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Gender Discrimination in Hiring*: Evidence from 19,130 Resumes in China

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Gender Discrimination in Hiring*: Evidence from 19,130 Resumes in China

ABSTRACT

We study gender discrimination in hiring markets by sending 19,130 fictitious matched resumes in response to professional employment advertisements posted on major Internet employment boards in China for positions such as engineers, accountants, secretaries, and marketing professionals in Beijing, Shanghai, Guangzhou, Shenzhen, Wuhan, and Chengdu. Our results show that, in general, state-owned firms tend to prefer male applicants. Foreign and private firms tend to prefer female applicants. On one hand, this evidence supports the hypothesis that economic reform and the market economy may mitigate gender discrimination. On the other hand, this evidence is consistent with statistics that describe discrimination based on gender segregation and information asymmetry that originated with higher ratios of female workers in foreign and private firms. With respect to regional income disparity, we find that the differences in gender discrimination between first- and second-tier cities are not significant. This result indicates that economic reform exerts limited mitigation effect on discrimination. We also find no evidence of taste discrimination based on traditional *son preference* in China.

JEL: J71, O12

Key Words: Discrimination, Audit Study, Gender, Employment

1. Introduction

For more than 40 years, social scientists in over 10 countries have conducted carefully controlled field experiments to measure discrimination in the market place and to discover evidence of discrimination based on race, gender, age, and so on. In their research, Riach and Rich (2002) present an excellent survey of these studies. In a number of studies on gender discrimination, authors send fictitious matched resumes in response to employment advertisements with controlled genders based on the methodology employed by Bertrand and Mullainathan (2004) (Riach and Rich, 1987; Neumark et al., 1996; Riach and Rich 2006).

Although many examples of this type of *audit study* have been conducted, Gneezy, List, and Price (2012) note, “While empirical studies have served to provide an empirical foundation measuring the extent of discrimination in the marketplace, they have been less helpful in distinguishing the nature of discrimination.”(p.1)

This study attempts to shed new light on the literature. It tests the nature of gender discrimination by the use of an audit study conducted in the context of the unique social and economic background of China. The contributions of this research are twofold:

Our paper enriches the literature by the provision of new evidence on the effects of economic reform on gender wage inequality. Previous studies have considered two contradictory powers released by economic reform. On one hand, the collapse of the planning economy enables managers to abandon egalitarianism and set employees’ wages and salaries based on productivity. This practice may widen the gender wage differential because it is less concerned with gender. On the other hand, according to the logic expressed by Becker (1971), economic reform might stimulate competition in the product and factor markets and lead to the punishment of those firms that practice discrimination. According to this logic, economic reform would mitigate the gender wage differential. In reality, evidence collected from China and Eastern European countries shows mixed results. No consensus has been reached with respect to the direction of discrimination’s effects on gender wages based on economic reform (Maurer-Fazio, et al., 1999; Gustafsson and Li, 2000; Liu et al., 2000; Brainerd, 2000; Orazem and Vodopivec, 2000; Hunt, 2002; Jolliffe and Nauro, 2004; Jolliffe and Campos, 2005; Ng, 2007).

As its initial endeavor, our study attempts to untangle this issue by the use of an audit study to evaluate the potential gender discrimination in the Chinese hiring market. In reality, the Chinese labor market has a great deal of heterogeneity, which makes it an excellent test ground. First, China has enormous regional income disparities. In addition to the rural and urban gaps in the economy, a large

disparity exists between first- and second-tier cities. Because of this, we could test whether more developed cities display less gender discrimination by the use of statistical comparisons of callbacks collected in first- and second-tier cities. Second, privatization continues to occur in China. Because the market contains many types of firms, we could test whether more market-oriented private and foreign firms display less gender discrimination than state-owned firms by the use of a statistical comparison of callbacks collected from state-owned, private, and foreign firms in the Chinese hiring market. Finally, in contrast to a study on the gender-based wages of manufacturing workers, our audit study could focus on the hiring market for middle and upper white-collar professionals. In fact, with respect to these professionals, the opportunity inequality based on gender in the hiring process is much more vital than the gender wage differential.

As its second endeavor, our study attempts to provide new insight into major theoretical hypotheses (i.e., taste versus statistical discrimination) based on the unique social and cultural background of modern China. On one hand, the Chinese economy has become increasingly privatized since the market reform that occurred during the 1980s. In addition, the mass entry of private and foreign firms into the market has also exerted strong impacts. In 1980, at the beginning of the market reform, all firms were state-owned. In 2003, the value contributed to the market from private firms accounted for 59.2% of the GDP (OECD, 2005, p.125). It is notable that gender ratios vary among different types of firms. According to the first Investment Climate Survey conducted by the World Bank¹, the ratio of female workers to male workers are 44%, 45% and 50%, respectively, for state-owned, domestic private, and foreign firms in the manufacturing industry. In addition, the official statistics in the *Chinese Labor Statistic Yearbook* show that the female to male ratio is 31.1% in state-owned firms and 38.2% in foreign and private firms². Therefore, we could use these two groups of data as benchmarks to test whether gender preferences would align with gender ratios in three types of firms. On the other hand, it is notable that China has suffered from severe gender imbalance for many years. The gender ratio is 106.74 in 2000, based on the fifth census. This ratio changed to 105.2 in 2010, based on the sixth census. More importantly, the gender ratios vary greatly among different regions. We postulate that the gender ratios at birth among different regions might be based on the heterogeneous Chinese *son preference*. Our paper relies on gender ratios at birth for six cities during

¹ The first Investment Climate Survey was performed in China by the World Bank between 1998 and 2000. The survey included 1,500 firms located in five cities: Beijing, Tianjin, Shanghai, Guangzhou and Chengdu.

² These numbers refers to all firms with the exclusion of state-owned and village-township collective firms.

the years 2010 and 2000 as the benchmarks to be tested to discover if a taste discrimination exists (i.e., Will cities with greater *son preference* culture display more discriminative hiring behaviors toward female professionals?).

In the study most relevant to our research, Kuhn and Shen (2011) provide an analysis of gender discriminative employment advertisements posted on the major Internet employment boards in China. Our study is different in that their research consists of an investigation on *apparent* gender discrimination. Our research might be categorized as an inquiry into *hidden* gender discrimination during the hiring process based on an *audit study*. In general, a typical field experiment may suffer due to a lack of sufficient numbers of observations. In our experiment, we send 19,130 resumes in response to employment advertisements found on three major Internet employment boards in China. We receive 1,111 callbacks in six major Chinese cities (i.e., Beijing, Shanghai, Guangzhou, Shenzhen, Wuhan, and Chengdu). It is important to note that, in comparison with traditional gender wage literature and, specifically, with Kuhn and Shen (2011), our audit study more closely approximates the ideal experimental test of gender discrimination. In addition, we examined hidden gender preferences, a significant phenomenon in the hiring market that has not yet been investigated.

First, based on the methodology used by Bertrand and Mullainathan (2004), we select our target occupations based on gender distribution (see, Table 1): secretary (female dominated), software engineer (male dominated), accountant (balanced), and marketing professional (balanced). Each occupation includes high- and low-ranked positions. Second, we fabricate matched resumes for individuals of different genders with identical backgrounds. We send these fictitious resumes in response to employment advertisements for eight positions with various firms posted on three major Internet employment boards in China (e.g., Chinahr, 51job, and Zhaopin). With respect to firm selection, we manage to equalize submission numbers among the various ownerships, sizes, and industries for thousands of firms. We maintain comparability of firms among different cities. Finally, a team of 11 research assistants responds to phone calls and emails, and they record callbacks and firms' relevant information between December 2010 and May 2011.

We find that, based on the callback statistics and regressions, females are generally preferred by hiring markets for professionals in six Chinese cities. In particular, we find that females are preferred for positions as high-ranked software engineers, high-ranked accountants, high- and low-ranked marketing professionals, and high- and low-ranked secretaries. We find that males are preferred for positions as low-ranked accountants. In terms of ownership, we find that, in general, state-owned firms prefer males; private and foreign firms prefer females. With respect to cities with different levels,

we find little variation in gender discrimination between first-tier and second-tier cities.

The aforementioned results support our hypothesis that economic reform would mitigate gender discrimination. In other words, the firms (especially private and foreign firms) would select employees primarily based on productivity. However, we find that gender preferences are almost homogenous between first-tier and second-tier cities. This finding does not confirm the mitigation effect of economic reform.

Our empirical findings actually support the hypothesis that statistical discrimination based on sex segregation and information asymmetry (i.e., foreign and private firms with higher female to male ratios) would provide more opportunities for female applicants.

