



### Understanding the barriers to women's career advancement in manufacturing sector: diagnostic study of Indian garment factories

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#### **ABOUT THIS PUBLICATION**

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#### **ABOUT IWWAGE**

Initiative for What Works to Advance Women and Girls in the Economy (IWWAGE) aims to build on existing research and generate new evidence to inform and facilitate the agenda of women's economic empowerment. IWWAGE is an initiative of LEAD, an action-oriented research centre of IFMR Society (a not-for-profit society registered under the Societies Act). LEAD has strategic oversight and brand support from Krea University (sponsored by IFMR Society) to enable synergies between academia and the research centre.

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### **EXECUTIVE SUMMARY**

The under-representation of women in managerial roles in the manufacturing sector is often explained as a consequence of supply-side constraints or outside labour market discrimination. However, these studies suffer from sample size issues and ignore the demand-side perspective.

This study aims to present an analysis of hypothetical situations of intermediate managers of garment manufacturing factories to refer workers for promotion. The supply-side constraints by comparing 'high potential workers' to a randomly selected sample of 'low-potential-workers' with an additional focus on workplace ties and aspirations is also checked here. The study shows that women are the preferred type for 'within workforce promotions' and that men are preferred for more valuable promotions. In the short run, however, women can break this glass ceiling through a higher number of vertical ties. This study shows that if management asks/assigns male intermediate managers to specifically mentor more female workers, it could balance gender representation at managerial levels.

These findings apply to sectors with a history of domination by a particular group in positions of influence and are supported by the invisibility hypothesis.

Keywords: gender, workplace ties, referrals, garment manufacturing, India

JEL Classification: D22, D91, M510, M540, Z130

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Historically women have formed much of the labour force in large garment manufacturing units in India. The docility of women, their lack of resistance to being laid off, smaller probability of becoming members of a labour union or participating in strikes make them the preferred choice for the labour force (Chakravarty (2004) reviews this literature). Liberalisation in the 1980s further expanded women's participation in the organised formal manufacturing sector, albeit with no significant impact on their representation in managerial roles (Krishna (1987), Chakravarty (2004)). Even after two decades, this figure varies from 0-15 per cent female supervisors with huge regional variation (Ranganathan and Shivarama (2017)).

The purpose of this study is to examine the reasons for the under-representation of women at entry-level managerial positions and how they can break this glass ceiling. The focus is on career advancement, not only from the point of view of inequalities or discrimination in the job market, but also because, as developing economies undergo structural changes, women will have to be hired for managerial roles in garment factories as men move away to more lucrative sectors.<sup>1</sup>

It is worth thinking about that a pool of 10–20 per cent of the male workforce fills up 90 per cent of the managerial positions in garment manufacturing units in developing countries (Naeem and Woodruff (2014)). This study aims to understand "why despite being in the majority (ranging from 60-90 per cent across the globe), women have been unable to progress". This study begins with precisely this question to existing intermediate managers responsible for 'getting the work done' from workers. These are entry-level staff managers who directly monitor workers. Figure 1 summarises intermediate managers' opinions regarding skewed gender representation at the supervisory levels. Notice that in the sample, much like other developing countries, only 10 per cent of the intermediate managers are women. While the sample size is an issue to draw an empirical conclusion, it can still be seen that there is no drastic difference in the direction of the responses of the two types of managers (except that women are less likely to say that their gender type is 'unfit for a supervisory role' in terms of the proportion of their responses). Note that these categories are not mutually exclusive, and that cultural barriers like mobility restrictions and household responsibilities may shape women's aspirations or impede them from staying late at factories (thus making them unfit as a choice for supervisory roles). On the other hand, men, on the whole, do not face such barriers despite social pressure to be the breadwinner, which may have led to a better investment in education and health since childhood, and which in turn leads them to have higher aspirations. Indeed, some studies have termed these socio-economic factors as discrimination outside the labour market to explain unequal outcomes in labour markets (Chakravarty, 2004). The analysis here does not dwell into these long-term issues even though they are relevant, and focusses instead on women who have already entered the job market and the possibility of their career advancement in the short run.<sup>2</sup>

Most of the reasons in Figure 1 are related to the supply-side constraints. However, training programs aimed at overcoming supply-side constraints have failed to increase female representation at the managerial level. An extensive experimental study of Bangladesh garment factories by Naeem and Woodruff (2014) found that female trainees (for supervisory roles) were half as likely as men to be hired as supervisors despite doing better in training skill tests and staying longer in the factories.

For a moment, consider the demand-side perspective, i.e., why/how firms overwhelmingly hire women for blue-collar levels and men for supervisory positions. Historically, the lower cost of hiring women (pecuniary and non-pecuniary as already discussed in the introductory paragraph) made them the preferred choice for the workforce, and the social dominance of men of exerting pressure and disciplining workers made men the preferred choice for monitoring positions (Chakravarty, 2014). Although men are also hired at lower-skilled jobs, they are more likely to be promoted to higher ranks in a shorter time frame. It is a well-known fact that promotions and recruitments to these managerial positions occur through in-house referral programs.<sup>3</sup> Workplace tied literature argues that historically dominant groups (men, in this case) are likely to have persistent advantages when informal mechanisms, such as referrals are used to correct information asymmetries (Kanter, 1979).

The reasons for employers' dependence on existing employee ties have been deliberated upon in depth in economics and anthropological studies. While it helps management to screen workers at a lower cost and addresses moral hazard issues, this process creates barriers for others with unequal access to these instrumental (useful) ties (see Afridi et al. (2015) for a review of this literature). Much of the literature on workplace ties is concentrated on white-collar jobs in developed countries to show why and how women face disadvantages when recommendations by existing male-dominated managerial staff is an important channel.

As the first of its kind, this study attempts to diagnose if existing workplace ties are instrumental for career mobility in a blue-collar job setting and its implications for women's career advancement in developing countries.

The primary issue with any study attempting to understand what makes a woman advance to a supervisory role in the manufacturing sector is the absence of enough sample size. Even

<sup>&</sup>lt;sup>2</sup> Advancing to intermediate managerial levels involves a three-five times increase in salary.

<sup>&</sup>lt;sup>3</sup> In this study, around 60 per cent of existing supervisors mobilised ties to become supervisors, of which around 89 per cent were from the workplace. Almost all the women had to rely on a mentor to become supervisors, of which 80 per cent were men (Table A.1). However, the sample size of women supervisors is too small to carry out an empirical analysis.

a panel study is not usually helpful as in the past three decades, the gender composition of intermediate managers has not seen significant changes (Chakravarty, 2004). This study is unique because of the use of real examples where existing intermediate managers have been asked to recommend workers for promotions. Getting a recommendation (equivalent to getting a real referral) has been treated as the outcome variable because these workers have a higher probability of getting promoted than other factory workers.<sup>4</sup> This provided a decent sample of men and women and examining their characteristics has helped shed light on the research interest.

Figures 2 and 3 graphically show that women are less likely to be referred. Men are more likely to be the first choice for supervisory roles and receive referrals from multiple intermediate managers. This study tries to diagnose if such a history of dominance of a particular group at positions of power and the prevalence of informal channels for accessing information.

The remainder of the paper is organised as follows. Section 2 has a brief presentation of some stylised facts from existing research on the relationship between gender and workplace networks in developed countries, existing theoretical frameworks, and growing literature from developing countries. Section 3 describes the context and setting of the study. Section 4 discusses the survey design and the sample. Section 5 summarises the data set and describes the measurement variables. Section 6 presents the data analysis. Section 7 discusses the results and Section 8 is the conclusion.

disadvantages (gender bias in referrals) exist even after controlling for differences in observables (reflective of out-of-labour market discrimination) and how women can overcome this in the short run.

The scope of this study extends beyond garment manufacturing or India as many export-oriented industries (sectors) in developing countries employ women at lowpaying and low-skilled jobs with little or no for career avenues growth. This study also offers insights into workplace settings with



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## Literature Review



This study focuses on the workplace-ties approach to examine barriers to women's career growth because ties (potential referees) provide access to information and influence. Granovetter (1973) highlighted the strength of weak ties in his seminal work and since then this concept has been used widely in labour economics to show (theoretically and empirically) how smaller and tighter network density (i.e., fewer and stronger ties) can lead to unfavourable labour market outcomes for women (Montgomery (1990), Ioannides and Loury (2004), Calvo-Armengol and Jackson (2004), Mortensen and Vishwanath (1994), Lalanne and Seabright (2016)), Horvath and Zhang (2018), Lindenlaub and Prummer (2017)).

Theoretical work done by Jackson and co-authors (Calvo-Armengol and Jackson (2004, 2007),Bolte et al (2020)) on referrals, inequality and immobility is worth describing briefly here as it directly fits the context of this study. A person born into a historically disadvantageous group and having ties within that group will find it difficult to get referrals for positions dominated by the other group. If high inequality across groups exists (let's say, in employment rates), due to homophily in referrals, the referrals will make inequality (and also immobility) persist naturally. This brings about conditions under which a more equitable distribution of referrals reduces inequality, mobility and productivity for future generations. They also show that even one-time affirmative action policies can lead to long-lasting impacts due to changes in future referrals.

