Labor Market Penalty for Single Mothers*

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Abstract

It is well established that there is a motherhood penalty in the labor market for child-bearing women. Theoretical models, as well as empirical estimates, suggest that unmarried or never married women without children have a relative advantage in terms of labor market opportunities. However, little is known about *single mothers* and their labor market outcomes. Aside from the fact that this is an expanding demographic worldwide, single mothers constitute an interesting case from a purely conceptual point of view. On the one hand, they might not have the typical social constraints of married women in traditional patriarchal societies, but on the other hand, they face the same constraints with respect to childcare and childbearing as other married mothers. While aggregate data suggests that single mothers' labor market participation rates are usually higher than those of unmarried women, we argue that in contrast to married women without children and married mothers, this realized labor market equilibrium masks potential demand-side discrimination and likely reflects strong supply-side incentives. With the aim of uncovering potential demand-side discrimination effects, we conduct a correspondence study experiment that involves applying to real jobs using fictitious resumes. We show that equally qualified single mothers are much less likely to receive interview callbacks than unmarried women without children, married without children, and married mothers. For every interview callback a single mother has to apply to about 30 jobs, whereas an unmarried woman receives more than two callbacks for as many job applications. As a potential mechanism behind our findings, we find suggestive evidence of inaccurate statistical discrimination by employers.

Keywords- single mothers; labor market discrimination; motherhood penalty
JEL Classification- J71; J23; O12

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1 Introduction

Single-parent households have steadily increased in numbers since the 1990s, with an overwhelming number of such households being led by a 'single mother'. For instance, while single parents now constitute about 15% of the households with dependent children in the EU, in the United States, there were about 15.76 million children living with a single mother in 2019. This number is on the rise even in developing countries. According to a UN report, an estimated 4.5% of all Indian households are headed by single mothers, which translates to approximately 13 million lone-mother households in India [1]. Additionally, around 32 million single mothers are estimated to be living in extended households. Children in single-parent households, primarily led by mothers, face a dual challenge. Firstly, they often experience resource constraints, as these households tend to have higher poverty rates. For instance, in India, the poverty rate among lone-mother households is as high as 38%, compared to 22.6% in dual-parent households [2]. Secondly, the alteration in family structure itself can significantly impact a child's emotional and intellectual growth (Fergusson et al., 2007).

While the notion of a motherhood penalty in the labor market is fairly well established empirically (Yang et al., 2024; Correll et al., 2007; Glauber, 2018; Anderson et al., 2002), it is not known whether the penalty extends to single mothers, and if yes, to what degree. This is partly due to the fact that it is not obvious that the penalty would naturally extend to single mothers in the labor market equilibrium. Unlike mothers in civil unions, the supply-side factors affecting single mothers' labor market outcomes are likely to be very different. For instance, while a mother in a union may rely on other sources of household income and, therefore, prefer childcare and adjust her labor market participation hours downwards, a single mother may not have this choice. Financial responsibility for children,

[1] See this article by Time of India

[2] See this report by UN Women,2019-2020

limited government support, poor socio-economic background, etc., may compel single mothers to disproportionately participate more in the labor market, i.e., to increase their labor supply (Meyer and Rosenbaum, 2001; Sherman, 2020; Gonzalez, 2004; Pronzato, 2009). Consequently, observing labor market equilibrium matches for single mothers and statistics on their employment status may largely reflect this supply-side mechanism and mask any demand-side inequalities and/or discrimination.

In this paper, we study whether single mothers face a labor market penalty. We construct a unique experimental design using a correspondence study approach (Bertrand and Mullainathan, 2004; Thorat and Attewell, 2007; Neumark et al., 2019; Chen, 2024) to estimate if real-life employers discriminate against single mothers compared to equally qualified single non-mothers for actual jobs advertised on a large job market portal in India [3]. In general, the labor market outcomes for any individual or group depend on both the demand and supply side (Bhalotra and Fernández, 2023). Simply based on supply-side factors, the theory predicts that single mothers should work more in comparison to unmarried women because of their relative deprivation of outside options on various dimensions, as we have discussed above. We provide suggestive evidence for this theoretical prediction using India's Demographic and Health Survey (DHS) data, also known as the Indian National Family Health Survey - 4 (NFHS 4) from 2015-16.

On the other hand, labor demand for single mothers is a function of a host of factors, including the taste and preferences of the employer. Ex-ante, it is not obvious that employers would discriminate against single mothers in the same way that discrimination manifests toward mothers in general. Mothers,generally, tend to be discriminated against largely on account of employers' perceptions of time use patterns, availability of resources, and resultant estimates of the candidates' productivity (Phelps, 1972; Jessen et al., 2019; Aigner and Cain, 1977). This provides an implicit advantage for single women without children in

[3]Other experimental methods used to identify labor market discrimination are vignette studies (Kübler et al., 2018; Baert and De Pauw, 2014; Van Borm et al., 2021) and list experiments (Aksoy et al., 2024; Osman et al., 2023).

the labor market.

The case of single mothers could, however, be very different, and if a penalty were to exist, it is not clear whether it is more substantial or weaker than the labor market penalty for married mothers. Becker (1985) defines a marriage penalty for women as the cost married women bear due to traditional household specialization, wherein married women invest and specialize in home production, and married men specialize in labor market activities. As the marriage penalty does not, by definition, concern single mothers, they should, in principle, be better off than married mothers in the labor market.

On the other hand, if the penalty manifests itself through either employer discrimination or actual lack of productivity issues, exemplified, for instance, by the lack of time available for the job, the penalty should be accentuated for single parents because of the potential absence of spousal support for child care. Moreover, the existence of negative societal attitude (Haire and McGeorge, 2012; Eby et al., 2004) towards single parents might potentially translate into discrimination against them in the labor market(Bertrand et al., 2005). Therefore, studying single mothers in the labor market helps revisit many unanswered questions within the motherhood penalty literature in labor economics.

Against this backdrop, our correspondence study design has two major advantages. First, it allows us to capture a pure motherhood penalty which is not contaminated by an associated marriage penalty for women. Second, by eliminating experimentally the supply-side heterogeneity, we are able to isolate a pure demand-side effect and, therefore, make predictions about the counterfactual labor market equilibrium in the absence of distortions due to potential demand-side discrimination. Additionally, to answer our question on the relative magnitudes of this penalty vis-a-vis the standard motherhood penalty, we also compare callback rates for equally qualified married women without children and married women with children to unmarried women without children. Additionally, the use of experimental methods have gained significance in understanding the advances in organization behavior

and have increasingly become popular due to their high internal and construct validity and also helps uncover theoretical mechanisms (Levine et al., 2023).

We create fictitious resumes/CVs of ned significapplicants that are identical in all relevant aspects but differ only in their respective parenthood and marital status. In our experiment, we have four treatment arms (unmarried women without children "Unmarried"[4], married women without children "Married", married women with children "Married Mothers", and women who are single mothers "Single Mothers"[5]), and we apply to each job with all 4 CVs. We only applied for openings in private sector firms and avoided job openings for highly specialized positions that required many years of on-the-job experience. Our aim was to select jobs that a university graduate might be eligible for entry-level jobs [6]. The companies whose job posts we responded to included Banking and financial services, education, IT services, business process management, retail, manufacturing, marketing, and mass media.

Our estimates suggest that there seems to be a clear rank order of the potential discrimination, as evidenced by differences in callback rates. Compared to equally qualified unmarried women without children, all other categories are less likely to receive a callback. However, the effects are smaller for married women without children, followed by married women with children, and the highest for single women with children, suggesting that single mothers are least likely to receive callbacks. This suggests that in the absence of such discrimination, in the counterfactual, the labor demand for single mothers would have been higher, and therefore, in equilibrium, we would have even more single mothers participating in the labor force.

[4]In our classification under "Unmarried," we exclusively account for unmarried women without children. Despite acknowledging the existence of unmarried women with children, we refrain from including them in the "Unmarried" category, given that the prevalence of unmarried women with children is not a common occurrence in India.

[5]In our experimental design, we have not categorized single mothers based on whether single motherhood is an endogenous choice (resulting from divorce or adoption without marriage) or an exogenous event (such as widowhood).

[6]We recognize that single mothers often come from lower socio-economic backgrounds, yet we use entry-level positions because, particularly in India, these jobs typically fall within the lower-middle class spectrum (equating to approximately $100-120 per month). Furthermore, we prioritize entry-level roles as they typically do not necessitate specialized skills, making them less susceptible to discrimination, and their availability is not restricted.

Finally, we examine some likely mechanisms driving our results using two complementary approaches. First, we conduct a heterogeneity analysis by looking at differences in results based on the potential relocation costs of the applicants. We find that the differential in callback rates is more pronounced for job locations that are farther away from the applicants' inferred home locations. On the other hand, we do not find a statistically significant difference in callbacks across groups for jobs located in the candidates' home location. This provides evidence in support of statistical discrimination where employers may accurately or inaccurately assume that single mothers may have higher opportunity costs of relocation (Csaszar et al., 2023). It is critical to disentangle whether this statistical discrimination is accurate or inaccurate, as it is a valuable distinction for both policy design and welfare analysis (Bohren et al., 2023). Therefore, to address this concern, we perform a vignette experiment on potential future employers and recruiters. The vignettes were conducted in a classroom of business school students in a leading (top 70 in global FT rankings) business school in India. Through this survey, we attempt to elicit general beliefs about the potential sources of labor market discrimination against single mothers. We employ a method similar to (Haaland and Roth, 2023; Chen, 2024), and we find that the modal belief among our respondents is that the callback differential is due to implicit discrimination: 44% of our respondents believe employers subconsciously rely on negative stereotypes about single mothers, and 41% state that the main reason driving this result relates to inaccurate statistical discrimination (employers incorrectly believing that single women are less productive on average).

2 Background and Context

As discussed earlier, there is a rising trend in the number of single-parent households (in general and single-mother households in particular), which is projected to persist in the foreseeable future. Single parenthood may be due to a host of factors, including personal

choice or natural events. In terms of labor market implications, this should not affect the demand for women workers from firms unless there is discrimination. However, single parenthood can increase the labor supply of an individual due to a host of factors, such as financial responsibility for children, limited government support, poor socio-economic background, etc (Meyer and Rosenbaum, 2001).

