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**Conference Paper**

## Can Group Identity Explain Gender Gap in Recruitment Process?

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# Can Group Identity Explain the Gender Gap in the Recruitment Process?

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Working Paper

## Abstract

*Despite evidence of the gender wage gap in favor of men, aggregate findings from correspondence studies show that women are more likely than men to be invited for a job interview (Gornall and Strebulaev, 2018). We hypothesize that the predominance of women among recruiters may explain this somewhat puzzling finding; recruiters may favor applicants of their own gender. We use the data from a large-scale correspondence study in Russia to test this hypothesis. As expected, we find that female applicants are more likely to receive callbacks for interview. We also see that in our sample the majority of contact persons responsible for the recruitment process are female. More importantly, we find that if recruiter and applicant are of the same gender, then the likelihood that the applicant will be invited for an interview increases. These findings taken together point out the gender favoritism at the hiring stage in the labor market.*

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## 1. Introduction

Women tend to earn less on average compared to men (Altonji and Blank, 1999; Weichselbaumer and Winter-Ebmer, 2005). This could be due to discrimination against women in the labor market. However, correspondence studies investigating discrimination at the hiring stage show that on average female candidates are more likely to be invited for interviews than men (Riach and Rich, 2002; Carlsson, 2011). The extent of the observed gender gap at the application stage varies by country, industry and occupation under study<sup>1</sup> (Neumark et al., 1996; Petit, 2004; Booth and Leigh, 2010; Weichselbaumer, 2004; Bertrandt and Duflo, 2016; Carlsson, 2011, Balkan and Cilasum, 2018; Albert et al. 2011; Gornall and Strebulaev, 2018) but the aggregate evidence highlights a rather surprising pattern of positive discrimination of women at the application stage of the hiring process (Albert et al. 2011; Gornall and Strebulaev, 2018; Booth and Leith, 2010; Birkelund et al., 2019)

Different theories have been proposed to explain this pattern. One notion is that it is due to occupational segregation in the labor market. The experimental evidence shows that discrimination of women is different depending if the professions are considered to be stereotypically male- or female-dominated (Carlsson, 2011; Riach and Rich, 2006; Rich, 2014). Another theory emphasizes the role of human capital and self-censorship among women (Petit, 2007). Female candidates tend to apply for low skill positions and can be less ambitious than male candidates. In turn, this might explain the high rate of women being invited to take up low prestige positions, and lower rates of females hirings for high prestige positions (Petit, 2007; Neumark et al., 1996; Carlsson, 2011).

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<sup>1</sup> A series of correspondence and meta-analysis studies provide evidence of a gender gap at the job application stage varying between 0.58 and 3.15. In most studies the average ratio is about 1.2: (1.34) Albert et al. 2011; (1.3) Gornall and Strebulaev, 2018; (1.28) Booth and Leith, 2010; (1.26) Birkelund et al., 2019.

Gender differences in candidates' preferences may also affect the gender imbalance at the application stage. Women and men exhibit different levels of altruism, trust, fairness and envy (Azmat and Petrongolo, 2014). However, Weichselbaumer's (2004) correspondence study does not support this phenomenon and shows rather that neither personal traits nor productivity have an influence on the gender bias in the labor market. Thus, there is either a lack of empirical evidence to support these various theories, or they fail when tested to explain the aggregate pattern of the positive treatment of female candidates at the job application stage compared to male candidates.

We investigate this further by testing an alternative explanation for the gender imbalance at the recruitment stage. We conjecture that the phenomenon of female candidates being more likely to be invited for interviews can be explained in two ways. First, most recruiters are female - in many countries over 70 percent of HR positions are occupied by women (Reichel et al., 2010).<sup>2</sup> Second, people tend to treat members of their gender group more favorably (e.g., Charness et al., 2007; Chen and Li, 2009) according to group identity theory (Akerlof and Kranton, 2000; Tajfel and Turner, 1979). Thus, if recruiters more often call back candidates of the same gender as themselves, then given that most recruiters are women callback rates will be higher for female than for male candidates on average.

We test this conjecture using data from a large correspondence study we conducted in the context of the Russian labor market. We applied for large numbers of vacancies using fictitious resumes with randomly varied characteristics and tracked callback rates which we assumed were an indication of interest in the applicant. As part of our randomization strategy we alternated randomly between female and male applicant names. In line with previous studies

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<sup>2</sup> See US Bureau of Labor Statistics (BLS) for details of the US labor market available at <https://www.bls.gov/cps/cpsaat39.htm>

using large samples (Albert et al. 2011; Gornall and Strebulaev, 2018; Booth and Leith, 2010; Birkelund et al., 2019), we found that female applicants were more likely to be invited for an interview than male applicants.