Milgrom and Oster (1987) make a slightly different case through 'the invisibility hypothesis'. They argue that the disadvantageous group's job skills are not easily identifiable to new employers and promotions act as a signal and enhance visibility. A firm would earn higher profits by not promoting efficient workers from disadvantaged groups (given the competitive labour market). They further predict that individuals (from the invisible group) will benefit from engaging in networking to obtain referrals and/or visibility. While in the former model, ties may exacerbate inequality, they reduce inequality in the latter. This study attempts to see which model's predictions has the potential to improve outcomes for the disadvantageous invisible group (women) in our context.

Presently there are no studies that directly examine workplace ties and career mobility in blue-collar settings for developing countries, even though the importance of workplace ties and referrals is well established. For instance, in lab-in-the-field experiments conducted by Beaman and Magruder (2012), 45 per cent of the experiment participants had helped a friend or relative find a job with their current employer in urban Kolkata (India). In a related study on garment factory workers, Afridi et al. (2020) note that 64 per cent (71 per cent) of workers (supervisors) used the informal channel (through a factory employee) to find out about current job openings.

There is indirect evidence from other contexts highlighting the disadvantages women face when information flows or is accessed through ties. For example, in experimental data from Malawi, Beaman et al. (2018) shows that men refer men despite knowing qualified women due to strong gender homophily. However, women do not refer more qualified women for jobs due to competition.

Further, Beaman and Dillon (2018) using social ties data from villages in Mali find that women are less likely to receive valuable information regarding agricultural technology because they are away from influential nodes in the network. In another Malawi-based study on information diffusion, Yishay et al. (2020) show that women are perceived to be less efficient in male-dominated roles even though there is no difference in the knowledge they possess. This study contributes to referrals, inequality in the labour market and workplace organisation literature. The novel contribution is the attempt to understand what works in the short run for women's career advancement in a highly competitive (labour supply) sector with barriers inside and outside the labour markets.



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# Context and Background



#### Women in garment manufacturing

A job in the apparel sector could be the first formal employment opportunity for many women in developing countries (ILO (2017), BSR (2017)). Globally, women represent 68 per cent of the workforce in garment manufacturing with huge inter- and intra-country variations. However, the most common stylised fact in garment manufacturing across developing countries is that 10–20 per cent of men from the workforce fill up 80–90 per cent of intermediate managerial positions. This trend has been consistent and often, lack of education, cultural barriers and aspiration are cited as the reason for this skewed representation (Chakravarty, 2004).

In India, the garment manufacturing industry employs a population of 12.3 million (2018) providing opportunities to millions of underprivileged individuals from the country's most backward parts (GOI, 2018). Women comprise around 60 per cent of the workforce in garment manufacturing with huge regional variation (BSR, 2017). Despite being in the majority and more productive as skilled operators, they face numerous challenges, such as overrepresentation in low-paying and low-skilled tasks, under-representation at managerial positions, wage-gaps, unsupportive norms and power dynamics (ibid). In the past decade, the Indian government and NPOs have taken many initiatives to increase the representation of women at supervisory roles (ibid). However, any drastic impact of these training programs is yet to be seen.

### Importance of vertical ties at the factory

Production in garment factories takes place in assembly lines across multiple floors.<sup>5</sup> Referred to as the sewing or stitching department (or production floors), the majority of the workers in the production lines are operators who sit at stitching machines one behind the other, sewing parts of the garment. They are assisted by helpers who do complementary jobs of folding, pressing,

<sup>5</sup> For details on production floor organisation and process, refer to Afridi et al. (2020) which covers the same set of factories.

and marking the intermediate garments pieces for operators. Apart from these, a line also has writers and feeders who are responsible for recording line and task outputs, and checkers to check the quality of output. A line may also have some thread cutters and a needle keeper, too. All these workers fall into different skill-grade levels that determine their salaries and position in the career trajectories. Operators' jobs involve more skilled tasks than helpers.

The following are the grade levels in the progression:

- Unskilled (mostly helpers, type C tailors)
- Semi-skilled A
- Semi-Skilled B
- Skilled A
- Skilled B
- Highly Skilled

These grades depend on the worker's role, experience and performance in the entry-skill tests at the time of hire. Workers move along these grades according to their performance on the production floor and the intermediate managers' recommendations. With experience, performance and support from seniors, a worker can move out of the workforce and become a supervisor. However, this happens only when demand for such roles arise, and this usually does not follow any pre-specified timelines.

This study focusses on the workers' vertical ties which serve as a source of information, mentorship, access to influence and thus, career advancement (Ibarra, 1993). For a worker, vertical ties would mean having connections or interactions with anyone from the managerial staff, e.g., supervisors (their immediate monitor/ mentor), floor in-charges, floor managers, etc.<sup>6</sup>

Discussions with the management of the sampled factories revealed no fixed time-bound promotion systems. Supervisors are hired through internal promotion processes or referrals as and when needs arise. Moreover, recommendations of existing supervisors and floors in-charge were seen to play a significant role in screening and mentoring workers for grade promotions, assistant supervisory and supervisory roles. It is to be noted that the competition for supervisory positions is very intense, especially for women. For the same qualification and ability, a potential candidate with access to referrals from these vertical ties is more likely to be hired for a factory position.<sup>7</sup>

The importance of workplace ties becomes evident when we look at the career trajectory of a typical supervisor (refer Table A.2). Around 68 per cent of supervisors used their ties to access job opening information, of which around 50 per cent originated at the workplace. Not surprisingly, 96 per cent of male supervisors' ties are men, whereas for women this percentage is around 44 per cent. Around 60 per cent of supervisors contributed their career advancement to a mentor/motivator, with 91 per cent (56 per cent) of female (male) supervisors giving credit to their seniors. Around 89 per cent of these mentors/motivators are males. It points out that women do not have gender homophilous ties due to their under-representation at influential positions, unlike men. Although women have a significantly higher number of seniors in their workplace networks, there are no differences in the size of friendship networks at the workplace or ties they access outside the factory for career advice.

<sup>6</sup>The supervisory position is the first entry-level managerial post at the factory. Hierarchically, line in-charge, floor in-charge, and production-head succeed supervisor. The factory head is the top production managerial position at the factory and deals directly with CEOs and factory owners. In the sampled factories (similar to the garment factories in developing countries), men dominate almost all the managerial positions except for some intermediary HR positions. For a worker, ties with any of these seniors can be a key to career advancement.

<sup>7</sup> Intermediate managers' monthly salaries include the variable element that depends on the line-level performance, so they have a higher incentive to refer good workers. Also, since intermediate managers themselves depend on factory management for their career growth (i.e., their vertical ties), they need to recommend good workers to maintain their own reputation and influence with the higher management.

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## Survey design and sample



#### Survey design

In the pilot stage of the survey, human resource managers (HRM) across four regions of India (North, South, West, and Centre) from different types of garment manufacturing factories (knitwear, woollen wear, protective wear, etc.) were interviewed using a detailed questionnaire on factory profile, gender composition at different hierarchy levels, production process organisation, and hiring and promotion policies. The discussions revealed similar trends in terms of gender representation at different hierarchy levels and recruitment policies.<sup>8</sup> These discussions revealed similar trends in terms of gender representation at different hierarchy levels and recruitment policies. To increase the study's precision, factories manufacturing readyto-wear apparel for the international market requiring similar skill sets and production organisation were approached to be a part of this study. Three factories under the same exporting enterprise form the sample-two factories located in Faridabad, Haryana, and one factory located in Bangalore, Karnataka. Since

these factories are part of the same business house, the broad macro managerial practices, policies, incentive schemes, salary structures and production processes are similar. The micro differences come from state government policies (e.g., minimum wage laws, definition of skillgrade level, etc.). However, these differences do not pertain to hiring and promotion rules and practices or gender representation requirements (as per the interviews with HRMs).

This study was conducted in two stages. In stage 1, all the supervisors and floors in-charge from the sewing departments were interviewed through telephonic calls, which on average lasted 45 minutes to one hour. The interview was divided into four major sections:

- Basic demographics, which included questions regarding personal characteristics like age, education qualification, marital status, native village, etc.
- Professional characteristics, with questions on work experience, career trajectories, training programmes, etc.

<sup>8</sup> Intermediate managers' monthly salaries include the variable element that depends on the line-level performance, so they have a higher incentive to refer good workers. Also, since intermediate managers themselves depend on factory management for their career growth (i.e., their vertical ties), they need to recommend good workers to maintain their own reputation and influence with the higher management.

- Professional networks, included questions on ties that have helped respondents at different stages of their career, and current workplace ties that help them at the workplace.
- Hypothetical situations asking for recommendations, wherein respondents were asked sequentially to recommend workers for (a) Grade promotion, (b) Supervisory promotion.<sup>9</sup> In the second situation, respondents were asked to refer people from their social networks (workers not employed in their factories).
- In the third and fourth situations, respondents were specifically asked to recommend women and men workers from the current factory for both types of promotions, respectively. This stage helped to capture the gender bias in recommendations, if any, and increased the sample size to compare workers more likely to be on an advanced upward trajectory in their careers.

