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LESS BUT BETTER? THE INFLUENCE OF GENDER ON POLITICAL ACTIVITY

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Abstract

In this article, we study gender differences in the activity and effectiveness of French parliamentarians between 1993 and 2022. Using fixed-effect regressions and RDD strategies based on close elections, we find that women are more active than men when we consider reports and oral questions but less active regarding bills, amendments and oral interventions. The gender gap for bills is observed only for newcomers and fades after a few years, suggesting a behavioral explanation rather than a selection effect. Regarding effectiveness, each term, 46 amendments authored by women pass, whereas 33 of the men's amendments pass. This difference is larger in the opposition group. This is mostly due to the use and quality of their amendments, with men being more prone to obstructive behaviors. On the other hand, women in the opposition party are less likely to have their bills passed than men in the opposition party. This is linked to discrimination within the party, which less often selects bills drafted by women to submit them to a vote.

Keywords: gender, elections, lawmaking, French parliament

JEL Classification: D72, J16, C14

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1 Introduction

The feminization of politics is a widespread phenomenon observed in developed and developing countries, in local positions as well as at national levels.¹ In France, the share of women elected in the Lower House of the Parliament went from approximately 5% until the mid-1990s to approximately 40% in 2017 and 2022 (Figure 1). Beyond the determinants of female representation in politics,² a large body of literature in economics and political science has attempted to study the consequences of this feminization. The underlying question is whether this change has affected the quality of politicians and political decisions. There are many reasons to think that gender could matter. On the one hand, selection issues may be at play. Indeed, achieving gender balance in politics to increase the representativeness of politicians has become an objective in most countries. To do so, quotas and other policies have been implemented, and they may have changed the selection process of politicians through the massive recruitment of women in a short period in a potentially reduced pool of candidates.³ On the other hand, behavioral differences across genders in terms of competition outcomes, self-confidence, negative feedback aversion and attitudes such as honesty, selfishness and cooperation are reported in the experimental literature. In the context of politics, these gender differences could affect the activity of politicians and the quality of their policies.⁴

Choosing the relevant measurement is a crucial issue when analyzing the quality of politicians

¹See [Hessami and da Fonseca \(2020\)](#) for an extensive literature review.

²Among the main reasons explaining the gender gap in representation, [Niederle and Vesterlund \(2007\)](#) point out the willingness to enter competitive situations. Other explanations can be found in gender differences in recontesting elections ([Peveri and Sangnier \(2021\)](#)), the propensity to resign ([Lassébie \(2020\)](#)), the biases that voters may have against women ([Barbanchon and Sauvagnat \(2022\)](#)), the biases that political parties may have against women ([Esteve-Volart and Bagues \(2012\)](#); [Casas-Arce and Saiz \(2015\)](#)) and, more recently, institutional constraints such as voting rules ([Profeta and Woodhouse \(2018\)](#); [Baltrunaite et al. \(2019\)](#)).

³See, for instance, [Bagues and Campa \(2021\)](#) or [Besley et al. \(2017\)](#).

⁴See, for instance, [Niederle and Vesterlund \(2007\)](#), [Niederle and Vesterlund \(2011\)](#) or [Buser \(2016\)](#) for attitude toward competition, [Kanthak and Woon \(2015\)](#) for aversion to entering into a competitive environment in the specific context of election, [Peveri and Sangnier \(2021\)](#) for difference in likelihood to persist in competition after losing an election, [Ellison and Swanson \(2018\)](#) for attitude toward negative feedback at school on exams, [Eckel and Grossman \(1998\)](#) for selfishness, [Kamas and Preston \(2018\)](#) for self-confidence and labor market outcomes and [Buser et al. \(2020\)](#) for self-confidence on preference for redistribution or [Cremer and Janssen \(2007\)](#) for cooperation. These behavioral differences across genders may have some important implications. For instance, in the labor market, [Bosquet et al. \(2019\)](#) show that an important part of the gender gap in promotion in academia in France is because fewer female researchers apply to professorship positions, which is compatible with behavioral differences toward competition and self-confidence.

and their policy making. There is no consensus in the literature on the measurement of politicians' quality or the quality of their actions. The politician's quality production function is undoubtedly multidimensional. Two main approaches have been implemented thus far.

First, papers have analyzed politicians' characteristics, especially following the implementation of gender quotas. Education ([Besley et al. \(2011\)](#)), labor market performance ([Besley et al. \(2017\)](#)) and IQ and previous occupations ([Ernesto Dal Bo and Rickne \(2022\)](#)) have been used as proxies for quality. The main limitation of this type of measurement is that identifying the characteristics that make a competent politician a complex and subjective process.

Second, a body of work has studied whether the policy choices of female politicians differ from those of male politicians. Indeed, there may be gender differences in the issues that politicians focus on. Gender imbalance among representatives can therefore lead to a lack of laws in some areas relative to the preferences of the whole population. Most of these papers analyzed public expenditures as an aggregate outcome and provided mixed evidence about the effect of gender.⁵ Budget orientation is, however, only a proxy for the quality of policies. Indeed, a proper evaluation of the use of these budgets would be necessary to provide a clear answer about quality. Moreover, the decisions about public expenditures and their implementation are collective, and it is therefore difficult to attribute the decision to a specific individual. At the parliamentary level, [Thomas \(1991\)](#) and [Lippmann \(2022\)](#) studied whether men and women author bills or amendments on different topics. They both found that women are marginally more likely to initiate bills or amendments about women's issues. The problem is that gender differences in topics (measured with a dictionary-based method) do not reveal much about the exact content of these bills or amendments. For example, a bill on taxation could

⁵On the one hand, women are found to increase public expenditures on health and education ([Clots-Figueras \(2011, 2012\)](#)) and on infrastructure ([Bhalotra and Clots-Figueras \(2014\)](#)), to set higher compensation for state workers ([Besley and Case \(2000\)](#)) and to provide public goods that better reflect women's preferences ([Chattopadhyay and Dufló \(2004\)](#)). Related to budgetary policies, [Accettura and Profeta \(2021\)](#) show that female mayors in Italy are less likely to engage in strategic and visible spending in preelectoral and electoral years than male mayors. On the other hand, [Ferreira and Gyourko \(2014\)](#) find no effect of the mayor's gender on policy outcomes related to the size of local government. A similar result is found by [Bagues and Campa \(2021\)](#) in Spain, by [Geys and Sørensen \(2019\)](#) in Norway and by [Baltrunaite et al. \(2019\)](#) in Italy.

very well increase the progressivity of the tax system or, on the contrary, reduce it. Moreover, the topic does not say much about the quality of amendments or bills.

In this paper, we choose a third approach by examining parliamentarians' activity and effectiveness. This is a more objective and direct measurement, and it allows us to have an individual indicator of parliamentary production. As stated earlier, the activity of politicians is multidimensional. By activity, we mean all the tasks related to the elaboration of the legislation (bills, amendments and reports) and the control of the government (questions for the government and oral interventions in plenary sessions). Quantifying a politician's activity is crucial *per se* because it is a direct indicator of his or her production and involvement. For some outcomes, such as oral questions and interventions, activity is a direct measure of the parliamentarian's visibility and ability to relay constituents' concerns. Activity is also key for bills and amendments. However, activity may be seen as an incomplete measure of the quality of politicians, as much of the production of legislative texts does not necessarily result in laws. As a consequence, we also study the parliamentarians' effectiveness (measured by the number of bills and amendments that passed) because it allows us to measure the capacity of parliamentarians to modify the law and thus their capacity to convince other parliamentarians to vote for their bill/amendment.

We collected unique data about French parliamentarians from 1993 to 2022. France provides a rare advantage because detailed data about both the characteristics and the activities of its parliamentarians are available. Using constituency fixed effects regressions and regression discontinuity design (RDD) based on close elections, we do not find any systematic gender difference regarding activity. Women tend to be slightly more active than men when we consider reports and questions. However, they are less active than men when we consider bills and, to a lesser extent, amendments and interventions. The gender gap for bills (the only large and statistically significant) is observed only for the first years of activity of newcomers and fades over time, suggesting a behavioral explanation rather than fundamental differences in terms of the quality of politicians. Indeed, the gender

gap in self-confidence, aversion to competition and negative feedback documented in the literature are compatible with the fact that activity is lower during the very first year in office for female newcomers, who take more time than male newcomers to learn how to draft their bills.

When looking at effectiveness, we find that women are more likely than men to have their amendments passed. The difference is substantial. Each term, 46 amendments authored by women pass, whereas 33 of the men's amendments pass. This difference is larger in the opposition group, where women have twice as many amendments accepted (24 vs. 12). To put it differently, women in the opposition group represent 21% of parliamentarians but 35% of all amendments that pass. The underlying reason is likely that the amendments authored by women are of higher quality. First, the use of amendments differs between men and women. Indeed, men more frequently engage in obstructive behaviors by producing many amendments whose main goal is to delay debates and which are not intended to pass. Moreover, women also author more admissible amendments, and they are more likely to attend plenary sessions to defend the amendments they author. Amendments authored by women are also more commonly cosponsored by other parliamentarians. All these differences have a direct impact on the effectiveness of parliamentarians and the resulting probability that amendments passed. This is again consistent with a behavioral explanation and, more specifically, with gender differences in honesty or the ability to cooperate documented in the literature.

On the other hand, women are less likely to have their bills passed, especially when they are in the opposition group. This is due to discrimination within political groups. The political groups do not choose the agenda of the Lower House (except one day per month). Therefore, they have to select a limited number of bills that will be examined and voted on. Bills authored by women are less likely to be selected by their own group, but conditional on their bills having been selected, the gender gap in effectiveness disappears. However, the unconditional effectiveness for bills is much lower than for amendments, as only 4% of bills pass. Therefore, the gender difference in the total number of bills that pass is modest. This suggests that amendments are probably the main tool for

parliamentary to impact the elaboration of the legislation.

We discard other potential mechanisms. We compare parliamentarians before and after the introduction in 2002 of financial incentives to promote female candidates to understand whether gender differences could be due to a selection effect related to the implementation of quotas. Moreover, we look at the influence of other observables (political orientation, peer effects, electoral competition, number of parliamentary assistants, etc.). These channels do not explain the differences in activity and effectiveness. Therefore, our results are probably driven by behavioral differences rather than selection issues between men and women.

Papers analyzing politicians' activity are scarce, and they do not specifically focus on gender differences. [Francois and Weill \(2014\)](#) and [Volle et al. \(2021\)](#) do not detect any statistically significant difference between male and female parliamentarians. In contrast, [Gavoille and Vershelde \(2017\)](#) and [Gavoille \(2018\)](#) show that women are more active than men. [Bach \(2012\)](#) analyzes the influence of holding multiple offices, but he does not study gender. Outside France, [Cox and Terry \(2008\)](#) study the activity of US parliamentarians, whereas [Arnold et al. \(2014\)](#) focus on Germany. These papers generally look at composite indices that aggregate several measurements of activity. We prefer to use separate outcomes for activity (because all types of activity differ and do not take the same amount of time). Effectiveness is even less well documented than activity. To our knowledge, all empirical evidence relies on US data. [Thomas \(1991\)](#), [Anzia and Berry \(2011\)](#), [Volden et al. \(2013\)](#) and [Volden and Wiseman \(2018\)](#) find that females are more effective than male parliamentarians in passing the bills they author, especially when they belong to the minority party. [Jeydel and Taylor \(2003\)](#), however, do not find any statistically significant difference between men and women when considering bills and amendments. By focusing on France, we study a different political context. Moreover, for both activity and effectiveness, the data collected allow us to tackle the plausible mechanisms through which gender differences appear and to focus on the production of amendments, which appear to be the main output of parliamentary activities.

The remainder of the article unfolds as follows. Section 2 describes the features of the French parliament. Section 3 presents the dataset and descriptive statistics. In section 4, we present our empirical strategy. Then, we investigate how gender affects parliamentarians' activity (Section 5) and effectiveness (Section 6). Section 7 presents our conclusions.

2 Context

The elections for the Lower House of the French parliament occur every 5 years. A total of 577 representatives in 577 constituencies are elected by direct universal suffrage. The parliamentary election (for the Lower House) follows a two-round plurality voting rule system. To be elected in the first round, an individual must obtain more than 50% of the votes from 25% of the registered citizens. If this is not the case, a second round is organized. Candidates qualify only if their first-round vote share was higher than 12.5% of the registered citizens. To be elected in the second round, a relative majority is sufficient, and the candidate who receives the highest vote share is the winner.

There are no quotas that directly affect the number of women in the French parliament (via numerous reserved seats, for example). However, a bill was voted in 2000 (and implemented for the first time for the 2002 parliamentary elections) to force political parties to nominate women as candidates. If less than 50% of a political party's nominees are women, the party's public funding will be reduced proportionally to the gender gap among its nominees. For instance, between 2012 and 2017, the value of penalties totaled 28 million euros overall, accounting for a loss of up to 16% of the public funding for some parties.

Parliamentarians' work can be divided into two main activities. First, they elaborate the legislation. **Bills** can come from both the government (*projet de loi*) and from parliamentarians (*proposition de loi*). The government sets the agenda of both houses for two weeks per month. One week per month is dedicated to the control of government policies and to public policy evaluation. One day each month, a political group sets the agenda. As a consequence, all bills authored by parliamen-

tarians are not examined. The bill is first handled by the relevant parliamentary commissions. This commission nominates another parliamentarian who will study the bill and write a **report**.⁶ In this report, the parliamentarian can modify, delete or add articles to the bill through **amendments**. Then, the Lower (resp. Upper) House votes on each article of the bill and then on the whole bill. If the bill is accepted, it passes to the Upper (resp. Lower) House for a vote. During this process, amendments authored by parliamentarians can be examined. Amendments and bills can be cosponsored by other parliamentarians.⁷ The number of amendments is not limited. All amendments must be examined and put to a vote (as long as they are admissible).⁸ The bill passes when the exact same text obtains most votes in both Houses. In case of disagreement, a committee is nominated to propose a new version of the bill. Then, there is a final vote in the Lower House.

