Biased Party Nominations as a Source of Women's Electoral Underperformance *

Thomas Fujiwara[†] Hanno Hilbig[‡] Pia Raffler[§]

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Abstract

What accounts for differences in electoral success between male and female candidates? We argue that parties systematically nominate female candidates to districts where the party is less popular, making it harder for women to get elected. Our empirical strategy uses the German mixed electoral system to create counterfactual gender vote gaps. These gaps represent the scenario where male and female candidates are nominated in districts where their respective parties have equal popularity. Using data on all candidates for the German Bundestag across eleven elections, we document that female underperformance, and its variation across parties and election years, is explained almost entirely by women running in districts where their party is less popular. In contrast, we find no evidence that voter bias or candidate characteristics play a substantial role. Our argument highlights gendered party gatekeeping that increases in district strength as an important driver of female underrepresentation.

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[†]Department of Economics and SPIA, Princeton University, fujiwara@princeton.edu

[‡]Department of Political Science, University of California, Davis, hhilbig@ucdavis.edu

[§]Department of Government, Harvard University, praffler@gov.harvard.edu

1 Introduction

Around the world, women are underrepresented in politics. In 2023, only 26% of national parliament members worldwide were female. In Europe, this figure is only 31% (Inter-Parliamentary Union, 2023*b*). This matters for substantive representation. In multiple contexts, female politicians advocate for different policies than their male counterparts (e.g., Betz, Fortunato and O'Brien, 2023; Brulé, 2020; Chattopadhyay and Duflo, 2004; Clayton and Zetterberg, 2018). Female underrepresentation also matters for citizen-state interactions, as more equitable representation can increase trust in government (e.g., Clayton, O'Brien and Piscopo, 2019). Importantly, it is more pronounced in pluralitarian or majoritarian systems with single-member districts, where voters cast their vote for specific candidates, compared to proportional representation, where voters cast their vote for party lists, as documented by a large literature surveyed by Wängnerud (2009). In 2022, only 22% of members of the national Parliaments in pluralitarian or majoritarian systems worldwide were women, compared to 29% in countries with proportional representation or mixed systems (Inter-Parliamentary Union, 2023*a*).

Why are fewer women elected in single-member districts? One potential explanation is direct discrimination by voters. Despite salient public debates about the "electability" of women, empirical evidence for gender discrimination by voters is scant. In the 1960s and 70s, men often received more votes than women in established democracies (Darcy and Schramm, 1977; Kelley and McAllister, 1984). However, recent work suggests that in many countries voters no longer discriminate based on gender (Brooks, 2013; Dolan, 2004; Hayes, Lawless and Baitinger, 2014; Schwarz and Coppock, 2022; Teele, Kalla and Rosenbluth, 2018). A second explanation is that gender is correlated with other characteristics valued by voters, such as experience in office (Palmer and Simon, 2010; Schwindt-Bayer, 2005). *If* male candidates had, on average, more of these desirable attributes, female candidates may receive fewer votes, but not *because* they are women. However, recent research shows that

female candidates tend to be, if anything, *more* qualified and skilled (Anzia and Berry, 2011; Besley et al., 2017).

In this paper, we propose, test, and quantify the role of a third explanation for female electoral underperformance. Building on prior research on gender and candidate nominations (Butler and Preece, 2016; Hennings and Urbatsch, 2015; Cheng and Tavits, 2011), we focus on the behavior of political parties. We argue that an underappreciated driver of underrepresentation is the systematic nomination of female candidates in "tougher" districts – electoral districts where the party of the candidate is less popular. Since party labels serve as important cues to voters (Cox, 1986; Rahn, 1993), single-member district candidates nominated in places where their party is less popular face an uphill battle (Stokes, 1962). We posit that recruitment practices by male-dominated local party networks (Fox and Lawless, 2010) result in the nomination of female candidates in districts that are harder to win.[1]

Importantly, we do not argue that gender-biased party nominations are the sole reason for female underrepresentation. Rather, we propose them as an important and underappreciated explanation that is complementary to others. For example, if women are cognizant that they are likely to be nominated to tougher districts, they may be discouraged from entering politics in the first place.

We study the German federal parliament (the *Bundestag*). Despite relatively equitable gender attitudes among voters,[2] only 26% of members of parliament (MPs) elected via single-member districts in 2021 were women. We exploit a feature of Germany's mixed electoral system to disentangle whether women's electoral underperformance is due to voter or party behavior. Each German voter simultaneously casts two votes for the *Bundestag*: one for the representative of their single-member district, who is elected by plurality rule ("candidate vote"); and one for a party list under closed-list proportional representation ("party vote").

[1] A fourth possible explanation may be that women are less likely to be on the ballot in the first place. We bracket this explanation since we focus on electoral success, conditional on running.

[2] A 2020 survey indicates 90% of Germans consider gender equality a "very important" issue (Menasce Horowitz and Fetterlof, 2020).

The party vote allows us to separate the district-level popularity of a given party from the popularity of the specific candidate the party fields in that district. Moreover, the two votes allow us to evaluate whether, on average, voters deviate from their party preference when the candidate who runs for their preferred party is female. We are thus able to quantify how much of the difference in average vote shares between male and female candidates (henceforth the "gender vote gap") is driven by parties systematically nominating female candidates to run in districts where the party itself is less popular.

