Policy brief

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Managerial Capital and Productivity

Evidence from a Training Program in the Bangladeshi Garment Sector

In brief

- Data from the garment factories in Bangladesh show that four of every five production workers are women, while just over one in 20 supervisors is a woman.
- We confront this issue by providing supervisory training to five people (four women and one man) in individual factories. Using a randomly selected comparison group, we examine whether the trainees continue to work at the same factory, whether they are given a trial as a supervisor, and whether they are promoted.
- We find that the female trainees are as likely as the male trainees to remain at the factory, but less likely to be tried out or to be promoted. In management simulation exercises, the female trainees outperform the male trainees.
- Using detailed data from production lines on which the trainees work as supervisors, we find some evidence that the male trainees outperform the female trainees, though the differences across gender are not statistically significant.
- Evidence from survey responses and exercises suggests that the female trainees face some initial resistance as supervisors, which could account for the lower initial performance on the line.

This brief is based on research carried out by IGC researchers, the DFID-ESRC Growth Research Programme (http://www.degrp.squarespace.com/), IPA's SME Initiative and GIZ. The researchers acknowledge and appreciate the cooperation of the factories participating in the project and the support of GIZ.

Introduction

In the last two decades, the ready-made garments (RMG) industry has emerged as a key driver of economic growth and development in Bangladesh. Garments accounted for more than 80 percent of Bangladesh's export earnings and 14 percent of the nation's GDP in fiscal year 2013-14.[1] The rapid growth of an internationally competitive export sector has had a dramatic effect on the economy as a whole, driving per capita growth rates of almost 7 percent per annum since 2000. But the impact of the sector's growth has been particularly important for women in Bangladesh. The RMG factories employ around 4 million workers, roughly two-thirds of whom are female. The sector is responsible for large-scale entry of female workers into the formal wage sector in Bangladesh. As Heath and Mubarak (2014) document, the employment opportunities for women have contributed to increased schooling rates for girls, delays in women's age at first marriage, and a decline in family size.

More detailed data reveal that employment opportunities for women in the sector have been largely limited to positions at the lowest levels, sewing machine operators and helpers. There is little female employment in supervisory or higher-level managerial roles. In our data, women comprise 80 percent of operators but only 10 percent of line supervisors.[2] Women were and are underrepresented in management in the textile and apparel industry in other countries as well, but usually by much smaller margins than is currently the case in Bangladesh. For example, throughout the 20th century in the United States, women's representation in management was half of women's representation in the workforce in the garment sector.

At the same time, data suggest that the RMG sector in Bangladesh owes its ascendance to very low wage rates rather than high productive efficiency. Comparable cross-country data are scarce, but a recent McKinsey study estimates that garment producers in Bangladesh are one-third less efficient than those in China and almost 20 percent less efficient than those in India.[3] Wages, on the other hand, remain lower than those of competing countries even after the 60 percent increase in the sector's minimum wage rate implemented in December 2013. If the sector is to continue growing, it will need to move toward higher-end products which are more demanding to manufacture. Low wage rates will not be enough.

With these two issues in mind, we examine productivity in factories in the RMG sector focusing on the choice of supervisors (production-line managers) and on the role of gender in their selection. The question we ask is whether, by failing to promote more women into management roles, the RMG sector in Bangladesh is passing up an opportunity to increase productivity. More than 95 percent of the supervisors we have surveyed tell us they entered the RMG sector at the level of operator, helper, or other comparable position. Is a female-to-male operator

1. Bangladesh Bank economic data
2. Our data likely overstate the participation of women in management because our sample includes two factories which are entirely female, at all levels. These factories are quite unusual in the sector.
3. *Bangladesh's ready-made garments landscape: The challenge of growth,* McKinsey and Company, 2011

ratio of 4:1 and female-to-male supervisor ratio of 1:9 efficient from productivity perspective? To untangle the reasons for the gender gap, we implemented an operator-to-supervisor training program in 58 factories.[4] The program induced factories to promote more female supervisors than they otherwise would. We examine the promotion rates for females and males trained through the program, and then compare the performance of females and males trained in the program, and the response of operators working for them, using both very detailed production data and factory surveys.