The second activity is to control the government. They can ask **oral questions** to government members during plenary sessions.⁹ The time dedicated to questions is proportional to the size of the political group. The minutes for each session also include information about **oral interventions** made by each parliamentarian during debates.

A missing dimension is the activity done in the constituency.¹⁰ There are several reasons why we do not consider it. First, we decided to focus on the final output, and we consider the time spent in constituencies to be an input that is used by parliamentarians to take notice of their constituents' concerns. Second, it is difficult to obtain a reliable measurement of this work. Indeed, it can be done in many formal or informal ways, by the parliamentarian or by his/her assistants, and it is therefore

⁶The parliamentarian is chosen according to his or her knowledge of the subject, but there is no specific rule regarding gender. To write his or her report, the parliamentarian may consult with experts and/or members of relevant ministries.

⁷In the guidelines provided to parliamentarians of the Lower and Upper Houses, it is clearly stated that amendments that are cosponsored (especially by head of political group or of parliamentary commission, etc.) are more likely to be accepted. These guidelines can be found here: [https://www.senat.fr/fileadmin/Fichiers/Images/relations_internationales/Cooperation_interparlementaire/Guides_et_recueils/Rediger_la_loi_juin_2007.pdf](https://www.senat.fr/fileadmin/Fichiers/Images/rerelations_internationales/Cooperation_interparlementaire/Guides_et_recueils/Rediger_la_loi_juin_2007.pdf).

⁸Amendments can be declared inadmissible for two main reasons. First, amendments authored by parliamentarians are not admissible when their adoption would result in a reduction in public resources. Second, amendments can be considered inadmissible for legal reasons, such as if the amendment is not within the scope of the law or if the amendment is filed too late and does not allow the authors of the bill time to prepare their response. If it is considered inadmissible (whatever the motive), the amendment is not put to a vote.

⁹Parliamentarians can also write questions to a minister, who must answer within 2 months. This variable is available starting in 2007. We do not detect any gender difference in this variable. On this issue, see also [Lazardeux \(2005\)](#).

¹⁰On this issue, see [Poyet and Siefken \(2018\)](#) and [Boelaert and Ollion \(2020\)](#).

difficult to measure it properly.¹¹

3 Data

3.1 Presentation of the dataset

We collected information from the *Assemblée Nationale* website for the last six terms: 1993-1997¹², 1997-2002, 2002-2007, 2007-2012, 2012-2017, 2017-2022. The website of the Lower House provides detailed information about the parliamentarians' activity as well as their characteristics.¹³

To measure the activity of parliamentarians, we use five outcomes: 1) number of reports written; 2) number of bills authored¹⁴; 3) number of amendments authored¹⁵; 4) number of oral questions to the government in plenary sessions; 5) number of oral interventions in plenary sessions¹⁶. For each of these outcomes, the unit is the yearly average value.¹⁷

We also collected information about all stages of the voting process to measure effectiveness (i.e., the number of bills and amendments that passed). For amendments, we know whether they are considered admissible, defended by the author in plenary sessions and cosponsored by other

¹¹One way to quantify this preparatory work is to count the number of meetings organized by each parliamentarian. The information is available for a limited fraction of the meeting: those for which a room has been reserved in the Lower House. We only have data for a short period (2017-2018). We did not detect any significant gender gap (Table B.1).

¹²There is a 4-year gap between the 1993 and 1997 elections because the parliament was dissolved in 1997 to organize early elections.

¹³For data prior to 2007, we also use part of the dataset built by [Gavoille and Vershelde \(2017\)](#).

¹⁴Contrary to amendments, bills can be authored by several parliamentarians. There is a coauthor in less than 4% of cases. By definition, it is impossible to measure the contribution of each author, but several findings suggest that some parliamentarians have coauthors for strategic reasons. Indeed, when the coauthor is the head of the political group or when the main author comes from the Lower House and the coauthor from the Upper House, we may think that this is done to promote the bills and to increase the likelihood of passing. The number of bills coauthored is similar for men and women. When the bill is coauthored, we attribute the bill to all the authors. As a robustness test, we also attribute the bill to the first author only (as is done for amendments). The results remain unchanged with this definition. For bills and amendments, we must distinguish the author from the cosponsors. We discuss the issue of cosponsorship in section 6.2.

¹⁵Before 2002, the identification of the author of amendments is difficult, so we use this variable only from 2002 to 2022. The amendments proposed in commissions since 2007 are included. Before 2007, the amendments were limited to those voted in plenary sessions.

¹⁶We restrict the oral statements to long statements (more than 20 words). Information about short interventions (less than 20 words) has been available since 2007. We do not detect any gender gap.

¹⁷We provide alternative measurements of activity using the presence in plenary sessions and parliamentary commissions and the voting turnout. However, we consider that these variables poorly measure parliamentary activity. Indeed, to be considered present, the parliamentarian's name must appear on the minutes of at least one session.

parliamentarians. For bills, we collected information about the selection process by the political group, as all bills are not put to a vote. All this information allows us to test specific mechanisms behind differences in effectiveness.

We also collected information about the characteristics of parliamentarians: gender, age, experience (number of past terms, local or governmental experience), and other positions in the Lower House (president/vice-president/secretary of the parliament, head of political group, head of a parliamentary commission, etc.), political orientation, size of political group, permanent parliamentary commission, and previous occupation.

All the information about the parliamentary elections comes from the *Ministère de l'Intérieur*. For each election and each round, we know the number of candidates, their name and their score. This information is necessary for the regression discontinuity design implemented (see section 4).

We restrict the sample to the parliamentarians with full terms only.¹⁸ Indeed, some activities, such as the elaboration of bills or reports, take time, so we want the parliamentarians to share the same working conditions. Moreover, parliamentarians can be replaced by their substitutes when they leave parliament. In this case, it may be difficult to identify the parliamentarian who actually authored the text. Therefore, our full sample includes 2,944 observations (parliamentarians \times term).

3.2 Descriptive statistics

Table 1 describes the characteristics of male and female parliamentarians in our sample. Women are younger than men (particularly since 2002), and male parliamentarians are significantly more experienced than female parliamentarians. This holds whether we consider the number of terms as well as local¹⁹ and governmental experience, even when there is most newcomers (such as during the 2017-2022 term). It is more likely for female parliamentarians to be in the majority group

¹⁸We studied more precisely the main reasons for incomplete terms during the 2017-2022 term (12% of our sample): ministry appointment (35%), municipal election (31%), other elections (12%), and death (9%).

¹⁹The share of parliamentarians who are also a mayor at the same time dropped starting in 2017 because of a bill passed in 2014 that limits the permissibility of holding multiple offices.

during the 1997-2002, 2012-2017 and 2017-2022 terms than during the other terms. Women are slightly overrepresented in high positions (president/vice-president/secretary of Lower House and president/vice-president of parliamentary group/commission), but this varies from term to term. Male and female parliamentarians are unevenly distributed across permanent parliamentary commissions. Women are overrepresented in several commissions (cultural affairs and education, social affairs) and underrepresented in others (defense, law). Parliamentarians from highly skilled occupations are overrepresented²⁰, but we do not notice any major gap between men and women.

Figures 2 and 3 describe the changes in activity over time by gender. For reports, amendments and oral interventions, the parliamentarians are increasingly active.²¹ This growth in activity comes from both the extensive margin (especially for reports and amendments) and the intensive margin (especially for amendments and interventions). For bills and questions, there is no clear trend. We find more “ghost” parliamentarians (i.e., parliamentarians without any activity) for outcomes such as bills (stable at approximately 30-40% of our sample) and, to a lesser extent, reports (from 43% between 1993 and 1997 to 9% between 2017 and 2022). In contrast, the share of ghosts is almost zero for questions, interventions and amendments.

This increase in activity is noticeable for both male and female parliamentarians. Graphically, the gender gap is limited, and it varies from one term to another. More specifically, at the extensive margin, the share of ghosts is slightly larger among male parliamentarians. There are more fluctuations at the intensive margin, but men are generally more active than women.

²⁰On this issue, see [Boelaert et al. \(2018\)](#).

²¹One may suspect that part of this growing activity may come from the growing publication of quantitative indicators on parliamentary activity over time. This issue is beyond the scope of the paper, as we focus on the influence of gender. However, the fact that the trend differs across outcomes (i.e., no clear trend over time for bills and questions) suggests that this effect is not straightforward. We tackle this issue by including a term fixed effect in our specifications. Moreover, in Table B.5, we analyze the gender gap term by term.

4 Empirical strategy

To identify the influence of the parliamentarian’s gender, we use two complementary analyses. First, we regress the outcomes measuring the parliamentarian’s activity Y_{ict} on a dummy variable $FemaleParliamentarian_{ict}$ equal to 1 if the parliamentarian is a woman. To measure activity, we use five outcomes: reports, bills, amendments, questions and interventions. To measure effectiveness, we compute the bills and amendments that passed. The unit of observation is the parliamentarian-term level. The first specification is as follows:

$$Y_{ict} = \beta_0 + \beta_1 FemaleParliamentarian_{ict} + \beta_2 X_{ict} + \mu_t + \gamma_c + u_{ict} \quad (1)$$

where i is the subscript for the parliamentarian level, c indicates the constituency and t indicates the term. For each outcome, the unit is the yearly average value. We first consider all values, including zeroes. Given that the distribution varies from one outcome to another, we use either Poisson (reports and bills) or OLS (amendments, questions and interventions) models.²² Then, we separately consider the extensive margin with a dummy variable (to determine whether there is any activity), so we use logit and the intensive margin by keeping only the positive values (to study the intensity of activity among active parliamentarians), so we use OLS. All standard errors are clustered at the constituency level.

X_{ict} includes several sets of control variables. More specifically, we control for the parliamentarian’s *experience* (age, number of past terms, local experience (being a mayor during the term), governmental experience), *political characteristics* (other positions in the Lower House (president/vice-president/secretary/quaestor of the parliament, head of political group, head of commission), political orientation (majority/opposition group, left/right), size of political group and a dummy for

²²In Table B.3 in the appendix, we use all models (OLS, Poisson and negative binomial, with and without constituency fixed effects) for reports, bills and amendments as a robustness test. The results are confirmed regardless of the model used, even though the gender gap is larger and more statistically significant for amendments when we use the Poisson model, but this model is less appropriate than OLS given the distribution of amendments.

geographically remote constituencies (such as Corsica and the French overseas departments)), *permanent parliamentary commission* (cultural affairs and education; defense; economic affairs; finance and budgetary control; foreign affairs; law; social affairs; sustainable development) and *previous occupation*.²³

The sharp increase in the proportion of women implies that female politicians are, on average, less experienced than male politicians. Controlling for political characteristics is crucial because being in some positions can increase activity and effectiveness, as it gives more visibility and more opportunities to the parliamentarian. However, some of these positions can also be time-consuming and can therefore reduce activity. Parliamentary commission may affect activity if some issues are more likely to generate more parliamentarian activity. Previous occupation has been used as a proxy for the quality of politicians, and the implementation of quotas may have affected selection and favored the entry of women with lower external labor market options (or, on the contrary, the eviction of men with lower outside options, as shown in [Besley et al. \(2017\)](#)).

Finally, we add term fixed effects (μ_t) to capture the global evolution of the activity of parliamentarians, as shown in section 3. We also add constituency fixed effects (γ_c) in a separate specification to control for time-invariant characteristics. Indeed, the election of female parliamentarians is not random, and it may reflect constituents' preferences. Fixed effects at the constituency level can help disentangle individual and constituency effects, but the identification of causal effects requires that the factors that determine the result of the election and the parliamentarian's activity do not vary over time.

To overcome this issue and potential omitted variable biases, we use a second specification that approximates a randomly assigned male or female parliamentarian. We use a regression discontinuity design (RDD) exploiting close mixed-gender elections, following [Lee \(2008\)](#) (and [Ferreira and Gyourko \(2014\)](#); [Bagues and Campa \(2021\)](#); [Lippmann \(2022\)](#)) for applications to the effect of gender in

²³We classified the last occupation into 12 categories: academic, business owner, engineer, executive, farmer, health-care worker, industry worker, legal occupation, politician, teacher, other civil servant and other occupation.

politics). In this type of election, the gender of the elected parliamentarian can be considered random. This second specification is as follows:

$$Y_{ict} = \beta_0 + \beta_1 D_{ict} + \beta_2 f(X_{ict}) + u_{ict} \quad (2)$$

where i is the subscript for the parliamentarian level, c for the constituency level and t for the term. X_{ict} is our running variable, and D_{ict} is equal to 1 if a woman is elected. $f(X_{ict})$ is a polynomial interacting with D_{ict} . Our parameter β_1 captures the local average treatment effect (LATE) of electing a woman instead of a man after a close election. This equation is estimated on close elections. In our preferred specification, we follow [Cattaneo et al. \(2020\)](#) by nonparametrically estimating this coefficient using a local linear function with a triangular kernel, and our inference is based on their robust bias-correction method. To define the reference bandwidth, we follow the approach of [Calonico et al. \(2014\)](#).²⁴ We also provide robustness tests in which we report results using alternative bandwidths and kernels (Table [A.2](#) in the appendix).

Table [A.1](#) summarizes the characteristics of parliamentary elections since 1993. The sample is unbalanced, as the number of parliamentarians with full terms varies from one term to another. The share of elections for which a second round is called between a male and a female candidate equals 36% overall, but it has significantly increased over time, reaching over 46% in 2007. The number of close elections depends on the bandwidth chosen (columns 4, 5 and 6).

Our empirical strategy is valid as long as there is no manipulation around the threshold. Figure [A.1](#) shows that male candidates are slightly more likely to win against female candidates. However, following [Cattaneo et al. \(2020\)](#), we test whether there is a manipulation: we do not reject the null hypothesis of no manipulation. This result is consistent with [Lippmann \(2022\)](#), who uses similar data (from a shorter period). Moreover, to be valid, we need to test the continuity of the main confounders to check whether male and female parliamentarians close to each side of the threshold are comparable.

²⁴The bandwidths are selected with the Stata package *rdrobust* ([Calonico et al. \(2017\)](#)).

