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Abstract

Many observational studies of micro and small enterprises have found that enterprise performance and education levels of entrepreneurs are positively associated. Does it follow that entrepreneurs' management capacities depend on their academic achievements? This paper examines what types of entrepreneurs participated in a managerial training program held in Ethiopia, who benefited more from the program, and who had better management knowledge before the program. We find that highly educated entrepreneurs were more willing to learn about management, more knowledgeable about management, and gaining more from the training program, but that such simple relationships are missing among entrepreneurs operating larger enterprises.

JEL No. O12, O15, M13, L2

Keywords: Africa, Ethiopia, education, management practices, management training

1. Introduction

The influential management consultant and writer, Peter Drucker (1985, p. 14) writes, “it . . . became increasingly clear, during this period [after World War II], that the development of management and managers in most of the developing countries was not proceeding fast enough to generate adequate development, especially in view of the explosive growth of population.” Recently, Bloom and Van Reenen (2010, p. 204) have “undertaken a large survey research program to measure management practices systematically across firms, industries, and countries” to provide empirical evidence for the view that persistent differences in productivity at the firm and the national level “largely reflect variations in management practices.” These views are supported firmly by the results of randomized experiments recently conducted in developing countries by 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), to name a few. That is, these experiments have found that managerial practices matter to business performance, that the vast majority of sample enterprises are managed poorly, and that managerial practices can be taught to entrepreneurs. These results suggest that it is desirable to transfer management knowledge from developed and emerging countries to developing countries.

As Bruhn *et al.* (2010, p. 632) argue, however, “much remains to be learned about the operational practicalities of teaching managerial skills.” Relevant questions include who wants to learn managerial skills. A possible answer to this question is that those entrepreneurs who are likely to benefit more from a learning opportunity are more willing to seize the opportunity. In their training experiment, however, Karlan and Valdivia (2011) find that entrepreneurs who were initially less willing to participate in a training program tended to benefit more from the program. Thus,

some forces are interacting here in an unknown manner. A related question is who have better management skills. Bloom and Van Reenen (2010) find among other things that the quality of management practices is strongly correlated with the education level of plant managers and workers in a cross section of medium-sized enterprises in high-income countries and emerging economies. Whether this finding holds true for entrepreneurs in low-income countries is an open question.

This paper attempts to answer these questions by using enterprise data collected before and after a management training program for small business owners in the garment industry in Addis Ababa, Ethiopia. Following the lead of Bloom and Van Reenen (2007, 2010), we measure the management practices of these entrepreneurs and examine whose managerial practices were better before the training program. However, unlike management training programs mentioned earlier, ours is not a part of a randomized controlled trial; rather it allowed all the interested entrepreneurs in our baseline survey sample to participate in the training, with a view to examining the mechanism of self-selection into management training participation in the sample of entrepreneurs generally indifferent to it. We also examine the characteristics of entrepreneurs who manage enterprises more solidly. Although the impacts of the program are difficult to measure because of the self-selection problem, we also attempt to examine the heterogeneous effects of the training on the adoption of management practices and business performance among entrepreneurs with different levels of education and other characteristics.

Bjorvatn and Tungodden (2011) use randomized experiment data of microfinance clients in Tanzania to inquire into the determinants of entrepreneurs' self-selection into participation in a business training program and heterogeneous effects of the training. Mano *et al.* (2012) use randomized experiment data of micro

and small metalworking enterprises in Ghana to examine the heterogeneous effects of a business training program. The findings of these experiments are consistent with the set of hypotheses that highly educated entrepreneurs are more willing to learn management practices, can absorb more knowledge from a learning opportunity, and manage their enterprises better than less educated entrepreneurs. A question arises, however, as to whether these findings obtained from data on microenterprises hold true for larger enterprises. Our sample of garment entrepreneurs includes both tailors and those operating readymade garment (RMG) factories.

We find that management scores are positively and strongly correlated with entrepreneurs' education levels among tailors, who have primary or secondary education, and between tailors and RMG entrepreneurs, who have secondary or tertiary education, but that such a correlation is not found among the RMG entrepreneurs. Similarly, straightforward results concerning training effects obtained among tailors do not hold true if RMG entrepreneurs are included in the analysis. However, participation in the training program is found to be strongly correlated with education levels among tailors, RMG entrepreneurs, and both. Another finding is that tailors operating in a larger and denser shopping area tend to have lower management scores.

In Section 2, we review relevant strands of the literature to further motivate our empirical inquiry. Section 3 describes the sampling scheme, the contents of the management training program, and basic statistics. Section 4 presents the empirical results, and Section 5 concludes.

2. Managerial Capital and Human Capital

Baumol *et al.* (2009, p.712) define entrepreneurs as individuals who demonstrate, in their economic activities, “initiative, imagination and willingness to expend effort in the pursuit of wealth, power, and prestige.” In many low-income economies, most enterprises are very small in terms of employment size and revenue and seldom achieve sustainable growth in productivity. While the owners and operators of these enterprises may not be demonstrating imagination in their economic activities, the majority of them are the founders of their enterprises, which indicates that they have demonstrated initiative. In this paper, for simplicity, we refer to owners of garment manufacturing businesses including tailor shops as entrepreneurs, whether or not they are the founders of their businesses.

In the United States, “entrepreneurs are better educated than the set of all adults” (Baumol *et al.*, 2009, p.723). In Sub-Saharan Africa, entrepreneurs are better educated than the set of all adults, as the studies by McPherson (1996), Ramachandran and Shah (1999), Mengistae (2001), and Sonobe and Otsuka (2011) among others attest. Unlike in the United States, however, few entrepreneurs hold MBA in Sub-Saharan Africa, even though local business schools are proliferating. Vocational schools and polytechnics in this region seldom or never teach management. Nonetheless, these observational studies of enterprise size and growth in Africa commonly find that employment size, employment growth, revenues, and enterprise survival are positively associated with the number of years of schooling of the entrepreneur. A possible interpretation of these common findings is that entrepreneurs’ education levels represent their financial abilities because persons from affluent families tend to be well educated.

