

# Will gender parity break the glass ceiling? Evidence from a randomized experiment

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## **Abstract**

This paper studies whether the gender composition of recruiting committees matters. The system of random allocation of candidates to committees implemented in Spanish public exams provides exceptional empirical evidence in this respect. We analyze how the chances of success of near 75,000 male and female candidates to the Judicial Corps in the period 1995-2004 were affected by the gender of their evaluators. We find that a female (male) candidate is significantly more likely to pass the exam whenever she (he) is randomly assigned to a committee where the share of female evaluators is relatively lower (greater). The evidence found in this paper suggests that the imposition of gender parity in recruiting committees will not increase the number of women in decision-making positions. Paradoxically, it will further reduce it.

*Keywords:*

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# 1 Introduction

Legislation and policy encouraging gender parity, or gender quotas, in top political or public positions has recently been approved in some countries and is being considered in many others. In Chile, Michelle Bachelet has just appointed 50% of women to her cabinet. In Norway, since 1988 there must be a minimum of 40% of each gender in publicly appointed committees, boards, and councils. Furthermore, since January 2005, Norwegian state-owned enterprises are required to have at least 40% board representation of each gender. In 2004 the newly elected Spanish Prime Minister, Socialist José Luis Zapatero, appointed 50% of women to his cabinet, and announced that "there will be gender parity in all selection committees in the state administration, public organizations and related firms".<sup>1</sup> Private corporations in Spain are also receiving governmental guidelines towards greater participation of women at boards.<sup>2</sup>

The reason for imposing gender parity in top positions lies in the extremely low percentages of women in decision-making posts, at both the public and private sectors. In political positions, only in 12 out of 179 countries women accounted for at least 30% of parliamentary seats in 2003.<sup>3</sup> In Italy and France, only 3% and 4% respectively of the 50 largest companies' board directors are women.<sup>4</sup> In the US, women constituted only 3.4% of the top level management in a sample of firms in 1997 (Bertrand and Hallock 1999).

In the past, policy towards gender equality in the professional and public spheres seemed to focus on the so-called *equal opportunities* approach.<sup>5</sup> Underlying this approach was the pipeline theory, according to which women are moving their way through the pipeline and into top level jobs. In that context, an increased ratio of female students would lead, more or less automatically, to an increase of women further up in the system. Accordingly, policy was designed to encourage women's higher education and skills on the understanding that providing women with the same human capital as men would enable them to reach the top positions they seemed unable to attain.<sup>6</sup> The evidence for the pipeline theory is disappointing: in Norway, despite significant increases in the female ratio among students in higher education (25% in 1960, 33% in 1970, and about 50% since 1986), only two out of ten professors are women.<sup>7</sup> In the same vein, there is a prevailing view that women have started to move up into management and public positions, but once they reach a certain point, the so-called 'glass ceiling', they do not seem to go any further. Whatever the reason behind the existence of a glass

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<sup>1</sup>See the Official State Bulletin (BOE) number 57, March 8th 2005, page 8111. See, as well, the *IV Plan de Igualdad de Oportunidades entre Mujeres y Hombres, 2003-2006* (Ministry of Social Affairs, Spain).

<sup>2</sup>The guidelines are as follows: (1) Board members are encouraged to clarify why there might be no women at the board, and any measures taken. (2) Whenever there are any vacancies, the board is encouraged to ensure that the selection process is not biased against females. The board should also intently look for women who have the desired professional profile. (3) Firms are encouraged to include a discussion of the gender distribution of positions and report any changes. The report also points out that, due to 'old boys' network effects and hysteresis, this sort of policy is necessary in order to increase the low percentages of men at boards (*Proyecto de Código Unificado de Recomendaciones de Buen Gobierno de Sociedades Cotizadas*, January 2006).

<sup>3</sup>Sweden leads the list with 45% (UN Millennium indicators).

<sup>4</sup>According to a report from the Aspen Institute Italia (The Economist).

<sup>5</sup>In the US and other countries there has also existed affirmative action policy, involving quotas but generally not at the 50-50 level (Fryer and Loury 2005).

<sup>6</sup>This approach is still in use and sometimes in connection with gender parity, e.g. the French Parliament passed legislation in 2001 mandating gender parity in party lists for a variety of elections (see Frechette *et al* 2005 for an analysis of the political economy of gender quotas).

<sup>7</sup>Rogg (200?).

ceiling, pessimism about the pipeline theory might explain the more recent approach, that of *equal results*: the imposition of gender parity in outcomes, such as cabinet, or board membership. The shift in policy is obvious in the Spanish case. In a recent governmental document on proposals towards gender equality, equality of opportunity is mentioned only once, while gender parity appears in the document six times.<sup>8</sup> Underlying this shift in policy lies the recognition that the equal opportunities approach has not created the desired move towards gender equality. Thus, the motivation for imposing gender parity seems to be the rationale that once more women are in top positions in the public sphere, it should be easier for other women to get to that level—in other words, gender parity in decision-making could break the glass ceiling.<sup>9</sup>

Nevertheless, it is not clear that imposing gender parity in top positions is going to increase the numbers of women in other high positions. Indeed, although implicit in many discussions of gender parity policy, there is no clear evidence for the hypothesis that the lack of women in top positions is due to men discriminating against women.

Indeed, there is empirical evidence that suggests that gender matters: Goldin and Rouse (2000) find that the adoption of a screen in the orchestras' hiring process of musicians fostered impartiality in hiring and increased the proportion of women hired, Lavy (2004) compares data on blind and non-blind scores that high school students receive on matriculation exams in their senior year in Israel, and finds gender discrimination against *male* students in each subject. Blank (1991) compares single-blind and double-blind reviewing of papers submitted to *The American Economic Review* and finds a small, insignificant effect, in that female authors fare better under double-blind reviewing.

Now, there are several explanations consistent with the low numbers of women in top level positions we observe in reality. First, there could exist taste discrimination, i.e. discrimination *à la* Becker,<sup>10</sup> where women do not get to the top because men in top positions do not hire them since that would entail a utility loss for them. Related would be the possible existence of 'old boys' network effects: the traditionally overwhelming presence of men in top positions in management and the public sphere might make it more difficult for women to get to that level.<sup>11</sup> Second, women could be, in average, less productive than men—that would generate statistical discrimination in which women are not hired because they are identified with the average woman.<sup>12</sup> For instance, Lazear and Rosen (1990) describe how statistical discrimination in the promotion process makes it difficult for women to progress up the job ladders—such discrimination would be rational and operates on the belief that women are more likely to withdraw from labor market activities than men. Gneezy *et al* (2003) find that women perform worse when the environment (here, the labor market) is competitive. The story in that paper, as well as Goldin and Rouse (2003), is consistent with statistical discrimination. Third, women could not be getting into decision-making positions because of other reasons, such as parental role

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<sup>8</sup>ORDEN PRE/525/2005, March 7 (*BOE, March 8, 2005*).

