Does gender matter for academic promotion?
Evidence from a randomised natural experiment

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Several countries have recently introduced gender quotas in hiring and promotion committees at universities. Evidence from promotions in the Spanish university system suggests that quotas are only effective at increasing the number of successful female applicants in promotions to top positions. This column argues that, given that sitting on committees reduces the available time for research, gender quotas should be implemented only for more senior academic positions.

Women have historically been under-represented in top academic positions. For years, this under-representation was partly the result of the smaller number of women obtaining doctorates. Currently, women account for about half of PhD graduates, but the increased presence of women at the lower rungs of the academic ladder has not translated into proportional increases in the presence of women at the top, particularly among full professors. For instance, in Spain, the presence of women among PhD graduates has grown from 36% to 49% over the last 20 years. During the same period, the incidence of women among faculty has increased from 30% to 39% among associate professors, but only from 11% to 18% among full professors (Figure 1).

The picture is qualitatively similar in the US and the rest of Europe. In Europe, women account for 45% of PhD graduates, 36% of associate professors and a mere 18% of full professors (European Commission 2009). In the US, excluding the humanities, the incidence of women among new PhDs was around 40%; figures are 34% and 19% for associate professors and full professors respectively (National Science Foundation 2009).

Figure 1. Proportion of women in Spanish Academia
Source: Authors calculations based on information from Instituto Nacional de Estadística, Estadística de la Enseñanza Universitaria, several issues.

Why are women less likely to become full professors?

It could be that women differ in some characteristics that divert them from advancement in their academic career. Some authors argue that family commitments make it more difficult for women to move up the academic career ladder beyond their early post-doctorate years (National Research Council 2007). Women’s careers may also be hindered by the lack of role models among the upper echelons. Alternatively, women may face discrimination, either explicit or implicit, in promotions to top positions by the (mostly male) committees granting promotion. To prevent gender discrimination, several countries, including Norway (1988), Finland (1995), Sweden (1999) and Spain (2007), have introduced a minimum share of women in hiring and promotion academic committees (European Commission 2008). In principle, if male evaluators are biased against women and female evaluators are more objective, the introduction of gender quotas in hiring and promotion committees should improve the chances of success of female applicants. However, almost no empirical evidence exists about the effectiveness of these policies.

A neat empirical analysis is usually hard to come by. In most situations, it cannot be ruled out that the gender composition of hiring committees is related to the relative quality of female and male candidates. The available empirical evidence dealing with endogeneity provides results contradicting the view that gender quotas are effective. Broder (1993) examines the ratings of proposals to grants from the National Science Foundation. She finds that female reviewers rate female-authored proposals lower than do their male colleagues. Following a similar identification strategy, Abrevaya and Hamermesh (2011) examine referee evaluations in a leading journal in Economics and do not find any effect from the interaction between the gender of referees and the gender of authors. In another setting, Bagues and Esteve-Volart (2010) analyse hiring for entry-level positions in the Spanish Judiciary and find that female candidates are significantly less likely to be hired if they are (randomly) assigned to a committee with a relatively greater proportion of female evaluators. In the same spirit, Booth and Leigh (2010) conduct an audit study in several female-dominated occupations in Australia and do not find any significant interaction between the gender of the applicant and the gender of the contact person in the hiring firm.

This body of evidence suggests that policymakers should not take female evaluators' alignment with female candidates as granted; however, none of these studies considers promotion to top positions. Given the low presence of women in top positions, and the persistence of the so-called “glass ceiling”, additional evidence is needed in order to understand the role of the gender of evaluators for promotion for higher level academic positions.

Peering through the glass ceiling

In recent research (Zinovyeva and Bagues 2010), we address this issue using evidence from promotions in the Spanish university system between 2002 and 2006. During this period, all academic promotions were decided through nation-wide competitions. Our setup has three exceptional features.

- Evaluations were performed for two types of positions: associate professor and full professor positions.
- The system affected a large number of candidates, as well as evaluators from all academic disciplines. In total, approximately 35,000 candidacies were evaluated by 7,000 evaluators.
- Evaluators were selected out of a pool of eligible professors using a lottery. The existence of a system of random assignment of evaluators to committees allows us to consistently estimate the effect of the gender composition of committees. To our knowledge, this is the first study that exploits a randomised natural experiment in order to analyse the determinants of promotion to top positions.

We find that the gender composition of committees strongly affects the chances of success of candidates applying to full professor positions. In quantitative terms, for a committee with seven members, an additional female evaluator increases the chances of success of female applicants by 14%. When evaluators decide on promotions to associate professor positions, we fail to observe any
significant interaction between the gender of evaluators and the gender of candidates. If anything, a larger presence of women in the committee may decrease the number of female candidates promoted to associate professor\(^1\). To investigate which committees are gender-biased in exams to full professor positions, we have collected information on the research productivity of candidates from the ISI Web of Science. Specifically, we observe the number of publications and the number of citations received by candidates. As long as these measures capture all potential gender differences in quality, taking them into account allows us to estimate the source of discrimination. We find that, conditional on the research production of candidates, female applicants to full professor positions have lower probability of success relative to male candidates when assigned to an all-male committee. In committees including at least one woman, we do not observe significant gender differences in success rates.

We explore several potential explanations consistent with our evidence. We find that the gender bias exists in small disciplines, but not in large disciplines. This goes against information-based explanations of the gender bias: in large disciplines, people are less likely to know each other prior to the exam, and thus information asymmetries should be larger. Our findings are also not consistent with female candidates being discriminated against on the basis of age, or with the existence of gendered networks. Instead, the evidence in this paper might reflect the existence of ambivalent sexism, arising when men's attitudes toward female candidates depend on the position at stake. Specifically, male evaluators might experience sexist antipathy towards female candidates applying to top academic positions, but not towards female applicants to lower-level positions.

Our findings have direct policy implications for countries and institutions that encourage female representation on hiring and promotion committees. In the case of Spain, since 2007, the gender quotas exist in all hiring and promotion committees in public institutions, including academic committees. The quota mandates that at least 40% of committee members must be of each gender. Given the low numbers of women in the upper levels of academia, this has implied that women participate in committees much more often than men. A back-of-the-envelope calculation suggests that a female full professor will sit in committees four times more often than a male full professor. Sitting on committees reduces the available time for research; thus gender quotas might lower the productivity of women who have managed to overcome the glass ceiling\(^2\). Since, as shown in this paper, quotas may have a positive effect on female promotion to full professor positions only, our work provides strong evidence against implementing gender quotas at the lower rungs of the academic ladder. Moreover, according to our findings, the presence of a single female on the committee is enough to overcome the gender bias in evaluation.

**References**


1 The magnitude of the effect is similar to the effect found in Bagues and Esteve-Volart (2010), but it is not significant at standard levels.

2 Daniel Hamermesh warns young female economists to avoid requests to sit in committees 'like the plague'. According to his view, asking women disproportionately to sit on committees constitutes 'another form of sexual exploitation' (An Old Male Economist's Advice to Young Female Economists, CSWEP Newsletter, Winter 2005, p. 2).