Does China’s Fertility Policy Induce Employment Discrimination Against Women? Evidence from a Nationwide Correspondence Experiment

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Abstract

We apply a two-wave nationwide correspondence experiment to assess the effects of the two-child and three-child policies in China. Using 13,751 observations collected through this experiment, we find that the announcement of the two-child policy led to a 4.9% decrease in total interview callbacks overall, and decreases of 4.3%, 5.7%, and 5.6% for single women, those married with no children, and those married with one child, respectively. The implementation of the three-child policy led to a 10.4% decrease, but only for married women with two children. The discrimination broadly affected all women, whether they disclose marriage and fertility status information or not, as we find their callback rates decreased by 4.5% under the universal two-child policy and 6.6% after the three-child policy.

1. Introduction

Although employment discrimination against women is being addressed in the labor market (Goldin, 2014; Blau & Kahn, 2017), women's fertility is still clearly an issue that leads to significant bias in companies' recruitment decisions (Kleven et al., 2019a). The so-called motherhood penalty, which refers to the cost of childbearing and childcare, results in gender inequality in both job hunting and wage rates (Kleven et al., 2019b). Thus, women are discriminated against worldwide in terms of fertility, but particularly in developing countries such as China. For example, of the 65,956 female respondents to the 2020 Survey Report on the Status of Chinese Women in the Workplace, 58% had been asked about their marital and childbearing status when applying for jobs, 27% had faced restrictions due to their gender, and 64% believed that “childbirth is an inescapable burden for women” in the workplace. In addition, the Report on the Gender Gap in China's Workplaces revealed that in 2020 Chinese women were paid 75.9% the pay of their male counterparts, and men's advantage over women in terms of salary was 2.1% higher than in 2019.

Thus, employment discrimination against women in terms of fertility status is unfortunately evident. The Employment Promotion Law of the People's Republic of China is aimed at ensuring employment fairness, and clearly stipulates in article 26 of its third chapter that “When employing units recruit personnel or job intermediaries engage in job intermediary activities, they shall provide equal employment opportunities and fair employment conditions to workers; discrimination in hiring is forbidden.” Under China's current legal framework, employers never disclose any instances of discrimination in public recruitment. The use of traditional empirical identification strategies or complex algorithms for identifying discrimination is challenging due to endogeneity and other issues (Rich & Riach, 2002; Mincer & Polachek, 1974; Kunze, 2008).

However, correspondence experiments can be effectively applied when exploring employment discrimination against women with children or who are or may in future be pregnant (Bertrand & Duflo, 2017). China's fertility policies provide an ideal context in which we can identify this discrimination. China's central government has implemented fertility policies to control the number of births in a family, and these policies represent an exogenous event. They were implemented in three stages: the “One-Child
Policy” between 1979 and 2015; the “Universal Two-Child Policy” between 2016 and 2021; and the “Universal Three-Child Policy,” which was implemented on May 31, 2021. We focus on these events and contribute to the literature by exploring the following questions. First, do the fertility policies induce employment discrimination on the basis of women’s fertility? Addressing this question can contribute new evidence from China to the literature, following studies such as those of Firth (1982), Angrist and Evans (1998), Correll et al. (2007), Bygren et al. (2017), and Becker et al. (2019). The intuition is simple. When the two-child policy was enacted in 2012, companies may have been concerned about the possibility of a woman with one child having another. Similarly, women with two children may have been more likely to be discriminated against after the implementation of the three-child policy. Evidence for this conjecture will, to the best of our knowledge, be unique in the literature and can encourage further investigations into the side effects of the new fertility policy. Second, if such effects do exist, which groups of women suffered more after the implementation of the two policies? Answering this question can help policy-makers target complementary policies toward a specific group. Third, can discrimination be avoided through not disclosing marriage and fertility information? If not, this indicates that women in general are discriminated against, and policy intervention is required.

