Lingering bias and representation quality: the effects of legislated gender quotas in the European Parliament

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Abstract

How does biased political recruitment – and the legislation of gender quotas – affect the quality of representation? The article theorizes that biased selection implies a higher hurdle for women than for men. Fewer, but more talented and ambitious female legislators enter office. When quotas are legislated, the bias lingers but takes on new forms. Uncertain about their initial choice, parties compensate by drawing on incumbent women's legislative record to update their beliefs. Quota women are more accountable.

Drawing on a "before-after" design with a control group, this study investigates legislators' effort, performance, ambition, and reselection to the European Parliament (1999-2014). It demonstrates that non-quota women handled more high-impact legislation and aimed at longer careers than any other legislator. When quotas were imposed, the share of women did not increase. However, quota women had a higher pay off from performing well in office and reacted by increasing their effort.

Introduction

How does biased political recruitment – and the subsequent legislation of quotas – affect the quality of representation provided by women? Gender quotas aim to increase the number of women in elected positions, yet remain a contested policy tool. When successful, quotas replace men, previously deemed qualified for office, with women suspected of thwarting fair competition. Research has shown that quotas vary in their origin and enforcement, and thus in their ability to change the gender composition in parliament (Krook and Schwindt-Bayer, 2013, p. 557-559). By contrast, we know little about how specific types of quotas impact the performance and behavior of elected representatives (Krook, 2014, p. 1283-1284).

This article studies changes in legislator talent and behavior when quotas are adopted "top-down". That is, it focuses on legislative ("statutory") quotas for candidate lists in closed-list proportional representation systems, as opposed to voluntary, party-level quotas (Krook, 2010b). Party-level quotas are endogenous. They may be the result of a genuine will to change practices and promote more women (Lovenduski and Norris, 1993, p. 8), or strategically applied to gain credibility with voters (Verge, 2012). Although, parties may well self-impose quotas, they may also omit to apply them over long periods of time (Verge and Espírito-Santo, 2016). In other words, the empirical implications of party quotas are ambiguous.

Instead, the current article focuses on the bias that lingers when quotas are imposed externally. Legislated quotas in closed-list systems are known as one of the most effective policies to make parties change their practices and bring women into office (Caul, 1999). This study contributes by showing that even when the share of elected women does not increase substantially, their democratic accountability may change.

Representation is multifaceted (Pitkin, 1967). While early studies of quota adoption focused on descriptive representation (Kittilson, 2006), newer research on women and politics often zooms in on substantive aspects: the policies they promote (paper 8), their congruence with voters (Dingler, Kroeber, and Fortin-Rittberger, 2019), skills and behavior (Murray, 2010; Kerevel and Atkeson, 2013; Wang, 2014; Franceschet and Piscopo,

2014; Weeks and Baldez, 2015; Lühiste and Kenny, 2016; Aldrich and Daniel, 2020).

This article focuses on a necessary condition for "high-quality" representation; when legislators pass laws and are held accountable for them. Theories of democratic accountability distinguish between the change in behavior induced by the prospect of a sanction and the change in legislator quality due to selection (Fearon, 1999; Ashworth, 2012). I draw on both insights to demonstrate a case of observational equivalence. Women may over-perform in office for different reasons before and after a quota is introduced: they may either be more talented due to biased recruitment or harder-working because of higher accountability (Anzia and C. R. Berry, 2011).

To make my point, I combine insights from research on women in politics with models of Bayesian updating where legislators seek reelection and parties seek to recruit the most talented legislators. Studies of women in politics highlight that gender stereotypes prevent party selectors to appropriately assess women's qualifications. This leads to a selection effect. I define biased recruitment as a selection process with a higher hurdle for women than for men (Fox and Lawless, 2010; Fox and Lawless, 2011). Without quotas, bias results in fewer but higher-quality women in office. Empirically, I show that in the absence of quotas, female legislators perform better at equal levels of effort and aspire to longer careers.

By contrast, when quotas are legislated, gender differences change rather than disappear. The perceptual bias that kept women from office lingers, but takes on new forms. Women are held more accountable. Specifically, since talent is hard to observe, parties are willing to update their beliefs in light of a candidate's legislative record (Banks and Sundaram, 1998). The weight of new information is furthermore higher when parties' prior belief is vague. When quotas are imposed externally, parties may comply but not fully internalize the new rules. A psychological effect occurs in the tension between "old" and "new" practices, creating a "label effect" on women (Franceschet and Piscopo, 2008; Dahlerup and Freidenvall, 2010; Bjarnegård and Kenny, 2016; Euchner and Frech, 2022). I theorize that parties, uncertain of female candidates' quality, intensify monitoring, prompting women to further prove their worth. Empirically, I demonstrate that

women elected under legislated quotas are equally talented as men elected under the same rules, but they stand more to gain from proving their abilities as legislators. As a result, they increase their effort.

"Over-performance" is often unobservable if we merely compare across genders. First, if female representatives face the same biases in office as they do when running for election, their higher talent might not translate into higher performance compared to their male colleagues (Kerevel and Atkeson, 2013; Folke and Rickne, 2016; Fernandes, Lopes da Fonseca, and Won, 2023).

Second, after the introduction of quotas, the appropriate comparison to assess the change in quality of representation is between the incoming women and the men they supplanted. Yet this is rarely done. Instead, several studies have demonstrated that quota women are as active, qualified, productive and motivated as quota men. While differences exist, they also follow similar routes to office (Murray, 2010; Kerevel and Atkeson, 2013; Wang, 2014; Franceschet and Piscopo, 2014; Weeks and Baldez, 2015; Lühiste and Kenny, 2016; Aldrich and Daniel, 2020). However, this is a poor counterfactual, as quotas aim to change the selection hurdle for both men and women. While opponents of quotas claim that they lower the standards for women, researchers have argued that quotas also heighten the threshold for men (Murray, 2014; Besley et al., 2017). In the end, whether the drop in quality among women equates the increase in quality among men is an empirical question.

To address the problem of comparisons across genders, this study employs a "before-after" design with a control group to examine the shifts in behavior among women and their parties when there is a change in quota policy. To do so, it relies on extensive data on 15 years of effort, performance, ambition and candidate selection in the European Parliament (EP).

As a transnational parliament, the EP offers natural variation in the application of quotas. On the one hand, electoral rules are decided nationally. Three member states – France, Portugal, and Spain – introduced legislated quotas during the period of study. This allows me to link shifts in behavior over time to the introduction of a quota, while

4

the remaining states are used as a control group. To pin the effect down to parties'
candidate selection, I further restrict my sample to countries relying on party-centered
electoral systems (closed-list proportional representation).

On the other hand, in office, all members (MEPs) face the same formal and informal
rules for how to obtain influence. Comparisons are thus also made across female legis-
lators serving in the same parliament, thereby controlling for the potentiality that task
distribution in office might also be gendered. In short, the findings cannot be explained
by innate characteristics of gender, but rather by elements of the political recruitment
process.

As such, I study the collective responses when informal political institutions (candidate
selection norms) meet formal requirements (legislated quotas) (paper 1/introduction to
this special issue). In the following, I review extant literature on quotas and candidate
selection. Next, I outline my theoretical argument and expectations regarding the impact
of a perceptual bias on candidate quality in the absence of quotas and detail how behavior
shifts in anticipation of sanctions when quotas are in effect. I then describe my case
selection and data. Finally, I present the empirical analysis that tests these predictions.

Literature on candidate selection and gender quotas

Causes for biased candidate selection

Political recruitment is a sequential process. It begins with a pool of eligible candidates
(1). Some aspire to run for office (2), but only a minority is nominated (3) and finally
elected (4) (Norris, 1997). The share of women tends to decrease at all four stages. The
phenomenon is at the core of the supply-and-demand model of candidate selection (Norris
and Lovenduski, 1995).

Supply-side explanations highlight the lack of women who aspire to a political career.
Norris and Lovenduski (1995) emphasize factors such as resources (time, money, relevant
experience) and motivation (ambition, interest in politics). Although the group of eligible
women has grown over time, they often deem themselves unqualified (Fox and Lawless,

2004; Fox and Lawless, 2011). Women consequently "fall off" in the passage from eligible to aspirant candidates. Experimental studies indicate that women avoid winner-take-all environments – even when their performance is high – so that fewer high-ability women and more low-ability men enter the competition (Niederle and Vesterlund, 2007). Kanthak and Woon (2015) moderate this finding by showing that when messages concerning skills are truthful, women compete at equal rates to men. However, they avoid electoral-campaign-like situations in which lying is a viable strategy. We may infer that more women opt out of races when they anticipate discrimination. Self-deselection is nevertheless an insufficient explanation for gender imbalances. The share of female candidates is higher, for example, when the party leadership plays a minimal role, leaving room for inclusive selectorates and self-nominations (Fortin-Rittberger and Rittberger, 2015).

Demand-side explanations point to the lack of interest among party selectors. Women with similar qualities to men are less likely to be recruited by party officials (Fox and Lawless, 2010). Except for instances of outright discrimination, the party disinterest can be conceptualized as "statistical" discrimination (Altonji and Blank, 1999). It is impossible to know how new candidates will perform in office. Party selectors therefore rely on information about visible skills to infer future performance. They start with a prior belief which they update based on signals of quality. Discrimination flows either from differences in the prior belief (Arrow, 1973; Coate and Loury, 1993) or from the precision of the signal (Aigner and Cain, 1977; Lundberg, 1991). The same information about two aspirant candidates thus results in different decisions, depending on the selectors' prior beliefs. Niven (1998) observes, for example, that the strong prior notion of women as an "outgroup" leads male party chairs to prefer male candidates.

The main takeaway is that female candidates must meet higher standards – either self-imposed or external – to achieve success. Selection bias means that successful female candidates had to be more talented and/or find the motivation to work harder to prove their aptitudes. This would explain why female candidates tend to perform at least as well as their male counterparts at the ballot (Fox and Lawless, 2004), although this may also be due to strategic calculations about when and where to seek office (Ondercin, 2022).

Moreover, the final set of elected women would be overqualified for office. Assuming equal opportunities in Parliament, these women should be expected to overperform (Anzia and C. R. Berry, 2011). Yet as is clear from paper 7 in this special issue, the same bias that prevents women from being nominated by their party may persist in Parliament, posing additional challenges to the empirical investigation of the selection effect that the gender bias implies.