In this paper, we present evidence for another possible explanation of why educated entrepreneurs have higher capacity for learning management practices than

less educated entrepreneurs. It is plausible that they can obtain ideas of good management from participating in short-term training programs, such as those in bookkeeping provided by NGOs and foreign aid agencies, and from reading books and magazines better than less educated entrepreneurs. If this is the case, they may be more willing to seek further opportunities for learning. Thus, a simple set of hypotheses are that more highly educated entrepreneurs seize more opportunities for learning management practices, absorb more knowledge from the same learning opportunity, and manage enterprises better than less educated entrepreneurs.

Of course, there are several factors that are not considered in the above discussion but which may strengthen or weaken the positive association between the education and managerial capabilities of entrepreneurs. First, the opportunity cost of participating in a training program may be higher for entrepreneurs of larger enterprises, to the extent that they are busier than microentrepreneurs. Since larger enterprise entrepreneurs tend to be educated more, this opportunity cost will weaken the association between education and learning management practices. Second, while highly educated entrepreneurs managing larger enterprises may be knowledgeable about advanced management practices, they may not be able to adopt such practices because it may be difficult to make middle managers and workers understand them. Thus, if entrepreneurs with high and low educational backgrounds differ in management knowledge, they may not differ significantly in management practices. Third, the present-bias effect, as discussed by O'Donoghue and Rabin (1999) and others, may influence whether entrepreneurs participate in a training program and whether they put the knowledge gained into practice. As Bloom and Van Reenen (2010) suggest, motivation to adopt new management practices may also be affected by overconfidence or complacency. Fourth, there may be uncertainty and ignorance

of the value of learning and adopting modern management practices. To the extent that this problem is less serious among highly educated entrepreneurs, they will have a higher propensity to participate in a management training program than less educated entrepreneurs.

In Bjorvatn and Tungodden's (2011) randomized experiment, the subjects were Tanzanian microfinance clients with about 8 years of schooling, and participants attended on average 15.9 out of 21 classroom training sessions, each lasting 45 - 60 minutes. Higher attendance rates were recorded by participants with higher education, high math skills, and smaller loan sizes and by elder participants. Probably, smaller loan sizes represent smaller business sizes and lower time costs. The impact of the training participation on management knowledge was stronger for participants with lower levels of education and higher levels of math skills, even though this result is not straightforward to interpret because math skills and education would be correlated with each other. In the randomized experiment conducted by Mano *et al.* (2012), the subjects were Ghanaian metalworking entrepreneurs with 10.4 years of schooling on average, and virtually all the entrepreneurs in the treatment group participated in the program and attended almost all the 15 lectures provided, each lasting 2.5 hours. Thus, these authors do not analyze the factors associated with participation and attendance, but they find that the training improved more the business practices of more educated participants.

These findings obtained from experiments involving microenterprises are more or less consistent with the simple hypotheses mentioned above – namely, that more educated entrepreneurs manage better, are more willing to learn management, and benefit more from training. A question arises, however, as to whether these findings can be extrapolated to larger enterprises and more highly educated entrepreneurs. It is

likely that entrepreneurs with tertiary or higher education will be more knowledgeable about advanced management practices that are standard in developed countries, than entrepreneurs who are secondary education dropouts. The former, however, may not adopt such practices and may operate enterprises in the same way as the latter type of entrepreneurs for various possible reasons including high opportunity costs, complacency, procrastination, and overconfidence. If this is the case, there will be no knowledge spillovers from the former to the latter, and from abroad to the industry in question. If this is not the case, the industry will grow in productivity and in enterprise size as well as in the number of enterprises. Thus, we are curious as to whether education and managerial capabilities are correlated not only among entrepreneurs with elementary or secondary education but also among those with secondary or tertiary education.

III. Training Program and Basic Statistics

In Addis Ababa, Ethiopia, there are a few clusters of tailor shops, which usually have inventories of rolls of cloth and produce Western-style suits and dresses for individual customers. Most tailors are self-employed artisans and employ only a few workers. Their quality control, marketing, and financial management, if any, are done on ad hoc bases. Thus, they are similar to microentrepreneurs in other low-income economies as described by de Mel *et al.* (2009) and Udry and Anagol (2006).

In the city, there are also readymade garment factories producing suits, sportswear, and other garments. Including a few former state-owned factories, 14 factories are exporting or attempting to export garment items to developed countries. Many of them are located in industrial areas. The remaining 21 readymade garment enterprises produce both readymade and tailor-made items for domestic consumers

and do not export any products abroad. Among them, seven are owned and operated by entrepreneurs who started their careers as tailors, including an entrepreneur owning and operating the largest readymade garment enterprise in the country. The non-exporting enterprises keep retail shops in shopping areas, where tailor shops are clustered, even though some have factories in industrial areas like the export-oriented enterprises. The smallest readymade garment enterprise is smaller than some tailors in terms of employment size. Thus, there are continuities between tailors and entrepreneurs of readymade garment factories.

In June 2007, we enumerated both types of garment producers, while excluding those self-employed sewers providing repairing services only, those working as subcontractors for merchants, and those specializing in traditional Ethiopian costumes. We found 667 tailors and 35 readymade garment factories and collected detailed data on production and costs, employment, and entrepreneurs' backgrounds from 138 randomly selected tailors and all the 35 readymade garment factories.

In October 2008, these 173 sample enterprises were informed by our enumerators that the Japan International Cooperation Agency (JICA) planned to provide a management training program for them free of charge, and that they were invited to an introductory workshop that explained the training aims. However, only about 50 entrepreneurs attended the workshop, and the training was offered to only 39 interested entrepreneurs. Such indifference to management training is in stark contrast to the strong interest reported by Mano *et al.* (2012) in Ghana.