<sup>9</sup>Gender quotas are often imposed on either of the following two stages of the selection process: the stage of finding aspirants, e.g. those willingly to be considered for nomination, or the stage of nominating the actual candidates (e.g. to be placed on the ballot by the party). In some cases, gender quotas are imposed on a third stage, the already selected or elected candidates. Here we implicitly consider gender quotas at a different stage, the *candidate evaluation* stage, but our evidence could also apply to the other quotas.

<sup>10</sup>Becker (1971).

<sup>11</sup>Bertrand and Hallock (1999) find some evidence against the 'old boys' network hypothesis in the US. They fail to find gender discrimination once they control for individual characteristics such as experience.

<sup>12</sup>Phelps (1972).

transmission (both female and male), identity issues (Akerlof and Kranton 2000),<sup>13</sup> women's lower confidence (Bengtsson *et al* 2004) or, more generally, social norms.

The focus of this paper is the effectiveness of the gender parity approach: does increasing the number of women in top positions lead to recruiting of more women? The answer to this question gives us information regarding the three theoretical possibilities above. Indeed, imposing gender parity will only increase the number of women in top positions if the reason for the low incidence of women is taste discrimination by men. In the case that discrimination is statistical in the sense of e.g. Lazear and Rosen (1990), gender parity will not be effective. In the case that the low numbers of women are due to social norms, gender parity could work only if in connection with a major cultural change as, for example, the women's liberation movement in the late 1960s and early 1970s in the United States.

Is gender parity actually effective in raising the numbers of women in other positions? In Spain, the cabinet gender parity that was imposed by the Socialist party in 2004 (from 18.75% women in cabinet in 2002) has not been followed by higher numbers of women in other top public positions.<sup>14</sup> That is, newly appointed female ministers have not hired more women than their (mostly male) predecessors (see Graph 1).<sup>15</sup>

A related issue arises from the heterogeneity of women and representation. Since women do not constitute a homogeneous group, the effect of imposing gender quotas might generate different effects. For instance, in less developed countries, female leaders have typically been widows or daughters of deceased male leaders (e.g. Indira Gandhi, Benazir Bhutto). If women who have easier access to politics (or public office skills) disproportionately share the same background, a gender quota will create female policy-makers with little in common with the majority of women.

A neat empirical analysis of the effects of gender parity is hard to come by, because of the endogeneity encountered: in most real life cases the composition of evaluating or hiring committees is likely to be related to the characteristics of the candidates. That is, usually one cannot rule out the possibility that the number of female members in a committee may be somehow related to the average quality of females in that field. In order to avoid this problem, ideally we want to observe how committees of different characteristics evaluate the quality of candidates that have been randomly allocated.

This paper provides evidence from such an experiment. Here, we show that greater numbers of women in decision-making positions do not necessarily imply that women will have it easier to get into the elite, or decision-making positions. In fact, we find that committees where the proportion of women is greater actually make it more difficult for women candidates than for men candidates. In order to show this, we have exploited the exceptional evidence provided by the particular mechanism that is applied in Spain to select members for the public sector.<sup>16</sup> In Spain, individuals who want to have access to any public official positions are required to pass a specific public exam at the national level. These public

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<sup>13</sup>Their model is consistent with empirical evidence that women who work more outside the home also work more inside the home. This evidence goes against Becker's (1965) theory of comparative advantage in gender roles (Akerlof and Kranton 2000, using data from the US for 1983-1992).

<sup>14</sup>With 19.6% of women in 2004 compared to 16.8% in 2002 with the then ruling Popular party, an increase that is consistent with previous years.

<sup>15</sup>We thank Florentino Felgueroso for pointing out this fact.

<sup>16</sup>For an economics study of public exams in Spain see Bagüés (2005), who finds that the probability to pass a public exam is largely affected by randomness, nepotism and localism.

exams, which are also common in other countries of Southern Europe and Latin America, typically involve an extremely large number of candidates.<sup>17</sup> For instance, about 5,000 candidates apply for a judge position every year. Such numbers require the creation of several evaluation committees. Each candidate is then allocated to evaluation committees according to a lottery, so that the process whereby candidates and committees are mapped is based on a first random draw and, most crucially, it is completely orthogonal to gender. Committees are mostly composed by top public officers, but also other professionals in the field.<sup>18</sup>

Thus, the beauty of this evaluation process is (1) that candidates are allocated to committees randomly, which automatically eliminates concerns about omitted characteristics of candidates and other issues; (2) that the subjects and the experiment are actually taken from real life, with real-life payoffs, hence avoiding the usual *caveats* of experimental work; and (3) that the experiment is relevant because of the importance, and magnitude, of public exams.

In this paper we use information on 75,000 public exam candidates over 1995-2004 from a number of public exams to the Judicial Corps (namely exams to pass in order to become judge, prosecutor, and court secretary) in order to explore the relationship between the gender composition of the evaluating committees and the probability of success of candidates by gender. Using data over the period 1995-2004, we find that whenever evaluated by committees with more male (female) members, more (fewer) female candidates tend to succeed. We find that a female candidate's chances of passing the exam are 5.5% greater if she is evaluated by a committee with more male committee members than the median committee, than if she is evaluated by a committee with fewer male committee members than the median. Moreover, as we show in the empirical analysis, these differences are statistically significant.

This result is consistent with two hypotheses: (1) male committee members are more generous with female candidates, and (2) female committee members are more strict with female candidates. The empirical analysis we perform for years 2003 and 2004, years for which information from a multiple choice test is available, suggests that there is a bit of truth for each hypothesis. Due to the small sample size in this analysis though, this is not statistically significant. Regardless of whether it is (1) or (2) that constitutes the true reason behind this finding, this evidence suggests that gender parity will not increase the numbers of women making it to the elite. In fact, in the case of the Judicial Corps, imposing gender parity in the committees will reduce the number of female members. In our numbers, having more men in the committees would have increased the number of successful women in 3.5%, 1271 women would have been hired instead of 1230.<sup>19</sup>

The evidence in this paper has great relevance for various reasons. First, the Spanish government and maximum judicial authority are considering imposing gender parity in all public recruiting committees, including the committees we study here. Importantly, it is possible that the evidence here can be extrapolated to similar committee systems in other sectors. In fact, Spain shares many features with the sort of countries where gender parity is considered.

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<sup>17</sup>In 2003, approximately 175,000 individuals including, of whom 131,000 were university graduates, were preparing for public exams in Spain ("Encuesta de Población Activa"). This figure represents about 1.5% of the active population between 24 and 54 years of age. @CHANGE@

<sup>18</sup>For instance, in judge exams, committees are composed by seven members of the Judicial Corps but also two non members, namely one lawyer, and one law university professor.

<sup>19</sup>These numbers have been calculated with respect to the median committee.

Second, successful candidates to public exams become figures who deliver relevant decisions to society.<sup>20</sup> Indeed, many political figures in Spain belonged to the Judicial Corps before landing important posts in the government. Therefore, according to the results in this paper, the gender composition of the evaluating committees has an important effect on the gender composition of the elite. For this reason, this experiment constitutes an example of a randomized design that operates in a very important framework: the elite formation of society.

