Wage Subsidies to Promote Female Hiring: Evidence from Pakistan*

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Female labor force participation rates are low across developing countries, especially in South Asia, but firm-side constraints to hiring women are not well understood. We test the impact of offering a 6-month wage subsidy for hiring a woman. A randomly selected half of 1,227 firms with an active job advertisement on Pakistan's largest online job search portal were made a subsidy offer via Becker-DeGroot-Marschak (BDM) mechanism, which elicited the minimum level of subsidy needed for the manager to hire a woman for the role. We find that the average minimum subsidy level required by managers to hire a female is 15% and that firms in the treatment group are 11 percentage points more likely to hire a woman for the position. Effects on hiring were particularly pronounced for firms with only male employees at baseline. There are lasting effects on gender preferences expressed in future job advertisements by treated firms.

PRELIMINARY. PLEASE DO NOT CITE OR SHARE.

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1 Introduction

Female labor force participation (FLFP) rates are low and there are large gender gaps in employment across the Middle East and North Africa region and in South Asia (World Economic Forum, 2020). While supply-side constraints to FLFP are relatively well understood (Jayachandran, 2021), we know less about the demand-side constraints (Gentile et al., 2023). In particular, we have very little evidence on demand-side interventions that can help overcome these constraints.

We address this gap in the literature with a study with Pakistani firms, a country with one of the lowest female labor force participation rates in the world: 23% of women overall and only 17% of women with intermediate (upper secondary or post-secondary non tertiary education) levels of education were employed in 2021 (World Bank, 2021). Firms may be reluctant to hire women as they may impose two types of explicit costs on firms: one due to (perceived) lower productivity and second, investments needed to hire women such as gender-separated toilets.[1] We conduct a randomized controlled trial with 1,227 firms to measure the impact of offering a temporary wage subsidy to lower the cost to the firm of hiring a woman. This allows us to answer two questions: (1) Can wage subsidies provided to firms boost female employment? and (2) Can these lead to longer term shifts in hiring potentially due to fixed investments made to hire women or due to learning about female worker productivity?

We partner with Pakistan's largest online jobs platform, Rozee.pk for the study. Our sample frame comprises all firms that advertised a job on Rozee.pk between April and November 2022 with no stated gender preference and due to budgetary constraints, had a monthly salary below PKR 80,000 (USD 1,700 PPP). We chose to conduct the study exclusively with firms that had no stated gender preference, as we were concerned that those explicitly wanting a male candidates would be significantly harder to influence. We conducted a baseline survey with the hiring manager for the position. Firms were then randomised to either the treatment or control group. The treatment arm is offered a 6-month wage subsidy if they hire a woman for the advertised position at a level elicited through the Becker-DeGroot-Marschak (BDM) mechanism. The mechanism was used to elicit the true level of subsidy needed to hire a woman and firms were only offered the subsidy if the manager's required level of subsidy was equal to or below a random number.

We find a 10.7 percentage points significant increase in the primary outcome of interest,

[1] Recent work by Gentile et al. (2023) using datasets from three sources in Pakistan finds that firms that have gender-separated amenities are more willing to hire women.

the likelihood of hiring a woman, in the treated group.[2] This effect is robust to the inclusion of controls. We also explore the impact on secondary outcomes of interest, the gender composition of applicants and those who are interviewed but don't find any significant impacts on these. The reported salary of the hired candidate and the likelihood of being offered a contract show some marginal improvement in the treatment group. However, we interpret these findings with caution, as they may reflect mechanical changes driven by the subsidy.

We find substantial variation in treatment effects based on job attributes. Among treated firms, job postings that require less than an undergraduate degree experience a 17 percentage point increase in female hiring. Similarly, for roles with an upper salary below the median ($<$ PKR 50,000), the effect is 10 percentage points higher, though only marginally significant. It appears that for jobs requiring higher education, offering higher salaries, and likely demanding greater skill levels, financial incentives are not sufficient for employers to hire more women. On the other hand, firms hiring low education employees where firm-side factors are a bigger constraint to female hiring than supply-side factors (Gentile et al., 2023), subsidy offers are effective.

Another important dimension of heterogeneity is firms with no female employees at baseline. Around 19% of firms had no female employees initially, and in these firms, the treatment effect is 17 percentage points. In contrast, mixed-gender firms also experience a positive and significant effect, but at a much lower magnitude of 7 percentage points. We examine whether this stronger response among male-only firms is driven by their greater tendency to advertise for lower-paid, lower-education jobs, but this does not appear to be the case.

The average minimum subsidy reported by managers is 15%, indicating that it isn't very costly to induce the change we find. Consistent with the channel of firms needing to make costly investments to hire women, firms with separate toilet facilities for women tend to require lower subsidies. Additionally, managers with less conservative views on societal norms also demand lower subsidies, suggesting that both physical workplace conditions and cultural attitudes shape the financial incentives necessary to hire women.

It is reassuring that we find no evidence of mistreatment of women hired through subsidies or of layoffs after the subsidy period ended. Out of the 131 women employed by firms receiving the subsidy, we successfully surveyed 112 women one month after the 6-month subsidy period

[2] 70% of the firms in the treatment group 'won' the subsidy and they were told immediately that they will be given a subsidy at the level they stated in the BDM if they hire a woman. The effect on hiring a woman is almost double for this group. We focus in the main analysis on the intent-to-treat estimates but discuss the treatment on the treated estimates in Section 5.1.2.

concluded.[3] Of those surveyed, approximately 28% were no longer with the same firm and nearly no one reported having left due to being fired once the subsidy had ended.

Our endline survey, conducted about 1.5 years after the baseline, had a very low follow-up rate of 27% due to the high rates of refusals and non-response due to firms potentially closing down or relocating. We find evidence that the advertised position was still more likely to be filled by a woman nearly 1.5 years after the intervention in the treatment group, but find no indication of broader firm-level changes. To complement the endline data, we analyze Rozee portal data on job advertisements from the same firms over a similar timeframe as the baseline to the endline survey. Gentile et al. (2023) highlight that a major contributor to the gender gap in employment in Pakistan is firms' reluctance to open vacancies to women. We examine how stated gender preferences in job advertisements change amongst our sample firms. Our analysis shows a significant decline of 5.5 percentage points in the likelihood of treatment firms specifying a male preference in job postings after the baseline. This effect is even more pronounced among male-only firms, aligning with the stronger impact of the treatment on the gender of hired candidates in these firms.

We contribute to the literature as the first study to look at wage subsidies as a demand-side intervention to boost female employment in a low- and middle-income country setting. Wage subsidies have a long history of broader use within the developed world (see e.g. Katz (1996)) and are a policy instrument that could be leveraged to create a more progressive work environment for women. The closest work to ours is by Groh et al. (2016) who examine the impact of a wage subsidy as a supply-side intervention in Jordan to boost female employment. They find that the wage subsidy provided directly to the women has only a transitory effect on employment during the period of the subsidy, due to a high and binding minimum wage. In Mexico, Abel et al. (2022) find more promising results beyond the subsidy period from temporary subsidies to school graduates to find and stay in formal employment. Our study is different since the wage subsidy is randomized at the firm level, allowing for the evaluation of impacts on firm-level outcomes.

Existing work on firm-side subsidies in Argentina (Galasso et al., 2004) and South Africa (Levinsohn et al., 2014), were not successful due to low take-up as a result of firms fearing labor regulations. de Mel et al. (2019) offered temporary subsidies to micro-enterprises to encourage hiring, most of which had no existing employees. However, our sample differs significantly. We also only offer a partial subsidy, incentivizing firms to conduct a genuine search for the best-qualified female candidate, rather than tying the subsidy to a particular

[3] 53% of the firms eligible to receive the subsidy provided all the necessary paperwork to set it up. We discuss this in Section 5.3.

worker at a fixed amount/proportion. We show that eliciting a meaningful subsidy level is possible using the BDM mechanism over the phone.

We also contribute to the growing literature on FLFP most of which has focused on understanding and alleviating the supply-side constraints on female employment and we focus on a demand-side intervention. Examples of supply-side work include work on women's safety from harassment and abuse in India (Siddique, 2022; Borker et al., 2021; Chakraborty et al., 2018); work in an experimental context on family members' norms about women's work (Dean and Jayachandran, 2019); limited entrepreneurship networks due to restrictive norms (Field et al., 2010; Feigenberg et al., 2014); innovations and infrastructure that make it easier for women to balance work and family (Dinkelman, 2011), and interventions to alleviate 'internal' or psychological constraints (Ahmed et al., 2024; McKelway, 2025).

The rest of the paper proceeds as follows: We discuss the context in Section 2, experimental design and intervention in Section 3, the data and estimation strategy in Section 4 and the results in Sections 5 and 6. Section 7 concludes.