Our study illustrates that gender preferences have no relationship to gender ratios at birth in six Chinese cities. We find no evidence of taste discrimination based on the traditional Chinese *son preference*.

We find that some unique circumstances exist in China that may affect gender preferences in various firms: (a) State-owned firms that share many of the same characteristics of governmental bureaus may prefer male applicants because males may be more compatible with male leaders. (b) Foreign firms may import gender balance concepts to China because foreign firms have been constrained by anti-discrimination laws in their home countries for many years. (c) Firms that offer marketing positions tend to prefer female applicants because it is believed that female applicants possess better social skills than male applicants. We find that this preference for female applicants is especially significant for short-lived and poorly managed private firms.

The remainder of the paper is structured as follows. Section 2 outlines the detailed experimental design. Section 3 provides descriptive statistics. Section 4 presents the basic empirical results and our analysis. Section 5 checks for robustness. Section 6 presents our conclusions and discusses suggestions for future research.

2. Experimental Design

The primary goal of the experimental design is the submission of gender-matched resumes to target employment positions posted by target firms in predetermined cities and the recording of basic information and any possible feedback. The basic design includes four steps: resume design, firm selection, resume submission, and response recording.

2.1 Selection of Occupations

In Table 1, we provide an illustration of the ratio of females to males that work in the four selected professions. We divide the selected occupations into four categories and eight positions. We define *secretary* as a female-dominated profession (the female-to-male ratio is 72%). We define *software engineer* as a male-dominated profession (the female-to-male ratio is 31%). We define *accountant* and *marketing professional* as balanced professions (the female-to-male ratios are 38% and 41%, respectively). We divide each profession into low- and high-ranked categories. Professionals that work in positions considered high-ranked have better comprehensive ability, longer work experience, and higher wages. In addition to the gender ratios, we include some other considerations during our selection of occupations: (a) We choose four very common occupations. Demanding firms are widely distributed across various industries, regions, and ownerships. (b) The occupations have significant rankings systems. (c) The employment applications do not involve special requirements for education or family background.

Once we set the target occupations, we use the database found on www.51job.com to acquire wage data for each of six cities and for each of the eight positions (see, Table 2).

2.2 Resume Design

First, we perform an extensive search for resumes on Internet employment search websites. We use these sample resumes to develop a series of resume models. Although the resumes found on these websites are not representative of the average applicant in society, the accumulated resume content provides useful proxies for our research. To differentiate ranks, we design a high quality curriculum vitae (hereafter, CV) that included two years of junior work experience and three years of managerial work experience with a medium-sized private company. We design the lower quality CV to include two years of junior work experience with a similar medium-sized private company. We attempt to maintain all resumes at a normal level by the avoidance of any possibility of over-qualification or under-qualification for these employment positions.

Second, we perform an extensive search for most common first and last names for male and female citizens on the website of the Department of Security of China. We randomly combine these names and use them as the names on the resumes. These names could be easily recognized as male or female applicants. It is important to note that we attempt to match the education, working experience, techniques, and other aspects of these two fabricated individuals to create *twin* resumes that contain

different names and genders but are otherwise identical. To overcome systematic errors, we randomly choose male and female names to form matching pairs. We send these pairs in response to employment advertisements posted on three major Internet employment boards in China. The age of the individuals for low quality resumes is 25; the age of the individuals for the high quality resumes is 28. We invite senior human resources (HR) managers from each profession to review the completed resumes to ensure their appropriateness.

Finally, because it is possible that applicants from other regions will face discrimination, we purposely manipulate our submissions so that applicants and their target firms are located in the same cities.

2.3 Firm Selection by City, Ownership, and Size

The great economic heterogeneity among various regions in China can significantly affect gender discrimination in hiring. Therefore, we select six cities as our targets. These cities include Beijing, Shanghai, Guangzhou, Shenzhen, Wuhan, and Chengdu. We base our selection criteria on the 2010 per capita GDP for each of the six cities and on the gender ratio at birth in 2010 and 2000 (see, Table 3). According to the per capita GDP for each of the six cities, Beijing, Shanghai, Guangzhou, and Shenzhen are considered as first-tier cities; Wuhan and Chengdu are considered as second-tier cities. It is notable that gender ratios at birth are significantly different for each city. In general, the gender ratios at birth for Wuhan and Guangzhou are significantly higher than those in Beijing, Shanghai, Shenzhen, and Chengdu are.

We postulate that gender preferences might be heterogeneous among firms with different ownership structures. We divide the target firms into state-owned, foreign, and privately owned firms³.

We postulate that gender preferences might be heterogeneous among firms of different sizes. We divided firms by size into three categories based on the standards posted on employment board websites: large firms (more than 500 employees), medium firms (150-500 employees), and small firms (less than 150 employees).

2.4 Submission of Employment Applications

We choose three major Internet employment boards as our platform for the submission of resumes (51job (www.51job.com), Chinahr (www.chinahr.com), and Zhaopin (www.zhaopin.com)). Although

³ In our study, we consider joint-venture firms to be foreign firms.

these websites are unable to provide employment opportunities for every position for each of the six cities, the boards are very inclusive and broadly constructed with respect to volume and coverage⁴.

The submission process began in December 2010. The recording process ended in May 2011. During that six-month period, research assistants submitted 19,130 resumes in response to employment advertisements for eight positions. We randomize the possibility that each position might receive a particular resume by 50-50. We also ensure that each pair of resumes would be received for the same position at the same firm in approximately one day. We try to avoid employment advertisements that required interviews prior to callbacks. In the final count, the total submission amount to 19,130 resumes. We receive 1,111 callbacks in response to our submissions.

2.5 Recording of Callbacks

We create 16 cell phone accounts and 16 email accounts for the collection of possible callbacks. When research assistants receive phone calls or emails from target firms, they politely refuse immediate interviews. They declare they have received other offers. The assistants will then record relevant information about applicants and firms. We discuss these results in detail in the next section.

3. Descriptive Statistics

3.1 Application Distribution

In Table 4, we provide a summary of our submission of 19,130 resumes to a number of positions in each of the six cities. Three types of firms are evenly distributed across firms of different sizes. The total for each type of firm in each size amounts to approximately 2,000.

With respect to different cities, we send slightly more resumes to firms in Beijing. These resumes account for approximately 21.9% of our total submissions. The other submissions are evenly distributed among the remaining five cities. With respect to ownership, and based on firm distribution on three job board websites, we submit the majority of resumes to private firms. We submit the second highest number of resumes to foreign firms. State-owned firms receive the lowest number of resumes

⁴ China HR has over 24 million registered job seekers, 19.4 million resumes, and more than 3.17 million valid jobs. 51job.com has the most registered members (over 53 million), the largest resume database (44 million), and the highest peak traffic (over 180 million average daily page views) among similar platforms. On average, there are over 2.1 million employment advertisements posted online. Approximately 22 million applications are delivered by 51job.com to potential employers every week. Zhaopin.com has provided professional HR services to over 190,000 organizations in various industries since its founding. It maintains more than 3,000,000 employment advertisements.

because more private and foreign firms post positions on the websites. However, we are able to achieve almost even distribution of the submission of resumes to three types of firms in each city. In addition, we maintain even distribution of submission of resumes to firms of different sizes and across high- and low-ranked occupations

With respect to gender distribution, we evenly distribute the submission of resumes across different cities, firms of different sizes, firms with different ownerships, and different professions.

3.2 Callback Distribution (Table 5)

In general, Wuhan has the highest callback rate (6.14%). Beijing, Chengdu, Shanghai, Guangzhou, and Shenzhen receive callbacks in that order. Notably, only Beijing and Wuhan achieve callback rates over 6%. If we consider that our resumes are of similar quality to other professionals, then these callback rates reveal fierce competition among middle and upper white-collar workers in the hiring markets of big cities in China during the period from 2010 to 2011.

With respect to occupations, applicants for software engineering positions achieve the highest callback rate (11.6%). In other words, every ten resumes submitted for software engineering positions receive at least one response. Marketing positions achieve the second highest callback rate (7.57%). Secretary positions achieve a 4.47% callback rate. Accounting positions achieve a 3.07% callback rate. The callback rate rankings may reveal the *status quo* for various professions. For example, engineers and marketing personnel may be more in demand in comparison to accountants and secretaries based on supply and demand in hiring markets.

