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Cluster-Based MSE Development: The Role of *Kaizen* Training

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I. 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 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. 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 (RCTs) of management training for micro and small enterprises (MSEs). While RCTs of management or business training

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¹See, for example, Bloom and van Reenen (2007, 2010), Bloom, Eifert, *et al.* (2011), Bloom, Mahajan, *et al.* (2010), Bruhn, Karlan, and Schoar (2010), and Syverson (2011).

²In 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.

are not new, a major feature of our training programmes is to teach basics of production management called *Kaizen* as well as basics of financial management and marketing which are usually taught in other programmes. *Kaizen* is based on industrial engineering developed in the US, assimilated and modified into a bottom-up approach to management in Japan, and imported by the US automobile industry under the name of Lean Manufacturing, which does not emphasises bottom-up flows of information as much as *Kaizen*.

We highlight cluster-based industrial development because low-income countries should have a comparative advantage in labour-intensive manufacturing industries, which are characterised by the dominance of 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.

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 II 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 III begins by discussing the possible reasons why they cannot improve these skills and what the government 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 IV contains concluding remarks.

II. 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.

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

⁴Our 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.

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

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.

Table 1

Origin of Development of Selected Industrial Clusters in Asia and Africa

Location	Main Product	Initial Firm Type and Initial Product	No. of Firms in Cluster	Entrepreneur's Schooling Years
1 Bingo, Japan			200	10.6
2 Hamamatsu, Japan	Working clothes	Farm households (traditional clothes)		
3 Taichung, Taiwan, China	Motorcycles	Small- and medium-scale (woodwork)	150	Na
4 Zhili, Zhejiang, China	Machine tool	Small- and medium-scale (simple machinery)	100	13.0
			5000 (incl. subcons)	
5 Wenzhou, Zhejiang, China	Baby clothes	Farm households (hand-made silk products)		7.5
		Farm households (repair parts for electrical fittings)	200	10.6
6 Bac Ninh, Vietnam	Electrical fittings			
7 Sargodha, Pakistan	Rolled steel bars	Farm households (agricultural implements)	133	6.7
8 Addis Ababa, Ethiopia	Electric fittings	Small- and medium-scale (electrical fittings)	1200	9.4
9 Nairobi, Kenya	Garment	Tailors (tailored suits)	700	10.1
10 Kumasi, Ghana	Garment	Tailors (tailored dresses)	640	8.6
11 Northern Taiwan, China	Metalwork	Small- and medium-scale (car repair)	500	11.0
12 Chongqing, China	Printed circuit board	FDIs (printed circuit boards)	60	13.2
		Small- and medium-scale and FDIs (motorcycle)	50	15.1
13 Three cities in Jiangsu, China	Motorcycles			
	Printed circuit board	SOEs and TVREs (printed circuit boards)	200	12.1
14 Hatay, Vietnam	Knitwear	Cooperative (knitwear for SOEs)	160	7.9
15 Addis Ababa, Ethiopia	Leather shoes	Migrant artisans (leather shoes)	1000	9.2
16 Addis Ababa, Ethiopia	Metalwork	Migrant artisans (metal work)	130	10.8
17 Nairobi, Kenya	Metalwork	FDIs and SOEs (metalwork)	150	11.0
18 Dhaka, Bangladesh	Garment	Training in Korea (garment)	4100	15.0
19 Dar es Salaam, Tanzania	Garment	UNIDO training (garment)	700	10.7

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

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 there was and is no such a list. The number of clusters is unknown, especially in SSA. It is likely that SSA has many more clusters and entrepreneurs than governments and researchers recognise. Most would be survival clusters.⁶ The 19 clusters that we studied are not representative of industrial clusters in

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

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 industrialised.

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 foreign direct investments (FDIs), 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 organisations. Consistent with the Heckscher-Ohlin theorem, the initial products of these clusters, as shown in the parentheses in the last column, tended to be labor-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. In Kumasi, Ghana (case 10), for example, metalworking 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 metalworking firms provide repair services but also manufacture a variety of metal products, such as corn mill machines, wheelbarrows, and cash safes. 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.

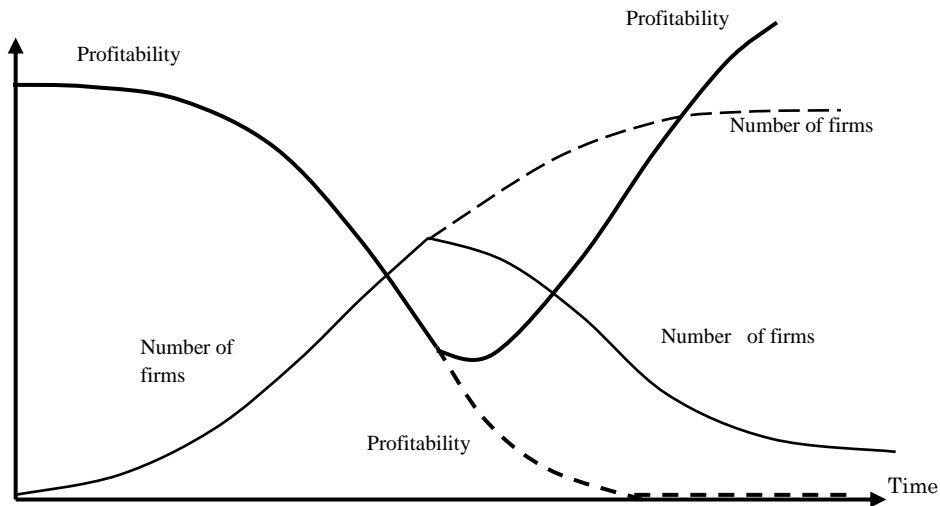
Why Business Owners and Managers who are not Entrepreneurial Set up Firms

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 sizable 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

⁷Although 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.