We examine these questions by conducting a large-scale correspondence study nationwide by the method of sending out customized fictitious resumes. We focus on the period between January 2015 and December 2016, which allows a before-and-after investigation of the implementation of the universal two-child policy, and the period between June 2020 and September 2021, which does likewise for the three-child policy. The resumes are designed to contain identical personal details except for marital and childbearing status. Only full-time accounting positions advertised on the Internet are applied for. We explore whether the applicants’ specific marital and childbearing status leads to fertility discrimination, using 13,751 collected observations and corresponding recruitment positions in 148 cities across 26 provinces in China. We measure this using the number of interview invitations (“callbacks”) received and a difference-in-differences (DID) method. We find that women subject to the universal two-child policy have 4.9% fewer callbacks. Married women with no children and those with one child are discriminated against the most, with 5.7% and 5.6% fewer callbacks. We find that for those subject to the three-child policy, those married and with two children are the most discriminated against. In addition, we find that even women who do not disclose their marriage and fertility information are discriminated against under the universal two-child policy, with a 4.5% reduction in callbacks, and with a 6.6% reduction after the three-child policy.

The remainder of this paper is organized as follows. Section 2 consists of a review of the background and literature and in Section 3 we develop the experimental design. Section 4 introduces the data and in Section 5 we discuss our empirical strategy. Our main findings are presented in Section 6. We explore various heterogeneities in the discrimination effects of the fertility policies in Section 7. Section 8 concludes.

2. Background And Literature
2.1 China’s fertility policy

As Fig. 1 illustrates, the one-child policy became fully operational in China in 1979, and it not only effectively reduced the population growth rate but also had a significant impact on female employment (Zhang, 2017). It reduced the costs of hiring women, and more importantly, made the potential fertility costs that companies would incur clear and more stable. Thus, to some extent, the one-child policy successfully increased the participation rate of the female labor force.

However, the one-child policy also brought problems such as aging and an unbalanced sex ratio at birth. The Chinese government initiated a universal two-child policy in 2016 to address these social issues. The policy restricted couples to having no more than two children, thus ending the previous one-child policy, and the government encouraged citizens to have a second child, with extended maternity leave as the main incentive. This policy also potentially increased women’s responsibilities to their families and society, and the pressure on them to have children, thereby posing a challenge to fair employment. The All-China Women’s Federation conducted a survey and noted that after the universal two-child policy was implemented, 24.7% of those surveyed thought that employers were reluctant to hire women of childbearing age who had not yet had children (Wang, 2019).

However, the Chinese government subsequently proposed a three-child policy due to the rapid decline in the population growth rate. From May 31, 2021, this policy now allows a family to have three children. However, without clear supporting policies, such as corresponding subsidies for companies hiring women of childbearing age, this incentive potentially increases both employment costs and uncertainty, which may lead to fertility discrimination against women of childbearing age.

2.2 Relevant literature

Correspondence experiments are widely applied in the literature (Banerjee & Duflo, 2017; Gaddis, 2018). This method allows researchers to exclude all except the specific focal effect. The development process of correspondence experiments also has advantages. Their applications in social sciences and other fields are described by Banerjee and Duflo (2017), while Neumark (2012; 2018) investigates in detail their widespread application in the field of labor market discrimination. Bertrand and Mullainathan (2004) conduct a resume experiment and find that white people are 50% more likely to be called for an interview than black people. Galarza and Yamada (2014) and Lee and Khalid (2016) take similar approaches when investigating the discrimination faced by indigenous people in Peru and Chinese people in Malaysia, respectively. Oreopoulo (2011) examines the nationality of applicants to assess discrimination against foreign names in Canada, and notes that the level of discrimination faced by an applicant with a Chinese, Pakistani, or Indian name is almost as severe as that Bertrand and Mullainathan (2004) identify for black people. This kind of discrimination has also been identified in Ireland (McGinnity & Lunn, 2011), Sweden (Bursell, 2014; Carlsson & Rooth, 2007), and France (Jacquemet & Yannelis, 2019). In addition, appearance can cause discrimination in the labor market. Francisco and Gustavo (2019) randomly assign photos to a fictitious resume and find that attractive candidates are 82% more likely to be successful than less attractive candidates. Galarza and Yamada (2014) also conclude that better looks
provide a competitive advantage in the labor market, but the extent of the advantage varies by job category.