We implement a version of the Kitagawa-Oaxaca-Blinder decomposition, a method commonly used in labor economics to study mean outcome differences between groups (Kitagawa, 1955; Oaxaca, 1973; Blinder, 1973; Dancygier et al., 2015). This decomposition allows us to construct counterfactual gender vote gaps that would have occurred if male and female candidates were, on average, nominated to run in districts where their parties are equally popular (a "party nominations component"). Moreover, the decomposition allows us to disentangle the nomination mechanism from (i) voters discriminating against female candidates or (ii) voters valuing characteristics more commonly found in male candidates.

Applying our method to a panel of election results covering 15,988 candidates from six parties across all districts in eleven federal elections between 1983 and 2021, we find that parties' nomination behavior is the main driver of the gender vote gap. Female candidates from the two historically largest parties, the Christian Democratic Union/Christian Social Union alliance (CDU/CSU) and the Social Democratic Party (SPD), receive fewer votes than their male counterparts because they are systematically nominated to run in districts where their party is less popular. We further show that this translates to women having substantially smaller probabilities of being elected.

Notably, party nomination behavior is not merely a partial driver of the relative gender gap. For both parties, we find that the *entire* gender vote gap can be explained by differences in party popularity between districts where male and female candidates are nominated. We

do not find any evidence of voters discriminating against female candidates. Moreover, party nominations not only explain the overall gender vote gap but also explain its variation over time, as well as between the six parties we study. For example, a larger gender vote gap in the CDU/CSU than in the SPD can be explained by the former being more likely to nominate women to districts that put them at a disadvantage. For both parties, we observe a trend of closing gender vote gaps over time, which again is explained by changing nomination patterns.

We explore several alternative explanations for our results. Our results are not explained by incumbency effects (a path dependency mechanism due to men being more likely to be incumbents in safe districts) since our conclusions remain the same when restricting the sample to open seats. They are also not driven by gender differences in candidate characteristics. Adding a rich set of covariates from candidate surveys to our decomposition does not change our main results. We further discuss and test five additional alternative explanations: strategic voting, parties anticipating voter preferences, parties viewing male candidates as more competitive, bias against outsiders *per se*, and unequal aspirant entry. Based on direct tests and secondary evidence, we conclude that these alternative explanations are unlikely to drive our findings.

To probe the mechanisms underlying the decomposition results, we present additional descriptive evidence. Our results are best explained by party elites engaging in taste-based discrimination that favors men, likely due to them being overwhelmingly male and exhibiting homophilic behavior. Using data on important local officials as a plausible proxy for the composition of local gatekeepers, we find that both gender vote gaps and nominating women to weak districts are less prevalent in areas where female representation among local gatekeepers is higher. We find no evidence that concerns about women's electability are driving the biased nomination patterns. If this were the case, women should be least likely to be nominated in competitive districts, while in safe districts (where the party expects to win by large margins), concerns about electability should be less relevant. Instead, we find

that women are *least* likely to be nominated to safe districts. The CDU/CSU and SPD are most gender-balanced when nominating for seats they are likely to lose and thus have little at stake. These descriptive results also serve as non-parametric complements (robustness checks) to the decompositions.

Our paper contributes to the literature on the underrepresentation of women and minorities on four fronts. First, we draw attention to an understudied explanation for female underrepresentation: their nomination in districts that are tougher to win because party popularity is lower. This argument complements literature on gendered differences in political ambition, candidate recruitment, and the decision to run for office (Preece and Stoddard, 2015; Kanthak and Woon, 2015; Cheng and Tavits, 2011) that emphasized the role of differences in political interest, aversion to conflict, or support from party leaders in creating fewer female candidates (Butler and Preece, 2016; Fox and Lawless, 2014, 2010). We show that *even* if i) voters do not discriminate and ii) women and men run for office in similar numbers, female under-representation may nevertheless persist due to party decisions that create differences in the *type of district* where women are nominated. Moreover, the mechanism we highlight offers a potential explanation for female underrepresentation in the candidate *pool* (Hennings and Urbatsch, 2015): if female aspirants realize they are more likely to be nominated in constituencies where their chances of winning are slim, this may discourage them from running for office at the outset.

Second, we implement a new method to empirically assess the contribution of party nominations to the gender vote gap. Our paper is the first to employ a decomposition analysis that not only allows us to test the presence of the mechanism but to *quantify* its role by decomposing gender vote gaps into a component due to biased party nominations and another component due to voter behavior. While such decompositions are workhorses in labor economics, to our knowledge the only other paper using similar methods to study election outcomes is Dancygier et al. (2015), who study the representation of Swedish immigrants. Our empirical strategy relies on German voters simultaneously casting votes for their pre-

ferred party *and* their preferred candidate, allowing us to measure district-level candidate support separately from party support, which is typically not possible in settings where voters cast only one vote.

