also found a few clusters in SSA that were not known to researchers.

⁷ Although printed circuit boards (PCBs) are core devices for electronics items and IT equipment, the PCBs produced in the clusters listed in Table 1 in their early days were technologically simple and produced without using expensive machinery.

⁸ This is consistent with the observation of Hidalgo et al. (2007) that countries move through the product space by developing new goods similar to those they currently produce.

2.2 Bangladesh vs. Ethiopia

Firms in survival clusters perform poorly not only because the business environment is unfavourable but also because their own managerial and innovative capacities are inadequate. To see this, compare the garment industries in Bangladesh (case 18 in Tables 1 and 2) and Ethiopia (case 8).⁹ Both are least developed countries and regarded as relatively corrupt.¹⁰ Both attempted to develop their export-oriented garment industries from scratch, but with contrasting outcomes. In Bangladesh, the garment industry now has more than 5,000 manufacturing firms, employs roughly four million workers directly, and ranks among the world's largest producers of garment items as is shown in Figure 1 (Mottaleb and Sonobe 2012). In Ethiopia, the garment industry's export performance has been very poor despite strong government support.

The export-oriented garment production in Bangladesh dates from 1979, when a newly established firm, Desh, entered a technical co-operation agreement with the then leading garment exporter, Daewoo, in Korea (Rhee 1990; Easterly 2002). These firms teamed up because both were sure that the creation of a cadre of professionals would allow the latent comparative advantage of Bangladesh in garment production to materialize. The agreement sent 130 young employees of Desh, who were university graduates, to Korea for intensive training for eight months in production skills, management skills, and international procurement and marketing at Daewoo's factory. The garment industry in Bangladesh has since continued to grow rapidly over three decades with the continual learning of technology and management from abroad.

By contrast, the government of Ethiopia attached only secondary importance to learning from abroad and entrepreneurship when it began promoting export-oriented garment production in the mid-2000s. The promotion policy offered various preferential incentives including the provision of land in industrial zones and finance to export-oriented firms. The managers hired by these firms were highly educated but had no experience in operating a garment business in the international market. Despite their preferential treatment, these firms have performed more poorly than the ready-made garment producers catering to the domestic market.¹¹

This comparison provides us with several lessons. First, a labour-abundant country does not necessarily have a comparative advantage in labour-intensive garment production. This is because while the Heckscher-Ohlin theorem assumes equal access to the same technology, comparative advantage is determined by productivity as well as factor endowments. Second, a major determinant of productivity is technical and managerial expertise, and the best way to acquire such expertise is to learn from abroad. This is true not only in the Bangladesh case but also in cases 11 to 17 and 19, all of which are relatively successful. Third, compared with the paramount importance of learning from abroad as a determinant of productivity, financing is a secondary issue. In all the cases listed in Table 1, apart from the state-owned enterprises

⁹ See Sonobe and Otsuka (2011, chapters 8 and 9) for details.

¹⁰ In terms of corruption, probably Bangladesh was worse, being ranked the most corrupt country in the world from 2001 to 2005, according to the Corruption Perceptions Index, which is available at <http://www.transparency.org/policy_research/surveys_indices/cpi>

¹¹ After a few years, many of the export-oriented firms received only trial orders but were unable to receive real orders, and their labour productivity was not significantly different from that of poorly equipped tailors and much lower than that of the best-performing factories producing ready-made garments for the domestic market.

(SOEs) and the township-and-village-run enterprises (TVREs) in China,¹² the firms were founded with the owners' funds or by borrowing from relatives and friends. There is much evidence that credit markets in developing countries are not working well.¹³ However, that so many industrial clusters were successfully established without using formal credits indicates that unfavourable access to finance is not the main constraint on the development of industries in their initiation stage when firm sizes are small.¹⁴

Fourth, managers and workers in the garment industry in Bangladesh know that returns to human capital investment are high. This is partly because they have the experience of investing in their human capital and partly because the demand for skilled workers and knowledgeable and experienced managers increases as new firms are established. They are keen to learn, and their human capital investment drives the industry's growth, which in turn maintains the high returns to human capital. Fifth, this virtuous circle was initiated by the success of the Desh-Daewoo training programme, which boosted the profitability of export-oriented garment production in Bangladesh. The increased profitability attracted investment in new factories by wealthy Bangladeshi families and foreign firms, offering worthwhile jobs to educated youth. As a result, the garment firms in Bangladesh were relatively large from the beginning and thousands of them grew to be larger (see Figure 1). This is *prima facie* evidence that training and experience can nurture entrepreneurs.

Sixth, and finally, replicating the Desh-Daewoo training programme is difficult because firms are reluctant to shoulder the cost of general training (Becker 1962).¹⁵ In Bangladesh, no other training programme comparable to the Desh-Daewoo programme in terms of the scale and quality has ever been offered by foreign or domestic firms. The governments of low-income countries are advised to seek learning opportunities.

2.3 Foreign direct investments

Learning from abroad is a core element of industrial development. Foreign direct investment (FDI) is a major channel of learning from abroad. It does not follow, however, that FDI is always an effective policy for industrial development. Whether low-income countries can attract FDIs depends on the business environment. This is affected by a variety of factors, including the quality of human resources, governance, business laws and regulations, the availability of auxiliary and supporting services including the supply of intermediate inputs, and infrastructure. The quality of these factors becomes satisfactory only after industries are considerably developed. Furthermore, foreign firms may not invest in subsidiaries in low-income countries if they anticipate that their products, production methods, and marketing channels are likely to be copied by native workers and their customers are likely to be stolen as in cases 11, 12, and 17.

¹² In the case of private firms in China, the main sources of start-up funds are own funds and borrowing from relative and friends (Allen et al. 2005).

¹³ See, for example, Beck et al. (2009) and Karlan and Morduch (2009).

¹⁴ Long and Zhang (2011) find that firms provide trade credit actively to each other in industrial clusters in China, which lessens the credit constraints. Ruan and Zhang (2009) find that firm size in industrial clusters in China is small due to the division and specialization of labour among firms, so that entry barriers are reduced.

¹⁵ Desh cancelled the contract with Daewoo after the training was completed, and the vast majority of the 130 trainees soon left Desh to join new factories as managers or to start their own trading houses.

While there is a substantial body of literature on the spillover effects of FDIs on local industries, the results of empirical studies are mixed. According to Blomström and Kokko (2003) among others, the potential spillover benefits are realized only if local firms have the ability and motivation to invest in absorbing foreign technology and skills. All these considerations point to the difficulty that low-income countries face in attracting FDIs and learning from them. While we do not deny the importance of attracting FDIs, we believe that it is risky for low-income countries to rely on FDIs alone as the main source of new knowledge for initiating a new industry.

