Melco Management Accounting Research Discussion Paper Series

Short- and Medium-run Impacts of Management Training: An experiment in Vietnam and Tanzania

Yuki Higuchi*
Associate Professor, Nagoya City University
Graduate School of Economics
1, Yamanohata, Mizuho-cho, Mizuho-ku, Nagoya-city, 467-8501, Japan
e-mail: higuchi@econ.nagoya-cu.ac.jp

Edwin Paul Mhede
Deputy Permanent Secretary
Ministry of Industry, Trade, and Investment, Dodoma, Tanzania

Vu Hoang Nam
Associate Professor
Foreign Trade University, Hanoi, Vietnam

Tetsushi Sonobe
Professor/ Vice President
National Graduate Institute for Policy Studies, Tokyo, Japan

*corresponding author

The Melco Foundation

Nagoya, Japan

Short- and Medium-run Impacts of Management Training:
An experiment in Vietnam and Tanzania

Yuki Higuchi

(Nagoya City University, Nagoya, Japan)

Edwin Paul Mhede

(Ministry of Industry, Trade, and Investment, Dodoma, Tanzania)

Vu Hoang Nam

(Foreign Trade University, Hanoi, Vietnam)

Tetsushi Sonobe

(National Graduate Institute for Policy Studies, Tokyo, Japan)

We conducted a randomized controlled trial of management training in industrial clusters in Vietnam and Tanzania, collecting baseline and follow-up data over the span of four years with negligible incidence of attrition. The data reveal that the training intervention improved the management practices of the treated firms, and that the impact remained significant two to three years after the intervention. Moreover, the initially insignificant impacts on value added became significant later in the study.

1 Introduction

Firms producing similar or related products tend to be located near one another, a phenomenon referred to as firm agglomeration. Areas with this firm agglomeration are called industrial clusters. While there are eye-catching clusters, such as the IT industries in Silicon Valley and Mumbai, the majority of industrial clusters are local and obscure. In reality, the vast majority of firms, both in the developed and developing worlds, are located in industrial clusters because they can take advantage of the various benefits of agglomeration economies (e.g., Atkin et al., 2017; Fujita, Krugman, & Venables, 1999).

Based on a number of case studies in Asia and Africa, Sonobe and Otsuka (2011) found that most firms in developing countries are indeed located in industrial clusters, and there are both successful clusters and failed ones. They found that it is most likely the managerial capacity of entrepreneurs that determines success. A capable entrepreneur introduces advanced technology by borrowing it from nearby cities or neighboring countries and instructs and motivates workers to produce upgraded products. A cluster with no such entrepreneur will continue to maintain the status quo, their products will eventually become old-fashioned, and the cluster will disappear.

In another strand of literature, Bloom and van Reenen (2007) developed a management score and found that managerial capacity is limited in developing countries based on data collected from thousands of firms around the world. To improve managerial capacity, several randomized controlled trials (RCTs) have been conducted to provide management training in developing countries. According to a survey of management training RCTs by McKenzie and Woodruff (2014), experimental training programs did indeed improve the management score of treated firms, but the evidence on the impact of such training on business performance is limited. Further, researchers have yet to arrive at a consensus on why the training impacts on business performance are limited. Are they due to inadequately designed training programs, too early assessment of training impacts, or knowledge spillovers from training participants to non-participants?

Our study attempts to integrate these two strands of literature by conducting RCTs on management training in industrial clusters. Our research question are whether management training improves the managerial capacity of firms in industrial clusters, whether it increases business performance, and as a result, whether it leads to dynamic development in these industrial clusters. Since our ultimate goal is to prescribe an effective policy toward income generation in developing countries, we are interested in evaluating training impacts in labor-intensive industries, in which developing countries have comparative advantages. Hence, we provided management training in labor-

intensive garment industrial clusters in Vietnam and Tanzania (Higuchi, Nam, & Sonobe, 2015; Higuchi, Mhede, & Sonobe, 2019).

2 Study Sites

The garment cluster in Tanzania is located in the country's largest city, Dar es Salaam, and has more than 700 garment producers, including the self-employed. We randomly selected 113 firms out of the 250 members of three major associations of garment firms. They mostly supply their products to the domestic market and occasionally export to neighboring countries by participating in trade fairs (Higuchi, Mhede, & Sonobe, 2019). In Vietnam, the study site is located on the outskirts of the capital city, Hanoi. It contains numerous subcontractors, but they are not included in the sample. Instead, the sample covers all 161 final product producers in the cluster. They supply their products to the domestic market, and a few of them export to Eastern Europe as well (Higuchi, Nam, & Sonobe, 2015).