Finally, recent literature shows that the composition of the government is not irrelevant to policy choices, suggesting that women might have different preferences on public expenditure than men (Pande 2003, Duflo and Chattopadhyay 2004). All in all, and whatever the reason behind the effect found in this paper, imposing gender parity in public exam committees for the Judicial Corps would not increase, but rather reduce, the number of women in the elite, and in turn, the government. Furthermore, this would later on translate into policy choices.

## 2 Background information

We analyze four types of Spanish public exams: exams to become (1) judge, (2) prosecutor, (3) court secretary, and (4) a joint exam to become either judge or prosecutor that has been in place since 2001 (the judge and prosecutor exams were separate until 2000).<sup>21</sup>

Candidates to becoming members of the Judicial Corps must have a first degree in law. Every year, once the number of candidates is known, evaluating committees are formed. The committees are formed within a month of the publication of the candidates' names in the BOE (Official State Bulletin), and their composition is published in the BOE as well. No committee member is in two committees. In general, an evaluating committee is formed for every 500 candidates. Candidates are ranked in alphabetical order and committees are ranked numerically. Then a lottery decides the initial according to which the alphabetical list of candidates will be matched with the list of evaluating committees. For instance, in January 2004, the letter that was randomly chosen was "S", hence the first candidate in the list whose initial was "S" was matched to the first committee in the list, and so on. Thus, the process whereby candidates and committees are mapped is based on a first random draw and, most crucially, it is completely orthogonal to gender.

The rules and composition of evaluating committees differ by exam, but the committees are generally composed by both members of the Judicial Corps and non members (law professors or lawyers).<sup>22</sup> Each committee is presided over by one member, who appoints the other members according to the rules.

Each committee evaluates a set of students, usually orally.<sup>23</sup> The topics that candidates are evaluated

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<sup>20</sup>This is especially important in light of the evidence consistent with the view that judicial resolutions are not gender neutral. Indeed, even though the empirical evidence is not perfectly exogenous, male judges seem to be more favourable towards female defendants (@CITE@).

<sup>21</sup>We cannot use data from the court secretary exam in 1997 because the exam outcome was not published in the BOE.

<sup>22</sup>For details, see the appendix.

<sup>23</sup>Except for the judge and prosecutor exam for which a preliminary eliminatory multiple choice test was used up to

on are drawn from the set of possible topics, which are listed in the BOE beforehand. The exam lottery consists of balls numbered after the topics in the exam. Five balls are drawn, determining a particular five-question exam. A candidate receives an evaluation if he manages to answer the questions—many candidates fail to get an evaluation for this reason. The grading system of exams is as follows. At the end of each session, candidates are evaluated by committee members' ballots containing the grade for the candidate.<sup>24</sup> The grade ranges between zero and five per topic. For each candidate, the minimum and the maximum grade ballots are excluded. For the rest of the ballots, grades are added and divided by the number of ballots, which determines each test's mark. Candidates who do not achieve at least half the maximum grade in each test are disqualified. Candidates who do not achieve at least more than half the maximum grade in three of the five topics in each test are disqualified too. Candidates' final grades are obtained by adding their grade in each test. The committee's decision is made on a majority basis. In case of a tie, the president decides the final outcome.

### 3 Description of the data

The data we use here have been compiled from Spanish official publications (BOE, selected issues) for public exams between 1995 and 2004. Our data base contains information on about 20 exams in which nearly 75,000 candidates were evaluated by 150 committees.<sup>25</sup> We investigate the relationship between gender composition of committees and candidates' success by gender using two types of data on public exams.

First, we use committee level data on the link between gender composition of committees and the gender of candidates. We have data on committees for exams over the period 1995 to 2004. In particular, we use data on 150 committees, for which we know members' characteristics. Usually the composition of committees that is first announced is somewhat different from the composition of committees that finally get to evaluate candidates,<sup>26</sup> so we use the data that correspond to the final committee composition. We do not observe the gender of all candidates, but we do observe the gender of successful candidates.

Second, we take advantage of a multiple choice test that was introduced in 2003 for the judge and prosecutor exam. Since then, the exam has consisted of three stages, all of them qualifying; the first one is a multiple choice test, the other two are two oral tests. For this, we have individual data on the 2003 and 2004 exams from over 4,000 candidates each year.

Next we discuss some descriptive statistics.

In Table 1 we show information from candidates. There are typically more female than male candidates (almost 70% for most exams). We do not have information on the total number of candidates by gender for previous years; we do though have data on the gender of successful candidates. Candidates from

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1997, and was re-introduced in 2003.

<sup>24</sup>However, unofficial information confirms this is only used for unclear cases.

<sup>25</sup>The set of candidates is not different from one year to another; some of them apply repeatedly.

<sup>26</sup>Reasons are varied, but some individuals initially appointed as committee members have other important commitments or may have moved because for job reasons.

the capital represent about a fifth of all candidates; more than Andalusia, the most populated region in Spain, and about twice as much as Catalonia. We have also collected some information on candidate 'experience', in the sense of the number of times candidates take the public exam. Since we have the complete names and ID number of candidates we can track them over time. However, this procedure is limited to the number of years we have information for each public exam. For example, in Table 2 we put information from Bagüés (2005) using the numbers for the 2005 judge and prosecutor exam. Out of the candidates who took that exam, at least 82.3% had taken the exam once before (i.e., 2004). Similarly, 65.7% of candidates had taken the exam twice before, 48.7% had taken the exam three times before, and 23.3% had taken it five times before (i.e. 2000, 2001, 2002, 2003, and 2004). That is, almost a fourth of all candidates to the judge and prosecutor in 2005 had already taken the exam at least five times before, which goes to demonstrate the exam difficulty and candidate perseverance.

Table 2 displays committee composition by type of exam, and the number of observations that are available for them respectively. As seen from the table, each committee has to be formed by Judicial Corps members (judges, prosecutors, court secretaries, and public defenders) and non members (law professors and lawyers). Members of the Judicial Corps cannot make more than half the committee (*Ley Orgánica 6/1985, July 1*). The rules for committee composition and formation are described in more detail in the appendix.

In Graph 2, we plot the percentage of women in committees, by year, and type of exam. Typically there are more men than women in committees; in the average committee women outnumber men only in the court secretary exams in 1998 and 2002 (about 57% were women). For the other types of exams, the average percentage of women is between 20 and 30%.

Table 3 presents some descriptive statistics on committee members' characteristics by gender. In general, female committee members are younger and have a lower relative rank than their male counterparts.

Now we compare the characteristics of committees to the characteristics of the total Judicial Corps population. We want to see if the incidence of women in committees for public exams is different than their incidence in the whole judicial population, or whether it is representative of this population. Graph 3 shows the percentage of women judges, prosecutors, and court secretaries, who were in judicial public exam committees over 1995-2004.<sup>27</sup> We also have data on 1995, 2000, 2002 and 2004 for the percentage of women in judges, prosecutors, and court secretaries in Spain. In the graph, the percentage for judges in the population and committees are very similar; this is also true for court secretaries except for 2002. The prosecutor series seem more distinct: males are overrepresented in committees.