The training program was offered by Japanese and local consultants employed by JICA for 24 weekdays in November and December 2008, each session lasting 2.5 hours from 5:30 in the evening, so that the entrepreneurs' opportunity cost of attending the training would be kept at a minimum. The training mainly relied on

classroom lectures, which were problem-centered and participatory with various demonstrations such as case studies and visual aids used frequently. The training contents were divided into three modules: an introduction to entrepreneurship and marketing, an introduction to production management, and an introduction to financial management. These modules were prepared in English and translated by a local interpreter into Amharic. Because of the translation, trainers and trainees sometimes had difficulty in making themselves understood, but the 39 trainees attended more than two thirds of the 24 sessions and, thus, they are regarded as participants. Their average attendance rate was 85% or 20.4 out of the 24 sessions provided. This high attendance rate suggests that the participants were not much disappointed at the program.

A follow-up survey of the 173 enterprises in the baseline survey sample was conducted a year later in October 2009. Data were collected from 151 enterprises. The remaining 22 enterprises were not operating at the addresses that we obtained in the baseline survey, but we found that 16 of these enterprises had completely closed down their businesses and changed their trade. These 22 enterprises are all non-participants, whereas there was not a single training participant who closed his or her shop or factory. A possible interpretation is that the training helped participants' business longevity, but because of the self-selection into the training participation, it is also possible that enterprises with higher survival probabilities participated in the training. In the tables shown below, we report only the results of descriptive and regression analyses which use the sample of the 151 enterprises, except for Table A1. The larger sample of the 173 enterprises could be used in the analysis of the participation, but the results are not qualitatively different from the ones shown below.

Table 1 presents the basic characteristics of the sample enterprises by participation status. Because of the self-selection, participants and non-participants differ significantly in years of schooling, the experience of participating in a business or vocational training program, and whether the entrepreneur is a founder of the current business, as shown in columns (1) and (2), which summarize the data of both tailors and RMG entrepreneurs. Columns (3) and (4) show the data of tailors, and the qualitative results of the *t*-test on the difference in means shown in these columns are the same as those in columns (1) and (2), reflecting the fact that tailors constitute a majority of the whole sample. Thus, among tailors, participants tend to have higher education, are more likely to have attended a training program in the past, and are more likely to be a founder.

Columns (5) and (6) of Table 1 show the data on readymade garment (RMG) entrepreneurs and their enterprises. Their average education level, which is about 15.2 years of schooling, is far higher than that of the tailors. Moreover, it is comparable to the education level of entrepreneurs in the export-oriented cut-flower industry, probably the most dynamically growing industry in Ethiopia, in which many entrepreneurs are foreigners (Mano *et al.*, 2011). It is also comparable to the education level of world-class garment entrepreneurs: the average number of years of education is 15.0 in the knitwear industry in Bangladesh, one of the largest exporters of knitwear items in the world, and 7.5 in the garment industry in Zhili, China, one of the largest clusters of baby clothes producers in the world, according to Mottaleb and Sonobe (2011) and Sonobe *et al.* (2002), respectively.

Other major differences between the tailors and RMG entrepreneurs in our sample are found in the prior experience in working at a factory and in location. While 12 RMG entrepreneurs had worked as factory managers in the past, 10 tailors

had worked as sewers in garment factories before they became self-employed tailors. The largest cluster of tailor shops is Addis Ketma, also called Marcato, where 33 tailors in our sample are located, followed by Arada, where 27 tailors are located. In these major clusters, a majority of the RMG enterprises have retail shops, but only six have headquarters. Nifas Silk is an industrial area where 10 RMG enterprises have factories but there are no tailors.

Table 2 presents the data on management knowledge, management practices, and business performance by participation status and enterprise type. The management knowledge score is the number of correct answers to four questions about standard management practices.¹ Our measures of management practices are very primitive, compared with Bloom and Van Reenen's (2007, 2010) measures. Since many tailors employ only a few workers, and since all transactions and productive activities occur in front of them, they can almost perfectly monitor workers' behaviors and directly control transactions and production with little awareness of management. In their small organizations, there is no room for promotion and no need for coordination among sections. Thus, many questions relevant to RMG entrepreneurs are irrelevant to many tailors. We selected 22 yes-no questions about 22 basic practices based on three criteria: they must be easy to understand for every entrepreneur; they must be relevant to not only RMG entrepreneurs but also some tailors; they must be so straightforward that our enumerators can visibly and quickly confirm that the entrepreneurs' answers are true. These 22 questions are classified into 6 questions about marketing and housekeeping

¹ The sample entrepreneurs were requested to choose the most appropriate answer from two choices. Two of the questions dealt with basic accounting concepts while the remaining two asked about the entrepreneur's responses to hypothetical business situations.

and 16 questions about record-keeping.² We added a question as the 23rd question, which is about planning based on records, even though it is not possible to confirm whether this practice is actually adopted. Table 2 also shows the data on accounting-based measures of performance, such as sales, value added, gross profits, the number of sewing machines regularly used, and the value added per worker.³

Six observations from Table 2 are noteworthy. First, RMG enterprises have much larger enterprise sizes in terms of sales, value added, and the number of machines. Particularly large are the few successful RMG enterprises focusing on the domestic market and the export-oriented RMG enterprises including former state-owned enterprises. None of the entrepreneurs of these RMG enterprises participated in the training program. Second, these large RMG enterprises do not differ from the tailor shops in the value added per worker. Third, while the RMG entrepreneurs and tailors share similar scores for business knowledge, they differ greatly in management practice scores, especially prior to the training program. Fourth, among microenterprises (that is, tailors), those with higher management practice scores and greater enterprise sizes tended to participate in the training program, whereas among small and medium enterprises (that is, RMG enterprises), those with lower management practice scores and smaller sizes tended to participate. Fifth, the participants recorded greater increases in management practice scores than the non-participants, but the accounting-based measures did not follow this pattern. Finally, the participants who are RMG entrepreneurs showed little improvement in the record-

² We asked whether the entrepreneur keeps records on 16 transaction items; 7 questions were asked on sales transactions, 7 on purchase transactions and 2 on levels of inventory. For example, if an entrepreneur keeps records on the inventory of semi-processed and finished goods, he/she will receive a score of 2 on the latter category.

³ Value added here is measured by subtracting material cost and utility cost and transportation cost from sales revenue. Gross profit is measured by subtracting labor cost from this value added.

keeping score, which suggests that the training contents were too rudimentary even for them, let alone for the entrepreneurs of the larger RMG enterprises.