In Figure A.2, we report the outcomes of a local linear regression, estimated separately on each side of the threshold. We find a statistically significant gap for only two variables related to experience (age and number of past terms), but the gap is not affected by the distance to the threshold, as a difference is also found for the parliamentarians elected by a wider margin. Therefore, the parliamentarians close to the cutoff are not different from those of the full sample, which is crucial when interpreting the results. To solve this issue, we include control variables about experience in our RDD analysis. For all the other characteristics depicted (governmental experience, political orientation, occupation and top positions in the Lower House), we do not detect any statistically significant difference around the threshold.

Ideally, we would like to replicate this analysis for traits such as aversion to competition or self-confidence. Indeed, one may argue that people with aversion to competition could be even more reluctant to be candidates in constituencies where the victory margin is generally small. To impact our results, men and women should be affected differently. Actually, if women averse to competition chose not to be candidates in these types of constituencies, then it would be an underestimation of the gender gap. The fact that we do find continuity in our observables suggests that this issue is limited, but we cannot completely rule it out.

5 Activity

5.1 Results

Table 2 describes the estimates for the five types of activity: reports, bills, amendments, questions and interventions. In columns 1 to 3, we study all the values, including zeroes, by using either the Poisson model (bills and reports) or OLS (amendments, questions and interventions). Column 1 presents the results without any control variables. Then, in column 2, we add the control variables, and in column 3, we add constituency fixed effects. In column 4, we focus on the extensive margin

to study whether the parliamentarian has been active (with a dummy variable using a logit model). In column 5, we analyze the intensity of activity by restricting the sample to active parliamentarians (OLS).

Our results highlight an absence of systematic differences between male and female parliamentarians. Women tend to be more slightly active than men when we consider reports and questions. However, they are less active than men when we consider bills and, to a lesser extent, amendments and interventions. More specifically, we do not detect any gender difference for reports and questions when we consider all values (column 1). The introduction of control variables and constituency fixed effects does not affect the results (columns 2 and 3). For these outcomes, the gender difference comes from the extensive margin, since the share of ghost parliamentarians is significantly lower among women (between 4 and 5.7 pp). The effect is sizeable for questions, as the share of inactive parliamentarians is approximately 5% on average. For bills, amendments and interventions, the activity of female parliamentarians is lower and mostly comes from the intensive margin (column 5). The gap is only statistically significant and robust to all specifications for bills. Up to half of the gross gap for bills (column 1) is explained by control variables (mostly experience), but when we add constituency fixed effects, the coefficient returns to its initial value. Among active parliamentarians, the activity of women is approximately one-third lower than that of men. Men author on average 6.5 bills over the term, whereas this number equals 5 bills for women. For amendments and interventions, the gap is more limited (approximately 15% lower) and not statistically significant (or only at 10%).²⁵

Figure 4 illustrates the results of our RDD estimates. These results confirm those of Table 2. More specifically, a discontinuity at the threshold is visually clear for bills (Figure 4b) and, to a lesser

²⁵We present several robustness tests in the appendix. First, we use alternative measurements for activity. In Table B.1, we present estimates for presence in plenary sessions and in parliamentary commissions (number of weeks) and the voting turnout (in plenary sessions only). Women are generally more active than men, especially when we add all the control variables and constituency fixed effects. Second, we consider the rank instead of the levels of activity (Table B.2). We only detect a significant gender gap for reports (at 5%). For the other outcomes, the signs of the coefficients are consistent with those presented in Table 2, except for interventions. Third, we consider alternative specifications for reports, bills and amendments: OLS, Poisson and negative binomial (Table B.3). The results remain consistent. The coefficient for amendments becomes statistically significant when using the Poisson specification.

extent, for amendments and questions (Figures 4c and 4d). For reports and interventions, there is no visible gap at the threshold, but the activity of both men and women tends to increase when they win the elections by a large margin. Table A.2 reports estimates with different specifications (without and with controls), bandwidths (MSE-optimal bandwidth) and kernel choices (uniform or triangular). Estimates are in line with Table 2, but they are globally statistically insignificant except for reports (when using a triangular kernel) and bills (when using a Poisson model).

5.2 Mechanisms

Newcomers and learning costs One possible explanation for the gender gap for bills and amendments is the learning costs to the parliamentary position. Since 2007, information about monthly activity has been available. This allows us to refine the analysis by examining the change in activity during the term. In Table 3, we consider men and women separately but also newcomers (whose first term is the current term) and more experienced parliamentarians (for whom the current term is at least the second term). Overall, the activity of newcomers is lower than experienced parliamentarians for bills and interventions (column 1), even if insignificantly for interventions. When we focus on bills (Panel B), we find that female newcomers are significantly less active than all the other categories, including male newcomers. The yearly analysis (columns 2 to 6) hides sizeable changes during the term for newcomers, whereas there is no clear trend for experienced parliamentarians. Male newcomers author a lower number of bills in the first year, but then they are as active as experienced parliamentarians. For women, this lower activity decreases over time and is statistically significant for the first three years. For the other outcomes, we do not detect any difference between newcomers and the other parliamentarians. We note a gender gap among newcomers for all outcomes except questions, but this gap is not statistically significant only for bills.

This result suggests a behavioral explanation. As mentioned earlier, it has been shown in the literature that women tend to have an aversion to competition (Niederle and Vesterlund (2007), Niederle

and Vesterlund (2011) or Buser (2016)) and negative feedback (Ellison and Swanson (2018)). Kamas and Preston (2018) also document a gender difference in self-confidence. This could explain why newly elected women take more time to adapt and wait longer before drafting bills and amendments. One could also see this temporary gap as a difference in cooperation between men and women. Indeed, bills and amendments need to be cosponsored to have a chance to pass. Gender differences in cooperation could delay the first bills and amendments authored by parliamentarians. Future research could examine this mechanism.

Quotas and selection Another potential mechanism could be related to the implementation of financial incentives starting in 2002, which could have affected the selection of female and male politicians differently. Indeed, before 2002, there were no financial incentives for political parties to nominate women as candidates. Therefore, women who were elected for the first time before 2002 may differ from those who benefit from these quotas because of selection issues (i.e., if being elected before 2002 as a woman was harder, then those who were elected may have been more competent, following Anzia and Berry (2011)).

In Table B.4 (Panel A), we show that there is no clear effect of quotas. More specifically, male parliamentarians elected for the first time before 2002 are less active than those elected after 2002 when we look at reports and bills, but they are more active when considering amendments, questions and interventions. However, the differences are never significantly different from 0. For women, the gaps also depend on the outcome. For amendments, questions and interventions, women elected before 2002 are more active than women elected after 2002. For reports, there is no difference. For bills, however, all women are less active than men, but women elected before 2002 are even less active than women elected after 2002. Despite large gaps among women, the differences are statistically significant only for amendments and questions (at 10%).²⁶

²⁶In Table B.5, we study the change in these gender gaps term by term. For almost all outcomes, we note a U-shaped curve between 1993 and 2017 for men and women. Therefore, we do not detect a change in the gender gap due to either the implementation of quotas in 2002 or the renewal of parliamentarians in 2017 (Boelaert et al. (2018)). For bills,

Peer effects Peer effects could also matter. Indeed, being the only woman in their political group may either limit one’s activity or, on the contrary, lead one to be put forward more frequently. We account for the share of elected women within the political group.²⁷ In Table B.4 (Panel B), we test whether being in a political group with a low proportion of women affects the activity of parliamentarians. To account for the growing representation of women, we analyze each term independently. We define a political group as having a ‘low percentage of women’ if the proportion of women within the group is below the average representation of women in parliament during the current term.

When we compare the activity of men and women belonging to the same type of group, we do not detect any statistically significant difference, except for bills. Indeed, as with the other mechanisms tested *supra*, women author a lower number of bills than men within each category. Interestingly, for all outcomes, we note that parliamentarians are significantly more active when the share of women is lower. This effect is found for both men and women, and it is large for bills, questions and interventions.

Alternative explanations In addition to experience (studied in Table 3), several variables affect activity: being in the majority group, size of the political group and permanent parliamentary commission (for bills and reports). The first two variables are related to the constraints faced by parliamentarians. Indeed, parliamentarians are more likely to be nominated to write a report if they are in the majority group and less likely if their political group is small. The opposite result is found for bills. The parliamentary commission also directly affects parliamentary activity, as some topics

the overall gap detected in Table 2 is actually driven by the 2012-2022 terms, which is consistent with the analysis of newcomers. For amendments, female parliamentarians are less active during the 2007-2012 term. For questions, there is no clear trend, as women are found to be significantly more active in 1997-2002 and 2012-2017 and significantly less active in 2007-2012. For interventions, the estimates are close to those of bills, as the gap is driven only by the last term.

²⁷A naive analysis of the overall effect of feminization on activity would consist of comparing the changes in parliamentarians’ activity when the share of elected women in the Lower House increases. This type of descriptive analysis is already implemented in Figures 2 and 3. Again, the trend depends on the outcome. We note an increasing activity for reports, amendments and oral interventions but no clear trend for bills and questions.

may imply different levels of activity. This channel matters because the gender distribution across commissions is uneven (Table 1), suggesting that male and female parliamentarians tend to specialize in different issues.

Then, we test whether the effects of some of the control variables differ between men and women (Table B.4 in Appendix). The results are unchanged when we compare men and women with the same political orientation. When we consider majority/opposition groups, the conclusion is likewise similar. Women write fewer bills than men regardless of whether they belong to the majority or opposition group. For the other outcomes, women in the majority group are generally as active as men in the majority group, except in terms of interventions. In the opposition group, however, the gender gap is more marked. Women tend to be more active in reports, amendments and questions.

Finally, we include supplementary control variables. First, we control for the influence of parliamentarians using the number of study or friendship groups to which the parliamentarians belong as a proxy (available only since 2007). Second, we test whether the results are explained by the number of parliamentary assistants. Data about assistants have been available only since 2017. Female and male parliamentarians have approximately 3.2 assistants, and the number of assistants does not affect their activity. Third, following [Gavoille and Vershelde \(2017\)](#), we control for electoral competition (measured by the gap in vote shares at the second round of the election). The results remain unchanged when we include these variables.

6 Effectiveness

One could argue that the parliamentarians' activity only partially measures their contribution. Indeed, even if the parliamentarians' activity *per se* is a crucial outcome and a signal of their influence, visibility and ability to stimulate debates, it is essential to know whether this activity is effective. One way to characterize effectiveness is to know whether bills and amendments have passed into law.

However, effectiveness is not measurable for reports, questions and interventions. Importantly, the number of bills authored each year by each active parliamentarian equals 1.2, and the probability it passed is 4%, whereas the number of amendments authored equals 53.7, with an 13% probability it passed. Therefore, even if bills can be seen as more important and more time consuming, amendments are probably the main tool available to parliamentarians to affect the drafting of legislation.

We use the same empirical strategy as in section 5 (i.e., multivariate regressions and RDD). We use three measurements for effectiveness: a dummy variable indicating whether at least one bill/amendment authored by the parliamentarian has passed into law, the number of bills/amendments that have passed and the share of bills/amendments authored by the parliamentarian that have passed. We restrict the sample to the 2002-2022 period and to the parliamentarians who have authored at least one bill/amendment.

6.1 Results

The probability of passing differs between bills and amendments. Between 2002 and 2022, 75% of parliamentarians have at least one amendment that passed into law, and 13% of amendments have passed on average. The figures for bills are lower: 12% of parliamentarians have had at least one bill pass, and 4% of their bills have passed on average.

Table 4 presents the results. In panel A, we show that female parliamentarians are less likely to have at least one bill that has passed, with a marginal effect of -2.3 pp. The coefficients for the number and the share of bills that have passed are close to 0. Regardless of the measurement, the difference between men and women is not statistically significant. The RDD estimates confirm this result (columns 4 and 7 and Figure 5a). In columns 2, 5 and 8, we separately consider men and women who belong to the opposition or to the majority group. Being in the majority group greatly increases the parliamentarians' effectiveness (7% of bills passed in the majority group compared with 2% in the opposition group). The likelihood of having at least one bill that has passed and the share

of bills that have passed is lower and statistically significant (at 10% and 5%, respectively) for women in the opposition group. Within the majority group, we do not detect any gender gap, even if the number of bills that have passed is slightly (but insignificantly) larger for men. This is consistent with the fact that men author more bills than women.

In Panel B, we replicate the analysis for amendments. Unlike with their bills, female parliamentarians are more likely to have at least one of their amendments that pass. The marginal effect equals 3.9 pp. The number of amendments that have passed does not differ between men and women, but the share of accepted amendments is larger for women. The economic significance of the gender gap is large at 3.5 pp. (compared with the average rate of 13%). We find an even larger effect with our RDD estimate (column 7). This result is confirmed by graphical evidence (Figure 5b). As in Panel A, we compare majority and opposition groups (columns 2, 5 and 8). We show that female parliamentarians belonging to the opposition group are more effective regardless of the outcome examined. All estimates are significant at 5%. This gap is all the more noteworthy because the average rate of the opposition group equals only 5.3%. Moreover, this difference can also be found in the majority group (except for the number of amendments). However, the gaps in the majority group are not statistically significant.

It is necessary to put these results into perspective. Each term, 46 amendments authored by women pass, whereas 33 of the men's amendments pass. This difference is larger in the opposition group, where women have twice as many amendments accepted (24 vs. 12). To put it differently, women in the opposition group represent 21% of parliamentarians but 35% of all amendments that pass. Effectiveness for bills is, however, larger for men than for women, but the magnitude differs as the number of bills authored is lower, and more importantly, it is rare for a parliamentarian to pass a bill. Indeed, each term, men pass only 0.24 bills, whereas 0.18 of the women's bills pass. The gap is also larger for parliamentarians in the opposition party, but it is close to 0 regardless of gender. All in all, even if bills can have a deeper impact than amendments in the elaboration of the legislation,

amendments are probably the most efficacious tool for parliamentarians.