We provide suggestive evidence for this theoretical prediction using the Demographic and Health Survey (DHS) data from India, also known as the Indian National Family Health Survey - 4 (NFHS 4) from 2015-16. In this connection, Figure 1 provides summary statistics of the current working status of different groups based on parenthood (or marital) status. This figure suggests that in equilibrium, single mothers are more likely to work than married mothers, unmarried women, and married women. The figure also establishes that the regular motherhood penalty and marriage penalty (labor force participation of married women and married mothers relative to unmarried women) can be observed from the summary statistics, i.e., in the labor market equilibrium.

Although the graph only provides a mean comparison of the current working status of the women, it does not control for factors like age of the individual, caste, religion, economic background, and other observables that might affect the labor market outcome of an individual and simultaneously be correlated with marital status. Therefore, we also conduct regression analysis to substantiate the differences observed in figure 1. We run the following specification:

$$Y_i = \alpha + \beta_1(marrnochld) + \beta_2(marrwchld) + \beta_3(singmother) + \gamma * X_i + \delta_d + \epsilon_i \quad (1)$$

Here, Y_i is the current working status of an individual, which is a dummy variable. *singmother*, *marrnochld*, and *marrwchld* are all dummy variables that indicate the candidate being a single mother, a married woman with no child, and a married woman with a child, respectively. We have also included district fixed effects, denoted by δ_d in the specification.

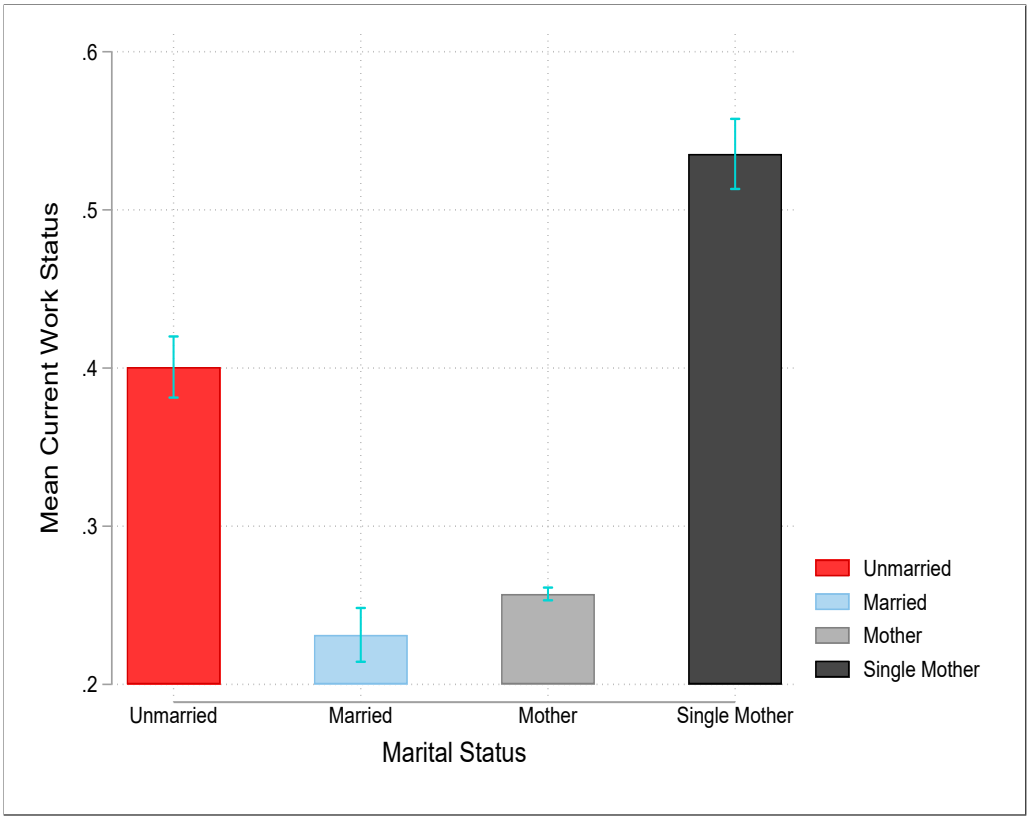

Figure 1: Mean comparison of working status across different parenthood (or marital) groups

X_j is a vector of individual-level covariates, including the age of the individual, education qualification, religion, caste, economic background, number of children under five, etc., and ϵ_i is the idiosyncratic error term. The coefficient of interest is β_k, which shows the effect of a candidate being in any specified category compared to the base category, unmarried women without children.

Figure 2 plots the β_k coefficients from the regression equation. The results provide a positive association between single motherhood and current working status, even after controlling for several observables. And these results are consistent with the theoretical prediction of Meyer and Rosenbaum (2001) that posits that single mothers will work more relative to unmarried women without children due to a given set of supply-side constraints or incentives.

The importance of this research is further emphasized by the continuous rise in the number

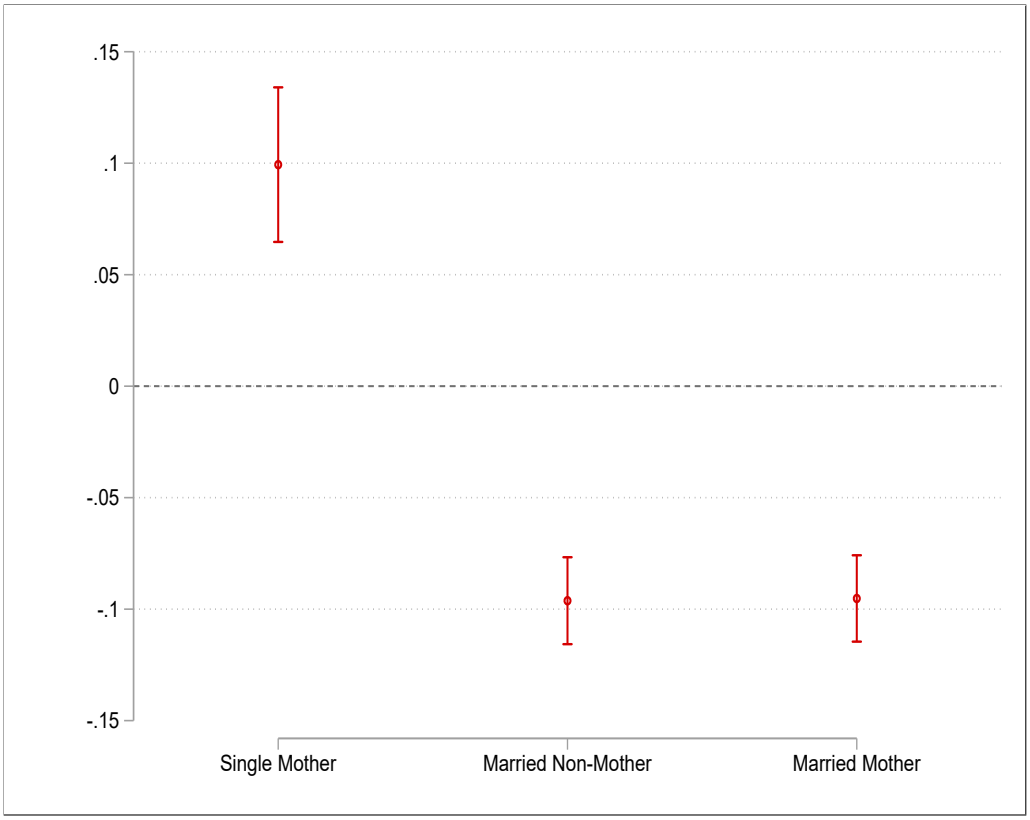

Figure 2: Regression estimates: Differences in Labor Supply Across Marital Groups

of single parents, underscoring the need to study this subject matter [7]. Changes in societal dynamics, such as shifts in family structures, higher divorce rates, and evolving gender roles, have contributed to a steady increase in single-parent households globally [8]. The upward trend of single parenthood is projected to persist in the coming years, influenced by economic factors, evolving social norms, and shifts in relationship dynamics (Moynihan and Smeeding, 2004). Hence, comprehending the challenges and discrimination faced by single parents, particularly single mothers, becomes imperative in addressing the requirements of this expanding demographic.

The outcomes of this study will yield empirical evidence that can guide the development and implementation of policies aimed at combating labor market discrimination. Policymakers

[7] See here: https://thewire.in/gender/71-million-single-women-39-rise-over-a-decade

[8] See the Pew Research Report on Family Structures in the US: Pew Research

can utilize these insights to formulate interventions and regulations that safeguard the rights of single parents and foster an inclusive labor market environment. Moreover, organizations can benefit from the study's findings by implementing workplace interventions to address the specific challenges single parents encounter. By understanding the barriers and biases inherent in the job application process, organizations can create supportive environments, provide flexible work arrangements, and introduce diversity initiatives that promote fair treatment and equal opportunities for single parents.

Beyond influencing policy and workplace practices, the results of this study can raise social awareness regarding the labor market discrimination experienced by single parents. Enhanced awareness can foster greater societal understanding and support for the employment rights of single parents. Consequently, this can contribute to advocacy efforts to establish a more inclusive and equitable labor market for single parents. The significance of this study also extends beyond immediate applications as it lays the groundwork for future research and enriches our understanding of labor market discrimination in general. This includes exploring the long-term career impacts on single parents, considering intersectionality in discrimination, and evaluating the effectiveness of interventions in addressing these issues.

3 Experiment Design

3.1 Field Work

The correspondence study used to measure parenthood-based discrimination was carried out over a period of 3 months between November 2023 and January 2024 across all cities in India. The sample consisted of firms that posted job vacancies online on job search websites. These job vacancies were located in different parts of the country (4 major locations in terms of the number of jobs applied are Mumbai, Gurugram, Delhi, and Bangalore). Job search sites are extensively used for recruitment into white-collar jobs in India. The largest of such

sites have as many as 20,000 recruiters and 10 million resume postings. The majority of jobs posted on the job websites are in IT-related fields, call centers and customer services, sales, marketing, management, and human resources.

Recruiters post job vacancies on the website, and applicants post resumes. The recruiter can contact applicants who have posted publicly available resumes. The applicants can also be the ones to contact the recruiter in response to a particular job vacancy posted by the recruiter in response at a specific job vacancy posted by the recruiter. An additional feature introduced by the main website used in the study during the data collection was that individual applicants who were single parents mothers could declare their status as "single parent" and "working mother," respectively.

3.2 Creating the Resumes

The first step of the experiment design is to generate templates for the resumes to be sent. The challenge is to produce a set of realistic and representative resumes without using resumes that belong to actual job seekers. To achieve this goal, we start with resume templates given by various job portals.