2 Context

2.1 Pakistan's labor market

The study setting is Pakistan, the fifth most populous country in the world. Consistent with other countries in South Asia and the Middle East and North African region, Pakistan has a large gap in male and female labor participation rates: the male labor force participation rate is 80.7% while female labor force participation is 24.5% (International Labour Organization, 2021). This gap persists for urban employment rates across genders and for those with at least an undergraduate degree (Ahmed et al., 2024).

2.2 Rozee

Rozee.pk, established in 2007, is a premier online job portal in Pakistan. Matsuda et al. (2019) analyze the Rozee database for the 2012 to 2019 period, which includes 5.0 million jobseekers and 108,000 registered employers associated with 412,000 job postings, comparing it with the nationwide Labour Force and Enterprise surveys in Pakistan to evaluate its scope and representativeness.

The employers utilizing the Rozee.pk portal tend to be smaller and younger firms, with a notable concentration in the Information and Communication Technology (ICT) sector. A

significant 87% of the jobs posted on the platform originate from firms located in three major cities - Lahore, Karachi, and Islamabad/Rawalpindi - and the job opportunities often come with comparatively higher salary offerings.

On the job-seeker side, 48% of the individuals registered on the platform also hail from these three major urban centers. The platform primarily attracts younger and more educated job-seekers. Importantly, the proportion of women among job-seekers on the platform is consistent with their representation in the broader labor market, indicating no major deviation in gender dynamics on the online portal.

3 Experimental Design and Intervention

3.1 Sample

The sample frame comprises the universe of firms on Rozee.pk's online jobs portal that meet certain criteria: firms must have no stated gender preference on their job posting, the position must be based in Pakistan, and the salary posted on the advertisement must be below PKR 80,000 (USD 1,700 PPP) due to budgetary constraints.

7,522 firms met these criteria and were contacted between April and November 2022. 1,277 (17%) of the contacted firms completed the baseline survey. The study sample comprises a diverse set of firms, with the average firm employing approximately 100 individuals (Table 1). 27% of the firms are in the ICT sector and 93% of the firms are based in a main city.[4] 85% of the hiring managers are male. On average, 23% of the employees are women but there is considerable heterogeneity in this, with 20% of the firms having no female employees at baseline. Consistent with this, about 80% of the firms do have separated toilets by gender but far fewer (16%) have childcare services or creches. A large proportion (approx. 60-70%) report flexibility to work from home or flexible hours.

3.2 Sample representativeness

The study sample of firms is comparable to firms on the Rozee portal with no-gender preference jobs (Table A3). The main difference between our sample and the population of vacancies on the portal with no gender preference is in the maximum salary the firm is willing to pay for the job. This is driven by the salary restriction imposed by us due to

[4]Main cities are those with a population of more than 1 million: Karachi, Lahore, Islamabad, Rawalpindi, Faisalabad, Gujranwala, Peshawar, Multan, Hyderabad, and Quetta.

Table 1: Baseline Summary Statistics

	Mean	SD	Min	Max	N
Panel A: Firm Characteristics					
Firm size	114.82	781.45	0.00	15,000	1,227
Share of female employees	0.23	0.20	0.00	1	1,204
Male only firm	0.19	0.39	0.00	1	1,227
Main city	0.93	0.25	0.00	1	1,227
Industry - Communications	0.11	0.31	0.00	1	1,224
Industry - Education	0.04	0.21	0.00	1	1,224
Industry - Finance	0.10	0.30	0.00	1	1,224
Industry - ICT	0.27	0.44	0.00	1	1,224
Industry - Retail	0.03	0.18	0.00	1	1,224
Separated toilets by gender	0.78	0.41	0.00	1	1,227
Childcare services or creches	0.16	0.36	0.00	1	1,227
Panel B: Job Characteristics					
Frequent interaction with public	0.46	0.50	0.00	1	1,226
Salary (upper limit PKR)	59,583.33	24,391.17	20,000.00	100,000	1,068
Requires undergraduate or above	0.67	0.47	0.00	1	1,227
Transportation (or allowance)	0.55	0.50	0.00	1	1,227
Health insurance	0.31	0.46	0.00	1	1,227
Flexible working hours	0.68	0.47	0.00	1	1,227
Possibility to work from home	0.60	0.49	0.00	1	1,227
Panel B: Manager Characteristics					
Age (years)	32.05	7.84	18.00	84	1,227
Male	0.84	0.37	0.00	1	1,227
Married	0.61	0.49	0.00	1	1,227
Masters or above	0.51	0.50	0.00	1	1,227

Note: The table reports statistics for the full sample of firms that completed the baseline survey. Panel A contains indicator variables for firm characteristics except for 'Firm size' which is the number of employees and 'Share of female employees' which is the ratio of total females to the total number of employees. Panel B contains indicator variables for job characteristics except salary upper limit. Panel C contains indicator variables for manager characteristics, except for age which is in years.

budgetary constraints. The difference in other characteristics is significant due to the large sample size but the size of the difference is very small and not meaningful.

Less than 30% of the total firms that post vacancies on Rozee.pk *do* report explicit gender preferences for candidates (Table A2). Among them, the number of firms reporting a preference for male candidates (18.3%) is double the number of firms with a preference for female candidates (9.2%). As expected, job characteristics vary significantly across firms that specify gender preferences and those that don't (Table A2). We focus in this study on the largest category, the 70% of firms that do not specify a preferred gender for the job vacancy.

3.3 Intervention

The study is designed as a randomized control trial with a single treatment arm consisting of a 6-month wage subsidy offer targeted to firms that hire women for technical/professional roles. The intervention provides the opportunity to win a 6-month wage subsidy to be paid directly into women's bank accounts monthly if a woman is hired for the position. The Becker-DeGroot-Marschak (BDM) method is used to elicit truthful reporting of the level of subsidy that would be needed for firms to hire a woman and eligible firms receive a subsidy only if their reported desired amount of subsidy is equal to or lower than a randomly drawn level.

We tell the employer "*Imagine you were offered a wage subsidy, that is, a share of the employee's salary would be paid by us for 6 months. What is the lowest subsidy percentage you would be willing to accept to hire a qualified female candidate for this position?*". The employer is told that if their desired subsidy amount is higher than the random draw, we cannot pay any share of the hired female employee's salary. They do a practice round using an unrelated scenario to make sure they understand how BDM works.

The hiring manager provides a number representing the percentage of salary they would need to be subsidized to hire a woman (incentivized subsidy). The position "wins" if 'incentivized subsidy' $\leq$ computer-generated random number. The manager is informed of the outcome immediately. The firms then proceed with the hiring process, which includes shortlisting candidates, conducting interviews, and hiring a candidate. We then confirm the gender of the hired candidate and the subsidy is paid monthly for up to 6 months as long as a female is working in the advertised position.

3.4 Conceptual framework

We sketch a simple conceptual framework to motivate the intervention drawing on McKenzie (2017). Women are often perceived - or may actually be - less productive than their male counterparts, leading to discriminatory hiring practices. Additionally, employing women might impose costs, such as providing gender-specific facilities or adjusting workplace dynamics, including concerns about potential reductions in team productivity due to male-female interactions or the need to accommodate flexible working hours.

In the simplest labor market models, workers are paid according to their marginal productivity. If women are perceived as less productive, firms may hire them but at lower wages. However, when hiring frictions exist - such as uncertainty about women's productivity or concerns about their family commitments and the broader implications for firm productivity - firms may choose not to hire them at all. In such cases, a temporary wage subsidy can reduce these barriers and increase female employment in the short run. Moreover, this intervention could have longer-term effects if firms gain experience with female workers and update their beliefs about their productivity, female employees enhance their skills through on-the-job learning, or the subsidy enables firms to make fixed-cost investments (e.g., constructing gender-specific facilities) that support the hiring of women.

On the supply side, subsidies could address a mismatch between the wages firms are willing to pay and the wages women are willing to accept, potentially stemming from women overestimating the costs of employment.

3.5 Randomization

Firms are randomly chosen with equal probability to be eligible for the subsidy. Note that only one subsidy is offered per firm even if they hire more than 1 person for the advertised post. A firm that participated in the baseline was not included if they submitted another job posting. The actual receipt of the subsidy was contingent on the outcome of the BDM mechanism. We use a minmax t-stat re-randomization procedure to split the sample of hiring managers into two groups, i.e. treatment and control following Bruhn and McKenzie (2009). The randomization is stratified by the following baseline variables: firm characteristics (location, industry, sex-ratio), hiring manager characteristics (non-incentivized subsidy desired at baseline, age, gender, marital status, education, gender attitudes and norms) and educational qualifications required for the job. As fresh vacancies are posted continuously, the firms (hiring managers) are randomized every week so that the

overall sample is balanced. We have 656 firms in the treatment and 570 firms in the control group.