If a job advertisement included a contact name (recruiter) this allowed us to identify the recruiter's gender since in the Russian language most female and male names (and surnames and patronymics) have specific feminine or masculine forms. As expected, most of the known contacts in our sample were female. Thus, we can test the conjecture that if the applicant is of the same gender as the recruiter contact person then he or she will be more likely to receive a callback compared to an applicant of the opposite gender.

We found that if the recruiter contact was female then female applicants were more likely to be called back for interview. This pattern holds also if the recruiter contact is male (i.e. males are more likely to be interviewed). More generally, we show that candidates of the same gender as the contact person are more likely to be invited for an interview compared to applicants of a different gender from the recruiter contact person. This explains the somewhat puzzling finding of positive discrimination of females in the labor market: in-group favoritism and predominance of females in recruiter positions explain the aggregate pattern of positive treatment of female compared to male candidates at the application stage.

## 2. Related Literature

Women tend to earn less compared to men across the world and in most countries (ILO, 2018). Discrimination in the labor market is a common reason that is put forward to explain this pattern. Indeed, many correspondence studies show that women receive fewer invitations - callbacks - for job interviews compared to men in different circumstances (Petit, 2007; Jackson, 2009; Capéau et al., 2012; Bailey et al., 2013; Bursell, 2014; Baert et al., 2016). However, literature based on correspondence studies tends to gravitate to counter-intuitive observation: On average women are more likely to be invited for the interview (Albert et al. 2011; Bertrand and Duflo, 2016; Gornall and Strebulaev, 2018; Booth and Leith, 2010; Birkelund et al., 2019).

One reason for the heterogeneity of results in the literature can stem from the fact that the level of gender discrimination is relatively small, e.g. compared to racial discrimination. As the sample variability leads to different and often insignificant results, one needs large samples to detect the genuine effect. Indeed, Gornall and Strebulaev (2018) in the largest correspondence study conducted show that applicants of female entrepreneurs are 9% more likely to generate interest compared to male entrepreneurs. To relate this result to previous literature, Gornall and Strebulaev (2018) provide quantitative synthesis of 22 correspondence studies finding a positive bias of 13% in favor of females when one weights relative callback ratio by the sample size of the studies.

Gornall and Strebulaev (2018) built their analysis on the studies in U.S, Canada, and Europe that are mentioned in Riach and Rich (2002), Bertrand and Duflo (2016), or Baert (2018) focusing on the relationship between the relative callback rate -relative ratio- and sample size. To be sure about these results and relate our main result of this paper to previous findings, we take a different path by providing a systematic meta-analysis of the correspondence studies that includes experiments within the period from 2005 to 2017 (including the year when our

correspondence study was conducted). We exhaustively searched for both published and preprints of correspondence experiments that randomize the gender of applicants irrespective of the place of study.<sup>3</sup> Moreover, we directly collected the number of applications sent and the number of callbacks per gender that allows making a reliable estimate of the relative callback ratio and odds ratio.<sup>4</sup>

Our dataset consists of 45 correspondence studies (not including our study) that randomize candidates' gender of applicant K, and an overall sample size N of 157 836 resumes sent with overall 28 192 callbacks. We want to understand how likely female candidates will be invited to the interview compared to male applicants. We use a random-effects meta-analysis model to combine the results from all these studies finding that the risk ratio that women are invited for the interview compared to men is equal to 1.11 (95% CI: 1.06; 1.16,  $p < 0.0001$ ) or the odds ratio is 1.14 (95% CI: 1.07; 1.21,  $p < 0.0001$ ).<sup>5</sup> That is women are statistically significantly more likely

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<sup>3</sup>As Gornall and Strebulaev (2018) we focused on the ethnic majority applications to make studies comparable and relate to results of our correspondence study. We used previous reviews of correspondence studies (Baert, 2018; Bertrand and Duflo, 2016; Gornall and Strebulaev, 2018; Riach and Rich, 2002) as starting point of the literature search. After making initial list based on previous reviews, we search exhaustively using google scholar other studies that use word “correspondence study”, “discrimination”, “experiment”, “field experiment”, “labor market”, and searched through references within the papers until we could not find any other study that use correspondence method to assess discrimination. We found 125 correspondence studies made publicly available within timeframe of 2005-2017 that result in 45 studies we can use for meta-analysis estimate of gender discrimination. We exclude the rest of the studies based on the following exclusion criteria: the gender of applicant is not randomized; the study uses only male or only female application; the study does not report gender difference or gender difference reported only in regression estimates and no data publicly available or researchers did not share the data after we contacted them. The full list of included papers can be found in the Appendix A.