Political agency and the effect of quotas

It is well established that electoral systems have an effect on the behavior of members of Parliament (John M Carey and Shugart, 1995; John M. Carey, 2007; Hix, 2004; André, Depauw, and Shugart, 2014). Yet this literature rarely considers legislated quotas as a part of the electoral setup (Euchner and Frech 2022; although, see Finke, 2019). Instead, the topic has been left to the literature on women and politics.

Theories of political agency distinguish between the effect of selection and sanction. The debate about gender quotas has mainly revolved around their effect on selection. Two questions recur: First, are *more* women elected into office? The question pertains to quotas' impact on descriptive representation, and contributions are centered on the efficiency of different policies (Dahlerup and Freidenvall, 2005; Tripp and Kang, 2008). Second, are the women selected through quotas *less* qualified? Some studies concentrate on behavior in office and find little evidence of marginalization or lower activity (Murray, 2010; Zetterberg, 2008; Devlin and Elgie, 2008; Wang, 2014). Others look at what candidates bring into office: their socioeconomic background or political experience (Franceschet and Piscopo, 2008; Murray, 2010; Franceschet and Piscopo, 2012; D. O'Brien, 2012; Murray, 2012a; Aldrich and Daniel, 2020). While gender differences exist, they seem of little consequence. From her study of French MPs before and after the parity reform, Murray (2010, p. 116) concludes that "...quota women are more like men than their nonquota counterparts, rather than the other way round."

Her observation points to an equally pertinent question: What were the gender differences in legislator quality prior to the quota? Besley et al. (2017) begin to answer the

question in their study of centrally imposed zipper quotas for local representatives. They find that competence levels among men were significantly lower prior to the quota due to biased recruitment.

In contrast, researchers have made few inferences about how behavior is sanctioned if bias lingers after quotas are imposed. Quotas aim to "make space" within existing parties (Htun, 2004), with a potential gap between the intended purpose of legislated quotas and parties' willingness to comply with them (Dahlerup and Freidenvall, 2005). While some studies indicate that exogenous quota adoption has propelled more women to the position of lead candidates (D. Z. O'Brien and Rickne, 2016), others argue that "top-down" quotas create a "label effect" on women (Franceschet and Piscopo, 2008). This latter term designates the perception that quota women did not win their seat in a fair competition, but rather through favorable treatment. Although Radojevic (2023) finds that the mere knowledge that quotas apply did not lead party elites to consider elected women as less competent, Verge and Espírito-Santo (2016) explain that there is still some "stickiness" to intra-party practices of recruitment. This may lead the party selectorate to doubt their candidate selection when faced with the consequences of the new rules. Women are thus subject to a "super surveillance" under which they need to prove their competence to hold office (Puwar, 2004; Verge and Fuente, 2014).

Theory

Norms and practices do not immediately change when quotas are introduced. Rather, the new requirements need to be "accommodated" to the parties' existing procedures (Verge and Espírito-Santo, 2016). The effects of quota adoption investigated here flow from that tension between "old" and "new" practices. To make inferences of how bias and quotas combine to impact representation, I draw on mainstream theories of political agency.

In *sanctioning models* of political accountability (Ferejohn, 1986) voters reject representatives whose efforts do not meet a set standard, while higher-performing incumbents return to Parliament. The threat of rejection influences in-house representation, as reelection-seeking candidates increase their efforts to pass the electoral hurdle. Other

models recognize that candidates are inherently different, leading voters in *selection models* to choose candidates with better intrinsic qualities (Fearon, 1999). However, since talent is not readily observable, parties may still look to incumbent candidates' legislative record to update their beliefs. This, in turn, may spur incumbent candidates to exert effort to prove their quality.

By conceptualizing political recruitment as a process of Bayesian updating, I integrate parties' (biased) perceptions as a moderating factor in their candidate assessment. In this process, the precision and the direction of parties prior beliefs as well as the precision and direction of the new information provided are important (Ashworth, 2012). Specifically, I theorize that parties seek to recruit the most talented legislators. However, gender stereotypes prevent parties from accurately perceive and assess female talent in the same way as men. This relates to the direction of parties' prior beliefs as well as the difficulty to project aspirant candidates' diverse backgrounds onto future performance in office. In the initial search for candidates, this leads to a selection effect whereby women have to pass a higher hurdle than men. Once the hurdle is passed, however, parties may feel certain that their elected representatives are of equal quality.

I further theorize that legislated quotas constitute an institutional reform that does not immediately change parties' minds. Parties continue their search for the most talented legislators in compliance with the new rules. Yet the informational environment has changed. Not trusting the process, parties may kindle some uncertainty about their elected women's talent. However, they are allowed to reconsider their choice at the reselection stage in light of the incumbent's legislative record. These records are readily comparable across legislators, and are therefore more reliable signals of quality than aspirant candidates' previous experience. This leads to increased emphasis on accountability.

While I theorize that parties' perceptual bias remains constant, in the following, I derive different empirical implications depending on the institutional rules. First, absent quotas, a preexisting bias affects legislators' performance and value of office. Second, when quotas are imposed, uncertainty from the initial selection alters parties' emphasis on new information and incumbent candidates' efforts.

Consequences of biased recruitment in the absence of quotas

A candidate has to invest talent and energy to successfully contest elections. The additional requirements implied in a biased selection mean that only women with lower opportunity costs enter office: They are more talented and/or place higher value on the mandate.

First, if women anticipate discrimination or underestimate their talent, they would have to work harder to gain office. Only the most committed candidates enter the more demanding races and are selected. This leads to the first hypothesis.

Hypothesis 1a. *The probability that women aspire to a long career in Parliament increases when the initial selection hurdle is harder to pass.*

H_{1a} is the first of two tests probing the effect of biased selection. However, in his seminal study of political ambition, Black (1972) also finds that those who initially had a considerable desire to be selected, were the most likely to later seek reelection. In terms of the quality of democratic representation that motivates this study, electoral ambition means that legislators can be held accountable. It may therefore be argued that support for H_{1a} implies that women – absent quotas – provide higher-quality representation.

Second, parties seek to select the most talented legislators. "Talent" in this respect pertains to any quality conductive to a higher legislative output, but that the candidate cannot himself alter over the period of study. If the party discounts talent, only the most qualified women pass. The same logic applies if women themselves discount their aptitudes. Although we cannot directly measure talent, we can observe the performance and effort of elected officials. At equal levels of effort, the most talented members perform better. This leads to the second hypothesis.

Hypothesis 1b. *At equal levels of effort, the performance of female members of Parliament is higher when the initial selection hurdle is harder to pass.*

This is not to say that discriminatory practices allow parties to recruit among the most talented pool of women. As we have seen, women tend to shy away from flawed competition. Biased recruitment may lead to substantial brain drain. However, if we

consider only the subset of women that have made it into office, we restrict our study to those with the additional ambition and talent required to brave the additional hurdle.

I have elaborated a conditional theory of how gender bias impacts legislator quality. To test H_1, I implement an interaction effect between gender and quotas that leverages variations in the hypothesized threshold to enter office. Aligning with authoritative advice on interaction effects, the theory spells out clear predictions for the marginal effect of both variables (W. D. Berry, Golder, and Milton, 2012). I begin by comparing between the genders when bias leads to a higher threshold for women and no quota mitigates this effect. I then compare within each gender when quotas are introduced. Quotas are designed to lower the entry costs for female candidates, but this is a zero-sum game. We would therefore expect a decrease in talent among female members after quotas are legislated, but also an increase in quality among men. Lastly, when quotas apply, I expect them to level the playing ground so that we should see a smaller gender difference than in the absence of quotas.

Consequences of uncertain candidacies when quotas apply

I also expect a change in party and candidate behavior when quotas are legislated. Legislated quotas are exogenous and compulsory. Parties may comply without fully adhering to them. If effective, quotas induce parties to field candidates they would not otherwise have chosen. In such cases, parties are uncertain about the candidates' talents. This leads them to seek new information before a potential reselection. The result is a "super surveillance" under which women need to prove their aptitude to hold office.

The argument is similar to the more formalized notion that voters and parties are sensitive to the informational context in which candidates are selected. Banks and Sundaram (1998) present, for example, a two-period model which combines the effect of selection with the behavioral incentives of a sanction. Parties make repeated decisions over the course of a member of Parliament's career, each time using the information at hand. The first selection is made based on parties' prior beliefs about the candidate's future performance. At the end of each term, parties may update their beliefs in light of the incumbent

candidates' legislative record before they decide on a retention.

Following the model, uncertain prior beliefs induce parties to rely more heavily on the incumbent's performance, since they now have the occasion to reconsider their choice. I expect that a party which has not yet internalized the new requirements is more likely to nourish doubts about the aptitude of the women selected. This leads to a greater reliance on in-house performance when deciding whether to retain incumbent quota women.

Hypothesis 2a. *In-house performance has an increased effect on the reselection of women who entered through legislated quotas.*

Note that this intuition about parties' uncertainty predicts an increased effect of performance among quota women. I test this in a three-way interaction between gender, quota and performance where the hypothesis pertains to the marginal effect of performance in the group. The theory remains agnostic as to the direction of parties' prior belief about quota women, which is reflected in the effect of gender at equal levels of performance. Here, I instead theorize that parties have little confidence in their original evaluation and are willing to reassess.

My last hypothesis relates to women's reaction to their party's uncertainty. They are well aware of the "label effect" of quotas and seize the opportunity to provide evidence that they can perform according to the standard. Reelection-seeking quota women are therefore incentivized to work harder during their mandate.

Hypothesis 2b. *Women from legislated quotas know the selectorate emphasizes performance, and therefore increase their effort to perform well.*

Note that I distinguish between *effort* and *performance*. Effort pertains to all actions that representatives may undertake freely. Performance, on the other hand, is a measure of the influence they obtain through these actions.

The European Parliament: before and after the legislation of quotas

The 1999-2014 period in the European Parliament (EP) is an ideal case to test the theorized effect of biased candidate selection and legislated quotas. Members of the European Parliament (MEPs) share the same institutional context. They sit within transnational political groups and face the same legislative agenda. Key positions are controlled by the transnational leadership, which decides how effort translates into performance (Chiou, Hermansen, and Høyland, 2020).

However, the electoral rules are decided nationally, meaning the data contains key variation in how MEPs enter Parliament. Three countries – France (2000), Portugal (2006) and Spain (2007) – adopted legislated quotas under the period of study. In the first term (1999-2004), these countries are observed prior to the change in policy. Because I am interested in the effect of quotas when bias lingers, I restrict the study to the period immediately after the reform.[1] I thus follow a "before-after" design in which the remaining member states serve as a control group to ensure comparability. It may, for example, be the case that the general level of legislative activity or gendered distribution of tasks in the EP has changed over time in parallel with – but unrelated to – the introduction of gender quotas.

