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**“As Rare as a Panda”:
How Facial Attractiveness, Gender, and Occupation
Affect Interview Callbacks at Chinese Firms**

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ABSTRACT

“As Rare as a Panda”: How Facial Attractiveness, Gender, and Occupation Affect Interview Callbacks at Chinese Firms^{*}

This study explores how both gender and facial attractiveness affect job candidates' chances of obtaining interviews in China's dynamic Internet job board labor market. It examines how discrimination based on these attributes varies over occupation, location, and firms' ownership type and size. We employ a resume (correspondence) audit methodology. We establish the facial attractiveness of candidate photos via an online survey. 24,192 applications are submitted to 12,096 job postings across four occupations in 6 Chinese cities. We find sizable differences in the interview callback rates of attractive and unattractive job candidates. Job candidates with unattractive faces need to put in 33% more applications than their attractive counterparts to obtain the same number of interview callbacks. Women are preferred to men in three of our four occupations. Women on average need to put in only 91% as many applications as men to obtain the same number of interview callbacks.

JEL Classification: C93, J71, J23, O53

Keywords: beauty, gender, field experiments, discrimination, Chinese firms, hiring, facial attractiveness, internet job boards, resume correspondence audit study

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I Introduction

From the perspective of job candidates, obtaining an interview is an essential and critical first step in the hiring process. Discrimination at this stage of the job seeking process can have profound impacts on individuals' labor market outcomes. Both rewards to, and discrimination based on, beauty, facial attractiveness, and gender in obtaining jobs, getting promotions, and determining compensation have been explored in a wide range of labor market contexts. There is, however, a shortage of research that examines the effects of facial attractiveness and gender in Chinese labor markets, especially with regard to obtaining job interviews via China's rapidly expanding Internet job board sector.

We conduct a large-scale field experiment to investigate how Chinese firms respond to the facial attractiveness and gender of job candidates who submit applications through Internet job boards. We focus on four occupations, one female dominated—administrative assistant; one male-dominated—software engineer; and two that are relatively gender neutral—accountant and sales representative. We establish the facial attractiveness of potential candidate photos via an online survey. The survey's responses are used to select the photos of one attractive man and one attractive woman and well as one unattractive man and one unattractive woman for use in the experiment. Two equally competitive resumes are prepared for each occupation. Pairs of applications are submitted for each suitable job opening.¹ Throughout the course of the fieldwork each of the four photos is attached to each of the resumes hundreds of times. We find a substantial premium on facial attractiveness, that is, applications with attractive photos attached received substantially higher rates of callbacks across gender, occupation, and location. We also find women are preferred, that is receive higher rates of callbacks, for both the gender-neutral occupations and female-dominated positions of accountant, sales representative, and administrative assistant while men receive higher rates of callbacks for the male-dominated field of software engineering. We believe that our

¹ This project was reviewed and approved by the co-chairs of the Institutional Review Board of Bates College.

study is the first application of a resume (correspondence) audit methodology to test for discrimination on gender and facial attractiveness in the hiring practices of Chinese firms.

In Section II of this paper we review and discuss related studies. We explain the design of our field experiment in Section III. In Section IV, we discuss how our photos of attractive and unattractive candidates were selected. We describe the application submission and tracking process in Section V. Our results are presented in the following two sections. The first, Section VI, is descriptive and reveals simple callback rates. The second, Section VII, presents the probit regressions that allow us to focus on the marginal effects of factors that simultaneously affect whether or not candidates receive interview callbacks. We conclude our paper in Section VIII and speculate there about the potential effectiveness in reducing discrimination of making the job application process anonymous.

II Review of the Literature—Facial Attractiveness- and Gender-Focused Resume Audit Studies

Resume audit (correspondence) studies yield the benefits of controlled experiments conducted in realistic field settings and have been used to study discrimination in a wide variety of country and labor market contexts.² Resumes of fictional applicants are first carefully crafted to make candidates appear equally productive in terms of their work histories and educational backgrounds. Researchers then control a particular attribute or set of attributes under study—in our case gender and facial attractiveness. Discrimination is estimated by calculating the differences in the rates of callbacks for interviews received by individuals whose applications vary only in terms of the attribute(s) under study.

A number of recent resume audit studies have explored the role of gender in obtaining interview callbacks. The experiment designed by Riach and Rich (2006) compared callback rates for applications using male and female names for a range of

² See for examples Bertrand and Mullainathan (2004), Booth, Leigh, and Varganova (2011), Kaas and Manger (2011), Maurer-Fazio (2012), Oreopoulos and Dechief (2011), Pager (2007), Riach and Rich (2002), and Siddique (2011).

four occupations in the English labor market. Their first two results were unsurprising. They found that men were discriminated against in the stereotypically female occupation of secretary. Similarly women were discriminated against in the stereotypically male occupation of engineer. However, when they focused on two occupations that typically included both men and women (even though more men than women)--computer programmer and chartered accountant trainee--they found significantly higher rates of callbacks for female applicants than for male applicants. That is, they found significant discrimination in favor of women. Riach and Rich attribute the discrimination they observed to demand-side, taste-based factors.

Carlsson and Rooth (2008) employ a similar resume audit study methodology to explore whether sex discrimination is the underlying cause of observed sex segregation in the Swedish labor market. They select thirteen different occupations that range from male-dominated, to mixed, to female-dominated. They find, as did Riach and Rich, that female applicants have higher rates of interview callbacks in both female-dominated and mixed occupations. However, they report that the differences in the callback rates are much smaller than the actual degree of sex segregation present across occupations in Sweden. They observe no differences in the callback rates for men and women in male-dominated occupations. Carlsson and Rooth attribute the Sweden's occupational sex segregation not to discrimination in hiring, but rather to factors on the supply side of the labor market.