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<sup>27</sup>These data exclude the committee presidents who typically belong to Superior Courts of Justice and therefore correspond to a different figure. RATHER THAN TYPICALLY BELONG I WOULD SAY THAT MUST BELONG OR SOMETHING LIKE THAT



## 4 Empirical analysis

In this section our goal is to estimate whether the gender composition of committees affects candidates' success according to their gender. Ideally, we would like to observe the individual vote of each committee member. However, we cannot do that, because only the committees' final aggregate decision is publicly available.

Given this limitation, our empirical strategy is twofold. In our first empirical strategy, we exploit committee composition and exam outcome for exams over the period 1995 to 2004. We use the female share in the committee as measure of the gender composition of the committee. For this, we have data on 150 committees (who evaluated about 75,000 candidates). Since, as described in the previous section, the allocation of candidates to committees is orthogonal to gender, we also know that the proportion of women evaluated by every committee is statistically similar.

We analyze the relationship between the gender composition of an evaluating committee and the candidate's probability to succeed by gender. We do this by looking at regressions of the form:

$$y_{cet} = \beta s_{cet} + \alpha_{et} + \varepsilon_{cet} \quad (1)$$

where  $y$  denotes a measure of successful candidates (e.g., female successful candidates, or male candidates),  $s$  denotes the share of women in the committee,  $e$  denotes type of exam (judge, prosecutor, court secretary, or judge and prosecutor together),  $t$  denotes year,  $\alpha_{et}$  and is an exam and year fixed effect.

In each committee the number of positions is more or less fixed,<sup>28</sup> therefore we cluster standard errors at the exam level.

In Table 4 we present results from running regression (1) using the number of female successful candidates as dependent variable in the left panel, and the number of male successful candidates as dependent variable in the right panel.<sup>29</sup>

In column (1), pooling all committee members (regardless of their membership to the Judicial Corps), the share of women in the committee shows a negative, not significant effect on the number of successful female candidates; in column (4) the effect is positive, and significant, for the number of male successful candidates.

In columns (2) and (5) we distinguish between members in the committee who belong to the Judicial Corps and those do not. In column (2), the share of female Judicial Corps members is strongly negatively related with the number of women who pass the exam (significant at the 1 percent level). In column (5), we observe a positive effect on the number of successful men; this is significant at the 5 percent level. The effect for non members is not statistical significant. This is consistent with the fact that, in reality, it is only the members of the Judicial Corps (and especially the president) who

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<sup>28</sup>See appendix for details.

<sup>29</sup>Since the first committee in each exam might have a different number of positions, we are also including a dummy variable that equals one for the first committee.

are relevant to the decision.

In sum, we find that the gender composition of the committee matters. Now we want to look at information about committees in order to try and learn more about this effect. For this, we run

$$y_{cet} = \beta s_{cet} + \delta X_{cet} + \alpha_{et} + \varepsilon_{cet} \quad (2)$$

where  $X$  is a set of committee characteristics. We also disaggregate Judicial Corps members between the president and the rest of Judicial Corps members.

In columns (3) and (6) we also introduce the mean age of Judicial Corps members of the committee (and a quadratic term), their mean age of entry into the Judicial Corps, and their mean ranking.<sup>30</sup>

In column (3), the female share of Judicial members in the committee is still significantly negatively related with the number of successful women. The gender of the president also has a negative effect, but it is not significant. Ranking is the only committee characteristic that matters: more highly ranked members are related to more women succeeding (at the 10 percent level). In column (6), while the female share in Judicial committee members does not have a significant effect for members other than the president, more male candidates are successful if the committee president is a woman. In the case of successful men, we do find that age is important, if only marginally. The effect is nonlinear: more men pass the exam when evaluated by older committees, up to age 50; from then on, older committee members are associated with more women passing the exam. That is, the fact that generally male committee members are older does not explain the gender effect we find—in fact, older committee members then to be associated with more male successful candidates (there is no effect on females as seen in column (3)).

In Table 5 we run regression (1), this time with the total number of candidates who pass the exam (left panel), and the percentage of female candidates that pass the exam (right panel).

In columns (1) to (3), none of the variables seem to affect the total number of successful candidates. The reason for looking into this is that whenever some committees do not fill all positions, other committees could potentially use those vacancies if there are more satisfactory candidates than available positions.<sup>31</sup> The results suggest that this is not important for the gender composition of the committee.

In columns (4) to (6) we show results using the percentage of successful women. Even though these results should be taken with some caution in statistical terms, they constitute a good summary of results in Table 4. Looking at column (4), the female share of committees is related with a lower percentage of women passing the exam at the 10 percent level—regardless of whether the committee members are Judicial Corps members or not. In column (5), the share of female Judicial Corps members lowers the percentage, the effect seems to come from the president but also the other members. As in Table 5, we also find a significant nonlinear age effect, which works in the same direction as previously.<sup>32</sup>

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<sup>30</sup>The ranking is a measure of both quality and seniority.

<sup>31</sup>See appendix..

<sup>32</sup>The age of entry of the president, and the age of the president, do not have any effect in regression (1). They are

In Graph 4 we show graphically the results. We classify committees with respect to the median committee's gender composition, that is we classifying committees into those where the percentage of women is lower than the median (52), and those where it is higher (58). The average percentage of female successful candidates is higher for the former, and the difference is significant at the 5 percent level.

Taken together, the results from Tables 4 and 5 are clear: female (male) candidates are more likely to be successful when evaluated by committees in which there are more women (men).<sup>33</sup> However, these results do not give us precise information about the reasons behind this phenomenon. In fact, they are consistent with two hypotheses: (i) male committee members are more generous with female candidates, and (ii) female committee members are more strict with female candidates. Hypothesis (i) is consistent with positive gender discrimination working in favor of male candidates, while hypothesis (ii) is consistent with some form of statistical discrimination being suffered by female candidates. If the quality of a professional cannot be observed and it is the average quality of that professional group that she is judged by, minorities are more affected by (the quality of) new entrants than non minorities: having just a few women in the Judicial Corps means that one new female judge creates a greater impact on the average quality of female judges than the effect of one new male judge on the average quality of male judges.

In order to try and shed light on this issue, in our second empirical strategy we are going to use our candidate-level information. We take advantage of the fact that in 2003 a multiple choice test was introduced in the judge and prosecutor exam. In 2003 and 2004, the other year for which we have recent data, that particular exam consisted of three stages, all of them qualifying; the first one was a multiple choice test, and the other two were two oral tests. For this type of public exam and years, we use candidates' multiple choice test performance as a proxy of the candidates' objective quality. We cluster standard errors at the committee level, and show results are in Table 6.