We begin with resume templates posted on two job search websites as the basis for our artificial resume(naukari.com and monster.com). The templates provided on these websites may not be entirely representative of the average job seeker, but they provide a practical approximation. We also restricted ourselves to two occupational categories: sales and customer service. We constructed our resumes to be eligible for out-of-college jobs with no experience.

We leveraged the "Key Skills" section on the naukri.com portal to optimize profiles for specific job roles. Resumes are screened based on the 'key skills' mentioned in this section rather than solely relying on the resumes. To strategically align applicants with customer

service and sales positions, we analyzed 100 job descriptions for each category. From this analysis, we curated a standard but diverse set of 'key skills' designed to enhance profile visibility on the portal for these particular job types (sales and customer service).

3.3 Identities of Fictitious Applicants

The subsequent phase involves the generation of identities for fictional candidates and the formulation of the experimental manipulation. To ensure uniformity across all four CVs, we maintained consistency in identity attributes. Specifically, we selected common female Bengali names commencing with the letter "S" for first names. We employed Bengali Brahmin surnames for all treatment arms, excluding considerations related to caste and gender heterogeneity.

In crafting personal contact details, diverse email IDs were generated, and distinct phone numbers were provided on both the profile and the CV to facilitate callbacks from both sources. All profiles were geographically located in Kolkata, and postal addresses were deliberately omitted. For educational backgrounds, we standardized the degree (B.Com and M.Com) and aligned institutions based on their NIRF ranking and perceived reputation. The same approach was adopted for schools associated with the profiles.

Our primary challenge involved determining effective methods for conveying candidates' parenthood or marital status. Various studies in the literature have explored diverse approaches, such as incorporating this information in cover letters (Granberg et al., 2020), using volunteering experiences to signal parenthood (Ishizuka, 2021), and utilizing the "about me" section (He et al., 2023).

In our scenario, incorporating information into cover letters proved impractical, given that most of the targeted entry-level positions did not require cover letters. Utilizing volunteering experience as a signaling method posed a potential challenge, particularly in defining

the parenthood status of the control group. This ambiguity relies on the subjective judgment of the employer, introducing a confounding variable that is not conducive to our study objectives, especially in unveiling the distinct impact of the pure-motherhood penalty. Another available avenue was leveraging the "About me" section, a common practice in India, where individuals provide a brief self-description. However, the verbosity inherent in this section raised concerns about introducing numerous confounding factors.

Hence, we opted for the Personal Information section as the means to convey parenthood status. This section is commonly found in resumes of entry-level candidates, providing a convenient space to input essential details. While at first pass it might seem unusual to report marital or parenthood status in CV, it is increasingly common in CVs to mention more personal details, especially in freshers' CVs, to fill in the space. The inclusion of information such as gender, marital status, religion, and caste is not considered extraordinary. For instance, the online job market that we used for applications, 'Naukri.com' specifically provides the option to mention the single parenthood status explicitly on the candidate's profile(APPENDIX). Additionally, it is important to note that we are comparing between CVs that all report this status. So are estimated effects capture the differences in callback rates for single parents compared to other CVs which also mention their marital status. As a result, we are not particularly worried about issues of sample selection and misconstrued signals coming from added information as we do not compare with CVs that remain agnostic on this ground. [9] The advantage of employing the Personal Information section lies in its capacity to deliver a signal for the control group without introducing unnecessary confounding factors. Furthermore, its brevity minimizes the potential confounders that can be induced because of verbose content. Finally, our study essentially captures the differences in callbacks when information is voluntarily given. If the information on single parenthood

[9]Furthermore, refer to the article on resume career branding tips mentioned in the following article, available here: "vibranturre.com". Even some websites provide sample CV which mention single parenthood status "livecareer.com" (Accessed on April 30, 2024). The article, including similar job market assistance articles, suggests including factors such as marital status that may add additional information to the resume, provided they lie within certain ethical and moral limits. Overall, we can say that mentioning parenthood status may not considered to be an anomaly within the general schema of resumes.

is considered irrelevant, employers always have the option to ignore such a signal. The fact that they do not seem to ignore it, provides support to our main hypothesis that there exists demand side discrimination based on signals that shouldn't matter.

Based on all the factors discussed above, we created four fictitious resumes/CVs of applicants that were identical in all relevant aspects but differed only in their respective parenthood and marital status. In our experiment, we have four treatment arms (unmarried, married, married mother, and single mother) and apply to each job with all four resumes.

4 Empirical Specification

The primary aim of our empirical exercise was to understand the causal effect of parenthood status on labor market outcomes. For this, we estimated the following specifications:

$$Y_i = \alpha + \beta_1(marrnochld) + \beta_2(marrwchld) + \beta_3(singmother) + \gamma * X_j + \delta + \psi + \epsilon_i \quad (2)$$

Here Y_i is an indicator of whether the individual i received a callback. X_j is a vector of firm-level covariates, and $epsilon_i$ is the idiosyncratic error term. $sing_mother$, $marrnochld$, and $marrwchld$ are all dummy variables that indicate the candidate being a single mother, a married woman with no child, and a married woman with a child, respectively. And β_k shows the effect of a candidate being in any specified category compared to the base category, unmarried women without children. Since for every job ad we applied with all four resumes, β_k captures the causal effect of parenthood (or marital) status on labor market penalty (in terms of call back differential). We also include industry and time (date and month) fixed effects and standard errors are clustered at the job-ad level across all the analyses. The main coefficients of interest are β_2 and β_3, as we are interested in understanding the pure motherhood penalty and single motherhood penalty.

5 Results

5.1 Descriptive Analysis

We applied to over 2500 unique jobs, each with four different resumes, and as a result, our sample comprises nearly 10,020 observations, a relatively larger sample size compared to much of the existing literature related to our study. The variable *callback* measures whether an applicant was invited for an interview. The unconditional probability of receiving a callback for all the applicants combined across different industry classifications is presented in Figure 3.

We find that the callback rate is maximum for the education industry, and the BPM (Business Process Management) industry is very close to the education sector in terms of callbacks. This is unsurprising considering the fact that the nature of both the education and the BPM sector is generally conducive for women. On the other hand, miscellaneous and manufacturing and production industries provide the least number of callbacks for all groups combined.

Figure 4 illustrates the unconditional probability of receiving a callback for applications to all types of jobs and shows the difference between different treatment arms. While for unmarried, the unconditional probability of receiving a callback is 7%, it is only 5.2% for married, 4.3% for mothers, and 3.3 % for single mothers.

This suggests that relative to every callback that an unmarried woman receives, the odds of receiving a call back for the single mother is only about 35%, whereas the odds of a married non-mother receiving the callback is about 64%. The corresponding odds for a married mother receiving a callback for every callback that the unmarried woman receives is around 50%.

We further perform this analysis for different types of jobs (i.e., sales and customer service)

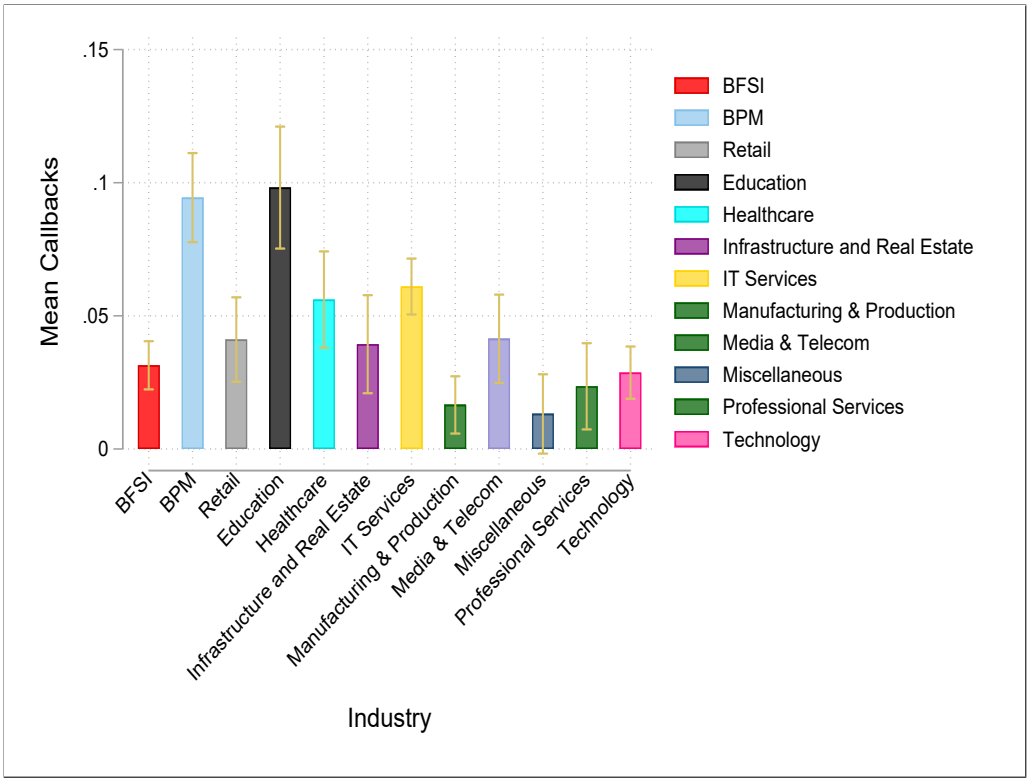

Figure 3: Mean comparison across different industry classifications

in order to identify potential heterogeneities in the effects. In the following section, we also report findings from the multivariate analysis controlling for other observed and unobserved time-in-varying characteristics within a regression framework and find that these results largely remain consistent.