Booth and Leigh (2010) further explore Riach and Rich's unexpected finding of higher callback rates for women by designing a resume audit study for the Australian labor market that focuses on four female-dominated occupations. They too find a pro-female bias but only for occupations that are 80% or more female-dominated. Booth and Leigh also explore whether the gender of the firm's contact person or the firm's use of a recruitment agency affects the bias in callback rates. They find no statistical significance for the role of either of these factors.

This methodology is also well suited for exploring beauty bias in the labor market. Is it easier, or more difficult, for attractive people to obtain interviews and ultimately jobs? A recent paper by Lopez Bóo et al. (2012) explores the question for the Argentinian labor market. Lopez Bóo et al. not only create fictitious resumes,

but given the standard practice in Argentina of attaching photos to resumes, they also carefully create composite photos. Based on psychological and anthropological research, their attractive candidates' facial dimensions were constructed to meet the "golden rule" criteria, that is, with an eye-mouth distance equal to approximately 36% of the distance from the hairline to the chin and the horizontal distance between the pupils of the eyes taking up approximately 46% of the face's width. The unattractive candidates were based on the same composite faces as the attractive photos, that is they featured the same eyes, ears, noses, mouth but had the eye-mouth and intraocular distances lengthened to make the fictitious candidates unattractive. Thus each composite face was featured in both an attractive and an unattractive version. The resumes with the attractive versions of the photos attached received 36% more interview callbacks than those with the unattractive versions. The attractiveness premium was similar for men and women.

A previous resume audit study conducted by Ruffle and Shtudiner (2010) for the Israeli labor market finds that employers call back men with attractive photos attached to their resumes at twice the rate of those with no photo or those with a plain-looking photo attached. Their study also reports that women with attractive photos attached to their resumes are penalized, that is, they have a significantly lower callback rates than women with no photos. They also report a penalty for women with unattractive photos attached, relative to the women who do not attach photos. After exploring a number of potential explanations for these gendered differences in the effects of facial attractiveness, Ruffle and Shtudiner attribute the penalty experienced by good-looking women to female jealousy of attractive women at work. Lopez Bóo et al. are skeptical of this explanation and attribute the difference rather to Ruffle and Shtudiner's more subjective judgment of who is, and who is not, attractive. Ruffle and Shtudiner use a panel of four male and four female judges to rank the attractiveness of candidate photos of real people.

Are the differences in rates of callbacks by gender and facial attractiveness actually indicators of discrimination in hiring? Some think not. Some argue that beauty can be productive and/or profit enhancing. Pfeifer (2011) finds, based on German 2008 Social Survey data, that more attractive people are both more likely to

be employed and to earn higher wages than less attractive people and that these attractiveness effects are positive across the entire wage distribution. Pfeifer uses both interviewers' and the interviewees' assessments of the interviewees' attractiveness. Pfeifer speculates that the premiums associated with attractiveness may be productivity and/or firm-profitability related but his empirical work does not allow readers to draw definitive conclusions about the underlying causes of the beauty-related premiums that he finds in rates of employment and levels of pay. Hamermesh (2011), however, explores in detail, especially for attorneys, whether the higher pay of the attractive and lower pay of the unattractive are results of discrimination or productivity differences or both. He reports that good-looking attorneys who start their careers in the public sector are more likely to change to the private sector than their plain-looking counterparts. He also reports that in the private sector, good-looking attorneys are much more likely to be higher paid litigators (appearing before judges and jurors) than their plain-looking counterparts. He also finds that among self-employed attorneys, the earnings of the good-looking exceed those of the less attractive—suggesting that customer discrimination is an important factor.

Langlois *et al.* (2000), discount the maxim, “Beauty is in the eyes of the beholder,” and demonstrate, as does Hamermesh, that raters agree about who is and who is not attractive. They also interrogate two other maxims: “Never judge a book by its cover,” and “Beauty is Only Skin-Deep.” Based on 11 meta-analyses, they report that attractive people, both children and adults, not only are perceived and treated more positively by others but also exhibit more positive behaviors and traits than unattractive children and adults. It is possible that the treatment received by both attractive and unattractive children affects their self-esteem and subsequently their productivity. Recent work by Postma (2014) reinforces the argument that beautiful people are more successful. He finds that the performances of good-looking/handsome male long-distance cyclists are better, that is, faster than those of their less attractive competitors.

III Experimental Design

Our experiment focuses on one rapidly growing, dynamic segment of China's labor market—the Internet job board sector. On a daily basis, millions of jobs are advertised on China's Internet job boards and many millions of applications are submitted in response.³ These boards serve a wide variety of firms but tend to focus on well-educated individuals seeking jobs in private firms (Kuhn and Shen, 2013). According to iResearch China (2013, Chart 2-2) in 2012, 27.4% of college graduates found their jobs through Internet job boards. A slightly earlier report predicted that by 2012, Internet job board companies would take over 16% of China's hiring market (iResearch China, 2009, Chart 10-2). We employ the largest of the Chinese job boards, 51job.com, to investigate whether Chinese firms respond differently to job applications from male and female candidates and from facially attractive and unattractive candidates.⁴ In China, it is standard practice to attach a photo to job applications and resumes.

Our experiment is large in scale—in the summer of 2012, we submitted 24,192 on-line applications to 12,086 advertised job postings. We applied for positions in four different occupations: accountants, administrative assistants, sales representatives, and software engineers. These occupations were chosen, in part, for a very practical reason—there were thousands of job postings for each of these occupations. Additionally, we chose software engineer because it is a male-dominated occupation in China. Similarly, we chose administrative assistant

³ Maurer-Fazio (2012, Table 1) documents approximately 50 million page views across three of China's job boards on a single, randomly chosen day (April 18, 2011).