The study further focuses on the 11 member states which applied closed lists (Austria, Bulgaria, Estonia (2009), France, Germany, Greece (2004 and 2009), Hungary, Portugal, Romania, Spain and Great Britain). There are two reasons for this. First, voters and parties may have different views of women in politics. As is illustrated elsewhere in this special issue, voters may reshuffle candidates to prioritize male incumbents (paper 6). The party selectorate may also ignore favorable changes in public attitudes towards women (paper 4). While all members are elected from a proportional representation ballot, approximately half hail from party-centered systems. In these systems, parties can secure election to their preferred candidates by allocating "safe seats", while voters can

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[1]France is observed for two terms after the policy implementation, while Portugal and Spain only for one term (2009-2014)

only vote for the party label. By focusing on closed-list ballots, I isolate the party's choice of candidates from voters' preferences

Second, MEPs have different incentives to engage in parliamentary work depending on the electoral system. Parties are policy seekers and tend to reward incumbents that have been instrumental in the drafting of new laws (Hermansen, 2018b). By contrast, voters rarely follow the legislative agenda as closely as parties. MEPs from candidate-centered systems thus tend to prioritize activities that attract voters' attention. They spend less time and resources in Parliament (John M Carey and Shugart, 1995; Høyland, Hobolt, and Hix, 2019) and more on constituency activities (Bowler and Farrell, 1993; Hermansen and Pegan, 2023). Their policy leadership also has negligible effect on their reelection prospects (Wilson, Ringe, and Jack van Thomme, 2016).

The legislated quotas can be seen as exogenous, although not randomized. They were passed by a majority of the members of the national parliaments, but are addressed to the selectorate in all parties and at all levels of government. Furthermore, the public debate was mainly concerned with the under-representation of women at the national – and not the European – level. Lastly, the quotas were first applied in the European elections at two different time points, which further controls for time-dependent characteristics.

At first glance, the quotas did not produce any substantial effect on the descriptive representation in the EP at all. A number of left-wing parties had already applied party-level quotas for some time prior to the legal change. Southwell (2013) also notes that the passage from a nation-wide French constituency to eight regional entities in 2004 dampened the effect of the reform. Moreover, the share of women from the reformed countries was already higher than in the control group[2] (40% against 33% in the 5th Parliament), and the increase was the same in both groups over the period of study (up 6% from the 5th to the 7th Parliament).

Country-level studies indicate nevertheless that the reforms encountered substantial opposition even from the instigators of the law. In all three countries, the laws were

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[2]The proportion for the control group is calculated among the countries which are present in the sample during all three periods: Austria, Germany and Great Britain. Including the other countries does not modify the results much.

adopted as high-profile policies by leftist governments. Yet the resistance was not limited to the right-wing parties. For example, Luc Ferry, a member of the French Socialist Party, worried that the reform "...runs the risk of creating *'quota women'*, elected women who could, rightly or wrongly, be suspected of owing their entry into politics more to legal obligations than to their personal merit" (my italics; Micheline Amar, *Le piège de la parité*, 1999, p. 124, cited in Murray, 2010, p. 95). The Portuguese Communist Party similarly rejected the law, arguing that differences in political participation had socioeconomic origins that could not be fixed by quotas (Baum and Espírito-Santo, 2012, p. 327). The adoption seemed to be the least controversial in Spain where, by the time of the reform, even the fiercest opponent of quotas (the Popular Party) had adopted targets to boost female representation (Verge, 2012, p. 399).

Resistance continued after the reforms, with parties often choosing to field women in unwinnable seats (Murray, 2004; Murray, 2012b; Murray, 2013; Verge, 2013). Election concerns had a particularly negative effect in the French case where parties preferred paying the financial penalties incurred by naming male incumbents over losing seats. Thus, even the main architect of the law, the French Socialist Party, sustained a yearly loss of 1.5 million euros in the 2002-2007 period due to its overt non-compliance (Murray, 2007, p.575).

Overall, these considerations mesh with the argument that top-down reforms are frequently accompanied by inertia in the actual assessment of candidates. The tension between targeted goals and party practice leads to the hypothesized increased accountability of quota women.

Variables

To test my argument, I rely on data on the value of office, effort, performance and reselection of MEPs and trace their variation back to the legislation of quotas. Unless otherwise stated, all information is drawn from the EP website.

Biased selection: outcome variables

The analysis begins by probing the selection effects entailed in biased recruitment and quota adoption. If women have to work harder or be more talented to obtain office, then these differences are observable in the pool of elected candidates.

Value of Office indicates the intention to stay in Parliament at least another ten years. That is, the MEP aspires to reelection. The variable is only observed among the respondents to the EPRG Survey (Farrell, Hix, and Scully, 2011). The survey is administered at the beginning of each new legislature, with 27% of the respondents expressing the intention to extend their tenure beyond a decade. Career spans are indeed short in the EP. The median tenure among individuals in the sample was 6 years, only slightly longer than one term.

Performance reports the count number of high-impact pieces of legislation an MEP handles during a term. Drafting legislation on behalf of their committee is a position which members can strive for, but not self-select into (Hermansen, 2018a). The EP is a committee-oriented legislature: Proposals are drafted and consensus is reached in committee prior to the plenary reading. In committee, draft legislation is delegated to one of the political groups which appoints a member to handle the dossier. The member writes a "report" on behalf of the committee and defends the amended proposal during the committee meetings, plenary deliberations and inter-institutional negotiations.

The institution of "rapporteurs" clearly identifies key players in Parliament other than the leadership itself. If national parties seek influence, they need legislators who acquire reports. Parties therefore update their beliefs by drawing on incumbent candidates' legislative record. In the EU's party-centered systems, reelection rates are higher among candidates that have held such influential positions (Frech, 2016; J. van Thomme, Ringe, and Victor, 2015). The effect is furthermore moderated both by the uncertainty in the party's prior belief and the precision of the signal that the legislative record communicates. Past performance is thus more important for newcomers that seek reelection and when the record contains a number of competitive, high-impact legislative proposals (Hermansen, 2018b). For the purposes of this study, I define legislation as "high im-

pact" when Parliament is a co-equal legislator to the Council (i.e., codecision and budget procedures). Allocations are not evenly distributed among members, and thus help discriminate between rank-and-file legislators. In the sample, 58% of the observations did not serve as high-impact rapporteurs during their term at all. Among those who did serve, in contrast, the average is three. The performance measure first enters the analysis as an outcome variable, reflecting the consequence of gender bias in the absence of quotas. It then reenters as a predictor, explaining the party's reselection criteria when quotas apply.

Accountability: outcome variables

The second part of the analysis focuses on the behavioral changes that gender bias induces when quotas apply.

Reselection flags whether incumbent members appear on a "safe seat" when they seek reelection. It captures the best positions a party can offer to their candidates for the upcoming election, and therefore reflects their wish to retain the MEP for another term. The variable is coded from parties' electoral lists (Däubler, Chiru, and Hermansen, 2022). A list placement is classified as "safe" if a member is put higher than the number of seats currently held by the party in a given district. 46% of the MEPs in the sample were renominated to a safe seat, while 54% returned to office. As paper 9 in this special issue illustrates, once elected, women are more likely to obtain a safe seat in the next electoral contest.

Effort measures MEPs' attendance in committee meetings. In contrast to legislative proposals – which are selective – attendance levels only depends on the individual and requires no co-option from the group leadership. It reports the proportion of times an MEP has attended committee meetings as compared to the most assiduous members (capped at 400 meetings). The information is drawn from the EP's minutes. Committees convene between one and three times per month during each session. Studies emphasize that a minimum of parliamentary activity is required in order to qualify for reports (Yoshinaka, McElroy, and Bowler, 2010; Hurka and Kaeding, 2012; Hurka, Kaeding, and Obholzer, 2015; Hermansen, 2018a). While plenary sessions take place once a month in Strasbourg,

17

the "committee week" takes place in Brussels. The core of Parliament's legislative work is done there. MEPs who want to make connections and profile themselves with the committee leadership, need to incur the cost of investing in committee work. As paper 10 in this special issue argues, female legislators across Europe often work harder to overcome additional hurdles posed by the electoral rules. In this article, I differentiate between women to investigate if quota women offset their additional accountability.

Explanatory variables: gender and quotas

Female indicates whether an MEP is a woman, which means that men are used as a baseline for comparison. I further expect that gender differences appear as a function of the candidate selection. All models therefore make comparisons within each gender through interaction terms between gender and *Legislated Quota*.

Control variables

Party Quota designates MEPs who entered through quotas imposed by the party. Information is drawn from the quotasProject – Global Database of Quotas for Women (International Instiute for Democracy and Electoral Assistance (IDEA) and the University of Stockholm, 2016) and completed where necessary by country-level studies (Baum and Espírito-Santo, 2012; Verge, 2012). I do not expect these voluntary quotas to have the same effect on candidate selection. In the first analysis, *All Quotas* indicates whether an MEP entered office within any of the two formalized quota systems. It serves to distinguish non-quota women from other women. In the sample, 77% of the women in their first term were elected through some form of quota, while 23% were not.

Incumbent indicates whether an MEP served in Parliament in the previous term. It is an important control when considering performance, as experienced members are preferred when high-impact reports are allocated (e.g.: Yordanova, 2011). This also means that MEPs need to provide less effort as their career advances, although their performance may continue to improve (Banks and Sundaram, 1998). Generally, we also know that male incumbency tends to work against female newcomers (Kerevel and Atkeson, 2013).

In the sample, 34% of the incumbents were female, while the same figure among freshmen is 40%.

Where relevant, the analyses also control for the difficulty implied in drafting reports. *Complexity of Reports* thus refers to the mean number of recitals that rapporteurs have included in their drafts (Kaeding, 2006). Recitals formalize the reasons for the contents of the proposal. The measure controls for the possibility that women may be assigned to a high number of low-salience dossiers, rather than obtaining real policy sway. Non-rapporteurs naturally have a zero count. The median high-impact rapporteur also did not use the opportunity to use recitals, while the mean rapporteur used two recitals. The distribution is thus heavily skewed and has – in line with previous research – been log-transformed.