Figure 5 provides the mean comparisons for customer service (left panel) and sales jobs (right panel), respectively. The unconditional probability of receiving a callback in customer service jobs is 8.5% for unmarried, 6.1% for married, 5.3% for mother,s and 4.9% for single mothers. Similarly, the unconditional probability of receiving a call is 6% for unmarried, 4.3% for married, 3.2% for mother,s and 2% for single mothers for sales jobs. It seems that the rank order for the callback rates is preserved for both these types of industries, whereas there exists some levels of difference in terms of average callback rates, with recruiters for sales jobs making fewer callbacks for women in general. However, since we do not have a male sample, we are unable to provide stronger evidence along this dimension, and

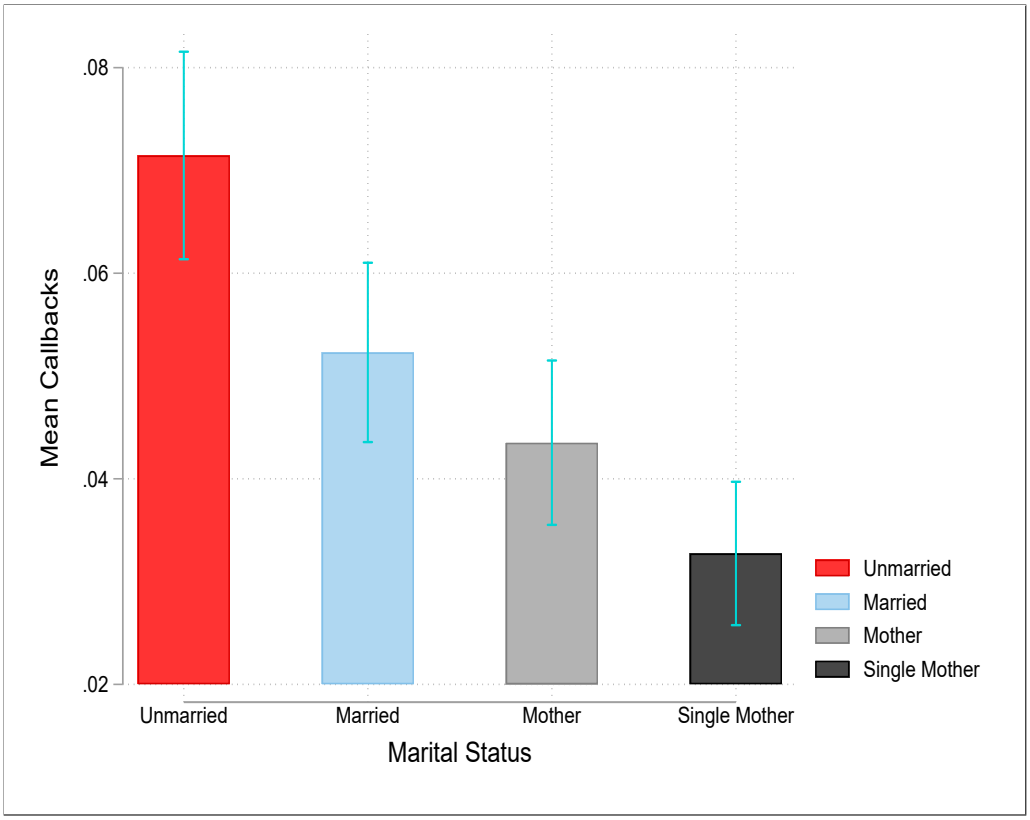

Figure 4: Mean comparison for all types of jobs across different treatment arms

we cannot rule out the fact that sales jobs systematically require fewer employees and, therefore, have lower callbacks in general, regardless of gender identity. Interestingly, we find that the single-motherhood penalty is relatively muted for customer service jobs when compared to sales, where it appears more stark.

5.2 Multivariate Analysis

In the following, we present our results from a variety of OLS regressions of the dependent variable "callback" on a broad set of controls. In addition to the treatment variables (parenthood or marital status), all regressions incrementally include controls for variables like zone (North, West, South, East, Central, multiple), time (date and month), of the application sent, industry type, number of employees and job type. The industry type is defined by using data from LinkedIn profile of the firms, and then we used the industry

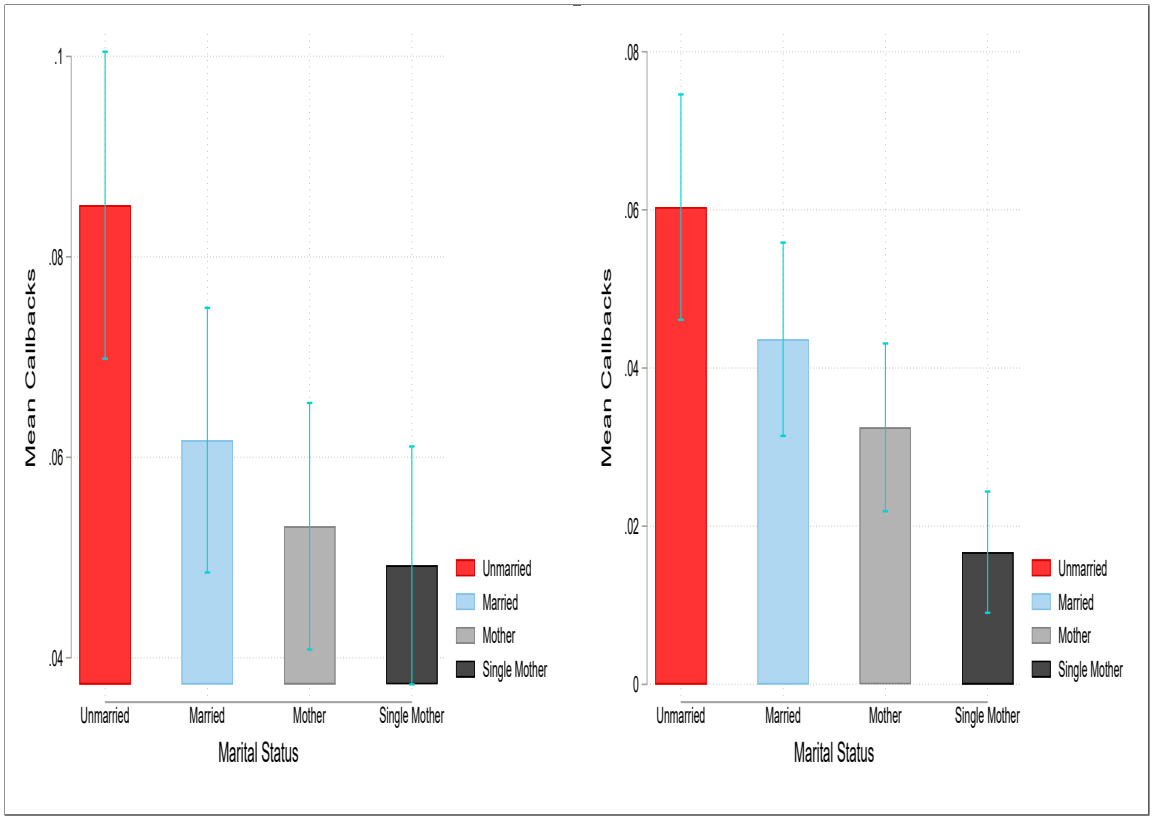

Figure 5: Mean comparison for customer service jobs (left panel) and sales jobs (right panel) across different treatment arms

classification given by Naukari.com to classify similar industries in one group. We also have data on firm size as given by the number of employees (seven dummies ranging from "1 to 10" to "more than 10000").

Table 1 presents the findings for the aggregated pool of applicants, encompassing both job categories. The regression analysis involves the outcome variable "callback," regressed against the treatment variables representing different marital statuses (unmarried without a child, married without a child, married with a child (mother), and single mother with a child). The table illustrates the estimated probabilities of receiving a callback for mothers and single mothers relative to unmarried individuals (without a child) across all occupations.

Successive columns in the analysis introduce progressively more comprehensive sets of co-

Table 1: Probability of a callback for all types of jobs

	Callbacks					
	(1)	(2)	(3)	(4)	(5)	(6)
Married	-0.019***	-0.019***	-0.019***	-0.020***	-0.020***	-0.020***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Mother	-0.028***	-0.028***	-0.029***	-0.031***	-0.031***	-0.031***
	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)
Single Mother	-0.039***	-0.039***	-0.040***	-0.040***	-0.041***	-0.041***
	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)
Zone		-0.009***	-0.009***	-0.010***	-0.010***	-0.010***
		(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Number of Employees			0.002	0.001	0.001	0.002
			(0.001)	(0.002)	(0.002)	(0.002)
Job-type				-0.027***	-0.022***	-0.026*
				(0.007)	(0.007)	(0.016)
Observations	10,020	10,020	9,552	8,988	8,952	8,952
Industry FE	No	No	No	No	Yes	Yes
Time FE	No	No	No	No	No	Yes

Notes: Standard errors clustered at the job-ad level are presented in parentheses. The outcome variable in each specification is a binary variable indicating whether a callback was received for a job application. In columns (2)-(6), we additionally control for job location (zone), size of the firm (number of employees), and job-type (sales vis-à-vis customer service). In all specifications, our base category (control group) is the unmarried female applicant.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

variates. In Column 2, the zones are included as a control variable, followed by the addition of firm size (number of employees) in Column 3. Further, in Column 4, we include a control for job type. Moving forward, Column 5 extends the model by incorporating industry-fixed effects alongside the existing set of controls. The final specification, Column 6, enhances the analysis by introducing time-fixed effects (date month).

Across both types of jobs combined, the probability of receiving a callback is 3.1 percentage points lower for mothers than unmarried women, which we define as a "pure motherhood" penalty. We also find evidence for the "single-motherhood penalty," i.e., the probability of receiving a callback is 4.1 percentage points lower for single mothers than unmarried women. Our first important result from the multivariate analysis is the presence of statistically significant effects associated with parenthood status, i.e., employers respond to the

parenthood status of job applicants.

5.3 Heterogeneity Analysis

5.3.1 Job Type

The sub-sample analysis is undertaken due to systematic differences in job requirements between sales and customer service roles. The distinct characteristics of these job types, such as the travel demands in sales and potential non-standard work hours in customer service, create uncertainties regarding the magnitude of observed penalties.

Table 2 delineates the estimated probabilities for mothers and single mothers receiving callbacks compared to unmarried individuals in customer service and sales jobs, respectively. In Panel A, we observe that the probability of receiving a callback is 3.3 percentage points and 3.6 percentage points lower for both mothers and single mothers, respectively, compared to unmarried women. Similarly, in Panel B, we find the probability of receiving a callback is 2.8 percentage points lower and 4.6 percentage points lower for both mothers and single mothers, respectively.

The results from both tables reveal that the "pure motherhood" and "single-mother" penalties are more pronounced in sales jobs than in customer service roles. This analysis indicates that the employer might perceive that the personal cost of dealing with the job requirement of sales jobs might be higher for single mothers.