Third, our results confirm and expand insights from recent survey experiments and meta-analyses (Brooks, 2013; Hayes, Lawless and Baitinger, 2014; Schwarz and Coppock, 2022; Teele, Kalla and Rosenbluth, 2018) suggesting a small role for discrimination against women by voters. By using observational data from "real" elections, we add evidence on the external validity of this experimental literature (see also Riaz et al., 2023). Moreover, our data covers multiple decades, allowing us to provide evidence on the dynamics of female electoral success over time, rather than only snapshots. Going beyond prior findings that demonstrate that voters are *currently* unbiased against women, we provide evidence that party (rather than voter) behavior explains female underperformance at the ballot box *over the course of four decades*.

Fourth, our findings can guide policymakers seeking to increase female representation in two ways. First, they suggest that efforts targeting party gatekeepers that control nomination procedures – or finding other ways of getting women on the ballot in districts where their parties are relatively popular – may be more productive than those targeting voters' attitudes, beliefs, or preferences. Second, it suggests that concerns about female electability are overstated: once men and women run in similar districts, the gender vote gap is close to zero.

2 Theory

We argue that an important explanation for differences in electoral success between female and male candidates in single-member districts is that parties act as gatekeepers and nominate women in constituencies where their party has fewer supporters. We contrast this to

two explanations that have received attention in the literature. First, voters may discriminate against female candidates, all else equal. Second, it is possible that all else is not equal, and that being a female candidate is correlated with other characteristics which voters value differently, such as experience in office or occupation. Of course, these three mechanisms are not mutually exclusive and may well complement or offset each other.

A common explanation for female underperformance at the ballot box is discrimination by voters. Prior research has emphasized the presence of gender stereotypes (Huddy and Terkildsen, 1993; Lawless, 2004; Sanbonmatsu, 2002; Stout and Kline, 2011), in particular when activated by campaigns (Bauer, 2015). The observable implication would be that, in contexts where attributes associated with males are considered desirable by voters, a female candidate receives fewer votes than if she were male. Recent survey experiments and meta-analyses, however, either find no evidence of gender bias in the evaluation of candidates (Brooks, 2013; Hayes, Lawless and Baitinger, 2014) or find an advantage of female candidates (Schwarz and Coppock, 2022; Teele, Kalla and Rosenbluth, 2018). We also find no empirical support for this explanation.

Another explanation is that candidate gender may be correlated with candidate characteristics that affect vote choice (Geys and Mause, 2014). For example, male candidates may be more visible (Reeves and Smith, 2019), have longer tenure in office, or be more likely to be the incumbent (Palmer and Simon, 2010; Schwindt-Bayer, 2005). As such, female candidates may not perform worse *because* they are women, but because they may lack attributes voters value. Of course, part of this phenomenon can be thought of as path dependency: men may be more successful in the present because they have been more successful in the past (Darcy and Choike, 1986). Such path dependency may be offset by higher qualifications of female candidates. Indeed, recent research shows that female candidates tend to be *more* qualified and skilled (Anzia and Berry, 2011; Besley et al., 2017), a finding that rhymes with ours.

We propose a third explanation for the gender vote gap: parties nominate female can-

didates in districts where their party is less popular. Since party strength and the electoral success of SMD candidates tend to be highly correlated, this would lead to the underperformance of female candidates.

Our proposed explanation could be due to three mechanisms. First, party elites may themselves engage in taste-based discrimination and be biased in favor of men. This could arise if party elites are overwhelmingly male and exhibit homophilic behavior (i.e., men being biased in favor of other men). Indeed, predominantly male gatekeepers have been argued to disadvantage female aspirants in the United States (Niven, 1998; Fox and Lawless, 2010; Sanbonmatsu, 2006), Canada (Cheng and Tavits, 2011), the UK (Rasmussen, 1981), and Turkey (**?**). We build on this literature and argue that such biased gatekeeping increases with the desirability of a nomination. If such homophily mechanism plays a key role, we would expect districts with more male gatekeepers to be more likely to engage in the biased nomination behavior we propose.

A second mechanism involves party elites (mistakenly) thinking that voters are biased against female candidates, thus nominating men in the expectation that they will perform better. Bateson (2020) calls this phenomenon "strategic discrimination" – withholding support from a candidate due to a belief that *others* will discriminate against them. Thus, women may be less likely to be nominated in competitive districts in the absence of taste-based discrimination by gatekeepers.

Note these two mechanisms imply different patterns in the data. If lower perceived electability of female candidates is the issue, we should observe more male candidates in *close* races, but not in *safe* districts where candidate identity is unlikely to affect results. If taste-based discrimination is at play, we should instead observe more male candidates in safe districts than in competitive or sure-loss districts.

Third, nomination patterns may be due to differential candidate emergence. If women are less politically ambitious (Lawless and Fox, 2005) and less willing to enter competitive

elections (Kanthak and Woon, 2015; Preece and Stoddard, 2015), and pre-election races become more competitive as the chances of winning the actual race increase, then party elites may simply have fewer or even no women to choose from in competitive and safe districts. In this case, we would also expect to see more male candidates in competitive and safe districts, compared to sure loss districts. However, this logic is unlikely to apply in contexts where local party elites are effectively kingmakers and either formally or informally appoint candidates (Sanbonmatsu, 2006) and/or can shape the nature of the nomination process. Then, if local party elites wanted to nominate or significantly bolster candidates from underrepresented groups, they could do so.