After all the recommendations were noted down for each recommended worker, the respondents were asked a series of questions to capture productivity, nature of ties, informal and formal interactions, etc. This section also had some generic perception-based questions.

The questionnaire was designed in a way that the data collection process for the stage 1 interviews ended speedily in order to avoid discussion among respondents that could have influenced their responses in section 4. After the interviews, unique worker IDs were collected for the recommended workers (through followup calls) to map them with the workers' human resource list.

These workers are referred to as High Potential Workers (HPW) because they were more likely to be promoted from the given pool of workers at the time of the study. A random sample of similar proportions (i.e., the proportion of recommended workers from the production department's population) from each production line was created after removing HPW from the production department population. Since these workers have a lower potential to get promoted compared to the recommended workers, whatever the reasons for the recommendation, they are referred to as Low Potential Workers (LPW).

In stage 2, these workers were interviewed to collect information on their personal characteristics (in section 1), professional characteristics (in section 2), workplace ties and interactions with seniors, social networks and aspirations (in section 3).

All the surveys took place after working hours (6:30 pm to 10 pm and full days on Sundays) using the contact numbers from the company's HR records to avoid disturbance during working hours. Further, the HRD was used to get in touch with workers who did not have a personal phone or had invalid numbers. Worker surveys took around 20 minutes to complete. All the data was collected digitally in a uniform template using the Survey CTO application on android phones.<sup>10</sup>

#### Sample

The sample of this study is described in detail in Table 1. This study's sample comes from three different factories labelled F0, F1 and F2. While F0 and F1 are in Faridabad, Haryana (North India), F2 is in Bangalore, Karnataka (South India). A total of 120 intermediate managers and 1098 workers were interviewed through study design. The final sample is 102 intermediate managers and 1076 workers.<sup>11</sup> A total of 111 production lines across these three factories and spanning over 13 production floors (sub-units) were covered. Additionally, the 'finishing' department of FO was also covered. This department is different from the sewing department in that it involves not just stitching the garment, but also in the checking and finishing of a garment before packing. The analysis has been done separately

<sup>9</sup> Grade promotion means a worker rising from a lower-skill grade level to a higher skill grade level, which involves an increase in designation and salary; supervisory promotion means a worker becoming a supervisor, i.e., an entry-level staff position. Since supervisors could have felt threatened by supervisory promotion questions, they were asked about grade promotion as well. A similar questionnaire (but shorter due to time constraint) was administered with floor in-charges to mitigate the bias in recommending workers due to the competition channel.

<sup>10</sup> Around 2 per cent of 1098 interviewed workers had to be dropped from the analysis as they belonged to male-dominated departments, such as packing, sampling, inventory management (with female participation <20 per cent). Some supervisors were listed as supervisors in the production/sewing department but managed sub-divisions that hardly had female participation drop out from the analysis.

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for the production department (finishing and sewing combined) and sewing alone.

Although all three factories used for the study belong to one enterprise with no difference in gender-specific promotion policies, some variation in the hierarchy structures were observed. While F0 has only male supervisors and floor in-charges, F1 has around 20 per cent of women as supervisors, and F2 has 15 per cent and 11 per cent as female supervisors and floor in-charges, respectively.

64 per cent of the sample is from the North Indian factories with almost equal shares of FO and F1. The mix of workers is similar in the factories in Faridabad as they are within 2 km of each other. The majority of workers in F0 and F1 are migrants from Uttar Pradesh and Bihar and speak mostly Hindi-based dialects. The majority of workers in F2 are migrants from other districts within Karnataka, but there is also a significant proportion from the states of Odisha and Jharkhand (14 per cent). Respondents in F0 and F1 were interviewed in Hindi by a mix of male and female surveyors. Respondents in F2 were interviewed according to the language of their preference, with 71 per cent (98 per cent) of workers (intermediate managers) interviewed in Kannada by a mix of male and female surveyors.

The dominance of women in the sewing department of North Indian factories is a relatively new trend compared to the industrial hubs of South India (but fairly older in both). Besides, North Indian society is relatively more patriarchal than South Indian society. However, in this study's experience, it meant little for gender interaction norms as only a minor proportion of F2 workers (but larger than North Indian workers) was seen to be uncomfortable with being interviewed by a surveyor of the opposite gender. Those that were uncomfortable were reassigned surveyors accordingly. The primary analysis uses workers' sample because the gender variation in the existing intermediate managers' population is insufficient.<sup>12</sup> Insights from the supervisor interviews have been used all through the paper, and supervisor characteristics have been summarised in the appendix. The outcome variable, i.e., getting referrals (i.e., recommendations), comes from these interviews. Intermediate managers gave recommendations across different lines. Around 24 per cent of intermediate managers did not give any recommendations for supervisory promotions.

The following section summarises the main data set used in the analysis.



<sup>12</sup> Only 10 per cent of intermediate managers are women.

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## Data, summary statistics and measurement variables



Data analysis pools together the data collected from all the workers. Similar to the overall gender composition of the garment sector, 82 per cent of the sample consists of women workers. Out of 1076 workers, 36 per cent (382) of workers are HPW. Due to the survey design, there are 282 recommended women (HPW) and thus, this study overcomes sample size issues to some extent.

The study also uses data collected from the human resource department to control some of the structural variables like the size of the production line, the proportion of females in the line, assigned lines, and skill-grades. The average size of the line is around 58 (54) workers for 106 (104) production (sewing) lines, with 0.89 (0.90) as the proportion of females. On average, this study covered ten workers from each line (consisting of HPW and LPW).

Table 2 describes the characteristics of a typical worker. A typical garment manufacturing worker is likely to be a migrant married Hindu woman, 32 years old, belonging to a nuclear family, and has a slightly more than secondary education level. Column 4 shows that men and women differ significantly across various demographics. The men are more likely to be educated, migrants from other states, and the family's sole bread earner. The responsibility of household chores mostly falls on women, and they are more likely to be older, married, and live in joint families.

Panel B depicts differences in professional characteristics. Women are more likely to have undergone stitching training (through training centres before entering factories) and are first-time employees with significantly lower salaries. They are more likely to be operators but at significantly lower skill-grade ranks.<sup>13</sup> The men have a significantly higher total experience in garment manufacturing but not within the same factory. Interestingly, these differences do not appear between male and female supervisors (refer Table A.1).

Panel C shows the differences in the ties used for accessing job information. Around 70 per cent of the workers used a tie to access job opening information in the current factory. Both men and

<sup>13</sup> One must note that a significant proportion of men are already on a career progression track (around 43 per cent of them are already being tried as helping-supervisors as against 8.5 per cent of women).

women used homophilous (by gender) ties for accessing information, with men being able to use close kin ties more.

#### Measurement of outcome variables

The outcome variable which reflects the potential for future career growth (i.e., referrals) uses recommendation data obtained from the supervisor interviews. Measures of this potential are:

- Recommended, viz., a worker receiving a recommendation from any intermediate manager for any type of promotion (supervisory or grade, before or after gender prompting were clubbed together to get a sizeable number of data points)
- Number of times recommended, viz., sum of recommendations received from unique intermediate managers, irrespective of the type of recommendation,
- · 'Recommendation score' is the sum of the different type of recommendations with a score of 4 if a worker receives recommendation without gender prompting for a supervisory position; 3 if they receive recommendation after gender prompting for a supervisory position; 2 if they receive a recommendation without gender prompting for grade promotion; and 1 if they receive a recommendation after gender prompting for grade promotion. In addition to this, a score of 1 was added if this recommendation came from the floor in-charge. For instance, a worker receiving a recommendation for 'supervisor promotion after gender prompting' by the floor in-charge gets a score of 4 (3+1). This score is an increasing function of the number of recommendations, the value of the recommendations, and the hierarchy status of the recommender. Panel A of Table 3 shows that despite only forming 10-20 per cent of the workforce, men are significantly more likely to be recommended, recommended more numbers of times, and have a higher recommendation score.

### Measurement of explanatory variables

This study is interested in workplace ties due to the importance of referrals in the hiring process and aspirations as lack of supply of enough female supervisors (due to lack of aspirations or cultural barriers) was cited as one of the primary reasons in the pilot and stage 1 of the study.