4 Data and Estimation Strategy

4.1 Data

All surveys were administered over the phone. The study design and the sample size for each survey are shown in Figure A1. The baseline survey administered from April - November 2022 was an approximately 20-minute phone survey with the position's hiring manager. The questions cover details about the firm, characteristics of the advertised job, hiring manager demographics, and questions on both personal attitudes and societal norms on gender in the workplace. At the end of the baseline, firms were asked if they were open to hiring a woman and would be open to taking a subsidy; if not, the firm did not go forward to randomization.

After the baseline survey, firms were randomised into the treatment and control groups. There are a total of 1,227 firms that completed the baseline survey of which 657 firms are in the treatment and 570 firms are in the control group. The sample is balanced across the two groups on observable characteristics at baseline (Table A1).

The intervention was done within one week after the baseline survey and was only administered to those randomised into the treatment group. We were able to reach 547 (83%) out of the 657 firms in the treatment group for the intervention.[5] Nearly 80% of these 547 firms which were offered the treatment won a wage subsidy. Overall, 70% of the treatment group were offered the subsidy.

A hiring follow-up survey (HFS) was administered between May 2022 and August 2023 with 1,054 of the 1,227 firms. We made the first attempt to contact firms approximately one month after they were baselined. If they had not yet made a hire, we continued follow-ups until they either filled the position or decided not to do so. The hiring follow-up survey asks whether the position has been filled, the gender of the hired person, reasons for hiring a man versus a woman, and how many people they interviewed for the post by gender.[6]

We also conducted a survey with the women hired through the subsidy and an endline survey with all sample firms. These are discussed in sections 5.3.1 and 6.1.

[5] 566 agreed to be surveyed, but 19 had already hired in between the baseline and the intervention call; 91 were not reached or refused to participate in a second survey.

[6] A survey skip pattern issue resulted in this information being mistakenly missing for a subset of firms.

4.2 Findings from Becker-DeGroot-Marschak (BDM)

The average minimum subsidy reported by managers in the BDM is 15%. A LASSO regression analysis on the incentivized subsidy amount required by managers to hire female employees was done to identify the correlates associated with lower subsidy requirements. The results suggest that workplaces with separate toilet facilities for women are linked to reduced subsidy amounts, highlighting the importance of the availability of infrastructure. Additionally, managers who exhibited less conservative perceptions of societal norms also tend to require lower subsidies. Together, these factors suggest a combination of the physical workplace environment and cultural norms determine the subsidy level required to hire a woman. Overall, the patterns are consistent with the BDM mechanism being well-understood.

At baseline, the entire sample was asked "*Imagine you were offered a wage subsidy, that is, a share of the employee's salary would be paid by us for 6 months. What is the lowest subsidy percentage you would be willing to accept to hire a qualified female candidate for this position?*". The response to this un-incentivised question is about 25.87% which is 10 percentage points higher than the incentivised response by the same sample. It appears that the BDM mechanism is important to get the managers to truthfully reveal the level of subsidy required.

4.3 Estimation strategy

Our main estimation strategy is the following:

$$Y_i = \alpha + \beta_1 * Treated_i + \epsilon_i \tag{1}$$

where Y_i is the outcome of interest for firm i and $Treated_i$ is an indicator for the firm being randomly selected to be offered a subsidy. The parameter of interest is β, i.e. the intent to treat estimate of a firm being in the treatment group.

The primary outcome of interest, an indicator of whether or not the firm hired a woman for the position, is pre-specified in a pre-analysis plan. There is 15% attrition in the hiring follow-up survey and this is differential across the treatment and control groups by 3.8 percentage points (Table A4). Therefore, as pre-specficied, we will present the lower and upper limits of treatment effects using the bounding procedure proposed in Lee (2009).

5 Short Term Effects

5.1 Hiring of women

We find a substantial and statistically significant effect of the wage subsidy treatment on the primary outcome of interest: the likelihood of hiring a woman. Firms randomized to receive the offer of a wage subsidy are 10.7 percentage points more likely to hire a woman compared to those in the control group (Table 2, Column 1). This effect represents a meaningful shift in hiring behaviour.

The result is robust to the inclusion of controls. In Table 2, Column 2, we include a comprehensive set of controls, accounting for firm characteristics (e.g., size, share of female employees), manager demographics (e.g., gender, age, education), and job requirements (e.g., qualification and public interaction). The estimated effect remains significant, indicating that the observed impact is not driven by differences in observable firm or job characteristics. In Column 3, we further validate the robustness of the findings by employing Post-Double Selection LASSO to select the optimal set of control variables based on their predictive power for both treatment assignment and the outcome of interest.

We report the upper and lower bound of treatment effects constructed following Lee (2009) in column 4 to account for non-random attrition. The bounds, ranging from 8.6 to 13.3 percentage points, do not cross zero, indicating that the positive effect of the treatment on the likelihood of hiring women is robust.

5.1.1 Heterogeneity in treatment effects

We examine how treatment effects vary across different firm and job characteristics. (Figure 1). We find significant variation in treatment effects based on job characteristics and one key firm attribute. In treated firms, job advertisements requiring less than an undergraduate degree see a 17 percentage point increase in female hiring. Additionally, for jobs with an upper salary below the median ($<$ PKR 50,000), the effect is 10 percentage points higher and marginally significant. For positions requiring higher education, offering higher salaries, and likely demanding greater skills, financial incentives alone do not appear sufficient to drive employers to hire more women.

Beyond job characteristics, firms with no female employees at baseline respond much more strongly to the subsidy. About 19% of firms had no female employees at baseline, and in these firms, the treatment effect is 17 percentage points higher compared to firms

Table 2: Treatment Effects on the Hiring of Women

	(1)	(2)	(3)	(4)
Treated	0.107***		0.121***	0.118***
	(0.031)		(0.030)	(0.030)
Lower Bound		0.086***		
		(0.033)		
Upper Bound		0.131***		
		(0.032)		
Control mean	.433	.433	.429	.429
# obs	1054	1227	1033	1033

Note: The dependent variable is an indicator variable for the manager reporting hiring a woman in the hiring follow-up survey, as compared to hiring a man or no longer looking to fill the position. Treated is an indicator variable for firms randomised to be offered the subsidy. The Lower Bound and Upper Bound in column (2) refer to the treatment effect bounds constructed using the Lee (2009) procedure. Results in column (3) include the following controls: frequent interaction with public, firm size, share of female employees, large city, male firm only, manager age, gender, marital status, education, norms score, job education requirement, industry dummies. In column (4) controls are selected using PDS lasso. All specifications use robust standard errors. $^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$.

that already had female employees. For mixed-gender firms, the subsidy still has a positive and significant effect on female hiring, but the impact is much smaller, at 7 percentage points. We investigate whether this stronger response among male-only firms is due to a higher likelihood of them advertising for lower-paid, lower-education jobs, but this does not appear to be the case. Additionally, we explore heterogeneity within male-only firms based on job characteristics—while the estimates are noisy, they do not account for the observed differences.

We do not find any heterogeneity in treatment effects by other characteristics such as firm size or if the firm is in the Information Technology sector (the largest industry category) or by any manager characteristics including their perceptions of societal beliefs about women working and un-incentivised subsidy levels needed to hire a woman (Figure A2).

5.1.2 Effect of the treatment on the treated

We estimate the treatment-on-the-treated effects by using the treatment indicator as an instrument for winning a subsidy. Results are reported for the full sample, as well as separately for male-only and mixed-gender firms, given the significant heterogeneity in treatment effects along this dimension. The first stage results in Table A5 Panel A show a strong first stage with nearly 70% of the firms offered in the treatment group winning a

Figure 1: Heterogeneous Treatment Effects on Female Hiring by Firm and Job Characteristics



Note: Each point corresponds to the coefficient of Treatment x Dimension at Baseline. Treatment is an indicator variable for firms that are randomised to be offered the subsidy. The dependent variable is an indicator variable for if a woman has been hired. Frequent Interaction with Public is an indicator for the job requiring frequent public interaction. Requires Undergraduate or below is an indicator for the job requiring less than an undergraduate degree. Below Median Salary is an indicator for the job posting having a below median ($<$ PKR 50,000) upper salary level. Information Technology Firm is an indicator for the firm being in IT sector. Above Median Firm size is an indicator for firms with more than 16 employees. Male Only Firm is an indicator for firms with only male employees. Above Median Share of Females is an indicator for firms with above median ($>$ 21%) female to total employees in the firm.

wage subsidy. This result holds and is consistent in magnitude across firms with different gender mix of employees. Panel B reports the second stage effects on female hiring of winning a subsidy. The effect size (34 percentage points shown in Table A5 Panel B column 2) is much stronger than the intent-to-treat estimates (17 pp.) for male-only firms, a pattern consistent with the earlier findings discussed in section 5.1.1 on heterogeneous treatment effects. This suggests that firms without female employees require a financial incentive to hire a woman.