Table 2: Probability of a Callback by Job Type

	Callbacks			
	Panel A: Customer Service Jobs			
	(1)	(2)	(3)	(4)
Married	-0.023***	-0.023***	-0.023***	-0.023***
	(0.008)	(0.008)	(0.008)	(0.008)
Mother	-0.032***	-0.033***	-0.033***	-0.033***
	(0.008)	(0.008)	(0.008)	(0.008)
Single Mother	-0.036***	-0.036***	-0.036***	-0.036***
	(0.008)	(0.008)	(0.008)	(0.008)
Zone		-0.015***	-0.015***	-0.015***
		(0.005)	(0.004)	(0.005)
Number of Employees		0.003	0.001	0.002
		(0.002)	(0.002)	(0.002)
Observations	5,120	4,896	4,864	4,864
Controls	No	Yes	Yes	Yes
Industry FE	No	No	Yes	Yes
Time FE	No	No	No	Yes
	Panel B: Sales Jobs			
	(1)	(2)	(3)	(4)
Married	-0.017**	-0.017**	-0.017**	-0.017**
	(0.007)	(0.007)	(0.007)	(0.007)
Mother	-0.028***	-0.028***	-0.028***	-0.028***
	(0.007)	(0.008)	(0.008)	(0.008)
Single Mother	-0.044***	-0.046***	-0.046***	-0.046***
	(0.007)	(0.008)	(0.008)	(0.008)
Zone		-0.005*	-0.003	-0.003
		(0.003)	(0.003)	(0.003)
Number of Employees		-0.001	0.002	0.003
		(0.002)	(0.002)	(0.002)
Observations	4,308	4,092	4,088	4,088
Controls	No	Yes	Yes	Yes
Industry FE	No	No	Yes	Yes
Time FE	No	No	No	Yes

Notes: Standard errors clustered at the job-ad level are presented in parentheses. The outcome variable in each specification is a binary variable indicating whether a callback was received for a job application. In columns (2)-(4), we additionally control for job location (zone), size of the firm (number of employees), and industry-specific and date-month fixed effects. Panel A: sub-sample of customer service jobs; Panel B: sub-sample of sales jobs. In all specifications, our base category (control group) is the unmarried female applicant.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5.3.2 Industry Specific

Table 3: Probability of a callback for 4 major Industries

	Callbacks			
	BFSI	BPM	IT Services	Technology
	(1)	(2)	(3)	(4)
Married	-0.012	-0.029	-0.029**	-0.019
	(0.011)	(0.019)	(0.014)	(0.012)
Mother	-0.009	-0.059***	-0.035***	-0.038**
	(0.012)	(0.021)	(0.013)	(0.015)
Single Mother	-0.024**	-0.062***	-0.026*	-0.049***
	(0.011)	(0.019)	(0.014)	(0.016)
Number of Employees	-0.002	-0.031***	0.015***	-0.004
	(0.004)	(0.010)	(0.003)	(0.004)
Job-Type	0.001	-0.181	-0.087	-0.014
	(0.003)	(0.133)	(0.104)	(0.019)
Observations	1,336	1,088	1,816	1,052
Controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes

Notes: Standard errors clustered at the job-ad level are presented in parentheses. The outcome variable in each specification is a binary variable indicating whether a callback was received for a job application. Each column corresponds to a separate regression on a sub-sample based on the industry classification of the firm. In all specifications, our base category (control group) is the unmarried female applicant.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

We investigate heterogeneity based on industry classification, which allows us to uncover industry-specific factors that may contribute to disparities in callback rates as industries often possess distinct work cultures, job requirements, and employer expectations. By scrutinizing the variations in callback responses across different industries, we can discern whether the observed penalties for mothers and single mothers are consistent or divergent. Given the eleven industry classifications in our dataset, we focus our heterogeneity analysis on the four major industries, considering both the volume of data and the number of callbacks to ensure robust results. In Table 3, we observe that pure motherhood and single motherhood penalties are present for all the sectors except BFSI (Banking, financial services and insurance). For the BFSI industry (column 1), we find that only a single motherhood

Table 4: Probability of a callback for 4 major Industries (in terms of callbacks)

	Callbacks			
	BPM	Education	IT Services	Healthcare
	(1)	(2)	(3)	(4)
Married	-0.029	-0.038	-0.029**	-0.050**
	(0.019)	(0.028)	(0.014)	(0.022)
Mother	-0.059***	-0.038	-0.035***	-0.035
	(0.021)	(0.030)	(0.013)	(0.022)
Single Mother	-0.062***	-0.083**	-0.026*	-0.064***
	(0.019)	(0.033)	(0.014)	(0.024)
Number of Employees	-0.031***	0.018*	0.015***	0.005
	(0.010)	(0.011)	(0.003)	(0.011)
Job-Type	-0.181	0.008	-0.087	0.014
	(0.133)	(0.039)	(0.104)	(0.026)
Observations	1,088	628	1,816	564
Controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes

Notes: Standard errors clustered at the job-ad level are presented in parentheses. The outcome variable in each specification is a binary variable indicating whether a callback was received for a job application. Each column corresponds to a separate regression on a sub-sample based on the industry classification of the firm. In all specifications, our base category (control group) is the unmarried female applicant.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

penalty is present.

Similarly, in Column 2 and Column 4 of Table 4, we provide the analyses for the education and healthcare sectors, respectively. The findings reveal an absence of penalties based on motherhood in both sectors. However, a notable single-motherhood penalty is observed. This heightened discrimination against single mothers in the education and healthcare sectors may be attributed to the vital care element characterizing these industries, potentially leading to increased bias based on negative stereotypes.

6 Robustness Check

6.1 Experiment 2: Robustness to Marital Status Disclosure

One question inherent in our study was whether revealing a job applicant's marital status per se could affect the callbacks as compared to not revealing this information on the resume. This stems theoretically from the fact that mentioning marital status can lead to a callback differential, signaling that the candidate is unprofessional. So, to investigate this question, we conducted an additional experiment after our main study. In this experiment, 420 resumes were set to 210 unique jobs. The resumes were taken from the main study, but we had only one treatment and one control group this time. For the treatment group, we revealed the fictitious applicant's marital status (with the main study's baseline category, i.e., unmarried). For the control group, we did not reveal any information about marital status. The criteria for job ad selection and the submission procedure were identical to those in the main study.

Table 5: Callback Differential Based on Marital Status Signal

	Callbacks	
	(1)	(2)
Marital Status Mentioned	0.010	0.012
	(0.017)	(0.019)
Observations	420	420
Controls	No	Yes
Industry FE	No	Yes
Time FE	No	Yes

Notes: Standard errors clustered at the job-ad level are presented in parentheses. The outcome variable in each specification is a binary variable indicating whether a callback was received for a job application.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5, reports the OLS regression analysis. Results suggest that revealing the disclosure of marital status by the applicant does not affect the callback rates as there is no statistically significant difference in the treatment group compared to the control group. In column 2, we add firm-level control, as well as industry fixed effect, and the results are identical. Moreover, we can say that employers do not penalize a candidate for mentioning her marital

status. Therefore, we can be assured that mentioning marital status does not drive our main results.

6.2 Test of Exact Randomisation

We perform a test for random simulation of treatment status or exact randomization. To perform the test we run two specific simulations. For the first simulation, we randomly assign motherhood and single motherhood status instead of using the parenthood status as assigned under the experiment. We then run the regression as stated in Equation (2) for our primary outcome. We repeat this exercise 1000 times and record the results.

$$Y_i = \alpha + \beta_1(SingleMother) + \gamma * X_j + \delta + \psi + \epsilon_i \tag{3}$$

Again, if our critical identifying assumption is true then most of the results from the randomization of profiles into single mother and married mother status would give us imprecise results, which should also be much smaller in magnitude as compared to our true causal estimate.

We analyze the result for callbacks which is a specification mentioned in equation (2), and we find that only 1% of the simulated results come out to be significant at a 95% confidence interval. This is on expected lines and adds to the confidence in our identification strategy and the efficiency of our experiment design. Also, when we observe the distribution of simulated coefficients given in Figure 6 we find that nearly all the coefficients are smaller than the true causal estimate of -0.098. The distribution is also largely centered around zero.

We observe similar results for another specification. Under which regress, a dummy variable on callbacks and by construction, this variable randomly allocates single mother and other women status to different profiles, and here we observe that only .46% of the results turn

out to be significant at a 95% confidence level. The true causal estimate is again much larger and in the right direction when compared with the distribution of coefficients given in Figure 7.

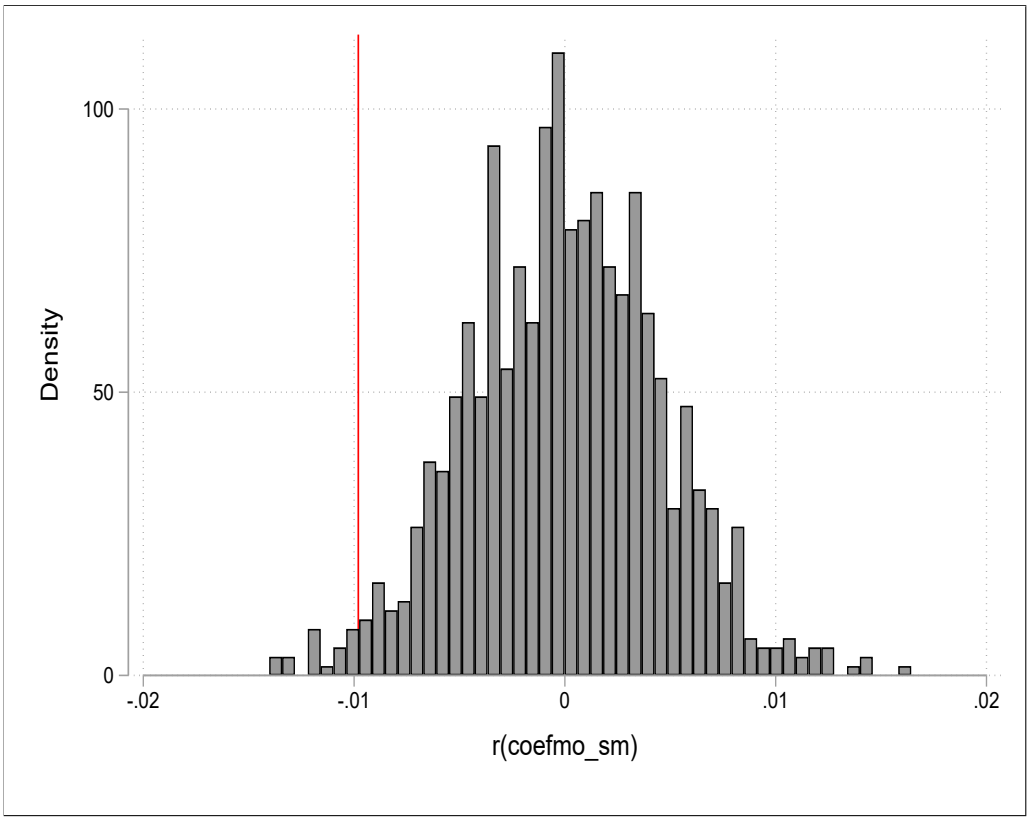

Figure 6: Callbacks: Single mother relative to mothers randomization

7 Potential Mechanism

In this section, we attempt to identify potential mechanisms that may explain the observed demand-side discrimination against single mothers. We explore various possibilities of why the odds of an equally qualified single mother getting called for an interview are substantially lower than that of her unmarried non-mother counterpart. We perform two complementary analyses here to uncover potential sources of discrimination. Typically, there are a few sources of discrimination that have been identified in the literature, viz, taste-based or statistical, including inaccurate statistical discrimination (Bohren et al.,