Panel B, Table 3 shows a measure of vertical ties identified as instrumental in career advancement from supervisor interviews. Men have a significantly larger number of vertical ties. Interestingly, such differences do not exist for current supervisors (see Panel B, Table A.2).<sup>14</sup>

Panel C, Table 3 shows the consolidated and break-up measures of aspirations used in this study. Workers were asked a direct question about 'wishing' to be a supervisor in the future. Around 77 per cent of men aspired to be supervisors in the future, whereas this number is 35 per cent for women. Men are significantly more likely to have taken the initiative, such as taking care of a line in the absence of a supervisor or showing interest in learning different work types independently. Since there is a significant and strong correlation between these variables in the collected data, they have been clubbed to form an 'aspiration score', which is significantly higher for men. Understanding the barriers to women's career advancement in manufacturing sector: diagnostic study of Indian garment factories





#### Methodology

The HPW and LPW were compared by pooling the data from all three factories and controlling for a variety of observables described in Table 2.<sup>15</sup> The worker level estimation equation is as follows:

#### Yi=β0+β1Genderi+β2Ti+β3Ai+γXi+δWi+εi

where, Yi is the measure of referrals as described in section 5.2. Genderi takes value 1 if female, Ti, Ai measure vertical ties and aspiration scores, respectively. Xi is a set of variables measuring interpersonal characteristics as described in. I control for Age, Age-sq, Education above higher secondary level (=1), Married (=1), Sole earner (=1), Lives in joint family (=1), No. of children, Caste categories (L=benchmark), if migrant to factory state (=1), Used social ties for current job (=1), Experience in garment industry and square term, current designation Operator(=1), current designation Helper (=1), participated in past skill training programmes organised by the management (=1).<sup>16</sup> Wi are workplace-related measures, such as number of recommendations in worker i's line, proportion of females in worker i's line, factory dummy or factoryfloor FE. Depending on the outcome variable, either the probit model or OLS was used with factory fixed effects. In all the regressions, standard errors are clustered at factory-line level.<sup>17</sup>

 $\beta$ *i*'s give the coefficients of interest and helps to understand the barriers or pathways to career advancement.

#### Results

Table 4 gives results for running the probit model on obtaining at least one referral. These include supervisory and grade promotion and shows that  $\beta$ 1 is insignificant. Interestingly, a higher number of vertical ties for personal issues (and not professional advice) is positively related to obtaining at least one referral. Higher aspirations and total experience in the current factory are positively related to getting referred but not with total garment manufacturing experience. Table 4 shows only a subset of all the controls due to lack of space. Results are consistent with different types of fixed effects specifications.

<sup>&</sup>lt;sup>15</sup> Results for overall differences in men and women: overall, HPW, LPW sub-samples are significant (Table A.3) and therefore, all these controls are used in the estimating equation.

<sup>&</sup>lt;sup>16</sup> Due to lack of space only coefficients of interest are shown.

<sup>&</sup>lt;sup>17</sup> Since some of the lines have no HPW (because none were recommended in that line), factory-line fixed effects could not be used. Also, since recommendations mostly came within the same floor (but across lines), using factory-floor fixed effects makes more sense.

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It is not surprising that the coefficient on Genderi is negative albeit insignificant in Table 4 because all types of recommendations have been clubbed together. Instead, in Table 5, the referral intensity shows a strong and significant gender bias. Women are less likely to receive multiple referrals or referrals for higher-level promotions as shown by col (1) to (4) and col (5) to (8). Results are consistent for finishing and sewing departments together and the sewing department alone. Aspirations and vertical ties results are also seen to hold (with some additions to professional vertical network and weakening personal advice vertical network). There are no significant results for expectations of help from seniors.

#### Heterogeneity analysis

In Table 6, the sample is broken up by gender and produces the results for Equation 1. A positive coefficient is noted against Ti, whereas Ai is driven by the female sub-sample, i.e., women with a higher number of vertical ties and higher aspirations (and also experience) are more likely to be referred by their seniors.

In Table 7 to Table 9, the sample is broken up by factory and the outcome variables for the overall and by gender sample was examined.<sup>18</sup> Positive results on female vertical ties are driven by F0 that has no female intermediate managers (Table 7). F1 drives positive results on aspirations with the highest number of female intermediate managers (Table 8). F2 does not show any such heterogeneity in results (Table 9).



<sup>18</sup> Some of the fixed effects specifications for the sub-sample of men were not possible to run. Since the study focusses on women's career advancement, the emphasis is on results by women subsamples.



Tables 4 and 5 shows that predictions of advantages to the historically dominating group holds. 74 per cent of referrals were given to female workers, but only 20 per cent of these referrals were for supervisory roles (with and without gender prompting). On the other hand, historically advantageous groups (men) were mostly referred for supervisory roles (57 per cent of their total referrals). Thus, while women were successful in obtaining referrals for grade promotion, they lost out on supervisory referrals. However, women who were successful in receiving referrals had a higher number of vertical ties (for discussing personal problems) as shown by Table 6. Thus, support for 'the invisibility hypothesis' proposed by Milgrom and Oster (1987) was found and that the disadvantageous group can overcome invisibility by using networks to signal themselves.

Surprisingly, this result is driven by F0, which has no female intermediate managers (Table 7). It is worth noting that there are strong results for the number of vertical ties for professional advice as well in Table 7. The intermediate manager interviews show that around 92 per cent of recommended workers were known to supervisors through the current factory only (workplace ties). Male (female) intermediate manager's recommendations included around 66 per cent (71 per cent) male workers. Male (female) intermediate manager recommendations for supervisory roles (142 (13)) comprised 36 per cent (31 per cent) men. Around 45 per cent (100 per cent) of the women were referred after prompting by male (female) supervisors. This echoes the argument by Dhar et al. (2020) that engaging men might be important for improving women's outcomes as they have more social power and freedom to adopt gender progressive attitudes.

Table 6 also shows that women who have higher aspiration scores are more likely to obtain referrals. This result is driven by F1, which has the highest number of female supervisors. None of these results are driven by F2, which is located in a more matriarchal society with a legacy of female supervisors and floor in-charge (even though there is a small proportion in the current factory) and the highest proportion of female workers. An ordinal probit was run on 'Aspiration score' (ranging from 0 to 3) in Table 10 with similar to the baseline specification for the overall, HPW and LPW sub-samples and add terms for exposure of worker 'i' to female intermediate managers. Workers on the floors with female intermediate managers were assigned a value of 1 for 'Female role models'. Exposure to female role models is negatively related with women worker's aspirations (given by the interaction term). Surprisingly, this result holds for high potential females as well. Interestingly, the term 'Number of seniors for taking help' becomes strongly significant (positive) for the first time. This is probably due to informal interactions with seniors being associated with encouragement.<sup>19</sup> The relevance of these results is hard to explain.

It must be kept in mind that these women (quite newer role models) are trying to survive in a role historically dominated by men and probably not able to command the same level of respect and support that juniors might find discouraging. It can also be because these women are assigned to floors with female workers with a lower average level of aspirations (however, sorting on the basis of aspirations seems unlikely, and it is supposed that the former is more likely to hold).

While this setup is perfectly explained by the model discussed in Bolte et al. (2020), no 'suggestive' evidence of breaking the barriers by the use of affirmative action was found. Female intermediate managers do not proportionately refer more females for supervisory positions, and neither do they generate significant positive role model effects.



<sup>19</sup> Similar results found if role model exposure is limited to the line of female supervisors only and her immediate neighbouring line.

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This study attempted to use cross-section data to answer some of the questions on the barriers women face in career growth in the manufacturing sector where promotions happen majorly through recommendations/mentoring. It is seen that in the short run, women can break these barriers by having more vertical ties and informal interactions which are also correlated with higher aspiration levels (Table 10). The most interesting contribution of this study is the suggestive evidence for 'the invisibility hypothesis'. From a policy perspective, it is found that creating avenues for informal interactions and encouraging male supervisors to mentor female workers could increase women's representation at managerial levels.

A possible low-cost intervention at factories to create avenues for interaction can provide opportunities to examine the suggestions made by this study causally in the future.



#### Table 1: Sample: Export-oriented Garment Manufacturing Factories

	Factory 1 (F0)	Factory 2(F1)	Factory 3(F2)	Total
A. Factory profile	Faridabad	Faridabad	Bangalore	India
Location	2604	2087	1511	6202
Size of "Stitching Department"	5	3	5	13
Number of Production Floors/Units	42	39	30	111
Number of Production Lines	62	34	50	56
Average strength per line	0.889	0.881	0.934	0.898
Proportion of Females (sewing department)	0.65	0.79	0.83	0.76
Proportion of Operators	0.19	0.15	0.15	0.16
Proportion of Helpers/Pressman*				
A. Survey profile	26	32	23	81
No. of Supervisors	0	6	3	9
No. of Female Supervisors	7	7 9 9		25
No. of Floor/Finishing in-charges**	163	186	152	526
No. of Recommendations from factory***	133	137	112	404
No. of unique workers (HPW)	24	7	44	75
No. of recommendations outside factory	.15	.10	.15	0.13
Proportion of randomly selected workers per line (LPW)	395	334	347	1076
Total sample size	0.80	0.78	0.89	0.813

F0: base factory, located in Faridabad (Haryana, North India) with no female supervisors or floor in-charges; F1: factory located in Faridabad (Haryana, North India) with 20 per cent of supervisors as women; F2: factory located in Bangalore (Karnataka, South India) with 15 per cent and 11 per cent female supervisors and floor in-charges, respectively.

\*Other workers on stitching floors (not assigned fixed positions on within production line) are checkers, writers, feeders, assistant supervisors and needle keepers etc.

\*\*Sample consists of only one woman floor in-charge (F2).

\*\*\*Total recommendations by factory are 174,208,172; approximately 5 per cent of HPW could not be interviewed as they either left the factory and refused to participate or could not be reached by telephone despite best efforts and coordination with HR.

Total workers interviewed were 1098, but 2 per cent of HPW were from male dominated departments (female proportion<0.2) like packing, sampling, so were dropped from the sample.