2.4 Why business owners and managers who are not entrepreneurs set up firms

While new industries in developed countries begin with invention of new products (Gort and Klepper 1982; Klepper 1996), new indigenous industries in developing countries begin with the imitation of imported products. In cases 1 to 10 in Table 1, an industry pioneer exerted great efforts to find new production methods, sources of materials, and marketing channels for imperfect imitations of imported products. Once these difficulties were overcome, the pioneer made sizeable profits, despite the low quality of his or her products, because poor domestic consumers created a high demand for cheap substitutes of imported products and because competitors were few. This profit attracted a swarm of imitators to the industry. Many were spin-offs, i.e., the former employees of the pioneer, who produced the same low-quality products by using the same low-quality inputs and sold their products on the same local markets as the pioneer. In this way, an industrial cluster was formed, as illustrated in Figure 2. Industries that began with technology brought by FDIs, SOEs, and international organizations followed almost the same path (cases 11 to 17 and 19).

Earning high profits for the time being, owners and managers in the early phase are not particularly interested in introducing new products or new production processes. Moreover, they are rarely capable of innovation. The pioneers are imitators, even though they are innovative in starting new business activities by imitating. Other firms in the cluster are imitators of imitators and even less likely to possess innovative capacity. Interestingly, setting up a firm in the cluster becomes increasingly easy over time for such entrepreneurs in the early phase of cluster development. As the cluster expands in terms of the number of firms and hence their output, an increasing number of traders buying products and supplying materials come to the cluster, which makes production and transactions in the cluster more convenient. Some firms specialize in the production of parts. In other words, the division of labour between assemblers and part-suppliers and between manufacturers and traders increases with the market size (Stigler 1951; Ruan and Zhang 2009). The problem of imperfect contract enforcement and asymmetric information is reduced in the industrial cluster by the ‘community mechanism’ an environment where people know each other and spread information regarding unscrupulous behaviour, as in rural communities (Hayami 2009; Arif and Sonobe 2012).¹⁶

The number of firms and the total output in the cluster increase over time, but productivity and product quality are hardly improved. This phase of cluster development may be termed the ‘quantity expansion’ phase. In clusters in their quantity expansion phase, even casual

¹⁶ Hayami (e.g., 2009) argues that the community mechanism is effective not only for the enforcement of contract-based transactions but also for the management of local commons and the provision of local public goods in rural communities. In this paper, however, we focus on the enforcement of contract-based transactions.

observers can see that very poorly managed firms are not forced to exit. Possible reasons include the low-level of competition within the cluster, the high demand for low-quality products, and the availability of low-wage labour. Thus, spontaneously formed and quantitatively expanded industrial clusters abound in firms with very limited managerial and innovative capacities. Since such firms make positive profits, more of the same kinds of firms are attracted to the cluster. They, however, will face difficulty in the next phase.

2.5 Increasing importance of managerial and innovative capacities

As the cluster expands quantitatively, the product price and profitability will eventually decline because increased output is supplied to the limited domestic market for the cluster's low-quality product. This process, illustrated by Figure 2, took place in the subsequent quantity expansion phase of industrial development in all cases except for case 18 listed in Table 1. As the profitability declines, the entry of new firms slows down and eventually ceases.

Declining profitability will induce business owners and managers to seek more profitable products (Aghion et al. 2005), which should be of higher quality and differentiated from the inferior products of other firms. Such endeavour, however, do not necessarily bear fruit. While a firm may successfully improve product quality by using high-quality materials and parts and by employing skilled workers, consumers may not immediately perceive the improved quality and the new product may fail to command a high price in market. As Akerlof (1970) points out, branding and quality guarantees would be effective countermeasures to this problem, but they may be known by only a few owners and managers, if any, in industrial clusters. Moreover, since brands may be stolen, branding may have to be supplemented with the use of exclusive sales agencies and other distribution methods (Sonobe et al. 2004). Since the improved products contain differentiated parts and components, and since such intermediate goods embody new ideas, it is also important to establish trust-based, long-term subcontracting relationships with parts suppliers. In addition, to enter the high-quality segment of the market, product quality must be strictly controlled. If these reforms are successfully implemented, production can be expanded profitably.

As the firm size is enlarged accordingly, the management of cash flows, inventory, and labour will assume greater importance. Good management is not an easy task for owners and managers in the cluster, as they have operated only small organizations and may be unaware of how to improve management. In this sense, they are not likely to be efficient managers. They now need to study management or hire competent managers or probably both.

The restoration of high profitability involves these multidimensional improvements in production and management. If one dimension of the improvements is missing, other improvements may not produce positive results. For example, even a firm that has successfully launched a popular product may suffer from losses if its supply chain is inadequate. Moreover, even a firm making profits may go into bankruptcy if its cash management is poor. If a firm's attempt to improve production and management miscarries, the news will spread quickly in the cluster, and others may recoil from any new attempt at similar improvements. This will lead the cluster to a long-run stalemate in which profitability is so low that existing firms struggle for survival and there are no new entrants (see the dotted curves in Figure 2). Most industrial clusters in SSA have been trapped in this equilibrium. A possible exception is the leather footwear industry (case 15) in Addis Ababa, which seems to

be going through multidimensional improvements in production and management by incorporating production and management knowledge from Italy.

Many clusters in Asia, including cases 1 to 5 and 11 to 14, succeeded in multidimensional improvements and followed a development path leading to the dramatic growth of the industry with a smaller number of much larger firms, as illustrated by the solid curves in Figure 2. Such a dynamic development phase may be termed the ‘quality improvement’ phase, in which managerial human capital plays a decisive role. The growth of the industry in this phase entails creative destruction. An increasing number of firms attempt to imitate the multidimensional improvements in the cluster, and some of them further improve production and management practices. Those firms undertaking continual improvements in production and management will grow, whereas firms that fail to keep pace will be forced to exit the industry or will be merged with growing firms. While the number of firms in the cluster will decrease as the result, the total production value and employment of the cluster will continue to grow, and the products will be sold in larger markets, including export markets.

Continual improvements in production and management will be achieved by learning from outside of the cluster, especially from abroad. More concretely, innovative entrepreneurs acquire new knowledge of technology and management by visiting foreign countries frequently to participate in trade fairs and training programmes. They also send workers abroad for training, and invite in foreign experts. They may also be able to learn from foreign firms operating within their countries. Entrepreneurs in Asia have been keen on learning from the successful experiences of advanced firms in neighbouring countries. Taiwan and Korea learned from Japan, while China learned from Taiwan and Korea as well as from Japan. At present, South Asian countries are learning from China, among other countries. In SSA, only a few owners and managers seem to clearly recognize the importance of learning from abroad.¹⁷

2.6 Employment size of industrial clusters

To illustrate how significant industrial clusters are in terms of job creation and how they differ in size, with and without successful multi-dimensional improvements in production and management, Table 3 shows the number of manufacturing jobs and the total number of jobs (including those in garages in case 10 and subcontractors in case 14). It also shows the gender and schooling composition of workers in the selected industrial clusters. Because we often failed to collect the relevant job data in case studies conducted earlier, we focus on recently surveyed industrial clusters. Except for cases 10, 14, 15, and 18, the clusters listed in this table are in the final stage of the quantity expansion phase, and their total employment size ranges from 600 to 13,000 and has been relatively stable for the last several years. The metalwork cluster in Ghana (case 10) was expanding in terms of the number of enterprises at the time of our baseline survey in 2003. However according to the results of our follow-up surveys it probably has been in the final stage of the quantity expansion phase since 2005. The number of jobs is significantly higher in the knitwear cluster in Vietnam (case 14) and leather footwear cluster in Ethiopia (case 15), which have entered the quality improvement phase by newly introducing multidimensional improvements (Sonobe and Otsuka 2011).