<sup>4</sup>Fliess and Berlin (2009) show that odds ratio is preferable for the meta-analysis of dichotomous variables.

<sup>5</sup>The results barely change if we use fixed-effects meta-analysis estimates or using trim fill estimates aim to account for potentially missing studies in meta-analysis (Duval and Tweedie, 2000). In case of fixed effect estimate the odds ratio is 1.14 (95% CI: 1.11; 1.18,  $p < 0.0001$ ) and random effects model that account for missing values using trim fill give odds ratio estimate 1.15 (95% CI: 1.08; 1.23,  $p < 0.0001$ ). If we include our study in meta-analysis, we get the odds ratio of 1.14 (95% CI: 1.08; 1.22,  $p < 0.0001$ ).

to be invited for the interview, and the positive bias towards women is relatively small but considerable.

Having established that females are more likely to be invited for the interview, we briefly overview the theories that aim to explain it. Gender-based labor segregation theory is commonly used to explain the differential treatment of men and women (Carlsson, 2011; Riach and Rich, 2006; Rich, 2014), but it is hard to reconcile with positive treatment of women compared to men at the hiring stage on average across occupations. Alternatively, women might apply for the less prestigious job due to a higher level of self-censorship, thus, employees positively react to their application expecting higher productivity (Petit, 2007). Similarly, gender differences in preferences can explain this pattern (Azmat and Petrongolo, 2014), but Weichselbaumer (2004) provides evidence against this. Finally, one can assume that in-group favoritism plays a role in this case (e.g., Charness et al., 2007; Chen and Li, 2009): A recruiter will treat favorably the applicant of the same gender. However, previous studies that aim to test it in correspondence experiments find either no significant interaction effect of the gender of the applicant and recruiter (Booth and Leigh, 2010; Carlsson, 2011), or provide evidence that only male recruiters seem to favor male applicants in the relatively homogenous skill level of occupations such as teacher, auditor, or chef (Erlandsson, 2019). To sum up, the fact that on average women worldwide are more positively treated compared to men at the application stage is relatively new. Thus, not many theories that can explain this aggregated pattern have empirical support.



### 3. Method

We use data from a correspondence experiment on self-employment conducted in the context of the Russian labor market in 2017 (Asanov and Mavlikeeva, 2020). In the period of March to August 2017 we sent over 8,600 fictitious resumes in response to real job openings in Moscow and Saint Petersburg, to study the treatment of the self-employed compared to wage earners, and tracked the interest in the candidate.

The experiment aimed to assess the influence of previous experience of self-employment on the candidate's chances of being hired in the wage labor market. To study this phenomenon, we sent fictitious resumes, varying whether applicants were wage earners or the self-employed. Second, in half of resumes we included a motivation section where the applicant justified the search for the new position. We applied a full-factorial design by generating four main CV types. All four types were sent to apply for every job offer, in random order and with time lags of about 10 hours.

Among other applicant characteristics, we varied applicant gender randomly. Depending on the gender assigned by this process, a computer program generated an appropriate (male or female) applicant name. It used the most popular Russian first names, patronymics and surnames to generate the applicant's full name.<sup>6</sup> Thus, full names were randomly created, but matched the focal gender.

The computer program was developed to ensure random generation of CV characteristics in line with the experimental design. By generating the applicants' CVs, the program helped to ensure external validity. The resume was created by selecting random sections from a set of CV

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<sup>6</sup> According to the Civil Registration Database  
<https://web.archive.org/web/20161119150927/https://zags.mos.ru/stat/imena/>

sections in a database, which included sections on job description, based on an analysis of a large set of real resumes posted online in the Russian labor market. Job descriptions included sets of sections for every occupation in our analysis: duties, education, further training, foreign languages, soft skills, and professional skills. The program also randomly assigned ages to applicants (between 27 and 29 years old) and generated appropriate dates of birth. The randomly generated number of years of professional experience was between two and five. Each resume was based on a randomly chosen design template. The completed resumes were accompanied by a cover letter selected randomly from among six versions, to apply for the job position.

The computer program contains a form for every vacancy, to be completed by the experimenter before the application is sent. It refers to information on the job offer including advertised job position, web page address of the advertisement and, if included, contact person for submission of the application. This last piece of information allows us to identify the gender of the person processing of the job applications and their subsequent gender preferences for callbacks.