IV. Linking participation, practices, and training effects to education

In this section, we will combine the data shown in Tables 1 and 2. By doing so, we would like to link the training participation, the management practice scores (prior to the training), and the training effects on the management practice scores and business performance to the education level of the entrepreneurs and other factors.

Participation

Table 3 presents the estimates of a probit model of the training participation, which links the entrepreneur's participation decision to his or her background characteristics and enterprise location, even though the coefficients on the location variables are not reported in the table. Columns (1), (2), and (3) show the results for the sub-sample of tailors, the sub-sample of RMG entrepreneurs, and the full sample, respectively. In columns (1) and (3), two variables have highly significant coefficients: the years of schooling and the dummy variable indicating that the entrepreneur is the founder. The coefficients on these variables in column (2) are not statistically significant, but they are positive and greater than their counterparts in columns (1) and (3), and their z -statistics are greater than unity. Thus, if the RMG sub-sample were as large in the sample size as the tailor sub-sample, these coefficients for the RMG entrepreneurs could be positive and significant. The coefficient on the number of sewing machines is negative and highly significant in column (3), which suggests that entrepreneurs operating larger enterprises tend to have higher opportunity costs.

The positive coefficient on the education variable suggests that more highly educated tailors are more interested in participating in the management training program. This may be because education helps entrepreneurs understand how useful the management training program is, or because education helps entrepreneurs learn and benefit more from the program.

Turning to the RMG entrepreneurs, the positive coefficient on education, though not significant, is somewhat strange in view of the fact that the program offered only rudimentary training. Why did they attend classes patiently for about three weeks? The image of the RMG participants emerging from our interviews with them is that of relatively highly educated entrepreneurs whose enterprises are dwarfed by the few, much less educated entrepreneurs' successful RMG enterprises focusing on the domestic market. This image is consistent with the data and estimates shown in Tables 1, 2, and 3. These entrepreneurs' frustration with their business performance might have motivated them to participate in our management training program.

The positive and significant coefficient on the founder dummy suggests that self-made entrepreneurs value learning opportunities highly or that they find it profitable to acquire systematic knowledge of management. As we will see in Table 5 below, the tailors who founded their shops tend to earn relatively high management practice scores, but the RMG entrepreneurs who founded their enterprises tend to earn relatively low scores. Thus, we see consistent patterns: among the tailors, relatively highly educated and high performing entrepreneurs tended to participate in the training program, whereas among the RMG entrepreneurs, relatively "weak" ones with high education but less experience and small enterprise sizes tended to be participants. A common thread is the relatively high education, which seems to have

led these entrepreneurs to think that leaning management skills might improve their business.

Knowledge

Table 4 links management knowledge to the characteristics of the entrepreneur and enterprise. The data on management knowledge are available only for the post training period. We could apply OLS to the management knowledge score, which is the sum of their correct answers to the four questions, but Table 4 reports the estimates of the ordered-logit model taking it into account that scoring 4 points, for example, is not necessarily twice as good as scoring 2 points. The OLS estimates and the estimates reported in Table 4 are qualitatively the same. Because the participants have substantially better knowledge about management after the training program than the non-participants, as shown in columns (2) and (4) of Table 2, Table 4 divides the sample and sub-samples into non-participants and participants, even though participation status is not exogenous. An exception is column (4), which shows the result for the RMG sub-sample but not for the RMG participants because the latter sub-sub-sample lacks sufficient degrees of freedom.

According to columns (1) and (2), more highly educated tailors, regardless of participation status, have better knowledge of management. The greater coefficient on education in column (2) suggests that although the program offered rudimentary training, more highly educated participants learned more than less educated participants. This point will be confirmed later with Table 7 below. The comparison between columns (1) and (2) also suggests that while tailors without prior experience in the garment business are at a disadvantage, participation in the training program makes up for the disadvantage, and that while tailors operating in the large clusters,

such as Addis Ketma and Arada, are less knowledgeable, training participation makes up for this disadvantage as well. We are still trying to understand the result that the dummy variable indicating whether the entrepreneur's father received formal education has a negative coefficient in column (2).

The results shown in columns (3) and (4) are in sharp contrast to those in columns (1) and (2). The years of schooling has a negative and insignificant coefficient in (3) and (4) indicating that RMG entrepreneurs' knowledge scores are not associated with their education levels. Column (3) indicates that older entrepreneurs and entrepreneurs who came from the outside of the garment industry are more knowledgeable, and column (4) suggests that participation in the training program mitigated the disadvantage of younger entrepreneurs who came from the garment industry to some extent. The positive and significant coefficient on the father's education variable in column (4) is as mysterious as the negative and significant coefficient on the same variable in column (2).

The coefficient on the dummy variable indicating whether the entrepreneur used to work at a factory as a worker or a middle manager is negative and insignificant in columns (1) to (4). It is negative and significant in column (5), indicating that such an entrepreneur is less knowledgeable about management, but the smaller (in absolute terms) and insignificant coefficient on the same variable in column (6) suggests that this disadvantage is somewhat mitigated by training participation.

Column (5) also indicates that the knowledge score is relatively low for entrepreneurs who operate in the largest cluster of tailor shops, Addis Ketma, or the industrial area for relatively large light-industry enterprises, Nifas Silk. Since locational choice is endogenous to management knowledge, we cannot take these

results at face value, but they suggest that localization economies help the survival of entrepreneurs with poor knowledge in clusters.

Practices

We turn now to the question of whether to know and to put knowledge into practice are different. Table 5 presents the estimated tobit models of the marketing and housekeeping score and the record-keeping score and an estimated probit model of whether business plans are made based on records. As seen at the bottom of columns (1) and (4), almost half of the tailors scored zero regarding marketing and housekeeping, whereas more than one third of the RMG entrepreneurs had perfect scores in the same category. This is the reason why we use the tobit specification, but the qualitative results do not differ from those obtained from OLS.

As shown in columns (1) to (3), the tailor's management practice scores increase with their education level, and their prior experience in the garment industry helps them score high in marketing and housekeeping. By contrast, as shown in columns (4) to (6), the RMG entrepreneurs' marketing and housekeeping scores do not increase with their education level, and their prior experience in the garment industry is negatively associated with the management practice scores. These contrasts are similar to the contrast that we have seen about the knowledge score in Table 4.