5.2 Treatment effects on the hiring process

During the hiring follow up survey we also collected information on the gender composition of candidates who were interviewed, the salary range of the hired candidates and whether they were given a formal contract. In addition, we were able to obtain the gender composition of applicants from the Rozee database.[7] We prespecified these as secondary outcomes of interest.

We find no treatment effects on a measure capturing the ratio of female to total applicants constructed using data from the Rozee database (Table 3 column 1). About 18% of the applicants are women in the control group. We would not expect this to change significantly as a result of the treatment unless winning a subsidy results in firms actively encouraging women to apply.

There is no significant impact of the treatment on the share of female to total candidates who were interviewed for the job (Table 3 column 2). Consistent with the rates of hiring of women we see in our dataset, the average share of women being interviewed is around 40%. We only have data on the gender breakdown of candidates interviewed for 574 firms due to a survey skip error. 250 of these 574 firms are from the control group. 48% of these control group firms report hiring a woman which is close to the overall control group rate of 43% of the positions being filled by women. This suggests that our data on the gender composition of interviewed candidates does not come from a highly selective subset. The data is also internally consistent: from the control group firms, those who do not report hiring a woman, the share of women interviewed is around 24% while for those who do hire, this is much higher at around 52%.

Finally, we look at the impact on two dimensions of job quality and find some improvement as a result of the subsidy: salary and formal contract provided (Table 3 columns 3-4). A lot of hiring managers did not provide us with information on the salary so we only have this

[7] This only includes those who applied via Rozee. Candidates could have also directly applied for the job.

for about 800 firms. We see a 7.4% marginally significant rise in the salary at which the candidate is hired. In addition, there is a 5.3 pp. increase (p-val = 0.100) in the likelihood of the contract being formal as compared to 61% of the hired being given a formal contract in the control group.

Table 3: Treatment Effects on the Hiring Process

	(1) Share of Women in Total Applicants	(2) Share of Women in Total Interviewed	(3) Log Salary	(4) Formal Contract
Treated	0.745	0.026	0.074*	0.053
	(0.862)	(0.023)	(0.038)	(0.032)
Control mean	17.7	.392	10.6	.608
# obs	1213	574	789	912

Notes: The dependent variable in column 1 is the ratio of female applicants to total applicants, in column 2 the ratio of female applicants who were interviewed to the total number of candidates interviewed, in column 3 is the log of the final monthly salary for the hired candidate and in column 4 is an indicator variable of whether the hired candidate was issued a formal contract. Treated is an indicator variable for firms randomised to be offered the subsidy. All specifications use robust standard errors. $^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$.

5.3 Subsidy receiving firms

Of the 246 firms eligible for the subsidy, 131 (53%) completed all necessary paperwork to set it up. Among these, 95% successfully received the subsidy for the full six-month period. The primary reason firms failed to receive the subsidy was their inability or unwillingness to submit the required documentation. The required documents included the candidate's offer letter, bank account details to make the transfer and the company's National Tax Number (NTN) or Computerized National Identity Card (CNIC, if NTN not available). However these criteria, other than the bank account number, were relaxed to "if available" so as to not dissuade informal firms from participating. While the rate of take-up of the subsidy is not very high, it is still sizeable compared to earlier work by Galasso et al. (2004) and Levinsohn et al. (2014) which found that almost no firms took up the subsidy offer due to not wanting to face labor regulations.

One possible explanation is that hiring managers, rather than business owners, were responsible for the process and may have lacked the authority or motivation to complete the additional steps. Alternatively, the financial incentive may not have been compelling enough to justify the effort. This highlights a key challenge in scaling such an intervention as a broader policy measure.

A LASSO regression analysis on subsidy receipt among eligible firms (i.e., the 246 firms

that won the subsidy and hired a female employee) reveals that the likelihood of setting up the subsidy is not correlated with the subsidy rate itself. Instead, firms with a higher share of female employees, those requiring higher educational qualifications, and those offering higher salaries are more likely to complete the process.

5.3.1 Findings from the hired women's survey

We conducted a survey with the hired women in subsidy-receiving firms one month after the subsidy completion. The primary motive of these surveys was to understand if the women were retained after the subsidy period ended and if there were any unintended adverse consequences of providing the subsidy. We could reach 112 women (86%) out of the 131 women hired in a subsidy-receiving firm. Of these, 31 (about 28%) were no longer at the same company. Only 1 woman reported being fired which assuages concerns about firms hiring women to just make use of the subsidy offers and firing them afterwards. The primary reason for leaving were finding a better opportunity and due to family obligations. Of these 31 that were no longer at the same company, at the time of survey 11 were employed full-time, 1 was employed part-time, 11 were unemployed and looking for a job, and 8 were unemployed and not looking for a job. Of the 81 who were still at the company, 77 were still in the same position whereas 4 had moved to a new position within the same company.

Among all 112, 18.8% (n=21) cited salary, 56.3% (n=63) cited the job matching their interest, and 16.1% (n=18) cited location as the main motivation for taking the original subsidy position. About 37% (n=41) did not have any previous work experience before taking on the subsidized position.

Of the 99 who knew their earnings before and after the subsidy completion, 22 had no difference in pay, 5 had less pay after the subsidy ended, and 72 had more pay after the subsidy ended. Nearly all women said they were treated well by colleagues during the subsidy period with only 2 reporting not being treated well after the subsidy ended.

6 Longer Term Effects

6.1 Endline survey

An endline survey was conducted between October 2023 and March 2024, approximately 1.5 years after the baseline and after the full 6 months for subsidy-receiving firms were over. We encountered a very low response rate. Out of the 1,227 firms in the sample, we were

able to survey only 329 (27%). We lost 33% of the firms due to refusal, and another 34% of the firms because we couldn't establish contact with them. Hence, the high rate of attrition can be attributed to Pakistan's economic conditions deteriorating rapidly, and the lingering effects of the pandemic leading to widespread firm closures, as well as, to firm-level studies being inherently challenging due to the difficulty of follow-ups. Using Rozee.pk portal data from January 2020 to May 2024, we confirm a contraction in job advertisements (Figure A3). Around the time of our endline, job postings had collapsed significantly, reaching levels as low as those observed during the peak of the COVID-19 pandemic.

Despite the high attrition rate, response rates are identical across treatment and control groups, with no evidence of differential attrition based on observable characteristics (Table A6). This enables us to proceed with analyzing endline outcomes. However, due to challenges in conducting the endline surveys, we did not register an updated pre-analysis plan for this round. Given the limited sample size, we interpret the results with caution.

We find evidence that there is a 13 percentage point greater likelihood of a female working in the position that was advertised at the time of the baseline in the treatment group (Table A7).[8] However, we do not find evidence that this translates into broader changes at the firm level – there is no significant impact on the share of women in overall firm employees, in the share of women in recent hires (last 6 months) or in the share of women in the respondent manager's team.

A potential concern with introducing a female employee into the firm is that it might disrupt team dynamics, reduce efficiency, or negatively affect the manager's well-being. To evaluate this, we asked the manager a series of questions regarding their personal well-being (including workplace conflicts, stress levels, being overworked, and sleep quality) as well as team dynamics, covering aspects such as how professionally they behave, honesty, shared responsibility, and communication. Our analysis, based on standardized indices constructed from these responses, finds no significant impact on any of these dimensions (Table A8, columns 1–2). Additionally, we observe no changes in the manager's perception of societal norms or personal beliefs about women working outside the home within the treatment group (columns 3–4).

[8]We also asked how long did the employee hired for the position stay in the position and find that the average is around 7.5 months and there is no significant difference between the treatment and control groups. Results not shown.

6.2 Impacts on gender preferences in job advertisements

To test for the longer-run impacts of the subsidy offer on gender preferences, we analyze administrative data from Rozee on the universe of job postings listed by the companies in the study sample (job characteristics statistics are in Table B1). These data include observations from January 2020 to April 2024. As is common in Pakistan and in many developing country labor markets, firms were free to specify a preference for a man (14%), a woman (7%) or no gender preference, similarly to as described in Gentile et al. (2023).

The primary outcomes of interest are indicators for whether firms specify a preference for hiring a man ("male preference") and whether firms specify a preference for hiring a woman ("female preference"). We argue that the frequency with which firms choose to actively advertise for a man or a woman are an indicator of gender preferences, and possibly bias, at the firm.