The advertisements covered occupations where both self-employment and wage employment were common in the three industries of Finance, Information Technology and Marketing. We applied for both high-skill and low-skill positions in these industries, based on the ISCO (International Standard Classification of Occupations) codes: skill level 4 (high) and skill level 2 (low). The position applied for included: at skill level 4 - Finance Managers (1211), Advertising and Public Relations Managers (1222), Information and Communications Technology Services Managers (1330); and at skill level 2: Accounting Associate Professionals

(3313); Conference and Event Planners (3332); Information and Communications Technology Operations Technicians (3511).<sup>7</sup>

In the job application process in Russia candidates are not required initially to send any documents or certificates. In the first stage of a job application, candidates generally submit a CV which includes only the telephone number and e-mail address; in Russia, it is not common practice to include a postal address. These characteristics are advantageous for correspondence studies since we did not get involved in providing fictitious certificates and postal addresses.

To track callbacks, we allocated a mailbox and phone number to every resume type. We interpreted callback (phone call) as interest in the candidate. We analysed the texts of emails to identify and categorize the reason for the contact. Thus, our main outcome is callback – a reply to the application, from the recruiter, by phone or email, to invite the applicant for interview or request additional information. In response to all calls and emails from recruiters, we called back and rejected the invitation so that real applicants would not lose the opportunity to be contacted.

#### **4. Sample Characteristics**

We sent 8,651 fictitious resumes in response to real job openings. In a few cases the computer program failed to send all four types of resume – we excluded these cases from our analysis. Our sample included 8,328 resumes sent in response to 2,082 advertised vacancies. The main results of our analysis of callback rates were unchanged with the inclusion of those cases (mentioned above) where the computer program failed to send all four resume types.

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<sup>7</sup> ISCO 2008 codes in brackets

**Table 1A:** Summary Statistics of Resumes

<i>Summary Statistics of the Main Sample (8328 resumes)</i>		
	Female Applicant	Male Applicant
N of Resumes	4168	4160
Wage Earners (%)	50.7	49.3
Self-Employed (%)	49.2	50.7
Motivation Section (% percent)	49.0	51.0
Age in Years	28.42 (0.58)	28.39 (0.59)
Work Experience in Months	52.96 (11.30)	52.74 (11.29)
Industry (%)		
<i>Finance</i>	35	35.8
Finance Managers	8.44	8.90
Accounting Associate Professionals	9.01	9.01
<i>IT</i>	35	33.7
Information and Communications Technology Services Managers	8.36	8.12
Information and Communications Technology Operations Technicians	9.19	8.73
<i>Marketing</i>	30	30.4
Advertising and Public Relations Managers	7.58	7.36
Conference and Event Planners	7.48	7.84

*Notes:* The table reports the means for the resume characteristics listed on the left. Standard deviations for the continuous variables in parentheses.

Applicant genders were assigned randomly: 4,168 resumes were for female applicants and 4,160 were for male applicants. Table 1 *Panel A* shows the balance in the resume characteristics in the main sample. All applicant characteristics are balanced. The number of applications (resumes) is also balanced across the industries.

As already mentioned, if the recruiter contact name was included in the job advertisement, we recorded it. Some 23 percent of the advertisements included this information and the sample obtained to analyse recruiters' gender preferences includes 1,980 resumes.

We exploit a distinctive features of the Russian language that female names and, also, surnames and patronymics generally have an "a" or "я" (ja) ending. This allowed us to identify the gender of most of the contact persons. In seven cases of uncommon names, we coded them manually. In line with the literature, we found that the majority - 75.8 percent - of recruiter contact persons were female.

*Table 1 Panel B* reports summary statistics for the resumes with known contact person names. In this sample, resumes characteristics are balanced across gender, work experience and presence of a motivation section. However, compared to the main sample, industries are not balanced: Finance accounted for the majority of applications, followed by information technology and marketing.

**Table 1B:** Summary Statistics of Resumes

<i>Summary Statistics of the Sample of Analysis (1980 resumes)</i>		
	Female Applicant	Male Applicant
N of Resumes	978	1002
Wage Earners (%)	51.4	48.6
Self-Employed (%)	47.4	52.6
Motivation Section (%)	50.3	49.7
Age in Years	28.45 (0.79)	28.42 (0.81)
Work Experience in Months	53.28 (15.40)	52.94 (15.22)
Industry (%)		
Finance	53.37	53.69
Finance Managers	8.84	8.94
Accounting Associate Professionals	17.53	18.23
IT	25.77	27.15
Information and Communications Technology Services Managers	3.28	3.38
Information and Communications Technology Operations Technicians	9.44	10.35
Marketing	20.86	19.16
Advertising and Public Relations Managers	5.96	5.15
Conference and Event Planners	4.34	4.55

*Notes:* The table reports means for the resume characteristics listed on the left. Standard deviations for the continuous variables in parentheses.