With respect to ownership, private firms achieve the highest callback rate (6.38%). Foreign firms achieve the second highest callback rate (5.4%). State-owned firms achieve the lowest callback rate (5.16%). In reality, these numbers parallel the *status quo* of the Chinese talent market. According to statistics posted in Talent Market Information Centers in 116 cities maintained under the guidance of the Chinese Labor and Social Security Department⁵, we find that the demand from state-owned, private, and foreign firms accounted for approximately 2.7%, 25.3%, and 8.6%⁶ of total market demand, respectively.

When we examine the heterogeneity of callback rates among different sized firms, we find that

⁵ http://www.molss.gov.cn/gb/zwxx/2011-02/11/content_391110.htm

⁶ The total number is not 100% in that the statistics have other categories such as village-township enterprises, HK, Macao and Taiwan based companies, joint ventures and so on.

6.22% of the small firms return calls, 5.75% of large firms return calls, and 5.45% of medium firms return calls. These statistics show that small firms appear to be the most demanding firms in hiring markets.

In addition, we find that the callback rate for high-ranked jobs is greater than the callback rate for low-ranked jobs (6.38% as opposed to 5.30%). This may imply that net demand for high-level professionals is much greater.

Finally, we find that the callback rate for females is 6.73%; the callback rate for males is 4.88%. These contrasting figures indicate that female applicants appear to be favored and tend to receive more opportunities for interviews. These results cause us to ask whether this evidence could support the argument that discrimination against male applicants exists in the Chinese hiring market. We will explore this question in the next section.

4. Empirical Results

4.1 Main Results

4.1.1. Gender Preferences of Firms with Different Ownership

In Table 6, Table 7, and Table 8, we provide an illustration of the statistics and test results for callback rates for each of the three types of firms. With respect to software engineering positions, our results show that limited gender preferences exist in foreign and private firms. However, it appears that private firms tend to discriminate against male applicants for high-ranked engineering positions. Based on the data shown in Table 2, we observe that the wages of engineers in state-owned and foreign firms are much higher than the wages of engineers in private firms. Therefore, it may be possible that talented male engineers will not choose to work for private firms because of lower wages. The female engineers do not have more advantages than the male counterparts do. Considering the family responsibility, they would rather choose private firms and stay for a longer period. It is possible that HR managers in private firms will have detected this trend. Thus, HR managers might prefer to hire female applicant for high-ranked engineering positions.

With respect to accounting positions, we find that foreign and state-owned firms tend to prefer male applicants for low-ranked accounting positions. However, they tend to prefer female applicants for high-ranked accounting positions. In contrast, state-owned firms tend to prefer male applicants for low-ranked accounting positions. They tend to show no gender preferences for high-ranked accounting positions. We could argue that this may have occurred because of the special

characteristics of state-owned firms in China. After 2000, the Chinese government actually permitted officials previously in charge of the economy prior to the reform to become shareholders in partially privatized, state-owned firms (Bian, Davis, and Galaskiewicz, 2005). Fan, Wong, and Zhang (2007) find that almost one-third of CEOs in their sample of 625 Chinese public companies are either current or former government bureaucrats. Because of governmental manipulation and soft budget constraints, the state-owned firms attempt many financial maneuvers⁷. The majority of CEOs in state-owned firms are male. It is possible that male accountants more easily follow the directions of CEOs than their female counterparts do. In reality, experimental and surveyed evidence indicates that the female is the fairer sex⁸. Therefore, female accountants might not agree to join with CEOs in the area of financial manipulation. Thus, to some degree, HR managers of state-owned firms may not favor them as employment candidates.

With respect to secretary positions, we find that foreign and private firms favor female applicants for low or high rank positions. While the state-owned firms show no gender preference for female as high rank secretaries. This finding may have occurred because (a) the duties of high-ranked secretaries do not include day-to-day administrative tasks. High rank secretaries may participate in decision-making processes. This can lend significance to their managerial abilities except for carefulness and flexibility. (b) As mentioned above, Chinese state-owned firms are semi-government bureau organizations. Although they seek profits, state-owned firms have their own unique power and ranking systems. They also have variations of governmental cultures. In general, high-ranked secretaries are the individuals closest to CEOs. High-ranked secretaries must belong to CEOs' *clans*. Therefore, it is possible that male high-ranked secretaries would be more willing to fulfill these roles in state-owned firms than their female counterparts would.

With respect to marketing positions, foreign and state-owned firms tend to prefer female applicants for low-ranked marketing positions. However, these firms tend to show no gender preferences for high-ranked marketing positions. Private firms tend to prefer female applicants for

⁷ According to statistics released by the Beijing Disciplinary Bureau (Jiwei), for the years 2007 to 2011, total corruption cases amounted to 706. Of those 706 cases, 624 cases involved state-own enterprises or companies with dominant state shares. The state sector is at high risk with respect to corruption in the economy. (Source: the website of the People's Magazine published by *the People's Daily* <http://www.rmlt.com.cn/qikan/2012-05-25/42634.html>).

⁸ Dollar, Fisman, and Gatti (2001) state that:

Women are more likely to exhibit "helping" behavior (Eagly and Crowley, 1986); vote based on social issues (Goertzel, 1983); score more highly on "integrity tests" (Ones and Viswesvaran, 1998); take stronger stances on ethical behavior (Glover et al., 1997; Reiss and Mitra, 1998); and behave more generously when faced with economic decisions (Eckel and Grossman, 1998). (p. 423)

marketing positions of both high and low ranks. We could argue that high-ranked marketing positions in state-owned and foreign firms tend to focus on strategies of market design and promotion; they require no special considerations of gender. Alternatively, low-ranked marketing positions tend to focus on sales and public relations; these positions may require female employees' social and communication abilities. Because, in most cases, private firms are poorly managed⁹, private firms may recruit female applicants for promotion and sales positions that could be considered either high- or low-ranked marketing positions.

Bian, Davis and Galaskiewicz (2005) state:

“By the late 1990s these transformations (economic reform) had created an expanded managerial class consisting of three strategic players in any business enterprise: (1) general managers, who assume the overall managerial authority and decision-making power of an enterprise; (2) accountants, who manage enterprises' budgets and exercise the power of manipulating accounting books in order to safeguard against any inside or outside uncertainties of a transitional economy; and (3) sales and marketing managers, who explore and secure business opportunities for the enterprises....Sociologically, therefore, these three business players both share a managerial class interest and tend to form a clique of trust and social protection to safeguard their positions.”(p. 1451)

Our previously mentioned results could be considered a restatement and extension of the argument proposed by Bian, Davis, and Galaskiewicz (2005). Foreign and private firms display gender preferences for female applicants for positions in the occupations of high-ranked accountants and high-ranked secretaries; state-owned firms show no gender preferences in these positions. It may be possible that general managers, high-ranked accountants, and high-ranked secretaries in state-owned firms form cliques of trust and social protection to safeguard their positions. It is important to note that we believe the members of these cliques are mostly male.

⁹In 2005, *the Report on Development of Chinese Private Firms* issued by the Chinese National Industrial and Commercial Association stated: “150,000 firms emerge annually in China, 100,000 firms die annually, 60% of private firms go bankrupt during 5 year period, 85% die during 10 year period. The average age of Chinese private firms is approximately 2.9 years.”

4.1.2. Gender Preferences by Occupation

In Table 9, we provide an illustration of the callback results for different occupations. With respect to software engineers, the total callback rate is 11.6%. The callback rate for low-ranked engineers is significantly lower than the callback rate for high-ranked engineers. The net discrimination rate for males is 9.6%. The discrimination rate for males for low-ranked engineers is not significant. The discrimination rate for high-ranked engineers is significant at a 1% level.

In reality, based on our review of audit study literature, we find that research conducted on gender preferences in the software industry has been far from conclusive. Riach and Rich (1987) examined Australian data for the city of Melbourne to reveal discrimination against females in high-level software engineering positions (computer analyst/programmers). They find a certain degree of discrimination against males in low-ranked software engineering positions (computer programmer). Riach and Rich (2006) examined experimental evidence collected in London. They find significant discrimination against males in high-ranked software engineering positions (computer analyst/programmers).