¹⁷ Some enterprise managers in East African countries, however, are learning from other countries by employing technicians and managerial advisers from Asia and by visiting European countries.

3 Trying to make management training more effective

In recent years, an increasing number of randomized controlled experiments have been carried out to test the effectiveness of management training and consulting services provided to MSEs in various parts of the developing world.¹⁸ A common finding obtained by these studies, including our own randomized experiments (cases 6, 10, 14, 16, and 19) and as non-randomized ones (cases 8, 15, and 17), is that the owners and managers of MSEs had very limited management knowledge before receiving management training or consulting service. While the training contents were rather rudimentary in many of these experiments, many participants in the training programmes adopted the management practices taught in their programme. This indicates they had not been aware of those management practices before.

3.1 Reasons for and countermeasures to low awareness

Most likely, the majority of the MSEs in the samples of these studies operate in survival clusters, and they know they need something new in order to increase profitability. Why then are these owners and managers ignorant of even basic management practices?

There are three possible explanations. First, a kind of market failure occurs because owners and managers do not know who possesses the knowledge they want to acquire, and when they do know, they are not able to verify whether or not the person has passed that knowledge to them. Moreover, once the seller shares his or her knowledge, the buyers may quickly grasp and become unwilling to pay for it. Because of this asymmetric information problem, the transaction of knowledge is difficult unless the seller has established a good reputation. Another market failure arises from the difficulty in keeping the purchased knowledge secret. If imitation or spillover is expected to be widespread, businesses will be reluctant to pay, preferring to get a free ride.

The third explanation may be down to the ignorance of the value of learning about management. MSE owners and managers may undervalue learning while overestimating their own abilities.¹⁹ Many owners and managers in our study sites maintain their management is better than average. When asked how they know what the average is, they simply smile. Moreover, some owners and managers may have a tendency to put off paying for expensive activities such as learning and investing.²⁰

The asymmetric information problem may be mitigated if management-training programmes are provided by organizations with good reputations, such as governmental or international organizations, foreign aid agencies, well-known companies and NGOs. The gap between the social and private benefits of owners and managers' acquiring management skills may be bridged by government's support for management training or the provision of financial incentives to either owners or managers who learn management skills or to organizations that

¹⁸ See, for example, Karlan and Valdivia (2011), Drexler et al. (2010), Bruhn et al. (2010), Field et al. (2010), Bjorvatn and Tungodden (2010), and Mano et al. (2012).

¹⁹ In the panel of Forbes 500 CEOs, Malmendier and Tate (2005) find that overconfident CEOs overestimate investment returns.

²⁰ There is growing literature on procrastination (e.g., O'Donoghue and Rabin 1999). A number of randomized controlled trials have confirmed the existence of procrastination.

train them.²¹ Public awareness campaigns may help address ignorance about the value of management skills. Owners and managers who tend to procrastinate may be nudged into action if microfinance or some other favourable treatment is linked with participation in a training programme.²² Implementing these programmes to assist MSEs is unlikely to lead to serious corruption, compared with infrastructure projects (Shleifer and Vishny 1993).

3.2 Estimating the benefits of management training

The above arguments about countermeasures are based on the premise that it is possible to design and implement a management-training programme with social benefits exceeding costs. There has, so far, been little empirical evidence that clearly supports this premise because the social benefits of management training programmes are not easy to estimate even if sample owners and managers are randomly assigned to control and treatment groups. Few studies have attempted cost-benefit analyses of management training. Many papers on management experiments do not even mention costs.

There are probably two major difficulties in measuring or estimating the social benefits of management training.²³ One arises from the possible external effects of the training. The social benefit is the sum of private benefits to the participants and those to non-participants, minus any harmful effects, if any. Non-participants may benefit from the training programme through knowledge spillovers. However, if participants increase sales revenues by taking customers from non-participants, someone will lose. Few attempts have been made to measure or estimate these positive and negative externalities.²⁴

A two-stage randomized design similar to the one used by Miguel and Kremer (2004) in estimating the external effects of education and health could be used. Because most MSEs are clustered, it is difficult to find owners and managers in remote places who are unaffected by what happens at the training site, especially if the researcher wants to control industry sectors. If external effects exist, and if they are not controlled for, the estimation of the training effects is biased downward because the stable unit treatment value assumption (SUTVA, Rubin 1978) is violated. Most of the existing studies simply assume that there are no externalities and attempt to estimate the private benefit of the training programme to the participants.

The second major difficulty in estimating the effects of training is that no one knows how long they take to become fully effective or how long they last. Existing studies measure how training programmes change participants' knowledge levels, their adoption of management practices taught in the programme, their longevity or survival in the market, and their accounting-based indicators of business performance, such as revenues, value added, and profits. Most of the studies find that the training effects on the participants' level of management skills and adoption of useful management practices are positive and statistically

²¹ Reviewing various policy options to facilitate industrialization in SSA, Page (2011) concludes that strengthening the managerial capabilities of firms and facilitating clustering are key policy measures.

²² There are already a number of management or business training programmes linked with microfinance provision, including the training programmes discussed by Karlan and Valdivia (2011) and Bjorvatn and Tungodden (2010).

²³ For a more comprehensive and rigorous discussion of the technical problems of the management experiments, see an excellent literature survey by McKenzie and Woodruff (2012).

²⁴ An exception is a new study by Calderon et al. (2012).

significant. Mano et al. (2012) find that management training improves a participant business's longevity significantly. However, the training effects on accounting-based performance indicators are significant in only a small number of studies. Presumably, this is partly because business performance is affected by a multitude of factors beyond the participants' control, and partly because the training effect on business performance takes a longer time to make its full impact. It is likely this effect was measured too early in most studies.

3.3 Tentative results of cost-benefit analysis

Since 2007 and in collaboration with the World Bank and the Japan International Cooperation Agency (JICA), we have been conducting pilot projects in eight clusters where management-training programmes are provided for small businesses free of charge. Cases 6, 10, 14, 16, and 19 can be regarded as randomized controlled experiments because owners and managers were assigned to treatment and control groups at random. Three cases (8, 15, and 17) are not randomized controlled experiments.