Our research extends the literature on employment discrimination against women due to their marital and childbearing status. Arceo-Gómez and Campos-Vazquez (2014) respond to job advertisements with fictitious resumes that include randomized information about the applicants and find that married women receive fewer interview callbacks than single women, but marital status has no effect on men. He et al. (2021) similarly finds that women but not men in China are subject to labor market discrimination due to expected family responsibilities. Firth (1982) finds that applicants who have finished bringing up their children are preferred by employers, and those who are potentially reproductive men are discriminated against much less than women. Angrist and Evans (1998) develop a similar design for their resume experiment framework, and find that the potential fertility of women significantly reduces their rate of participation in the labor force, using both the least-squares and the instrumental variable methods. Similar findings are also documented in various European countries. Correll et al. (2007) investigate the motherhood penalty that can result from the perceived risk of potential fertility using a laboratory experiment and find that women without rather than with children are more favored by employers. However, Bygren et al. (2017) conduct a resume experiment involving 2,144 employers in the Swedish labor market and find that whether a woman has children makes no difference to her job-hunting success. Becker et al. (2019) conduct a multinational resume experiment focused on accounting and secretarial positions in Germany, Switzerland, and Austria. They find that among married women seeking part-time work, those with older rather than younger children are significantly preferred.

In addition to marital and childbearing status, the perceived risk of a woman's potential fertility can also be evaluated by her age. Thus, whether it is age or childbearing status that leads to employment discrimination is difficult to ascertain. Some studies consider that age conveys the likelihood of future marriage as well as childbearing, and age groups can be used to represent whether a female applicant is of childbearing age. Duguet (2005) and Petit (2007) conduct resume experiments in France, and categorize virtual job hunters into those who are young without children (25 years old), older without children (37 years old), and older with two children (37 years old). The results suggest that there is no gender discrimination in the older category, but for the younger group, or those applying for higher-paid jobs, women are much less likely to be invited to interviews than men. Helleseter et al. (2016) propose the “age twist” in employers’ gender selection, which indicates that when employers choose older (as opposed to younger) workers, their gender selection will shift sharply from female to male due to the differences in family responsibility.

Indirect evidence has been provided regarding whether there is a penalty for potential maternity in the labor market. Although some studies show that lesbian applicants are less likely to receive callbacks than heterosexual women (Drydakis, 2009, 2011, 2012, 2014; Ahmed et al., 2013), the consideration that homosexual women are less likely to have children can reverse this perception. For example, by examining different ages and sexual orientations in addition to marital status, Baert (2014) compares the relative likelihoods of hiring heterosexual and homosexual women who are young or middle-aged through
a resume experiment, and finds that young lesbians are preferred to other young women, while there is no preference in terms of middle-aged women with different sexual orientations.

3. Experimental Design

3.1 Timeline and locations of the experiment

As shown in Fig. 1, the first wave of our experiment was conducted between January 2015 and December 2016, and the second wave between June 2020 and September 2021. On October 29, 2015, the Chinese government announced that the universal two-child policy would be implemented on January 1, 2016. The government then allowed families to have a third child from May 31, 2021, only five years after the two-child policy was enacted. We timed our two-wave experiment to enable before-and-after investigations of the two fertility policies.

The study was conducted in 148 prefectural Chinese cities, including the four first-tier megacities of Beijing, Shanghai, Guangzhou, and Shenzhen along with other 23 provincial capital cities and 121 other cities. As shown in Fig. 2, most of these cities are in southeast China, below the Hu Line[1]. They accounted for 94.41% of the population and 94.13% of China’s GDP in 2010 (Chen & Gong et al., 2016).

3.2 Design of fictitious resumes

**Potential fertility.** The virtual applicants in our experiment were all aged 30[2] and categorized into the following marital and childbearing statuses:[3] unmarried without children, married without children, married with one child, married with two children, and married with three children. The levels of discrimination against women in these categories under a given fertility policy can be expected to differ. For example, since the universal two-child policy was fully implemented in 2016, married women with no children could in future have two children, and married women with one child were allowed to have one more child. Married women with two children could have no more children at that time, but were able to have a third when the universal three-child policy began. In addition, unmarried women are less likely to give birth than married women, as illegitimate children bring a social stigma.

In addition, we included resumes that provided no information on the candidates’ marital and childbearing statuses. These “no information” job hunters were incorporated to assess whether female applicants can avoid discrimination by omitting information about their marital and childbearing status in their resume, under the assumption that employers may statistically discriminate against job-hunting women who lack fertility information.

