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Anonymous job applications of fresh Ph.D. economists

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ABSTRACT

This paper analyzes anonymous job applications of Ph.D. economists in the academic job market. We use data on interview invitations from a randomized experiment at a European-based research institution. Results show that the underrepresented gender was hurt by anonymous applications.

1. Introduction

Firms should hire the most productive workers—discrimination is costly. However, empirical studies document substantial discrimination in hiring (e.g. Bertrand and Mullainathan, 2004; Carlsson and Rooth, 2007). This market failure calls for policy interventions, among which anonymous job applications gain popularity. Their intuition is straightforward: Removing information about characteristics employers may discriminate against should reduce or even eliminate discrimination. Several European countries have recently conducted experiments with this approach. Available results are encouraging and indicate that positive effects for minority groups can materialize (e.g., Åslund and Nordström Skans, 2012; Krause et al., 2012).

This paper analyzes the effects of anonymous job applications in a particular labor market. We use data on interview invitations from a randomized experiment. Participants are economists applying at a European-based economic research institution for a post-doctoral position. Because of random assignment, we can rule out any selection into treatment status. Our paper therefore adds to the literature on anonymous job applications and to the literature on the annual job market.

2. The job market for Ph.D. economists

The annual job market for Ph.D. economists is exceptionally organized. Mainly academic institutions, but also government agencies and private firms stand on the demand side. The screening process is an annual three-step procedure.

The first step is in early fall when vacancies are posted. Candidates send their applications to potential employers, who then decide about interview invitations. The second stage takes place at the Allied Social Science Association (ASSA) meetings in January, where candidates and employers meet for interviews. In a third step, the most convincing candidates visit the institutions between January and March. Job offers are also communicated during this period. Candidates and institutions from outside the United States also participate in this market.

The literature on the annual job market is mainly concerned with determinants of the screening process. Professional signals are identified as most important determinants of interview and hiring decisions. For example, the number of publications positively affects the number of interviews and site visits (Taube, 1987; Carson and Navarro, 1988; List, 2000). Ph.D. economists from higher-ranked departments tend to have more interviews and job offers (Stock et al., 2000). Reference letters from eminent economists increase the number of interview invitations (List, 2000, 2001). On the demand side, the higher employers are ranked, the more likely are applicants to accept their job offer (Barbezat, 1992; Stock et al., 2000).

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Table 1
Descriptive statistics.
Source: Own experimental data.

	Standard	Anonymous	t-statistics
Interview invitation	0.244	0.171	0.811
	(0.435)	(0.381)	
Female	0.341	0.366	−0.228
	(0.480)	(0.488)	
Non-Western origin	0.293	0.268	0.234
	(0.461)	(0.449)	
Age	30.78	29.95	1.269
	(3.158)	(2.747)	
Number of papers	4.366	4.610	−0.354
	(3.352)	(2.862)	
Number of publications in A/A+ journals	0.073	0.195	−1.266
	(0.461)	(0.511)	
Ph.D. from top 20 university	0.171	0.293	−1.306
	(0.381)	(0.461)	
Years to complete Ph.D.	5.000	4.707	1.080
	(1.285)	(1.167)	
Ph.D. at time of application	0.146	0.171	−0.299
	(0.358)	(0.381)	
Work experience	0.122	0.049	1.181
	(0.331)	(0.218)	
Experience in institution's fields of specialization	0.756	0.634	1.195
	(0.068)	(0.076)	
Number of observations	41	41	

Notes: standard deviations in parentheses. Non-Western origin is defined as having citizenship from an African, Asian, Latin American or Eastern European country. A/A+ journals are defined according to the *Handelsblatt* journal ranking. Top universities are defined according to the *RePEc* ranking (July 2011). * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.

However, some studies suggest that gender, age and ethnic background influence the invitation probability (e.g. List, 2001). This gives rise to the question whether such different treatments are present when anonymous job applications are introduced.

3. Experiment and sample

Our experiment took place at a European-based economic research institution during the annual job market 2010/2011. In total, 148 applications were screened and 26 candidates were invited for interviews at the ASSA meetings.

Because of data protection laws, our sample decreases to 96 individuals. Participants in the experiment have to give permission to use their data, and we electronically asked them to do so. The response rate of about 65% appears reasonable, in particular when considering the time lag of about four months between application submission and request for permission. We are not aware of any reason why this procedure results in a selective sample. For example, our outcome of interest appears not related to individual responses. Out of 26 candidates who received an interview invitation, 6 applicants did not give permission. Data protection laws prevent us to analyze the issue of selective response in more detail. Our final sample consists of 82 individuals when we exclude observations with missing information about age and citizenship.

Applicants were not aware of the experiment. Applications were submitted as usual and no specific requirements were imposed. After the application deadline had expired, treatment status was randomly assigned. If included in the treatment group, name, contact details, age, nationality, gender and any other indications of the candidate's identity were overwritten with correction fluid.

Otherwise, the screening process for interview invitations was conducted as in previous years by two members of the institution's experienced hiring committee. Both are male, of European origin and senior researchers involved for years in hiring decisions. They reviewed both standard and anonymous applications. While they were aware of the experiment, they were involved neither in its design nor in the analysis of the data. The preparation of the material and an imposed strong time-pressure to review the applications have left only a few possibilities to identify the applicants. Both reviewers are experienced researchers and interviewers, open to experiments and monitoring. Also in previous traditional recruitments, invitation decisions were typically reviewed by a different member of the hiring committee. Hence, the reviewers were unlikely to react to the experimental situation. According to the recruiters, a maximum of four to six positions could be filled.