In each cluster, local business consultants provided management training in local languages in a classroom setting. An interpreter accompanied any international consultants. In the clusters in Vietnam (cases 6 and 14), Ethiopia (case 16), and Tanzania (case 19), we also offered on-site training several months after the classroom training was completed. In the on-site training programme, instructors visited participants' firms to teach them how to adopt useful management practices. They later visited the firms again to check if the assimilation was going well and to give further advice. The assignment to the on-site training was random and independent of the random assignment to the classroom training.

To measure management practices, we use a simpler version of the management score developed by Bloom and Van Reenen (2007, 2010) for medium-sized firms in developed and emerging economies. Our version is suitable to MSEs in low-income countries. More than half of the elements of our management score are based on visual inspection by our enumerators. They base the remainder on the interviews with the owners or managers of the firm. In each experiment, we observed the management score and the accounting-based performance indicators of each owner or manager in the treatment group and the control group before and after the training programme. In cases 6, 14, 16, and 19, we also observed management scores between the classroom training and the on-site training (Survey 2). Another round of surveys has been conducted very recently in one study site and is planned in the others.

In our randomized experiments, we randomly invited a number of owners and managers to take part in a training programme. It was up to them to decide whether or not to attend. Since some did not, we estimated the local average treatment effects (LATE) (Imbens and Angrist 1994). The estimated LATE on the participants was positive and highly significant for the management score in all the randomized experiments that we conducted (cases 6, 10, 14, 16, and 19). As mentioned earlier, the LATE on firm survival is also positive and significant in case 10, even though it could not be estimated in the other cases because the incidence of exit was negligibly low. Since owners and managers may not be fully aware of the value of management skills, it is interesting to examine how training affects the willingness to pay WTP for management training. We asked our sample owners and managers about their willingness to pay about US\$400 before and after four of our experiments (cases 6, 14, 16,

and 19). In three cases, the WTP for the participants increased sizeably after the training. In two of these three cases, the WTP also increased for non-participants in the control group. These WTP results suggest that many owners and managers were unaware of the value of training before taking part, and that the vast majority of training participants attach high value after taking part. In addition, some non-participants also become willing to pay, based solely on what they hear about the programme.

The LATEs on the participants' accounting-based performance indicators, however, are not statistically significant in case 16. This is most likely because the follow-up survey was conducted too soon, only two months after the on-site training was completed and five months after the classroom training. In cases 6 and 14, a number of MSEs had not collected receivables from their customers in the short period before the follow-up survey, so accounting-based performance data are not available until the next round of survey.

In case 10, where the follow-up survey was conducted a year after the classroom training programme, the estimated LATE on annual value added is US\$13,890 and is marginally significant. This indicates that participation in the classroom training for three weeks increased a participant firm's value added by US\$13,890 on average relative to the non-participant firms' value added for the single year immediately after the training programme. The training effect may persist for several years, and the estimate of the effect may be diluted by the improved performance of non-participants due to knowledge spillovers. Thus, the estimated LATE of US\$13,890 is likely to underestimate the social benefit of the training. The cost of the training per participant is US\$740. For the experiment in this study site, we did not hire international consultants, and the venue was provided by a nearby vocational school free of charge. The cost per participant in this study site was relatively low. It could have been even lower if the same training had been rolled out for a large number of participants because some costs, such as preparing teaching material are fixed.

In case 19, the follow-up survey was conducted just three months after the on-site training had been completed. Since almost all the invited owners and managers participated in the training in this site, we estimated the average treatment effect on the participants. It is estimated that the classroom training increased the annual value added of firms taking part by US\$4,181. On-site training increased that by US\$4,038 on average relative to non-participants.²⁵ The classroom training cost per invited firm was US\$2,905, which includes the fee for an international consultant from Japan and banquet hall rental paid to in one of the largest hotels in Dar es Salaam. The on-site training cost per participating firm was US\$2,043, which again includes the fee for an international consultant from Japan. Despite cost being over-estimated and benefits under-estimated, it is remarkable and encouraging that the estimated effect tends to exceed the cost.

3.4 Issues for future research

It may be interesting to note that training effects depend on the education level of the training participant, as our studies in Ghana and Ethiopia, Bjorvatn and Tungodden (2010), and some other studies attest. For example, educated owners and managers tend to benefit more from training in record keeping practices probably because record keeping requires math skills. According to Giné and Mansuri (2011), female training participants benefit less than male

²⁵ Note that the effect of the on-site training would be more difficult to be realized by the time of the follow-up survey because the on-site training was implemented after the classroom training.

participants probably because females are faced with more severe constraints limiting their latitude in the adoption of new management practices and in the expansion of their businesses. Berge et al. (2011) measure preference variables and argue that female owners and managers perform less well because they are more risk-averse and less willing to compete than their male counterparts. In our sample of garment producers in Tanzania (case 19), female owners and managers comprise the majority, and many of them operate businesses not to make a living but to have disposable income that they can spend as they wish, according to our unstructured interviews with them. Yet, we find no evidence for underperformance of female owners and managers in terms of business performance. In terms of management skills, they were somewhat superior to their male counterparts, probably because many of them had started their businesses after receiving garment business training provided by some organizations exclusively for females. In our experimental management training programme, male owners and managers participated and benefited from the training a little more than female participants. This could be a catch-up rather than the gender difference in the effect of training.

More generally, there are those training participants who can apply new ideas to their businesses successfully, and those who cannot acquire useful knowledge. Indeed different effects in terms of education have already been reported by several studies, including Mano et al. (2012). To the extent that these different effects are more a rule than exception, the cost-benefit analysis of the training would need to take them into account. We will come back to this point shortly after the discussion of spillovers below.

Knowledge spillovers are a vexing problem for researchers who want to estimate training effects, but they are socially beneficial. To design better training programmes, we should pay more attention and devote more efforts to explore what type of knowledge is easy or difficult to spread, what the major channels of spillovers are, and how fast and how accurately knowledge is conveyed through spillovers. The data generated by our experiments in Ethiopia and Tanzania suggests that knowledge spills over not only from participants to non-participants but also from participants to participants. Also, participants benefit from talking about the training contents to others. In other words, you can better yourself by observing others and the best way to learn something is to teach it. To the extent that these tentative results are robust, it is useful to increase opportunities for participants to discuss management and to visit each other's firms, for example, by encouraging them to organize alumni associations.

The methodology featuring randomized controlled trials and the estimation of the average treatment effect on the treated (ATT) has been extensively used in medical studies of the effects of medicines. Spillovers are not a major concern in such studies. By contrast, the effect of teaching knowledge and skills is likely to be accompanied by spillovers. If management training generates considerable external effects, it may not necessarily be a good idea to estimate ATT or LATE in order to grasp the training impacts. If training contents spill over widely, we should focus on analyzing what types of owners and managers assimilate training contents better and disseminate them to a greater number of others. If training contents do not spill over widely, but the success story of participants spurs many others to actively try to acquire useful knowledge and skills, it is desirable to concentrate the limited training resources on nurturing promising owners and managers and developing success stories or role models. In either case, it is meaningless to be obsessed by the idea of estimating the impact on average and to evaluate training programmes through the estimated impact on average.