**Other personal information.** Other than marital status, all applicants provided identical information including name, age (30), appearance, ethnicity (Han), education, work experience (5 years), and relevant skills (junior accountant certificate and accounting software). We set all aspects of personal information to an ordinary level (i.e., the job hunters were 30-year-old women with 5 years working experience) to prevent any strong substitution effects on marital status. The name and appearance of our applicant were randomly generated by software and set to normal levels. In terms of education and skills, the
applicant was an undergraduate with a junior accountant certificate. The applicant was of Han ethnicity as this is China's major ethnic group and accounted for more than 91.51% of the population in 2010 and 91.11% in 2020. This group is therefore the most affected by the family planning policy (National Bureau of Statistics of China [NBSC], 2021). As in studies of female employment discrimination in other countries (Riach & Rich, 2010; Rich & Riach, 2002), we focused on one job type, namely, accounting positions[4].

Quality of virtual resumes. We invited an HR employee from Fortune Global 500 with 10 years’ work experience to help us design the resumes and thus ensure their quality. However, we still needed to ensure that the virtual resumes appeared sufficiently realistic to other HR staff, which required that the disclosure of marital status and fertility information would not appear deliberate. Thus, we invited five HRs from different companies (with eight years’ experience on average) to confirm the authenticity of our resumes before we embarked on the experiment. We presented the five HR employees with our designed resume and four real resumes and clearly stated that one was fake. Only one out of the five employees correctly identified the fake. Thus, we were able to guarantee the quality of our fake resume.

3.3 Resume delivery and data collection

Delivery process and information record. We conducted our study on 58.com, which is one of the largest recruitment websites in China. This company was listed on the New York Stock Exchange in 2013. According to its website, 58.com currently has more than 600 million registered users and 96 million resumes. We selected the job posts that met our selection criteria and recorded company information, which included name, email address, expected salary, number of job applicants, company size, resume feedback rate, city location, and ownership of company. Next, we randomly delivered resumes to the email addresses we had collected and recorded the delivery time (including date, day of the week, and 24-hour time) to control for the fixed effect of time. Each email was entitled “Job application + Accounting/C Finance + Candidate Name + five years of work experience” and included a covering letter (see Table S6) with the resume in PDF format attached.

Record of HR response. Employers typically invite prospective candidates to an interview (or preliminary test for other job types) after receiving a resume. The invitation is made through a phone call or text message, and rejection is generally conveyed by email. We recorded whether each delivered sample received an interview invitation. Following Bertrand and Mullainathan (2004), we defined an application as a success if it received a callback from the recruiter within 14 days of resume submission. If no response or a rejection was received within two weeks of sending the resume, the result was marked as “0,” and “1” otherwise. Only one application led to a callback within 14 days.

[1] The Hu Line named after Hu Huanyong, a famous Chinese population geographer. He proposed it to demonstrate the different population densities of the areas either side of the line in 1935.
The age of obtaining a Bachelor’s degree in China is generally 22, and the average marriage age of women with a Bachelor’s degree is 27 (although in Beijing, the average age of first marriage for women with a Bachelor’s degree increased from 26.5 years in 2011 to 30.1 years in 2019). The marriage and childbearing statuses of women aged 30 can vary, and 5 years of work experience is typical. In addition, 30 is a typical age setting in other studies (Becker et al., 2019), which enables us to compare our results.

Our virtual applicants are limited to women of childbearing age. We focus on employment discrimination against women of childbearing age due to their potential fertility risk; studies have shown that the impacts of marital status on female and male job hunters are opposite and difficult to compare (Firth, 1982). Thus, we do not include male applicants.

We focus on accounting positions because most companies have them and thus the volume of employees ensures we can collect the required quantity of data. Second, accountancy tasks are generally similar, so there is no need to control the work content. Third, in China and in other countries, women are in the majority in accounting.