## 5. Descriptive Results

Next, we analyse the job application process: callback rates for applicants with different characteristics. *Table 2* reports the main results. In line with the literature (Bertrandt and Duflo, 2016; Gornall and Strebulaev, 2018; Albert et al., 2011), we find a favorable attitude towards female compared to male applicants, in the application process based both on all resumes (*Table 2 Panel A*: ratio 1.48) and resumes responding to advertisements that include the name of a contact person (*Table 2 Panel B*: ratio 1.47). This effect was observed for both candidates with self-employment and wage-earning experience.

It should be noted that the callback rate related to ads that include the name of a contact person is higher than the overall callback rate: 11 percent versus 6.95 percent. We take this into account in the subsequent regression analysis.

**Table 2A:** Callback Rate

<i>Callback Rate for All Sent Resumes</i>			
	Female Applicant	Male Applicant	Female to Male Ratio
Overall	8.30	5.60	<b>1.48</b>
N of Resumes	4168	4160	
Wage Earners	8.7	6.29	<b>1.43</b>
N of Resumes	2114	2050	
Self-Employed	7.89	4.93	<b>1.56</b>
N of Resumes	2054	2110	

More important, we find evidence of preferential treatment for members of the same gender as the recruiter contact. *Table 2 Panel B* shows that if the contact person is female, she is more likely to call back a female applicant (ratio 1.89), whereas if the contact is male there is a higher likelihood that a male applicant will be called for interview (ratio 1.20). This pattern holds if the data are broken down by applicant's employment status: a self-employed or a wage earner. The more favorable treatment of members of the same gender is in line with the idea of in-group favoritism in experimental studies in the field of psychology (Balliet et al., 2014).