There is an exception, however: the coefficients on the education variable in columns (2) and (5) of Table 5 are significant and share almost the same magnitudes. Thus, as the education level of the entrepreneur increases from the elementary level to the tertiary level, record-keeping practices at his or her enterprise become more and more meticulous. By contrast, marketing and housekeeping are improved as the

education level increases only for the relatively low education levels but not for the relatively high levels. This is partly because low scorers include highly educated entrepreneurs and partly because high scorers in this category include a few RMG entrepreneurs who are secondary school dropouts. The latter started their careers as tailors and then branched out to RMG manufacturing and mass selling in the local market successfully. In interviews, they said that they were not interested in exporting their products abroad as they were not educated enough to succeed in international business.

At least at the time of our surveys, there were no foreign owned garment manufacturers in Addis Ababa. Although some of the RMG enterprises hire technicians from India and Mauritius for technical guidance and to provide on-the-job training for Ethiopian workers, these foreign technicians are very few in number. Moreover, few entrepreneurs are familiar with the international marketing of garments and international procurement of materials. Highly educated entrepreneurs, especially those of export-oriented enterprises, are not proactive in seeking such expertise. It is little wonder that the export-oriented garment industry in Ethiopia has not been growing rapidly despite the availability of low-wage sewers who are paid only a quarter of the wage paid to their Indian counterparts, according to an Indian technician training these sewers in an RMG enterprise in our sample.

Returning to Table 5, another contrast is found between the tailors and the RMG entrepreneurs: the coefficient on the founder dummy is positive in columns (1) to (3) and significant in column (2), whereas it is negative in columns (4) to (6) and marginally significant in column (6). The latter results for RMG enterprises is reminiscent of Bloom and Van Reenen's (2010) finding from a large sample of

medium-sized enterprises in developed and emerging economies that management scores are lower at firms led by founders.

We also see some similarities between columns (1) to (3) and columns (4) to (5) as to the coefficients on the prior factory experience dummy and the location variables. While both tailors and RMG entrepreneurs who had prior experience of working at a factory tend to be less knowledgeable about management according to Table 4, their practice scores, as shown in Table 5, are not worse than the others' scores and are actually better with respect to RMG entrepreneurs' marketing and housekeeping. Similarly, those located in the large clusters and industrial area tended to be less knowledgeable, but their practice scores are not worse and are in fact better in some cases as the coefficients on the Addis Ketma and Nifas Silk dummies in columns (3) to (5) indicate. Thus, although practices are of course related to knowledge, there seem to be practices not backed by knowledge but rather based on experience and norms in clusters.

Training impacts

Our goal in this subsection is to see how the training effect depends on the education and other characteristics of the entrepreneurs. Since, however, our sample entrepreneurs were not randomly assigned to the treatment and control groups, and since our sample size is small, it is difficult to obtain an unbiased estimate of the treatment effect on the treated. We rely on the fixed-effect model specification, the difference-in-differences propensity score matching (DID-PSM), and the difference-in-differences biased corrected matching (DID-BCM) developed by Abadie and

Imbens (2002), even though these methods are not enough to cope with unobservable time-variant effects.⁴

Tables 6 and 7 present the estimates of the training effects mixed with the confounding effects arising from self-selection into training participation. Table 6 reports the estimates which are the averages of such combined effects across entrepreneurs with different characteristics, while Table 7 reports the coefficients on the interaction terms in the fixed-effects model, which are intended to capture the heterogeneity in such effects. Each table has two panels: the upper panel for the tailor sub-sample and the lower panel for the full sample. The estimate of the training effect on the RMG entrepreneurs is unavailable because of the small size of their sub-sample.

The results shown in Table 6 are, as one would expect, a faithful replica or summary of what one would obtain from the difference-in-difference exercises applied to the before- and after-training data shown in Table 2. That is, the combined effects of training and self-selection in the above sense are positive and highly significant on the marketing and housekeeping score and positive and marginally significant on the record-keeping score and the planning dummy. No effects of the training are found on the accounting-based measures of business performance. The only exception is the number of sewing machines. Since tailor participants tended to invest in sewing machines after the training program (see Table 2), the estimate of the effect on this variable is positive and significant, as shown in column (7), even though

⁴ In addition to the data in the two survey years shown in Table 2, the estimation of the fixed-effect model, of which results are shown in Tables 6 and 7 uses recall data whenever available. The results obtained without using the recall data are fairly similar, however. In the application of DID-PSM, we imposed a common support, following Heckman *et al.* (1998). The results of the balancing tests are available on request to the authors.

the corresponding DID-BCM estimate for the whole sample is negative and significant because some RMG non-participants invested in machinery more drastically.

Table 7 presents the estimated coefficients on the interaction terms, i.e., treatment (Participant \times Year 2009) times characteristics, which are used to capture the heterogeneous effects. Each column of each panel report the coefficients on four interaction terms, but these interaction terms were not included in the same regression but one by one. In the upper panel, which is about the tailors, the positive and significant estimates in columns (1) to (3) and in column (7) indicate that more highly educated participants with higher management practice scores prior to the training benefited more from the training participation. Thus, relatively highly educated and high performing tailors tended to participate in the training program as we have seen in the previous tables, and Table 7 indicates that the relatively highly educated and high performing participants tended to benefit more from the training than other tailor participants.

The RMG participants' heterogeneous effects are not directly estimated. It seems reasonable, however, to infer that the heterogeneous effects of the training on the RMG participants are much weaker or even of the opposite signs, from the fact that the lower panel has much smaller and less significant coefficients than the upper panel. Exceptions are very few in number but include the coefficient on the interaction of education and participation on the marketing and housekeeping score, as shown in column (1). Thus, relatively highly educated participants benefited more from the training than the less educated participants, whether they were tailors or RMG entrepreneurs. In short, among the RMG entrepreneurs, relatively highly educated but poorly performing ones tended to participate in the training program, as

we have seen from the previous tables, and Table 7 suggests that the relatively highly educated and poorly performing participants did not benefit less and possibly benefited more from the training than the other RMG participants.