4. Data

4.1 Overall descriptive statistics

The experimental sample includes 13,751 observations, covering 148 Chinese cities in 26 provinces that are mainly concentrated in the southeast (the spatial distribution of sample posts is shown in Fig. 2a). In our experiment, each company only receives one resume. To the best of our knowledge, our sample is larger than others in the literature, and particularly in terms of the number of companies (Becker et al., 2019). In addition, the numbers of resumes within each category of women are controlled to be as close as possible. The final totals for women who are unmarried without children, married without children, married with one child, married with two children, married with three children, and those who offer no marital information are 2,575, 2,565, 2,414, 2,449, 1,226, and 2,472 resumes, respectively[5]. Fig. 2 compares the geographic distribution of our sample with the total number of accounting posts in 58.com. This illustrates that our sample and the total accounting posts are very close. We can therefore regard our sample as geographically representative. We also check the sample balance in Supplement Table S1, which shows that in terms of enterprise size, property rights, and city scale the proportions of samples are almost the same across the categories. For example, the proportion of candidates applying for jobs with small firms (1-49 employees) overall is 36.94%, and is 38.1% for single women, 36.26% for married women without a child, and 34.92%, 39.18%, and 38.34% for those with one, two and three children, respectively. When there is no information, the proportion is 35.48%.

4.2 In-principle test
To identify changes in the callback rate before and after the two policies, we visualize our data in Fig. 3. We find that before the universal two-child policy, the overall callback rate is 17.46%, while after the policy the rate is 13.45%, demonstrating a significant decrease of 4.01 percentage points (p = 0.000). After the universal three-child policy the overall callback rate (excluding married women with three children) decreases from 13.52–7.90%, representing a 5.62 percentage point (p = 0.000) decrease. Thus, the post-policy callback rates of 13.45% and 13.52% validate our experimental design.

Fig. 4 gives the monthly callback rates of the overall sample and each category in each month[6]. In the left panel, before the announcement of the universal two-child policy, the lines for all categories share a very similar trend, while after the policy, women who were married with two children remained at a similar level while the callback rates of the other groups declined. Hence, we find no significant difference between the callback rates for married women with two children before and after the two-child policy (p = 0.968). The right panel displays the fluctuations in callback rates for the overall sample and each group before and after the three-child policy. Married women with two children experienced the most significant change, even though they had not been affected by the two-child policy. As expected, married women with three children received the fewest callbacks and this remained unchanged after the policy was implemented (p = 0.951).

[5] Married women with three children were only included in the second wave experiment (2020-2021), so the number of observations was half that of the other groups.

[6] Note that the Chinese Lunar Festival is generally in February, and thus companies are usually closed for the holiday. Callback rates are therefore typically at their lowest in February.

5. Methodology

We use the DID method to provide a clean estimate of the impact of fertility policy on employment discrimination. We construct the following linear probability model to estimate the causal effect of fertility policy on callback rates.

$$\text{Callback}_i = \beta_0 + \beta_1 \text{Treat} + \beta_2 \text{Post} + \beta_3 \text{Treat} \times \text{Post} + Z_i \delta + \text{FE} + \epsilon_i$$

In the model, Callback$_i$ measures the job-search status, which is represented by whether an interview invitation is received (receiving an invitation = 1, otherwise = 0). We use the marital status of female job hunters to reflect their potential fertility. Those in the treatment group take the value of 1 if they are exposed to the impact of the policy and 0 if not. In the first wave, our control group is married women with two children, as this group is unlikely to be affected by the two-child policy. In the second wave, the control group is married women with three children. Post is a dummy that denotes the time after the policy. Z$_i$ refers to a series of influencing factors including monthly expected salary, number of historical
applicants, company's industrial classification, property rights, and scale. We further control the fixed effects ($FE$) of city, day of week, and resume delivery time, and cluster the standard error ($\varepsilon_i$) at city level.

6. Main Findings

6.1 The fertility policies led to employment discrimination

Figure 5 reports the results of the two waves. The left panel displays the effect of the universal two-child policy overall and for each category. We find that on average, the two-child policy decreased the callback rates by 4.9% ($p = 0.003$). The right panel illustrates the effect of the three-child policy. The policy induced an overall decrease of 5.3% in callback rates ($p = 0.008$). These findings confirm that the fertility policies led to more employment discrimination against women. They also indicate that the three-child policy led to more discrimination than the two-child policy.