In column (1), we present results from running the following simple regression in the sample of all available candidates:

$$y_{it} = \sigma Fcandidate_{it} + \gamma_t + \varepsilon_{it} \quad (3)$$

where  $t$  denotes year, the dependent variable is the probability that candidate  $i$  passes the exam; and  $Fcandidate$  is a dummy variable equal to one in the case that candidate  $i$  is a woman.

According to these estimates, female candidates have a significantly smaller probability to pass the exam than male candidates.

In column (2), we introduce our quality measure in expression (2), and hence we are running,

$$y_{it} = \sigma Fcandidate_{it} + \phi quality_{it} + \varphi quality_{it}^2 + \gamma_t + \varepsilon_{it}.$$

As expected, higher quality candidates, as measured by their multiple choice test mark, have higher

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not included in tables 4 and 5 because there are some missing observations in those series.

<sup>33</sup>Results also hold if we do not include the 1995 exam for court secretary, which included a multiple choice test.

chances to pass the exam. Also, once we introduce the quality of candidates in the regression, the female dummy is no longer significant—suggesting that the result in column (1) was due to unobserved heterogeneity.

In order to study the link between the probability of a candidate’s success and the gender composition of the committee, we need to consider the sample of candidates that have successfully passed the multiple choice test—because these are the candidates who take the second stage evaluation—that is, these are the candidates that are actually evaluated by the committees. In this sample, we have information on ten committees. Of those, in five committees there is only one female member; in the other five, there is more.<sup>34</sup> Again, we use as measure of committee membership by gender the share of female members in the committee. For this we run:

$$y_{it} = \sigma Fcandidate_{it} + \varphi s_{it} + \eta Fcandidate * s_{it} + \phi quality_{it} + \varphi quality_{it}^2 + \gamma_t + \varepsilon_{it}. \quad (4)$$

In column (3) in Table 6, we find that female candidates have a lower probability of passing the exam if they are evaluated by a committee with a larger share of women. The effect is similar in magnitude to the effect we found in Tables 4 and 5, but now is not statistically significant at standard levels, it is only significant at the 14 percent level—however, this is because of the small sample size here: we only have ten committees in those two years.

How big is this effect? Simple calculations show that, for the 2003 judge exam, a woman’s chances of passing the exam are 9.4% greater if she is evaluated by a male committee (that is, a committee with only one female member) than if she is evaluated by a female committee (with more than one female member). For 2004, this figure equals 7%.

In sum, this result suggests that the gender composition of a committee does matter for whether a candidate of a particular gender passes the exam or not. In particular, women evaluated by male committees have better chances to pass the exam than women evaluated by female committees. Analogously, men evaluated by female committees are more likely to succeed than men evaluated by male committees.

What can we say about hypotheses (i) and (ii)? For the data on 2003 and 2004, the probability to pass for a female candidate increases in 1.7% if evaluated by a committee with only one woman (not significant), consistent with hypothesis (i); if she is evaluated by a committee with more than one woman, the probability decreases in 1.4% (not significant), consistent with hypothesis (ii). In total, then, for a female candidate, being evaluated by a committee with only one or more than one woman increases her chances in 3.1% (significant), which is about 30% change in the observed probability to win. However, the effects that are respectively consistent with (i) and (ii) are not statistically significant, hence we cannot base statements on those, either of them could be behind the results, but so could both.

The results from estimating (3) are suggestive, but they should be taken with caution—first, because they are only marginally significant; indeed, since we only have data for the multiple choice test for

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<sup>34</sup>There are no committees with zero women in this sample.

2003 and 2004, the number of committees in these data is small, and hence variability in committee composition is very small. It could also be that these ten committees are not very representative. In truth, there could also exist some omitted committee variable bias (that is, we might be omitting some committee characteristic that is correlated with gender). Furthermore, relaxing the assumption of independence of disturbances within committees, which is important here, requires clustering standard errors at the committee level, which is problematic with such a small number of clusters. Since the multiple choice test is still in use, soon more data will be available that will make it possible to exploit this strategy better.

In sum, with data from only these two years, it is difficult to say much about what could be going on at committees. Our results are consistent with a variety of situations, for instance with men in committees being more generous towards female candidates, but also with men in committees being less generous towards female candidates whenever there are more women in the committee.

## 5 Conclusions

Gender parity policy is being adopted in many countries on the basis that women are underrepresented in top level positions at both the public and the private spheres. The motivation underlying the imposition of gender parity is the existence of (taste) discrimination against women. Related is the perception that there exists a 'glass ceiling'—beyond which women cannot go any further. If women are not able to break the glass ceiling, imposing gender parity at the top level should increase hiring of other women, and therefore in turn increase the percentage of women in decision-making.

This paper uses data from Spanish public exams that provide evidence that gender parity will not increase the number of women in decision-making positions, in fact, our main finding is that gender parity would reduce that number. The analysis of Spanish exams is adequate because of the characteristics of their evaluation process: first, candidates are allocated to committees randomly, which automatically eliminates concerns about endogeneity; second, the subjects and the experiment are actually taken from real life, hence avoiding the usual *caveats* of experimental work; and finally the experiment is relevant because of the importance, and magnitude, of public exams in Spain and other countries.

We use data from candidates to the Judicial Corps between 1995 and 2004, and find that female (male) candidates are more likely to be successful when evaluated by committees in which there are more women (men). In particular, we find that a female candidate's chances of passing the exam are 5.5% greater if she is evaluated by a committee with more male committee members than the median committee, than if she is evaluated by a committee with fewer male committee members than the median. Moreover, as we show in the empirical analysis, these differences are statistically significant.

These results suggest that the reason for the low numbers of women in decision-making positions does not lie with taste discrimination. The results suggests that the reason is more complicated—either consistent with statistical discrimination in connection with women's higher likelihood to withdraw

from labor market activity,<sup>35</sup> or consistent with social norms and identity-based gender roles.<sup>36</sup> The main policy lesson from this paper is thus that introducing gender parity in recruiting committees will not increase the numbers of women in decision-making posts. Instead, a deeper understanding of factors limiting women's participation should be gathered in order to derive adequate policy. In the Spanish case particularly, a quick glance at cabinet members resumes shows the difficulty of reconciling family and career, which brings us to Lazear and Rosen (1990).<sup>37</sup>

Another implication of our work is that, given our finding that evaluation is sensitive to committee composition, it is important to make selection procedures more objective. In that sense, the recent introduction of a multiple choice test in some public exams goes in the right direction.

Finally, it would be interesting to gather data from exams previous to 1995, as the inclusion of more past data should be useful in order to observe any trends and understand this phenomenon better.

## 6 Appendix: Committee composition and formation

The exams for judges and prosecutors were separate until 2000, but since 2001 it has been joint for both types of candidates; and rules have been common since then.

For the prosecutor exam, in place until 2000, the rules were as follows. Committees evaluating prosecutor candidates had to be composed of one prosecutor from the Superior Court of Justice (who was to preside over the committee), two prosecutors, one judge, one professor in law, one lawyer (to be chosen by the Lawyers' Corps), a public defender (affiliated with the Ministry of Justice), and one prosecutor working for the Technical Secretariat in the State's General Prosecuting Office (who was to be the committee's secretary) (*Ley 50/1981, December 30*).