⁴ Kuhn and Shen (2013) analyze over 1 million job ads placed on Zhaopin.com, China's third largest Internet job boards. They find that gender targeting of ads is common, but much more so for low-skill occupations than for those requiring higher education levels. 10.5% of the job ads they collected and studied expressed gender preferences (for either men or women). Gender preferences (either male or female) were expressed in only 3.38% of the jobs posting used in our project. 41% of the ads analyzed by Kuhn and Shen required a bachelor's degree. All of the postings that we responded to required both a bachelor's degree and 1-3 years experience. 80% of Kuhn and Shen's ads required at least one year of work experience.

because it is female dominated. Accountant and sales representative were chosen because in China it is typical for both men and women to be employed in these occupations.

(Insert Table 1 here.)

We submitted applications in response to job ads posted in six large cities with active Internet job boards. These six cities: Nanjing, Beijing, Shenzhen, Wuhan, Shanghai, and Chengdu vary substantially in terms of their geographic locations, prosperity, and population size.

We created two resumes for each of our four occupations. To focus on gender and facial attractiveness, we limited the range and scope of the resumes we created. Each of our resumes represented a single, currently employed, university-educated man or woman who had graduated from university in 2009 and started work in August of the same year. Each resume was designed to be realistic in terms of job experience, education, certificates and training, and other personal information. The content of our fictitious resumes was based on observation of a very large number of resumes for the same occupations at the same levels of experience posted on a competing Internet job board, Chinahr.com. The descriptions of tasks carried out by an applicant on his/her first and second job after university graduation were taken from these real resumes and appropriately edited and reassigned to our fictional resumes. The company names associated with our applicants' work history were altered to represent real companies operating in each of our target cities. To keep the two resumes per occupation equivalent in terms of education and work experience, we ensured that each of the universities were similarly ranked, and the current employers were similarly prestigious.

IV Photo Selection: Attractive and Unattractive Faces

To select photos for use on our resumes, we first purchased, from on-line stock photo companies, the rights to use 36 (18 male and 18 female) real, non-celebrity portrait-style photos of ethnically Chinese young men and women. We created an online survey to gather people's rating of the candidates' attractiveness on a scale from 1(very unattractive) to 5 (very attractive), as well as the

respondents' demographic information.⁵ The majority of our survey respondents were Asian men and women, most of whom resided in China. Since our goal was to select photos that reflect Asian standards of attractiveness, we restricted our photo selections to the ratings of the survey's 583 respondents who identified themselves as Asian. The most "attractive" male and female photo candidates received average ratings of 4.29. The "unattractive" male candidate received an average rating of 2.42 while the "unattractive" female candidate received an average rating of 2.63.

Despite the low relative rankings of the two unattractive candidates, their faces were not particularly unattractive. Why? Stock photo companies typically do business by supplying attractive photos to customers and thus have very limited inventories of unattractive, yet professionally attired, young Chinese men and women from which we could draw.

Furthermore, the job board company we used, 51Job.com, limited the size of the photos that candidates could post to only 300 KB. To make the differences between our attractive and unattractive candidates apparent within such a small photo size, we slightly altered the photos of the unattractive candidates. These alterations were guided by the surgical and psychological research on facial attractiveness that reports the qualities of symmetry and averageness as attractive.⁶

⁵ The survey was brought to respondents' attention via email messages written by the authors and our research assistant and sent out to professional colleagues, business owners, friends, relatives, academics, and others. The recipients were, for the most part, residents of China. Their residential locations were spread throughout the country but also included other parts of Asia, North America, and Europe. Those original messages requested help from the recipients in spreading the survey link far and wide. A typical email message accompanying the link would be personalized but similar to the following: "This summer we are carrying out a resume audit study of the hiring practices of Chinese firms that explores the effects of both gender and appearance on the chances of getting a call back for an interview. We are looking for help on ranking the attractiveness of photos of potential job candidates. I'm hoping that you are willing to take a look at these potential resume photos and rank the attractiveness of the candidates. Please feel free to share the survey link with your colleagues and friends as we are seeking a large number of responses."

⁶ See for example: Cunningham *et al.* (1995), Little *et al.* (2011), Murakami *et al.* (2008), and Rhodes *et al.* (2001).

In particular, we altered the unattractive man's photos such that his eyes appeared to be smaller, chin somewhat less defined, and the shape of his face less symmetric. We altered the unattractive woman's photos such that her eyes were slightly less symmetric, nose wider, cheek color-tone less even, and lips more prominent. A professionally trained image specialist working with very high-resolution photos of our candidates carried out the alterations. The final versions of the four photos are presented in Figure 1.⁷

Figure 1:

Resume Photos



1-Attractive Male



2-Attractive Female



3-Unattractive Male



4-Unattractive Female

V Application Process

From June through August of 2012, we submitted a pair of applications for each suitable job posting in each of our four occupations in each of our six locations. By "suitable," we simply mean that our candidates' characteristics were a good match for the advertised position, that is, they appeared well qualified for the

⁷ Each of the final versions of the photos was reduced to the maximum size permitted by 51job.com, that is, 300KB, and was of the same photographic quality. The printed reproductions of our images included here are not as clear and precise as those attached to the job applications we submitted.

positions. The content of the two resumes that we customized for each occupation in each location were used, unaltered, for each posting. However, throughout the summer's application process, each of these resumes was assigned hundreds of times to each of our fictitious, attractive and unattractive, male and female candidates with their respective photos.

The resumes were assigned to attractive and unattractive, male and female candidates, with their respective photos, systematically. They were also paired systematically such that each type of candidate was matched with each of the other three types an equal number of times. Two resumes were submitted for each opening and the order of the resumes submitted per opening was also varied systematically.

We submitted 1,008 resumes per city per occupation, for a total of 24,192 applications. Each application contained an active email address and a mobile phone number through which we received interview callbacks. We tracked each application and collected as much information about the firm advertising each position as feasible, given the scale of our experiment. We recorded each firm's name and, if available, the size of the firm (measured in terms of the number of its employees), and the type of firm ownership. The vast majority of firms that pursued/contacted our candidates did so by calling the mobile phones associated with each of the resumes. A small number responded via email and an even smaller number responded by text message to the mobile phones.