Because we observe job postings for firms in our sample before, during and after the study, we are able to estimate the impacts of being randomized into treatment on these outcomes using a difference-in-difference design, where the treatment effect is estimated as the coefficient on the interaction between the indicator for being in the treatment arm and the indicator for being post the date the baseline was administered with the firm.[9]

We augment equation 1 to estimate the following intent-to-treat specification:

$$Y_{it} = \alpha_i + \beta_1 Treated_i + \beta_2 Post_{it} + \beta_3 Treated_i * Post_{it} + \epsilon_{it} \tag{2}$$

where Y_i is the outcome of interest for firm i and $Treated_i$ is an indicator for the firm being randomised to be in the treatment arm. $Post_i t$ is an indicator for time t being after the baseline survey.[10] α_i are the firm fixed effects and $Post_{it}$ is an indicator for whether the job advertisement was posted after the baseline date. The parameter of interest is β_3, i.e. the interaction term between the indicator for being a treatment firm and being post-baseline. We enrich this specification by adding fixed effects for the year and month of posting, and including posting characteristics (such as being a high salary position, education requirements, the job shift and whether the contract type is full-time/permanent). Robust

[9] Although there was some lag between the baseline and the intervention, we use the baseline date for all firms to define the "post" indicator using the baseline date because it is observed for all firms, whereas the intervention date is only observed for treated firms – those assigned to treatment who participated in the intervention.

[10] Note that there was an error in the hiring follow-up PAP where we had mentioned that the relevant variable of interest would be an indicator for the firm winning a subsidy. We also estimate a specification to get the treatment on the treated effects.

standard errors are clustered at the firm level.

We find in intent-to-treat specifications that assignment to treatment reduces the firms' likelihood of specifying a male preference in hiring and that this is robust to the inclusion of a rich set of controls (Table 4). The point estimates suggest that assignment to treatment reduced the future likelihood that firms would express a male preference in a job advertisement by 5.5 percentage points, which reflects a 39% decline in the rate of male preference relative to the control group mean. In contrast, in the full sample, there are no detectable effects on the likelihood of specifying a female preference in future job advertisements. When looking at male-only firms (column 4), the effects are larger, with assignment to treatment causing a 10.3% reduction in the likelihood of listing a job advertisement with a male preference. Finally, while there are overall no effects on firms expressing a female preference in a job advertisement, for male-only firms we see some evidence that assignment to treatment led to a marginally significant 6% increase in female preference. Reassuringly, the treatment on the treated effects is even larger (discussed in Appendix 7).

Table 4: Treatment Effects on Gender Preference in Job Advertisements

	Male preference				Female preference			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post	0.018	0.044**	0.045**	0.133**	0.010	0.016	0.012	0.009
	(0.016)	(0.020)	(0.020)	(0.060)	(0.012)	(0.014)	(0.014)	(0.022)
Post*SubsidyAssignment	-0.051**	-0.051**	-0.056**	-0.081*	-0.003	-0.002	0.002	0.069**
	(0.025)	(0.025)	(0.025)	(0.046)	(0.015)	(0.015)	(0.015)	(0.032)
Control mean	.14	.14	.141	.108	.0722	.0722	.0719	.0367
Number of Obs	25484	25484	25354	1932	25484	25484	25354	1932
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year and Month FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Controls	No	No	Yes	Yes	No	No	Yes	Yes
Sample	All	All	All	Male only	All	All	All	Male only

Note: The dependent variable in columns (1)-(4) is an indicator for whether or not the firm expressed a preference for a man in a given job advertisement. The dependent variable in columns (5)-(8) is an indicator of whether or not the firm expressed a preference for a woman in a given job advertisement. Columns 1 and 5 show specifications including only firm fixed effects. Columns 2 and 6 show specifications adding month and year fixed effects and columns 3 and 7 add a further set of controls for job characteristics, including controls for above median salary, job type, education requirement, job shift and industry. Columns 4 and 8 show results for male-only firms at baseline. Treated is an indicator variable for firms randomized to be offered the subsidy, and this overall treatment assignment indicator is dropped from the specifications because all specifications include firm fixed effects. Post is an indicator of whether the job advertisement in question was listed after the baseline survey and the coefficient of interest is on the interaction between Treated and Post. All specifications use cluster robust standard errors, clustered at the firm level. $^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$.

7 Conclusion

We study the effect of a temporary 6-month subsidy to firms to hire a woman. We find that the subsidy offer leads to an 11 percentage point increase in the likelihood of a woman being hired, with the effect being especially strong in firms that previously had only male employees. We do not find any evidence of adverse effects on women who were hired with the subsidy.

Although we observe promising results on female hiring, the study is limited by a low response rate at the endline. Although the endline data suggest that firms were persistently more likely to have a woman in the position in the treatment group and that there were no adverse effects on team dynamics or productivity or changes in norms, these results are difficult to interpret because of the very low response rates. To address this, we supplement our analysis with administrative data on future job advertisements. We find lasting shifts in firms' gender preferences for future job advertisements, suggesting that exposure to female employees may alter employer perceptions over time. These results indicate that wage subsidies can serve as a mechanism for reducing hiring biases and expanding opportunities for women.

A key question for active labor market programs is how to make them simpler and cheaper. We use the Becker-DeGroot-Marschak (BDM) mechanism to elicit the truthful level of subsidy required to hire a woman. We find that firms require, on average, a 15% subsidy to consider hiring a female candidate. This is promising as it is much lower than subsidies offered in previous studies. Rough cost-benefit estimates suggest that a conservative estimate of the cost per additional woman hired within the period of our study implied by our experimental estimates is $86 per woman hired. This includes additional women hired directly as a consequence of the subsidy offer as well as additional women hired due to shifting employer perceptions and gender preferences as reflected in the administrative data. To benchmark this, we note that this is less than two weeks of salary for a man in an entry-level technical or professional role comparable to those considered in our study. To the extent that policymakers can use incentivized experiments to benchmark the appropriate level of intervention, this approach could be helpful in finding the most cost-effective approach to achieving policy outcomes including around gender and work.

A valuable direction for future research would be to investigate the effectiveness of wage subsidies for firms that explicitly state a gender preference for hiring men in their job advertisements. Gentile et al. (2023) highlight that such gender preferences are a significant

contributor to the employment gender gap in Pakistan. Firms that are hesitant to hire women and openly signal this preference in their advertisements may require a substantially larger subsidy or, in some cases, might not respond to such incentives at all.

Additional work could consider the effects of wage subsidies in general equilibrium, especially with tipping points in behavior generated by employer perceptions as in Miller et al. (2022), with employer learning or in a search framework as in Levinsohn and Pugatch (2014).

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Online Appendix

A Additional Tables and Figures

Table A1: Baseline Summary Statistics by Treatment Status

Variable	Control	Treatment	Control vs Treatment
Firm size	112.530	116.816	4.286
	(795.150)	(769.972)	(44.749)
Share of female employees	0.229	0.238	0.010
	(0.197)	(0.199)	(0.011)
Male only firm	0.204	0.184	-0.019
	(0.403)	(0.388)	(0.023)
Main city	0.935	0.932	-0.004
	(0.247)	(0.253)	(0.014)
Industry - Communications	0.106	0.107	0.001
	(0.308)	(0.309)	(0.018)
Industry - Education	0.040	0.049	0.008
	(0.197)	(0.216)	(0.012)
Industry - Finance	0.106	0.098	-0.008
	(0.308)	(0.297)	(0.017)
Industry - ICT	0.271	0.264	-0.007
	(0.445)	(0.441)	(0.025)
Industry - Retail	0.028	0.035	0.007
	(0.166)	(0.184)	(0.010)
Separated toilets by gender	0.777	0.791	0.014
	(0.416)	(0.407)	(0.024)
Childcare services or creches	0.147	0.164	0.017
	(0.355)	(0.371)	(0.021)
Frequent interaction with public	0.477	0.447	-0.031
	(0.500)	(0.498)	(0.029)
Salary (upper limit PKR)	58,789.473	57,587.520	-1,201.955
	(24,899.260)	(23,665.646)	(1,387.875)
Candidate BA education and above	0.663	0.674	0.011
	(0.473)	(0.469)	(0.027)
Transportation (or allowance)	0.582	0.519	-0.063**
	(0.494)	(0.500)	(0.028)
Health insurance	0.351	0.282	-0.069***
	(0.478)	(0.450)	(0.027)
Flexible working hours	0.700	0.665	-0.035
	(0.459)	(0.472)	(0.027)
Possibility to work from home	0.607	0.591	-0.016
	(0.489)	(0.492)	(0.028)
Age	32.128	31.976	-0.152
	(8.218)	(7.502)	(0.449)
Male	0.847	0.833	-0.015
	(0.360)	(0.374)	(0.021)
Married	0.618	0.604	-0.013
	(0.486)	(0.489)	(0.028)
Masters or above	0.504	0.516	0.012
	(0.500)	(0.500)	(0.029)
# obs	570	657	1,227

Note: Sample includes firms that completed the baseline survey and were randomized into treatment or control groups, regardless of whether the firm was reached for the intervention. For variable definition see Table **??** note.