6.2 Mechanisms

Selection within political group For bills, a key aspect to explain the gender difference is the selection of bills within political group. Indeed, all the bills authored by parliamentarians are not subject to a vote. The parliamentarians do not set the agenda of the Lower House except one day per year per political group. Therefore, each political group has to select the bills they want to put to a vote because only 3 or 4 bills (depending on the number of articles of law) can be put to vote by the end of the day.²⁸ Given that bills authored by parliamentarians from the majority group can be defended by the government, this issue mostly affects the opposition groups. In Table C.1, we show that bills initiated by women are less likely to be selected for these one-day periods even though the gender gap is not statistically significant. This effect is mostly driven by women in the opposition group. In Table 5, we reestimate the effect of gender on effectiveness with controls measuring this selection (number or share of selected bills). The lower effectiveness of women in the opposition group is eliminated once we control for selection (columns 2, 5 and 8).

Gender discrimination within parties about the political agenda seems to explain the gender difference in the effectiveness of passing bills. This result is striking because it suggests that quotas alone are not sufficient to increase female representation in politics, especially when the objective is to have policymakers more in line with voters' preferences.

Use of amendments For amendments, the mechanisms are different because all amendments are subject to a vote. Therefore, we use all the information we collected about all the stages of the voting process of amendments to analyze the way parliamentarians use their amendments.

We first document the share of men and women among the most active parliamentarians. One can suspect that when a parliamentarian author many amendments, some of them may be meant

²⁸During these "*niches parlementaires*", many amendments can delay the debates about a bill and postpone the vote to the next "*niche*" several months later.

to obstruct the functioning of parliament and to delay debates and votes.²⁹ They could also be a way for the parliamentarians to be more visible. The top 10% most active parliamentarians (respectively, the top 5%) each author an average of 260 (resp. 344) amendments each year. Women are underrepresented among the top 10% and top 5% most active parliamentarians (Figure 6a). Indeed, the share of women is on average on-third lower when we compare their share among the most active parliamentarians to the whole sample³⁰ Figure 6b presents the share of amendments that have passed, along with the distribution of proposed amendments. Effectiveness continuously decreases as the number of amendments authored increases. This trend is visible for both male and female parliamentarians. Another way to address this issue is to exclude the most active parliamentarians (i.e., the top 5%). In this new subsample, we show that women are even more effective than men (Table C.2). The gender gap is larger and more statistically significant, regardless of the measurement.

The status of amendments is another proxy for analyzing their effectiveness. First, before being put to a vote, amendments must be considered admissible.³¹ The number of inadmissible amendments is larger for male than for female parliamentarians, but this gap is not statistically significant (Table C.3, columns 4-6). Then, when the amendment is considered admissible, it must be defended by its author in plenary sessions or in commissions to be voted on. Again, we find that women are more likely than men to defend their amendments (columns 7-9). One last indicator of the quality of amendments relates to cosponsorship. Indeed, amendments can be cosponsored by other parliamentarians, which likely affects the probability of the amendment passing (see section 2). The number of cosponsored amendments is larger for women than for men (columns 10-12).

Therefore, all the results converge and reflect the fact that the amendments authored by men

²⁹During the 2017-2022 term, more than 60,000 amendments have been authored to the universal pension system bill. Some parliamentarians alone authors 2,500 amendments.

³⁰These results are confirmed when we focus on specific bills that have generated a high number of amendments (Table C.3, columns 1-3). More specifically, we selected the two bills that generated the highest number of amendments for the last two terms (2012-2017 and 2017-2022). When we focus on the subsample of parliamentarians who authored at least one amendment for either of these two laws (66% of the sample), we find that men authored more amendments than women (133 versus 116, respectively). This gap is not affected when we add our set of control variables.

³¹For a definition of this, see section 2. Information about admissibility is available only for 2017-2022.

differ from those authored by women, which affects the amendments' effectiveness. Here again, the results point to a behavioral explanation for the gender difference. Obstruction behavior, which consists of filing many amendments for the sole purpose of delaying the debates and votes on a bill, entails significant costs and may deteriorate the functioning of legislative institutions. Thus, the gender gap in selfishness ([Eckel and Grossman \(1998\)](#)) and in the ability to cooperate ([Cremer and Janssen \(2007\)](#)) could explain this result.

Topics One may think that these differences in effectiveness for both bills and amendments could also come from differences in the topics addressed by male and female parliamentarians. [Thomas \(1991\)](#) suggests that women could be more effective than men because they promote consensual issues that are more likely to be passed into law. Before examining this channel, the fact that the gender gap in effectiveness moves in the opposite direction for bills and amendments indicates that this mechanism is probably not relevant in the French context.

[Lippmann \(2022\)](#) shows that the difference in topics between men and women is limited. Female parliamentarians are more likely to be active regarding women's issues, whereas men are more active regarding military issues. On all the other issues listed (justice, labor, security, business, culture, etc.), the author does not detect any significant difference. However, this difference is limited at the aggregate level, as women's issues represent only 2% of all amendments overall. When we study the topics of bills following [Lippmann \(2022\)](#)'s methodology on the 2012-2017 and 2017-2022 terms, we find similar results: female parliamentarians are more likely to author bills on women's issues. However, as for amendments, this topic represents an even more limited share of all bills (approximately 1%). Therefore, given the modest number of bills/amendments about which men and women differ, the explanatory power of this channel is likely to be limited.

Alternative explanations Effectiveness is less well predicted than activity. Apart from the majority/opposition groups, few variables significantly affect effectiveness: parliamentary experience

and political orientation for amendments and leadership positions (head of political group or commission) for bills. Thus, we then test whether these variables affect men and women differently. For amendments, we find only that female newcomers are more effective than male newcomers. For bills, male parliamentarians in leadership positions are more effective than female parliamentarians.

We also include supplementary variables such as electoral competition, and we compare the pre- and postquota periods. Indeed, according to [Anzia and Berry \(2011\)](#), women face gender discrimination in being elected, so those who manage to gain office are more talented and hard-working and should thus perform better. Our results seem to contradict their finding because we do not find any effect of electoral competition or quotas on effectiveness.

One might also think that differences in effectiveness could come from the specialization of parliamentarians.³² More specifically, women would be more effective in getting their amendments passed because they neglect other parliamentary activities. This channel is unlikely to be relevant. Indeed, in [Table 2](#), we have shown that gender differences in activity are limited regardless of the type of activity if we exclude bills for which the gender difference is mainly explained by differences in learning costs. Moreover, we do not detect any gender difference in other types of activity, such as membership in study or friendship groups.

7 Conclusion

This paper highlights gender-related differences in the activity and effectiveness of French parliamentarians using close elections as an identification strategy. We do not find any systematic gender gap. Women tend to be more active than men when we consider reports and questions. However, they are less active than men when we consider bills and, to a lesser extent, amendments and interventions. The large and significant gender gap for bills is driven by newly elected women during the first years of their term. This result is compatible with a behavioral explanation, as the experimental literature

³²On this issue, see also [Boelaert and Ollion \(2020\)](#).

has shown that women tend to be relatively more averse to competition and have a lower degree of self-confidence than men. It is, however, unlikely that the gender differences can be explained by a selection effect linked to the massive entry of women into politics in recent decades. Indeed, the results are unchanged whether we consider parliamentarians elected for the first time before and after the implementation of quotas. This result is far from constituting an argument against quotas and policies aimed at increasing the share of women in politics. Being less active at the beginning of one's term for newcomers is not necessarily negative insofar as a learning period is undoubtedly necessary to produce quality bills.

Another way to study the consequences of feminization on the quality of political decisions is study effectiveness. Female parliamentarians are more effective in authoring amendments that pass but less effective when we consider bills. The magnitude of these gender gaps differs. Each term, 46 amendments authored by women pass, whereas 33 of the men's amendments pass. However, only 4% of bills passed on average, so the magnitude is substantially more limited. The differences in effectiveness are mostly explained by behavioral factors. Women author fewer amendments with the sole purpose of obstructing parliamentary activity. Moreover, the quality of women's amendments is higher as they author a higher share of cosponsored amendments with a greater chance of being accepted and are more likely to defend their amendments. These results are consistent with the experimental literature that has highlighted a greater ability among women to cooperate as well as more virtuous behaviors. However, differences in effectiveness for bills are not due to a lower quality of female parliamentarians or differences in topics but rather to discrimination within political parties, which less often select bills authored by women to vote on.

Measuring the quality of political action is a crucial issue, and our measurement of activity and effectiveness, more objective, direct and individual than the other measurements used in the literature, is only a partial measure of it. More efforts should be made in future research to measure the quality of bills by, for example, focusing more precisely on the content of bills. This task is

difficult insofar as there is no nonpartisan consensus on what constitutes the quality of a given policy or legislative text.

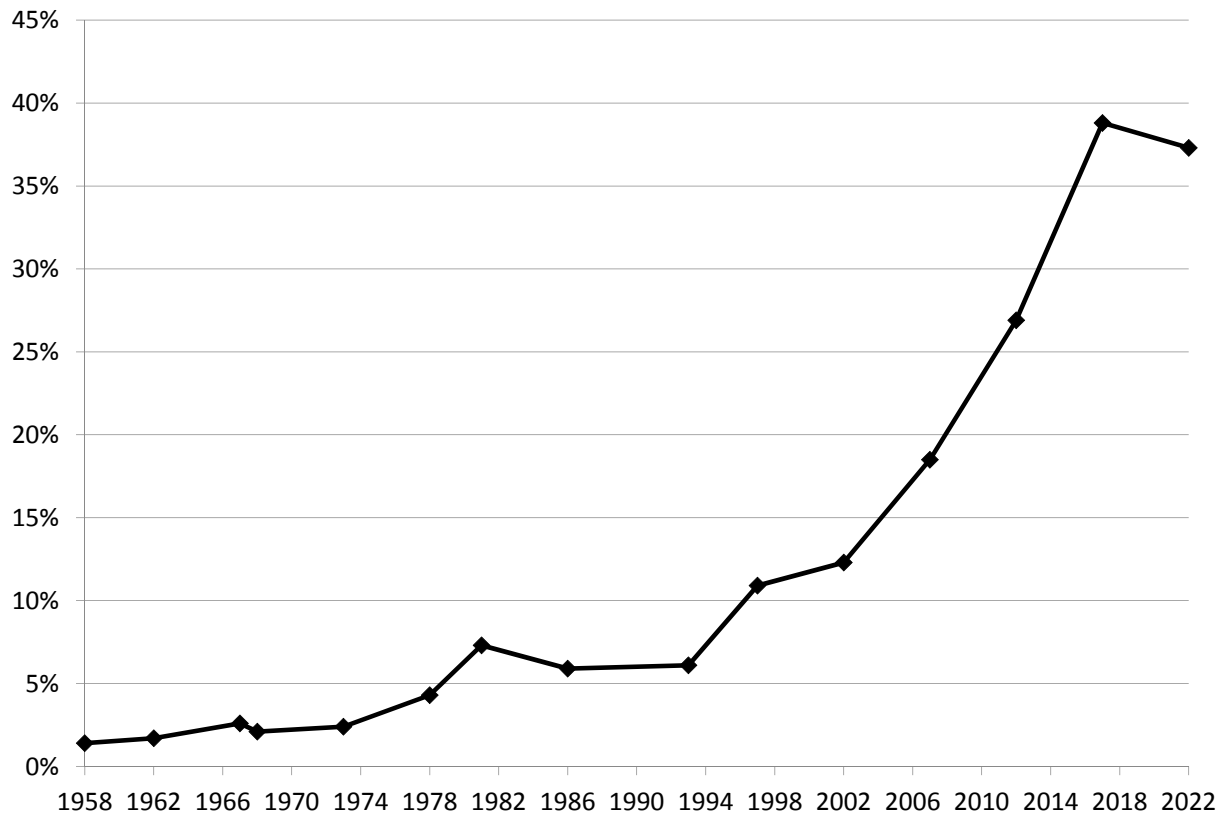
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Figure 1: Share of female parliamentarians (1958–2022)



Note: each diamond represents a parliamentary election.

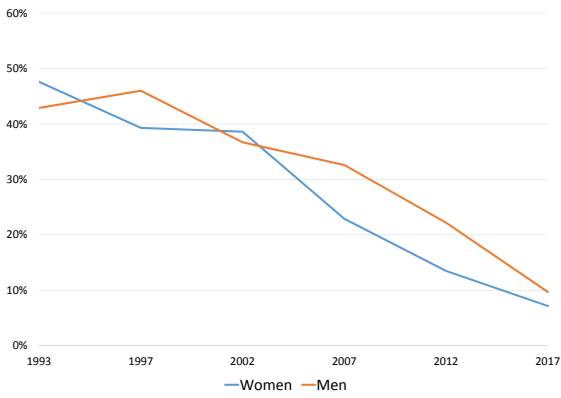
Source: *Assemblée Nationale* website.