Why might factories promote an inefficiently small number of women? One reason commonly given is that women have a lower attachment to the labor force. They are expected to leave the sector when they marry or when they have children. The shorter time they are expected to work in the sector yields a shorter period over which factories believe they will be able to recoup investments in their skills. An alternative, though perhaps related, possibility is that factories initially promoted men to be supervisors, and that this initial promotion of men might have created a path dependence: factories learned how to select the men – but not the women - capable of being supervisors. Thus, men with leadership skills may have entered the sector, seeing opportunities for career advancement. We examine these and other possibilities in the project.

The study aims to inform policy not only on enhancing firm capabilities but also on the cross-cutting issue of gender, which is of particular interest given the striking level of gender imbalance in the RMG sector in Bangladesh.

Design

We implemented a training program designed for operators on the sewing lines in woven/light knit factories. The trainees were experienced sewing machine operators with no experience working as line supervisors. The training course provided is intensive – six days per week over six weeks, and delivers knowledge and skills in three areas: production planning, quality control, and leadership / social compliance.

The factories participating in the project are broadly representative of factories in the upper half Bangladeshi factories, ranked by size and/or capabilities. We selected the sample using transaction-level trade data from the Bangladesh National Board of Revenue, identifying firms with annual exports and unit values comparable to the suppliers of a particular large, mass-market British buyer. The 96 factories agreeing to participate in the project were randomly assigned to eight treatment rounds.

Our objective was to train four female operators and one male operator from each factory. We asked factories to select a pool of operators – usually eight women and four men. We administered a short diagnostic exam to these workers, testing

4. The training program was designed by the German bilateral aid agency, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), together with local training companies.

technical knowledge, literacy, and non-verbal reasoning skills. Factories selected two women to receive the training, subject only to their passing the literacy exam. We then ranked the remaining women and all of the men by their scores on the diagnostic exam, and selected at random two of the top four females and one of the top two males. Those randomized out of the training at this step provide a comparison group for certain key outcomes in the study. Starting in November 2011, and continuing through January 2013, we provided training for 271 operators, of which 213 were females.[5] The direct cost of training was paid by the research project; the factories continued to pay the workers' salaries during the training period.

Data and Initial Findings

We rely on two main sources of data for the analysis: surveys of trainees, management, and many others in the participating factories and detailed line-level production data. The surveys were carried out at three points in time: a baseline survey shortly after trainee selection (before training began) and two follow up surveys - four months after training was completed and 10 months after training was completed. As a part of the first survey undertaken after training, we also conducted leadership exercises.

The first column of Table 1 summarizes basic demographic characteristics and attitudes and expectations for the trainees. Columns 2 and 3 then show how the characteristics of the trainees differ from typical operators and typical supervisors in the factories, respectively. Finally, Column 4 shows how the female trainees compare with the male trainees. Most (59 percent) of the trainees are married and a significant minority (40 percent) have children. They report having just over eight years of schooling and three years of experience working in their current factory. About one in seven has received formal training as an operator.

The trainees have almost two years more schooling than typical operators in the factories. They also have a half-year more experience in the factory and are almost twice as likely to have received training (14 percent vs. 8 percent) in the past. However, the comparison with existing supervisors is not so flattering. The trainees have 1.3 years less schooling and a year less experience in the factory. Moreover, comparing female and male trainees (Column 4), we find that the female trainees are 1.5 years younger, and they have 0.7 years less schooling and one year less experience in the garment sector.

Recall that one reason often given for the reluctance to promote more women is that women are likely to leave the labor force earlier, and when they have children. The demographic data on Table 1 are at odds with this assertion. Three in five female trainees are married, and 43 percent of the female trainees (and 49 percent of typical female operators) have children. Not only do they remain in the factory after

5. A second phase of the project began in February 2014. In the second phase, and additional 146 operators were trained – 73 females and 73 males from 20 factories

marriage and child-bearing, but female trainees report that they expect to remain working in the factory for a further five years on average – the same expected tenure as for male trainees. Moreover, in the broader sample of operators, we find that the age distribution is almost identical for male and female operators.