Table A2: Job Characteristics by Gender Preference on the Advertisement

	All (n=39,801) 100 %	No preference (n=28,801) 72.5 %	Male (n=7,350) 18.3 %	Female (n=3,650) 9.2 %
Max salary	80883.07 (84024.35)	88194.32 (89795.39)	67357.58 (71855.46)	51997.62 (39523.35)
Industry - Admin	0.03 (0.18)	0.04 (0.18)	0.03 (0.17)	0.03 (0.16)
Industry - Comm	0.10 (0.31)	0.12 (0.32)	0.07 (0.25)	0.09 (0.28)
Industry - Edu	0.05 (0.22)	0.05 (0.22)	0.03 (0.17)	0.12 (0.32)
Industry - Finance	0.10 (0.30)	0.11 (0.32)	0.05 (0.22)	0.09 (0.29)
Industry - Health	0.03 (0.18)	0.03 (0.16)	0.05 (0.23)	0.04 (0.20)
Industry - IT	0.25 (0.43)	0.28 (0.45)	0.20 (0.40)	0.12 (0.32)
Industry - Mfg	0.09 (0.29)	0.07 (0.25)	0.20 (0.40)	0.08 (0.26)
Industry - Other	0.20 (0.40)	0.20 (0.40)	0.19 (0.39)	0.23 (0.42)
Industry - Retail	0.03 (0.16)	0.02 (0.13)	0.06 (0.23)	0.03 (0.17)
Main city	0.90 (0.30)	0.91 (0.29)	0.86 (0.34)	0.93 (0.26)
Candidate BA education and above	0.75 (0.43)	0.79 (0.41)	0.63 (0.48)	0.70 (0.46)
Job type- contract or freelance	0.04 (0.20)	0.05 (0.21)	0.03 (0.16)	0.03 (0.17)
Job type- full time/ perm	0.92 (0.27)	0.91 (0.28)	0.95 (0.21)	0.94 (0.24)
Job type- part time	0.01 (0.10)	0.01 (0.11)	0.00 (0.07)	0.01 (0.11)

Note: The statistics reported in this table are based on administrative data from the Rozee.pk portal for the April 2022 - Nov 2022 period. All differences are statistically significant (p=0.001) across no pref/ male/female jobs. We use OLS for max salary and chi-squared test for binary measures. The industry is missing for 8.5% of the jobs with no pref, 12.1% for male-only jobs and 18.3% for female-only jobs.

Table A3: Our Sample Comparison to Rozee.pk No-Gender Preference Jobs

	(1) Other non-pref jobs (n=27,576)	(2) Study sample (n=1,227)	(3) Difference (1) - (2)	(4) Standard Error
Max salary	89741.45	45241.30	44500.14***	(4244.03)
Industry - Admin	0.04	0.01	0.03***	(0.01)
Industry - Comm	0.12	0.11	0.01	(0.01)
Industry - Edu	0.05	0.04	0.01	(0.01)
Industry - Finance	0.11	0.10	0.01	(0.01)
Industry - Health	0.03	0.03	0.00	(0.00)
Industry - IT	0.28	0.27	0.01	(0.01)
Industry - Mfg	0.07	0.07	0.00	(0.01)
Industry - Other	0.20	0.22	-0.01	(0.01)
Industry - Retail	0.02	0.03	-0.01***	(0.00)
Main city	0.91	0.93	-0.03***	(0.01)
Candidate BA education and above	0.79	0.67	0.12***	(0.01)
Job type- contract or freelance	0.05	0.02	0.03***	(0.01)
Job type- full time/ perm	0.91	0.94	-0.03***	(0.01)
Job type- part time	0.01	0.01	0.00	(0.00)

Note: The statistics reported in this table are based on administrative data from the Rozee.pk portal for the April 2022 - Nov 2022 period. The sample is restricted to job advertisements that do not specify the gender of the candidate. Other non-pref jobs refer to all job advertisements that did not specify a preferred gender but are not part of the study sample. The study sample refers to the characteristics of the firms which are part of this study. Salary information is missing for 53.6% for those not included in our sample, 0% for sample; Industry is missing for 10.5% for non-sample and 0.2% for those that are included in our sample. $^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$.

Table A4: Attrition in the Hiring Followup Survey

	(1)	(2)	(3)
Treated	-0.038*		-0.150
	(0.020)		(0.133)
Firm size		0.000	0.000
		(0.000)	(0.000)
Share of female employees		-0.010	0.100
		(0.061)	(0.103)
Male only firm		0.042	0.064
		(0.033)	(0.050)
Main city		0.049	-0.042
		(0.035)	(0.065)
Industry - Communications		0.012	0.046
		(0.035)	(0.058)
Industry - Finance		-0.052*	-0.076*
		(0.031)	(0.043)
Industry - ICT		0.005	0.035
		(0.025)	(0.040)
Separated toilets by gender		-0.034	-0.095**
		(0.026)	(0.042)
Childcare services or creches		-0.003	-0.011
		(0.028)	(0.042)
Age		0.004**	0.006**
		(0.002)	(0.003)
Male		-0.023	-0.070
		(0.030)	(0.049)
Married		-0.028	-0.020
		(0.026)	(0.039)
Masters or above		-0.016	-0.049
		(0.021)	(0.034)
Treated=1 × Firm size			0.000
			(0.000)
Treated=1 × Share of female employees			-0.184
			(0.129)
Treated=1 × Male only firm			-0.036
			(0.068)
Treated=1 × Main city			0.153**
			(0.072)
Treated=1 × Industry - Communications			-0.058
			(0.072)
Treated=1 × Industry - Finance			0.047
			(0.061)
Treated=1 × Industry - ICT			-0.052
			(0.051)
Treated=1 × Separated toilets by gender			0.114**
			(0.053)
Treated=1 × Childcare services or creches			0.020
			(0.056)
Treated=1 × Age			-0.005
			(0.004)
Treated=1 × Male			0.073
			(0.062)
Treated=1 × Married			-0.010
			(0.052)
Treated=1 × Masters or above			0.065
			(0.043)
Control mean	0.16	0.16	0.16
# obs	1227	1201	1201

Note: All columns show regressions of a firm-level indicator for not being surveyed at the hiring follow-up survey on treatment indicator (column 1); baseline characteristics (column 2); and a treatment indicator, baseline characteristics, and their interactions (column 3). Treated is an indicator variable for firms randomised to be offered the subsidy. Baseline characteristics are described in Table **??** notes. All specifications use robust standard errors. $^{*}p < 0.10,^{**} p < 0.05,^{***} p < 0.01$.

Table A5: Treatment on the Treated Effects on the Hiring of Women

	All firms	Male only firms	Mixed-gender firms
	(1)	(2)	(3)
Panel A	First-stage dependent variable: Won intervention		
Treated	0.694***	0.725***	0.688***
	(0.019)	(0.044)	(0.021)
Kleibergen-Paap F-stat	1306.607	266.7779	1041.656
Panel B	Second-stage dependent variable: Hired a woman		
Won intervention	0.154***	0.339***	0.107**
	(0.044)	(0.093)	(0.049)
Control mean	.433	.264	.473
# obs	1054	193	861

Note: The dependent variable in the first-stage (Panel A) is an indicator of whether the firm won the BDM wager for a subsidy after being randomly selected into treatment. The dependent variable in the second-stage (Panel B) is an indicator variable for the manager reporting hiring a woman in the hiring follow-up survey, as compared to hiring a man or no longer looking to fill the position. Treated is an indicator variable for firms randomised to be offered the subsidy. Column 2 restricts the sample to male-only firms at baseline and Column 3 restricts the sample to the female-only or mixed-gender firms at baseline. All specifications use robust standard errors. $^{*}p < 0.10,^{**} p < 0.05,^{***} p < 0.01$.