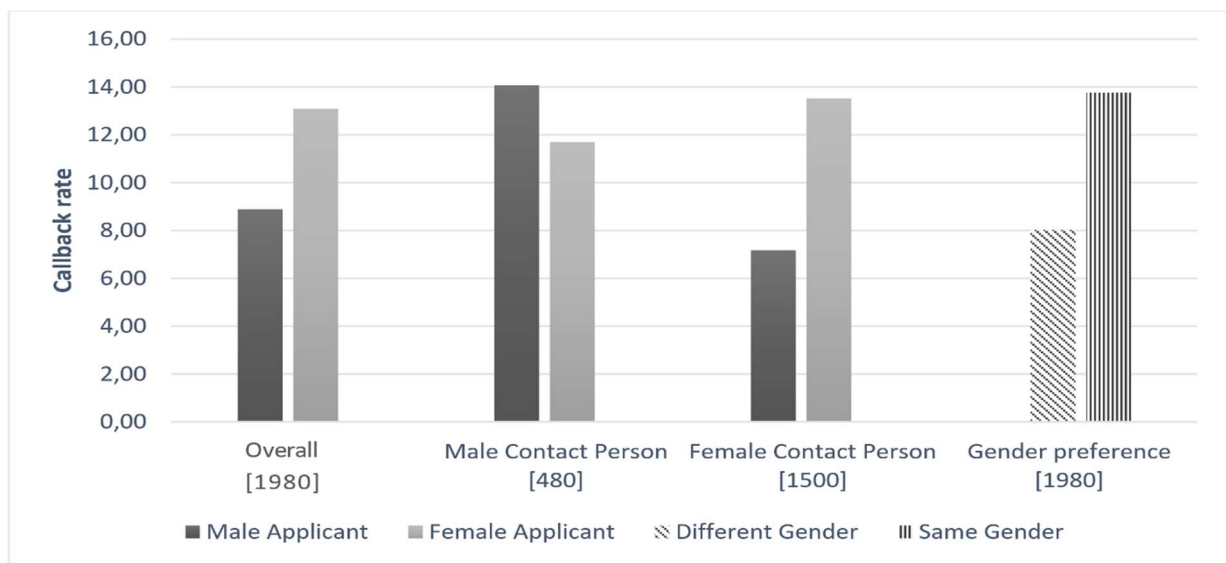
**Table 2B:** Callback Rate

<i>Callback Rate for Applications with Contact Persons' Data</i>			
	Female Applicant	Male Applicant	Female to Male Ratio (Male to Female Ratio)
Overall	13.09	8.88	<b>1.47</b>
Female Contact Person	13.52	7.17	<b>1.89</b>
Male Contact Person	11.69	14.06	<b>0.83 (1.20)</b>
N of Resumes	978	1002	
<i>Wage Earners:</i>	14.54	9.56	<b>1.52</b>
Female Contact Person	15.42	7.20	<b>2.31</b>
Male Contact Person	11.67	16.67	<b>0.70 (1.43)</b>
N of Resumes	509	481	
<i>Self-Employed:</i>	11.51	8.25	<b>1.39</b>
Female Contact Person	11.45	7.14	<b>1.46</b>
Male Contact Person	11.71	11.63	<b>0.87 (1.15)</b>
N of Resumes	469	521	



*Figure 1* depicts the general pattern of the callback distribution based on the gender characteristics of the applicant and the contact person. It shows that male applicants generally receive fewer callbacks than their female counterparts (columns 1 and 2) and that when male candidates are called back, the contact person is more likely to be a male (columns 3 and 4). Similarly, female applicants more often receive a callback if the contact person is female (see columns 5 and 6). *Figure 1* also shows the level of callbacks for candidates of the same gender as the contact and those of a different gender to the contact person (last two columns). About 63 percent of contact persons prefer to call applicants of the same gender as themselves with only 37 percent calling applicants of a different gender. We assess the significance of these results in Section 5.

**Figure 1:** Gender Preferences in Callbacks



Notes: Number of resumes is given in parentheses

## 6. Econometric analysis

To analyse whether the above results are statistically significant, we use probit regression with robust standard errors clustered at the vacancy level. First, we simply assess the effect of gender on the probability of callback, for the main sample and the gendered samples:

$$Pr(\text{Callback} = 1) = \Phi(\beta_0 + \beta_{\text{femApp}} T_{\text{femApp}} + c_i)$$

where *Callback* equals 1 if the recruiter responds via telephone or email,  $\Phi$  is the standard cumulative normal distribution,  $T_{\text{femApp}}$  equals 1 if the applicant is female and  $c_i$  is the unobserved cluster effect of the vacancy  $i$ .

*Table 3* reports the estimations. Columns (1) to (4) present the results of the gender effect on callback rates for the main sample (8328 resumes). The regression analysis supports the descriptive results presented earlier. We see that candidate gender has a statistically significant effect on the probability of being called back (columns (1) and (2)).

*Table 3* column 1 shows that female applicants are treated more favorably in the application stage compared to male job applicants. In column 2, we include regression estimates with a set of controls: Previous work experience (wage earner/self-employed), skill level of the position, applicant age, day of the week day and order of sending the application, whether the CV includes a motivation section and industry specific effects. The results are robust to the inclusion of these control variables.

The regressions in columns (3) and (4) include a dummy variable that equals one if the contact person name is given in the job advertisement to check whether the gender effect holds for the main sample and sample with a contact name. The gender effect remains statistically significant and the inclusion of the dummy variable for presence of the name of the contact person does not change the point estimates.

**Table 3:** Callback Rate According to the Gender and the Presence of Contact Person

	Depended Variable					
	Callback					
	Main Sample			Sample of the Analysis		
	(1)	(2)	(3)	(4)	(5)	(6)
Female	0.204***	0.200***	0.209***	0.206***	0.225***	0.202**
Applicant	(0.048)	(0.049)	(0.048)	(0.049)	(0.087)	(0.09)
Contact			0.355***	0.342***		
Person Given			(0.068)	(0.073)		
Constant	- 1.589***	- 2.086***	- 1.693***	- 2.208***	-1.348***	- 2.030***
	(0.041)	(1.166)	(0.046)	(0.169)	(0.075)	(0.334)
Number of	8328	8328	8328	8328	1980	1980
Resumes						
Controls	No	Yes	No	Yes	No	Yes

Notes: Probit regressions. Robust-clustered standard errors at the vacancy level in parentheses. The vector of controls in columns (2), (4) and (6) includes previous work experience (wage earner/self-employed), skill level of the position, applicant age, day of the week, order of sending the application, whether the CV includes a motivation section and industry specific effects. \*p<0,1; \*\*p<0.05; \*\*\*p<0,01

Columns (5) and (6) report the results for the effect of gender on the callback rate for applications where we have the name of a contact person (sample size 1980). Again, the effect is statistically significant in this sample and the magnitude of the effect is similar to that in the main sample. That is, in both samples (with and without the contact person name) female candidates are more likely to receive a callback and, since we see that the magnitude of the gender effect does not change across samples, we would suggest that the samples are comparable.