Lastly, note that the three explanations of voter discrimination, candidate characteristics, and nomination patterns by parties may offset each other – e.g., perhaps voters are biased against women *and* women are more qualified, thus yielding similar vote shares as men (Ashworth, Berry and Bueno de Mesquita, 2024; Fulton, 2012).

Differentiating between these explanations is typically hampered by our inability to observe the counterfactuals, i.e. whether voters would have voted for a candidate if she were of a different gender and whether politicians would have appointed a candidate to a given district if she were male. As we discuss in the next section, we take advantage of the mixed electoral system in Germany to overcome these challenges.

3 Electoral Rules and Candidate Selection in Germany

This section discusses the main institutional features of German elections that inform our analysis. Beyond its electoral rules providing a key ingredient to our decomposition, Germany constitutes an interesting context to explore our argument since there is substantial variation in gender vote gaps across parties and over the years.

Electoral Rules. Germany is one of 32 countries worldwide with a mixed electoral sys-

tem. On Election Day, each voter simultaneously casts two separate votes to elect members of parliament (MP). The first is the *candidate vote* (Erststimme) in a first-past-the-post election in single-member districts (Wahlkreise), similar to the US House of Representatives. Each party fields at most one candidate per district, and the most-voted candidate in each district becomes an MP. The second is the *party vote* (Zweitstimme), which is cast to a party in a closed-list proportional representation system: the number of party members elected to the Bundestag is roughly proportional to their vote share. At least half of the Bundestag is elected via the party vote.[3] Appendix A provides further information on the German electoral system.

Advantages of the German Context for the Decomposition. A core challenge in studying the relative performance of female candidates is that we cannot observe counterfactuals. The German mixed electoral system allows us to address this issue since it simultaneously elicits two votes from each citizen. Moreover, it does so on the same Election Day and for the same elected office.[4] Our empirical strategy employs the party vote as a measure of party preferences. If voters deviate from their party vote when casting their votes for a specific candidate, they express their preference for the candidate. Vote splitting could be motivated by specific candidate characteristics, such as candidate gender, or by strategic voting (Spenkuch, 2018). Compared to pure proportional or pure single-member district systems, the German case allows us to disentangle voter preferences for parties from voter preferences for candidates.

Moreover, ticket-splitting is widespread in *Bundestag* elections. Estimates suggest that roughly 40% of German voters may split their tickets, with percentages that are close to 15% for those voting for the CDU/CSU and SPD party lists and over 50% for those choosing the

[3]The exact number of MPs elected to the Bundestag varies from one year to year, given the possibility of overhang and/or balance mandates that increase the number of MPs elected via the party vote (Appendix A).

[4]Figure A1 presents an example of a ballot used in the election.

list of smaller parties.[5]

Party Nominations and Candidate Selection Procedures. One of the stated goals of German election law is the decentralization of single-member district (SMD) candidate selection, with selection decisions taking place at the local level. German electoral law stipulates that their selection should occur at the local level "in a sufficiently democratic manner." SMD candidates are selected by district party chapters—either through an election where all members of the local party branch vote (member convention), or through an election by delegates who were themselves elected by party members (party delegation). SMD candidates reside in the districts where they run (Davidson-Schmich, 2016). Prior work has argued that central party organs have little formal or informal influence on SMD candidate selection and nominations are a function of local party preferences (Detterbeck, 2016). At the same time, central party leaderships increasingly pay attention to gender balance. Some parties have introduced gender quotas for the party leadership and candidates on party lists (see Appendix A for more details).

SMD candidate selection procedures are not as democratic as the election law stipulates. District party elites command considerable influence over who gets selected, and pre-convention campaigning often results in uncontested conventions (Detterbeck, 2016). The nomination process for district candidates has been described as "decentralized oligarchy" (von Beyme, 2000), in which influential members effectively select candidates, not rarely from among themselves (Weege, 2003). Similarly, Detterbeck (2016) names "public office holders from that area" (p. 843) as important players in the informal selection stage, and argues that these local party elites often try to use their connections and influence to unite delegates and party members behind their preferred candidate. Conventions are particularly noncompetitive for incumbents. Reiser (2011) shows that in 2009, over 90% of all races for incumbent CSU/CSU and SPD candidates seeking reelection were uncontested. For districts

[5]This pattern is consistent with strategic voting (Section 9). Estimates of the extent of split-ticket voting are both from voter surveys and official reports by the Federal Returning Officer (Spenkuch, 2018; Gschwend, Johnston and Pattie, 2003)

where the incumbent did not run again, more than half were uncontested. The consensus among scholars working on candidate selection in Germany is that this absence of competition is indicative of informal selection processes that occur before the nomination convention (Detterbeck, 2016; Reiser, 2011). Thus aspiring candidates without elite support often drop out before the convention, either because they are explicitly discouraged from running or because they realize their chances of nomination are slim.

Historically, delegate conventions, where only a small group of local party elites decides on the party's candidate, were by far the most common selection method (Detterbeck, 2016). In recent years, more candidates have been selected via member conventions, where all party members in a district get to cast a secret vote (Schüttemeyer and Sturm, 2005). Given the latter involves, at least nominally, a larger selectorate, this may appear as a movement towards a more inclusive and democratic approach. However, Reiser (2011) suggests that member conventions are not more competitive than delegate conventions, in part because local party elites influence the outcome of the selection convention.