To design better training programmes, what to teach and how to teach are critical issues to be explored. These issues have not received due attention in existing studies of management training. A major exception is the study by Drexler et al. (2010), which compares different ways of teaching bookkeeping. Traditionally, Japanese businessmen, business consultants, and aid workers are fond of teaching the Japanese style of production and quality management, Kaizen. Kaizen is ‘a commonsense, low-cost approach to management’ according to Imai (1997). It is now adopted by a number of large firms in the developed and emerging economies, often under the name of lean management. Business development service (BDS) providers who received, say, the ILO’s entrepreneurship and business management training must have heard of Kaizen, but they do not allocate much time to it when they serve as instructors in training programmes. However, in our experience of hiring them as instructors in our pilot projects, they are excellent at teaching entrepreneurship, business strategy, marketing, and record keeping. The tentative results of our training experiments indicate that training participants appreciate both Kaizen-type training and BDS-type training. Therefore we have designed our programmes to include both.

While the discussion in this section has focused on management training, we believe that training programmes for MSE owners and managers in developing countries should include innovation as a major subject. As we saw in the previous section, it is vital for these owners and managers to succeed in product quality improvement, branding, improvements in marketing, strengthening relationships with suppliers, and improvements in management of labour, inventory, and finance. Moreover, since a number of clusters in developed and emerging economies have achieved these multidimensional improvements in production and management, a number of them should be able to share their experiences with owners and managers in survival clusters in the developing world, especially in SSA. Thus, These issues should be incorporated in management training programmes to cultivate both the innovative and managerial capacities of owners and managers.

If MSE owners and managers are likely to benefit from learning diverse subjects, should all subjects be taught in the same way? Given the heterogeneity of owners and managers, the question arises also as to whether to include them all in the same class. According to our tentative results classroom training and on-site training have similar effects in BDS-type training but differ in Kaizen-type training. It is difficult for training participants to understand how to apply the knowledge of Kaizen without looking at concrete examples. So for Kaizen on-site training and visiting other participants’ workshops seem to be more effective. Another related finding is that while the effect of on-site training on the adoption of Kaizen-type practices does not depend on the participant’s education level, the effect of classroom training on the adoption of BDS-type practices does. These preliminary results warrant further studies on how to efficiently teach management to MSE owners and managers in developing countries.

4 Conclusions

The pace of industrial development is largely determined by the dissemination and adoption of new technologies and good management practices. The market for management consulting and training services, however, is likely to fail. This is partly because knowledge spillovers create a gap between the social and private benefits of acquiring managerial capacity, and partly because many owners and managers are not aware of the importance of management

knowledge. In this paper we argue that to help MSEs in developing countries prosper management training should be supported by government and foreign aid. In Taiwan, the Industrial Technology Research Institute has facilitated importing foreign technologies and disseminating them by means of adaptive research and training (Hong and Gee 1993). In SSA, there have been no effective institutions in charge of adaptive research and training toward improvements in production and management.

In Ethiopia, the late Prime Minister Meles Zenawi took the powerful initiative to establish the Kaizen Management Institute in collaboration with JICA recently. It is hoped that this institute will serve as a model of foreign aid that attempts to foster entrepreneurship in developing countries. In this institute, promising local, young, and staff are trained by Japanese experts with a view to disseminating management skills adapted to the local context. We expect such foreign aid programmes to reach a high success rate in fostering entrepreneurship and boosting MSE development.

Although this paper focuses on cultivating managerial and innovative capacities, financial development and infrastructure development are as important. Management training can have an additional impact if it is linked with finance and infrastructure development. High-performing firms require finances not only to invest in capital goods but also to move from their original industrial clusters to more spacious and better-equipped industrial zones. If a training programme is provided before offering low-interest credits, it is relatively easy to distinguish innovative, promising entrepreneurs. It is desirable to link management training programmes with the provision of credit and space in the industrial zone. This way firms with improved managerial and innovative capacities and, hence, higher ability to repay loans, will be more likely to receive loans and relocate their production bases with expanded scale of operations.

Much remains to be studied about the design of management training programmes for owners and managers, public awareness campaigns, trainers' training systems, trainers' quality assurance systems, and the overall strategy of dissemination and adoption. In this paper we argue, based on our case studies, that management training programmes are likely to have significant impact. They should facilitate learning from the experience of multidimensional improvements in production and management and cultivate innovative capacities. Considerably many more empirical studies are warranted. We would like to propose that each developing country build effective institutions that facilitate the dissemination and adoption of technologies in earnest by taking advantage of the progress of studies in this area.

References

- Aghion, P., N. Bloom, R. Blundell, R. Grifitt, and P. Howitt (2005). 'Competition and Innovation: An Inverted-U Relationship'. *Quarterly Journal of Economics*, 120(2): 701-28.
- Akerlof, G.A. (1970). 'The Market for 'Lemons': Quality Uncertainty and the Market Mechanism'. *Quarterly Journal of Economics*, 84(3): 488-500.
- Allen, F., J. Qian, and M. Qian (2005). 'Law, Finance, and Economic Growth in China'. *Journal of Financial Economics*, 77(1): 57-116.

- Altenburg, T., and J. Meyer-Stamer (1999). 'How to Promote Clusters: Policy Experiences from Latin America'. *World Development*, 27(9): 1693-713.
- Arif, B.W., and T. Sonobe (2012). 'Virtual Incubation in Industrial Clusters: A Case Study in Pakistan'. *Journal of Development Studies*, 48(3): 377-92.
- Beck, T., A. Demirgüç-Kunt, and P. Honohan (2009). 'Access to Financial Services: Measurement, Impact, and Policies'. *World Bank Research Observer*, 24(1): 119-45.
- Becker, G. (1962). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. Chicago, IL: University of Chicago Press.
- Berge, L.I., K. Bjorvatn, and B. Tungodden (2011). 'Human and Financial Capital for Microenterprise Development: Evidence from a Field and Lab Experiment'. CMI Working Paper.
- Bjorvatn, K., and B. Tungodden (2010). 'Teaching Business in Tanzania: Evaluating Participation and Performance'. *Journal of the European Economic Association*, 8(2-3): 561-70.
- Blomström, M., and A. Kokko (2003). 'The Economics of Foreign Direct Investment Incentives'. In H. Hermann and R. Lipsey (eds), *Foreign Direct Investment in the Real and Financial Sectors of Industrial Countries*. Heidelberg: Springer.
- Bloom, N., A. Mahajan, D. McKenzie, and J. Roberts (2010). 'Why do Firms in Developing Countries Have Low Productivity?' *American Economic Review*, 100(2): 619-23.
- Bloom, N., and J. Van Reenen (2007). 'Measuring and Explaining Management Practices across Firms and Countries'. *Quarterly Journal of Economics*, 122(4): 1351-409.
- Bloom, N., and J. Van Reenen (2010). 'Why Do Management Practices Differ across Firms and Countries?' *Journal of Economic Perspectives*, 24(1), 203-24.
- Bloom, N., B. Eifert, A. Mahajan, D. McKenzie, and J. Roberts (2011). 'Does Management Matter? Evidence from India'. Policy Research Working Paper No. 5573, World Bank.
- Bruhn, M., D. Karlan, and A. Schoar (2010). 'What Capital is Missing in Developing Countries?' *American Economic Review*, 100(2): 629-33.
- Calderon, G., J. Cunha, and G. de Giorgi (2012). 'Business Literacy and Development: Evidence from a Randomized Trial in Rural Mexico'. Mimeo. Stanford University.
- Drexler, A., G. Fischer, and A. Schoar (2010). 'Financial Literacy Training and Rule of Thumbs: Evidence from Field Experiment'. CEPR Discussion Papers, No. 7994.
- Drucker, P. (1973). *Management*. New York: Harper & Low.
- Easterly, W. (2002). *The Elusive Quests for Growth: Economist's Adventures and Misadventures in the Tropics*. Cambridge, MA: MIT Press.
- Field, E., S. Jayachandran, and R. Pande (2010). 'Do Traditional Institutions Constrain Female Entrepreneurship? A Field Experiment on Business Training in India'. *American Economic Review*, 100(2): 125-29.
- Giné, X., and G. Mansuri (2011). 'Money or Ideas? A Field Experiment on Constraints to Entrepreneurship in Rural Pakistan'. World Bank Working Paper.