We can now assess whether female candidates are more likely to get a callback if the contact person is female. We interact the randomly assigned female status (*TfemApp*) with the dummy

variable which equals 1 if the contact person is female ( $T_{femCP}$ ) and can write the general regression as:

$$Pr(Response = 1) = \Phi(\beta_0 + \beta_{femApp}T_{femApp} + \beta_{femCP}T_{femCP} + \\ + \beta_{femApp \times femCP}T_{femApp} \times T_{femCP} + c_i)$$

**Table 4:**

	Depended Variable			
	Callback			
	(1)	(2)	(3)	(4)
Female Applicant X	0.474**	0.540***	0.493***	0.502**
Female Contact Person	(0.189)	(0.196)	(0.188)	(0.196)
Female Applicant	-0.113	- 0.183	- 0.126	- 0.152
	(0.160)	(0.166)	(0.159)	(0.166)
Female Contact Person	-0.385**	- 0.422**	- 0.431**	- 0.371**
	(0.167)	(0.179)	(0.169)	(0.173)
Constant	-1.078***	-1.748***	- 1.113***	- 1.513***
	(0.141)	(0.384)	(0.151)	(0.352)
Number of Resumes	1980	1980	1980	1980
Controls	No	Yes	No	Yes
Industry Fixed Effect	No	Yes	Yes	No

Notes: Probit regressions. Robust-clustered standard errors at vacancy level in parentheses. The vector of controls in columns 2) and (4) includes previous work experience (wage earner/self-employed), skill level of the position, applicant age, day of the week of the application, order of sending the application, whether the CV includes a motivation section. Columns (3) and (4) include controls for industry fixed effects. \*p<0,1; \*\*p<0.05; \*\*\*p<0,01

*Table 4* column 1 presents the regression results, which indicate that there is a higher possibility that the applicant will be called back if both an applicant and a contact person are of the same gender compared to if a contact person is of a different gender. The results are robust to the inclusion of control variables and to alternative specifications (see column 2, 3, and 4). It is important to note that the statistical significance and the magnitude of the effect are unaffected by the inclusion of industry dummies (see columns 2 and 3). Thus, it seems that effect is persistent across industries.

**Table 5:** Callback Rate for Applicants of the Same Gender

	Depended Variable			
	Callback			
	(1)	(2)	(3)	(4)
Applicant and Contact	0.240**	0.254**	0.251**	0.275**
Person of the same	(0.103)	(0.105)	(0.105)	(0.107)
gender				
Female Applicant	0.107	0.085	0.101	0.069
	(0.104)	(0.107)	(0.107)	(0.108)
Constant	-1.417***	-1.854***	-1.494***	-2.142***
	(0.078)	(0.304)	(0.088)	(0.330)
Number of Resumes	1980	1980	1980	1980
Controls	No	Yes	No	Yes
Industry Fixed Effect	No	No	Yes	Yes

*Notes:* Probit regressions. Robust-clustered standard errors at vacancy level in parentheses. The vector of controls in columns 2) and (4) includes previous work experience (wage earner/self-employed), skill level of the position, applicant age, day of the week of the application, order of sending the application, whether the CV includes a motivation section. Columns (3) and (4) include controls for industry fixed effects. \*p<0,1; \*\*p<0.05; \*\*\*p<0,01

Finally, we assess the chances of both male and female applicants being called back by a contact person of the same gender. We constructed a dummy variable that equals 1 if the applicant's and the recruiter contact's gender coincide: *same gender applicant and contact person*. Table 5 reports the results of this regression analysis. We find that applicants of the same gender as the contact person are statistically significantly more likely to receive a callback. The effect is robust to the inclusion of industry specific effects and the control variables. This is evidence of gender based in-group favoritism in the recruitment process.

## 7. Conclusion and Discussion

In this paper we investigated the causal link between in-group gender favoritism and a gender imbalance in the labor market. We used data from a large correspondence study in the context of Russia, involving fictitious resumes sent in response to job advertisements to study callbacks. Since, among other characteristics, we randomly varied applicant gender, we were able to investigate employers' attitudes to male and female candidates.

In line with previous findings, we obtained evidence of favorable treatment of female candidates at the callback stage. In the pooled sample for all occupations, women were more likely than men to be invited for interview (ratio 1.48). If we control for industry specific effects and other applicant characteristics, this effect persists whether the applicant is self-employed or a wage earner. We hypothesize that the effect is driven by in-group favoritism: recruiters are more likely to send invitations to interviews to applicants of the same gender as themselves. We tested this hypothesis by exploiting a distinct feature of our dataset – inclusion in the advertisement of the name of the contact person.