Elected on a Safe Seat is the lagged version of the Reselection variable. It indicates whether an MEP entered Parliament on a safe seat. It is included as a control in two instances. First, while representatives who value office are likely to seek reelection, they also make a calculation of the probability of winning the next election too (Black, 1972). If an MEP entered on a safe seat, they may believe they have a higher likelihood of future reselection as well. Second, a lag is included when modeling the party's reselection of candidates to isolate the effect of candidates' talent (expressed as performance) from parties' prior belief (expressed in the safety of their seat).

The data structure and model choices

My unit of analysis is MEPs who were registered as members at the end of each legislative term. The data thus includes 1,131 observations of a total of 765 individual MEPs over three legislative periods (1999-2014). Since I theorize about the party selectorate's choice, independent members and members of technical and eurosceptic groups are excluded (i.e., the EDD, IND/DEM, UEN, TDI, EDF, ECR and ITS).

The hypotheses are tested in a series of generalized linear models with a varying link function ($g()$), depending on the explained variable in question (Y_i). My interest lies in the interaction between gender and legislated quotas.

$$Y_i \sim g(\mu_i)$$

$$\mu_i = a_{Nationality_i} + a_{Party_i} + a_{Legislative\ term_i} + a_{Transnational\ group_i}$$

$$+ b_1 \times Female_i$$

$$+ b_2 \times Female_i \times Quota_i$$

$$+ b_3 \times Quota_i$$

$$+ b_{4,\dots j} \times Controls_{1,\dots(j-3)}$$

All models further control for unexplained variation from different sources: They include varying intercepts for each legislative term, transnational party group, nationality and national party. The effect of legislated quotas can thus be attributed to the change in legislation, and not to national, party level or other time-dependent differences. For clarity, descriptions of each model are provided immediately before each analysis and in the Appendix.

Results

The analysis begins by probing the effect of a biased selection on legislators' *quality* before it explores the change in *behavior* when quotas induce parties to deviate from their previous practices.

The effect of biased selection on legislator quality (H_1)

When recruitment is biased, I expect women elected without quotas to be significantly more likely to aspire to long careers (H_{1a}) and perform higher (H_{1b}) than other legislators at equal levels of effort. The results overwhelmingly support both claims.

Women who pass the selection hurdle aspire to longer careers (H_{1a})

I begin by fitting a binomial logistic model to explain *Value of Office*, drawing on the subset of 305 MEPs who answered the EPRG Survey. Given the low number of obser-

**The effect of gender bias on
VALUE of OFFICE**

Density

Women – HIGHER hurdle
(no quota)

Male baseline
(no quota)

−3   −2   −1   0   1   2   3

Coefficient
$p(\beta > 0) = 0.98$

**The effect of gender bias on
VALUE of OFFICE**

Density

Women – LOWER hurdle
(all quotas)

Male baseline
(no quota)

−3   −2   −1   0   1   2   3
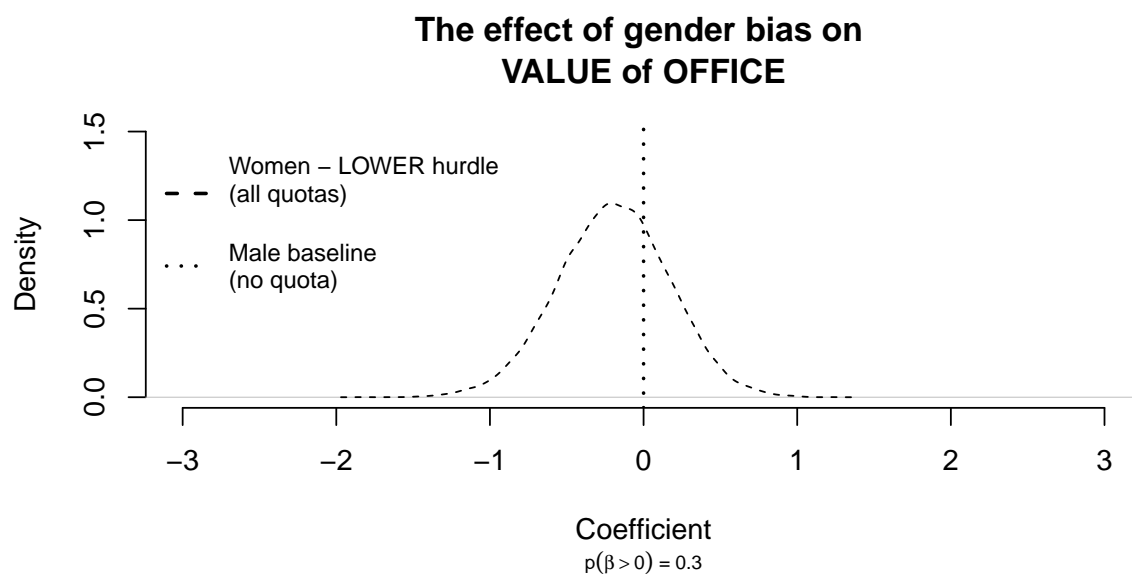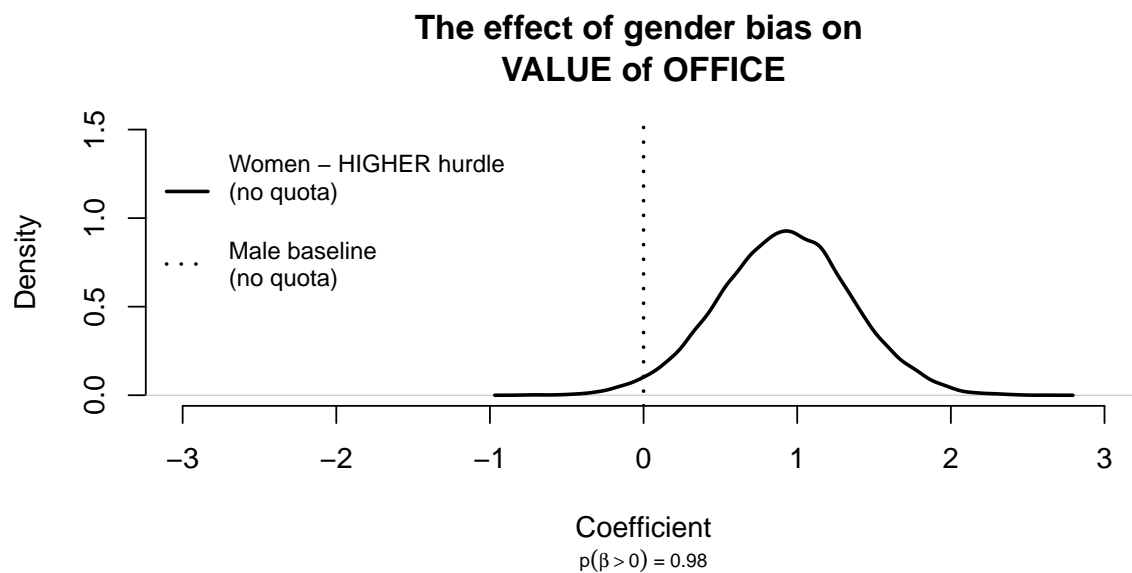
Coefficient
$p(\beta > 0) = 0.3$

Figure 1: Women not elected from quotas aspire to longer careers in Parliament than other members of Parliament.

Dependent variable: 'Aims at Lengthy Career'	Coef.
Intercept	-0.48
	[-1.06 , 0.07]
Female (Elected without Quota)	0.92
	[0.06 , 1.77]
Female (Elected from All Quotas)	-0.19
	[-0.92 , 0.5]
Incumbent	-0.78
	[-1.36 , -0.23]
Elected on a Safe Seat	-0.49
	[-1.08 , 0.11]
Number of observations	305
σ^2 (Legislative Term)	0.11
σ^2 (Transnational Group)	0.17
σ^2 (Nationality)	0.21

Note: Median effect with 95 % symmetric posterior density interval.

Table 1: Women elected without help from quotas are more likely to seek a EU-level career. Results from a binomial model.

vations, the model tests the hypothesis by including a dummy for (non-quota) women. The model then controls for women elected under quota rules, incumbency, whether the MEP entered office on a safe seat, as well as the legislative term, transnational group and nationality.

The results are reported in Table 1 and illustrated in Figure 1. They align with the predictions of H_{1a}. Upon entering Parliament, women elected without quotas are more than twice as likely to plan on a lengthy career as men. This is not due to gender. Quota women are equally unlikely to aspire for a long career as men. The results speak to the higher investment that women have to make to obtain office when selection is biased.

Women who pass the selection hurdle are more talented (H_{1b})

I then fit a Poisson model to explain MEPs' talent as legislator. To do so, I regress *Performance* – measured as the number of high-impact reports MEPs have handled dur-

ing their term – on the interaction between *Female* and *Legislated Quotas*. Since I am interested in women's talent as legislators, the model controls for other predictors that influence performance: the level of effort in office, party quotas, incumbency and the average complexity of reports. Varying intercepts account for unexplained variation between legislative terms, transnational groups, nationality and party affiliation.

The results are reported in Table 2 and illustrated in Figure 2. When no formal mechanism ensures female representation, women who pass the selection hurdle perform better than men (H_{1b}). The difference is sizeable. Even when controlling for effort, the predicted number of legislative proposals among non-quota women is 54% higher than that of non-quota men. The results are in line with Anzia and C. R. Berry (2011)'s observation that biased selection leads to higher-performing women. In contrast to their analysis, I have ruled out effort as an explanation. Instead, we may argue that this is a selection effect, whereby gender bias brings fewer but more talented women into office.

The model also allows us to directly estimate the marginal effect of introducing quotas for men and women, respectively. Quotas intervene to lower the selection hurdle for women, while putting a limit on male mediocrity (Murray, 2014; Besley et al., 2017). In the data, the largest effect of the reform was indeed among men. Their productivity more than doubled following the electoral reform. However, the results also lend a semblance of credence to the skeptics of gender quotas. Among women, the reform led to a 32% drop in productivity. Their performance remains nevertheless on par with male legislators because of the higher initial performance among women. The normative question relating to the effect of quotas on the quality of our legislators, is whether quota women perform worse than the non-quota men they replace. The answer is empirical. We have no indications to that effect. The difference between the two groups (5%) is minor and not statistically significant.

To conclude, when quotas are legislated, the gender gap in estimated talent disappears. This comes as a result of a change in parties' candidate selection. However, we may ask what happens to MEPs' accountability when electoral laws lead party selectors to deviate from their previous criteria.