- Gort, M., and S. Klepper (1982). 'Time Paths in the Diffusion of Product Innovations'. *Economic Journal*, 92(367): 630-53.
- Hayami, Y. (2009). 'Social Capital, Human Capital, and the Community Mechanism: Towards a Conceptual Framework for Economists'. *Journal of Development Studies*, 45(1): 96-123.
- Hidalao, C.A., B. Klinger, A.-L. Barabasi, and R. Hausman (2007). 'The Product Space Conditions the Development of Nations'. *Science*, 317: 482-87.
- Hong, C.-M., and S. Gee (1993). 'National Systems Supporting Technical Advance in Industry: The Case of Taiwan'. In R.R. Nelson (ed.), *National Innovation Systems: A Comparative Analysis*. Oxford: Oxford University Press.
- Huang, Y., and A.M. Bocchi (eds) (2008). *Reshaping Economic Geography in East Asia*. Washington, DC: World Bank.
- Iddrisu, A., Y. Mano, and T. Sonobe (2012). 'Entrepreneurial Skills and Industrial Development: The Case of a Car Repair and Metalworking Cluster in Ghana'. *Journal of the Knowledge Economy*, 3(3): 302-26.
- Imai, M. (1977). *Gemba Kaizen: A Commonsense: Low-cost Approach to Management*. New York: McGraw-Hill.
- Imbens, G.W., and J.D. Angrist (1994). 'Identification and Estimation of Local Average Treatment Effects'. *Econometrica*, 62(2): 467-75.
- Karlan, D., and J. Morduch (2009). 'Access to Finance'. In D. Rodrik and M. Rosenzweig (eds), *Handbook of Development Economics*, Volume 5. Amsterdam: North Holland.
- Karlan, D., and M. Valdivia (2011). 'Teaching Entrepreneurship: Impact of Business Training on Microfinance Clients and Institutions'. *Review of Economics and Statistics*, 93(2): 510-27.
- Klepper, S. (1996). 'Entry, Exit, Growth, and Innovation over the Product Life Cycle'. *American Economic Review*, 86(3): 562-83.
- Long, C., and X. Zhang (2011). 'Cluster-Based Industrialization in China: Financing and Performance'. *Journal of International Economics*, 84(1): 112-23.
- Malmendier, U., and G. Tate (2005). 'CEO Over Confidence and Corporate Investment'. *Journal of Finance*, 60(6): 2661-700.
- Mano, Y., A. Iddrisu, Y. Yoshino, and T. Sonobe (2012). 'How Can Micro and Small Enterprises in Sub-Saharan Africa Become More Productive? The Impacts of Experimental Basic Managerial Training'. *World Development*, 40(3): 458-68.
- McCormick, D. (1999). 'African Firm Clusters and Industrialization: Theory and Reality'. *World Development*, 27(9): 1531-51.
- McKenzie, D., and C. Woodruff (2012). 'What Are We Learning from Business Training and Entrepreneurship Evaluations around the Developing World'. Mimeo, World Bank.
- Miguel, E., and M. Kremer (2004). 'Worms: Identifying Impacts on Education and Health in the Presence of Treatment Externalities'. *Econometrica*, 72(1): 159-217.

- Mottaleb, K.A., and T. Sonobe (2012). 'An Inquiry into the Rapid Growth of the Garment Industry in Bangladesh'. *Economic Development and Cultural Change*, 60(1): 67-89.
- O'Donoghue, T., and M. Rabin (1999). 'Doing It Now or Later?' *American Economic Review*, 89(1): 103-24.
- Page, J. (2011). 'Can Africa Industrialize?' Paper presented at the African Economic Research Consortium Semi-Annual Plenary Meeting, Nairobi, Kenya.
- Rhee, Y.W. (1990). 'The Catalyst Model of Development: Lessons from Bangladesh's Success with Garment Exports'. *World Development*, 18(2): 333-16.
- Rodriguez-Clare, A. (2007). 'Clusters and Comparative Advantage: Implications for Industrial Policy'. *Journal of Development Economics*, 82(1): 43-57.
- Ruan, J., and X. Zhang (2009). 'Finance and Cluster Based Industrial Development in China'. *Economic Development and Cultural Change*, 58(1): 143-64.
- Rubin, D.B. (1978). 'Bayesian Inference for Causal Effects: The Role of Randomization'. *Annals of Statistics*, 6: 34-48.
- Schmitz, H., and K. Nadvi (1999). 'Clustering and Industrialization: Introduction'. *World Development*, 27(9): 1503-14.
- Schumpeter, J.A. (1934). *The Theory of Economic Development: An Inquiry into Profits, Capital, Interest, and the Business Cycle*. London: Oxford University Press.
- Shleifer, A., and R.W. Vishny (1993). 'Corruption'. *Quarterly Journal of Economics*, 108(3): 599-617.
- Sievers, M., and P. Vandenberg (2007). 'Synergies through Linkages: Who Benefits from Linking Micro-Finance and Business Development Services?'. *World Development*, 35(8): 1341-58.
- Sonobe, T., and K. Otsuka (2011). *Cluster-Based Industrial Development: A Comparative Study of Asia and Africa*. Basingstoke: Palgrave Macmillan.
- Sonobe, T., J.E. Akoten, and K. Otsuka (2011a). 'The Growth Process of Informal Enterprises in Sub-Saharan Africa: A Case Study of a Metalworking Cluster in Nairobi'. *Small Business Economics*, 36(3): 323-35.
- Sonobe, T., A. Suzuki, and K. Otsuka (2011b). *KAIZEN for Managerial Skills Improvement in Small and Medium Firms: An Impact Evaluation Study*, Japan PHRD Trust Fund No. TF096317. Washington, DC: World Bank.
- Sonobe, T., and K. Otsuka (2006). *Cluster-Based Industrial Development: An East Asian Model*. Basingstoke: Palgrave Macmillan.
- Sonobe, T., D. Hu, and K. Otsuka (2004). 'From Inferior to Superior Products: An Inquiry into the Wenzhou Model of Industrial Development in China'. *Journal of Comparative Economics*, 32(3): 542-63.
- Sonobe, T., J.E. Akoten, and K. Otsuka (2009). 'An Exploration into the Successful Development of the Leather-Shoe Industry in Ethiopia'. *Review of Development Economics*, 13(4): 719-36.