Evidence collected in China reveals that male applicants face discrimination in the hiring market at level similar to discrimination found in the UK evidence. The reasons for this might include (a) Software engineers perform time-consuming and exhausting programming jobs. Biologically, males may possess weaker endurance ability. Males may move to other jobs, assume management positions, or become entrepreneurs prior to their positions as high rank software engineers. Thus, equally-qualified female applicants might receive more callbacks. (b) Females are very scarce in the field of high level engineering. If an equally-qualified female applicant were to compete with a male applicant, it may signal that this woman possesses hidden talent or that she possesses better programming abilities not displayed in her resume. (c) Males overwhelmingly outnumber females in the engineering world. If we consider gender balance and harmony, HR managers might possibly prefer equally-qualified female applicants. In reality, a gender-balanced work environment might easily create an atmosphere where employees might develop affections for one another. McKinnish (2007) provides evidence that supports the hypothesis that work environments that include mixed genders might lower costs for partner searches. This might also increase the possibility of divorce. In other words, McKinnish employed data found in the 1990 Census and the NLSY79 to reveal a positive correlation between the opposite gender ratio of the work environment and the possibility of divorce.

With respect to accounting positions, the callback ratio for low-ranked accountants is higher than the callback ratio for high-ranked accounting positions. We find that females faced significant

discrimination for low-ranked accounting positions. However, we find that males faced significant discrimination for high-ranked accounting positions. We observed that these results are significantly different from the results obtained by similar studies conducted in other countries. Riach and Rich (1987) find that HR managers preferred to hire males for high-ranked accounting (management accounting) positions. Riach and Rich (2006) revealed that HR managers preferred to hire female applicants for low-ranked accounting (trainee accounting) positions.

We might argue that preferences for male applicants in the low-ranked accounting market occur because (a) accountants tend to work extra shifts. Pregnant women would have to forfeit many working hours. (b) Low-ranked accountancy is a female-intensive position. The hiring of additional female workers might lead to another gender-imbalanced work environment. In comparison to low-ranked accountants, HR managers prefer high-ranked female accountants because they possess many advantages: They offer a low probability of pregnancy because of the Chinese *one child* policy. They are more reliable and careful in financial positions than their male counterparts. In addition, the majority of male high school graduates in China choose science and engineering majors upon completion of college entrance examinations. Therefore, HR managers may find it difficult to acquire talented male accountants. However, it is easy to find talented females for high-ranked accounting positions. Thus, female applicants for high-ranked accounting positions have more opportunities for callbacks.

With respect to marketing positions, we find that the callback rate for low-ranked marketing positions is lower than the callback rate for high-ranked marketing positions. Females are preferred for both low- and high-ranked marketing positions. We find this preference to be even more significant for low-ranked marketing positions. We might argue that, in general, females possess better social abilities than males. Low ranked marketing positions in China tend to involve promotion and sales. Thus, HR managers may believe female employees are comparatively more capable in social networking and public relations activities than male employees are. We observe that this finding for the Chinese market differs from the results found in other studies. In France, Albert et al., (2008) discover that the callback gaps between male and female sales representatives (low-ranked marketing positions), or marketing technicians (high-ranked marketing positions) are not significant. In an Australian study, Booth and Leigh (2010) find that gender differences for callbacks are not significant for sales positions.

Our findings show that females are preferred for both ranks of secretaries. These results are consistent with the empirical results discovered by Riach and Rich (2006). It is apparent that gender

stereotyping is widespread in both eastern and western cultures. Female secretaries tend to accept positions inferior to their superiors. They possess qualities of softness, carefulness, flexibility, and persistence. Alternatively, male secretaries may be considered weird. Some may consider secretarial positions for males to be humiliating. Our data reveals that female applicants have three to four times the probability of callbacks for secretarial positions than their male counterparts.

4.1.3 Gender Preferences in Cities

With respect to the six cities studied, it shows that software engineering positions in first-tier cities prefer female applicants at a 5% significance level. Specifically, high-ranked engineering positions prefer female applicants at a 1% significance level. Low-ranked engineering positions show no significant preferences. Firms in second-tier cities demonstrate no significant gender preferences for engineering positions.

We might argue that these results demonstrate that opportunities for entrepreneurship in first-tier cities are more abundant than those in second-tier cities¹⁰. Turnover rates for high-ranked male engineers are very high. Many high-ranked engineers choose to start their own businesses once they have accumulated sufficient work experience and techniques. Therefore, with respect to job security, high-ranked engineering positions prefer more secure female applicants. In contrast, firms in second-tier cities find it more difficult to attract talented engineers. Therefore, firms in second-tier cities might not consider gender during the hiring process.

In both first-tier and second-tier cities, male applicants are preferred for low-ranked accounting positions; female applicants are preferred for high-ranked accounting positions. High-ranked marketing positions show no gender preferences in first-tier cities; low-ranked marketing positions show a preference for female applicants in first-tier cities. In second-tier cities, both high and low-ranked marketing positions appear to discriminate against male applicants. We might argue that this occurs because business conducted in second-tier cities is more dependent on social networking and *Guanxi*. Thus, firms in these cities might be more reliant on women for their better communication and social skills. Finally, we find that female secretaries are popular in both first-tier and second-tier cities.

We summarize the primary statistics by different cities and ownerships in Table 10.

¹⁰ The database from China Venture Source indicated that 3,526 private equity and venture capital firms operated in China as of November 2011. Of those firms, 565 operated in Beijing, 518 operated in Shanghai, 56 operated in Guangzhou, 317 operated in Shenzhen, 45 operated in Wuhan, and 66 operated in Chengdu.

4.2. Regression and Analysis

4.2.1. Main Findings

In general, the results from a full sample regression indicate that female applicants, on average, receive more callbacks than their male counterpart (see, Table 11). In particular, female applicants receive more callbacks from private and foreign firms. These results are fully consistent with results find in previous statistical examinations.

In general, with respect to software engineers, female applicants, on average, are more preferred than their male counterparts. They are especially preferred for high-ranked engineering positions. With respect to accounting positions, high-ranked accounting positions tend to prefer female applicants; low-ranked accounting positions tend to prefer male applicants. When we combine these results, we find that the general preference for accounting positions is for male applicants. In addition, accounting positions in foreign firms tend to prefer women more than accounting positions in state-owned firms. In general, marketing positions tend to prefer female applicants. This is especially notable in low-ranked positions. With respect to secretaries, females are always favored among different ranks, different types of firms, and in different cities.

In general, first- and second-tier cities tend to prefer female applicants. In first-tier cities, private and foreign firms tend to prefer women more than state-owned firms preferred women.

In general, foreign and private firms tend to prefer female applicants (see, Table 12). Foreign firms in Chengdu, Guangzhou, and Shenzhen tend to prefer women more than state-owned firms preferred women. Private firms in Guangzhou tend to prefer women more than state-owned firms preferred women.

4.2.2. Gender Preferences and Imbalanced Gender Ratios

The full sample regression reveals that female applicants in Chengdu, Guangzhou, and Shenzhen receive more callbacks than female applicants in Beijing. However, we find no significant difference among the number of callbacks female applicants received in Shanghai, Wuhan, and Beijing. In 2010, the gender ratios at birth are 109.00, 113.10, 111.89, 107.61, 127.00, and 109.00 in Beijing, Shanghai, Guangzhou, Shenzhen, Wuhan, and Chengdu, respectively. Thus, we can infer that, based on the

information mentioned above, gender ratios at birth in each of the six cities in 2010 have no relationship with gender preferences in the hiring markets of those cities¹¹.

In addition, the subsample regressions by occupation and ownership indicate that, for each occupation or ownership, gender ratios at birth for each of the six cities have no relationship with gender preferences in the hiring market of those cities.

5. Robustness Check

5.1. Firms that Maintain Branches in Different Cities

In some cases, our sample includes the same firms that maintained branches in at least two cities. We treat these firms as samples of different firms. In this section, we single out this data as a subsample to investigate the status of gender discrimination. This provides a unique opportunity to evaluate the potential diversity of gender preferences in various regions. The regression table is available upon request.

We find that, based on our submission of 88 resumes for secretarial positions, the female applicants are significantly discriminated as the low rank secretaries in the state-owned firms in the first tier cities, confirming the evidence in the last section.. Based on our submission of 326 resumes for accounting positions, we find that only two male applicants are called back for high-ranked accounting positions. However, low-ranked accounting positions display no significant gender preferences. Based on our submission of 230 resumes for software engineering positions, we find that the callback difference between males and females is not significant. Based on our submission of 330 resumes for marketing positions, the results show that female applicants are favored for both high and low-ranked marketing positions. In summary, our main results appear to be fairly robust with respect to this subsample.

5.2. The *Twin Cities* Test

The data collected in Guangzhou and Shenzhen could be highlighted as a unique source for our robustness check. Both cities are considered economic engines for the Pearl River delta in China. They share similar geography, income levels, dialects, and cultures. Thus, many firms have built

¹¹ Based on the data provided in Table 3, we find that the gender ratios at birth for each of the six cities in 2000 do not correlate with gender preference in each of the six cities.

branches in both cities. Therefore, we use the sample for these *twin cities* to fix the effect of the cities' development and evaluate the influence of ownership, occupation, and other factors on the gender preferences of various firms.