Source: Factory data provided by HRD, Survey data (September 2020-January 2021).

#### Table 2: Worker Characteristics by Gender

		Prod	uction	
Ν	Overall 1076 (1)	Male 188 (2)	Female 888 (3)	Diff (4)
A. Demographics				
Age (years)	32.548	31.412	32.858	-1.310***
Mean education levela	3.058	3.346	2.3	0.348***
Proportion married	0.771	0.681	0.791	-0.110***
Number of children	1.70	1.340	1.776	-0.436***
Joint family	0.311	0.362	0.301	0.061*
Sole earner	0.248	0.553	0.184	0.370***
Onus of household chores	0.460	0.319	0.490	-0.171***
Proportion Hindu	0.936	0.936	0.936	0.000
Proportion H	0.371	0.319	0.382	-0.064*
Proportion M	0.434	0.463	0.428	0.034
Proportion L	0.194	0.189	0.218	0.029
Migrants from other states	0.724	0.888	0.689	0.199***
B. Work profile				
Stitching training	0.466	0.388	0.482	-0.094***
First-time employee	0.581	0.287	0.581	-0.294***
Current salary (INR)	9052.823	9226.85	9052.82	210.87**
Proportion of Operators	0.636	0.367	0.693	-0.327***
Prop of Helpers	0.136	0.142	0.106	-0.035
Skill-grade rankb	3.6168	3.561	3.878	3.616***
Participated in factory training programmes	0.431	0.314	0.456	-0.142***
Experience in current designation (yrs)	3.541	3.359	3.54	-0.22
Experience in current factory (yrs)	5.267	5.662	5.183	0.478
Experience in garment industry(yrs)	7.794	9.535	7.425	2.110***
C. Job Information Networks				
Used ties for current job info	0.706	0.697	0.708	-0.011
Tie was a femalec	0.65	0.145	0.755	-0.610***
Tie was a neighbour(post migration)c	0.405	0.229	0.442	-0.213***
Tie was a relative/family memberc	0.230	0.359	0.201	0.158***
Current strong social ties in garment industry <sup>d</sup>	1.314	1.398	1.296	0.103

Note: Col (4) based on t-test for differences in mean.

a. Education level categories: 0(Illiterate), 1(Literate, but no schooling), 2(Up to primary level), 3(Up to secondary level),4(Up to Senior Secondary), 5(Graduate), 6(Masters), 7(Professional training like ITI, Diploma).

b. Skill-grade=1 if Unskilled; 2 if Semi-Skilled A; 3 if Semi-Skilled B; 4 if Skilled A; 5 if Skilled B; 6 if Highly skilled. H (General), M (OBC), L (SC/ST) are administrative caste categories created after mapping reported jati and native states using government prescribed lists. Stitching training includes training at stitching training centres or apprenticeship at a relative's shop.

c. Conditional on mobilisation of ties for job information in the current factory.

d. Sum of affirmative responses to having 1. spouse/parents; 2. immediate family member/close relative; 3. current immediate neighbours; 4. childhood friends working in the garment industry.

Source: Factory survey data, September 2020 - January 2021.

Standard errors not reported due to space constraint. Significant at \*10 per cent, \*\*5 per cent and \*\*\*1 per cent.vv

#### Table 3: Referrals, Workplace Ties and Aspirations

Ν	Overall 1076 (1)	Male 188 (2)	Female 888 (3)	Diff (4)
Panel A. Referrals				
Recommended	0.355	0.532	0.318	0.214***
	(0.015)	(0.036)	(0.016)	(0.038)
Number of times recommended	0.466	0.888	0.376	0.512***
	(0.024)	(0.086)	(0.021)	(0.060)
Recommendation score	1.272	3.096	0.886	2.209***
	(0.083)	(0.346)	(0.061)	(0.207)
Panel B. Vertical ties				
Number of seniors for professional advice	1.139	1.207	1.125	0.082
	(0.020)	(0.050)	(0.022)	(0.052)
Number of seniors for personal advice	0.267	0.479	0.222	0.267***
	(0.017)	(0.551)	(0.017)	(0.045)
Number of seniors for taking help	0.646	0.830	0.607	0.223***
	(0.024)	(0.068)	(0.024)	(0.062)
Panel C. Aspiration score				
Aspire to be supervisor	0.424	0.777	0.349	0.427***
	(0.015)	(0.030)	(0.016)	(0.038)
Ever taken leadership initiative	0.327	0.590	0.271	0.319***
	0.014	0.036	0.015	0.036
Willingness to work overtime	0.668	0.862	0.627	0.234***
	(0.014)	(0.025)	(0.016)	(0.234)
Aspiration score	1.419	2.229	1.247	0.981***
	0.031	0.032	0.063	0.075

**Note:** A worker i is 'Recommended' if recommended by at least one intermediate manager, irrespective of the category of promotion. 'Number of times recommended' is the sum of recommendations a worker i received from all intermediate supervisors, irrespective of the category of promotion. Recommendation score is the sum of all types of recommendations; a score of 4 if recommended without gender prompting for supervisory position; 3 if recommended after gender prompting for supervisory position; 2 if recommended without gender prompting for grade promotion; and 1 if recommended after gender prompting for grade promotion; plus 1 if referral was given by floor in-charge.

Source: Factory survey data, September 2020–January 2021.

Standard errors not reported due to space constraint. Significant at \*10 per cent, \*\*5 per cent and \*\*\*1 per cent.

		Worke	er received reco	mmendation	(=1)	
		Production			Sewing	
	(1)	(2)	(3)	(4)	(5)	(6)
Female (=1)	-0.093	-0.106	-0.177	-0.184	-0.181	-0.205
	(0.141)	(0.144)	(0.142)	(0.157)	(0.158)	(0.159)
Number of seniors	0.103	0.104	0.127*	0.087	0.090	0.116
for professional advice	(0.068)	(0.071)	(0.070)	(0.070)	(0.073)	(0.075)
Number of seniors	0.190***	0.189***	0.185***	0.191**	0.189**	0.177**
for personal advice	(0.067)	(0.068)	(0.068)	(0.075)	(0.074)	(0.074)
Number of seniors	-0.027	-0.031	-0.030	-0.062	-0.060	-0.069
for taking help	(0.070)	(0.069)	(0.070)	(0.065)	(0.065)	(0.065)
Aspiration score	0.135***	0.131***	0.135***	0.135***	0.137***	0.135***
	(0.046)	(0.047)	(0.047)	(0.050)	(0.052)	(0.051)
Characteristics controls	Yes	Yes	Yes	Yes	Yes	Yes
Line level controls	Yes	Yes	Yes	Yes	Yes	Yes
Factory FE		Yes			Yes	
Factory-floor FE			Yes			Yes
Constant	-0.855	-0.662	-3.303**	-2.108	-2.220	-3.550**
	(1.414)	(1.461)	(1.338)	(1.415)	(1.499)	(1.455)
Number of observations	1076	1076	1076	980	980	980
Pseudo R-sq	0.192	0.192	0.207	0.198	0.198	0.206

#### Table 4: Probability of Receiving Recommendations and Worker Characteristics

**Note:** Dependent variable takes value 1 if worker 'i' received at least one recommendation for promotion (irrespective of type of promotion). Includes controls for Age, Age-sq, education above higher secondary level (=1), Married (=1), Sole earner (=1), Lives in joint family (=1), Number of children, Caste categories (L=benchmark), if migrant to factory state (=1), Used social ties for job information for current job (=1), Experience in garment industry and square term, Experience in current garment industry and square term, First- time employee (=1), Current designation Operator(=1), Current designation Helper (=1), Skill-grade rank, Participated in skill training programme (=1).

Detailed results shown in . Standard errors clustered at factory-line level in parentheses. Source: Factory worker survey, September 2020-January 2021.

Significant at \*10 per cent, \*\*5 per cent and \*\*\*1 per cent.

		V	Vorker rece	ived reco	mmendat	ion (=1)		
	Numb	er of time	s recomme	nded	Red	commend	ation Inc	lex
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Female (=1)	-0.195	-0.211	-0.236	-0.239	-1.005	-1.039	-1.211	-1.198
	(0.081)	(0.079)	(0.088)	(0.087)	(0.317)	(0.313)	(0.339)	(0.338)
Number of seniors for	0.071	0.077	0.048	0.055	0.221	0.226	0.172	0.180
professional advice	(0.041)	(0.042)	(0.040)	(0.042)	(0.139)	(0.142)	(0.142)	(0.148)
Number of seniors for	0.090	0.087	0.084	0.079	0.259	0.254	0.202	0.193
personal advice	(0.040)	(0.040)	(0.044)	(0.044)	(0.154)	(0.155)	(0.162)	(0.162)
Number of seniors for	-0.031	-0.030	-0.031	-0.032	-0.103	-0.100	-0.096	-0.101
takıng help	(0.033)	(0.033)	(0.037)	(0.037)	(0.125)	(0.125)	(0.140)	(0.142)
Aspiration score	0.040	0.041	0.042	0.042	0.172	0.178	0.175	0.175
	(0.025)	(0.024)	(0.027)	(0.027)	(0.089)	(0.088)	(0.097)	(0.096)
Characteristics controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Line level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Factory FE	Yes		Yes		Yes		Yes	
Factory-floor FE		Yes		Yes		Yes		Yes
Constant	0.258	-0.650	-0.147	-0.683	0.090	-2.382	-1.095	-2.280
	(0.582)	(0.509)	(0.581)	(0.551)	(1.928)	(1.862)	(1.971)	(1.955)
Number of observations	1076	1076	980	980	1076	1076	980	980
R-sq	0.260	0.272	0.270	0.279	0.277	0.289	0.288	0.296

#### Table 5: Recommendation Intensity and Worker Characteristics

**Note:** Number of times recommended= number of times a worker 'i' by recommended by different intermediate managers; Recommendation score as explained in Table 3. Includes controls for Age, Age-sq, Education above higher secondary level (=1), Married (=1), Sole earner (=1), Lives in joint family (=1), Number of children, Caste categories (L=benchmark), if migrant to factory state (=1), Used social ties for job information for current job (=1), Experience in garment industry and square term, Experience in current garment industry and square term, First-time employee (=1), Current designation Operator(=1), Current designation Helper (=1), Skill-grade rank, Participated in skill training programme (=1).