Table 1: Characteristics of parliamentarians (1993-2022)

	1993-1997		1997-2002		2002-2007		2007-2012		2012-2017		2017-2022	
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men
Age	52.4	52.3	52.2	52.5	52.1	53.9	53.8	55.7	54.1	55.6	47.6	49.9
% 1st term	0.57	0.47	0.50	0.41	0.63	0.35	0.52	0.21	0.61	0.42	0.89	0.75
Nb of terms served	0.8	1.3	1.0	1.4	0.6	1.5	0.7	1.8	0.7	1.5	0.2	0.6
% deputy and mayor	0.29	0.52	0.18	0.58	0.32	0.52	0.23	0.51	0.19	0.43	0.00	0.01
% government exp.	0.05	0.11	0.14	0.11	0.11	0.08	0.10	0.07	0.03	0.06	0.01	0.02
% majority group	0.76	0.81	0.61	0.54	0.53	0.68	0.42	0.61	0.69	0.42	0.72	0.56
% high positions	0	0.04	0.07	0.06	0.09	0.12	0.17	0.15	0.22	0.15	0.11	0.13
<i>Parliamentary commission (%):</i>												
Culture-education	0.62	0.23	0.50	0.23	0.51	0.20	0.18	0.09	0.18	0.10	0.17	0.09
Defence	0.00	0.12	0.04	0.12	0.04	0.13	0.07	0.14	0.10	0.14	0.06	0.14
Foreign affairs	0.09	0.13	0.21	0.12	0.07	0.14	0.11	0.14	0.09	0.13	0.11	0.14
Economy	0.24	0.30	0.14	0.28	0.21	0.27	0.17	0.13	0.15	0.13	0.12	0.13
Public finance	0.00	0.12	0.00	0.14	0.05	0.14	0.07	0.15	0.05	0.16	0.11	0.14
Environnement	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.11	0.13	0.11	0.12	0.11
Social policies	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.09	0.17	0.10	0.19	0.10
Law	0.05	0.10	0.11	0.11	0.12	0.12	0.10	0.15	0.14	0.13	0.11	0.16
<i>Occupation (%):</i>												
Civil	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.11	0.08	0.11	0.10
Teacher	0.19	0.12	0.18	0.20	0.14	0.14	0.17	0.13	0.17	0.11	0.09	0.10
Academic	0.05	0.06	0.11	0.07	0.02	0.06	0.04	0.05	0.02	0.05	0.03	0.04
Legal	0.10	0.08	0.00	0.08	0.11	0.10	0.07	0.11	0.05	0.10	0.08	0.08
Business	0.05	0.10	0.00	0.07	0.05	0.08	0.04	0.07	0.03	0.07	0.10	0.09
Executive	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.13	0.19	0.18	0.21	0.23
Health	0.05	0.15	0.14	0.11	0.12	0.13	0.08	0.14	0.06	0.08	0.09	0.09
Engineer	0.00	0.06	0.00	0.04	0.02	0.05	0.00	0.04	0.02	0.02	0.03	0.03
Politics	0.05	0.04	0.11	0.05	0.07	0.06	0.06	0.05	0.03	0.04	0.02	0.04
Farmer	0.05	0.05	0.00	0.04	0.00	0.03	0.01	0.03	0.02	0.03	0.01	0.05
Industry	0.05	0.02	0.04	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.00	0.00
Other	0.43	0.32	0.43	0.32	0.46	0.35	0.29	0.19	0.29	0.23	0.25	0.16

Note: we restrict the sample to parliamentarians with full terms only. % 1st term represents the share of parliamentarians for whom the current term is their first term. % governmental experience represents the share of parliamentarians who have been either minister or secretary of state. High positions include president/vice-president/secretary/quaestor of the Lower House as well as president of political group/parliamentary commission. The number and the composition of parliamentary permanent commissions have changed in 2007.

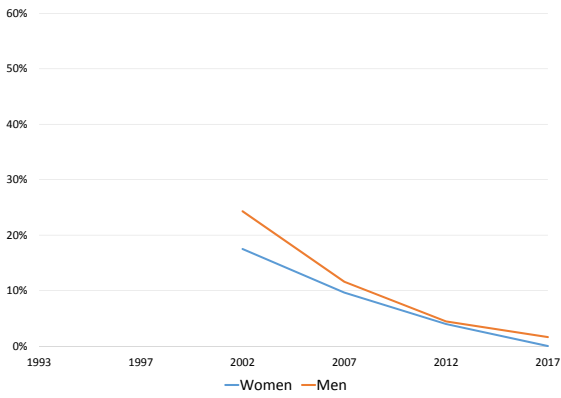
Figure 2: Parliamentarians with no activity (in %)



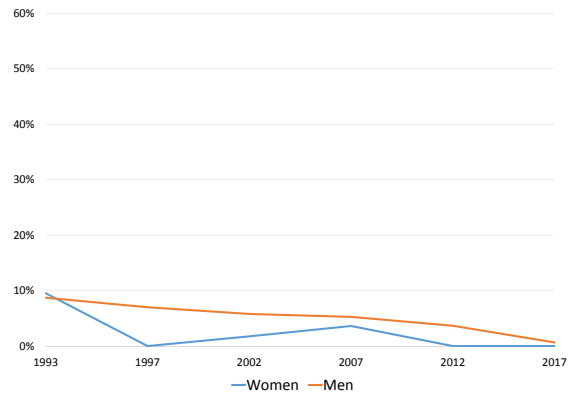
(a) Reports



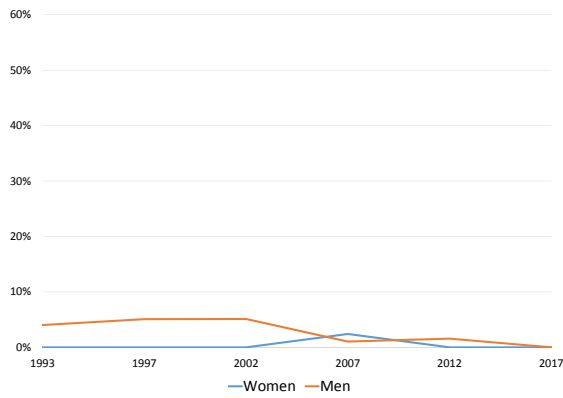
(b) Bills



(c) Amendments



(d) Questions



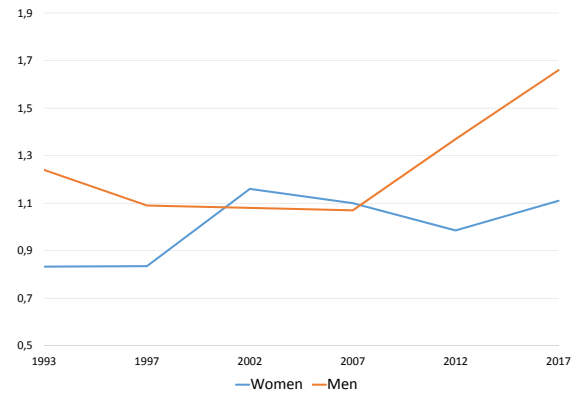
(e) Interventions

Note: We restrict the sample to parliamentarians with full terms only. Information about amendments is not available before 2002.

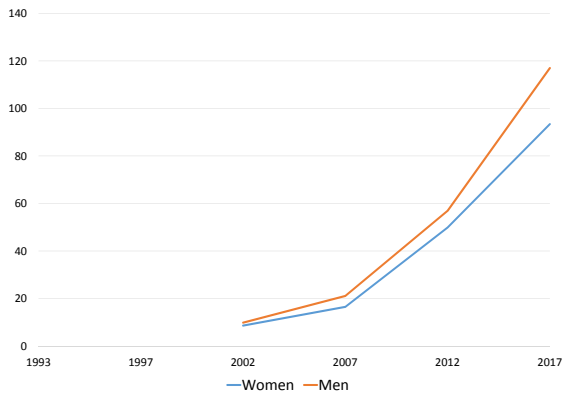
Figure 3: Yearly activity among active parliamentarians



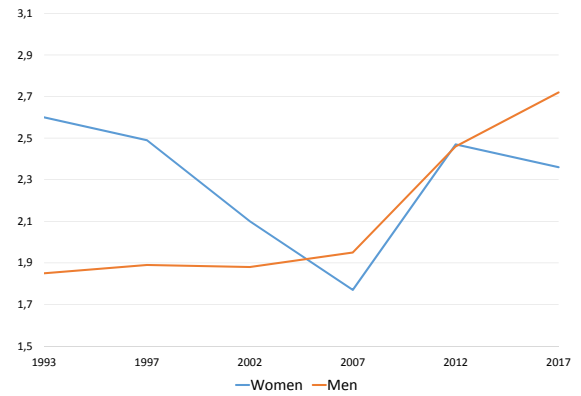
(a) Reports



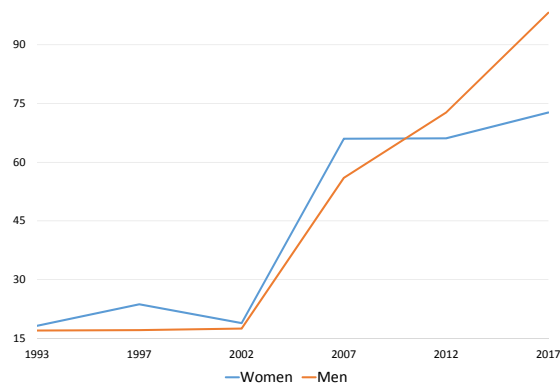
(b) Bills



(c) Amendments



(d) Questions



(e) Interventions

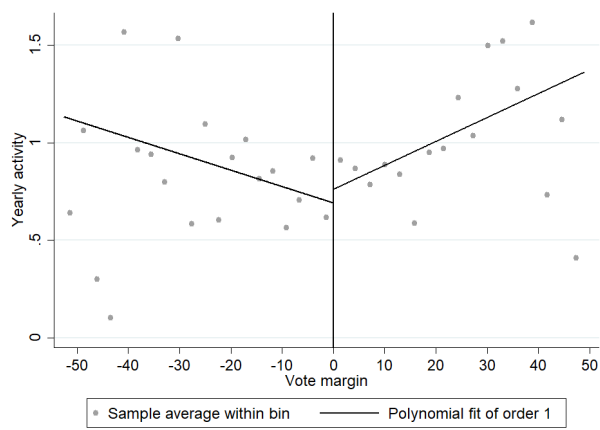
Note: We restrict the sample to parliamentarians with full terms only. For all outcomes, the unit is the yearly activity. Information about amendments is not available before 2002.

Table 2: Effect of the parliamentarian's gender on activity

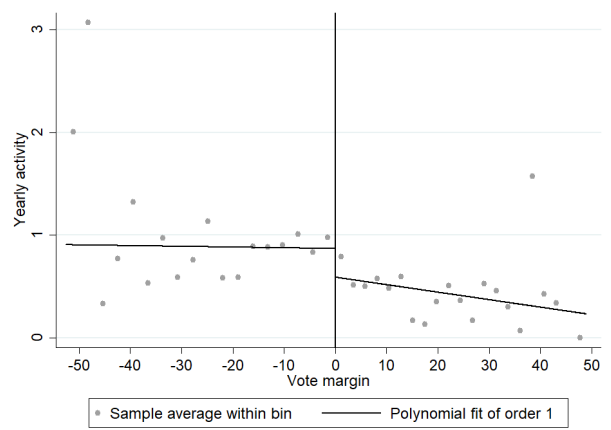
	(1)	(2)	(3)	(4)	(5)
	Pooled	Pooled	Fixed-effects	Any activity	Mean activity if parliamentarian active
Panel A: Reports (% of ghosts = 31% / mean if active = 1.17)					
Female parl.	0.006 (0.067)	-0.007 (0.069)	0.049 (0.088)	0.321** (0.157) [0.057]	-0.120 (0.093)
<i>N</i>	2944	2944	2913	2944	2040
Spec	Poisson	Poisson	Poisson	Logit	OLS
Panel B: Bills (% of ghosts = 35% / mean if active = 1.24)					
Female parl.	-0.390*** (0.127)	-0.210* (0.108)	-0.365*** (0.107)	-0.097 (0.120) [-0.018]	-0.476*** (0.149)
<i>N</i>	2944	2944	2896	2939	1906
Spec	Poisson	Poisson	Poisson	Logit	OLS
Panel C: Amendments (% of ghosts = 10% / mean if active = 53.7)					
Female parl.	-9.853 (6.653)	-6.826 (5.723)	-4.009 (8.066)	0.247 (0.328) [0.017]	-6.791 (8.922)
<i>N</i>	1977	1977	1977	1956	1780
Spec	OLS	OLS	OLS	Logit	OLS
Panel D: Questions (% of ghosts = 4.7% / mean if active = 2.13)					
Female parl.	0.018 (0.096)	0.026 (0.076)	0.0790 (0.095)	0.939** (0.452) [0.040]	0.019 (0.093)
<i>N</i>	2944	2944	2944	2908	2805
Spec	OLS	OLS	OLS	Logit	OLS
Panel E: Interventions (% of ghosts = 2.6% / mean if active = 49.6)					
Female parl.	-7.934 (7.243)	-8.818* (6.320)	-8.613 (7.300)	1.086* (0.622) [0.038]	-8.688 (7.333)
<i>N</i>	2944	2944	2944	2932	2868
Spec	OLS	OLS	OLS	Logit	OLS
Controls:					
Term f.e.	Yes	Yes	Yes	Yes	Yes
Experience	No	Yes	Yes	Yes	Yes
Political	No	Yes	Yes	Yes	Yes
Commission	No	Yes	Yes	Yes	Yes
Occupation	No	Yes	Yes	Yes	Yes
Constituency f.e.	No	No	Yes	No	Yes

Note: Standard errors (clustered at the constituency level) in parentheses and marginal effect in brackets; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We restrict the sample to parliamentarians with full terms only. The information about amendments is not available before 2002. For all outcomes, the unit is the yearly activity except in column 4 where the dependent variable is a dummy variable equal to 1 if the outcome is strictly positive. "Ghosts" = parliamentarians who were inactive during the whole term.