- Stigler, G.J. (1951). 'The Division of Labor is Limited by the Extent of the Market'. *Journal of Political Economy*, 59(3): 185-93.
- Syverson, C. (2011). 'What Determines Productivity?' *Journal of Economic Literature*, 49(2): 326-65.
- World Bank (2012). *World Development Report 2013 – Jobs*. Washington, DC: World Bank.
- Yoshino, Y. (2011). 'Industrial Clusters and Micro and Small Enterprises in Africa: From Survival to Growth'. Washington, DC: World Bank.

Table 1: Origin of development of selected industrial clusters in Asia and Africa

No.	Location	Main product	Origin of cluster development: initial firm type and initial product
1	Bingo, Japan	Working clothes	Farm households (traditional Japanese working clothes)
2	Hamamatsu, Japan	Motorcycles	Small- and medium-scale (woodwork, loom, musical instruments, general machinery)
3	Taichung, Taiwan, China	Machine tool	Small- and medium-scale (simple machinery)
4	Zhili, Zhejiang, China	Baby clothes	Farm households (silk products and hand-made merchandises)
5	Wenzhou, Zhejiang, China	Electrical fittings	Farm households (repair parts for electrical fittings in SOE factories)
6	Bac Ninh, Vietnam	Rolled steel bars	Farm households (agricultural implements)
7	Sargodha, Pakistan	Electric fittings	Small- and medium-scale (electrical fittings)
8	Addis Ababa, Ethiopia	Garment	Tailors (tailored suits)
9	Nairobi, Kenya	Garment	Tailors (tailored dresses)
10	Kumasi, Ghana	Metalwork	Small- and medium-scale (car repair)
11	Northern Taiwan, China	Printed circuit board	FDIs (printed circuit boards)
12	Chongqing, China	Motorcycles	Small- and medium-scale and FDIs (motorcycle)
13	Three cities in Jiangsu, China	Printed circuit board	SOEs and TVREs (printed circuit boards)
14	Hatay, Vietnam	Knitwear	Co-operative (knitwear for SOEs)
15	Addis Ababa, Ethiopia	Leather shoes	Migrant artisans (leather shoes)
16	Addis Ababa, Ethiopia	Metalwork	Migrant artisans (metal work)
17	Nairobi, Kenya	Metalwork	FDIs and SOEs (metalwork)
18	Dhaka, Bangladesh	Garment	Training in Korea (garment)
19	Dar Es Salaam, Tanzania	Garment	UNIDO training (garment)

Notes: FDIs, SOEs, and TVREs stand for foreign direct investments, state-owned enterprises, and township-village-run enterprises, respectively.

Sources: Authors' compilation. Cases 1, 2, 3, 4, 5, 11, 12, and 13 are from Sonobe and Otsuka (2006). Cases 6, 7, 8, 9, 14, 15, 16, and 17 are from Sonobe and Otsuka (2011). Case 10 is from Iddrisu et al. (2012) and Mano et al. (2012). Cases 16 and 19 are from Sonobe, Suzuki, and Otsuka (2011). Case 18 is from Mottaleb and Sonobe (2012).

Table 2: Characteristics of the selected industrial clusters in Asia and Africa

No.	Cluster	Year	No. of final goods producing firms	No. of workers per firm	Education of entrepreneur (years)	Export markets
1	Working clothes, Japan	1968	200	n.a.	10.6	Not exporting
		1998	100	n.a.	13.7	Not exporting
2	Motorcycle, Japan	1950s	150	n.a.	Na	Not exporting
		1965	3	n.a.	Na	Worldwide
3	Machine tools, Taiwan, China	1998	100	70	13.0	Southeast Asia
4	Baby clothes, China	1999	5000 (incl. subcons)	15	7.5	Russia
5	Elec. fittings, China	2000	200	340	10.6	Not exporting
6	Rolled steel, Vietnam	2006	133	22.1	6.7	Not exporting
7	Elec. fittings, Pakistan	2008	1200	10.0	9.4	Not exporting
8	Garment, Ethiopia	2007	700 ¹	26.1	10.1	Not exporting
9	Garment, Kenya	2002	640	4.8	8.6	Neighbouring countries
10	Metalwork, Ghana	2005	500 ²	5.9	11.0	Not exporting
11	PCB, Taiwan, China	2000	60	930	13.2	Worldwide
12	Motorcycle, China	2001	50	900	15.1	Southeast Asia
13	PCB, China	2003	200	107	12.1	Not exporting
14	Knitwear, Vietnam	2007	160	12.0	7.9	East Europe
15	Leather shoes, Ethiopia	2005	1000 ³	10.1	9.2	Neighbouring countries
16	Metalwork, Ethiopia	2008	130	72.5	10.8	Not exporting
17	Metalwork, Kenya	2006	150	7.2	11.0	Not exporting
18	Garment, Bangladesh	2005	4100	1231	15.0	Worldwide
19	Garment, Tanzania	2010	700	5.0	10.7	Neighbouring countries

Notes:

1. About 30 firms were engaged in the factory production of ready-made garments, and the rest were tailors with own shops at which they directly contacted with consumers.
2. This is a rough estimate of the number of metalwork firms. In the same cluster, there were thousands of garages or car repairers.
3. This number includes self-employed shoe makers who were sometimes employed by other shoemakers (Sonobe et al. 2009).

Source: The same as footnote in Table 1.