Standard errors clustered at factory-line level in parentheses.

Source: Factory worker survey, September 2020-January 2021. Significant at \*10 per cent, \*\*5 per cent and \*\*\*1 per cent.

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					Worker re	ceived rec	:ommenda	tion (=1)				
			Prod	uction					Sewi	ng		
	Recomn	nended	NG	o. of	Recomme	endation	Recomm	lended	No. 6	of	Recomm	endation
	) )	1)	recomm	endations	Ind	ex	(=)	_	recommen	dations	Inc	ex
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
	(1)	(2)	(3)	(4)	(5)	(9)	(2)	(8)	(6)	(10)	(11)	(12)
Number of seniors for	0.125	0.261	0.060	0.153	0.090	0.774	0.122	0.440	0.041	0.173	0.043	0.972
professional advice	(0.083)	(0.217)	(0.042)	(0.132)	(0.124)	(0.548)	(0.086)	(0.245)	(0.041)	(0.159)	(0.124)	(0.666)
Number of seniors for	0.266	-0.207	0.116	-0.071	0.278	-0.153	0.285	-0.463	0.130	-0.138	0.319	-0.485
personal advice	(0.079)	(0.181)	(0.034)	(0.141)	(0.111)	(0.566)	(0.083)	(0.218)	(0.038)	(0.141)	(0.125)	(0.576)
Number of seniors for taking	-0.079	-0.063	-0.045	-0.050	-0.140	-0.116	-0.087	-0.237	-0.042	-0.064	-0.126	-0.137
help	(0.077)	(0.201)	(0.028)	(0.123)	(0.089)	(0.527)	(0.076)	(0.242)	(0.029)	(0.167)	(0.092)	(0.734)
Aspiration score	0.120	0.160	0.035	0.084	0.157	0.326	0.111	0.269	0.032	0.091	0.143	0.326
	(0.054)	(0.154)	(0.019)	(0.123)	(0.057)	(0.521)	(0.058)	(0.176)	(0.021)	(0.143)	(0.061)	(0.613)
Characteristics controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Line level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Factory-floor FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-1.158	-8.856	0.202	-2.924	0.864	-14.617	-2.808	-19.761	-0.033	-4.174	0.782	-15.970
	(1.421)	(4.724)	(0.428)	(2.407)	(1.503)	(8.966)	(1.524)	(6.686)	(0.514)	(2.573)	(1.844)	(10.088)
Number of observations	888	188	888	188	888	188	826	154	826	154	826	154
R-sq			0.234	0.364	0.232	0.360			0.237	0.386	0.238	0.378
Pseudo R-sq	0.198	0.410					0.196	0.502				

Note: Recommended=1 if worker 'i' received at least one recommendation (results for probit model). Number of times recommended= number of times a worker is recommended by different intermediate managers; Recommendation score as explained in Table 3. Includes controls for Age, Age-Sq, Education above higher secondary level (=1), Married (=1), Sole earner (=1), Lives in joint family (=1), Number of children, Caste categories (L=benchmark), if migrant to factory state (=1), Used social ties for job information for current job (=1), Experience in garment industry and square term, Experience in current garment industry and square term, First-time employee (=1), Current designation Operator(=1), current designation Helper (=1), Skill-grade rank, Participated in skill training program (=1). Standard errors clustered at factory-line level in parentheses.

Source: Factory worker survey, September 2020-January 2021.

Significant at \*10 per cent, \*\*5 per cent and \*\*\*1 per cent.

#### Table 7: Recommendations and Worker Characteristics in FO

	Rec	ommend	ed	Reco	Number o ommenda	of tions	Recom	Recommendation Index			
	Produ	ction	Sewing	Produ	uction	Sewing	Produ	uction	Sewing		
	Overall	Female	Female	Overall	Female	Female	Overall	Female	Female		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)		
Female (=1)	0.145			-0.107			-0.682				
	(0.154)		İ	(0.111)			(0.473)	İ			
Number of	0.391	0.323	0.354	0.173	0.150	0.354	0.440	0.308	0.354		
seniors for professional advice	(0.088)	(0.119)	(0.123)	(0.061)	(0.062)	(0.123)	(0.209)	(0.161)	(0.123)		
Number of	0.167	0.312	0.462	0.123	0.137	0.462	0.456	0.376	0.462		
seniors for personal advice	(0.107)	(0.155)	(0.171)	(0.065)	(0.051)	(0.171)	(0.263)	(0.162)	(0.171)		
Number of	0.183	0.189	0.153	0.061	0.036	0.153	0.203	0.088	0.153		
seniors for taking help	(0.114)	(0.143)	(0.159)	(0.061)	(0.046)	(0.159)	(0.231)	(0.109)	(0.159)		
Aspiration score	0.012	-0.008	-0.047	-0.019	0.009	-0.047	0.011	0.116	-0.047		
	(0.080)	(0.086)	(0.112)	(0.035)	(0.025)	(0.112)	(0.126)	(0.055)	(0.112)		
Characteristics controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Line level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Floor fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Constant	-3.187	-2.417	-0.808	-1.955	-0.721	-0.808	-8.635	-2.272	-0.808		
	(1.967)	(2.332)	(2.879)	(0.832)	(0.715)	(2.879)	(3.217)	(2.138)	(2.879)		
Number of observations	395	318	256	395	318	256	395	318	256		
R-sq				0.290	0.258		0.301	0.273			
Pseudo R-sq	0.223	0.222	0.266			0.266			0.266		

**Note:** Recommended=1 if worker 'i' received at least one recommendation. 'No. of times recommended'= number of times a worker by recommended by different intermediate managers; Recommendation score as explained in Table 3. Includes controls for Age, Age-sq, Education above higher secondary level (=1), Married (=1), Sole earner (=1), Lives in joint family (=1), Number of children, Caste categories (L=benchmark), if migrant to factory state (=1), Used social ties for job information for current job (=1), Experience in garment industry and square term, First-time employee (=1), Current designation Operator(=1), Current designation Helper (=1), Skill-grade rank, Participated in skill training programme (=1). Standard errors clustered at factory-line level in parentheses.

Source: Factory worker survey, September 2020-January 2021.

Significant at \*10 per cent, \*\*5 per cent and \*\*\*1 per cent.

	Recomm	nended	Nur Recomn	nber of nendations	Recommendation Index		
	Overall	Female	Overall	Female	Overall	Female	
	(1)	(2)	(3)	(4)	(5)	(6)	
Female (=1)	-0.145		-0.187		-1.113		
	(0.310)		(0.122)		(0.494)		
Number of seniors for professional	-0.227	-0.306	0.016	-0.077	0.294	-0.114	
advice	(0.218)	(0.236)	(0.150)	(0.086)	(0.532)	(0.213)	
Number of seniors for personal	0.279	0.284	0.018	0.088	-0.072	0.266	
advice	(0.123)	(0.145)	(0.058)	(0.053)	(0.223)	(0.193)	
Number of seniors for taking help	-0.206	-0.182	-0.083	-0.075	-0.341	-0.261	
	(0.124)	(0.110)	(0.054)	(0.042)	(0.202)	(0.162)	
Aspiration score	0.402	0.399	0.135	0.099	0.498	0.322	
	(0.090)	(0.109)	(0.040)	(0.041)	(0.143)	(0.127)	
Characteristics controls	Yes	Yes	Yes	Yes	Yes	Yes	
Line level controls	Yes	Yes	Yes	Yes	Yes	Yes	
Floor FE	Yes	Yes	Yes	Yes	Yes	Yes	
Constant	-8.447	-7.296	-2.185	-1.087	-6.115	-1.586	
	(2.386)	(3.040)	(0.729)	(0.886)	(3.138)	(3.534)	
Number of observations	334	260	334	260	334	260	
R-sq			0.377	0.296	0.400	0.270	
Pseudo R-sq	0.376	0.331					