We registered and recorded as a callback any action by a firm that indicated it was interested in the candidate and wanted to follow up with an interview. The research assistants answering the calls were trained to immediately inform callers that they, posing as the candidate, had just accepted another position and were no longer interested in that firm's job opening. They responded in like manner to emails and followed up appropriately, usually with a phone call, to text messages.

VI Results—Descriptive Analysis

The first two columns of Table 2 reveal that on average our male and female candidates were contacted to set up interviews (or carry out the next step(s) in the hiring process) by 11 and 12 firms, respectively, for each hundred applications that

they submitted. The differences in callback rates were much more pronounced on the basis of facial attractiveness. Attractive candidates experienced an interview callback rate of 13.27% while unattractive candidates experienced a rate of 10.01%. Table 2, columns 3 and 6, also present ratios of callbacks of men to women and of the attractive to the unattractive. What these ratios reveal in terms of gender differences is that a woman could put in 9% less applications than an equally qualified man and still expect to get the same number of interview callbacks. However an unattractive candidate would need to put in 33% more applications than an equally qualified attractive one to receive the same number of callbacks. This finding is consistent with that of Lopez Bóo *et al.* (2012) who find, based on resume photos, that attractive people in Argentina receive a 36% higher rate of interview callbacks than unattractive people.

(Insert Table 2 here.)

When we interact gender and attractiveness, we find that attractiveness pays off for both men and women, at least in terms of getting one's foot in the door in the hiring process, that is, in obtaining an interview. Table 3 reveals attractive female applicants obtain the highest rate of callbacks, 14%, followed by attractive males with a rate over 12%. The difference in the rates of callbacks for unattractive men and women is statistically insignificant--both hover close to 10%. The ratio calculations reveal that while unattractive men need to put in 24% more applications than their attractive male rivals to get the same number of interview callbacks, the difference is greater for women. Unattractive women need to submit 41% more applications than attractive women to obtain the same number of callbacks. This finding, of a substantial payoff to facial attractiveness for women applying for jobs through Internet job boards in China, stands in marked contrast to Ruffle and Shtudiner's (2010) field experiment based in Israel. Although they find a substantial payoff men's attractiveness, they observe a penalty to women's attractiveness.

(Insert Table 3 here.)

Interesting differences in callback rates arise at the city level. Table 4 reveals that job applicants in Beijing are treated more equally by potential employers than

in any of our other locations, at least in terms of giving both men and women, and the attractive and unattractive, chances for interviews. In Beijing the ratio of callbacks of men to women is 0.96. The ratio of callbacks of the attractive to the unattractive is 1.14, implying that unattractive candidates in Beijing need only submit 14% more applications, on average, than the attractive to get the same number of interviews. At the other end of the spectrum, in Nanjing on average a woman need put in only 83 applications for each 100 put in by a man to obtain the same number of interviews. And in Nanjing the premium for attractiveness is remarkably high: the unattractive need to put in 51% more applications than the attractive to obtain an equal number of interview callbacks.

(Insert Table 4 here.)

Beijing appears to be the least discriminatory of our 6 cities, in terms of both gender and facial attractiveness while Nanjing appears to be the most discriminatory. We expect that the tighter a labor market is, the higher will be the overall rate of callbacks. We also expect that the tighter the labor market, all else equal, the less employers will be able to discriminate on non-productive attributes as such discrimination will be costly to firms.⁸ It is difficult to obtain objective information that would allow us to rank openness/tightness of the labor markets in these six different cities. Although Shenzhen, Shanghai, and Beijing have higher GDP per capita, greater flows of in migration, and higher employment rates of their college graduates than Nanjing, Wuhan, and Chengdu, it would be very difficult to argue that Beijing's labor market is substantially tighter than Nanjing's or even Shenzhen's or Shanghai's.

(Insert Table 5 here.)

There are marked differences in callback rates by occupation as revealed in Table 5. The markets for sales representatives and software engineers were apparently significantly tighter than those for accountants and administrative

⁸ Baert *et al.* (forthcoming 2015) find, in the Flemish labor market, that job candidates with foreign-sounding names suffer no discrimination when labor markets are tight but have to send twice as many applications as candidates with local-sounding names in slack labor markets.

assistants. As mentioned above, accountant and sales representative are relatively gender-neutral occupations, while administrative assistant is female-dominated and software engineer is male-dominated. Our results show that women receive almost twice as many callbacks as men do in the female-dominated field, slightly more callbacks than males in the gender-neutral occupations, and fewer responses than men in the male-dominated occupation of software engineer. This result matches those findings of several previous research projects. Booth and Leigh's (2010) field experiment finds that female candidates are more likely to receive callbacks than male candidates in general, with the discrimination being significant at the occupational level in occupations that are at least 80% female. Carlsson and Rooth (2008) also find, in their study on sex segregation in the Swedish labor market, that women have a somewhat higher callback rate for interviews in female-dominated occupations, while in male-dominated occupations there is no evidence of gender differences in the rates of callbacks. Interestingly, Table 5 also reveals that discrimination based on facial attractiveness is particularly evident for administrative assistants. This brings to the fore, questions about the source of the discrimination. Compared to the other three occupations of our study, administrative assistants seem likely to interact more often with their managers. This may suggest that employers are the source of the discrimination/beauty bias rather than customers or coworkers.

(Insert Table 6 here.)

Last but not least, gender seems to generally outweigh facial attractiveness for administrative assistants and software engineers. That is, the employers of administrative assistants prefer both attractive and unattractive women to men. Employers of software engineers appear to prefer both attractive and unattractive men to women.⁹ In the gender-neutral occupations of accountant and sales representative, appearance seems more important than gender in obtaining

⁹ This is not always the case. The title of our paper arose from a text message that one firm's recruiter sent to our attractive female candidate about her application, "To have a woman apply for a software engineering job is rare, but to have one as beautiful as you is as rare as a Panda."

callbacks. See Table 6. These cross effects are further explored, more precisely through regression analysis, in the following section.