Table A6: Attrition in the Endline Survey

	(1)	(2)	(3)
Treated	-0.003	-0.004	0.186
	(0.025)	(0.026)	(0.172)
Firm size		0.000***	0.000***
		(0.000)	(0.000)
Share of female employees		0.021	0.049
		(0.083)	(0.116)
Male only firm		0.007	0.026
		(0.042)	(0.061)
Main city		0.069	0.116
		(0.055)	(0.085)
Industry - Communications		0.028	0.096
		(0.043)	(0.062)
Industry - Finance		-0.029	0.053
		(0.046)	(0.065)
Industry - ICT		-0.019	0.036
		(0.032)	(0.047)
Separated toilets by gender		-0.029	-0.000
		(0.032)	(0.048)
Childcare services or creches		-0.040	-0.084
		(0.037)	(0.057)
Age		-0.000	0.000
		(0.002)	(0.003)
Male		-0.053	-0.066
		(0.036)	(0.054)
Married		-0.033	-0.048
		(0.032)	(0.047)
Masters or above		-0.041	-0.048
		(0.028)	(0.042)
Treated=1 × Firm size			-0.000
			(0.000)
Treated=1 × Share of female employees			-0.035
			(0.167)
Treated=1 × Male only firm			-0.019
			(0.084)
Treated=1 × Main city			-0.077
			(0.112)
Treated=1 × Industry - Communications			-0.128
			(0.086)
Treated=1 × Industry - Finance			-0.151*
			(0.092)
Treated=1 × Industry - ICT			-0.108*
			(0.065)
Treated=1 × Separated toilets by gender			-0.052
			(0.065)
Treated=1 × Childcare services or creches			0.083
			(0.075)
Treated=1 × Age			-0.001
			(0.004)
Treated=1 × Male			0.021
			(0.073)
Treated=1 × Married			0.037
			(0.065)
Treated=1 × Masters or above			0.010
			(0.056)
Control mean	0.73	0.73	0.73
# obs	1227	1201	1201

Note: All columns show regressions of a firm-level indicator for not being surveyed at the endline survey on treatment indicator (column 1); baseline characteristics (column 2); and a treatment indicator, baseline characteristics, and their interactions (column 3). Treated is an indicator variable for firms randomised to be offered the subsidy. Baseline characteristics are described in Table **??** notes. All specifications use robust standard errors. $^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$.

Table A7: Treatment Effects on Firms, Endline

	(1) Position Filled by Woman	(2) Share of Female Employees	(3) Share of Women Hired to Total Hires	(4) Share of Women in Team
Treated	0.129**	-0.012	0.031	0.009
	(0.058)	(0.022)	(0.034)	(0.025)
Control mean	.417	.3	.316	.331
# obs	300	325	283	315

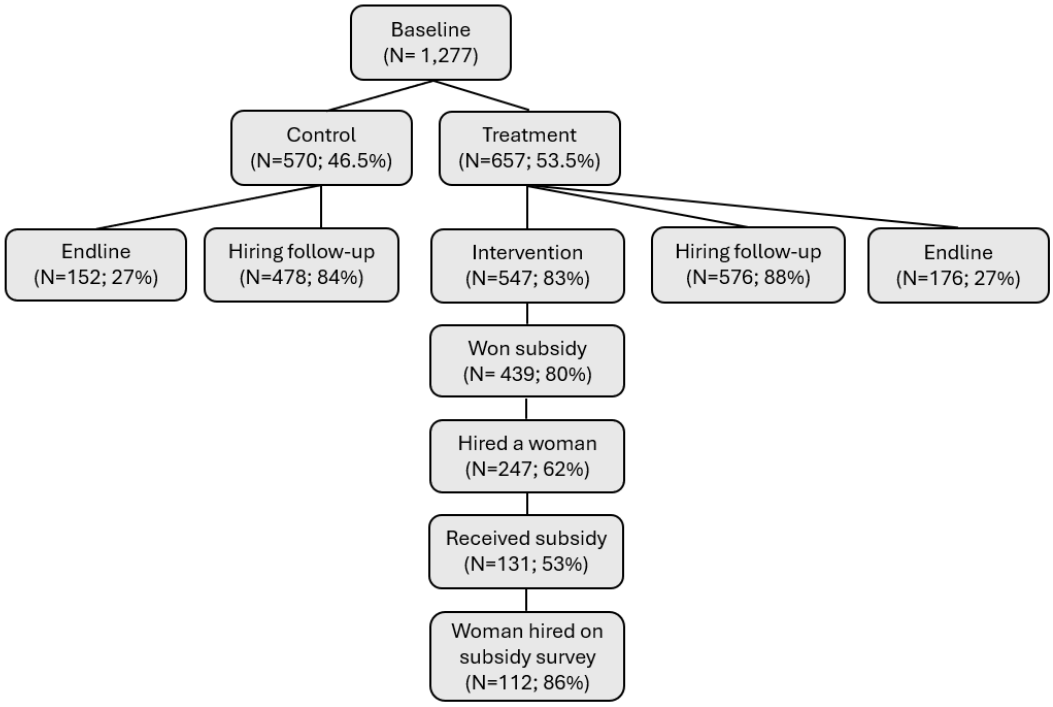
Note: Treated is an indicator variable for firms randomised to be offered the subsidy. Position filled by woman is an indicator for if the job advertised at baseline is filled with a woman. Share of female employees is the ratio of the total number of female employees to total number of employees. Share of women hired to total hires is the ratio of women hired as a proportion of all hiring in the last 6 months. Missing observations are due to firms not hiring in the last 6 months. Share of women in team is the ratio of women in the respondent managers' team. All specifications use robust standard errors. $^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$.

Table A8: Treatment Effects on Manager Responses, Endline

	(1) Team Performance Index	(2) Manager Well-being	(3) Perceived Norms	(4) Own Norms
Treated	0.034	-0.012	0.302	0.080
	(0.069)	(0.130)	(0.263)	(0.153)
Control mean	-.0183	1.96	29.4	21.6
# obs	327	328	328	328

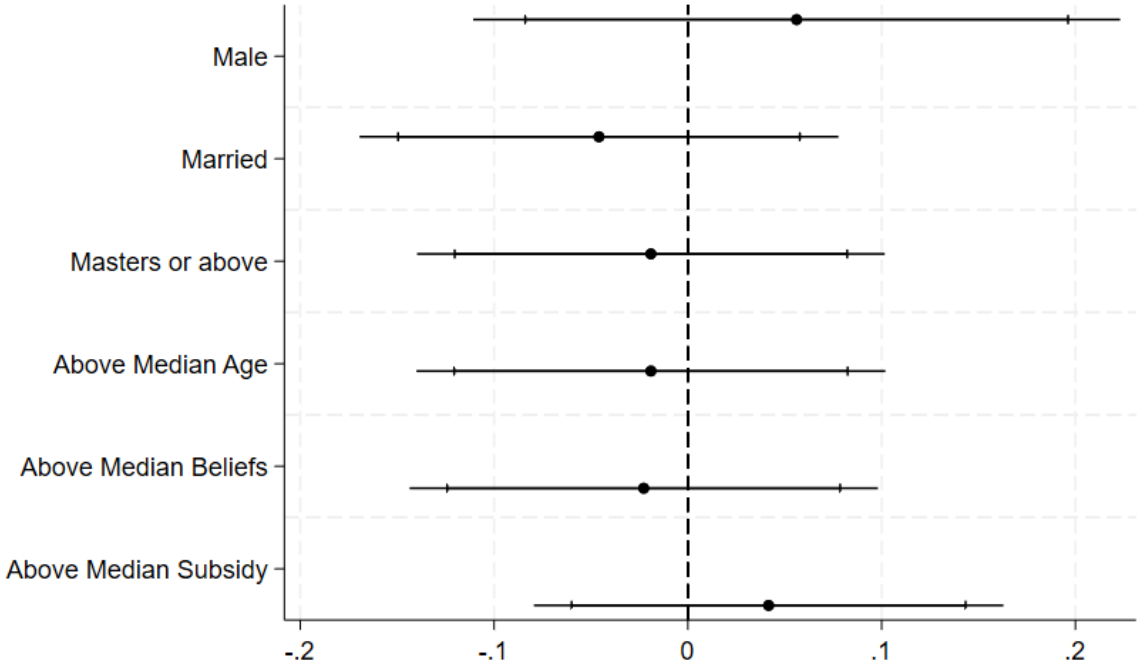
Note: Treated is an indicator variable for firms randomised to be offered the subsidy. Team performance index is a standardized index of manager's perception of how good the team is on the following dimensions: behavior with each other, honesty levels, sharing responsibility, and communication. Manager Wellbeing is a sum of indicator variables for the manager experiencing the following: conflict at work, stress, over-working, impact on sleep. Sum belief (higher prog.). Perceived norms are managers perceptions about what most people in society believe about women working outside the home (higher values indicate progressive perceptions). Own norms are manager's own beliefs about women working outside the home (higher values indicate progressive beliefs). Own norms and All specifications use robust standard errors. $^{*}p < 0.10,^{**}p < 0.05,^{***}p < 0.01$.