#### Table 8: Recommendations and Worker Characteristics by F1

#### Table 9: Recommendations and Worker characteristics by F2

	Rec	ommend	ed	l Recc	Number o ommenda	of tions
	Overall	Female	Overall	Female	Overall	Female
	(1)	(2)	(3)	(4)	(5)	(6)
Female (=1)	-0.165		-0.156		-0.702	
	(0.371)		(0.140)		(0.425)	
Number of seniors for professional advice	0.092	0.080	0.033	0.033	0.028	-0.003
	(0.106)	(0.118)	(0.054)	(0.058)	(0.177)	(0.181)
Number of seniors for personal advice	0.106	0.200	0.045	0.073	-0.007	0.014
	(0.169)	(0.167)	(0.091)	(0.094)	(0.273)	(0.283)
Number of seniors for taking help	-0.182	-0.327	-0.039	-0.056	-0.061	-0.150
	(0.129)	(0.167)	(0.055)	(0.054)	(0.166)	(0.173)
Aspiration score	0.103	0.139	-0.023	0.001	-0.111	0.036
	(0.107)	(0.108)	(0.052)	(0.039)	(0.168)	(0.139)
Characteristics controls	Yes	Yes	Yes	Yes	Yes	Yes
Line level controls	Yes	Yes	Yes	Yes	Yes	Yes
Floor FE	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-6.413	-6.843	-0.233	-0.511	0.174	-0.890
	(2.086)	(2.450)	(0.853)	(0.840)	(3.574)	(3.566)
Number of observations	347	309	347	310	347	310
R-sq			0.316	0.326	0.299	0.296
Pseudo R-sq	0.301	0.339				

			ļ	spiration	score			
		Produ	iction			Sew	ing	
	Overall (1)	Overall (2)	HPW (3)	LPW (4)	Overall (5)	Overall (6)	HPW (7)	LPW (8)
Female (=1)	-0.820	-0.610	-0.373	-0.663	-0.840	-0.567	-0.369	-0.563
	(0.102)	(0.126)	(0.272)	(0.131)	(0.120)	(0.168)	(0.305)	(0.195)
Exposed to female		0.177	1.081	-0.153		-0.187	0.091	-0.356
role models		(0.307)	(0.531)	(0.438)		(0.226)	(0.371)	(0.274)
Exposed to female		-0.523	-0.737	-0.437		-0.576	-0.744	-0.592
role models*Female		(0.179)	(0.309)	(0.241)		(0.207)	(0.336)	(0.275)
Number of seniors for	0.004	0.010	-0.030	0.046	-0.033	-0.025	-0.065	0.002
professional advice	(0.067)	(0.067)	(0.101)	(0.087)	(0.068)	(0.070)	(0.108)	(0.088)
Number of seniors for	0.025	0.016	-0.054	0.057	-0.009	-0.016	-0.107	0.035
personal advice	(0.073)	(0.072)	(0.110)	(0.101)	(0.067)	(0.068)	(0.109)	(0.100)
Number of seniors for	0.225	0.237	0.266	0.231	0.230	0.241	0.293	0.236
taking help	(0.051)	(0.050)	(0.076)	(0.073)	(0.056)	(0.054)	(0.083)	(0.074)
Characteristics controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Line level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Floor fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1076	1076	382	694	980	980	351	629
Pseudo R-sq	0.134	0.136	0.154	0.127	0.130	0.132	0.150	0.125

#### Table 10: Recommendation Intensity and Worker Characteristics

Table 11: Aspirations, Role Models and Worker Characteristics (by factory)

						Aspiration	ו score					
			Fact	ory F0				actory F1		Ľ	actory F2	
	١d	oduction			Sewing							
	Overall	МдН	LPW	Overall	MDM	LPW	Overall	Мдн	LPW	Overall	MdH	LPW
	(1)	(2)	(3)	(4)	(5)	(9)	(2)	(8)	(6)	(10)	(11)	(12)
Female	-0.412	-0.012	-0.678	-0.089	0.523	-0.333	-1.084	-0.868	-1.148	-0.919	-0.082	-1.249
	(0.153)	(0.385)	(0.145)	(0.256)	(0.420)	(0.322)	(0.315)	(0.609)	(0.313)	(0.322)	(0.795)	(0.295)
Exposed to female role							-0.185	0.405	-0.459	0.240	-0.317	-0.031
models							(0.256)	(0.445)	(0.348)	(0.436)	(0:630)	(0.466)
Exposed to female role							-0.040	-0.429	0.045	-0.029	-0.676	0.254
models*Female							(0.315)	(909.0)	(0.440)	(0.361)	(0.773)	(0.336)
Number of seniors for	0.197	0.321	0.198	0.144	0.264	0.098	0.156	0.408	0.057	-0.103	-0.357	0.032
professional advice	(0.081)	(0.166)	(0.155)	(0.113)	(0.208)	(0.172)	(0.153)	(0.304)	(0.241)	(0.103)	(0.176)	(0.138)
Number of seniors for	0.020	-0.057	0.084	-0.046	-0.389	0.126	0.050	-0.024	0.057	-0.061	-0.156	-0.009
personal advice	(0.135)	(0.294)	(0.170)	(0.137)	(0.313)	(0.171)	(060.0)	(0.150)	(0.157)	(0.164)	(0.242)	(0.240)
Number of seniors for	0.218	0.349	0.102	0.224	0.513	0.088	0.270	0.364	0.306	0.324	0.280	0.363
taking help	(0.079)	(0.131)	(0.136)	(0.095)	(0.143)	(0.142)	(0.080)	(0.166)	(0.130)	(0.102)	(0.128)	(0.113)
Characteristics controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Line level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Floor fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	395	133	262	299	102	197	334	137	197	347	112	235
Pseudo R-sq	0.098	0.168	0.091	0.092	0.188	0.083	0.155	0.209	0.137	0.150	0.199	0.204

#### Figure 1: Intermediate managers' opinions regarding skewed gender distribution at supervisory level



Absence of female supervisors Presence of female supervisors

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**Note:** 76 per cent (i.e., 78/102) of intermediate managers gave referrals for supervisory roles. Of the recommended workers (without gender prompting), 36 per cent were females, 64 per cent were males. F0 = Faridabad factory with no female intermediate managers, F1= Faridabad factory with (15 per cent) female intermediate managers, F2 = Bangalore factory with (12.5 per cent) female intermediate managers.

**Source:** Factory supervisors' survey, September 2020-December 2020.

### *Figure 3:* Number of times a worker got recommendation as first choice for supervisory promotion





**Note:** 76 per cent (i.e., 78/102) of intermediate managers gave referrals for supervisory roles. Of the recommended workers (without gender prompting), 36 per cent were females, 64 per cent were males. F0 = Faridabad factory with no female intermediate managers, F1= Faridabad factory with 15 per cent female intermediate managers, F2 = Bangalore factory with 12.5 per cent female intermediate managers.

**Source:** Factory supervisors' survey, September 2020-December 2020.



## 9 APPENDIX A Additional Results

#### Table A.1: Intermediate Managers Characteristics

	Overall (1)	Male (2)	Female (3)	Diff (4)
A. Demographics	96	85	11	(2)-(3)
Age (years)	37.17	37	38.54	-1.54
	(0.680)	(0.734)	(1.786)	(2.141)
Proportion married	0.89	0.87	1	-0.129
	(0.033)	(0.037)	(0.0)	(0.102)
Proportion Hindu	0.843	0.835	0.909	-0.074
	(0.037)	(0.040)	(0.090)	(0.037)
Prop. of migrants from Bihar	0.25	0.259	0.182	0.077
	(0.004)	(0.048)	(0.122)	(0.140)
Mean education level	3.813	3.788	4	-0.212
	(0.117)	(0.123)	(0.381)	(0.368)
Proportion H	0.543	0.536	0.6	-0.064
	(0.052)	(0.055)	(0.163)	(0.168)
Proportion M	0.34	0.345	0.3	0.045
	(0.340)	(0.052)	(0.153)	(0.160)
Proportion L	0.117	0.119	0.1	0.019
	(0.033)	(0.035)	(0.1)	(0.109)
B. Work Profile	20423.21	20676.75	18464	2212.753
Current salary (INR)	(526.435)	(572.776)	(1117.374)	(1645.781)
Total experience in current factory	7.208	6.776	10.545	-3.769***
	(0.620)	(0.642)	(1.983)	(1.919)
Total experience in garment manufacturing	15.406	15.377	15.636	-0.259
	(0.737)	(0.810)	(1.562)	(2.327)

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Started career from the current factory	0.083	0.047	0.364	-0.317***
	(0.028)	(0.023)	(0.152)	(0.083)
Stitching training (formal or informal)	0.406	0.4	0.454	-0.055
	(0.050)	(0.053)	(0.050)	(0.159)
Special skills training by the management	0.667	0.671	0.636	0.034
	(0.048)	(0.051)	(0.152)	(0.153)

**Note:** Col (5) is based on t-test for differences in mean. # Conditional on being married. H (General), M (OBC), L (SC/ST) are administrative caste categories as reported by the respondents, 2 respondents said "Don't know" (N=94). Education level categories: 0(Illiterate), 1(Literate but no schooling), 2(Up to primary level), 3(Up to secondary level),4(Up to Senior Secondary), 5(Graduate), 6(Masters), 7(Professional training like ITI, Diploma). Stitching training includes training at stitching training centres or apprenticeship at a relative's shop.