Conducting an RCT of management training in an industrial cluster has both advantages and disadvantages. A major advantage is that the sample firms face the same prices for products, factors, and intermediate inputs, and have the same access to infrastructure because they produce the same products in geographical proximity to one another. This reduces heterogeneity among the sample firms, thereby facilitating statistical inference.

A major disadvantage is that imitation is rampant in industrial clusters. Management practices and business performance might improve even for those firms that did not receive training, which would lead to an underestimation of training impacts unless a special method of impact evaluation, such as the one proposed by Baird, Bohren, McIntosh, and Özler (2014), is applied. Having said that knowledge spillovers make impact evaluation difficult, we note that such spillovers have a positive effect, making the social benefit of training greater than its private benefit; this warrants further research on management training in industrial clusters. Although there is suggestive evidence for the existence of spillovers, we have not applied any special method in this paper, and hence, our results are likely to understate the impacts.

3 Experiments

Table 1 shows the sample size, the average number of employees, and other data on our sample firms. Typical firms in the Tanzania study site employ about 5 workers,

while the firms in Vietnam employ about 20 workers. When a firm has no employees, business owners must know about self-management, financial management, and marketing. When a firm has many employees, owners need to know how to coordinate the division of labor as well. Thus, our experimental training programs covered not only basic accounting, marketing, and business strategy, as often adopted in the existing studies, but also elementary training in *Kaizen* management. *Kaizen* is an approach to production management and quality control, aimed at improving coordination among workers.

In both study sites, the training programs consisted of two components: one offered classroom lectures for about 45 hours, and the other sent trainers to participants on several occasions to provide coaching tailored to the respective firms. In each site, the sample was randomly divided in half, and one-half was invited to participate in the classroom training component. Then, independently of this, the sample was randomly divided in half again, and one-half was invited to participate in the on-site training component. We refer to those firms that were invited to either one component or both as the treatment group and those that were not invited to either component as the control group. The two groups in each study site differ in the baseline average firm size in terms of value added due to some outliers and the small sample sizes, but the difference is not statistically significant (see the *p*-values reported in columns 3 and 6).

After the training programs were implemented in 2010, follow-up surveys were conducted twice in Vietnam and thrice in Tanzania from early 2011 through early 2014. As shown in Table 1, the incidence of sample attrition was low, probably because the sample firms were sufficiently large to survive and because even the control group continued to cooperate with our repeated surveys, expecting to participate in an advanced training program that we plan to provide in the future.

4 Major Results

An outcome variable of interest is the management score, or the number of good practices adopted by a firm. It was constructed based on enumerators' visual inspections and personal interviews with the owners/managers of the sample firms.[1] In both sites, as shown in Table 1, the treatment and control groups share about the same baseline scores, but their scores diverged from the first follow-up survey onwards (see the *p*-values for the difference in the changes from the baseline level reported in columns 3 and 6). The

---

[1] The score ranges from 0 to 27 in Tanzania and 0 to 30 in Vietnam, reflecting differences in training content.

control group's average score increased from the baseline through the second follow-up survey, suggesting knowledge spillovers from the treatment group to the control group.[2] In Tanzania, the management scores at the third follow-up survey were lower than at the second, indicating that the firms stopped using some practices that they had adopted earlier. Still, the *p*-value shows that the difference in changes from the baseline is significant.

Another interesting variable is the annual value added, which is defined as sales revenue minus the costs of materials, electricity, other intermediate inputs, and subcontracting. In both sites, the product markets worsened throughout the post-training period, mostly because of competition with imported goods, and the average value added declined substantially for the control group. In Tanzania, it continued to decline even for the treatment group, although the magnitude of decline is smaller among the treated firms. Table 1 shows that the difference in changes from the baseline level was initially small and insignificant, but it became significant at the 5 percent level in 2012 in Vietnam and in 2013 in Tanzania.[3]

The bottom two rows of Table 1 show the fraction of firms that were willing to pay the local currency equivalent of 150 USD for training participation. The fraction was very low in Vietnam, indicating that few business owners in this cluster knew the value of learning about management. Consistently, there were many firms that were invited to the training program free of charge but did not participate in it. In Tanzania, the fraction of willing firms was much higher and reached the upper bound after the training intervention. Indeed, the take-up rate was nearly 100 percent. The firms in this cluster were more willing to learn, probably because some successful entrepreneurs had started their businesses after participating in business training programs provided by international organizations and NGOs. In addition, the increased willingness to pay in the control group suggests that the training was favorably received by non-participants due to knowledge spillovers.