Finally, as a robustness check, we conducted a non-parametric bounds test to see the impacts of attrition, which occurred only to non-participants. The details of the procedure of this test and the results are shown in the appendix.

V. Conclusions

This paper has obtained findings for micro and small enterprises (MSEs) and those for medium enterprises. We have found that entrepreneurs of MSEs (that is, tailors and small RMG enterprises) are more willing to learn about management and can make better use of a learning opportunity if they are more highly educated. Consistently, we have also found that highly educated MSEs had relatively good management practices before the training program. These findings are consistent with the results of the observational studies of MSE size, growth, and survival in developing countries, mentioned in the earlier sections. Thus, MSE entrepreneurs, especially educated ones, are willing and able to learn about management if they have opportunities to do so.

The medium enterprises (that is, large RMG enterprises) did not participate in our training program, which is not a problem because the training contents we offered would be too rudimentary for them. Our data, however, suggest that these enterprises have a big problem: they have been unsuccessful in the transfer of knowledge, both technical and managerial, from abroad. Medium enterprises in developing countries in general and those seeking to make inroads into export markets in particular need the continual absorption and assimilation knowledge from abroad. Since learning

from abroad is difficult for the uneducated, the role played by highly educated entrepreneurs is quite important, as the experiences of the successfully growing garment industries in Bangladesh indicate clearly (e.g., Rhee, 1990; Mottaleb and Sonobe, 2011). Thus, the education level of entrepreneurs and management scores are expected to be closely correlated, and such an expectation is confirmed firmly by the large data set including enterprises in emerging economies compiled by Bloom and Van Reenen (2010). In our data on medium enterprises in the Ethiopia garment industry, however, management scores and education level are not related. Indeed, their growth performance has been quite poor.

The lack of knowledge transfer from abroad implies the lack of knowledge diffusion within the local industry. This industry in Ethiopia is an example of probably common cases in which while MSEs are willing and able to learn new knowledge, larger enterprises are either unable or unwilling to absorb such knowledge from abroad. In such cases, policy intervention assisting larger enterprises' learning from abroad will have a social benefit greater than the private benefit for the assisted enterprises because their learning from abroad will be followed by spillovers of knowledge into relatively educated MSE entrepreneurs.

Although we have found that less educated MSE entrepreneurs are less willing to learn about management, Karlan and Valdivia (2011) and Bjorvatn and Tungodden (2011) find that if less educated micro entrepreneurs participate in a management training program, they show healthy absorptive capacity. Since such entrepreneurs self-selected into non-participation in our training program, we could not check the relevance of such a finding. However, if it is relevant to various cases, we agree with these authors that it is important to encourage, by such means as campaigns and

microfinance provision, less educated entrepreneurs to take advantage of learning opportunities.

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Table 1. Characteristics of enterprises by participation status.

	Both types		Tailors		RMG	
	Participants	Non participants	Participants	Non participants	Participants	Non participants
	(1)	(2)	(3)	(4)	(5)	(6)
Years of schooling	12.8	10.5	11.9	9.2	15.5	15.1
	(0.76***)		(0.74***)		(1.18***)	
Age of the entrepreneur	41.4	43.8	40.4	42.1	44.1	49.8
	(2.05)		(2.34)		(3.78)	
Years of prior experience in garment business	2.4	2.2	2.7	2.2	1.5	2.2
	(0.67)		(0.71)		(1.73)	
Father received formal education (yes = 1)	0.38	0.31	0.34	0.21	0.50	0.68
	(0.09)		(0.09)		(0.18)	
Prior training experience (yes = 1)	0.38	0.24	0.31	0.15	0.60	0.56
	(0.08*)		(0.08*)		(0.19)	
Entrepreneur is the founder (yes = 1)	0.92	0.73	0.93	0.78	0.90	0.56
	(0.08*)		(0.08*)		(0.17*)	
Prior factory experience (yes = 1)	0.20	0.13	0.07	0.09	0.60	0.24
	(0.07)		(0.06)		(0.17*)	
Located in Addis Ketma (yes = 1)	0.21	0.27	0.24	0.30	0.10	0.16
	(0.08)		(0.10)		(0.13)	
Located in Arada (yes = 1)	0.19	0.19	0.28	0.23	0	0.04
	(0.07)		(0.09)		(0.06)	
Located in Nifas Silk (yes = 1)	0.08	0.08	0	0	0.10	0.36
	(0.05)		(na)		(0.17)	
Number of observations	39	112	29	87	10	25

Notes

Numbers in parentheses are standard errors of the difference in the means (participants – non-participants).

*** p<0.01, ** p<0.05, * p<0.1.

There are 10 sub cities in Addis Ababa. More than 80 percent of the sampled enterprises, however, are concentrated in four of the sub cities, Addis Ketma, Arada, and Nifas Silk.

Table 2. Knowledge, practices, and performance

	Tailors				RMGs			
	Participants		Nonparticipants		Participants		Nonparticipants	
	Before (1)	After (2)	Before (3)	After (4)	Before (5)	After (6)	Before (7)	After (8)
Business knowledge score (max = 4)	na	3.41	na	2.84	na	3.10	na	3.40
Marketing & housekeeping score (max = 6)	1.14	1.79	0.45	0.59	3.10	4.80	4.28	4.80
Record keeping score (max = 16)	7.79	8.55	6.46	6.61	12.4	12.6	14.4	14.4
Planning based on records (max = 1)	0.51	0.55	0.37	0.37	0.49	0.52	0.47	0.47
Accounting-based measures of performance								
Sales (10 ³ birr, per year)	50.1	69.2	22.1	36.2	728.0	669.1	2949.0	4251.5
Value added (10 ³ birr, per year)	32.2	38.0	12.7	22.3	361.0	338.6	1387.0	2000.1
Gross Profit (10 ³ birr, per year)	20.4	25.7	9.13	17.3	210.1	221.1	983.8	1366.0
Number of sewing machines	2.62	3.69	2.09	2.48	32.8	29.0	167.2	178.6
Value added per worker (10 ³ birr, per year)	7.17	7.62	3.80	6.25	13.6	18.3	4.90	8.82
Number of observations	29		87		10		25	

Notes.

na means that data are not available.