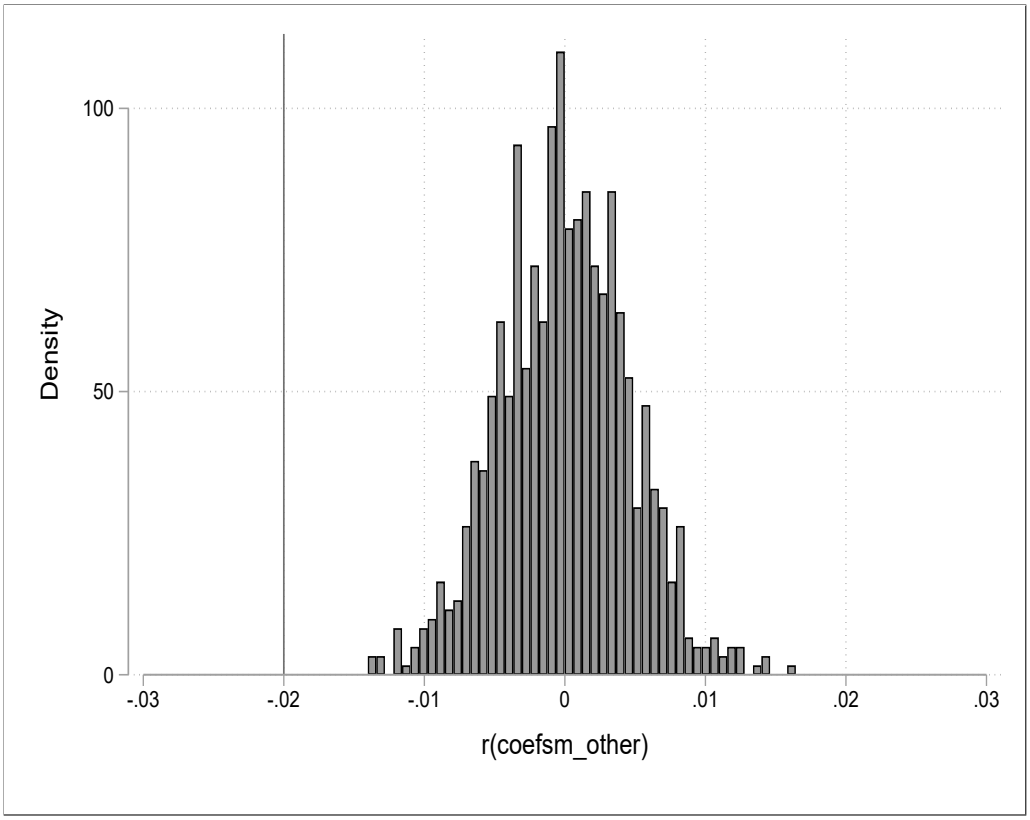

Figure 7: Callbacks: Single mother relative to other groups randomization

2019, 2023) and implicit discrimination (Bertrand et al., 2005). The central idea of inaccurate statistical discrimination posits that such discrimination arises due to heuristics and biases or asymmetric information (Bohren et al., 2023). In our context, this would imply that employers incorrectly correlate group identity, such as single mother status, with productivity or misconstrue the identity as a signal of low productivity. We generally find support in favor of inaccurate statistical discrimination while we cannot entirely rule out potential implicit discrimination mechanisms. We describe these motivations and our attempts to isolate these in more detail below.

7.1 Geographic Variation in Effects

Statistical discrimination may operationalize through accurate or inaccurate beliefs about candidates' ability to relocate. For instance, if the employer believes (with/without any

Table 6: Probability of a callback for all type of jobs

	Callbacks			
	North	West	South	East
	(1)	(2)	(3)	(4)
Married	-0.016*	-0.020*	-0.030***	-0.028
	(0.010)	(0.011)	(0.009)	(0.039)
Mother	-0.026***	-0.035***	-0.040***	-0.037
	(0.010)	(0.011)	(0.010)	(0.037)
Single Mother	-0.031***	-0.054***	-0.051***	-0.019
	(0.011)	(0.011)	(0.010)	(0.035)
Number of Employees	0.007**	-0.001	0.002	-0.012
	(0.003)	(0.003)	(0.003)	(0.019)
Job-Type	-0.076**	-0.035	-0.025	0.007
	(0.030)	(0.034)	(0.021)	(0.120)
Observations	2,964	2,168	2,900	432
Controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes

Notes: Standard errors clustered at the job-ad level are presented in parentheses. The outcome variable in each specification is a binary variable indicating whether a callback was received for a job application. Each column corresponds to a separate regression on a sub-sample based on job location (zone). In all specifications, our base category (control group) is the unmarried female applicant.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

foundational basis) that a single mother is constrained by relocation costs and is unlikely to relocate for jobs given her specific childcare responsibilities, then the employer may disproportionately invite fewer single mothers for interviews and this is a form of statistical (accurate/inaccurate) discrimination.

One way to test this hypothesis would be by looking at effects based on the distance of the job location from the location of the applicant. We do not include specific addresses, but we create an applicant pool based on Bengali demonyms. Essentially, the names of our fictitious applicants are usually identified with people who are Bengalis, i.e., natives of the state of West Bengal and largely inhabit eastern parts of India. Additionally, the educational institutions from which our fictitious applicants have graduated are all located in Kolkata, the capital of West Bengal. This provides a reasonable signal to the em-

ployer about the typical location preference of the candidates. More specifically, few of the fictitious resumes explicitly mention that their current location is the city of Kolkata. Consequently, if employers practice statistical discrimination along this dimension for jobs located around Kolkata (the eastern zone of India) - we would not expect any evidence of differential callbacks.

Table 6 presents these results. It shows the richest set of specifications (mirroring column 6 of Table 1) for four primary geographic regions or zones, North, West, South, and East, separately. The table illustrates that results vary across different zones. We find that results go in the same direction for the northern, western, and southern zones. We clearly document an absence of pure-motherhood and single-motherhood penalty for the east zone. As a result, we fail to reject the hypothesis that employers are using statistical discrimination based on potential opportunity costs of relocation, and this is leading to observed differences in callback rates.

7.2 Uncovering Evidence of Inaccurate Statistical Discrimination through Vignettes

As discussed above, the literature has categorized labor market discrimination mainly into four broad types: taste-based (Becker, 1957), statistical (Arrow, 1973; Aigner and Cain, 1977), inaccurate statistical (Bohren et al., 2019), and implicit discrimination (Bertrand et al., 2005). Some empirical studies have attempted to infer the nature of discrimination indirectly by analyzing variations in employer demographic characteristics (Siddique, 2011). Since we are unable to directly observe employer characteristics, we utilize a vignette study to tease out the potential sources of discrimination that potentially explain our findings in the preceding sections.

The study was conducted in February 2024 with masters-level business school students ($N = 125$) at a leading B-School in India who will be potential employers in the future.

Similar to the design of Haaland and Roth (2023); Chen (2024), we attempt to elicit the participant's beliefs about the potential source of discrimination against single mother applicants. Appendix A.1 contains a detailed description of the design of the vignette survey. Further, Figure 12 in the Appendix contains the survey questionnaire utilized for the study,

Our sample is constituted of 62.70% males, 34.92% females, and 2.38% others. The maximum number of respondents were in the age bracket of 21 to 25 (73.60 %), followed by the age bracket 25 to 30 (24.80%). Additionally, 66.67% of the respondents reported having at least one year of work experience, with 17.46% having zero to 1 year of experience, 30.16/ having 2-3 years of experience, and 19.05% having 2-plus years of experience. We also collect information regarding the educational background of the respondents, with around 66% of them being engineers and the rest coming from arts, commerce, and other fields.

Figure 8 contains the results of our vignette survey. Upon being presented the results on the lower callback rates for single-mother applicants, 44.08% of the participants believe that employers "incorrectly think that single mothers, on average, tend to be less productive than unmarried women". This response option corresponds to the theoretical category of inaccurate statistical discrimination.

Further, 40.16% of the respondents attribute the callback differential to the employers "subconsciously relying on negative stereotypes about single mothers," which corresponds to the theoretical bracket of 'implicit' discrimination (Bertrand et al., 2005). Finally, only 13.38% of the participants link the callback differentials to the presence of (accurate) statistical discrimination, while only 3% believe that the underlying mechanism corresponds to a form of taste-based discrimination. One interesting finding is that none of the respondents think employers are not likely to impose some kind of penalty for single mothers ("I don't think it's true that employers are more likely to call back applicants who are unmarried women."). This insight echoes the result of our field experiment.