Table 3: The number of jobs, monthly wages, and sex and schooling compositions of workers in selected industrial clusters

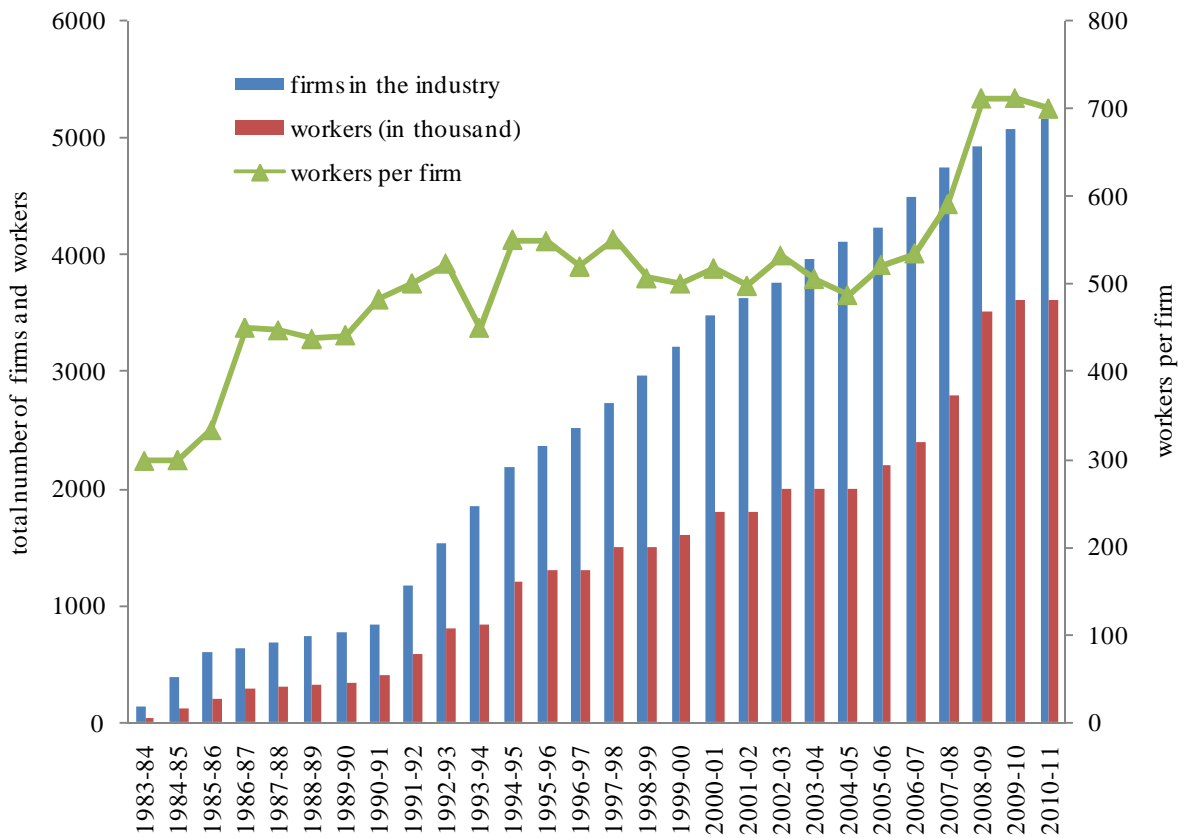
No. ¹	Cluster	Year	No. of manufacturing jobs (1000)	Total no. of jobs (1000) ²	Monthly wage (US\$) ³	% of women	% of high school education and above
6	Rolled steel, Vietnam	2010	3.3	n.a.	161	5	0
7	Elec. fittings, Pakistan	2008	13.2	n.a.	105	10	18
8	Garment, Ethiopia	2007	7.2	n.a.	36-45 ⁴	59	17 ⁵
10	Metalwork, Ghana	2003	6.7	99.2 ⁶	32	0	25
14	Knitwear, Vietnam	2010	3.2	20-30 ⁷	59	70	25
15	Leather shoes, Ethiopia	2008	22.2 ⁵	n.a.	35-53 ⁴	23	15 ⁸
16	Metalwork, Ethiopia	2009	9.1	n.a.	63-88 ⁴	9	44 ⁸
17	Metalwork, Kenya	2008	1.2	1.7	117-208 ⁹	0	43
18	Garment, Bangladesh	2004	2,100 ⁹	n.a.	61-97 ¹¹	40	50
19	Garment, Tanzania	2010	0.6	n.a.	57	83 ¹²	11

Notes:

1. The numbers are the same as in Tables 1 and 2.
2. Including related jobs in the cluster (e.g., car repairing in the metal work cluster).
3. Converted to US\$ by the prevailing exchange rate.
4. The lower number refers to female wage and the higher one to male wage.
5. The number refers to 2009.
6. Including 80,000 jobs generated by about 8,000 garages.
7. Including more than 5,000 subcontractors in nearby villages.
8. Including those who have completed vocational training.
9. The lower number refers to casual worker wage and the higher one to regular worker wage.
10. The data include the employment in the country as a whole including the Greater Dhaka and Chittagong.
11. The lower number refers to casual worker wage and the higher one to regular worker wage.
12. Proportion of female owners, not workers.

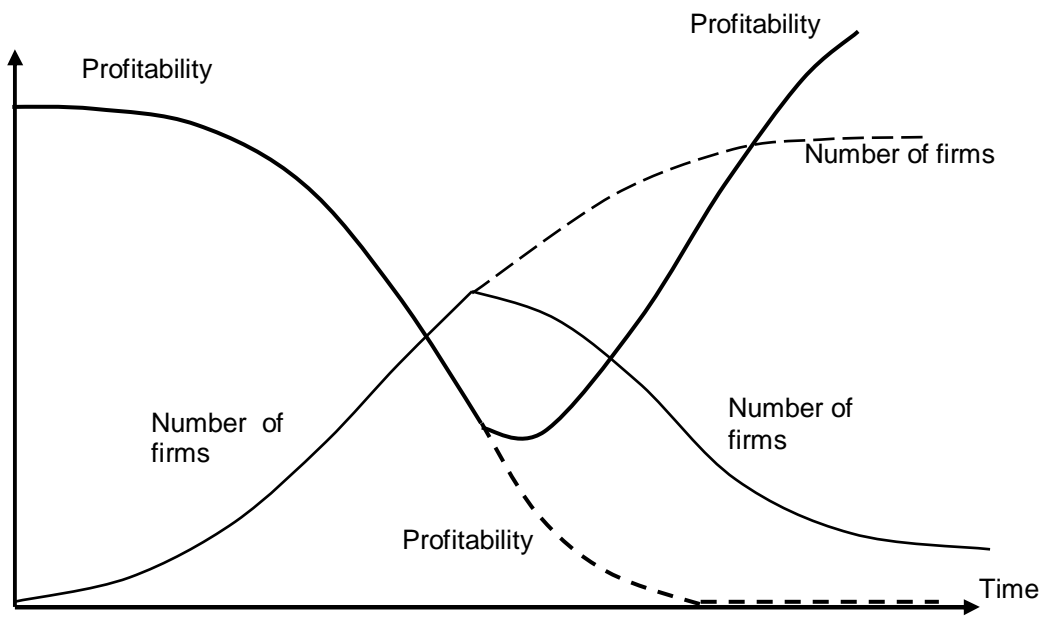
Source: See footnote in Table 1.

Figure 1: Growth of the garment industry in Bangladesh



Source: Bangladesh Knitwear Manufacturers and Exporters Association (2012), 'History of Development of Knitwear of Bangladesh', Bangladesh, BKMEA.

Figure 2: An illustration of development patterns of industrial clusters in terms of changing profitability and the number of firms



Source: Authors' illustration.