In reality, our basic findings are fairly consistent with the full sample analysis. For example, state-owned firms tend to favor male applicants and private firms tend to favor female applicants, etc. The regression table is available upon request.

Based on *twin cities* data, we find no significant gender discrimination for high-ranked marketing positions. This result demonstrates that high-ranked marketing positions in first-tier cities such as Guangzhou and Shenzhen may be more involved with strategy design and promotions rather than sales and social networking compared to marketing positions in second-tier cities.

6. Conclusion

Based on our evaluation of the evidence collected on eight professional positions in six cities in China, we conclude that female applicants are generally preferred in hiring markets for middle and upper white-collar professions. This overall finding is not consistent with the findings of studies conducted in other countries (Riach and Rich, 1987; Neumark et al., 1996; Riach and Rich 2006). We might argue that this difference may relate to the higher status of urban women in China than the status of urban women in other countries. Based on statistics collected by OECD released by *The Economist*, the overall female labor participation rate in China is approximately 70%. This rate greatly surpasses the labor participation rates in OECD countries.

With respect to ownership of firms, in general, we find that state-owned firms tend to prefer male applicants; private and foreign firms tend to prefer female applicants. We believe the reasons for this difference are as follows:

First, based on data collected from the manufacturing industry above mentioned in the first section, foreign firms have the highest female-to-male ratios. The second highest ratios occur in private firms. State-owned firms have the lowest female-to-male ratios. If this trend is applied to other industries, our findings on the ownership issue actually support statistical discrimination due to sex segregation and information asymmetry (i.e., the type of firms with higher female-to male-ratios would provide more opportunities for female applicants).

Second, our findings support the mitigation effect of economic reform on gender discrimination with respect to ownership (i.e., the economic transition would enlarge the market's power to outweigh the egalitarianism that pre-exists in the planning economy). Firms would choose employees

increasingly based on their productivity. Further, this trend is more significant for private and foreign firms because they are less affected by the traditional mentality. They tend to cater to market demand. In contrast, state-owned firms can be hampered by traditional ideology in the planning economy. This may lead to their preference for male employees.

Last, some unique characteristics of China may affect gender preferences in different types of firms: (a) State-owned firms may behave like quasi-governmental bureaus. They may prefer that male applicants form cliques to maintain security and common interests. (b) Foreign firms may bring gender-balanced concepts to China because foreign firms have been regulated by anti-discrimination laws in their home countries for many years. (c) Marketing positions tend to prefer female applicants because of their good communication and social skills. This preference is especially significant for short-lived private firms.

With respect to different cities, differences in gender preferences among firms in first- and second-tier cities are generally not significant. The mitigation effect of economic reform on gender discrimination does not appear to be supported at the city level. Our results show that high-ranked marketing positions in second-tier cities tend to prefer female applicants because their businesses rely on social networking and *Guanxi*. In addition, male applicants face discrimination for high-ranked software engineering positions in first-tier cities due to higher turnover rates for male engineers in these cities.

7. Discussion and Suggestions for Future Research

Heckman and Siegel (1993, 1998) discuss the limitations of the methodology employed in audit studies in detail. They emphasized: (a) It is difficult to control all factors that affect the productivity of the applicants. If an experiment were to neglect some unobservable factors that affect productivity, it might bias the discrimination estimates. (b) If these factors were to exert some nonlinear effect on callback possibilities, then the insistence on a linear assumption might bias the discrimination estimates.

In a new working paper, Neumark (2010) attempts to accommodate the variance of unobservable factors into the traditional audit study to overcome the second problem raised by Heckman and Siegel (1993, 1998). Neumark suggests the concept of “second-moment” statistical discrimination.

Our paper attempts to accommodate factors that affect productivity as many as possible. We attempt to use the estimator provided by Neumark (2010) to adjust our results. However, Neumark’s method demands rigid requirements for the experiment (i.e., four resumes must be submitted for the

same job position). For example, we should have submitted two pairs of gender matched resumes for the same high-ranked engineering position with the same firm in Beijing. This procedure would have been difficult to achieve because HR managers might easily have detected us. Actually, our research assistants once were asked if they knew the other *person* after HR managers received the matched pair of resumes.

With respect to future research, when we consider Neumark et al. (1996), we can easily contemplate the collection of gender ratio data from HR managers at these firms. However, thousand of firms are born and thousands die every month in China. Internet employment board websites do not provide any information about firms' HR managers. We believe future research might consider the dynamics of gender discrimination over the years to create new theoretical hypotheses on gender discrimination for developing countries such as China.

Table 1 Female-to-Male Ratios for Four Professions

Profession	Low-ranked Position	High-ranked Position	Female-to-Male Ratio
Male dominated	Software Engineer (Programmer)	Senior Software Engineer	31%
Female dominated	Office Assistant Secretary	Senior Office Assistant	72%
Balanced 1	Assistant Accountant	Senior Accountant	38%
Balanced 2	Marketing Specialist	Marketing Manager	41%

Source: The First World Bank Investment Climate Survey.

Notes: This table provides the results of our submission of fictitious resumes in response to employment advertisements posted for four professions in China. It also includes the female-to-male ratios for these professions in China. We define the profession with the 31% female-to-male ratio as male-dominated, the professional with the 72% ratio as female-dominated. We define the professions with 38% and 41% female-to-male ratios as balanced professions.

Table 2 Self-reported and Surveyed Wages by Occupation, City, and Ownership

Software Engineer							Accountant					
Ownership	SOF		FIF		PIF		SOF		FIF		PIF	
Rank	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Beijing	7429	5262	13248	9384	7250	5135	9210	4744	16423	8460	8988	4630
Shanghai	7575	5365	13508	9568	7392	5236	9390	4837	16745	8626	9164	4721
Guangzhou	6992	4953	12468	8832	6824	4833	8668	4465	15457	7962	8459	4357
Shenzhen	7138	5056	12728	9016	6966	4934	8849	4558	15779	8128	8635	4448
Chengdu	5900	4179	10520	7452	5757	4078	7314	3767	13041	6718	7137	3677
Wuhan	7111	3663	12679	6532	6939	3575	6411	3302	11431	5889	6256	3223

Marketing Professional							Secretary					
Ownership	SOF		FIF		PIF		SOF		FIF		PIF	
Rank	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
Beijing	7626	3928	13598	7005	7442	3834	8607	4434	15348	7907	8400	4327
Shanghai	7775	4005	13865	7142	7588	3909	8776	4521	15649	8062	8565	4412
Guangzhou	7177	3697	12798	6593	7004	3608	8101	4173	14446	7441	7906	4072
Shenzhen	7327	3774	13065	6730	7150	3683	8270	4260	14747	7596	8071	4157
Chengdu	6056	3119	10798	5563	5910	3044	6835	3521	12188	6279	6670	3436
Wuhan	5308	2734	9465	4876	5180	2668	5991	3086	10684	5503	5847	3012

Note:

1. Source: Database and firm-level survey collected from www.51job.com. The 51job site provides this database so that employment applicants enrolled in the website can better understand the hiring market.
2. The “SOF” is the state-owned firm; the “FIF” is the foreign invested firm; the “PIF” is the private invested firm.

Table 3 Overview of Cities

	Region	Per capita GDP	Tier	SRB 2010	SRB 2000
Beijing	North	72536	first	109.00	110.56
Shanghai	East	80995	first	113.10	110.64
Guangzhou	South	89082	first	111.89	119.54
Shenzhen	South	92772	first	107.61	132.08
Wuhan	West	51144	second	127.00	127.92
Chengdu	Southwest	35215	second	109.00	106.16

Notes: 1. 2010 Per capita GDP is collected from the 2011 Urban Statistics Year Book.

2. “SRB 2010” denotes gender ratios at birth for six cities in 2010. Data is collected from the Sixth Census and from the websites of local governments.

3. “SRB 2000” denotes gender ratios at birth for six cities in 2000. Data is collected from the Fifth Census.