VII Results--Multivariate Probit Analysis

In Tables 2 through 6 above, we have sequentially discussed some of the factors (gender, attractiveness, location, occupation) that influence the callback rates received by candidates using paired resumes. Recall that these applications differ only in terms of gender and facial attractiveness (indicated through attached resume photos) as the same pairs of resumes were used repeatedly. In this section of the paper, we explore how these factors interact. We estimate probit regressions with the 0-1 dependent variable indicating whether or not a candidate received a callback for an interview. The independent variables include controls for a candidate's occupation, location, gender, and attractiveness. We also create control variables to track firm characteristics such as firm ownership and firm size (indicated by the number of employees). Table 7 presents the results of our probit regression based on all 24,192 observations. Tables 8-11 present results separately for each occupation.

The results in Table 7 reveal that even after controlling for occupation, location, firm ownership type, and firm size, attractiveness by gender still has a statistically significant effect on candidates' chances of receiving interview callbacks. Given the overall callback rate of 11.6%, the size of these marginal effects are very large. Using attractive men as the base case, we see that attractive women have a callback rate that is 1.9 percentage points higher than that of the attractive men, while the unattractive women and men have rates that are 2.2 and 2.4 percentage points lower.

(Insert Table 7 here.)

There are also significant differences by both occupation and location, suggesting that the labor market conditions differ substantially across these dimensions. In the summer of 2012, the callback rates for sales representatives and software engineers were 6.8 and 7.2 percentage points higher, respectively, than those for accountants. The labor market in Shanghai had a significantly higher callback rate than did the other locations of our field experiment. Our findings, thus

far, indicate that facial attractiveness is an asset in getting job interviews in China and that it has a bigger premium for women than for men. Callback rates seem to be largely similar across firm ownership types and firm size.¹⁰ The one exception to this generalization is that the callback rates of foreign-owned firms are 2 percentage points lower than those in privately owned firms.

We next divide our data by occupation and re-run probit regressions for each occupation (Tables 8-11). Some interesting results now emerge. First, for accounting applicants, there are no significant differences in callback rates by location or firm type or firm size. Attractive women do have an advantage of approximately 2 percentage points over attractive men in getting callbacks in accounting. Recall this is based on an overall rate of callbacks of 8.3%. Interestingly, in the accounting field while unattractive men are penalized relative to attractive men there is no such penalty in callbacks for unattractive women, that is unattractive women seem to get callbacks at the same rates as attractive men.

(Insert Table 8 here.)

There are significant locational differences in callback rates for candidates applying for positions as sales representatives. Relative to Nanjing as the base case, there are very large positive differences in callback rates for those applying to job openings in Shenzhen, Beijing, and Wuhan. Unattractive candidates, whether male or female, are both significantly penalized in terms of their chances of obtaining an interview relative to attractive men. Attractive women, once again, have a 2-percentage point advantage in getting interview callbacks.

(Insert Table 9 here.)

Attractive female applicants are strongly preferred to males for administrative assistant positions. Our regressions show that attractive females are preferred by 5.6 percentage points over attractive males, who are themselves preferred over unattractive males by 2 percentage points. Keep in mind that the

¹⁰ Kaas and Manger (2011) note that in the German labor market, small firms, that is, those with 50 or fewer employees are 24% more likely to give callbacks to internship applicants with German-sounding names than Turkish-sounding names. However, this firm-size effect disappears when all else is held equal in their multivariate probit regressions.

overall callback rate for administrative assistants was a relatively low 7.6%. Interestingly, all else equal, there is no significant difference here in the callback rates for attractive male applicants and unattractive females applicants.

(Insert Table 10 here.)

Last but not least, we see that firms hiring software engineers prefer attractive men. Attractive women and unattractive men are treated about the same. Both suffer a penalty in getting callbacks of approximately 2.5 percentage points. Unattractive women suffer a 6.5 percentage point penalty in getting callbacks. Location matters for software engineers. Nanjing seems to have callbacks rates that are similar to those in Shanghai and Wuhan but significantly higher than those in Shenzhen, Beijing, and Chengdu. Women, even attractive women, are disadvantaged as applicants for software engineers. Attractive male applicants are favored over all others.

(Insert Table 11 here.)

These regressions reveal significant differences by gender and attractiveness across the four occupations included in our study. Similar to the findings of Carlsson and Rooth (2008), and Booth and Leigh (2010), our data indicate a significantly higher callback rate for women than men in the field of administrative assistant, an occupation clearly female-dominated. We also find women significantly disadvantaged as applicants for software engineering positions, a distinctively male-dominated profession in China.

VIII Conclusion

This paper explores the issues of discrimination based on gender and facial attractiveness of job candidates in the hiring process of Chinese firms that post job openings on Internet job boards. Our data was collected through a resume audit study conducted in summer of 2012. Callback rates were calculated based on 24,192 applications submitted in response to job postings across four occupations in six cities.

In the Chinese labor market, women are preferred, at least in terms of obtaining those all-important interview callbacks, for both gender-neutral and female-dominated occupations. Attractiveness appears to be a plus for young

professionals in China -- across occupations, locations, and gender. Similar to the experience of attractive males in Israel studied by Ruffle & Shtudiner (2010), handsome Chinese men tend to receive more callbacks for interviews than their unattractive male competitors. However, the penalty they find on beauty for women in Israel does not show up in the Chinese labor market. Rather, one major finding of our research project is a pronounced beauty premium for young women seeking jobs in China.