The prosecutor exam consisted of two oral tests. In the first one, the candidate had to develop five topics drawn from a lottery; the five topics had to be developed within 75 minutes, and the candidate could not spend more than 20 minutes in each topic. The topics were in the following fields: one in general theory of law and constitutional law, two in civil law, and two in criminal law. In the second test, candidates had to develop a topic drawn from a lottery for each of these fields: civil procedural law, criminal procedural law, administrative law, commercial law, and labor law. The candidate was allowed 30 minutes before the development of each topic, but could not have access to any law textbook or document during the exam.

The date, time, and venue for the first test was to be announced at least 20 days in advance. The details for the second test were to be determined by the first evaluating committee, but there had to be at least one month between both tests (*Orden December 18, 1996*).

In the case of exams to become judge or prosecutor, in place since 2001, committees are composed by

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<sup>35</sup>Lazear and Rosen (1990).

<sup>36</sup>Akerlof and Kranton (2000).

<sup>37</sup>While the eight male cabinet members have a family and several children, the eight female cabinet members are mostly childless.

nine members. Each committee is formed by a committee president, who must be a top member of the Judicial Corps—either a judge, in the case of oddly numbered committees, or a public prosecutor, in the case of evenly numbered committees; all from a Superior Court of Justice. The president appoints the other eight members. The composition of the other eight members in the committee must include two judges, two public prosecutors, one law professor, one public defender, and one lawyer with over ten years of professional experience. Finally, the committee secretary is a court secretary of first category.

There is the possibility that one or more committees consider that the number of satisfactory candidates within the pool of evaluated candidates is lower than the number of positions that the committee has been assigned. In that case, the vacant positions are transferred to other committees for which the number of satisfactory candidates is larger than the number of positions the committee has been assigned (*Ley Orgánica 9/2000, December 22*). That is, there is not a direct trade off between any two candidates for a specific fixed number of positions, as the number of positions is in fact somewhat variable.

Since 2003, the judge and prosecutor exams consists of three stages, all of which are qualifying. First a multiple choice test, and then two oral tests. The material covered by the first and second stages is the same. The topics in the material are published in the BOE.

Court secretary exam committees are composed by seven members. The president must be a judge, and there must be a second category prosecutor, three court secretaries, one law professor, and one lawyer with more than five years of professional experience (*Ley Orgánica 19/2003, December 23*). In 1995, the exam contained a multiple choice test.

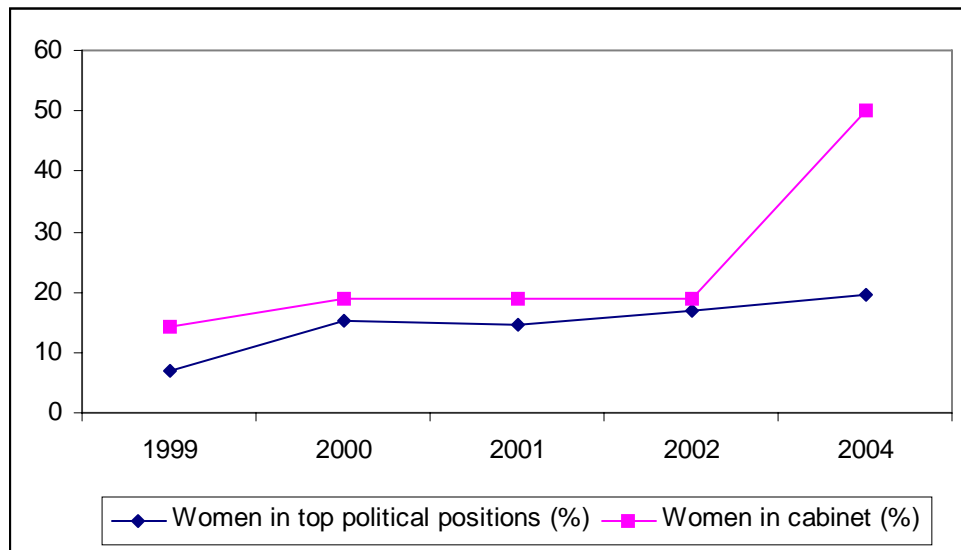
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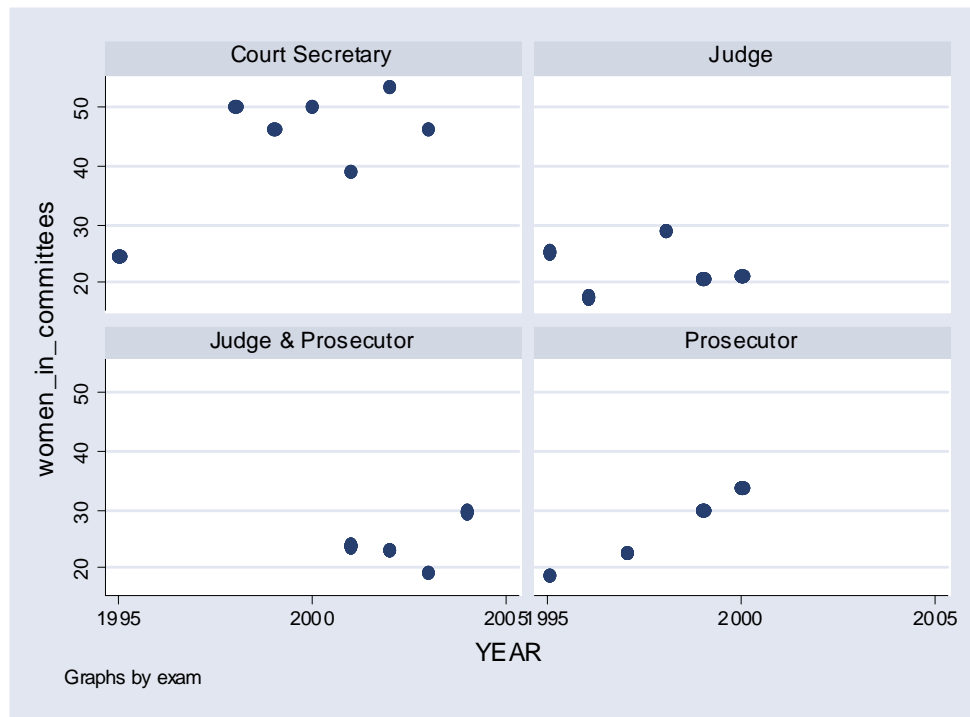