Table 4 Submissions Summary

	large	medium	small	Total
foreign	2,018	1,980	2,170	6,168
state	1,556	1,268	1,209	4,033
private	2,612	3,005	3,312	8,929
Total	6,186	6,253	6,691	19,130

Table 5 Callback Summary

	No	Yes	callback rate	Total
Beijing	3,933	257	6.13%	4,190
Shanghai	3,404	208	5.76%	3,612
Guangzhou	2,810	170	5.70%	2,980
Shenzhen	3,088	168	5.16%	3,256
Wuhan	2,337	153	6.14%	2,490
Chengdu	2,447	155	5.96%	2,602
accountant	6,258	198	3.07%	6456
marketing	4,215	345	7.57%	4560
engineer	2,546	334	11.60%	2880
sectary	5,000	234	4.47%	5234
foreign	5,835	333	5.40%	6,168
state	3,825	208	5.16%	4,033
private	8,359	570	6.38%	8,929
high	8,452	576	6.38%	9,028
low	9,567	535	5.30%	10,102
large	5,830	356	5.75%	6,186
medium	5,914	339	5.42%	6,253
small	6,275	416	6.22%	6,691
female	8,921	644	6.73%	9,565
male	9,098	467	4.88%	9,565
Total	18,019	1,111	5.81%	19130

Table 6 Gender Preferences of Foreign Firms

	submission	callback	callback rate	male/female	No callback	Usable tests (1)	Equal treatment (2)	male only (3)	female only (4)	Net discrimination against male (4)-(3)/[(4)-(3)]/(1)		Chi2	T test
IT	902	123	13.6%	55/68	718	123	62	24	37	13	10.6%	N.S	N.S
low-ranked IT	418	46	11.0%	20/26	350	46	24	8	14	6	13.0%	N.S	N.S
high-ranked IT	484	77	15.9%	35/42	368	77	38	16	23	7	9.1%	N.S	N.S
accountant	1912	49	2.6%	24/25	1822	49	8	20	21	1	2.0%	N.S	N.S
low-ranked accountant	872	23	2.6%	15/8	830	23	4	13	6	-7	-30.4%	0.05	0.05
high-ranked accountant	1040	26	2.5%	9/17	992	26	4	7	15	8	30.8%	0.05	0.05
marketing professional	1443	106	7.3%	43/63	1494	106	38	24	44	20	18.9%	0.00	0.00
low-ranked marketing	1025	79	7.7%	30/49	1104	79	12	24	43	19	24.1%	0.00	0.00
high-ranked marketing	418	27	6.5%	13/14	390	27	26	0	1	1	3.7%	N.S	N.S
secretary low ranked	1686	55	3.3%	14/41	1586	55	10	9	36	27	49.1%	0.00	0.00
secretary	844	25	3.0%	5/20	802	25	8	1	16	15	60.0%	0.00	0.00
high-ranked secretary	842	30	3.6%	9/21	784	30	2	8	20	12	40.0%	0.00	0.00
total	5943	333	5.6%	136/197	5620	333	118	77	138	61	18.3%	0.00	0.00

Notes: “Usable tests” equals the number of callbacks for each occupation. “Equal treatment” equals the number of callback for both genders. “Male only” equals the number of callback for males only. “Female only” equals the number of callbacks for females only. The last two columns indicate the significance of Chi-square and T tests (i.e., “0.10” Significant at 10%; “0.05” significant at 5%; “0.1” Significant at 1%; “N.S” not significant at 10%; “N.A.” not available).

Table 7 Gender Preferences of State-owned Firms

	submission	callback	callback rate	male/female	Neither callback	Usable tests (1)	Equal treatment (2)	male only (3)	female only (4)	Net discrimination again male (4)-(3)/[(4)-(3)]/(1)		Chi2	T test
IT	549	46	8.4%	25/21	471	46	14	18	14	-4	-8.7%	N.S	N.S
low-ranked IT	319	29	9.1%	15/14	273	29	12	9	8	-1	-3.4%	N.S	N.S
high-ranked IT	230	17	7.4%	10/7	198	17	2	9	6	-3	-17.6%	N.S	N.S
accountant	1464	43	2.9%	29/14	1384	43	6	26	11	-15	-34.9%	0.00	0.00
low-ranked accountant	760	26	3.4%	20/6	710	26	2	19	5	-14	-53.8%	0.00	0.00
high-ranked accountant	704	17	2.4%	9/8	674	17	4	7	6	-1	-5.9%	N.S	N.S
Marketing													
Professional	1066	73	6.8%	33/40	971	73	42	12	19	7	9.6%	N.S	N.S
low-ranked marketing	664	31	4.7%	12/19	602	31	0	12	19	7	22.6%	0.10	0.10
high-ranked marketing	402	42	10.4%	21/21	369	42	42	0	0	0	0.0%	N.A	N.A
secretary	954	46	4.8%	19/27	868	46	6	16	24	8	17.4%	N.S	N.S
low-ranked secretary	576	22	3.8%	8/14	536	22	4	6	12	6	27.3%	0.10	0.10
high-ranked secretary	378	24	6.3%	11/13	332	24	2	10	12	2	8.3%	N.S	N.S
total	4033	208	5.2%	106/102	3694	208	68	72	68	-4	-1.9%	N.S	N.S

Notes: “Usable tests” equal the number of callbacks for each occupation. “Equal treatment” equals the number of callbacks for both genders. “Male only” equals the number of callbacks for males only. “Female only” equals the number of callbacks for females only. The last two columns indicate the significance of Chi-square and T tests (i.e., “0.10” Significant at 10%; “0.05” significant at 5%; “0.1” Significant at 1%; “N.S” not significant at 10%; “N.A.” not available).

Table 8 Gender Preferences of Private Firms

	submission	callback	callback rate	male/female	Neither callback	Usable tests (1)	Equal treatment (2)	male only (3)	female only (4)	Net discrimination again male (4)-(3)/[(4)-(3)]/(1)		Chi2	T test
IT	1429	165	11.5%	71/94	1183	165	84	29	52	23	13.9%	0.10	0.10
low-ranked IT	689	44	6.4%	21/23	615	44	14	14	16	2	4.5%	not sig	not sig
high-ranked IT	740	121	16.4%	50/71	568	121	70	15	36	21	17.4%	0.00	0.00
Accountant	3080	106	3.4%	55/51	2908	106	40	35	31	-4	-3.8%	not sig	not sig
low-ranked accountant	1552	48	3.1%	32/16	1472	48	16	24	8	-16	-33.3%	0.00	0.00
high-ranked accountant	1528	58	3.8%	23/35	1436	58	24	11	23	12	20.7%	0.10	0.10
Marketing													
Professional	1826	166	9.1%	62/104	1574	166	80	22	64	42	25.3%	0.00	0.00
low-ranked marketing	1146	105	9.2%	34/71	960	105	24	22	59	37	35.2%	0.00	0.00
high-ranked marketing	680	61	9.0%	28/33	614	61	56	0	5	5	8.2%	0.05	0.05
Secretary													
low-ranked secretary	2594	133	5.1%	37/96	2346	136	18	28	87	59	44.4%	0.00	0.00
high-ranked secretary	1012	57	5.6%	14/43	908	57	10	9	38	29	50.9%	0.00	0.00
secretary	1582	76	4.8%	23/53	1438	76	8	19	49	30	39.5%	0.00	0.00
Total	8929	570	6.4%	225/345	8011	570	222	114	234	120	21.1%	0.00	0.00

Notes: “Usable tests” equal the number of callbacks received for each occupation. “Equal treatment” equals the number of callbacks received by both genders. “Male only” is the number of callbacks received by males only. “Female only” equals the number of callbacks received by females only. The last two columns indicate the significance of Chi-square and T tests (i.e., “0.10” Significant at 10%; “0.05” Significant at 5%; “0.1” Significant at 1%; “N.S” Not Significant at 10%; “N.A.” Not Available.