If resume screeners are both paying attention to resume photos and discriminating against particular candidates based on what their photos reveal, in terms of gender and attractiveness rather than their productivity, it would seem that an application system could be designed that might mitigate some of this discrimination. That is, if job-board companies were to implement a system wherein resumes are submitted to firms without either photos or gender identification, but rather employing an identifying number, it would seem that interviews could be offered to the more skilled and best qualified candidates.

Although it seems that such a system should prevent discrimination at this critical early stage of the hiring process—getting an interview, field experiments based in Germany and France (Krause *et al.* 2012 and Behaghel *et al.* 2014) suggest rather complex and sometimes unexpected outcomes arise when anonymous job application systems are implemented. The characteristics that are typically made anonymous include the applicant's name, contact information, gender, nationality, age, disability, marital status and appearance (by prohibiting use of photos). Such systems may prevent progressive firms from favoring minority and/or disadvantaged candidates. However, Krause *et al.* report that recruiters view the removal of photos from the application process as a positive change. They also note that the employers who recruit with anonymous application systems are able to present their corporate image positively as non-discriminatory, open-minded, and objective.

Krause *et al.* also point out that recruitment practices differ greatly between countries. Therefore the introduction and implementation of an anonymous job application system in a particular location may require anything from small

modifications to large, fundamental changes to current recruitment practices. The Chinese Internet job board system is relatively parsimonious in its requirements in terms of candidates' data. Elimination of just a few of its currently supplied elements: name, gender and photo, would move this system a good way towards anonymity and a more level playing field.

References

- Baert, S., Cockx, B., Gheyle, N., & Vandamme, C. (forthcoming 2015). Is there Less Discrimination in Occupations where Recruitment is Difficult? *Industrial and Labor Relations Review*.
- Behaghel, L., B. Crepon, and T. Barbanchon. (2014) Unintended Effects of anonymous resumes. *IZA Discussion Paper Series*, No. 8517
- Bertrand, M., and S. Mullainathan. Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination. *The American Economic Review* 94, no. 4 (2004): 991-1013.
- Booth, A. & Leigh, A. (2010). Do Employers Discriminate by Gender? A Field Experiment in Female-Dominated Occupations. (2010). *Economic Letters*. Volume 107, pp. 236-238. DOI: 10.1016/j.econlet.2010.01.034
- Booth, A., A. Leigh, and E. Varganova. Does Ethnic Discrimination Vary Across Minority Groups? Evidence from a Field Experiment. *Oxford Bulletin of Economics and Statistics* 74, no. 4 (2011): 1-27.
- Brooks, A., Huang, L., Kearney, S., Murray, F. (2014). Investors prefer entrepreneurial ventures pitched by attractive men. *PNAS Early Edition*. doi: 10.1073/pnas.1321202111
- Carlsson, M. & Rooth D. (2008). An Experimental Study of Sex Segregation in the Swedish Labour Market: Is Discrimination the Explanation? *IZA Discussion Paper Series*, No. 3811.
- Cunningham, M., Roberts, A., Wu, C., Barbee, A., Druen, P. (1995). "Their ideas of beauty are, on the whole, the same as ours: Consistency and variability in the cross-cultural perception of female physical attractiveness." *Journal of Personality and Social Psychology*, Vol 68(2), Feb., 261-279. <http://dx.doi.org/10.1037/0022-3514.68.2.261>
- Hamermesh, D. (2011). *Beauty Pays: Why attractive people are more successful*. Princeton University Press: Princeton and Oxford.
- iResearch China (2009) Internet Market Annual Review Report, web-published at <http://www.iresearch.cn/> Dec. 2009, accessed Oct. 25, 2014
- iResearch China (2013) Online Recruitment Report 2012-2013, web-published at <http://www.iresearch.cn/> Sept. 22 2013, accessed Oct. 25, 2014
- Kaas, L. and C. Manger. (2011) Ethnic Discrimination in Germany's Labour Market: A Field Experiment. *German Economic Review* Vol. 13, No. 1, pp. 1-20.

- Krause, A., U. Rinne and K. Zimmermann, *IZA Journal of European Labor Studies* 2012, 1:5 doi:10.1186/2193-9012-1-5
- Kuhn, P. and K. Shen. Gender Discrimination in Job Ads: Evidence from China. *The Quarterly Journal of Economics* (2013) 128 (1): 287-336.
doi: 10.1093/qje/qjs046
- Langlois, J., Kalakanis, L., Rubenstein, A., Larson, A., Hallam, M., Smoot, M. (2000). Maxims or Myths of Beauty? A Meta-Analytic and Theoretical Review. *Psychological Bulletin*, vol. 126, No. 3, 390-423. American Psychological Association, Inc. doi:10.1037//0033-2909.126.3.390
- Little, A., Jones, B., DeBruine, L. (2011). Facial attractiveness: evolutionary based research. *Phil. Trans. R. Soc. B* 366, 1638–1659. doi:10.1098/rstb.2010.0404
- López Bóo, F., Rossi, M., Urzúa, S. (2012). The Labor Market Return to an Attractive Face: Evidence from a Field Experiment. *IZA Discussion Paper Series* No. 6356.
- Maurer-Fazio, M. Ethnic Discrimination in China's Internet Job Board Labor Market *IZA Journal of Migration*. 2012, 1:12. DOI: 10.1186/2193-9039-1-12 URL: <http://www.izajom.com/content/1/1/12>
- Murakami, Y., Deguchi, T., Kageyama, T., Miyazawa, H., Foong, K. (2008). Assessment of the esthetic smile in young Japanese women. *Orthodontic Waves*, 67 (2008), 104–112.
- Pager, D. The Use of Field Experiments for Studies of Employment Discrimination: Contributions, Critiques, and Directions for the Future. *The Annals of the American Academy of Political and Social Science* 609, no. 1 (2007): 104-133.
- Patzer, G. (2008). *Looks: Why They Matter More Than You Ever Imagined*. AMACOM, American Management Association: New York.
- Pfeifer, C. (2011). Physical Attractiveness, Employment, and Earnings. *University of Lüneburg Working Paper Series in Economics*, No. 201.
www.leuphana.de/institute/ivwl/publikationen/working-papers.html
- Postma, E. (2013). A relationship between attractiveness and performance in professional cyclists. *Biology Letters*, vol. 10, no. 2.
doi:10.1098/rsbl.2013.0966
- Rhode, D. (2010). *The Beauty Bias: The Injustice of Appearance in Life and Law*. Oxford University Press: New York
- Rhodes, G., Yoshikawa, S., Clark, A., Lee, K., McKay, R., Akamatsu, S. (2001). Attractiveness of facial averageness and symmetry in non-Western cultures: In search of biologically based standards of beauty, *Perception*, Volume 30(5), 611-625. doi:10.1068/p3123