Table 3. Estimated probit model of participation

	Tailors	RMGs	Both tailors and RMGs
	(1)	(2)	(3)
Years of schooling	0.17*** (0.06)	0.29 (0.27)	0.21*** (0.05)
Age of the entrepreneur	0.01 (0.02)	-0.02 (0.05)	0.02 (0.01)
Years of prior experience in garment business	-0.01 (0.05)	-0.11 (0.25)	-0.02 (0.04)
Father' s education	0.54 (0.35)	-1.11 (1.43)	0.32 (0.32)
Prior training experience	0.49 (0.35)	-0.34 (1.07)	0.47 (0.31)
Founder	1.24** (0.50)	2.47 (2.15)	1.16*** (0.39)
Prior factory experience	-0.41 (0.60)	-0.26 (1.42)	0.08 (0.41)
Number of Sewing machines	0.05 (0.08)	-0.02 (0.02)	-0.02*** (0.01)
Constant	-4.01*** (1.27)	-5.00 (9.47)	-4.24*** (1.14)
Number of observations	116	35	151

Note. The model includes the three sub city dummies. Standard errors are in parentheses.
 *** p<0.01, ** p<0.05, * p<0.1.

Table 4. Estimated ordered-logit model of management knowledge after training

	Tailors		RMGs		Both tailors and RMG	
	Non-participants	Participants	Non-participants	All	Non-participants	Participants
	(1)	(2)	(3)	(4)	(5)	(6)
Years of schooling	0.16** (0.08)	0.45** (0.22)	-0.13 (0.26)	-0.10 (0.16)	0.10 (0.07)	0.24* (0.14)
Age of the entrepreneur	0.02 (0.03)	0.15 (0.10)	0.22* (0.11)	0.11* (0.06)	0.01 (0.02)	0.05 (0.04)
Years of prior experience in garment business	0.19** (0.08)	-0.17 (0.13)	-0.62** (0.31)	-0.24* (0.13)	0.07 (0.07)	-0.04 (0.10)
Father's education	0.84 (0.59)	-2.25** (1.10)	0.56 (1.46)	1.97* (1.06)	0.92* (0.48)	-0.72 (0.87)
Prior training experience	0.10 (0.62)	-1.08 (0.92)	1.77 (1.24)	0.07 (0.93)	0.41 (0.50)	-1.19 (0.79)
Founder	0.17 (0.67)	-1.05 (1.94)	-1.24 (1.64)	0.13 (1.07)	0.39 (0.52)	-0.94 (1.61)
Prior factory experience	-0.81 (0.80)	-1.15 (1.73)	-2.05 (1.73)	-1.58 (1.21)	-1.37** (0.64)	-0.67 (1.28)
Addis Ketma	-1.30** (0.58)	-1.02 (1.33)	2.65 (2.60)	-0.40 (1.56)	-0.79* (0.47)	-1.59 (1.04)
Arada	-0.81 (0.57)	-0.77 (1.22)			-0.50 (0.52)	-0.72 (1.02)
Nifas Silk				-0.64 (1.04)	-1.67* (0.92)	
RMG					0.89 (0.72)	-2.00 (1.26)
Constant	-2.30 (1.86)	5.49 (4.73)	-2.13 (9.08)	4.28 (4.50)	-2.37 (1.58)	-0.15 (2.96)
Observations	87	29	25	35	112	39

Notes.

Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 5. Estimated models of business practices prior to the training program

	Tailors			RMGs		
	Marketing & housekeeping	Record keeping	Planning	Marketing & housekeeping	Record keeping	Planning
	(1)	(2)	(3)	(4)	(5)	(6)
Years of schooling	0.28*** (0.07)	0.43*** (0.16)	0.11** (0.05)	-0.01 (0.09)	0.45** (0.20)	0.15 (0.15)
Age of the entrepreneur	0.00 (0.02)	-0.07 (0.06)	-0.01 (0.02)	0.05 (0.03)	0.25*** (0.07)	0.12* (0.07)
Years of prior experience in garment business	0.11* (0.06)	0.12 (0.15)	-0.02 (0.04)	-0.17** (0.07)	-0.31* (0.15)	-0.16 (0.11)
Father' s education	0.07 (0.44)	-0.45 (1.15)	-0.22 (0.32)	-0.48 (0.61)	0.84 (1.29)	-0.33 (0.91)
Prior training experience	0.72 (0.45)	0.08 (1.17)	0.60* (0.33)	0.03 (0.52)	1.60 (1.16)	-1.73 (1.08)
Founder	0.30 (0.54)	2.37* (1.40)	0.20 (0.39)	-0.92 (0.58)	-1.61 (1.33)	-1.68 (1.06)
Prior factory experience	0.48 (0.67)	-0.24 (1.80)	0.49 (0.51)	1.24* (0.69)	2.37 (1.50)	0.00 (0.98)
Addis Ketma	-0.67 (0.49)	1.12 (1.21)	0.80** (0.33)	-0.27 (0.89)	7.16*** (2.13)	1.08 (1.59)
Arada	-0.17 (0.48)	-0.32 (1.20)	-0.26 (0.36)	-1.07 (1.48)	4.56 (3.44)	
Nifas Silk				1.21* (0.60)	0.76 (1.25)	-1.08 (0.88)
Constant	-3.19** (1.29)	2.96 (3.22)	-1.36 (0.91)	3.57 (2.41)	-6.78 (5.82)	-4.10 (4.74)
Observations	116	116	116	35	35	34
Right censored	2	1		13	7	
Left censored	56	19		0	1	

Notes. Columns (1), (2), (4), and (5) report estimated tobit models while columns (3) and (6) report estimated probit models. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table 6. Estimates of the combined effects of the training and self-selection