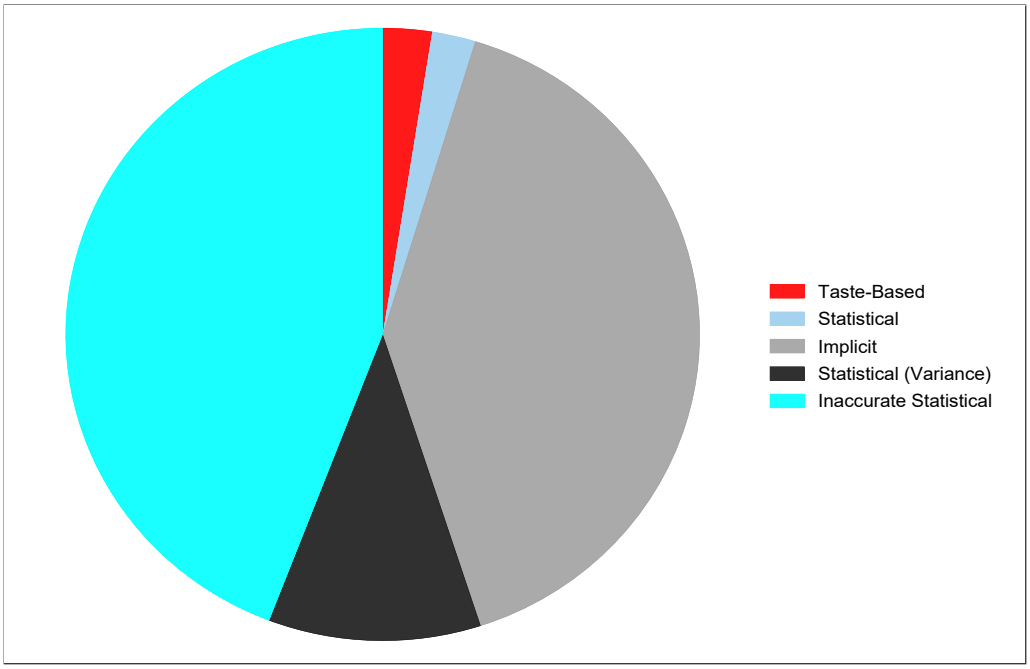

Figure 8: Vignette Results: Potential Sources of Discrimination

We now provide a rationalization for the aforementioned response distribution and further argue that these can indeed serve as the primary driver of our findings from Section. As observed in our vignette results, "Inaccurate Statistical Discrimination" is widely believed to be the main reason for the discrepancy in callback rates. This could potentially be because employers might find it difficult to estimate the average productivity of single-mother applicants correctly due to their small proportion in the pool of working women. They might then construct a weighted average of other groups' (parenthood/marital) productivity to arrive at an estimate for single mothers, which might be inaccurate. This then explains the source of observed discrimination in the main study results.

The second most common belief is Implicit Discrimination. Given the nature of the selection process, implicit discrimination can be a potential explanation for the kind of jobs we consider in this paper. The selection process is arguably characterized by time boundedness, considerable ambiguity, and a form of nonverbal automated selection procedure. Therefore, employers might unintentionally accord lower callbacks to single-mother applicants.

Further, we examine whether there exists any heterogeneity in the elicited beliefs based on the gender of the respondent. We find around 12.66% of the male candidates think that the source of discrimination is accurate statistical discrimination compared to only 4.5% of females. Within the sub-population that selected accurate statistical discrimination as a source of callback differential, 71.43% were male. In table 8 the Appendix, we do a multinomial logistic regression to analyze the association (if any) between the respondent's gender and the potential source of discrimination.

The coefficient is negative and statistically significant for accurate statistical discrimination. This indicates that female respondents, relative to male respondents, are less likely to be in the "Accurate statistical" outcome category than the base category. This reflects that in male-dominated industries, the entry barrier can be pronounced for single mothers as they are more likely to believe that single mothers are less capable in expectation.

8 Discussion

In this paper, we study single mothers and the associated labor market penalty. Single mothers are unique because in principle, they are unlikely to face the marriage penalty in the labor market relative to married women but are likelier to face a child penalty in the labor market relative to childless women. Consequently, for this category of mothers, the manifestation of the typical motherhood penalty is not obvious.

A snapshot of aggregate data from household surveys suggests that married women and mothers are less likelier to work compared to unmarried women in the Indian labor market. However, single mothers are more likely to work compared to unmarried women in the same setting. This could potentially be due to higher supply side incentives that single mothers are responding to and the equilibrium realization of their outcome potentially crowds out the demand-side discrimination.

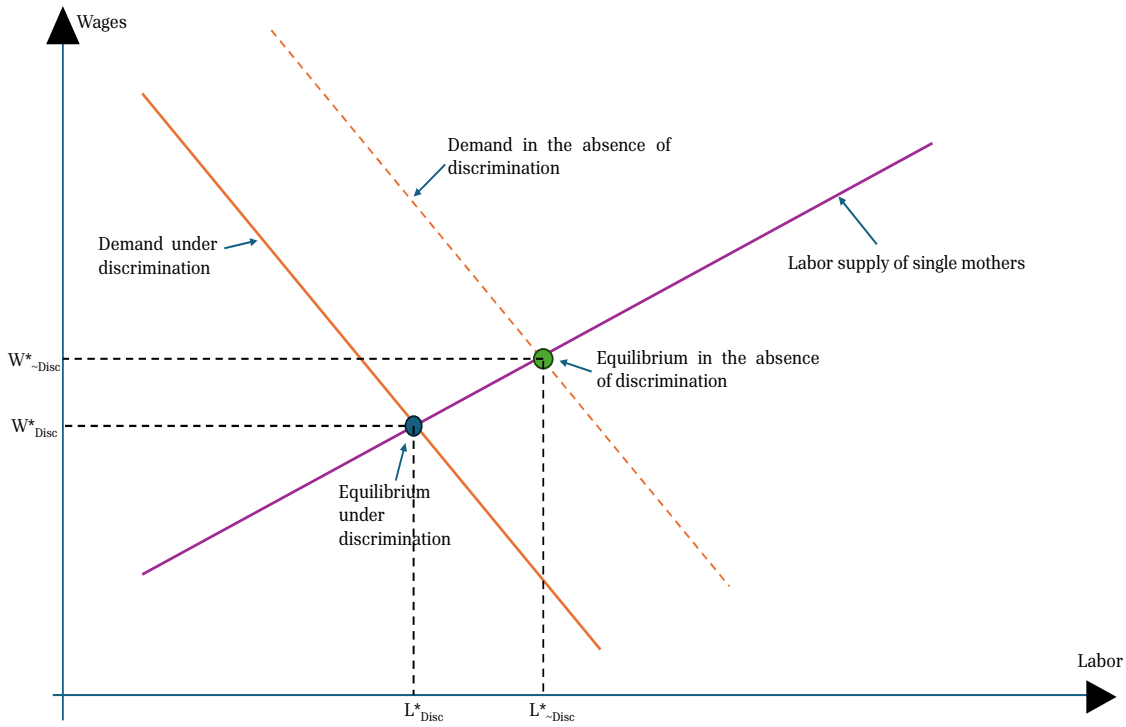

Figure 9: Conceptual Framework- Labor Market of Single Mothers

We represent this idea in Figure 9, where we consider a textbook labor market model with an upward-sloping labor supply curve for single mothers. The tuple (W_{Disc}, L_{Disc}) represents the equilibrium that we observe in the labor market. The numbers that we get from the DHS data, for instance, would correspond to the L_{disc} optimal value for labor force participation rates of single mothers. We argue that this is an equilibrium which masks the demand-side discrimination.

We perform a correspondence study and provide evidence of such discrimination by experimentally eliminating any supply-side variation. We show that equally qualified single mothers get fewer callbacks relative to unmarried women. This implies that in the counterfactual, without the existence of such discrimination (which we hypothesize as inaccurate statistical discrimination), the demand curve for single mothers would shift to the right as

depicted in Figure 9. The resultant equilibrium would have higher earnings and a higher labor force participation number for such women.

This has policy implications and suggests that labor market discrimination against single mothers can be distortionary and lead to welfare losses. Transparent shortlisting measures and explicit equal opportunity initiatives in firms may result in a representative shift in the demand curve to the right, and responding to increased wages and earnings opportunity, the overall labor force participation rate would also go up as a result.

To get a better sense of the extent of discrimination that we are able to capture, we present some analysis in the of the callback rates in Table 7 below, in the spirit of (Bertrand and Mullainathan, 2004).

Table 7: Average Number of Applications Required to Receive ONE Callback By Treatment Category

Marital/Parenthood Status	**Average Number of Applications**
Unmarried	14
Married	19
Married Mother	23
Single Mother	30

If the results of our correspondence studies can be generalized, a potential unmarried applicant with similar qualifications may need to apply to at least 14 jobs to get one callback for interview. However, an equally qualified married woman will need to apply to about 19 jobs and the corresponding number for married mothers is 23. In stark contrast, a single mother with similar qualifications with respect to all the other categories will need to apply to 30 such jobs. This is purely at the extensive margin. At the intensive margin or at next rungs of shortlisting and interviewing, if there exists further discrimination, this only magnifies the job search problem for single mothers and imposes heavy search costs for finding potential matches in the labor market on them.