Local party politics is still a male domain in Germany, especially in the center-right parties. While male and female party members report being about equally engaged in the lead-up to candidate selection (Höhne, 2020), women constitute the minority of members across all parties. Left of center, the share of female party members ranges from 40% for the Greens, over 36% for the Left, to 32% for the SPD. Right of center, it ranges from 26% for the CDU, 22% for the FDP, 20% for the CSU, to 17% for the AfD. All figures are from 2017 by Höhne (2020), who also shows female party membership across parties is increasing very slowly (Höhne, 2020).

4 Data

We use official electoral results provided by the Federal Returning Office for the eleven most recent federal elections in Germany (1983–2021), combined with data on gender and party affiliation of all candidates.[6]

The Federal Returning Officer also maintains a list of all candidates which includes information on candidate gender, age, and occupation, which we link to electoral results. We limit the sample to candidates of the six largest German parties during the period: the center-right Christian Democratic Union and its Bavarian sister party, the Christian Social Union (CDU/CSU), the center-left Social Democrats (SPD), the Green Party, the Left Party, the classical liberal FDP and the radical-right AfD.[7] In 2021, these six parties together obtained 91.3 percent of the party vote.

Our main sample includes 15,988 observations (district-party-year combinations, which map one-to-one to SMD candidate-party-years), of which 25% involve a female SMD candidate. Figures A1 and A2 provide summary statistics.

We complement our data with two additional data sets. First, the German Longitudinal Election Study (GLES) collected before the 2009, 2013, and 2017 elections provides additional background information for a subset of candidates that completed the survey. This provides us with data on candidates' highest educational attainment, employment and marital status, years of party membership, left-right political self-placement, campaign budget, and seven variables related to previous political activities. Appendix D provides further information. We employ this data for robustness checks testing whether differences in back-

[6]Data available athttps://www.bundeswahlleiter.de/en/. The 1980 election is the first election with available data. Since some of our analyses rely on lagged variables, for consistency we use 1983 as the first election in our data throughout the paper. The number of electoral districts changes over time in our sample (starting from 248, increasing to 328 in 1990 after reunification, then reducing to 299 in 2002 after a redistricting reform). Note that our main analysis does not require a panel of geographic units that are constant over time.

[7]The Left enters our sample post-reunification (1990) and the AfD first competed in 2013.

ground characteristics beyond what is measured in our main dataset can explain the gender vote gap. Second, we use data from Eder and Fortin-Rittberger (2017) on the composition of local (city and county) assemblies for 2002–2013. It provides us with a proxy for the gender composition of party gatekeepers that informs a test of our proposed mechanism in Section 8. Appendix E provides further information.

5 The Gender Vote Gap in Germany

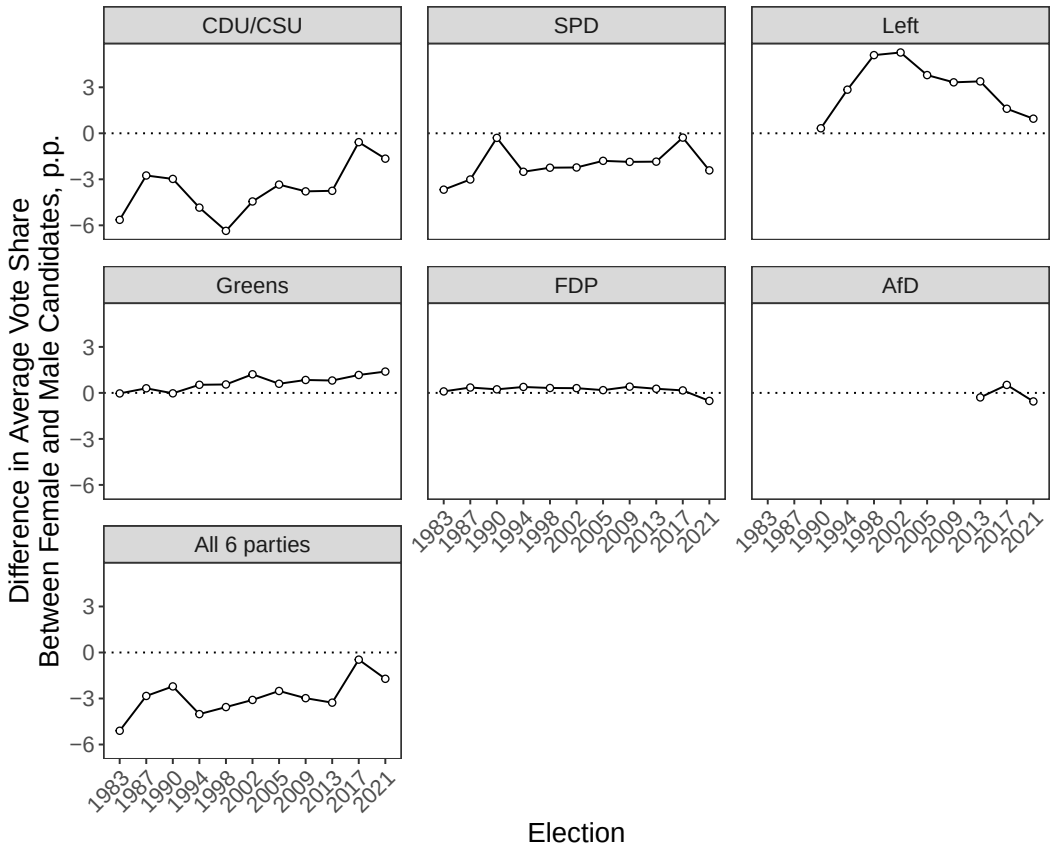
We start the analysis by describing key stylized facts about our main object of study, which we aim to decompose and explain its determinants: the **gender vote gap**.