However, our data do suggest that by several measures, females are less prepared to be supervisors before the training. We noted above that the female trainees have less schooling than male trainees. Among later cohorts of trainees, we conducted an extensive skills assessment. Data from this assessment are shown on Table 2. We find female trainees to be equal to their male counterparts in literacy and – somewhat surprisingly, given the responses from operators described below – in technical knowledge of sewing machines, garments, and quality issues. But we find males perform significantly better on exercises measuring numeracy, and in teaching and leadership exercises. We also find males are more confident in their ability to be supervisors. Males rate their ability as almost equal to the current supervisors in their factories, while females rate themselves about 0.7 points lower on a scale of one to 10.

Operators' opinions about supervisors

We asked operators whether females or males were more effective in performing several tasks as supervisors. We display their responses in Figure 1, first (Panel A) taking the responses of all operators together. We find that female supervisors are viewed as being friendlier, but males are viewed as more effective in every other task we raise – motivating workers, resolving conflicts, resolving technical issues, and inducing workers to improve skills. However, the sample of operators splits almost evenly between those who say they have at some point worked under a female supervisor and those who say they have not. We find that the lack of direct exposure to female leadership matters: those with experience working for a female supervisor rate women better in every category. Males are still seen as somewhat better than female supervisors in most areas even among operators who have worked for females, but the gaps are much smaller. The data suggest that greater exposure of workers to female supervisors may correct previously held misconceptions and biases.

Post-training Outcomes

The first outcome of interest is whether trainees remain at the factory after receiving the training. This is relevant for two reasons. First, factories will be willing to pay for training only if they are able to recoup their investment. Second, we often heard that factories were reluctant to promote women because they are more likely than men to exit the factory. A related outcome of interest is whether the trainees are given trials and ultimately promoted to supervisory roles after returning to the factories.

Table 3 compares the outcomes of females and males assigned to and attending training, and males and females in the control group (those not assigned to and not attending training). Overall, we find that the retention of trainees is high: 95 percent of males and 89 percent of females remain in the factory four months after

training. Exit from the factory is more prevalent at 10 months, when 23 percent of males and 28 percent of females have exited. However, training has a clear positive effect on retention, with a more pronounced effect for males. Ten months after training, males attending training were 10 percentage points more likely to remain in the factory. There is a small (2 percentage points) effect of training on retention of females.

The slightly higher exit rates for females may be explained by the significantly lower probability that females were given a trial as a supervisor, or promoted to supervisor. At 10 months, 92 percent of the male trainees had been given a trial as a supervisor, compared to 75 percent of female trainees; and 88 percent of male trainees had been promoted compared to 53 percent of female trainees. We can view the outcomes for females as either a glass half empty or a glass half full. While female trainees are significantly less likely to receive trials and promotions than their male counterparts, the training nevertheless induces the average factory to promote almost two female trainees to supervisor. This represents a significant gain at the margin since the median factory in our sample had two female supervisors before the project began.

Of course, whether anyone should pay for training also depends on how effective the training is. We measure the effectiveness of the trainees using both management simulation exercises and actual line-level production data. The production data have the obvious advantage of representing the outcomes that matter most to factories. However, a typical production line has two or three supervisors, and the outcomes are measured at the line level. Moreover, the trainees not promoted are not observed as supervisors on the line. The management simulation exercise allows us to observe actions and outcomes in a more controlled environment.

Management simulation exercises

To gain insight into the relative effectiveness of male and female trainees as supervisors, we conducted a management simulation exercise as a part of the first follow-up survey. In each factory, eight randomly selected operators were placed into four teams of two each. Each team was assigned a leader whose job it was to explain the particular exercise and manage the operators as they performed their tasks. The teams each played two "production" games, one involving Legos and one involving buttons. Each team leader played only once, and we focus here on a comparison of the outcomes of teams led by female and male trainees. In this comparison, we find that the female trainees were significantly more effective in generating production than were the male trainees. The differences were large – about 3/10ths of a standard deviation. Moreover, we find that the females performed best when they were matched with a pair of female operators. Those trainees who were promoted before the time of the first follow-up survey (four months after training) also perform significantly better than those not promoted.