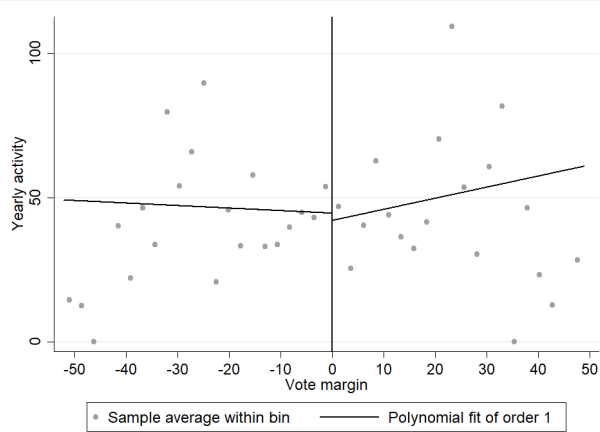
Figure 4: RDD plots - Effect of the parliamentarian's gender on activity



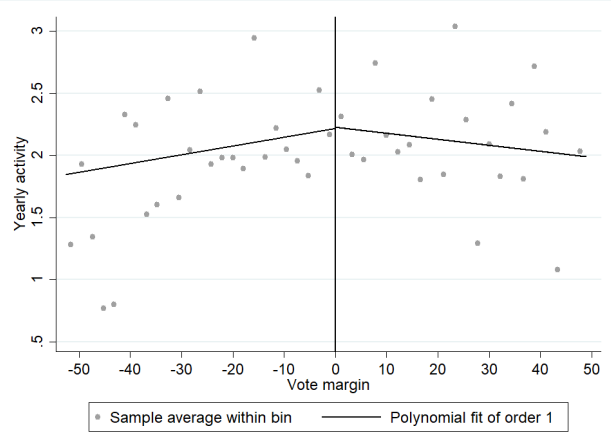
(a) Reports



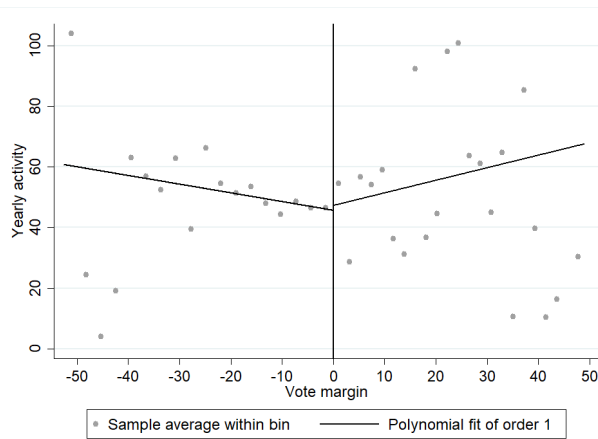
(b) Bills



(c) Amendments



(d) Questions



(e) Interventions

Note: We restrict the sample to parliamentarians with full terms only and to elections for which a second round between a male and a female candidate has been organized. For all outcomes, the unit is the yearly activity. Information about amendments is not available before 2002. The graphs report quantile-spaced bins that capture averages from the same number of observations for each treatment group (Calonico et al. (2014)). The solid lines represent a first-order polynomial. The vertical lines capture the discontinuity point at zero. The x-axis represents the vote margin for the female candidate. On the right-hand side of the vertical line, a woman is elected, and on the left-hand side, a man is elected.

Table 3: Effect of the parliamentarian's gender and experience during the term

	(1)	(2)	(3)	(4)	(5)	(6)
	All	year 1	year 2	year 3	year 4	year 5
Panel A: Reports (mean = 0.94)						
Experienced male	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Newcomer male	-0.110 (0.117)	-0.424*** (0.151)	-0.162 (0.148)	-0.117 (0.144)	0.003 (0.130)	0.264** (0.129)
Experienced female	0.298 (0.283)	-0.009 (0.246)	-0.291 (0.216)	-0.539* (0.327)	-0.187 (0.264)	-0.154 (0.275)
Newcomer female	0.019 (0.130)	-0.504** (0.198)	-0.445** (0.175)	-0.0819 (0.192)	-0.086 (0.177)	0.167 (0.185)
<i>Diff male - female newcomers</i>	<i>-0.129</i>	<i>0.080</i>	<i>0.283*</i>	<i>-0.035</i>	<i>0.089</i>	<i>0.097</i>
Panel B: Bills (mean = 0.86)						
Experienced male	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Newcomer male	-0.275 (0.195)	-0.547** (0.245)	0.0726 (0.225)	0.104 (0.212)	-0.118 (0.183)	0.342* (0.199)
Experienced female	0.261 (0.266)	0.167 (0.401)	0.514 (0.360)	0.605* (0.337)	0.331 (0.350)	0.308 (0.331)
Newcomer female	-0.512** (0.231)	-1.621*** (0.315)	-0.594* (0.332)	-0.545* (0.281)	-0.179 (0.253)	-0.141 (0.267)
<i>Diff male - female newcomers</i>	<i>0.237</i>	<i>1.074***</i>	<i>0.666***</i>	<i>0.649***</i>	<i>0.061</i>	<i>0.483**</i>
Panel C: Amendments (mean = 62.3)						
Experienced male	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Newcomer male	15.76 (16.465)	3.683 (10.162)	11.54 (15.432)	48.43 (45.243)	3.437 (28.159)	16.48* (9.182)
Experienced female	25.43 (26.487)	9.937 (20.088)	55.18** (27.427)	15.89 (71.080)	29.20 (40.787)	6.276 (20.049)
Newcomer female	16.33 (22.085)	-17.45 (11.110)	0.0581 (19.196)	60.47 (49.163)	13.72 (38.021)	23.26* (13.359)
<i>Diff male - female newcomers</i>	<i>-0.570</i>	<i>21.133**</i>	<i>11.482</i>	<i>-12.040</i>	<i>-10.283</i>	<i>-6.780</i>
Panel D: Questions (mean = 2.29)						
Experienced male	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Newcomer male	0.125 (0.151)	0.492*** (0.164)	0.620*** (0.156)	0.625*** (0.211)	0.738*** (0.196)	0.528*** (0.129)
Experienced female	0.151 (0.217)	0.200 (0.240)	0.354 (0.238)	0.397 (0.304)	0.442 (0.296)	0.0284 (0.168)
Newcomer female	0.210 (0.167)	0.601*** (0.192)	0.601*** (0.200)	0.658** (0.259)	0.998*** (0.243)	0.627*** (0.145)
<i>Diff male - female newcomers</i>	<i>-0.085</i>	<i>-0.109</i>	<i>0.019</i>	<i>-0.033</i>	<i>-0.260</i>	<i>-0.099</i>
Panel E: Interventions (mean = 79.9)						
Experienced male	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
Newcomer male	-8.526 (12.426)	-6.162 (11.557)	-14.97 (13.864)	-0.002 (11.444)	-3.929 (12.717)	9.017 (8.422)
Experienced female	34.60 (21.320)	14.06 (19.828)	41.07* (23.788)	29.48 (19.635)	30.96 (21.820)	-10.90 (14.450)
Newcomer female	-12.00 (15.669)	-35.07** (14.573)	-15.98 (17.483)	-7.404 (14.431)	-7.068 (16.037)	0.448 (10.620)
<i>Diff male - female newcomers</i>	<i>3.474</i>	<i>28.908**</i>	<i>1.010</i>	<i>7.402</i>	<i>3.139</i>	<i>8.569</i>
Controls and f.e.	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	1473	1473	1473	1473	1473	1473

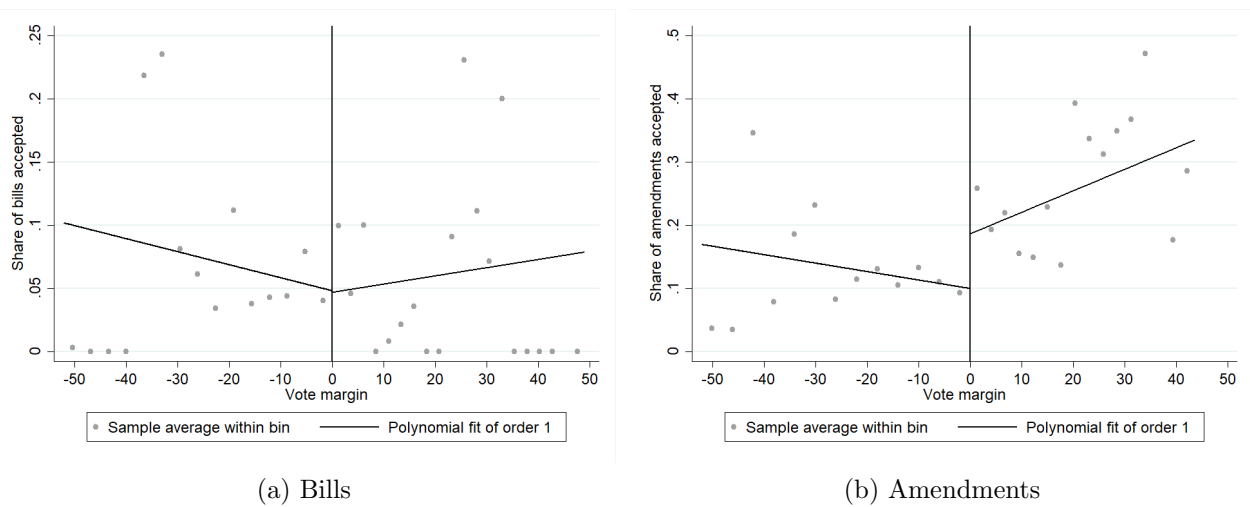
Note: Standard errors (clustered at the constituency level) in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We restrict the sample to parliamentarians with full terms only and to the last three terms (2007-2012, 2012-2017, 2017-2022). The information about amendments is available since 2012. For all outcomes, the unit is the yearly activity. Control variables include experience, political characteristics, commission, occupation and time and constituency f.e. In Panels A and B, we use a Poisson model. In Panels C, D and E, we use OLS.

Table 4: Effect of the parliamentarian's gender on effectiveness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Passed (=1)	Passed (=1)	Number	Number	Number	Share	Share	Share
	All	All	All	RDD	All	All	RDD	All
Panel A: Bills (Passed (=1) = 12% / number = 0.05 / share = 4%)								
Female parl.	-0.244 (0.244) [-0.023]		-0.0110 (0.013)	0.019 (0.029)		-0.0261 (0.024)	-0.008 (0.052)	
Male × Opposition		Ref.			Ref.			Ref.
Male × Majority		1.228*** (0.257)			0.126* (0.069)			0.0958*** (0.025)
Female × Opposition		-0.924* (0.498)			0.0200 (0.040)			-0.0654** (0.031)
Female × Majority		1.249*** (0.329)			0.0941* (0.051)			0.0960** (0.039)
<i>N</i>	1282	1282	1296	325	1296	1296	324	1296
Panel B: Amendments (Passed (=1) = 25% / number = 7.2 / share = 13%)								
Female parl.	0.330 (0.208) [0.039]		-0.829 (1.563)	1.517 (1.289)		0.035** (0.018)	0.065* (0.066)	
Male × Opposition		Ref.			Ref.			Ref.
Male × Majority		0.769*** (0.226)			14.27*** (2.125)			0.278*** (0.017)
Female × Opposition		0.697** (0.301)			3.952** (1.808)			0.0528** (0.024)
Female × Majority		0.815*** (0.287)			11.24*** (2.353)			0.305*** (0.022)
<i>N</i>	1778	1778	1780	338	1780	1780	308	1780
Controls:								
Term f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Experience	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Political	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Commission	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constituency f.e.	No	No	Yes	No	Yes	Yes	No	Yes

Note: Standard errors (clustered at the constituency level) in parentheses and marginal effect in brackets; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We restrict the sample to parliamentarians with full terms only. The information about effectiveness is not available before 2002. In columns 1 and 2, the dependent variable is a dummy variable equal to 1 if at least one bill/amendment passed. In columns 4 and 7, the RDD coefficient is estimated using MSE-optimal bandwidth with a triangular kernel.

Figure 5: RDD plots - Effect of the parliamentarian's gender on effectiveness



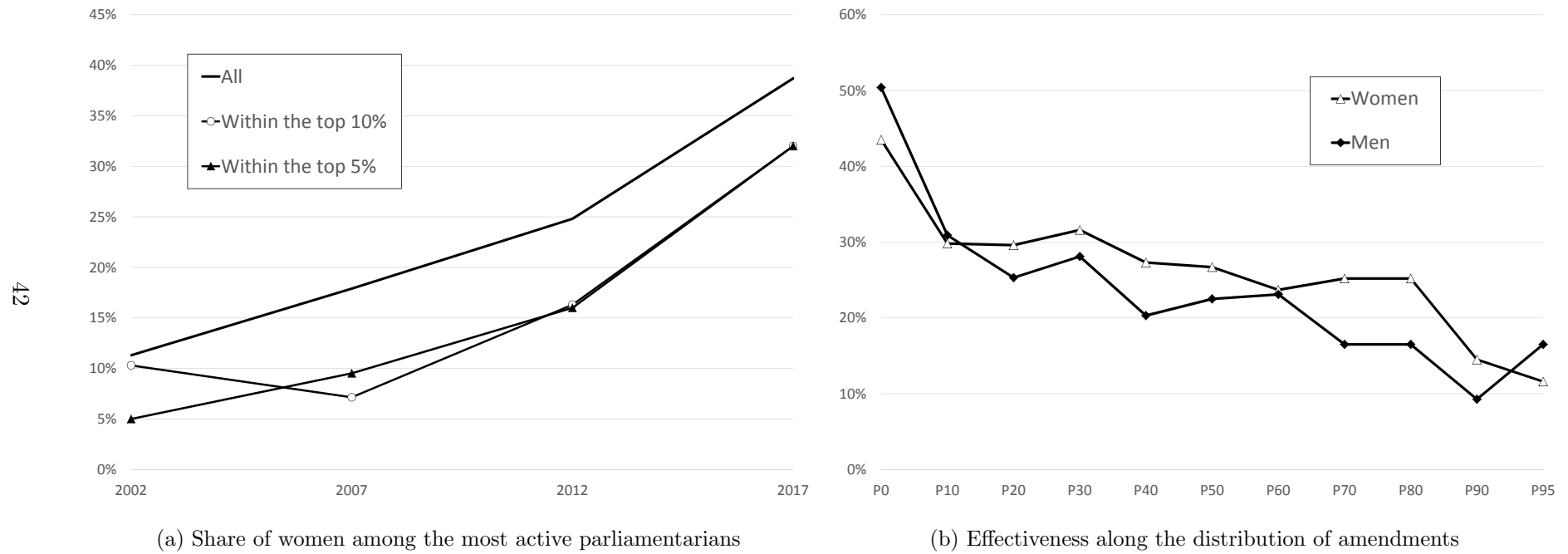
Note: We restrict the sample to parliamentarians with full terms only and to elections for which a second round between a male and a female candidate has been organized. For all outcomes, the unit is the share of texts that passed. Information about effectiveness is not available before 2002. The graphs report quantile-spaced bins that capture averages from the same number of observations for each treatment group (Calonico et al. (2014)). The solid lines represent a first-order polynomial. The vertical lines capture the discontinuity point at zero. The x-axis represents the vote margin for the female candidate. On the right-hand side of the vertical line, a woman is elected, and on the left-hand side, a man is elected.