6.2 The “cut-off” group suffered more discrimination after the policies

As shown in Fig. 5, callbacks received by single women decreased by 4.3% ($p = 0.024$) after the universal two-child policy. For married women without children or with one child, callbacks decreased by 5.7% ($p = 0.009$) and 5.6% ($p = 0.010$), respectively, and thus we find no significant difference between the two effects ($p = 0.925$). We also find that the three-child policy only affected married women with two children. The sharp decline of 10.4% ($p = 0.000$) in this category may be due to employer expectations that women with two children have a higher likelihood of having a third child. The effects are negative and insignificant for single women, married women without children, and those with one child. By combining these findings, we can conclude that the “cut-off” groups (i.e., married women with one child in the first wave and married women with two in the second wave) suffered more discrimination than other groups.

6.3 Discrimination affects all women, whether they disclose their information or not

Interestingly, Fig. 5 shows that in the first wave, the received callbacks decreased by 4.5% ($p = 0.044$) for women who did not disclose their marriage and fertility information. In terms of the policy effect, this positions them between single women and married women without children or with one child. This implies that to avoid the uncertain fertility status of a female candidate who does not disclose this information, an employer will tend to discriminate statistically against her due to the assumption that she is likely to have a child. This may be why the effect on this category is higher than for single women. In the second wave, the callback rate for women who did not disclose this information decreased by 6.6% ($p = 0.022$), indicating that the three-child policy led to further discrimination against this category. More details of the regression analysis are given in Supplementary Table S2 and Table S3.

7. Further Analysis
7.1 Parallel trends and placebo test

As we use a standard DID implementation, we check whether we meet the assumption of parallel trends. We develop a dynamic model that captures the effects in each month before the policy. Fig. S1 illustrates the dynamic effects over the four months before the policy, and we find these to be insignificant, indicating that the parallel trend assumption is met. The average effects become significant after the policy.

We also conduct a placebo test to address the possibility that our findings are coincidental. We randomly assign the beginning point of the policy to another date, and use this as a false beginning date to run another DID regression. If the coefficient of interest is insignificant, the findings are not due to a coincidence. We repeat this procedure 500 times and illustrate the results in Fig. S2. We find that the mean of the coefficients is close to zero, and most of them are insignificant. Overall, these two tests validate our empirical design.

7.2 Heterogeneity

We further analyze the heterogeneous effects of the fertility policies on different levels of firm scale, company ownership, and city development, and the results are illustrated in Fig. 6. First, in terms of firm size we find that employment discrimination is more prevalent in small businesses. The Report on the Development of Small and Micro Enterprises in China (2014) states that small businesses account for 94.15% of all enterprises in China and provide 150 million positions (State Administration of Market Supervision of China, 2014). Our findings therefore imply that women were discriminated against after the fertility policies were implemented. Second, in terms of ownership, we find that from the first wave to the second wave, discrimination in state-owned companies increased significantly. We also find that discrimination in private companies significantly increased after the three-child policy. No change is identified in foreign companies. Third, we find that the effect of the two-child policy was significant in first-tier cities while the three-child policy had a significant effect in second-tier and third-tier cities. In China, only 80 million people live in first-tier cities while more than 900 million live in second and third-tier cities. This implies that more women were discriminated against after the implementation of the three-child policy. Further details of the regression results are given in Table S4 and Table S5.

8. Concluding Remarks

Governments worldwide have in recent years made great strides in providing women with equal rights in the labor market through policies such as increasing levels of education, but employers’ concerns about women’s fertility are still cited as the main reason for their relatively disadvantaged position. Our large-scale correspondence experiment using 13,751 accounting posts indicates that discrimination against women of fertile age, motivated by the potential that they will have children, is prevalent in the Chinese labor market. In every fertility policy, the “cutoff” group suffers more discrimination than those in other categories. In addition, even women who do not disclose their marriage and fertility status may still suffer from discrimination. Our study also highlights the pattern of discrimination across different firm sizes,
ownership types, and city scales. This implies that employment discrimination against women was aggravated and extended after the fertility restrictions were put in place.