23

Dependent variable: 'Performance'	Coef.
Intercept	-0.66
	[-0.9 , -0.45]
Female	0.43
	[0.23 , 0.64]
Female * Legislated Quota	-0.38
	[-0.68 , -0.09]
Legislated Quota	0.78
	[0.5 , 1.07]
Female * Party Quota	-0.32
	[-0.57 , -0.07]
Party Quota	-0.02
	[-0.37 , 0.31]
Incumbent	0.51
	[0.38 , 0.64]
Effort (Attendance in Committee)	0.24
	[0.18 , 0.29]
Effort (Questions)	0
	[0 , 0.01]
Complexity of Report	0.48
	[0.41 , 0.55]
Number of observations	1122
σ^2 (Legislative Term)	0.19
σ^2 (Transnational Group)	0.1
σ^2 (Nationality)	0.19
σ^2 (Party)	0.5

Note: Median effect with 95 % symmetric posterior density interval.

Table 2: Women who were not elected through a quota system perform better than other MEPs. Quotas lowers female performance compared to previous levels. Results from a poisson model with varying intercepts.

Lingering bias: the change in behavior when quotas are imposed (H_2)

Quotas can be a "fast track" to increase female representation. However, they do not eradicate the perceptual bias that led to female under-representation in the first place.

The gender imbalance prior to the reforms was minor in the EP, leading to little relative change in the number of women who entered office. This makes for a hard case to test the psychological effect of quotas.

I start by observing the increased monitoring that parties engage in to dissipate their uncertainty (H_{2a}), then move on to quota women's increased effort in response to the new "super surveillance" (H_{2b}). The results support both expectations.

Higher accountability of quota women (H_{2b}).

Quotas bring women into office whom parties would otherwise not have selected. They may doubt their choice. Parties' prior uncertainty about female candidacies might lead them to put more emphasis on new information about legislators' talents when candidates seek reelection (H_{2b}).

To test the prediction, I run a binomial logistic model to explain *Reselection*, measured as the allocation of safe seats to incumbent members. Predictors of interest are MEPs' *Performance* interacted with *Female* and *Legislated Quota*. The term tests the insight that women elected under legislated quotas reap disproportional benefits from a good record of service compared to other MEPs. The model controls for the average complexity of reports, incumbency and whether the incumbent entered Parliament on a safe seat. By including a lag of my dependent variable, the results may be interpreted as the party's decision to promote (or demote) incumbent candidates from marginal to safe seats. Finally, the model includes an estimation of legislators' intention to seek reelection. As such, it can be considered a propensity score model that compares MEPs on the basis of a latent/unobserved trait. The propensity scores are estimated simultaneously to the main equation drawing on information on the MEPs' effort, age and career stage (Hermansen, 2018b). Details are provided in the Appendix. The model also includes varying intercepts for the legislative term, transnational group, party affiliation and nationality.

The results are reported in Table 3. As illustrated in Figure 3, performance has a disproportionately positive effect on quota women's likelihood of reselection. Certainly,

Dependent variable: 'Safe Seat'	Coef.
Intercept	-1.33
	[-1.78 , -0.92]
Performance	0.13
	[0.04 , 0.24]
Female * Legislative Quota * Performance	0.48
	[0.08 , 0.93]
Female * Performance	-0.08
	[-0.25 , 0.07]
Female * Legislative Quota	-0.48
	[-1.37 , 0.38]
Legislative Quota * Performance	-0.12
	[-0.33 , 0.09]
Female	-0.05
	[-0.42 , 0.32]
Legislative Quota	-0.06
	[-0.68 , 0.56]
Complexity of Report	0.04
	[-0.32 , 0.41]
Incumbent	-0.67
	[-0.98 , -0.35]
Aims at Lengthy Career (estimated)	1.4
	[0.85 , 1.95]
Lag (Elected on a Safe Seat)	0.99
	[0.65 , 1.35]
Number of observations	1122
σ^2 (Legislative Term)	0.1
σ^2 (Transnational Group)	0.42
σ^2 (Nationality)	0.42
σ^2 (Party)	0.33

Note: Median effect with 95 % symmetric posterior density interval.

Table 3: Women elected from legally binding qutoas have a greater effect of performance during reselection to office. Results from a binomial model with varying intercepts.

the probability of reselection increases for all incumbents when they perform well: For each piece of high-impact legislation handled by the baseline MEP, the probability of

obtaining a safe seat increases by 14%. In contrast, upon the introduction of quotas, this figure dramatically rises to 85% for women. The change is statistically significant. On the other hand, there is no indication that accountability changes among men, nor that non-quota women are more monitored than non-quota men. Specifically, since the control group includes non-quota women, the alteration in reselection criteria can be traced back to the change in quota policy rather than gender.

Note that the change in effect of performance is driven by parties' prior *uncertainty* following the top-down introduction of quotas. In contrast, the interaction between *Female* and *Legislated Quota* (necessarily included) captures the direction of parties' prior beliefs about quota women's talent. While vastly imprecise, it is negative and of the same magnitude as the allocation of one report. It would imply that quota women have a lower probability of being reselected than other legislators unless they can off-set the initial bias by obtaining additional high-impact legislative proposals. This would be in line with the idea that parties hold negative prior beliefs about the quota women they select. However, given the lack of precision of the estimate, the results neither support nor invalidate such a statement.

Higher effort of quota women (H_{2b}).

Women elected from legislated quotas struggle with a "label effect." As the previous findings indicate, in-house performance can dissipate doubts about their quality as legislators. Quota women have thereby incentives to provide more effort to perform well.

Effort is also modeled as as a function of the interaction between *Female* and *Legislated Quota*. I expect the term to be positive. For comparison, the model also includes a similar interaction for party quotas. Given that experienced members tend to be more effective, I further control for whether the MEP has already been reelected at least once, as well as for the number of years the MEP has been a member during the current term. The model also contains varying intercepts for the legislative period, transnational group, nationality and party affiliation. I run a linear model in which committee attendance is the dependent variable operationalizing effort. Since the measure is bounded between 0

and 1, it is transformed to obtain an approximately normal distribution $(log(\frac{x}{1-x}))$.

The results displayed in Table 4 and illustrated in Figure 4 are in line with the expectations. The effect of the reform on women's investment in committee meetings is substantial and bounded away from the constituent terms of the interaction. While there is no indication of gender differences in effort prior to the reform, the introduction of quotas led to a 65% increase in the attendance rate among female MEPs. The marginal effect of the quota among men is less clear. Although the model suggests a 16% increase, the estimate is statistically insignificant. Overall, the model indicates that – in the presence of legislated quotas – women's attendance rate in Parliament is 42% higher than for men.

To conclude, the introduction of quotas led to a disproportional increase in women's accountability. While gender differences in talent disappeared after the quota, the incentive structure for reelection-seeking candidates became conditional on gender in a way that was not observable previously.

Dependent variable:	Attendance (linear mod.)
Intercept	-3.4
	[-3.73 , -3.07]
Female	-0.03
	[-0.26 , 0.2]
Female * Legislated Quota	0.35
	[0 , 0.7]
Legislated Quota	0.15
	[-0.08 , 0.37]
Female * Party Quota	-0.03
	[-0.3 , 0.25]
Party Quota	-0.15
	[-0.47 , 0.17]
Incumbent	-0.31
	[-0.45 , -0.17]
Years of Term	0.64
	[0.57 , 0.71]
Number of Observations	1050
σ^2 (Legislative Term)	0.4
σ^2 (Transnational Group)	0.13
σ^2 (Nationality)	0.22
σ^2 (Party)	0.07

Note: Median effect with 95 % symmetric posterior density interval.

Table 4: Women elected from legally binding quotas provide more effort in office than other MEPs – male or female. Results from a linear model with varying intercepts.
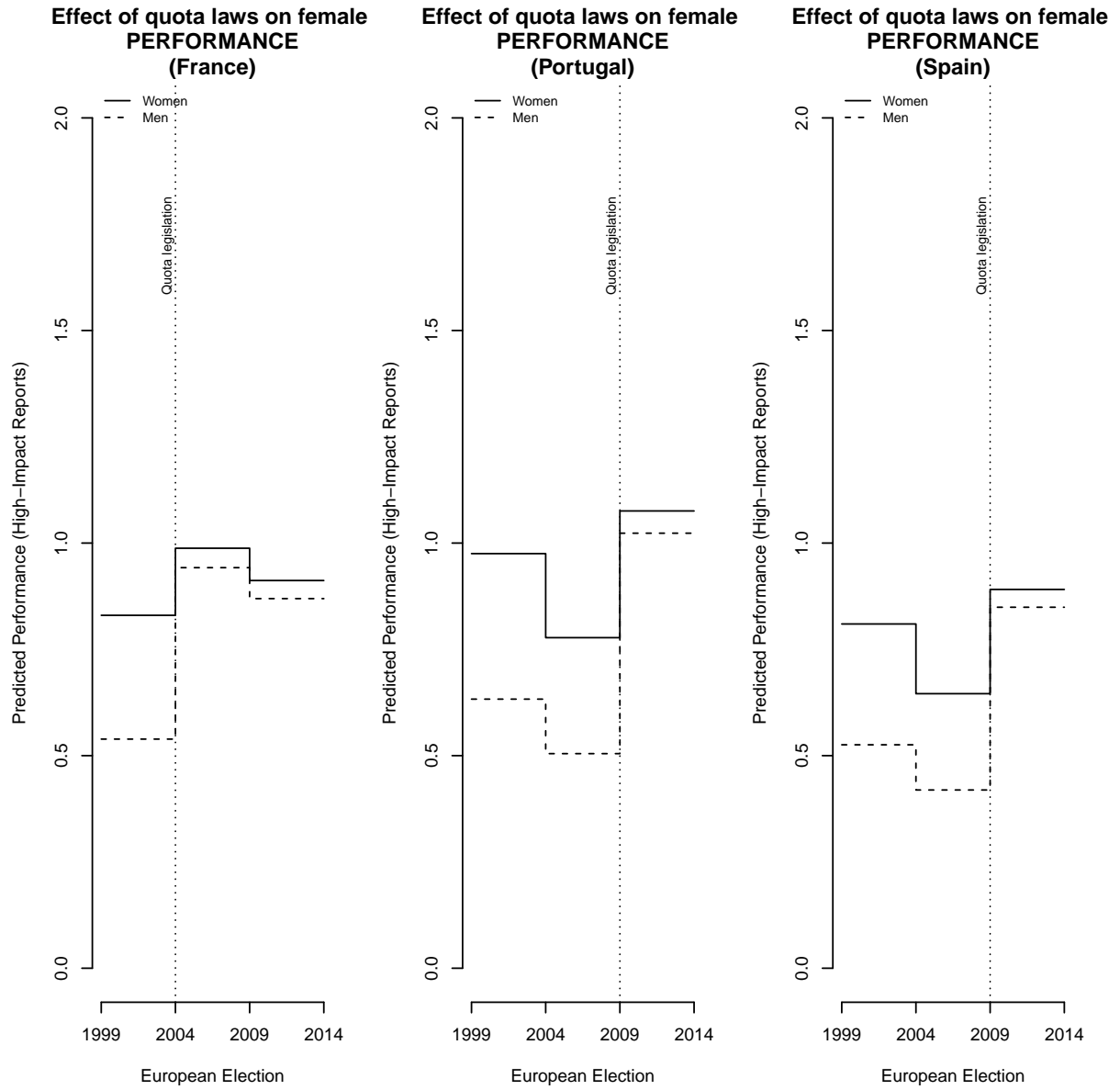
Figure 2: In the absence of quotas, women perform better than men at equal levels of effort. Differences are smaller after the quota reform. Predicted results from a Poisson model of high-impact report allocations with varying intercepts.