	Marketing & housekeeping (1)	Record keeping (2)	Planning (3)	Sales (10 ³ birr) (4)	Value added (10 ³ birr) (5)	Gross profit (10 ³ birr) (6)	No. sewing machines (7)
<u>Tailors</u>							
Participant dummy × Year 2009 dummy in the fixed-effects model	0.52*** (0.15)	0.61* (0.37)	0.04* (0.02)	0.38 (11.3)	-2.48 (8.50)	-2.28 (8.06)	0.70*** (0.27)
Number of observations	232	232	232	348	348	348	348
Participant × Year 2009 in the FE model after trimming top 5% and bottom 5%	0.58*** (0.16)	0.64 (0.41)	0.04* (0.02)	3.93 (8.67)	3.91 (4.20)	4.68 (3.43)	0.55* (0.29)
DID-PSM	0.23 (0.29)	0.73 (0.51)	0.32 (0.24)	23.9 (24.7)	3.80 (11.3)	6.12 (13.0)	0.88 (0.56)
DID-BCM	0.47** (0.21)	0.70 (0.48)	0.03 (0.03)	16.1 (17.6)	-1.77 (11.7)	1.80 (11.0)	0.84 (0.52)
<u>Both tailors and RMG factories</u>							
Participant dummy × Year 2009 dummy in the fixed-effects model	0.70*** (0.15)	0.49* (0.29)	0.03* (0.015)	-110.4 (358.3)	-62.2 (118.4)	-39.5 (90.1)	-1.70 (4.793)
Number of observations	302	302	302	453	453	453	453
Participant × Year 2009 in the FE model after trimming top 5% and bottom 5%	0.75*** (0.16)	0.53* (0.32)	0.03* (0.017)	66.6 (231.2)	-7.47 (108.2)	-9.79 (86.7)	-0.99 (5.11)
DID-PSM	0.38* (0.21)	0.59* (0.35)	0.17 (0.21)	754.4 (476.8)	151.0 (219.0)	167.1 (269.1)	-13.2 (13.8)
DID-BCM	0.67*** (0.19)	0.54 (0.36)	0.03 (0.02)	113.0 (634.6)	-42.8 (193.7)	16.9 (173.1)	-15.4** (6.14)

Notes.

The samples used to estimate DID-PSM and DID-BCM have 151 observations for both RMG and tailors (in the upper panel) and 116 observations for tailors (in the lower panel). Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7. Fixed-effects model estimates of heterogeneous combined effects

	Marketing & housekeeping (1)	Record keeping (2)	Planning (3)	Sales (10 ³ birr) (4)	Value added (10 ³ birr) (5)	Gross profit (10 ³ birr) (6)	No. sewing machines (7)
<u>Tailors</u>							
Years of schooling × Participant × Year 2009	0.10** (0.04)	0.18* (0.11)	0.01 (0.01)	3.06 (3.22)	1.65 (2.42)	1.43 (2.30)	0.23*** (0.08)
Marketing & housekeeping score before training × Participant × Year 2009	0.51*** (0.06)	0.40** (0.19)	0.03*** (0.01)	6.53 (6.30)	6.02 (5.64)	5.98 (5.63)	0.22** (0.10)
Record practice score before training × Participant × Year 2009	0.05* (0.03)	0.21*** (0.07)	0.01*** (0.00)	1.17 (2.53)	1.18 (2.27)	1.03 (2.26)	0.07* (0.04)
Planning based on records before training × participant × Year 2009	0.77*** (0.25)	0.96 (0.65)	0.06* (0.03)	3.81 (21.77)	8.99 (19.48)	10.88 (19.41)	0.79** (0.35)
<u>Both tailors and RMG factories</u>							
Years of schooling × Participant × Year 2009	0.12*** (0.04)	0.08 (0.07)	0.00 (0.00)	-7.71 (90.96)	-8.04 (30.04)	-7.47 (22.86)	0.02 (1.22)
Marketing & housekeeping score before training × Participant × Year 2009	0.35*** (0.06)	0.12 (0.12)	0.01 (0.01)	16.12 (30.39)	4.93 (14.76)	1.94 (13.50)	0.12 (0.67)
Record practice score before training × Participant × Year 2009	0.01 (0.03)	0.11** (0.05)	0.01** (0.00)	3.12 (12.94)	0.46 (6.28)	-0.50 (5.74)	0.05 (0.29)
Planning based on records before training × Participant × Year 2009	0.06 (0.26)	0.69 (0.49)	0.05* (0.03)	45.47 (124.58)	35.98 (60.41)	35.56 (55.24)	-0.00 (2.75)

Notes.

The sample sizes are 302 observations for both RMG and tailors (in the upper panel) and 232 observations for tailors (in the lower panel). Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A1 Lower Bound estimates of treatment effects

	Marketing & housekeeping score	Record keeping score	Planning based on records	Sales (10 ³ birr)	Value added (10 ³ birr)	Gross profit (10 ³ birr)	Number of sewing machines
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>Both RMG and tailors</u>							
Fixed-effects model	0.61*** (0.14)	0.46* (0.26)	0.025* (0.01)	-1015.7 (642)	-539.7* (290)	-430.9* (225)	-30.2* (16.0)
DID-PSM	0.25 (0.22)	-0.11 (0.47)	0.03 (0.04)	-1548.0 (1398.5)	-506.3 (329.1)	-359.4 (340.1)	-25.2 (16.6)
DID-BCM	0.54*** (0.20)	0.17 (0.40)	0.025 (0.02)	-1181.0* (659.2)	-463.9** (212.4)	-319.0* (174.8)	-22.4*** (7.43)
<u>Tailors</u>							
Fixed-effects model	0.43*** (0.14)	0.52 (0.34)	0.03* (0.02)	-30.6** (14.5)	-32.1*** (11.6)	-31.9*** (11.2)	0.03 (0.44)
DID-PSM	0.07 (0.34)	0.24 (1.09)	0.03 (0.05)	2.74 (39.5)	-18.9 (30.1)	-17.6 (27.4)	0.18 (0.87)
DID-BCM	0.43* (0.22)	0.56 (0.50)	0.03 (0.03)	6.19 (19.5)	-10.2 (13.6)	-6.13 (12.6)	0.73 (0.55)

Notes.

Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1