Table 9 Gender Preferences of Different Occupations

	submission	callback	callback rate	male/female	Neither callback	Usable tests (1)	Equal treatment (2)	male only (3)	female only (4)	Net discrimination again male		Chi2 Test	T Test
										(4)-(3)	[(4)-(3)]/(1)		
IT	2880	334	11.6%	151/183	2372	334	160	71	103	32	9.6%	0.00	0.00
low ranked IT	1426	119	8.3%	56/63	1238	119	50	31	38	7	5.9%	N.S	N.S
high-ranked IT	1454	215	14.8%	95/120	1134	215	110	40	65	25	11.6%	0.00	0.00
Accountant	6456	198	3.1%	108/90	6114	198	54	81	63	-18	-9.1%	0.05	0.05
low-ranked accountant	3184	97	3.0%	67/30	3012	97	22	56	19	-37	-38.1%	0.00	0.00
high-ranked accountant	3272	101	3.1%	41/60	3102	101	32	25	44	19	18.8%	0.00	0.00
Marketing													
Professional	4560	345	7.6%	138/207	4030	345	160	58	127	69	20.0%	0.00	0.00
low-ranked marketing	3060	215	7.0%	76/139	2666	215	36	58	121	63	29.3%	0.00	0.00
high-ranked marketing	1500	130	8.7%	62/68	1364	130	124	0	6	6	4.6%	0.01	0.01
Secretary													
low-ranked secretary	5234	234	4.5%	70/164	4800	234	34	53	147	94	40.2%	0.00	0.00
high-ranked secretary	2432	104	4.3%	27/77	2246	104	22	16	66	50	48.1%	0.00	0.00
secretary	2802	130	4.6%	43/87	2554	130	12	37	81	44	33.8%	0.00	0.00
Total	19130	1111	5.8%	467/644	17316	1111	408	263	440	177	15.9%	0.00	0.00

Notes: “Usable tests” equal the number of callbacks received by each occupation. “Equal treatment” equals the number of callbacks received by both genders. “Male only” is the number of callbacks received by males only. “Female only” equals the number of callbacks received by females only. The last two columns indicate the significance of Chi-square and T tests (i.e., “0.10” Significant at 10%; “0.05” Significant at 5%; “0.1” Significant at 1%; “N.S” Not Significant at 10%; “N.A.” Not Available.

Table 10 Summary of Gender Preferences

	Engineer	Accountant	Marketing Professional	Secretary	All
all	female	male	female	female	female
low-ranked	not sig	male	female	female	
high-ranked	female	female	female	female	
foreign	not sig	not sig	female	female	female
low-ranked	not sig	male	female	female	
high-ranked	not sig	female	not sig	female	
state	not sig	male	not sig	not sig	not sig
low-ranked	not sig	male	female	female	
high-ranked	not sig	not sig	none	not sig	
private	female	not sig	female	female	female
low-ranked	not sig	male	female	female	
high-ranked	female	female	female	female	
tier1	female	male	female	female	female
low-ranked	not sig	male	female	female	
high-ranked	female	female	none	female	
tier2	not sig	not sig	female	female	female
low-ranked	not sig	male	female	female	
high-ranked	not sig	female	female	female	

Note: The “female” or “male” in the cells stands for the preference for a certain gender.

The “not sig” indicates the results are not significant at the 5% level.

The “none” indicates both the male and female applicants get the callbacks.

Table 11 Full Regression

	(1)	(2)	(3)	(4)
	Model1	Model2	Model3	Model4
female	0.161* (0.09)	-0.0300 (0.11)	0.0640 (0.10)	-0.106 (0.11)
Shanghai	-0.0280 (0.05)	-0.0280 (0.05)	-0.0760 (0.05)	-0.0700 (0.05)
Guangzhou	-0.0830 (0.06)	-0.0830 (0.07)	-0.170* (0.09)	-0.160* (0.08)
Shenzhen	-0.110*** (0.03)	-0.110*** (0.03)	-0.172*** (0.05)	-0.162*** (0.05)
Wuhan	-0.282*** (0.02)	-0.282*** (0.02)	-0.318*** (0.05)	-0.309*** (0.05)
Chengdu	-0.215** (0.10)	-0.215** (0.10)	-0.331*** (0.06)	-0.321*** (0.06)
finance	0.209*** (0.05)	0.209*** (0.05)	0.210*** (0.05)	0.209*** (0.05)
manufacture	-0.0880 (0.07)	-0.0890 (0.07)	-0.0880 (0.07)	-0.0890 (0.07)
medicine	-0.227 (0.21)	-0.229 (0.21)	-0.227 (0.21)	-0.228 (0.21)
media	-0.101 (0.08)	-0.101 (0.08)	-0.101 (0.08)	-0.101 (0.08)
housing	-0.240*** (0.08)	-0.240*** (0.08)	-0.241*** (0.08)	-0.240*** (0.08)
education	-0.0310 (0.13)	-0.0310 (0.13)	-0.0310 (0.13)	-0.0310 (0.13)
service	-0.219** (0.11)	-0.218** (0.11)	-0.220** (0.11)	-0.219** (0.11)
logistics	-0.0480 (0.16)	-0.0480 (0.16)	-0.0480 (0.16)	-0.0480 (0.16)
resource	-0.544*** (0.20)	-0.544*** (0.20)	-0.545*** (0.20)	-0.546*** (0.20)
multi-industry	-0.420*** (0.10)	-0.427*** (0.10)	-0.417*** (0.10)	-0.423*** (0.10)
small	-0.0130 (0.08)	-0.0130 (0.08)	-0.0140 (0.08)	-0.0130 (0.08)
medium	-0.0580 (0.05)	-0.0580 (0.05)	-0.0580 (0.05)	-0.0580 (0.05)
private	0.088*** (0.02)	-0.0430 (0.04)	0.088*** (0.02)	-0.0370 (0.04)
foreign	0.530*** (0.11)	0.416*** (0.09)	0.531*** (0.11)	0.421*** (0.09)
Inwage	-0.903*** (0.17)	-0.904*** (0.17)	-0.905*** (0.17)	-0.906*** (0.17)
marketing	0.274*** (0.03)	0.274*** (0.03)	0.273*** (0.03)	0.274*** (0.03)
engineer	0.584*** (0.04)	0.585*** (0.04)	0.584*** (0.04)	0.585*** (0.04)
secretary	0.134*** (0.01)	0.134*** (0.00)	0.133*** (0.01)	0.133*** (0.00)
low-ranked	-0.648*** (0.08)	-0.649*** (0.08)	-0.649*** (0.08)	-0.650*** (0.08)

Private*female		0.250*** (0.03)		0.238*** (0.03)
Foreign*female		0.220*** (0.06)		0.214*** (0.06)
Chengdu*female			0.209*** (0.06)	0.191*** (0.06)
Guangzhou*female			0.160** (0.08)	0.141** (0.07)
Shenzhen*female			0.115* (0.07)	0.097* (0.06)
Shanghai*female			0.0900 (0.09)	0.0790 (0.09)
Wuhan*female			0.0670 (0.08)	0.0500 (0.08)
Cons	6.355*** (1.65)	6.463*** (1.65)	6.423*** (1.65)	6.521*** (1.65)
N	19130	19130	19130	19130
Pseudo R2	0.05	0.05	0.05	0.05

Note: The dependent variable is the callback dummy. The first regression (Column 1) presents the results without interaction terms. The second, third and fourth regressions (Column 2, Column 3 and Column 4) present the results with the interaction terms. Robust standard errors are in parentheses clustered at the occupation level.

*Significant at 10%

** Significant at 5%

*** Significant at 1%.

Table 12 Ownership Subsample Regressions

	(1)	(2)	(3)	(4)	(5)	(6)
	private1	private2	foreign1	foreign2	state1	state2
female	0.220** (0.10)	0.134 (0.12)	0.194** (0.08)	0.059*** (0.02)	-0.0310 (0.11)	-0.0530 (0.18)
Shanghai	-0.0640 (0.10)	-0.163* (0.09)	0.0630 (0.10)	0.0130 (0.04)	-0.106 (0.15)	-0.0390 (0.17)
Guangzhou	-0.148 (0.13)	-0.228* (0.14)	0.0410 (0.05)	-0.060* (0.04)	-0.118 (0.20)	-0.139 (0.25)
Shenzhen	-0.245* (0.13)	-0.232** (0.11)	0.0250 (0.05)	-0.140* (0.08)	0.0390 (0.10)	-0.0300 (0.15)
Wuhan	-0.646*** (0.08)	-0.680*** (0.12)	0.0110 (0.13)	-0.0160 (0.19)	0.326* (0.17)	0.322* (0.18)
Chengdu	-0.514** (0.21)	-0.612*** (0.18)	0.0550 (0.10)	-0.0800 (0.08)	0.186 (0.22)	0.0950 (0.24)
small	-0.0330 (0.11)	-0.0330 (0.11)	0.0370 (0.09)	0.0360 (0.09)	-0.0470 (0.11)	-0.0470 (0.11)
medium1	-0.0530 (0.07)	-0.0530 (0.07)	-0.0370 (0.06)	-0.0370 (0.06)	-0.101*** (0.01)	-0.102*** (0.02)
lnwage	-1.864*** (0.10)	-1.863*** (0.10)	-0.376* (0.20)	-0.374* (0.20)	0.967* (0.53)	0.963* (0.53)
marketing	0.120*** (0.03)	0.120*** (0.03)	0.375*** (0.07)	0.376*** (0.07)	0.612*** (0.08)	0.612*** (0.08)
engineer	0.418*** (0.05)	0.418*** (0.05)	0.845*** (0.06)	0.846*** (0.06)	0.503*** (0.02)	0.502*** (0.02)
secretary	0.100*** (0.02)	0.100*** (0.02)	0.101*** (0.01)	0.101*** (0.01)	0.340*** (0.04)	0.341*** (0.04)
Low-ranked	-1.228*** (0.05)	-1.227*** (0.06)	-0.305*** (0.09)	-0.304*** (0.09)	0.464** (0.19)	0.461** (0.19)
Chengdu*female		0.174* (0.10)		0.244* (0.13)		0.174 (0.26)
Guangzhou*female		0.144* (0.08)		0.186*** (0.04)		0.0420 (0.09)
Shenzhen*female		-0.0230 (0.09)		0.291* (0.16)		0.136 (0.24)
Shanghai*female		0.176 (0.11)		0.0950 (0.11)		-0.148 (0.17)
Wuhan*female		0.0640 (0.18)		0.0530 (0.17)		0.00600 (0.13)
Industry	controlled	controlled	controlled	controlled	controlled	controlled
cons	15.223*** (0.91)	15.259*** (0.96)	1.533 (2.00)	1.582 (2.00)	-10.452** (4.83)	-10.408** (4.82)
N	8929	8929	6168	6168	4033	4033
Pseudo R2	0.06	0.06	0.06	0.07	0.07	0.05