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 1. Industries that began with technology brought by FDIs, SOEs, and international organisations followed almost the same path (cases 11 to 17 and 19).

Fig. 1. An Illustration of Development Patterns of Industrial Clusters in Terms of Changing Profitability and the Number of Firms.



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 specialise 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 [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)].⁸

⁸Hayami (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.

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 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.

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 1, 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, Hu, and Otsuka (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 organisations 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 1). Most industrial clusters in SSA have been trapped in this equilibrium. A possible exception is the leather shoes 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 1. 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 recognise the importance of learning from abroad.⁹

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 2 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

⁹Some 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.

clusters listed in this table are in the final stage of the quantity expansion phase, and their total employment size ranges from 600 to thirteen thousand 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 shoe cluster in Ethiopia (case 15), which have entered the quality improvement phase by newly introducing multidimensional improvements [Sonobe and Otsuka (2011)].

Table 2
*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 dollars 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 thousand jobs generated by about 8 thousand 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.

III. 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.¹⁰ A common finding obtained by these studies, including our own randomised 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

¹⁰See, for example, Karlan and Valdivia (2011), Drexler, Fischer, and Schoar (2010), Bruhn, Karlan, and Schoar (2010), Bjorvatn and Tungodden (2010), and Mano, *et al.* (2012).

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.

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 two possible explanations. One attributes this ignorance to market failures. One 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. The second type of relevant 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 second explanation may be down to ignorance. MSE owners and managers may value of learning as well as overestimating their own abilities.¹¹ 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.¹²

The asymmetric information problem may be mitigated if management-training programmes are provided by organisations with good reputations, such as governmental orienteer national organisations, 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 organisations that train them. 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 favorable treatment is linked with participation in a training programme.¹³ Implementing these programmes to assist MSEs is unlikely to lead to serious corruption, compared with infrastructure projects [Shleifer and Vishny (1993)].

¹¹In the panel of Forbes 500 CEOs, Malmendier and Tate (2005) find that overconfident CEOs over estimate investment returns.

¹²There is growing literature on procrastination [e.g., O'Donoghue and Rabin (1999)]. A number of randomized controlled trials have confirmed the existence of procrastination.

¹³There 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).

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.¹⁴ 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, with Calderon, *et al.* (2012) being an exception.

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 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.

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

¹⁴ 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).

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). 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 400 US dollars before and after four of our experiments (cases 6, 14, 16 and 19). In three cases, the WTP for the participants increased sizably 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 13,890 US dollars and is marginally significant. This indicates that participation in the classroom training for three weeks increased a participant firm's value added by 13,890 dollars 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 13,890 dollars is likely to underestimate the social benefit of the training. The cost of the training per participant is 740 dollars. 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 4,181 US dollars. On-site training increased that by 4,038 dollars on average relative to non-participants.¹⁵ The classroom training cost per invited firm was 2,905 US dollars, 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 2,043 dollars, 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.

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. 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 because many of them had started their businesses after receiving garment business training provided by some organisations exclusively for females. In our experimental 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

¹⁵Note that the effect of the on-site training would be more difficult to be realised by the time of the follow-up survey because the on-site training was implemented after the classroom training.

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 organise alumni associations.

The methodology featuring randomised 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 analysing 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, Fischer, and Schoar (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*. It is "a common-sense, 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 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.

IV. 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)]. It is hoped that Sub-Saharan Africa will have such effective institutions in charge of adaptive research and training toward improvements in production and management in the not-too-distant future.

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.

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Comments

Thank you, Dr Sonobe for a really fruitful presentation. It is really an honour for me to be a discussant on the work of Dr Sonobe. But, unfortunately, I did not have your paper for a detailed discussion. However, I went through the abstract of your paper and come up with some brief comments and questions.

Dr Sonobe your presentation tries to put many things together. For example, the cluster-based industries, Kaizen Management and MSE growth. Surely your presentation/paper is a coherent explanation of title and subtitles. However, I have just few comments and question for more understanding the subject.

- (1) The Clusters must be expected to display the negativities of asymmetric knowledge. How do you think how the clusters may work in this situations?
- (2) I just wonder how the concept of KAIZEN management is different than Lean Manufacturing. In my understanding, lean manufacturing also reduces costs, lead times, and inventory requirements, ensures greater productivity, and brings about overall efficiency. Similarly, what is differences between 5s approach and Six sigma approach.
- (3) The KAIZEN management has a constant focus on improvement becomes an obsession and causes stress in the workforce. How do you think about the stress management in your KAIZEN management model?
- (4) No Margins for Error.
- (5) There is no margin of error in KAIZEN management arrangements. Apparently, it requires a favourable external climate. For instance is not possible in places with unreliable energy supply, inadequate transportation infrastructure, and or poor work culture in the society. Similarly, in KAIZEN management arrangements.
- (6) Is management training enough? Surely, Technology is also important, Credit/finance is also important, Infrastructure is also important
- (7) The KAIZEN arrangement over-focus on elimination of waste, and it overrides other concerns. For example, it ignores other crucial parameters such as employee wellness, and corporate social responsibility. Please comment.
- (8) KAIZEN is more a culture than a method, and there is no standard KAIZEN production model.

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