5 Conclusion

This study presents new evidence indicating that, while management training can increase not just management scores but also value added or firm income, it takes a few years to

---

[2] As additional direct evidence of spillovers, we have data on conversations between sample firm owners about the training content.

[3] The results of a more rigorous evaluation are reported in Higuchi, Nam, and Sonobe (2015) and Higuchi, Mhede, and Sonobe (2019).

experience a significant impact on incomes. The majority of firms are located in industrial clusters, where knowledge tends to spill over, and they may not know the value of learning about management. Such ignorance and spillovers, together with the favorable training effects, suggest a need for policy intervention and, hence, warrant a considerable compilation of future research.

References

Atkin, D., Chaudhry, A., Chaudry, S., Khandelwal, A. K., Raza, T., & Verhoogen, E. (2017). On the origins and development of Pakistan's soccer-ball cluster. *World Bank Economic Review*, 30, s34-s41.

Baird, S., Bohren, A., McIntosh, C., & Özler, B. (2014). Designing experiments to measure spillover effects. *World Bank Policy Research Working Paper*, 6824.

Bloom, N., & van Reenen, J. (2007). Measuring and explaining management practices across firms and countries. *Quarterly Journal of Economics*, 122(4), 1341-1408.

Fujita, M., Krugman, P. R., & Venables, A. J. (1999). *The Spatial Economy, Cities, Region and International Trade*. Cambridge, Massachusetts: MIT Press.

Higuchi, Y., Mhede, E. P., & Sonobe, T. (2019). Short- and medium-run impacts of management training: An experiment in Tanzania. *World Development*, 114, 220-236.

Higuchi, Y., Nam, V. H., & Sonobe, T. (2015). Sustained impacts of *Kaizen* training. *Journal of Economic Behavior and Organization*, 120, 189-206.

McKenzie, D., & Woodruff, C. (2014). What are we learning from business training and entrepreneurship evaluations around the developing world? *World Bank Research Observer*, 29(1), 48-82.

Sonobe, T., & Otsuka, K. (2011). *Cluster-Based Industrial Development: A Comparative Study of Asia and Africa*. New York, New York: Palgrave Macmillan.

Table 1. Sample Size, Management Score, and Value Added by Treatment Status

	Vietnam			Tanzania		
	(1)	(2)	(3)	(4)	(5)	(6)
	Treated	Control	*p*-value	Treated	Control	*p*-value
Number of observations						
Baseline (early 2010)	107	54	-	81	32	-
1st follow-up (early 2011)	107	54	-	81	32	-
2nd follow-up (late 2012/early 2013)	102	46	-	78	32	-
3rd follow-up (early 2014)	-	-	-	75	30	-
Baseline number of workers	17.2	22.4	(0.37)	5.4	4.8	(0.37)
(mean of 2008 and 2009)						
Management Score						
Baseline	13.4	13.3	(0.89)	10.9	10.3	(0.36)
1st follow-up	17.1	13.9	[0.00]	16.5	12.8	[0.00]
2nd follow-up	19.2	15.0	[0.00]	20.1	17.5	[0.05]
3rd follow-up	-	-	-	16.5	13.1	[0.00]
Value added						
Baseline (mean of 2008 and 2009)	171.8	292.6	(0.15)	16.7	27.6	(0.13)
2010 (2010 was the training year)	181.1	196.2	[0.28]	26.7	32.4	[0.52]
2011	-	-	-	22.2	25.4	[0.18]
2012	186.0	96.9	[0.03]	17.2	13.3	[0.06]
2013	-	-	-	18.4	13.1	[0.04]
Willingness to pay (yes = 1)						
Baseline	0.23	0.11	(0.06)	0.68	0.71	(0.82)
1st follow-up	0.53	0.13	[0.00]	1	1	[0.82]

Notes: The *p*-values in parentheses are for the *t*-tests of the null hypothesis that two groups share the same mean. The *p*-values in brackets are for the *t*-tests of the null hypothesis that the difference in changes from the baseline between two groups is zero. Management score ranges from 0 to 27 in Tanzania and 0 to 30 in Vietnam. Value added is expressed in terms of PPP-adjusted 1,000 USD. We assume that closed firms have zero value added.