After the second session of the games, the operators on the production team were asked to compare the management styles of their two team leaders. They were asked whether the first or second team leader was better at explaining the game, better at answering questions, better at motivating them, always pressuring them, and so forth. Looking at the responses of the 19 teams led by both a female and a

male trainee, we find that operators are more likely to say that the male trainees were better at answering questions, at motivating, and at encouraging. Thus, even though the female trainees produced better outcomes, the workers tended to say that the males were more effective leaders.

Line-level productivity

The management simulation exercises provide some evidence of effectiveness as a leader in a controlled environment and a situation in which supervisory effort can be mapped directly to the individual. Of course, conditions and performance on the production line may differ. We are able to measure productivity at the line level, and make very careful and accurate comparisons within factories using standard minute values (SMVs). Calculating an SMV requires measuring the time it takes for a fully efficient worker to sew each seam or other stich, and aggregating these steps for each garment. Using comparable SMVs, we are able to compare the output of lines producing many varieties of shirts with the output of lines producing many varieties of pants.

To measure performance of the promoted trainees as supervisors, we aimed to collect very detailed line-level production data from each of the participating factories. In practice, both the quality of the data available and the level of cooperation of the production staff in providing the data varied. Hence, while we trained workers in 58 factories, we do not have useable production data from all the factories. We examine four outcomes – efficiency of the line, defect / rework rates, absenteeism and work hours.

We find a statistically significant difference between female and male trainees only with respect to the number of hours a production line operates. The lines supervised by promoted female trainees work about a third of an hour longer than those supervised by promoted male trainees. The differences between female and male trainees with regard to production efficiency, quality defect rates and absenteeism are not statistically significant, though with regard to efficiency, males appear to perform slightly better. Overall, the trainees (males and females) appear to be effective in reducing defect rates, compared with other supervisors in the factories.

Conclusion

We work with local training companies to provide supervisor training to four female operators and one male sewing machine operator in almost 60 ready-made garment factories in Bangladesh. We find that training improves retention rates and training induces higher promotion rates for males than female trainees, though overall promotion rates differ across factories.

Female trainees significantly outperform male trainees in a post-training management simulation exercises. We find hints of resistance by operators to the female trainees. In spite of performing better in the management simulation exercises, female trainees fare worse than male trainees in the opinions of the production teams.

Our analysis sheds light on the difficulties factories face to transition from the practice of promoting only males as supervisors to one of promoting females and males. Employee retention rates are impacted in a modestly positive way by the training, but 10 months after training, the exit rates of trainees are high enough to cause some concern about the factories' return on the investment in training. There is an indication of a negative reaction by male operators to the change, perhaps not surprising given that the overwhelming majority of male operators want to be promoted to supervisor, and the new policy reduces the chance of that occurring.

Policy Implications

The success of the RMG industry in Bangladesh so far, can be attributed to an enabling policy environment, specifically characterized by trade services and trade facilitation, as well as the private sector's appropriate exploitation of the competitive advantage of a large pool of semi-skilled, cheap labor. At its initial stage, a considerable degree of technology and know-how diffusion from foreign partners was critical in spurring interest of local entrepreneurs to invest in this industry.

Over the years, BGMEA and BKMEA – apex garment and knitwear exporters associations – have emerged as influential voices in informing and reforming RMG-specific industrial policy. However until recently, skills development has received less attention from policymakers. With recent upward wage pressure, there is now a clear need to improve efficiency to sustain the competitiveness of the sector. Improving the skills of mid-level managers is an avenue for efficiency gains that is often noted as crucial by industry observers.

Contrary to received wisdom, we find that female and male operators have equal levels of attachment to the industry. The retention rate of trainees in factories is reasonably high, and one can argue that long-term investments, possibly through skills and leadership training, are likely to offer win-win scenarios for both workers and firms. Indeed, this is underlying goal of GIZ in developing the training program we implemented in this project. But since the training imparts skills which are valuable to any factory in the industry, a case can be made for the need for private- and public- sector partnerships in mainstreaming industry-wide training programs that close the existing skills and learning gaps, and address the gender undercurrents at the managerial level.