We define the gender vote gap as the average vote share of female SMD candidates minus the average vote share of male SMD candidates. Thus negative numbers indicate female underperformance. We calculate it separately for each party and election year and present them in Figure 1. Among the two main parties, we observe that between 1983 and 2021 female CDU/CSU candidates receive a vote share that is, on average, 5.3 percentage points (p.p.) smaller than male CDU/CSU candidates. The gap varies over time, ranging from -6.4 to -0.6. The average vote gap for the SPD in the sample period is -2.99 p.p., ranging from -3.7 to -0.3. A general trend towards smaller (closer to zero) gender vote gaps is visible for both parties. The reverse is true for the Left Party, where female candidates receive on average 3.1 p.p. *higher* vote share than their male counterparts. For the FDP and Green parties, women do somewhat better than men, but this difference is close to zero.

The "All 6 parties" panels provides a weighted average of the party-specific gaps. To reflect the gaps that influence representation in the *Bundestag*, we use the party-year's number of elected SMD candidates as weights.[8] Figures A2 and A3 show the share of female SMD candidates and the average vote share of male and female candidates separately.

[8] An unweighted average would be uninformative since, on average, the smaller parties (Left, Greens, FDP, and AfD) have a relatively higher share of female candidates but also receive fewer votes (regardless of gender).

Figure 1: The Gender Vote Gap: Difference in Average Vote Share between Female and Male SMD Candidates



Notes: Figure shows the gender vote gap (average female vote share minus average male vote share), separately for each election and party. "All 6 parties" is the average of the party-specific gaps, using the number of elected SMD candidates as weights. Negative values on the y-axis indicate that, on average, female candidates have a lower vote share than male candidates.

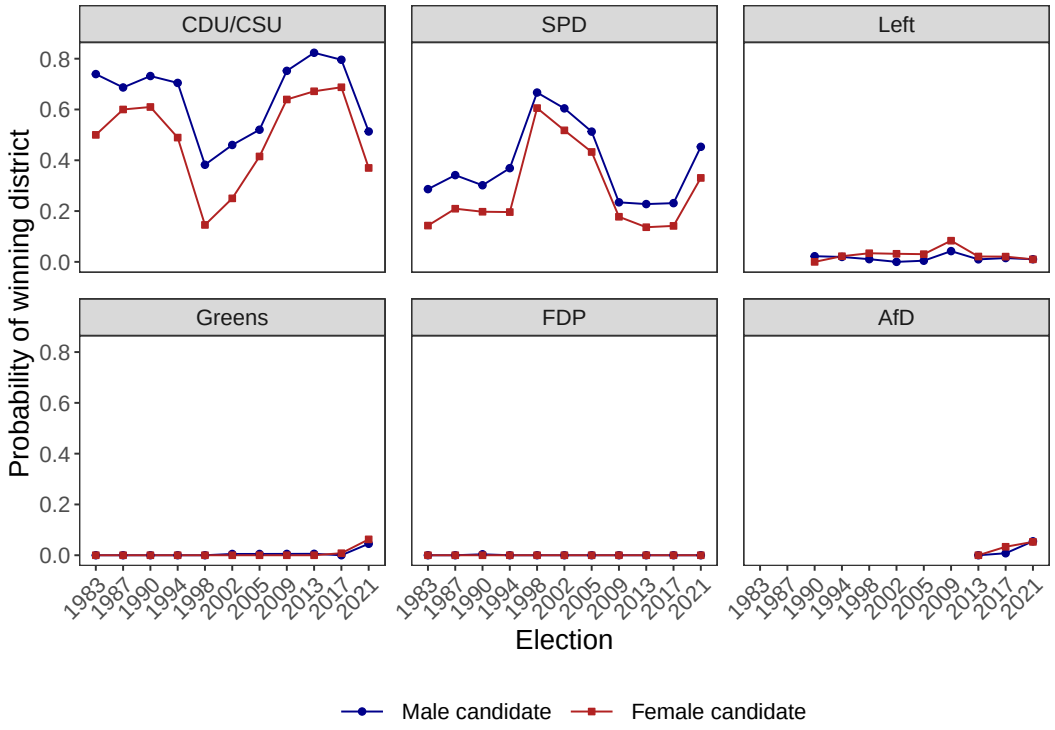
These gender vote gaps translate into a lower probability of being elected for female candidates in the two largest parties. Figure 2 shows the probability of being elected for male and female SMD candidates over time. For the CDU/CSU and SPD, women were, respectively, 16.5 and 8.3 percentage points less likely to be elected than their male counterparts in the 1983-2021 period. As evident from the relatively flat lines hovering over zero, the four smaller parties rarely win an SMD race.[9]

Note all figures mentioned in this section refer only to the direct (district) candidates.