Effect of performance on female RESELECTION (no legislated quota)

Effect of performance on female RESELECTION (legislated quota)

Probability of safe seat

Performance (number of reports)

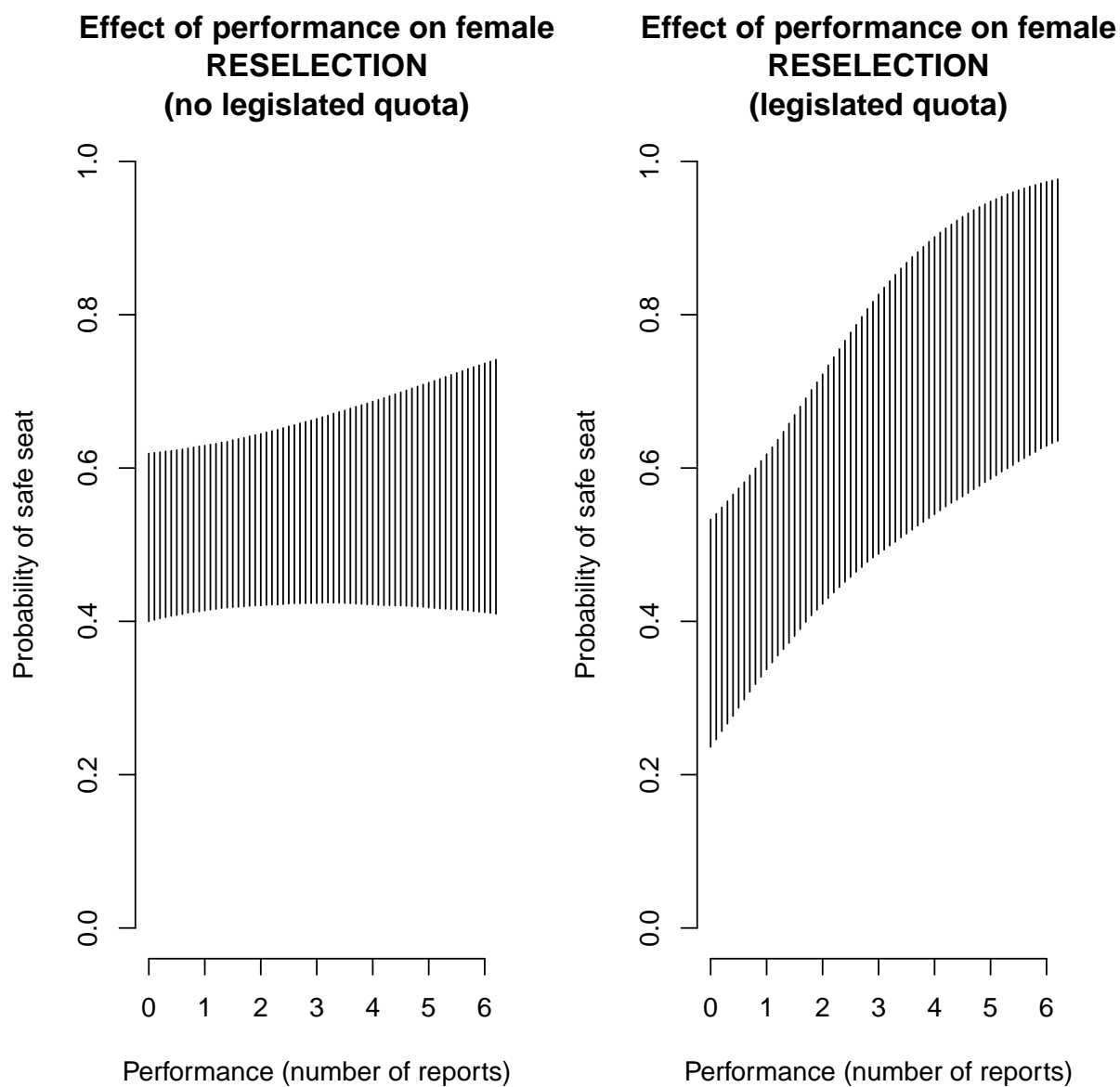Probability of safe seat

Performance (number of reports)

Figure 3: Legislated quotas lead parties to hold women more accountable: They have a greater effect on performance.
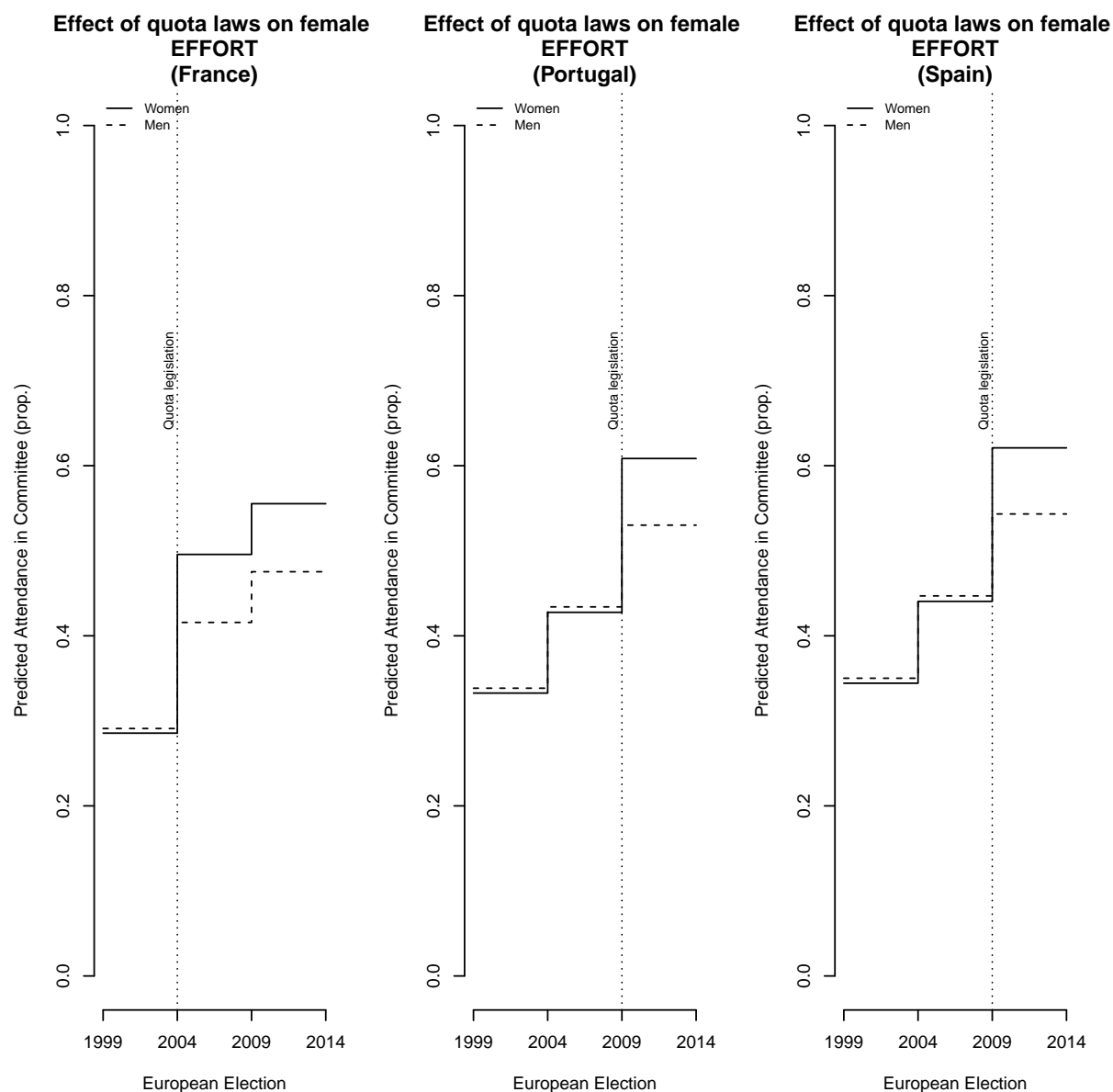
Figure 4: Legislated quotas lead women to increase their efforts. Predicted results from a linear model with varying intercepts.

Conclusion

Reliance on gender quotas has exploded since the 1990-ies (Krook, 2010a), but they remain contested. While quotas can be justified a means to compensate for the injustice that women experience during political recruitment, it amounts to treating elected office as any other profession. However, quotas have potentially profound implications of our democratic representation (Phillips, 1998).

On the one hand, gender quotas aim to increase the number of female representatives with the assumption that women better represent female interests. Yet the link between descriptive and substantive representation remains elusive (Pitkin, 1967). On the other hand, opponents of quotas emphasize a potential trade off between the justice payed to individual candidates and the quality of representation that citizens obtain. Newer research has instead reframed the debate to highlight the lack of meritocracy that quotas address. Quotas limit the number of low-quality male legislators at the same time as they lower the threshold for women (Murray, 2014; Besley et al., 2017). In the end, whether the quality of the new group of women in office is different from the old group of men is an empirical question.

This article enters the debate by investigating the selection effect of biased political recruitment on legislator quality. It further breaks new ground by demonstrating how lingering bias impacts democratic accountability and legislator behavior when quotas are imposed. The study relies on a "before-after" design with a control group to investigate legislators' effort, performance, ambition, and parties' reselection of candidates in the European Parliament. It argues that gender quotas have pervasive effects on representation beyond mere numbers.