Table 5: Effect of the parliamentarian's gender on effectiveness controlling for selection (bills only)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Passed (=1)	Passed (=1)	Number	Number	Number	Share	Share	Share
	All	All	All	RDD	All	All	RDD	All
Female parl.	0.164 (0.280) [0.009]		0.005 (0.009)	-0.004 (0.177)		-0.012 (0.016)	-0.018 (0.036)	
Male × Opposition		Ref.			Ref.			Ref.
Male × Majority		2.795*** (0.484)			0.073*** (0.016)			0.053*** (0.015)
Female × Opposition		-0.231 (0.749)			0.010 (0.014)			-0.020 (0.020)
Female × Majority		3.092*** (0.4592)			0.075*** (0.016)			0.045** (0.022)
<i>N</i>	1282	1282	1296	258	1296	1296	296	1296
Controls:								
Term f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Experience	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Political	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Commission	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constituency f.e.	No	No	Yes	No	Yes	Yes	No	Yes

Note: Standard errors (clustered at the constituency level) in parentheses and marginal effect in brackets; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We restrict the sample to parliamentarians with full terms only. The information about effectiveness is not available before 2002. In columns 1 and 2, the dependent variable is a dummy variable equal to 1 if at least one bill passed. In columns 4 and 7, the RDD is estimated using MSE-optimal bandwidth with a triangular kernel.

Figure 6: Distribution and effectiveness of amendments (2002–2022)



Note: We restrict the sample to parliamentarians with full terms only. In Figure 6b, the x-axis represents the distribution of amendments from the least active parliamentarian to the most active.

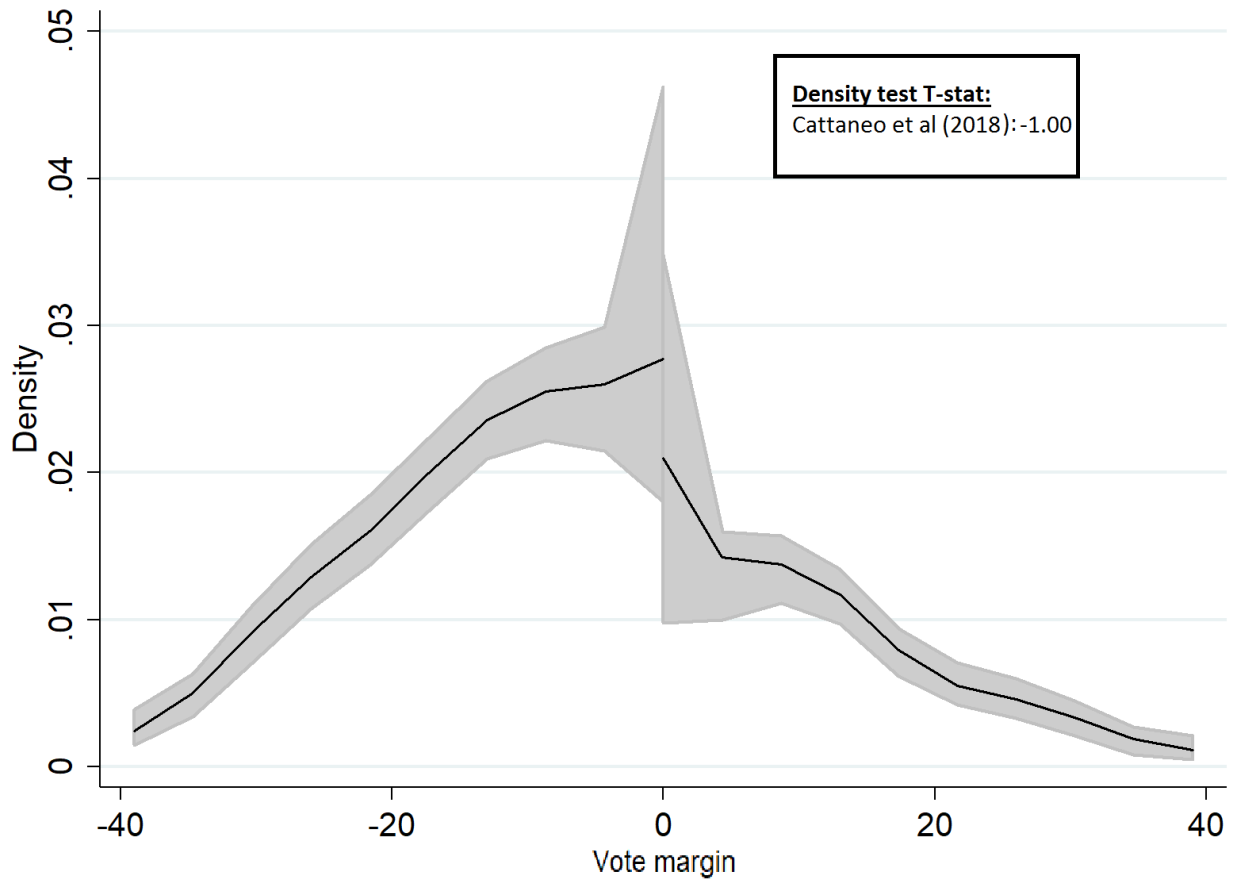
A RDD - Internal validity tests and supplementary results

Table A.1: Parliamentary elections since 1993

	Number of elections	No 2nd round	2nd round man-woman	Gap < 10	Gap < 5	Gap < 2.5
All	2951	210	1071 36%	408 38%	208 19%	120 11%
1993	469	48	71 15%	20 28%	8 11%	5 7%
1997	500	7	129 26%	59 46%	30 23%	15 12%
2002	506	45	176 35%	66 38%	35 20%	19 11%
2007	463	81	211 46%	84 40%	39 18%	23 11%
2012	509	27	235 46%	99 42%	54 23%	37 16%
2017	504	2	249 49%	80 32%	42 17%	21 8%

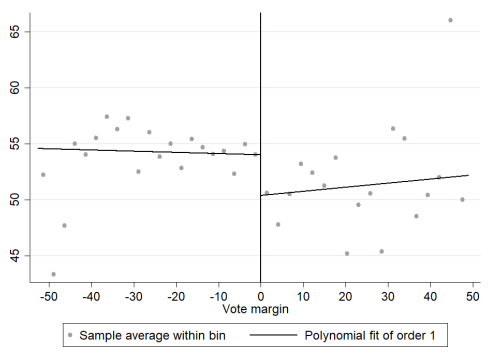
Note: we restrict the sample to parliamentarians with full terms only. “Gap” represents the difference between the winner’s score and the second candidate. In other words, “Gap < 10” accounts for all the elections for which the winner’s score was between 50 and 55% of votes.

Figure A.1: Manipulation test

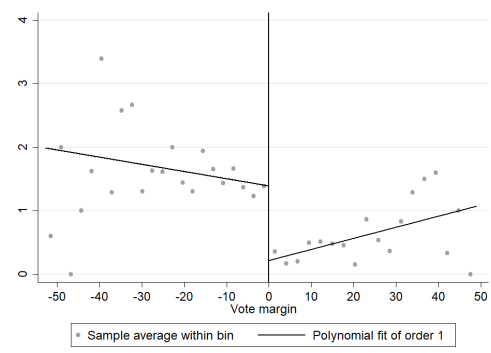


Note: We restrict the sample to parliamentarians with full terms only and to elections for which a second round between a male and a female candidate has been organized. The x-axis represents the vote margin for the female candidate. On the right-hand side of the vertical line, a woman is elected, and on the left-hand side, a man is elected.

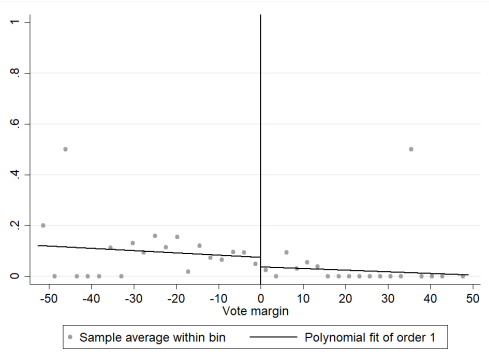
Figure A.2: RDD plots - Continuity assumption



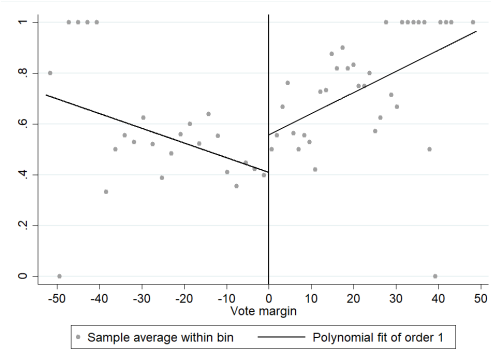
(a) Age (in years)



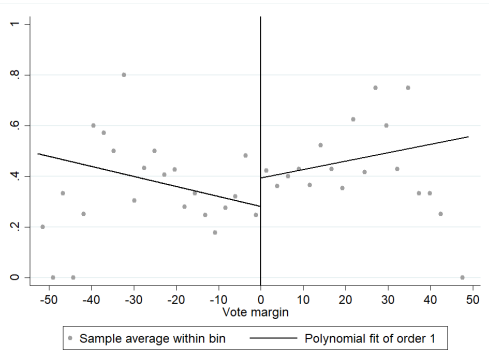
(b) Parl. experience (number of terms)



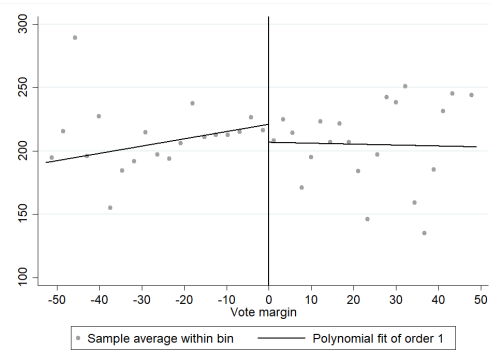
(c) Governmental experience (%)



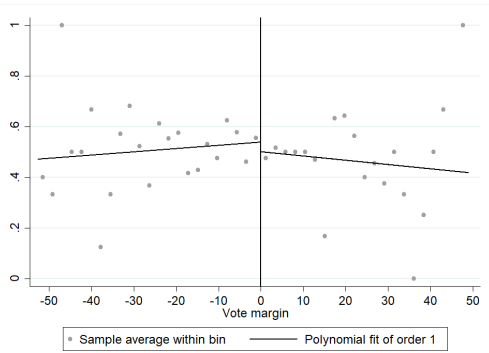
(d) Majority group



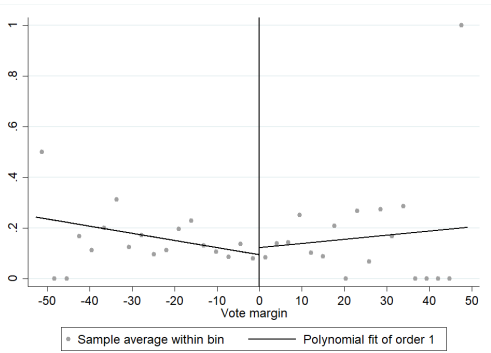
(e) Left parties (%)



(f) Group size



(g) High-skilled occupation (%)



(h) High position (%)

Note: We restrict the sample to parliamentarians with full terms only and to elections for which a second round between a male and a female candidate has been organized. The solid lines represent a first-order polynomial. The vertical lines capture the discontinuity point at zero. The x-axis represents the vote margin for the female candidate. On the right-hand side of the vertical line, a woman is elected, and on the left-hand side, a man is elected. High-skilled occupation = law, academia, business, executives engineer, health and politics. High position = president/vice-president/secretary/quaestor of the Lower House, head of political group, head of parliamentary commission.

Table A.2: RDD - Alternative specifications and bandwidths

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Spec.	OLS	OLS	OLS	OLS	OLS	OLS	OLS	Poisson	Poisson	Poisson
Kernel		Uniform	Uniform	Uniform	Triangular	Triangular	Triangular	Uniform	Uniform	Uniform
Bandwidth		mserd	mserd	55-45	mserd	mserd	55-45	mserd	mserd	55-45
Panel A: Reports										
Female parl.	0.0382 (0.063)	0.141 (0.203)	0.229 (0.175)	0.347* (0.186)	0.181 (0.187)	0.276** (0.159)	0.278* (0.162)	0.201 (0.230)	0.425 (0.262)	0.457 (0.377)
<i>N</i>	2948	334	334	208	384	384	208	334	334	208
Panel B: Bills										
Female parl.	-0.191* (0.081)	-0.260 (0.229)	-0.016 (0.241)	-0.369 (0.284)	-0.244 (0.240)	-0.088 (0.209)	-0.154 (0.244)	-0.351* (0.206)	-0.243 (0.231)	-0.662 (0.440)
<i>N</i>	2948	356	356	208	547	547	208	547	547	208
Panel C: Amendments										
Female parl.	-6.863 (5.012)	-21.304 (21.671)	-12.972 (15.591)	9.860 (19.239)	-14.404 (19.968)	-5.789 (15.748)	18.645 (20.447)			
<i>N</i>	1478	269	269	170	294	294	170			
Panel D: Questions										
Female parl.	-0.081 (0.089)	-0.005 (0.265)	-0.225 (0.243)	0.154 (0.266)	-0.108 (0.278)	-0.104 (0.225)	0.386 (0.264)			
<i>N</i>	2948	337	337	208	434	434	208			
Panel E: Interventions										
Female parl.	-5.600 (4.541)	-0.767 (14.031)	-8.863 (12.618)	-4.778 (13.768)	4.345 (13.398)	-6.269 (10.534)	19.23 (13.803)			
<i>N</i>	2948	258	258	207	438	438	207			
Controls:	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Constituency f.e.	Yes	No	No	No	No	No	No	No	No	No

Note: Standard errors in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We restrict the sample to parliamentarians with full terms only. The information about amendments is not available before 2002. For all outcomes, the unit is the yearly activity. In columns 2, 3, 5, 6, 8 and 9, we apply one common Mean Square Error optimal bandwidth. In columns 4, 7 and 10, we consider a close election if the gap in vote shares at the second round of the election is less than 10 points. In columns 5, 6 and 7, we apply a triangular kernel, in the other columns, the kernel is uniform

B Activity - Supplementary results

Table B.1: Effect of the parliamentarian's gender on presence and voting turnout

	(1)	(2)	(3)
	Pooled	Pooled	Fixed-effects
Panel A: Number of meetings (mean = 8.9)			
Female parl.	-0.09 (1.215)	-1.770 (1.251)	
<i>N</i>	559	559	
Panel B: Presence in plenary sessions (in weeks) (mean = 143)			
Female parl.	1.243 (1.896)	-1.196 (1.784)	5.728** (2.645)
<i>N</i>	1473	1473	1473
Panel C: Presence in parliamentary commissions (in weeks) (mean = 241)			
Female parl.	10.93* (6.175)	1.450 (5.900)	19.71** (8.197)
<i>N</i>	1473	1473	1473
Panel D: Voting turnout (mean = 19%)			
Female parl.	0.033*** (0.005)	0.018*** (0.005)	0.021*** (0.008)
<i>N</i>	931	931	931
Spec	OLS	OLS	OLS
Controls:			
Term f.e.	Yes	Yes	Yes
Experience	No	Yes	Yes
Political	No	Yes	Yes
Commission	No	Yes	Yes
Occupation	No	Yes	Yes
Constituency f.e.	No	No	Yes

Note: Standard errors (clustered at the constituency level) in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We restrict the sample to parliamentarians with full terms only. The information about presence is available between 2007 and 2022. The information about presence is available between 2012 and 2022.