[9]However, they do obtain representation in the Bundestag via the party vote (e.g., 41% of seats in the 2021 election).

Appendix A discusses how women are less under-represented in the state-level party lists.

Figure 2: Probability of Being Elected for Female and Male SMD Candidates



Notes: Figure shows the share of candidates that were elected, separately for each gender, election, and party.

6 Empirical Decomposition Strategy

To understand the mechanisms underlying the gender vote gap in Germany, we leverage the German mixed electoral system in combination with a Kitagawa-Oaxaca-Blinder decomposition, a method commonly used in labor economics to study differences in averages between two groups.[10]

Intuitively, female and male vote shares in SMD races can be modeled as a function of

[10]This method was first proposed by Kitagawa (1955) and later popularized by Oaxaca (1973) and Blinder (1973). For a comprehensive treatment and survey of applications, see Fortin, Lemieux and Firpo (2011). To our knowledge, the only other paper using this method to study election outcomes is Dancygier et al. (2015), who study the representation of immigrants in Sweden.

party list vote shares – voters who support a party likely also support the SMD candidate of that party. However, some voters may split their tickets, so party vote shares will not explain all of the variation in SMD vote shares. The overall difference in electoral success between female and male candidates can be decomposed into two parts: one that is explained by differences in party vote shares, and one that is explained by differences in voter behavior.

The formal setup of the method is as follows. Using only female candidates, one can estimate the following equation via OLS:

$$CV_{idt}^{W} = \alpha^{W} + \beta^{W} PV_{idt}^{W} + \epsilon_{idt} \tag{1}$$

where CV_{idt}^{W} is the candidate (SMD) vote share of female candidate i in district d at election year t. PV_{idt}^{W} is the party list vote share of female candidate i's party in district d at election year t.

The same equation can be estimated using only male candidates:

$$CV_{idt}^{M} = \alpha^{M} + \beta^{M} PV_{idt}^{M} + \epsilon_{idt} \tag{2}$$

Let $\overline{CV^{M}}$ and $\overline{CV^{W}}$ be the average candidate vote share of male and female candidates, respectively. We are interested in studying (decomposing) differences in average electoral performance between men and women, or more precisely the gender vote gap we defined and presented in the previous section, which can be denoted as $\overline{CV^{W}} - \overline{CV^{M}}$. Note this can be calculated for many subsamples (e.g., only one particular election year or region, only one particular party, or only a particular party in a year).

The mathematical properties of OLS estimation of (1) and (2) guarantee that $\overline{CV^{g}} = \alpha^{g} + \beta^{g}\overline{PV^{g}}$ for $g \in \{M, W\}$, where $\overline{PV^{g}}$ is the the analogous party vote average to $\overline{CV^{g}}$.

The average vote share difference between men and women can be decomposed as follows:

$$\begin{aligned}\overline{CV^W} - \overline{CV^M} &= \alpha^W + \beta^W\overline{PV^W} - \alpha^M - \beta^M\overline{PV^M} = \\ &= \alpha^W + \beta^W\overline{PV^W} - \alpha^M - \beta^M\overline{PV^M} + \beta^W\overline{PV^M} - \beta^W\overline{PV^M} = \\ &= [\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M}] + \beta^W(\overline{PV^W} - \overline{PV^M}) \quad (3)\end{aligned}$$

The term $\beta^W(\overline{PV^W} - \overline{PV^M})$ is the part of the gender vote gap that can be attributed to parties. More precisely, it isolates the part of the gender vote gap that can be attributed to women being, on average, nominated to run in districts where their parties are more or less popular. If a male and female candidate were nominated to run in districts where their party vote is the same (on average), this term would be zero. If this term is negative, it indicates that women are systematically nominated to run in districts where their party vote is lower. This measure thus provides a counterfactual thought exercise: how much larger or smaller would the candidate gender vote gap be if parties, on average, nominated men and women in districts where the parties are equally popular (as measured by the party vote share).