- Riach, P.A., and J. Rich. Field Experiments of Discrimination in the Market Place. *The Economic Journal* 112, no. 483 (2002): 480-518.
- Riach, P. A., & Rich, J. (2006). An experimental investigation of sexual discrimination in hiring in the English labor market. *Advances in Economic Analysis & Policy*, Retrieved from <http://search.proquest.com/docview/59924191?accountid=8505>
- Ruffle, B. & Shtudiner, Z. (2014). Are Good-Looking People More Employable? *Monaster Center for Economic Research, Ben-Gurion University of the Negev*. Available at <http://dx.doi.org/10.2139/ssrn.1705244>.
- Siddique, Z. (2011) Evidence on caste based discrimination. *Labour Economics*, 18 (S1). S146-S159. doi: 10.1016/j.labeco.2011.07.002

Tables

Table 1

Number of Job Openings Posted on 51job.com for Selected Cities and Occupations May 14, 2012 (1/2/3 years of work experience)			
City	Accountant	Administrative Assistant	Software Engineer
Beijing	800/1200/1600	4000/1500/500	4000/5000/3000
Chengdu	200/300/500	700/300/100	800/700/400
Wuhan	200/300/400	800/300/100	800/600/300
Shenyang	100/100/300	400/100/100	300/200/100
Shanghai	1000/1500/2000	4000/1500/700	4000/4000/2500
Shenzhen	500/700//800	1400/600/200	1500/2000/1000
Nanjing	200/300/300	500/200/100	1300/900/400
Kunming	100/200/200	300/100/50	100/60/30

Table 2 Interview Callback Rates by Gender and by Attractiveness

	Male	Female	Ratio M/F	Attractive	Unattractive	Ratio A/U
Callback rates	11.09%	12.19%	0.91	13.27%	10.01%	1.33

Table 3 Interview Callback Rates with Interactions of Gender and Attractiveness

	Attractive Male	Attractive Female	Unattractive Male	Unattractive Female	Ratio A/U for Men	Ratio A/U for Women
Callback rates	12.27%	14.27%	9.92%	10.10%	1.24	1.41

Table 4 Callback Rates by City (Overall, and by Gender and Attractiveness)

	Nanjing	Shenzhen	Shanghai	Beijing	Wuhan	Chengdu
Overall	11.19%	12.30%	12.62%	11.09%	12.70%	9.95%
Male	10.17%	11.61%	12.20%	10.86%	12.30%	9.42%
Female	12.20%	13.00%	13.05%	11.31%	13.10%	10.47%
Ratio	0.83	0.89	0.93	0.96	0.94	0.90
Attractive	13.44%	14.48%	13.94%	11.81%	14.29%	11.66%
Unattractive	8.93%	10.12%	11.31%	10.37%	11.11%	8.23%
Ratio	1.51	1.43	1.23	1.14	1.29	1.42

Table 5 Callback Rates by Occupation (Overall, Gender, and by Attractiveness)

	Accountant	Sales Rep	Admin Assistant	Software Engineer
Overall	8.32%	15.13%	7.56%	15.56%
Male	7.47%	14.32%	5.42%	17.16%
Female	9.16%	15.94%	9.69%	13.96%
Ratio	0.82	0.90	0.56	1.23
Attractive	9.42%	17.03%	9.49%	17.13%
Unattractive	7.21%	13.23%	5.62%	13.99%
Ratio	1.31	1.29	1.69	1.22

Table 6 Callback Rates by Occupation (Gender and Attractiveness Interacted)

	All occupations	Accountant	Sales Rep	Admin Assistant	Software Engineer
Attractive Male	12.27%	8.33%	16.01%	6.22%	18.52%
Attractive Female	14.27%	10.52%	18.06%	12.76%	15.74%
Unattractive Male	9.92%	6.61%	12.63%	4.63%	15.81%
Unattractive Female	10.10%	7.80%	13.82%	6.61%	12.17%

Table 7 Average Marginal Effects on Predictions of Callback

Probit Statistics:			
Number of observations		24192	
Wald chi2(18)		346.37	
Prob > chi2		0.0000	
Log pseudolikelihood		-8472.520	
Actual rate of callbacks		0.116	
Marginal Effects	dy/dx	z	P> z
Indicator of Advertised Occupation:			
sales representative	0.068	9.230	0.000
administrative assistant	-0.010	-1.320	0.186
software engineer	0.072	9.670	0.000
(base case: accountant)			
Indicator of Job Location:			
Shenzhen	0.012	1.320	0.187
Shanghai	0.019	2.090	0.037
Beijing	0.000	-0.040	0.966
Wuhan	0.015	1.640	0.100
Chengdu	-0.013	-1.360	0.173
(base case: Nanjing)			
Indicator of Applicant's Photo:			
attractive female	0.019	3.920	0.000
unattractive male	-0.024	-4.850	0.000
unattractive female	-0.022	-4.090	0.000
(base case: attractive male)			
Indicator of Advertised Firm Type:			
joint venture firm	-0.017	-1.650	0.100
foreign-owned firm	-0.020	-2.560	0.011
state-owned firm	-0.017	-1.190	0.234
unknown ownership	0.018	1.990	0.046
(base case: privately-owned firm)			
Indicator of Advertised Firm Size:			
small firm (<50)	-0.008	-1.270	0.203
large firm (>500)	0.004	0.640	0.519
unknown size	0.017	0.460	0.646
(base case: medium size firm 50 to 500 employees)			