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A Appendix

Figure 10: Personal Information Section: naukri.com

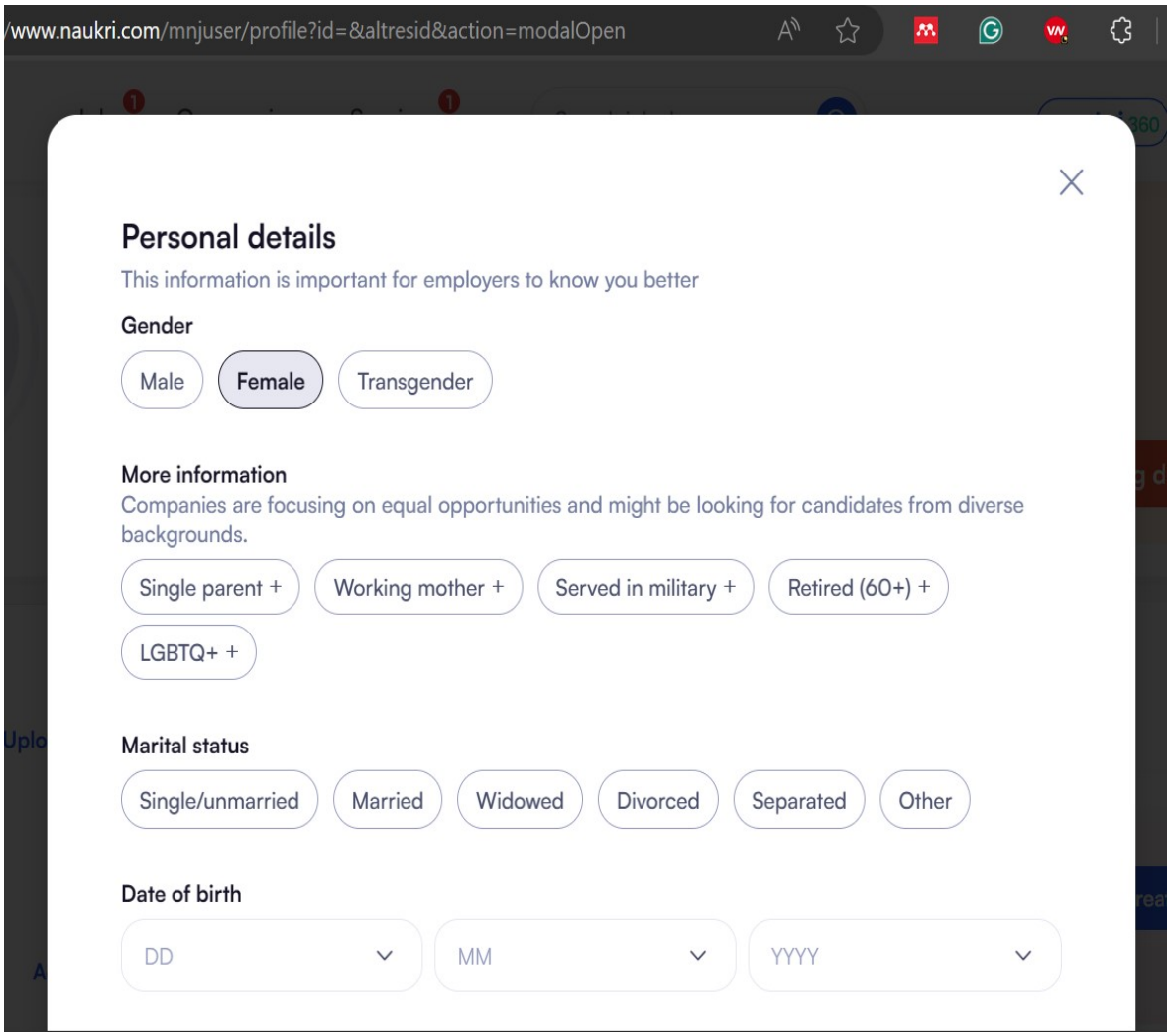
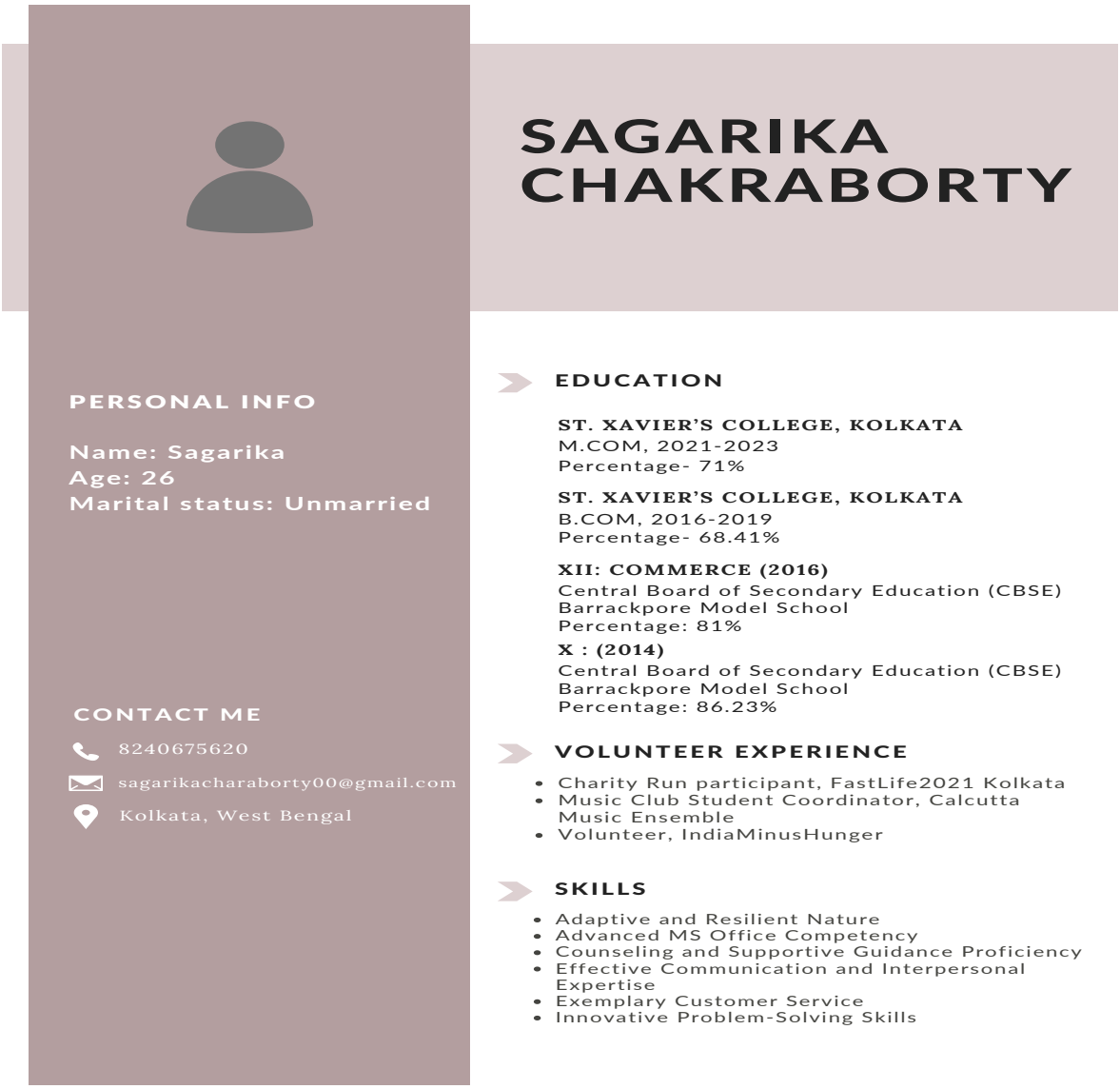


Figure 11: Representative CV



SAGARIKA CHAKRABORTY

PERSONAL INFO

Name: Sagarika
Age: 26
Marital status: Unmarried

CONTACT ME

8240675620
sagarikacharaborty00@gmail.com
Kolkata, West Bengal

EDUCATION

ST. XAVIER'S COLLEGE, KOLKATA
M.COM, 2021-2023
Percentage- 71%

ST. XAVIER'S COLLEGE, KOLKATA
B.COM, 2016-2019
Percentage- 68.41%

XII: COMMERCE (2016)
Central Board of Secondary Education (CBSE)
Barrackpore Model School
Percentage: 81%

X : (2014)
Central Board of Secondary Education (CBSE)
Barrackpore Model School
Percentage: 86.23%

VOLUNTEER EXPERIENCE

- Charity Run participant, FastLife2021 Kolkata
- Music Club Student Coordinator, Calcutta Music Ensemble
- Volunteer, IndiaMinusHunger

SKILLS

- Adaptive and Resilient Nature
- Advanced MS Office Competency
- Counseling and Supportive Guidance Proficiency
- Effective Communication and Interpersonal Expertise
- Exemplary Customer Service
- Innovative Problem-Solving Skills

Figure 12: Vignette Design

We conducted an experiment (correspondence study) to find evidence of labour market discrimination faced by single mothers in Indian job market.

Correspondence study was a method popularised by Massachusetts Institute of Technology professors and it provides a credible way to reveal discrimination in hiring. The method involves sending matched pairs of identical job applications to employers posting jobs— the only difference being *including a characteristic that signals membership to a particular group rather than the other*.

The idea in our study was to make sure that applicants were seen as having identical qualifications, but that employers would use the applicants' **marital/parenthood status** as an indicator of them belonging to a different group (unmarried vs. married mother with a child vs. a single mother with a child).

We conducted the above study and following are our results:

Marital/parenthood status	Average number of applications to receive **ONE** callback
Unmarried	14
Mother	23
Single mother	30

Q1. What do you think is the main reason that single mothers receive fewer callbacks relative to unmarried women and mothers with identical qualifications? (mark only ONE option)

a. They don't want to hire single mothers because they don't like to interact with single mothers.

b. Resume credentials are seen as more reflective/informative of skills for unmarried women than for single mothers.

c. They sub-consciously rely on negative stereotypes about single mothers.

d. They correctly think single mothers on average tend to be less productive than unmarried women.

e. They incorrectly think that single mothers on average tend to be less productive than unmarried women.

f. I don't think it's true that employers are more likely to call back applicants who are unmarried women.

> Demographics:

2. Age:

a. <21 b. 21-25 c. 25-30 d. 30+

3. Gender:

a. female b. male c. others d. prefer not to say

4. Experience:

a. 0 b. 0-1 year c. 1-2 years d. 2-3 years e. 3+ years

5. Education:

a. arts b. commerce c. engineering d. natural sciences e. others

A.1 Details of Vignette Design

In the vignette (figure 12), we provide participants with information on the general design of correspondence study followed by communicating results from our own study summarised by table 7. Then, we asked our respondents what they think is the main reason why employers are more likely to call back unmarried applicants. We presented participants with possible options in such a way that it captured the most commonly cited theoretical reasons for differences in callback rates. We employ this vignette design as it helps us address a potential concern of social desirability bias. We asked participants why other employers are discriminating against single mothers rather than asking whether the respondent himself/herself would discriminate or not. A second set of questions was included for all respondents, which sought to collect data on demographic characteristics.

Table 8: Vignette Results: Multinomial Logistic Regressions

	Gender	
	(1)	(2)
Taste-Based	-13.535***	-14.846***
	(.641)	(0.3349)
Accurate Statistical (high variance)	-0.4052	-0.5333
	(1.259)	(1.161)
Implicit Discrimination	-0.34464	-0.2665
	(.40535)	(0.4171)
Accurate Statistical (low productivity)	-1.3217	-1.4001**
	(.8238)	(.7442)
Controls	No	Yes
Observations	122	122
Log Pseudo-likelihood	-136.351	-129.839
Pseudo R-squared	0.0217	0.0621

Notes: Robust standard errors presented in parentheses. The explanatory variable is the gender of the respondent (a binary variable which takes a value one for female and zero otherwise). In Column (2), we have added a host of controls based on other demographic information. The outcome variables correspond to the following response statements: *Taste-Based*: "They don't want to hire single mothers because they don't like to interact with single mothers"; *Accurate Statistical (high variance)*: "Resume credentials are seen as more reflective/informative of skills for unmarried women than for single mothers."; *Implicit Discrimination*: "They sub-consciously rely on negative stereotypes about single mothers"; *Accurate Statistical (low productivity)*: "They correctly think single mothers on average tend to be less productive than unmarried women." The omitted base category corresponds to the response statement, "They incorrectly think that single mothers on average tend to be less productive than unmarried women.". All columns correspond to a multinomial logistic regression estimation.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$