Biased selection implies a higher threshold for women to enter office. Bias in the absence of quotas brings fewer but higher-quality and more ambitious women into Parliament. Non-quota female legislators handled 54% more high-impact legislation at equal levels of effort than both non-quota men and quota women. They were also more than twice as likely to aim at a lengthy career in office. Surprisingly, when quotas were imposed, the share of women did not increase substantially compared to the control group,

however female accountability and behavior changed. This is the result of a lingering perceptual bias in the party selectorate. Faced with new requirements, parties comply but remain uncertain about their initial choice. They compensate by considering the legislative record of female legislators. Thus, for each piece of high-impact legislation that quota women spearheaded, their likelihood of reselection increased by 85% compared to the 14% baseline. Conscious of the uncertainty that quotas generate, women reacted by increasing their effort. In the period(s) immediately after the introduction of quotas, quota women attended 65% more committee meetings than before.

This study forwards our understanding of how representation changes in surprising ways when gender bias and quotas intersect. First, while gender differences in legislator talent vanished following the introduction of quotas, they resurfaced in a higher accountability and effort among quota women. It is unclear whether quota women are held to higher standards, but parties are more prone to update their opinion about them. Instead of thwarting fair competition, legislated quotas also open a new, predictable, competitive arena for female politicians. Previous research has shown that women shy away from competitions where skills do not determine outcomes (Kanthak and Woon, 2015). Parties' new reliance on observable merits rather gendered prior beliefs may thus increase political recruitment in the long run.

Second, while women's higher payoff from legislative performance and their increased effort may be perceived as unjust, quotas imply few costs in terms of the quality of representation that voters receive. The quota reform brought male legislators into office that performed twice as well as their non-quota predecessors. Furthermore, because of parties' persistent gender bias, women often overperform in office compared to men, albeit for two different reasons. Prior to quotas, the female candidates that pass the higher selection hurdle are more talented legislators, while quota women work harder in office than their male colleagues to justify their reselection.

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Online Appendix

	Nationality	Party	Year of intro.	Quota	Prop. female	MEPs
1	Austria	Sozialdemokratische Partei Osterreichs	1985	40%	0.39	18
2	Austria	Die Grunen - Die Grune Alternative	1993	50%	0.67	6
3	Austria	Osterreichische Volkspartei	1995	33%	0.26	19
4	France	Parti Socialiste	1990	50%	0.47	60
5	Germany	Bundnis 90/Die Grunen	1986	50%	0.53	34
6	Germany	DIE LINKE.	1986	>50%	0.62	8
7	Germany	Sozialdemokratische Partei Deutschlands	1988	40%	0.42	79
8	Germany	Christlich Demokratische Union Deutschlands	1996	33%	0.26	117
9	Greece	Panellinio Socialistiko Kinima	?	40%	0.47	17
10	Hungary	Magyar Szocialista Part	?	20%	0.62	13
11	Portugal	Partido Socialista	1988	33%	0.32	31
12	Romania	Partidul Democrat	?	30%	0.14	7
13	Romania	Partidul Social Democrat	2004	30%	0.55	20
14	Spain	Partit dels Socialistes de Catalunya	1982	40%	0.4	5
15	Spain	Partido Socialista Obrero Espanol	1988	40%	0.44	62
16	Spain	Izquierda Unida	1989	40%	0.14	7
17	Spain	Bloque Nacionalista Galego	2002	40%	-	-
18	Spain	Esquerra Republicana de Catalunya	2004	40%	-	-
19	United Kingdom	Labour Party	?	50%	0.37	60
20	United Kingdom	Liberal Democrats Party	1999	40%	0.5	10

Table 5: List of party quotas.

Variable description

The data set includes 1,131 observations of MEPs from 11 member states.

Performance: Count. Indicates the number of high-impact reports for which an MEP has acted as rapporteur. The impact is defined as all legislation falling under the codecisition and budget procedures. The list is collected from the EP website. (`ImportantReports`)

Value of Office: Binary. Indicates if an MEP would like to stay in Parliament the next 10 years. The variable is drawn from the EPRG Survey (Farrell, Hix, and Scully, 2011). The question asked in the 2000 and 2006 waves read as follows: "Where would you most like to be 10 years from now?". The 2010 wave refrased the question: "What would you like to be doing 10 years from now?" (`FutureInEP`)

Reselection: Binary. A seat is defined as "safe" when the list placement of the candidate is above the number of seats the party won in the same circumscription following the previous election. (`SafeSeat`)

Effort (Attendance in Committee):   Proportion. The untransformed variable indicates the number of committee meetings an MEP has attended during the term, expressed as a proportion of the most assidious member of that committee (capped at 400). (`AttendanceCommittee.prop`)

Continuous. The variable used in the analysis is transformed $log(\frac{x}{1-x})$ to look more like normal distribution: The normalization implies that the measure is not sensitive to the fact that the number of committee meetings varies across committees and over time. (`Attendance`)

Female: Binary. Indicates whether an MEP is female. (`Female`)

All Quotas: Binary. Indicates all MEPs who have been elected under either a party-level or a statutory quota system. Information is collected from the IDEA database

(International Instiute for Democracy and Electoral Assistance (IDEA) and the University of Stockholm, 2016) (`AllQuota`)

Party Quota: Binary. It indicates MEPs who were elected from parties which applied party-level gender quotas. Information is collected from from the IDEA database (International Instiute for Democracy and Electoral Assistance (IDEA) and the University of Stockholm, 2016). The data base only lists party quotas which exeed the legislated quotas. For France, Portugal and Spain I have additionally relied on information from case studies (Baum and Espírito-Santo, 2012; Verge, 2012). A list of the parties, their nationality, the number of observations in the sample and the proportion of women among the obseved MEPs is displayed in table 5. (`PartyQuota`)

Legislated Quota: Binary. Includes the member states in which legally binding gender quotas applied for the election of the legislature. In the sample this includes France (enacted in 2000, applied for the 2004 and 2009 elections), Spain and Portugal (enacted in 2007 and 2006 respectively, applied for the 2009 election). Information about the quota system was drawn from the database of International Instiute for Democracy and Electoral Assistance (IDEA) and the University of Stockholm, 2016. (`StatutoryQuota`)

Age: Continuous. The age (expressed in years) of a member of Parliament as of June the year of his/her election. (`Age`)

Education: Ordinal. Ranges from 1 to 4. Drawn from Daniel (2013) and completed with information from MEPs' curriculum on the EP website. (`Education`)

National MP or Minister: Binary. Has the MEP previously served as a minister of government or member of Parliament at the national level? Information from MEPs curriculum on the EP website. (`NationalPolitics`)

Incumbent: Binary. Indicates whether an MEP has previously been reelected at least once. (`Incumbent`)

Years of Term: Continuous. Expresses the number of years of the current term the MEP has been registered as a member of Parliament. Most members stay for a full term (5 years). (`TimeInEPTerm`)

Complexity of Report: Continuous. Expresses the average number of recitals in the report delivered by the MEP during the term. Information is collected from the EP website. In the analyses the variable is logtransformed ($log(x+1)$). (`Complexity.N.recitals` and `Complexity.N.recitals.log`)

Elected on a Safe Seat: Binary. Indicates whether an MEP entered office in the current term on a safe seat. In the case of new member states, the variable is calculated from the number of observers to the EP from the party. (`SafeSeatLastElection`)

Party Size: Proportion. Proportion of of the seats held by the national party. (`PartySeats.prop`)

In Favor of EU Integration: Ordinal. Ranges from 1 to 7 where higher values indicate more favorable. The variable is drawn from the Chapel Hill Expert Survey (Bakker et al., 2015). It expresses the "overall orientation of the party leadership towards European integration". (`position`)

MEP: Categorical. An anonymous personal identifier for each MEP. (`ID`)

Nationality: Categorical. Indicates an MEPs' nationality. (`Nationality`)

Transnational Group: Categorical. Indicates an MEPs' transnational group affiliation. (`EPGroup`)

Legislative Term: Count. Indicates the legislative term: EP5 (1999-2004), EP6 (2004-2009) and EP7 (2009-2014) (`EP`)

Table 6: Descriptive statistic

Statistic	N	Mean	St. Dev.	Min	Max
Performance	1131	1.105	2.148	0	24
Value of Office	305	0.269	0.444	0	1
Reselection	1131	0.460	0.499	0	1
Effort (Attendance in Committee)	1058	0.387	0.202	0.002	1.000
Effort (log(Attendance/1-Attendance))	1058	−0.594	1.288	−5.989	4.595
Effort (Questions)	1129	33.144	32.257	0	100
Female	1131	0.370	0.483	0	1
All Quotas	1131	0.627	0.484	0	1
Party Quota	1131	0.507	0.500	0	1
Legislated Quota	1131	0.187	0.390	0	1
Age	1131	55.359	9.669	26.510	79.671
Education	1091	3.258	0.908	1	4
National MP or Minister	1125	0.264	0.441	0	1
Incumbent	1131	0.508	0.500	0	1
Years of Term	1131	4.530	1.142	0.181	5.005
Complexity of Report	1093	0.808	19.176	0.000	632.000
log(Complexity of Report+1)	1093	0.093	0.390	0.000	6.450
Elected on a Safe Seat	1058	0.682	0.466	0	1

Party: Categorical. The Chapel Hill ID number indicating an MEP's national party affiliation. (`ChapelHillID`)

	Women	Men	Women		
			No Quotas	Party Quotas	Legislated Quotas
Age	51.31	53.44	49.46	51.86	54.01
Education (1 - 4)	3.27	3.34	3.19	3.19	3.64
National MP or Minister (0 or 1)	0.25	0.29	0.24	0.27	0.19
Elected on a Safe Seat (0 or 1)	0.55	0.54	0.52	0.63	0.42
Party Quota (0 or 1)	0.46	0.41	-	-	0.28
Legislated Quota (0 or 1)	0.24	0.19	-	0.14	-
Effort (Attendance in Committee) (0 - 1)	0.37	0.37	0.34	0.4	0.38
Effort (Questions) (0 - 100)	31.35	32.53	27.21	31.22	35.66
Performance (High-Impact Reports) (0 - 24)	0.72	0.79	0.76	0.64	0.79
Value of Office (Aims at Lengthy Career) (0 or 1)	0.45	0.32	0.61	0.33	0.44
Reselection (Renominated to Safe Seat) (0 or 1)	0.5	0.48	0.5	0.53	0.38
Number of observations	224	333	82	104	53

Table 7: Bivariate statistics: Mean values among MEPs in their first legislative period (1999-2014).