Table 8 Marginal Effects on Prediction of Callbacks, Accountants

Probit Statistics:			
Number of observations		6048	
Wald chi2(15)		27.43	
Prob > chi2		0.0254	
Log pseudolikelihood		-1719.119	
Actual rate of callbacks		0.083	
Marginal Effects	dy/dx	z	P> z
Indicator of Job Location:			
Shenzhen	-0.019	-1.220	0.222
Shanghai	-0.009	-0.610	0.544
Beijing	-0.019	-1.240	0.216
Wuhan	-0.004	-0.280	0.782
Chengdu	0.000	0.010	0.993
(base case: Nanjing)			
Indicator of Applicant's Photo:			
attractive female	0.019	2.230	0.026
unattractive male	-0.019	-2.000	0.046
unattractive female	-0.006	-0.610	0.544
(base case: attractive male)			
Indicator of Advertised Firm Type:			
joint venture firm	-0.011	-0.620	0.534
foreign-owned firm	-0.007	-0.550	0.581
state-owned firm	-0.009	-0.440	0.658
unknown ownership	0.020	1.330	0.183
(base case: privately-owned firm)			
Indicator of Advertised Firm Size:			
small firm (<50)	-0.012	-0.860	0.390
large firm (>500)	0.000	-0.020	0.986
unknown size	-0.042	-0.740	0.459
(base case: medium size firm 50 to 500 employees)			

Table 9 Marginal Effects on Prediction of Callbacks, Sales Representative

Probit Statistics:			
Number of observations		6048	
Wald chi2(15)		60.50	
Prob > chi2		0.0000	
Log pseudolikelihood		-2531.701	
Actual rate of callbacks		0.151	
Marginal Effects	dy/dx	z	P> z
Indicator of Job Location:			
Shenzhen	0.086	4.210	0.000
Shanghai	0.028	1.290	0.196
Beijing	0.062	3.020	0.003
Wuhan	0.057	2.790	0.005
Chengdu	0.025	1.170	0.243
(base case: Nanjing)			
Indicator of Applicant's Photo:			
attractive female	0.018	1.680	0.093
unattractive male	-0.036	-3.180	0.001
unattractive female	-0.022	-1.910	0.056
(base case: attractive male)			
Indicator of Advertised Firm Type:			
joint venture firm	-0.016	-0.690	0.492
foreign-owned firm	-0.045	-2.430	0.015
state-owned firm	-0.069	-1.380	0.167
unknown ownership	0.000	0.000	0.998
(base case: privately-owned firm)			
Indicator of Advertised Firm Size:			
small firm (<50)	0.018	1.350	0.178
large firm (>500)	0.021	1.190	0.234
unknown size	-0.055	-0.710	0.477
(base case: medium size firm 50 to 500 employees)			

Table 10 Marginal Effects on Prediction of Callbacks, Administrative Assistants

Probit Statistics:			
Number of observations		6048	
Wald chi2(15)		117.63	
Prob > chi2		0.0000	
Log pseudolikelihood		-1567.061	
Actual rate of callbacks		0.076	
Marginal Effects	dy/dx	z	P> z
Indicator of Job Location:			
Shenzhen	0.023	1.550	0.122
Shanghai	0.031	2.190	0.029
Beijing	0.007	0.470	0.639
Wuhan	0.013	0.910	0.364
Chengdu	-0.002	-0.140	0.890
(base case: Nanjing)			
Indicator of Applicant's Photo:			
attractive female	0.056	6.750	0.000
unattractive male	-0.020	-2.180	0.029
unattractive female	0.005	0.530	0.595
(base case: attractive male)			
Indicator of Advertised Firm Type:			
joint venture firm	-0.007	-0.450	0.656
foreign-owned firm	-0.019	-1.480	0.140
state-owned firm	0.021	0.930	0.352
unknown ownership	0.027	2.100	0.036
(base case: privately-owned firm)			
Indicator of Advertised Firm Size:			
small firm (<50)	-0.017	-1.500	0.134
large firm (>500)	0.003	0.290	0.770
unknown size	0.020	0.400	0.692
(base case: medium size firm 50 to 500 employees)			

Table 11 Marginal Effects on Prediction of Callbacks, Software Engineer

Probit Statistics:			
Number of observations		6048	
Wald chi2(15)		66.66	
Prob > chi2		0.0000	
Log pseudolikelihood		-2570.344	
Actual rate of callbacks		0.156	
Marginal Effects	dy/dx	z	P> z
Indicator of Job Location:			
Shenzhen	-0.040	-1.890	0.059
Shanghai	0.025	1.200	0.229
Beijing	-0.046	-2.190	0.028
Wuhan	0.002	0.080	0.940
Chengdu	-0.071	-3.320	0.001
(base case: Nanjing)			
Indicator of Applicant's Photo:			
attractive female	-0.026	-2.350	0.019
unattractive male	-0.025	-2.420	0.016
unattractive female	-0.065	-5.460	0.000
(base case: attractive male)			
Indicator of Advertised Firm Type:			
joint venture firm	-0.033	-1.330	0.184
foreign-owned firm	-0.012	-0.650	0.518
state-owned firm	-0.040	-1.360	0.172
unknown ownership	0.023	1.080	0.281
(base case: privately-owned firm)			
Indicator of Advertised Firm Size:			
small firm (<50)	-0.028	-1.840	0.066
large firm (>500)	0.001	0.090	0.930
unknown size	0.113	1.100	0.273
(base case: medium size firm 50 to 500 employees)			