Most of the known contact persons in our sample, 75.8 percent, were women, in line with the prevalence in other countries of female human resources managers. More important, we found that female candidates were more likely to receive callbacks if the contact person was female with the reverse holding true for male applicants, who are more likely to be invited for interview if the contact person is male. Finally, we identified a general pattern showing that applicants are more likely to receive callbacks if they are of the same gender as the contact person. Thus, our analysis provides evidence of gender group favoritism in the labor market and, given that most human resources staff are female, this might explain the favorable treatment of females at the application stage of the recruitment process.

The limitation of this study is that not all companies provide the name of a recruiter contact person in job opening so our sample included only applications for the job advertisements which contained the recruiter contact name. We found evidence of higher callback rates if the recruiter contact was named on the advertisement, compared to the full sample. However, the regression analysis shows a statistically significant effect of the gender gap in both samples; its effect size is almost the same in both samples and is robust to controlling for the presence of a contact person's name. Second, the sample of applications involving a recruiter contact name shows imbalance across the industries considered. However, the point estimates and the statistical significance of the main results remained unchanged when we controlled for industry specific effects.

We cannot rule out the possibility that the gender gap could be caused by a gender quota policy (Azmat and Petrongolo, 2014). However, our results tend not to support this explanation. If a gender quota is responsible for positive discrimination of women in the labor market, we would observe this effect for recruiters of both genders. In our sample, female candidates had a higher probability of being invited back by female recruiters, whereas male recruiters favored

male applicants. More studies are needed to understand if observed pattern of gender group favoritism in the labor market is generalizable across contexts. For instance, one can study the same phenomena in countries with strong gender equality policy and in occupational fields where clear gender policy is present.



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## Appendix A.

### 1A. Funnel plot based on Meta-Analysis

**Figure 2:** Funnel plot of risk ratio (left) and odds ratio (right) of callback for female compared to male applicants.

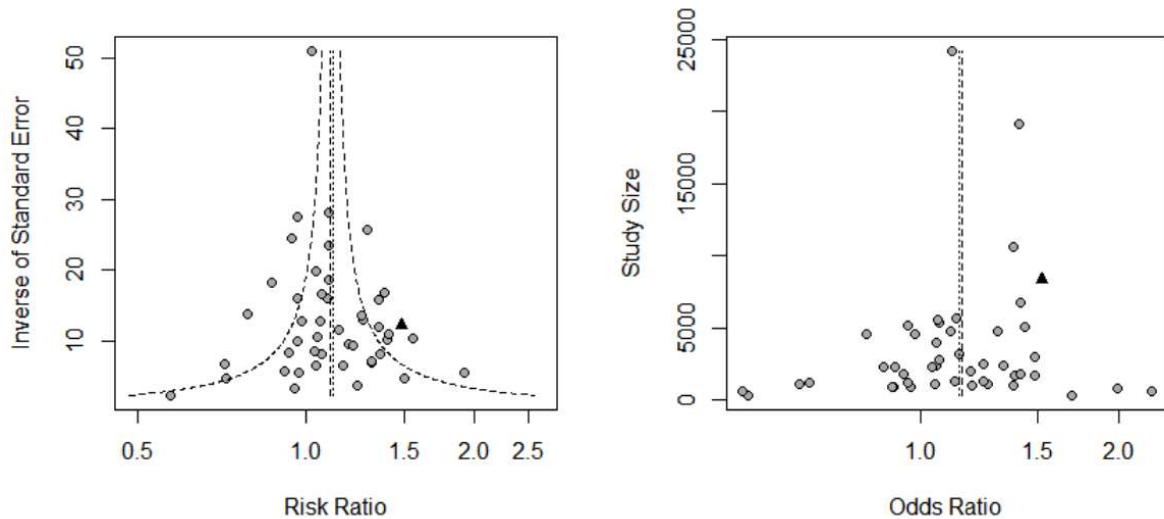


Figure 2 depicts the distribution of risk ratio or odds ratio to receive a callback for female applicants compared to male applicants. Each dot represents estimate of this effect from each individual study included in our meta-analysis (45 studies). The black triangle is the estimate from our study reported in the present paper. As funnel plot can give different impression on the distribution of effect depending on the scale, we report both risk ratio against inverse of standard error of the study and odds ratio against sample size of the study (number of sent applications). One can see substantial heterogeneity of the distribution of effects, but they are centered to the right of 1 (equal chance) meaning that female applicant is more likely to receive the callback compared to men.

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