**Graph 1. Women in top political positions and cabinet members, Spain, 1999-2004**



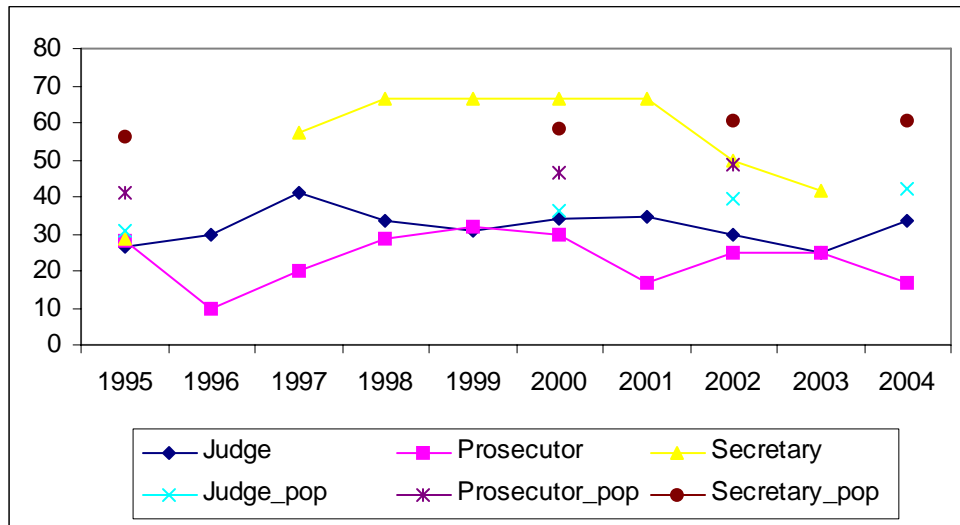
Notes: women in top political positions includes deputy secretaries and under secretaries. The government elected in 2004 imposed cabinet gender parity. Source: Instituto de la Mujer, <http://www.mtas.es/mujer/mujeres/cifras/tablas/W98.XLS>

**Graph 2. Women in committees (%), by type of exam**



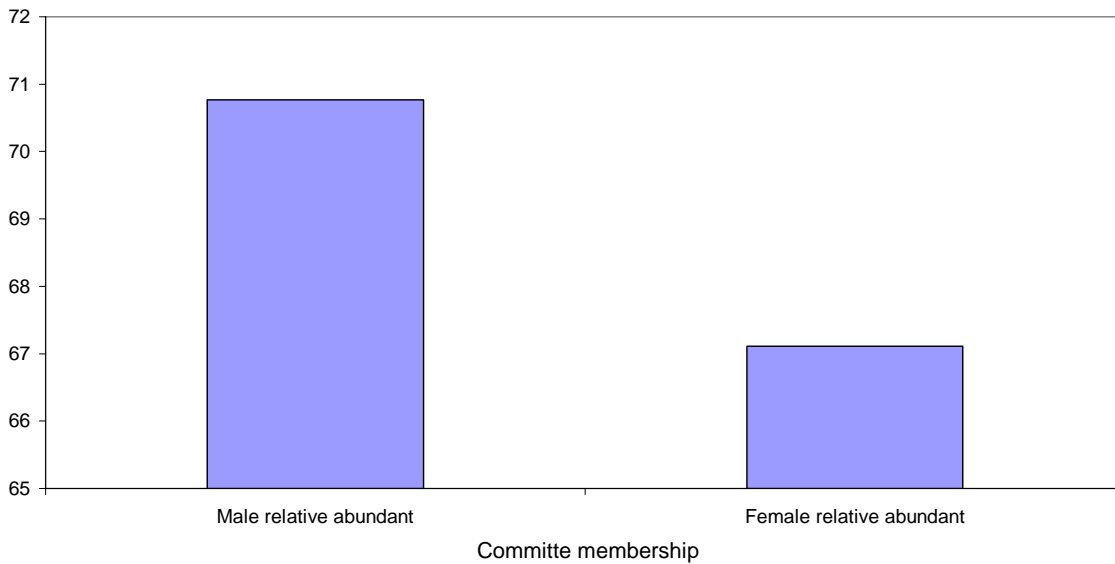
Notes: since 2001, the judge and prosecutor exams have been unified in one common exam. The corresponding number of committees for each type of exam is: 50 (judge), 26 (prosecutor), 33 (judge and prosecutor), and 31 (court secretary).

**Graph 3. Percentage of women in population and in committees, by profession**



Notes: The Spanish figure corresponding to 'judge' is 'magistrado'. Source for the population figures: Instituto de la Mujer, <http://www.mtas.es/mujer/mujeres/cifras/tablas/W99.XLS>.

**Graph 4. Female successful candidates (%), by type of committee membership**



Notes: committee membership has been calculated using the median by exam and year. 'Male (female) relative abundant' denotes committees where the number of men is greater (lower) than the median for that exam type and year; includes 52 (committees 58). We can reject that the female membership of the two sets of committees is the same at the 5 percent significance level.

**Table 1. Descriptive Statistics – Candidate characteristics, by type of exam and year**

	Prosecutor	Judge & Prosecutor				Court Secretary			
<i>Year</i>	2000	2002	2003	2004	2005	2000	2001	2002	2003
Female (%)	69.1	68	68.6	68.2	68.7				
Geographic origin(%)									
Madrid	21.8	19.6	21.8	21.8	21.0	19.4	18.9	17.6	17.4
Andalusia	19.2	17.6	18.6	18.2	19.0				
Catalonia	8.51	9.04	9.27	10.2	9.95				
Years of experience									
One			77.6	78.0	82.3		53.7	61.1	47.4
Two		59.0		59.8	65.7			36.7	29.5
Three			42.9		48.7				17.9
Four				30.7					
Five					23.3				
Number of candidates	4487	5122	4973	4732	4082	1226	1523	1680	2246

Notes: experience has been calculated from looking at names repeated over the years. Candidates with one (two) year experience are candidates who are taking the exam for (at least) the second (third) time.

**Table 2. Committee composition, by type of exam**

	Judge	Prosecutor	Judge & Prosecutor	Court Secretary
Available years	1995, 1996, 1998, 1999, 2000	1995, 1997, 1999, 2000	2001, 2002, 2003, 2004	1995, 1998, 1999, 2000, 2001, 2002, 2003
Average number of committees per year	10	9	8.25	4.43
Number of members per committee	9 (1995,1996), 10	8	9	7
President's Occupation	Superior Court Judge	Superior Court Prosecutor	Superior Court Judge or Prosecutor <sup>1</sup>	Judge <sup>3</sup>
Other Members' Occupations				
Judge	3/4 <sup>2</sup>	1	2	1/0
Prosecutor	1	3	2	0/1
State lawyer	1	1	1	1/0
Lawyer	1	1	1	1
Professor	2	1	1	1
Court Secretary	0/1	0	1	2/3

1\Every odd (even) committee is presided by a judge (prosecutor), alternatively. In our data set, a prosecutor (judge) has been the committee president 48.5% (51.5%) of the time. 2\The composition of committees for the judge and court secretary exams changed over the period (in 1998). We provide the profession composition before (first number) and after (second number) the change, where applicable. 3\From a Superior Court until 1997. For information on committee composition rules see the appendix.