Figure A1: Study Design and Sample



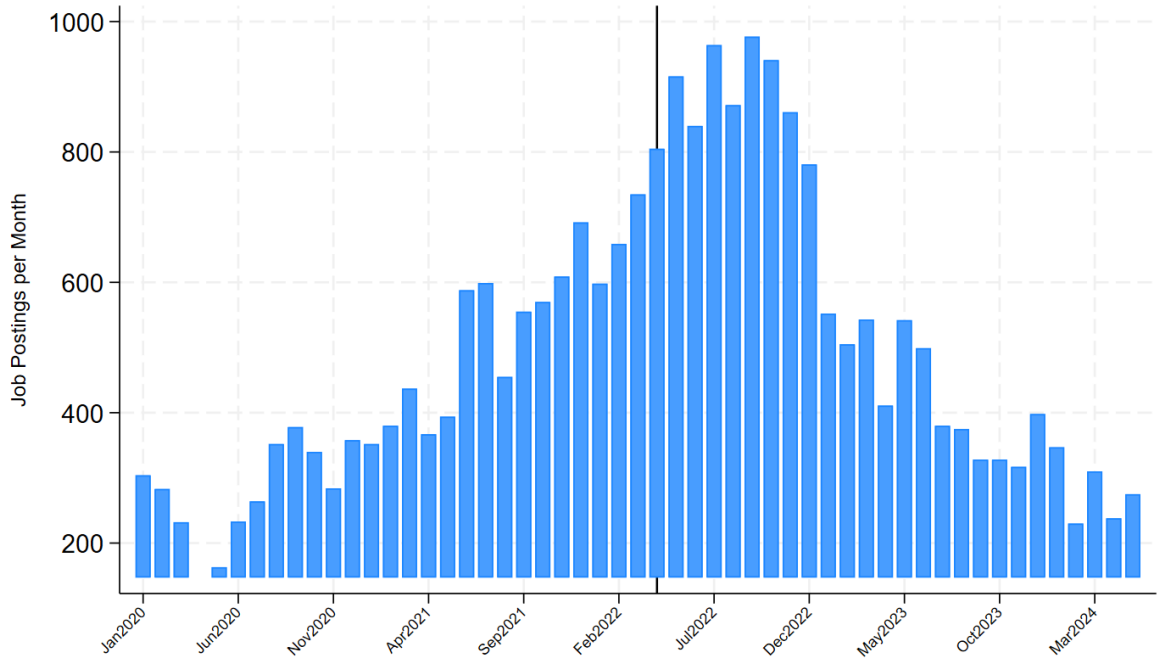
Note: The figure illustrates the study design and the sample size at each stage of data collection. The reported percentages represent the proportion of the sample size from the preceding level.

Figure A2: Heterogeneous Treatment Effects on Hiring by Manager Characteristics



Note: Each point corresponds to the coefficient of Treatment x Dimension at Baseline. Treatment is an indicator variable for firms that are randomised to be offered the subsidy. The dependent variable is an indicator variable for if a woman has been hired. Male, Married, and Masters or above are indicator variables for the manager being male, married and having masters or above respectively. Above Median Beliefs are if they have above median beliefs about societal norms regarding women working. Above Median Subsidy is if the reported unincentivised subsidy value is higher than the median.

Figure A3: Job Postings on Rozee.pk



Note: The figure shows the number of job postings on the Rozee.pk portal each month from January 2020 to May 2024. The black line indicates the month when the intervention for the study started. Note that due to the Covid-19 pandemic, there were no job postings in April 2020.

B Rozee Portal Job Advertisements Data

.1 Summary Statistics

Table B1 presents summary statistics for all jobs on the Rozee.pk portal posted by the study sample of firms between January 2020 and May 2024.

Table B1: Characteristics of Jobs Posted by Study Sample Firms (January 2020 - May 2024)

	Mean	SD	Min	Max	N
Candidate BA education and above	0.82	0.38	0.00	1	25,863
Full time	0.94	0.24	0.00	1	25,863
Entry level or intern position	0.31	0.46	0.00	1	25,837
Minimum required years of experience	2.24	2.33	0.00	30	25,813
Salary (PKR)	97788.47	1.2e+05	0.00	1000000	25,805
If a dedicated vehicle is available	0.08	0.27	0.00	1	3,465
If transport support is available	0.21	0.41	0.00	1	3,465
If flexible work arrangements are possible	0.30	0.46	0.00	1	3,465
If no overnight travel is required	0.75	0.43	0.00	1	3,465
Day shift	0.76	0.43	0.00	1	25,863
Admin	0.04	0.21	0.00	1	25,863
Communications	0.06	0.24	0.00	1	25,863
Edu	0.13	0.34	0.00	1	25,863
Finance	0.10	0.30	0.00	1	25,863
Health	0.01	0.10	0.00	1	25,863
IT	0.26	0.44	0.00	1	25,863
Mfg	0.13	0.33	0.00	1	25,863
Other	0.23	0.42	0.00	1	25,863
Retail	0.02	0.12	0.00	1	25,863
Female friendly facilities	0.11	0.31	0.00	1	3,465
Female share of employees	0.27	0.18	0.00	1	25,808

Note: This table reports the characteristics of all jobs advertised between January 2020 and May 2024 by the firms that completed the study baseline survey. A firm is considered female-friendly if it offers 2 or more of the following: flexible work, transport, vehicle, or no overnight travel.

.2 Robustness of ITT estimates

Treatment-on-the-Treated Effects

To gauge the magnitudes of the impact of receiving a subsidy offer on firms' future gender preferences in hiring, we estimate treatment-on-the-treated (TOT) effects using a panel data instrumental variables specification. In particular, we instrument for whether or not a firm

received an offer of a subsidy for hiring a woman and the interaction with the indicator for being after the baseline with the indicator for the assignment to treatment and the interaction with the indicator for being after the baseline.

We estimate the following TOT specification:

$$Y_{it} = \alpha_i + \beta SubsidyOffer_i + \gamma Post_{it} + \\ \delta SubsidyOffer_i * Post_{it} + \epsilon_{it}$$

where $SubsidyOffer_i$ is an indicator for if the firm participated in the intervention and won a subsidy offer in the Becker-Degroot-Marschak lottery. We instrument for $SubsidyOffer_i$ and $SubsidyOffer_i * Post_{it}$ with $SubsidyAssignment_i$ and $SubsidyAssignment_i * Post_{it}$. The coefficient of interest is δ, the instrumented coefficient on the interaction between $SubsidyOffer_i$ and $Post_{it}$.

We find that as anticipated the instrumented TOT effects are larger than the estimated ITT effects (Table B2), because the participation in the intervention was less than 100 percent and also because use of the BDM effectively lotteried some firms out of receiving the subsidy offer. Taking this into account, the effect of receiving a subsidy offer is to reduce male preference by 16.9 percentage points, or to effectively completely eliminate male preference relative to the control group mean. These effects are marginally statistically significant but very economically significant. There is no measured effect of the intervention on female preference on average. This is a striking result, and below in subsections 6.4 and 6.5, in the discussions of effects estimated from the variation within the BDM lottery and dynamic effects we explore whether or not this reflects effects that could be considered experimenter demand effects (e.g. if firms thought a future subsidy offer for women would be forthcoming) or if it reflects longer-term changes in attitudes and behaviors.

Table B2: Treatment-on-the-treated Effects on Gender Preference in Job Advertisements

	Male preference			Female preference		
	(1)	(2)	(3)	(4)	(5)	(6)
SubsidyOffer*Post	-0.169*	-0.188*	-0.089*	-0.006	0.007	0.076**
	(0.098)	(0.101)	(0.050)	(0.050)	(0.049)	(0.034)
Post	0.049**	0.052**	0.132**	0.016	0.011	0.009
	(0.024)	(0.024)	(0.060)	(0.015)	(0.015)	(0.022)
Control mean	.14	.141	.108	.0722	.0719	.0367
Number of Obs	25484	25354	1932	25484	25354	1932
Company FE	Yes	Yes	Yes	Yes	Yes	Yes
Year and Month FE	Yes	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	Yes	No	Yes	Yes
Sample	All	All	Male only	All	All	Male only

* p¡0.10, ** p¡0.05, *** p¡0.01

Note: The dependent variable in columns (1)-(3) is an indicator for whether or not the firm expressed a preference for a man in a given job advertisement. The dependent variable in columns (4)-(6) is an indicator for whether or not the firm expressed a preference for a woman in a given job advertisement. SubsidyOffer is an indicator variable for firms who were offered the subsidy, and this overall treatment assignment indicator is dropped from the specifications because all specifications include firm fixed effects. Post is an indicator for whether the job advertisement in question was listed after the baseline survey and the coefficient of interest is on the interaction between SubsidyOffer and Post. SubsidyOffer*Post is instrumented with SubsidyAssignment*Post, where SubsidyAssignment is an indicator for randomized assignment to the treatment arm. All specifications use cluster robust standard errors, clustered at the firm level. $^{*}p < 0.10,^{**} p < 0.05,^{***} p < 0.01$.