Source: Factory survey data, September 2020-December 2020

Standard errors in parentheses. Significant at \*10 per cent, \*\*5 per cent and \*\*\*1 per cent.

#### Table A.2: Instrumental Networks of Existing Intermediate Managers

	Overall	Male	Female	Diff
	(1)	(2)	(3)	(4)
A. Ties used for information in past	96	85	11	(2)-(3)
Used ties for job in current factory	0.687	0.671	0.8184	-0.148
	(0.048)	(0.051)	(0.122)	(0.149)
Tie is a woman	0.106	0.035	0.556	-0.520***
	(0.038)	(0.025)	(0.176)	(0.009)
Tie is a prior co-worker	0.545	0.596	0.222	0.374**
	(0.061)	(0.066)	(0.147)	(0.175)
Ties is an older friend	0.242	0.263	0.111	0.152
	(0.053)	(0.059)	(0.111)	(0.155)
<b>Used tie for guidance to become</b> supervisor (mentor)	0.60	0.565	0.909	-0.344**
	(0.050)	(0.090)	(0.564)	(0.154)
Mentor is a woman	0.103	0.08	0.2	-0.117
	(0.040)	(0.040)	(0.133)	(0.107)
Mentor is a prior co-worker	0.344	0.354	0.3	0.054
	0.063	0.153	0.070	0.168
Mentor is a current factory senior	0.55	0.521	0.7	-0.179
	(0.066)	(0.073)	(0.153)	(0.174)
B. Current ties	-	-		
Number of factory ties for professional	1.885	2.363	1.823	-0.54
advice/help (seniors)	(0.089)	(0.088)	(0.388)	(-0.189)
Number of ties outside factory for	0.510	0.727	0.482	-0.245

professional advice/help	(0.069)	(0.072)	(0.237)	(0.218)
Number of factory ties for personal	0.469	0.447	0.636	-0.189
advice/help (co-workers)	(0.088)	(0.088)	(0.388)	(0.280)

**Note:** Col (5) is based on t-test for differences in mean.

Source: Factory survey data, September 2020-December 2020.

Standard errors in parentheses. Significant at \*10 per cent, \*\*5 per cent and \*\*\*1 per cent.

#### Table A.3: Differences in Female and Male Workers

	C	iender (=1)				
	Р	roduction			Sewing	
	Overall (1)	HPW (2)	LPW (3)	Overall (4)	HPW (5)	LPW (6)
Age	0.087	0.349	0.068	0.091	0.199	0.076
Married	-0.184	-1.166	0.090	-0.194	-0.944	0.098
Lives in joint family	0.074	0.687	0.103	-0.060	0.468	-0.102
Number of children	0.224	0.450	0.249	0.218	0.298	0.278
Sole earner	-0.937	-1.977	-0.647	-0.895	-1.816	-0.487
Hindu	-0.108	-0.082	0.113	-0.162	-0.259	0.210
Unreserved category	0.674	1.869	0.301	0.817	1.864	0.579
OBC	0.149	0.848	-0.109	0.266	0.941	0.058
Migrant from other state	-0.515	-1.215	-0.387	-0.594	-1.288	-0.452
First-time employee	0.520	0.872	0.526	0.547	0.667	0.697
Experience in garment industries (yrs)	-0.091	-0.148	-0.075	-0.114	-0.188	-0.090
Experience in current factory (yrs)	-0.031	0.052	-0.106	-0.049	0.068	-0.131
Education (higher sec. abv)	-0.293	-0.574	-0.158	-0.274	-0.647	-0.027
Operator	0.850	1.306	0.845	0.856	1.329	0.862
Helper	0.442	0.106	0.638	0.681	0.129	1.252
Skill-salary grade	-0.081	-0.233	0.017	-0.032	-0.221	0.187
Senior-professional advice index	-0.073	-0.430	0.011	-0.096	-0.402	-0.008
Senior-personal advice index	-0.156	-0.001	-0.299	-0.182	0.046	-0.430
Senior-expectation index	-0.018	-0.176	0.057	0.002	-0.201	0.086
Social ties in garment industry	-0.483	-0.743	-0.428	-0.500	-0.762	-0.473
Willing to do overtime	-0.568	-0.203	-0.753	-0.532	-0.177	-0.719
Taken leadership initiative	-0.186	-0.339	0.066	-0.340	-0.445	-0.127
Aspiration to be supervisor	-0.583	-0.184	-0.803	-0.475	-0.102	-0.747
Participated in special training programme	0.386	0.811	0.169	0.464	0.801	0.198

Used ties for job information	0.070	0.029	0.022	0.180	0.276	0.126
Recommendations by line	0.032	0.049	0.019	0.036	0.053	0.023
Proportion of females in line	7.798	3.699	12.161	8.473	3.866	13.103
Line strength	-0.007	-0.030	-0.002	-0.007	-0.031	-0.002
Experience in garment industries (yrs)-sq	0.002	0.001	0.001	0.003	0.003	0.002
Experience in current factory (yrs)-sq	0.004	0.001	0.012	0.005	-0.001	0.013
Constant	-6.167	-5.768	-10.237	-6.821	-3.352	-11.821
Factory-floor FE	Yes	Yes	Yes	Yes	Yes	Yes
Ν	1076	382	694	980	351	629
Pseudo R-sq	0.444	0.627	0.409	0.450	0.620	0.430

**Note:** Probit regression with dependent variable takes value 1 if worker 'i' is female in respective sub-sample; HPW (High Potential Worker = more likely to get promotion), LPW (Low Potential Worker = less likely to get promotion). Standard errors clustered at factory-line level in parentheses (not shown due to lack of space).

Source: Factory worker survey, September 2020-January 2021.

Significant at \*10 per cent, \*\*5 per cent and \*\*\*1 per cent.

	Worker receive	d recomme	ndation (=	1)		
	Р	roduction			Sewing	
	Overall (1)	HPW (2)	LPW (3)	Overall (4)	HPW (5)	LPW (6)
Female (=1)	-0.093	-0.106	-0.177	-0.184	-0.181	-0.205
Age (in yrs)	0.107	0.104	0.123	0.114	0.115	0.125
age-sq	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002
Education (Higher secondary & above)	0.118	0.116	0.112	0.064	0.064	0.066
Married (=1)	-0.062	-0.068	-0.044	-0.136	-0.136	-0.111
Number of children	-0.133	-0.137	-0.153	-0.151	-0.152	-0.160
Sole earner	0.017	0.008	0.007	-0.065	-0.064	-0.058
Joint family	0.218	0.201	0.220	0.267	0.267	0.282
Migrant from other state	0.047	-0.013	-0.011	0.035	0.034	-0.010
Hindu	0.012	0.027	0.013	0.002	-0.002	-0.013
Unreserved	-0.065	-0.073	-0.092	-0.082	-0.083	-0.108
ОВС	-0.019	-0.014	-0.025	-0.015	-0.014	-0.023
Used ties for job information	-0.160	-0.153	-0.153	-0.196	-0.198	-0.202
Number of seniors for professional advice	0.103	0.104	0.127	0.087	0.090	0.116
Number of seniors for personal advice	0.190	0.189	0.185	0.191	0.189	0.177
Number of seniors for taking help	-0.027	-0.031	-0.030	-0.062	-0.060	-0.069
Social ties in garment industry	0.113	0.113	0.104	0.079	0.080	0.059
First-time employee	-0.197	-0.190	-0.179	-0.175	-0.175	-0.184
Experience in garment industries (yrs)	-0.036	-0.031	-0.029	-0.009	-0.010	-0.009
Experience in garment industries (yrs)-sq	0.001	0.001	0.001			
Experience in current factory (yrs)	0.189	0.188	0.178	0.145	0.145	0.147
Experience in current factory (yrs)-sq	-0.008	-0.008	-0.007	-0.005	-0.006	-0.006
Skill-salary grade	0.033	0.024	0.024	0.080	0.081	0.076
Operator	-0.620	-0.599	-0.590	-0.583	-0.581	-0.600
Helper	-0.922	-0.931	-0.891	-0.621	-0.618	-0.610
Aspiration score	0.135	0.131	0.135	0.135	0.137	0.135
Participated in special training programme	-0.021	-0.024	-0.015	-0.041	-0.044	-0.039

#### Table A.4: Probability of Receiving Recommendation and Worker Characteristics

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Number of recommendations from line	0.090	0.092	0.111	0.108	0.108	0.110
Proportion of females in line	-1.244	-1.251	1.514	0.442	0.535	1.835
Line strength	-0.011	-0.011	-0.015	-0.017	-0.017	-0.015
Factory FE		Yes			Yes	
Factory-floor FE			Yes			Yes
Constant	-0.855	-0.662	-3.303	-2.108	-2.220	-3.550
Ν	1076	1076	1076	980	980	980
Pseudo R-sq	0.192	0.192	0.207	0.198	0.198	0.206

#### Figure 4: Hierarchy structure at a production unit



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