Table 1 displays descriptive statistics for the two groups with anonymous and standard applications. The randomization appears successful as any differences are insignificant. About 20% receive an interview invitation. About one third are female, the average age is around 30 years, and roughly 30% have a non-Western background. Applicants have written between four and five papers, of which less than one is published in A/A+ journals. About 25% receive their Ph.D. degree from top 20 departments. Applicants need about five years to complete their Ph.D. and less than 20% already hold a Ph.D. degree when they apply. Few applicants have work experience outside academia. About 70% have experience in the institution's fields of specialization.[1]

The distribution of characteristics is similar to related studies. The slightly larger fraction of women in our sample is likely related to the increasing number of female economists over time (most other studies use data from more than ten years ago). The fraction of applicants from top 20 departments may appear relatively small. But given that most of these departments are based in the United States, and that most applicants receiving their Ph.D. in the United States apply in this region, applicants from these departments should appear more often in North American data.

[1] Results are similar when excluding 25 applicants without experience in these fields.

Table 2
Probit regressions.
Source: Own experimental data.

	(1)	(2)	(3)	(4)
Anonymous	−0.073	−0.056	−0.029	0.124
	(0.089)	(0.089)	(0.086)	(0.104)
Female		0.117	0.129	0.297***
		(0.086)	(0.082)	(0.107)
Anonymous × Female				−0.383***
				(0.136)
Non-Western origin		−0.020	−0.030	−0.007
		(0.090)	(0.089)	(0.123)
Anonymous × Non-Western origin				0.038
				(0.176)
Age		1.067**	1.158**	1.131**
		(0.477)	(0.523)	(0.480)
Age squared		−0.017**	−0.019**	−0.018**
		(0.008)	(0.009)	(0.008)
Number of publications in A/A+ journals			0.052	0.032
			(0.081)	(0.085)
Ph.D. from top 20 university			−0.092	−0.128
			(0.098)	(0.094)
Years to complete Ph.D.			−0.065*	−0.058*
			(0.034)	(0.032)
Ph.D. at time of application			−0.206	−0.248*
			(0.149)	(0.149)
Work experience			0.284**	0.250**
			(0.133)	(0.124)
Log likelihood	−41.516	−37.532	−34.619	−32.166
Number of observations	82	82	82	82

Notes: average marginal effects. Standard errors in parentheses. Dependent variable equals 1 if individual is invited.
* $p < 0.10$.
** $p < 0.05$.
*** $p < 0.01$.

4. Results

Table 2 displays the results of probit regressions. The dependent variable equals 1 if an interview invitation is received and 0 otherwise. Column (1) displays the raw difference in this outcome between standard and anonymous applications. This difference is not statistically different from zero and remains so when we include additional control variables. Hence, anonymous job applications do not have an impact on the invitation probability.

We include socio-demographic and professional characteristics in columns (2) and (3). Age has an inversely U-shaped effect on the invitation probability. Being female and having a non-Western background do not significantly influence the recruiters' decision. The number of publications in A/A+ journals is positively associated with the invitation probability, although this effect is not statistically significant. Candidates who already hold a Ph.D. degree have a lower invitation probability. Already holding a degree may be interpreted as a negative signal because it likely indicates that the candidate does not participate in the market for the first time (Cawley, 2011). Work experience outside academia has a significantly positive effect on the outcome variable. This can be explained by the fact that the institution also serves as a place of communication between economic research and political practice.

To identify whether anonymous job applications have different effects on certain groups, we add interaction terms between treatment status and socio-demographic characteristics in column (4). Whereas the coefficient estimate on the interaction term between anonymous applications and female is significantly negative, the coefficient estimate for female becomes significantly positive. This indicates that (a) with standard applications, female applicants are more likely to receive an interview invitation relative to male applicants, and that (b) this relative advantage disappears with anonymous job applications. One possible explanation is that female candidates are generally favored in the hiring process at this institution, but such behavior is not possible when gender is unknown.

Professional signals might receive a different weight when screening anonymous applications. This hypothesis is confirmed when we include interaction terms between professional characteristics and treatment status.[2] For example, whereas publications in A/A+ journals have a significantly negative effect on the invitation probability with standard applications, this effect disappears with anonymous job applications. It thus seems that the recruiters interpret "traditional" quality signals differently when confronted with anonymous job applications.

5. Conclusions

To analyze the effects of anonymous job applications in the annual job market for Ph.D. economists, we use data from a randomized experiment among applicants at a European-based economic research institution. Our results indicate that anonymous job applications are in general not associated with a different invitation probability.

However, whereas female applicants have a higher probability to receive an invitation than male applicants with standard applications, this difference disappears with anonymous applications. Whereas this indicates that males were discriminated against with standard application procedures, this is not the case for applicants

[2] Results confirming this hypothesis are displayed and discussed in an earlier version; see Krause et al. (2011).

of non-Western origin. The results moreover indicate that certain professional signals are weighted differently with anonymous applications. Our results concur with the often discussed notion that anonymity prevents employers from favoring minority applicants when credentials are equal—at least in the initial stage of the hiring process (see, e.g., Åslund and Nordström Skans, 2012, p. 100) (Krause et al., 2012, p. 48). Anonymous job applications thus do not have very large effects in our study. However, one should be cautious when generalizing from this finding. We also need to recognize that the instrument of anonymous job applications only has potential if there is a relevant size of discrimination. Discrimination is lower for high-skilled occupations and in more competitive labor markets. This may limit the effects of anonymous job applications in the case studied here. The effects may, however, be very different in other job markets.

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