Our findings have implications for public policy. First, the coverage and level of social safeguards must be improved. Only when a system that ensures the fertility security of female workers is effectively implemented can women give birth without worrying about the negative effects on work. Second, the government should implement policies involving incentives for businesses. Any fertility security system should consider the interests of women, employers, and others in society. This can both help eliminate fertility discrimination and also encourage childbearing, thus addressing the issue of a low fertility rate. For example, tax incentives can be implemented according to the proportion of female employees and fertility in businesses, thus reducing their fertility costs. However, no policies encouraging businesses to employ women workers through tax reduction and exemption have been implemented. The government can also increase the supply of childcare services and provide allowances to grandparents to take care of grandchildren, thus reducing the pressure on parents to care for young children. The family responsibility of caring for children under 3 years old is an important factor for businesses and may encourage them to discriminate against women. Recent figures suggest that only 4.1% of children under 3 were cared for in professional institutions in 2016, and nearly one-third of full-time mothers were on maternity leave from work due to their childcare responsibilities. More than three-quarters said they would return to employment if they had help looking after their children (National Working Committee on Children and Women under the State Council of China, 2017).

Our study has some limitations that suggest further useful research directions. First, fertility discrimination is reflected in all stages of employment, but we were only able to investigate discrimination at the resume delivery stage. Examining discrimination at the interview, job assignment, and promotion stages would be worthwhile. Second, examining whether the levels of higher education or work experience have strong substitution effects for marital and childbearing status, or if they even reduce fertility discrimination, would be meaningful in future studies. Finally, as the preference in China is for a male child, the gender of children may affect the potential fertility rate (Jiang et al., 2015). Whether gender also influences the decision of employers is a question that requires further exploration.

** Declarations**

**Code availability**

The code that supports the findings of this study is available from the corresponding author upon reasonable request.

**Data availability**

The data that support the findings of this study are available from the corresponding author upon reasonable request.
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Competing interests

Authors declare that they have no competing interests.

Additional information

Correspondence and requests for materials should be addressed to L.Y. or J.Y. All data, code, and materials used in the analysis are available upon request. We agree with the condition that all data, code, and materials will be totally open to anyone for replication and further study if the manuscript has been fully accepted.

References


**Figures**
Figure 1

Timeline of China’s Family Panning Policy

- 1979 One-child policy for ethnic Han majority population.
- 1984 Allowing a second child for some families in specified circumstances.
- Oct. 15, 2013 Allowing two children for families in which one parent was an only child from Jan. 1, 2014.
- Oct. 29, 2015 Allowing all couples to have two children from Jan. 1, 2016.
- May 31, 2021 Allowing all couples to have three children.

Figure 2

Geographic distribution of accounting job posts in China. **a**, Distribution of geotagged accounting posts applied for using our fictitious resumes. **b**, Distribution of all geotagged accounting jobs. The city-specific accounting post density ranges from 0 to 1,733 and is indicated by the color scale.
Figure 3

The callback rate before and after the two fertility policies. Mean differences in callback rate (%) before and after the two-child and three-child policies. The p-values reported in the inset table are derived from the t-tests of differences in the means.

Figure 4
Callback rates in each month. The colored lines show the monthly trend of overall callback rates and callback rates for each type of candidate. The vertical dotted lines indicate the announcement times of the new fertility policies. \textbf{a}, The callback rates in each month before and after the universal two-child policy (January 2015-December 2016). \textbf{b}, The callback rates in each month before and after the universal three-child policy (June 2020-September 2021).

\begin{figure}
\centering
\includegraphics[width=\textwidth]{figure5.png}
\caption{The impact of fertility policy change on employment discrimination. \textbf{a}, The impact of the two-child policy on callback rates. \textbf{b}, The impact of the three-child policy on callback rates. *p < 0.1, **p < 0.05, ***p < 0.01. The supporting regression results of these graphs are presented in Supplementary Table S2 and Table S3.}
\end{figure}
Figure 6

The heterogeneous effect of fertility policy on callback among different levels of firm scale, company ownership, and city development. 

a, The impact of the two-child policy on callback rates. 

b, The impact of the three-child policy on callback rates. 

*p < 0.1, **p < 0.05, and ***p < 0.01. The supporting regression results of these graphs are presented in Supplementary Table S4 and Table S5.
Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- SupplementaryMaterials.docx