Note: The dependent variable is the callback dummy. Column 1 and Column 2 present the regression results for private firms. Column 3 and Column 4 present the regression results for foreign firms. Column 5 and Column 6 present the regression results for state-owned firms. Robust standard errors are in parentheses clustered at the occupation level.

*Significant at 10%

** Significant at 5%

*** Significant at 1%.

References

- Albert, R., Escot, L., and Fernández-Cornejo, J. A. 2008. *A Field Experiment to Study Sex and Age: Discrimination in Selection Processes for Staff Recruitment in the Spanish Labor Market*, available at http://www.ief.es/documentos/recursos/publicaciones/papeles_trabajo/2008_20.pdf
- Becker, G.S. 1971. *The Economics of Discrimination, Second Edition*, Chicago: University of Chicago Press.
- Bertrand, M., and Sendhil, M. 2004. "Are Emily and Greg more employable than Lakisha and Jamal? A field experiment on labor market discrimination." *American Economic Review*, Vol. 94, No. 4, September, pp. 991-1013.
- Bian, Y., J, Breiger, R., Davis, D., and Galaskiewicz, J., 2005. "Occupation, class, and social networks in urban China." *Social Forces*, Vol. 83, No. 4, pp. 1443-1468.
- Booth, A., and Leigh, A. 2010. "Do employers discriminate by gender? A field experiment in female-dominated occupations." *Economics Letters*, Vol. 107, pp. 236–238.
- Brainerd, E. 2000. "Women in transition: Changes in gender wage differentials in Eastern Europe and the former Soviet Union." *Industrial and Labor Relation Review*, Vol. 54, pp. 138–162.
- Dollar, D., Fisman, R., and Gatti, R. 2001. "Are women really the 'fairer' sex? Corruption and women in government." *Journal of Economic Behavior & Organization* Vol. 46, pp. 423–429.
- Eagly, A.H., and Crowley, M. 1986. "Gender and helping behavior: A meta-analytic review of the social psychological literature." *Psychological Bulletin*, Vol. 100, pp. 283–308.
- Eckel, C.C., and Grossman, P.J. 1998. "Are women less selfish than men? Evidence from dictator experiments." *Economic Journal*, Vol. 108, pp. 726–735.
- Fan, J., Wong, T.J., and Zhang, T.Y. 2007. "Politically-connected CEOs, corporate governance and post-IPO performance of China's partially privatized firms." *Journal of Financial Economics*, Vol. 84, pp. 330-357.
- Glover, S.H., Bumpus, M.A., Logan, J.E., and Ciesla, J.R. 1997. "Reexamining the influence of individual values on ethical decision-making." *Journal of Business Ethics*, Vol. 16, Nos.12/13, pp. 1319–1329.
- Gneezy, U., List, J., and Price, M.K 2012. *Toward an Understanding of Why People Discriminate: Evidence from a Series of Natural Field Experiments*, NBER Working Paper 17855.
- Goertzel, T.G. 1983. "That gender gap: Sex, family income, and political opinions in the early 1980s." *Journal of Political and Military Sociology*, Vol. 11, pp. 209–222.
- Gustafsson, B., and Li, S. 2000. "Economic transformation and the gender earnings gap in urban China." *Journal of Population Economics*, Vol. 13, pp. 305–329.
- Heckman, J.J. 1998. "Detecting Discrimination." *Journal of Economic Perspectives*, Vol. 12, No. 2, Spring, pp. 101-16.

- Heckman, J., and Siegelman, P. 1993. "The Urban Institute audit studies: Their methods and findings." In Fix and Struyk, eds., *Clear and Convincing Evidence: Measurement of Discrimination in America*. Washington, D.C.: The Urban Institute Press, pp. 187-258.
- Hunt, J. 2002. "The transition in East Germany: When is a ten-point fall in the gender wage gap bad news?" *Journal of Labor Economics*, Vol. 20, pp. 148–169.
- Jolliffe, D., and Campos, N.F. 2005. "Does market liberalization reduce gender discrimination? Econometric evidence from Hungary, 1986–1998." *Labour Economics* Vol. 12, No. 1, pp. 1–22.
- Jolliffe, D., and Nauro, N.F. 2004. *Does Market Liberalization Reduce Gender Discrimination? Econometric Evidence from Hungary, 1986–1998*. William Davidson Institute Working Paper Series, Vol. 678.
- Kuhn, P.J., and Shen, K. 2011. *Gender Discrimination in Job Ads: Theory and Evidence*, NBER Working Paper No. 17453.
- Liu, P., Meng, X., and Zhang, J. 2000. "Sectoral gender wage differentials and discrimination in the transitional Chinese economy." *Journal of Population Economics*, Vol. 13, pp. 331–352.
- Maurer-Fazio, M., Rawski, T.G., and Zhang, W. 1999. "Inequality in the rewards for holding up half the sky: Gender wage gaps in China's urban labor market, 1998–1994." *China Journal*, Vol. 41, pp. 55–88.
- McKinnish, T.G. 2007. "Sexually integrated workplaces and divorce: Another form of on-the-job search," *The Journal of Human Resources*, Vol. 42, No. 2 (Spring, 2007), pp. 331-352.
- Neumark, D. 1996. "Sex discrimination in restaurant hiring: An audit study," *Quarterly Journal of Economics*, Vol. 111, No. 3, August, pp. 915-41.
- Neumark, D. 2010. *Detecting Discrimination in Audit and Correspondence Studies*, NBER Working Paper 16448, available at <http://www.nber.org/papers/w16448>
- Ng, Y.C. 2007. "Gender earnings differentials and regional economic development in urban China, 1988–1997," *Review of Income and Wealth*, Vol. 53, No. 1, pp. 148–166.
- OECD, 2005. *Organization for Economic Co-operation and Development, OECD Economic Surveys: China*. Paris: OECD.
- Ones, D.S., and Viswesvaran, C. 1998. "Gender, age, and race differences on overt integrity tests: Results across four large-scale job applicant data sets." *Journal of Applied Psychology*, Vol. 83, No. 1, pp. 35–42.
- Orazem, P., and Vodopivec, M. 2000. "Male–female differences in labor market outcomes during the early transition to market: The cases of Estonia and Slovenia." *Journal of Population Economics*, Vol. 13, pp. 283-303.
- Reiss, M.C., and Mitra, K. 1998. "The effects of individual difference factors on the acceptability of ethical and unethical workplace behaviors." *Journal of Business Ethics*, Vol. 17, No. 14, pp. 1581–1593.

- Riach, P.A., and Rich, J. 2002. "Field experiments of discrimination in the market place." *The Economic Journal*, Vol. 112, No. 483, November, pp. F480-518.
- Riach, P., and Rich, J. 1987. "Testing for sexual discrimination in the labour market," *Australian Economic Papers*, Vol. 26, pp. 165-78.
- Riach, P., and Rich, J. 2006. "An experimental investigation of sexual discrimination in hiring in the English labor market." *BE Press Advances in Economic Analysis & Policy*, Vol. 6, No. 2.