Table B.2: Effect of the parliamentarian's gender on activity (ranks)

	(1)	(2)	(3)	(4)	(5)
	Reports	Bills	Amendments	Questions	Interventions
Female parl.	0.0401**	-0.00944	-0.0151	0.0262	0.0133
	(0.020)	(0.017)	(0.020)	(0.018)	(0.017)
<i>N</i>	2944	2944	1977	2944	2944
Controls:					
Term f.e.	Yes	Yes	Yes	Yes	Yes
Experience	Yes	Yes	Yes	Yes	Yes
Political	Yes	Yes	Yes	Yes	Yes
Commission	Yes	Yes	Yes	Yes	Yes
Occupation	Yes	Yes	Yes	Yes	Yes
Constituency f.e.	Yes	Yes	Yes	Yes	Yes

Note: Standard errors (clustered at the constituency level) in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We restrict the sample to parliamentarians with full terms only. The information about amendments is not available before 2002.

C Effectiveness - Supplementary results

Table B.3: Effect of the parliamentarian's gender on activity (alternative specifications)

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	Poisson	Poisson	Neg. binomial	Neg. binomial
		Fixed-effects		Fixed-effects		Fixed-effects
Panel A: Reports						
Female parl.	-0.004 (0.064)	0.019 (0.073)	-0.007 (0.071)	0.049 (0.088)	0.006 (0.072)	0.054 (0.077)
<i>N</i>	2944	2944	2944	2913	2944	2913
Panel B: Bills						
Female parl.	-0.172** (0.082)	-0.223*** (0.086)	-0.210** (0.100)	-0.365*** (0.107)	-0.207** (0.091)	-0.263*** (0.094)
<i>N</i>	2944	2944	2944	2896	2944	2896
Panel C: Amendments						
Female parl.	-6.826 (5.723)	-4.009 (8.066)	-0.144* (0.085)	-0.0791 (0.110)	-0.170** (0.077)	0.0428 (0.063)
<i>N</i>	1977	1977	1977	1938	1977	1938
Controls:						
Term f.e.	Yes	Yes	Yes	Yes	Yes	Yes
Experience	Yes	Yes	Yes	Yes	Yes	Yes
Political	Yes	Yes	Yes	Yes	Yes	Yes
Commission	Yes	Yes	Yes	Yes	Yes	Yes
Occupation	Yes	Yes	Yes	Yes	Yes	Yes
Constituency f.e.	No	Yes	No	Yes	No	Yes

Note: Standard errors (clustered at the constituency level) in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We restrict the sample to parliamentarians with full terms only. The information about amendments is not available before 2002. For all outcomes, the unit is the yearly activity.

Table B.4: Effect of the parliamentarian's gender on activity - Potential mechanisms

	(1)	(2)	(3)	(4)	(5)
	Reports	Bills	Amendments	Questions	Interventions
Panel A: First election before/after quotas (2002)					
Male × After quotas	Ref.	Ref.	Ref.	Ref.	Ref.
Male × Before quotas	-0.0515 (0.133)	-0.167 (0.174)	6.434 (14.758)	0.0311 (0.143)	6.777 (9.359)
Female × After quotas	0.0299 (0.090)	-0.375*** (0.129)	-6.104 (8.533)	0.0109 (0.100)	-9.679 (8.383)
Female × Before quotas	0.0932 (0.252)	-0.544* (0.287)	30.40 (21.104)	0.463* (0.250)	6.816 (12.885)
Panel B: % of women in the political group					
Male × High % of women	Ref.	Ref.	Ref.	Ref.	Ref.
Male × Low % of women	0.208* (0.106)	0.790*** (0.124)	5.978 (18.068)	0.481*** (0.151)	38.05*** (9.397)
Female × High % of women	0.0927 (0.111)	-0.291* (0.164)	-11.23 (7.608)	0.0347 (0.115)	-14.27 (9.256)
Female × Low % of women	0.180 (0.170)	0.372** (0.147)	16.44 (27.118)	0.684*** (0.187)	42.50*** (14.181)
Panel C: Majority group					
Male × Opposition	Ref.	Ref.	Ref.	Ref.	Ref.
Male × Majority	0.699*** (0.080)	-0.808*** (0.130)	-66.84*** (9.032)	-0.918*** (0.094)	-26.72*** (8.544)
Female × Opposition	0.391** (0.168)	-0.186 (0.140)	19.27 (16.953)	0.286 (0.176)	9.815 (14.033)
Female × Majority	0.631*** (0.111)	-1.370*** (0.164)	-81.90*** (11.218)	-0.941*** (0.125)	-44.43*** (10.856)
Controls:					
Term f.e.	Yes	Yes	Yes	Yes	Yes
Experience	Yes	Yes	Yes	Yes	Yes
Political	Yes	Yes	Yes	Yes	Yes
Commission	Yes	Yes	Yes	Yes	Yes
Occupation	Yes	Yes	Yes	Yes	Yes
Constituency f.e.	Yes	Yes	Yes	Yes	Yes
<i>N</i>	2913	2896	1977	2944	2944

Note: Standard errors (clustered at the constituency level) in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We restrict the sample to parliamentarians with full terms only. The information about amendments is not available before 2002. For all outcomes, the unit is the yearly activity. In panel B, to account for the growing representation of women, we analyze each term independently. We define a political group as having a "low % of women" if the proportion of women within the group is below the average representation of women in parliament during the current term.

Table B.5: Effect of the parliamentarian's gender on activity over time

	(1)	(2)	(3)	(4)	(5)
	Reports	Bills	Amendments	Questions	Interventions
Male × 1993	Ref.	Ref.	na	Ref.	Ref.
Male × 1997	-0.136 (0.105)	-0.492*** (0.116)	na	-0.389*** (0.090)	-14.11*** (4.170)
Male × 2002	-0.250** (0.126)	-0.705*** (0.136)	Ref.	-1.061*** (0.132)	-36.11*** (7.450)
Male × 2007	-0.108 (0.130)	-0.483*** (0.143)	50.43*** (6.487)	-0.492*** (0.135)	16.82* (8.815)
Male × 2012	0.168 (0.116)	-0.324* (0.183)	91.06*** (8.963)	0.131 (0.122)	37.03*** (7.387)
Male × 2017	0.497*** (0.108)	0.136 (0.141)	184.8*** (15.960)	0.384*** (0.127)	83.34*** (10.422)
Female × 1993	0.265 (0.422)	-0.745** (0.367)	na	0.173 (0.358)	-1.430 (9.465)
Female × 1997	0.133 (0.319)	-1.028*** (0.300)	na	-0.0399 (0.267)	-19.38 (16.721)
Female × 2002	-0.442** (0.192)	-0.891*** (0.259)	-0.528 (11.063)	-0.954*** (0.221)	-35.35*** (12.257)
Female × 2007	0.298 (0.261)	-0.437 (0.293)	35.66*** (11.079)	-0.665*** (0.209)	22.96 (18.748)
Female × 2012	0.165 (0.196)	-0.803*** (0.207)	90.39*** (10.649)	0.421** (0.162)	43.41*** (12.834)
Female × 2017	0.456*** (0.125)	-0.289* (0.162)	181.5*** (20.287)	0.361** (0.140)	54.05*** (11.148)
<i>Male</i> ₁₉₉₃ ≠ <i>Female</i> ₁₉₉₃	ns	ns		ns	ns
<i>Male</i> ₁₉₉₇ ≠ <i>Female</i> ₁₉₉₇	ns	*		**	ns
<i>Male</i> ₂₀₀₂ ≠ <i>Female</i> ₂₀₀₂	ns	ns	ns	ns	ns
<i>Male</i> ₂₀₀₇ ≠ <i>Female</i> ₂₀₀₇	**	ns	*	ns	ns
<i>Male</i> ₂₀₁₂ ≠ <i>Female</i> ₂₀₁₂	ns	***	ns	*	ns
<i>Male</i> ₂₀₁₇ ≠ <i>Female</i> ₂₀₁₇	ns	***	ns	ns	***
<i>N</i>	2913	2896	1977	2944	2944
Controls:					
Term f.e.	Yes	Yes	Yes	Yes	Yes
Experience	Yes	Yes	Yes	Yes	Yes
Political	Yes	Yes	Yes	Yes	Yes
Commission	Yes	Yes	Yes	Yes	Yes
Occupation	Yes	Yes	Yes	Yes	Yes
Constituency f.e.	Yes	Yes	Yes	Yes	Yes

Note: Standard errors (clustered at the constituency level) in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We restrict the sample to parliamentarians with full terms only. The information about amendments is not available before 2002. For all outcomes, the unit is the yearly activity. ns = non statistically significant

Table C.1: Effect of the parliamentarian's gender on the selection of bills subject to a vote

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Selected (=1)	Selected (=1)	Number	Number	Number	Share	Share	Share
	All	All	All	RDD	All	All	RDD	All
Female parl.	-0.195 (0.171) [-0.032]		-0.029 (0.021)	0.044 (0.036)		-0.024 (0.033)	0.009 (0.088)	
Male × Opposition		Ref.			Ref.			Ref.
Male × Majority		-0.201 (0.204)			0.095** (0.101)			0.074** (0.029)
Female × Opposition		-0.384 (0.232)			0.018 (0.060)			-0.079* (0.040)
Female × Majority		-0.216 (0.261)			0.034 (0.077)			0.087* (0.044)
<i>N</i>	1296	1296	1296	329	1296	1296	310	1296
Controls:								
Term f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Experience	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Political	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Commission	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Occupation	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constituency f.e.	No	No	Yes	No	Yes	Yes	No	Yes

Note: Standard errors (clustered at the constituency level) in parentheses and marginal effect in brackets; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We restrict the sample to parliamentarians with full terms only. In columns 1 and 2, the dependent variable is a dummy variable equal to 1 if at least one bill has been selected to be put to a vote.

Table C.2: Effectiveness of amendments after excluding the most active parliamentarians

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Passed (=1)	Passed (=1)	Number	Number	Number	Share	Share	Share
	All	All	All	RDD	All	All	RDD	All
Female parl.	0.396*		0.886	1.517		0.041**	0.077***	
	(0.2010)		(1.392)	(1.289)		(0.018)	(0.038)	
	[0.039]							
Male × Opposition		Ref.			Ref.			Ref.
Male × Majority		0.844***			10.04***			0.272***
		(0.228)			(1.249)			(0.017)
Female × Opposition		0.786***			4.688***			0.0647**
		(0.306)			(1.458)			(0.026)
Female × Majority		0.946***			9.291***			0.302***
		(0.290)			(1.957)			(0.022)
<i>N</i>	1689	1689	1689	338	1689	1689	306	1689
Controls:								
Term f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Experience	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Political	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Political	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Commission	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Occupation	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Constituency f.e.	No	No	Yes	No	Yes	Yes	No	Yes

Note: Standard errors (clustered at the constituency level) in parentheses and marginal effect in brackets; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We restrict the sample to parliamentarians with full terms only and we exclude the top 5% of parliamentarians who authored the most amendments each term. The information about effectiveness is not available before 2002. In columns 1 and 2, the dependent variable is a dummy variable equal to 1 if at least one amendment passed. In columns 4 and 7, the RDD is estimated using MSE-optimal bandwidth with a triangular kernel.

Table C.3: Effect of the parliamentarian's gender on the type of amendments

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Bills with most amendments			Inadmissible amendments			Non-defended amendments			Non-sponsored amendments		
Female parl.	-36.93 (44.055)	-27.11 (37.671)		-2.103 (2.375)	-1.236 (2.043)		-5.792** (2.906)	-2.844 (2.742)		-0.798*** (0.240)	-0.653** (0.257)	
Male × Opposition			Ref.			Ref.			Ref.			Ref.
Male × Majority			-251.5*** (57.231)			-17.95*** (3.677)			-22.99*** (3.761)			0.416 (0.315)
Female × Opposition			-37.22 (78.620)			0.774 (3.539)			2.651 (6.545)			-0.497 (0.360)
Female × Majority			-273.9*** (59.074)			-20.14*** (3.823)			-28.05*** (4.139)			-0.323 (0.394)
<i>N</i>	886	886	886	496	496	496	983	983	983	1284	1284	1284
Controls:												
Term f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Experience	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Political	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Commission	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Occupation	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Constituency f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Standard errors (clustered at the constituency level) in parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We restrict the sample to parliamentarians with full terms only, to the terms for which the information is available (2002-2017 for non-supported amendments 2012-2022 for bills with most amendments and non-defended amendments and 2017-2022 for inadmissible amendments) and to active parliamentarians (who have authored at least one amendment). The unit is the yearly number of amendments.