Some of the necessary skills can be obtained on the job. Our analysis suggests a story of simple path dependence. The industry finds itself in an equilibrium in which women are not promoted and therefore do not invest in leadership skills. As a result, they may leave factories earlier and, as a result, be less qualified than men to be supervisors. A way out of this stable but possibly inefficient equilibrium is to provide training to enough women to convince other women that their career prospects have changed.

At the same time, males may be selecting into the sector with the expectation of transitioning to managerial positions. As more women are promoted to supervisory

roles, they may justifiably view their chances for promotion as diminished. This could affect their willingness to remain in the industry, and, indeed, we find some evidence of this. Clearer communication with regard to promotion and career paths may be necessary to reassure qualified males and females of opportunities for advancement.

A final point is that providing opportunities for women in management is likely to be viewed positively by foreign buyers and their customers. Given recent events contributing to a negative image of the RMG sector in Bangladesh, the contribution to an improved image may also be valuable to the sector.

Figure 1, Panel A

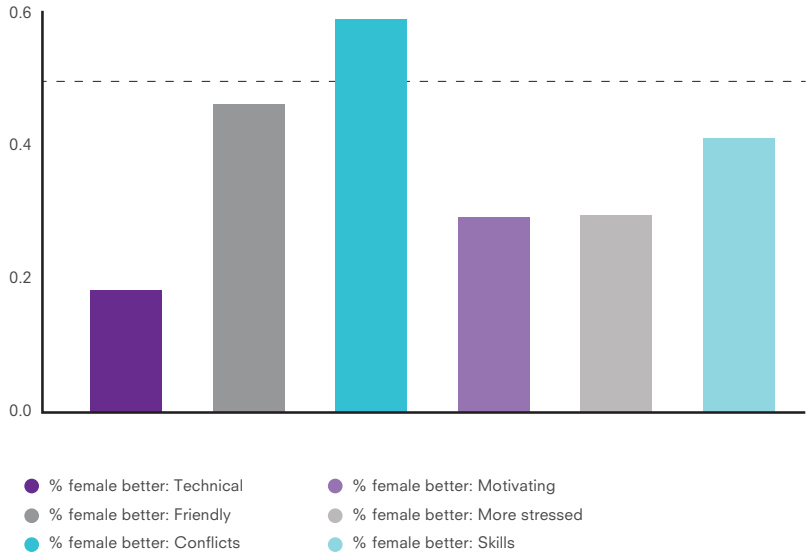
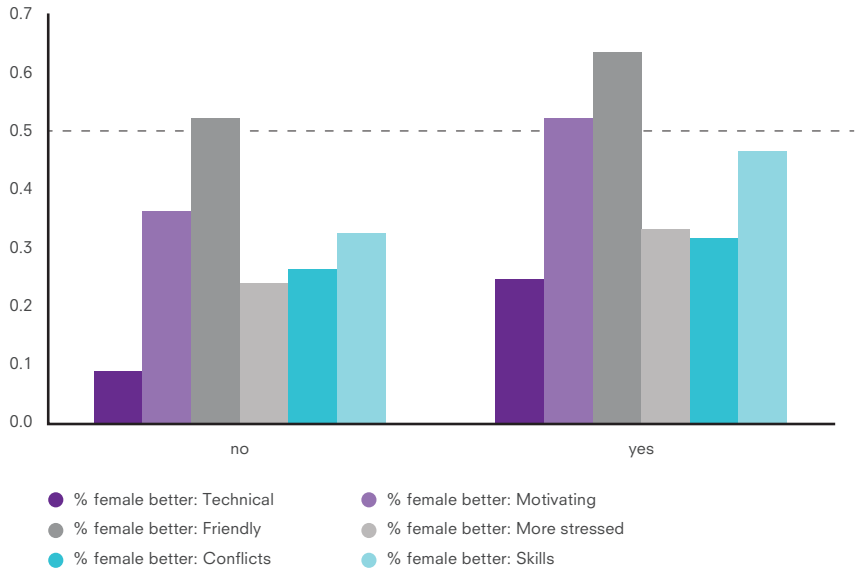


Figure 1, Panel B



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