Model descriptions

All models are Bayesian, estimated via the MCMC algorithm. Each model is run with 60,000 iterations with 5,000 iterations burn-in, keeping every 10th iteration, and shows no signs of non-convergence. Priors on the β-coefficients are non-informative multivariate normal ($\beta \sim N(0, 10)$). Varying intercepts are centered around a grand mean, and are fitted with slightly stricter priors ($\alpha \sim N(0, 1)$).

The model testing H_{1a}: Fitted as a binomial model in which the dependent variable is binary, indicating whether a newly elected MEP intends on staying in Parliament at least 10 more years. The model is run among the respondents to the EPRG survey (Farrell, Hix, and Scully, 2011), and therefore includes 305 observations. The model includes varying intercepts for the legislative term, the EP group, and nationality.

Given the low number of respondents, the different categories of women are estimated as dummies depending on whether a quota applied rather than through interaction terms. The model furthermore controls for incumbency, as MEPs who have already been reelected once are more likely to retire, and whether (s)he entered on a safe seat.

$$Aims\ at\ Lengthy\ Career_i \sim \text{Binomial}\,(p_i)$$

$$log(p_i) = \alpha$$
$$+ \alpha_{EPGroup,i}$$
$$+ \alpha_{EP,i}$$
$$+ \alpha_{Nationality,i}$$
$$+ \beta_1 \times Female\ Outside\ of\ Quota\ System_i$$
$$+ \beta_2 \times Female\ from\ Statutory\ Quota_i$$
$$+ \beta_3 \times Female\ from\ Party\ Quota_i$$
$$+ \beta_4 \times Incumbent_i$$
$$+ \beta_5 \times Elected\ on\ a\ Safe\ Seat_i$$

The model testing H_{1b}: Fitted as multilevel Poisson model in which the dependent variable is the count number of high-impact reports drafted by an MEP during term.

The number of reports varies over time and across political groups. The model therefore includes varying intercepts for the legislative term (*EP*) and the transnational political group to which MEPs belong (*EPGroup*) as well as national characteristics (*Nationality*) and national party affiliation (*Party*).

The model furthermore controls for the effort MEPs provide (*Attendance*). The variable is transformed ($log(\frac{x}{1-x})$) and missing observations (6%) are imputed through a second, linear equation estimated simultaneously to the main regression. Predictors include plenary attendance, age, committee chairmanship, whether an MEP was elected in a safe seat and whether he or she intends on having a long career (where available). All other missing observations are assumed to be random and imputed by drawing from an empirically informed distribution. Count variables are drawn from a normal distribution with empirically informed mean and standard deviation. Binary predictors are drawn from a binomial distribution with an empirically informed proportion of "successes" and a size of 1. MEPs who do not have a national party affiliation as registered in the Chapel Hill survey are listwise excluded ($N = 1,120$).

The model includes an interaction between *Female* and *Legislated Quota*. β_1 thus captures the difference in performance among non-quota women (the baseline woman) compared to non-quota men. β_2 captures the difference in performance between women elected from a legislated quota system and women elected without quotas.

$$Reports_i \sim \text{Poisson}\,(\lambda_i)$$

$$log(\lambda_i) = \alpha$$

$$+\, \alpha_{ID,i}$$

$$+\, \alpha_{EPGroup,i}$$

$$+\, \alpha_{EP,i}$$

$$+\, \alpha_{Nationality,i}$$

$$+\, \beta_1 \times Female_i$$

$$+\, \beta_2 \times Female_i \times Legislated\ Quota_i$$

$$+\, \beta_3 \times Legislated\ Quota_i$$

$$+\, \beta_4 \times Female_i \times Party\ Quota_i$$

$$+\, \beta_5 \times Party\ Quota_i$$

$$+\, \beta_6 \times Incumbent_i$$

$$+\, \beta_7 \times Attendance_i$$

$$+\, \beta_8 \times Questions_i$$

$$+\, \beta_9 \times Complexity\ of\ Report_i$$

The model testing H_{2a}: Fitted as a binomial model in which the dependent variable is binary, indicating whether an incumbent member obtained a safe seat in the upcoming elections. The model includes varying intercepts for the legislative term, the EP group, nationality and party affiliation. The model controls for the prior belief of parties (lagged dependent variable) (*Elected on a Safe Seat*), the average complexity of the reports drafted, incumbency and an estimation of the likelihood that the member intends on seeking reelection (*Aims at Lengthy Career*). Missing observations mainly exist on the lagged dependent variable (6%). These are assumed to be random and imputed by drawing from a binomial distribution with an empirically informed proportion of "successes" and a size of 1. Most of these missing observations stem from Romania and Bulgaria which joined the EU in 2007. MEPs who do not have a national party affiliation as registered

in the Chapel Hill survey are listwise excluded ($N = 1,120$).

The hypothesis is tested in a three-way interaction term between the candidate's gender (*Female*), the quota system (*Legislated Quota*) and high-impact legislation (*Performance*).

Main model:

$$Safe\,Seat_i \sim \text{Binomial}\,(p_i)$$

$$log(p_i) = \alpha$$

$$+ \alpha_{ID,i}$$

$$+ \alpha_{EPGroup,i}$$

$$+ \alpha_{EP,i}$$

$$+ \alpha_{Nationality,i}$$

$$+ \beta_1 \times Performance_i$$

$$+ \beta_2 \times Female_i \times Legislated\,Quota_i \times Performance_i$$

$$+ \beta_3 \times Female_i \times Performance_i$$

$$+ \beta_4 \times Female_i \times Legislated\,Quota_i$$

$$+ \beta_5 \times Legislated\,Quota_i \times Performance_i$$

$$+ \beta_6 \times Female_i$$

$$+ \beta_7 \times Legislated\,Quota_i$$

$$+ \beta_8 \times Complexity\,of\,Report_i$$

$$+ \beta_9 \times Incumbent_i$$

$$+ \beta_{10} \times Aims\,at\,Lengthy\,Career_i$$

$$+ \beta_{11} \times Lag\,(Elected\,on\,a\,Safe\,Seat)_i$$

The main equation is estimated simultaneously to two supplementary equations. The first supplementary model estimates the likelihood that an MEP will wish to seek re-election. Is based on the question from the EPRG Survey about the intention to stay in Parliament. Given the low response rate, for most of the MEPs the estimation is in-

formed by a number of contextual factors. Intention is therefore modeled as a function of where the MEP is in his or her career (*Age, National MP or Minister*), the salience of a European mandate (*Party Size*, i.e., larger parties are able to offer better opportunities to their members) and the effort he or she has put into office (*Committee Attendance*).

A second supplementary model accounts for whether the response rate to the survey is correlated with the dependent variable of the main model (*Safe Seat*). The absence of correlation gives an indication that the survey sample is representative for the population under study. Results are reported in table 8.

Measurement model:

$$Aims\,at\,Lengthy\,Career_i \sim \text{Binomial}\,(p_i)$$

$$log(p_i) = \gamma_1$$

$$+ \gamma_2 \times Age_i$$

$$+ \gamma_3 \times Proportion\,of\,Party\,Seats_i$$

$$+ \gamma_4 \times National\,MP\,or\,Minister_i$$

$$+ \gamma_5 \times Committee\,Attendance_i$$

$$Pr(Aims\,at\,Lengthy\,Career = NA) \sim \text{Binomial}\,(p_i)$$

$$log(p_i) = \delta_1$$

$$+ \delta_2 \times Safe\,Seat_i$$

$$+ \delta_3 \times Years\,of\,Term_i$$

$$+ \delta_4 \times In\,Favor\,of\,EU\,Integration_i$$

The models testing H_{2b}: Two models test the hypothesis using different dependent variables.

The first model is fitted as a linear regression in which the dependent variable is a transformed version of committee attendance (*Effort*). Attendance is measured as a

Dependent variable: 'Aims at Lengthy Career'	Coef.
Intercept	3.75
	[2.13 , 5.48]
Age	-0.09
	[-0.12 , -0.07]
Party Seats	0.14
	[0.01 , 0.27]
Former Mandate on National Level	0.38
	[-0.23 , 0.99]
Effort(Attendance in Committee)	0.34
	[0.13 , 0.57]

Dependent variable: 'Aims at Lengthy Career=NA'	Coef.
Intercept	7.33
	[4.77 , 10.75]
Safe Seat	-0.09
	[-0.36 , 0.19]
Years of Term	-1.49
	[-2.16 , -1]
In Favor of EU Integration	0.17
	[0.06 , 0.27]

Number of observations	1129
Number of respondents	305

Note: Median effect with 95 % symmetric posterior density interval.

Table 8: Results from a binomial model run in parallel to the main model predicting safe seat allocations.

proportion, and is thus transformed ($log(\frac{x}{1-x})$) so as to approximate a normal distribution.

The model includes varying intercepts for the legislative term, the EP group, nationality and party affiliation. They control for lower incentives to provide effort among members who have already been reelected at least once (*Incumbent*) and the number of years the MEP has been a member during the term. (*Years of Term*). Missing observations on the dependent variables are listwise excluded, as are MEPs without party affiliation (as listed in the Chapel Hill survey), so that the model is estimated on 1,048 observations.

H_{2b} is tested through an interaction between gender (*Female*) and legislated quota system (*Legislated Quota*). I expect β_2 to be positive and distinguishable from zero. On the other hand, I do not expect that women in general (β_1) spend more time in committees. For comparison of the differential effects of different quotas, an equivalent interaction is fitted between gender (*Female*) and party-level quotas (*Party Quota*).

$$Attendance_i \sim \text{Normal}\,(\mu_i, \tau)$$

or

$$Questions_i \sim \text{Poisson}\,(\mu_i)$$

$$
\begin{aligned}
log(\mu_i) = \ &\alpha \\
&+ \alpha_{ID,i} \\
&+ \alpha_{EPGroup,i} \\
&+ \alpha_{EP,i} \\
&+ \alpha_{Nationality,i} \\
&+ \beta_1 \times Female_i \\
&+ \beta_2 \times Female_i \times Legislated\ Quota_i \\
&+ \beta_3 \times Legislated\ Quota_i \\
&+ \beta_2 \times Female_i \times Party\ Quota_i \\
&+ \beta_3 \times Party\ Quota_i \\
&+ \beta_4 \times Incumbent_i \\
&+ \beta_5 \times Years\ of\ Term_i
\end{aligned}
$$