**Table 3. Descriptive Statistics – Committee members, by type of exam**

<i>Gender</i>	Judge		Prosecutor		Judge & Prosecutor		Court Secretary	
	F	M	F	M	F	M	F	M
Age	41.3 (8.67)	48.8 (11.5)	38.7 (6.71)	44.8 (11.3)	48.3 (7.95)	52 (12.3)	40.2 (5.23)	45.4 (10.9)
Entry age	29.4 (4.37)	30.4 (5.81)	30 (5.19)	29.2 (4.31)	29.7 (5.18)	29.8 (4.96)	28.5 (3.53)	31 (6.39)
Relative rank	0.51 (0.22)	0.69 (0.26)	0.46 (0.28)	0.41 (0.20)	0.47 (0.19)	0.63 (0.27)	0.57 (0.25)	0.61 (0.31)
Number of observations	110	373	78	210	69	228	104	162

Notes: standard errors in parentheses. The relative rank index has been calculated based on the member's ranking within her age group (for Judicial Corps members only). A higher number means higher in the rank. Entry age is the age at which the member entered the Judicial Corps, and therefore does not apply to non-members (i.e. professors and lawyers).

**Table 4. Gender composition of committee and successful candidates**

<i>Dependent variable:</i>						
	Female successful candidates			Male successful candidates		
	(1)	(2)	(3)	(4)	(5)	(6)
Female share in the committee	-1.85 (1.47)			2.11* (1.23)		
Female share in the committee, members of Judicial Corps only (including the president)		-3.02*** (0.83)			1.70** (0.73)	
Female share in the committee, members of Judicial Corps only (excluding the president)			-1.72** (0.74)			0.70 (0.85)
Gender of president (=1 if female)			-2.72 (1.96)			3.30*** (1.20)
Female share in the committee, who are not members of Judicial Corps		0.39 (1.04)	0.29 (1.02)		0.33 (0.30)	0.46 (0.97)
Mean age of committee members			-0.48 (0.83)			0.86* (0.44)
Mean age of committee members, squared			0.004 (0.01)			-0.01* (0.004)
Mean entry age of committee members			0.14 (0.13)			-0.01 (0.18)
Mean ranking of committee			8.16* (4.19)			-1.66 (5.03)
Exam type dummies*Year dummies	YES	YES	YES	YES	YES	YES
Number of observations	150	150	150	150	150	150

Note: all regressions include a dummy variable for the first committee, which sometimes evaluates fewer candidates than other committees (not shown). Age, age of entry and ranking is only available for Judicial Corps members; entry age is the age at which the member entered the Judicial Corps. Robust standard errors clustered at the exam level in parentheses. \*\*\*significant at the 1 percent level, \*\*significant at the 5 percent level, \*significant at the 10 level.

**Table 5. Gender composition of committee and successful candidates**

<i>Dependent variable:</i>						
	Total successful candidates			Female successful candidates (%)		
	(1)	(2)	(3)	(4)	(5)	(6)
Female share in the committee	0.26 (1.44)			-0.09* (0.05)		
Female share in the committee, members of Judicial Corps only (including the president)		-1.32 (0.80)			-0.13*** (0.04)	
Female share in the committee, members of Judicial Corps only (excluding the president)			-1.02 (0.98)			-0.08** (0.03)
Gender of president (=1 if female)			0.57 (2.84)			-0.12*** (0.02)
Female share in the committee, who are not members of Judicial Corps		0.72 (0.94)	0.74 (0.99)		0.03 (0.05)	0.02 (0.04)
Mean age of committee members			0.38 (0.85)			-0.05** (0.02)
Mean age of committee members, squared			-0.004 (0.01)			0.001** (0.001)
Mean entry age of committee members			0.13 (0.17)			0.001 (0.01)
Mean ranking of committee			6.51 (6.80)			0.11 (0.15)
Exam type dummies*Year dummies	YES	YES	YES	YES	YES	YES
Number of observations	150	150	150	150	150	150

Note: regressions in the left panel include a dummy variable for the first committee, which sometimes evaluates fewer candidates than other committees (not shown). Age, age of entry and ranking is only available for Judicial Corps members; entry age is the age at which the member entered the Judicial Corps. Robust standard errors clustered at the exam level in parentheses. \*\*\*significant at the 1 percent level, \*\*significant at the 5 percent level, \*significant at the 10 level.

**Table 6. Probability of success by gender and gender composition of committee, 2003 and 2004**

<i>Dependent variable=1 if candidate succeeds, =0 otherwise</i>			
Probit	<i>All candidates</i>		<i>Candidates who passed the qualifying multiple choice test</i>
	(1)	(2)	(3)
Female candidate (=1 if female)	-0.008** (0.004)	-0.00001 (0.0002)	0.023 (0.018)
Female share in the committee			0.07 (0.05)
Female candidate* Female share in the committee			-0.092 (0.064)
Multiple choice mark		0.001*** (0.0002)	0.028*** (0.011)
Multiple choice mark—squared		-0.0004** (0.0001)	-0.0001 (0.0001)
Year fixed effects	YES	YES	YES
Number of observations	9698	8118	3478

Note: standard errors clustered at the committee level in parentheses. Year fixed-effects here is a dummy for either year 2003 or 2004. There are three stages, all of them qualifying for passing the public exam. The first stage is a written multiple choice test. Stages two and three are both oral tests. In the left panel, we consider all candidates. In the right panel, we consider candidates that are evaluated by committees, i.e. candidates that have passed the multiple choice test.  
 \*\*\*significant at the 1 percent level, \*\*significant at the 5 percent level, \*significant at the 10 level.



**Appendix Table 1. Percentage of women in population and in committees, by profession and year**

	Judge		Prosecutor		Court Secretary		Estate lawyer		Lawyer		Professor	
	P	C	P	C	P	C	P	C	P	C	P	C
1995	27.6	26.5	41.3	28	56.3	28.6		30		40		11.1
N	2584	34	1232	25	2300	14		20		20		27
1996		30		10				10		40		5.0
		30		10				10		10		20
1997		41.2		20		57.1		17.6		17.6		17.6
		17		30		14		17		17		17
1998		33.3		28.6		54.5		40		14.3		29.2
		30		14		22		10		14		24
1999		30.8		31.8		50		10		41.7		20.6
		39		44		22		20		24		34
2000	34.1	34.1	46.3	29.8	58.4	52		26.1		40.7		20
	3099	44	1388	47	2572	25		23		27		40
2001		34.6		16.7		56		7.70		35.3		23.5
		26		30		25		13		17		17
2002	35.5	30	48.8	25	60.3	40.9		10		64.3		28.6
	3289	20	1504	24	2746	22		10		14		14
2003		25		25		43.8		0		50		12.5
		8		12		16		4		8		8
2004	37.8	33.3		16.7	60.3	50		0		66.7		0
	3505	12		12	2746	6		6		6		6
Average		31.9 (0.47)		25 (0.43)		48.8 (0.50)		18.0 (0.39)		38.9 (0.49)		18.4 (0.39)
		260		248		166		133		157		207

Notes: the numbers from our database do not include presidents of committees, because those are typically members of superior courts hence not comparable to the population data.