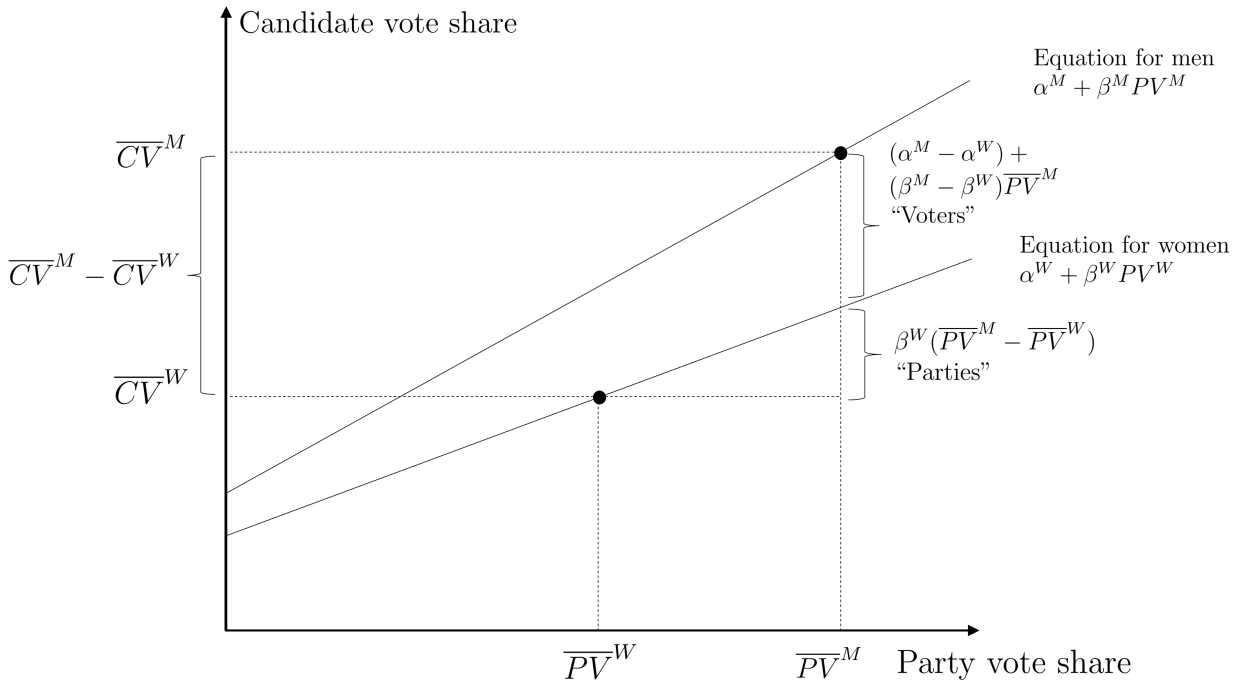
The term in brackets $[\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M}]$ can be interpreted as the part of the gender vote gap that is attributed to voters. More precisely, if voters are equally likely to cast an SMD vote that "differs" from the party vote when the SMD candidate is either a man or woman, then this bracket equals zero (since $\alpha^M = \alpha^W$ and $\beta^M = \beta^W$). If the term is negative, it implies that voters are predicted (by the estimated equations 1 and 2) to be more likely to vote for party x but **not** vote for the SMD candidate of party x when such candidate is a woman instead of a man. Note that this prediction is evaluated at the mean $\overline{PV^M}$ level since we are decomposing the mean difference in electoral performance $(\overline{CV^W} - \overline{CV^M})$. Moreover, it provides a counterfactual exercise: a measure of how much larger or smaller the candidate gender vote gap would be if voters treated male and female candidates equally, conditional on the party vote.

Figure 3 exemplifies the decomposition graphically, focusing on a hypothetical case where

men outperform women ($\overline{CV^W} < \overline{CV^M}$) and also where ($\alpha^W < \alpha^M$ and $\beta^W < \beta^M$). To facilitate exposition, compared to equation (3), it multiplies the gender vote gap by minus one (decomposing $\overline{CV^M} - \overline{CV^W}$ instead of $\overline{CV^W} - \overline{CV^M}$).

Note that if $\alpha^W = \alpha^M$ and $\beta^W = \beta^M$, both regression lines for men and women overlap and the party component will explain the entire gender vote gap. Note also that if all voters cast ballots for a candidate and list of the same party (no split tickets), then the party component would equal any gender vote gap (since $\alpha^W = \alpha^M = 0$ and $\beta^W = \beta^M = 1$). However, as discussed in Section 3, ticket-splitting is widespread in the context we study.

Figure 3: Graphical Depiction of the Decomposition



Notes: Black circles represent average candidate (SMD) and party vote shares for male and female candidates. Lines represent the estimated relationships between candidate and party vote shares for each gender. To facilitate exposition, compared to equation (3), it multiplies the gender vote gap by minus one (i.e., it decomposes $\overline{CV^M} - \overline{CV^W}$ instead of $\overline{CV^W} - \overline{CV^M}$).

A key feature of the method is that it is a *decomposition*. The "party" and "voters" components by construction add up exactly to the gender vote gap. They thus "account for" or, in a specific sense discussed above, "explain" the entire gender vote gap. This allows

us to move beyond merely *testing* whether our proposed party-based mechanism is present to *quantifying* its role in driving our object of interest, while at the same time quantifying the alternative explanations captured in the voter term.

Lastly, while we focused on decomposing gaps in vote shares, the method can be applied to other variables, including binary indicators such as a dummy for whether a candidate won the race. Doing so would decompose the gender gap in the probability of winning a race. Indeed, Section 7 discusses results from such decomposition. Appendix C discusses how additional covariates can be added to the decomposition.

Decomposition Assumptions. First, our decomposition does not require a causal interpretation for equations (1) and (2). Our method is compatible with voters making interdependent decisions about SMD and party-list votes in ways that one informs the other. What would potentially complicate the interpretation of our decomposition is SMD candidate gender having a causal impact on party votes (e.g., a party nominating a female SMD candidate causing a reduction in its party vote in the district). While theoretically possible, Appendix B provides evidence suggesting that candidate gender has a zero or negligible effect on party votes. We use a difference-in-differences framework exploiting switches in candidate gender between elections, holding party and district constant.

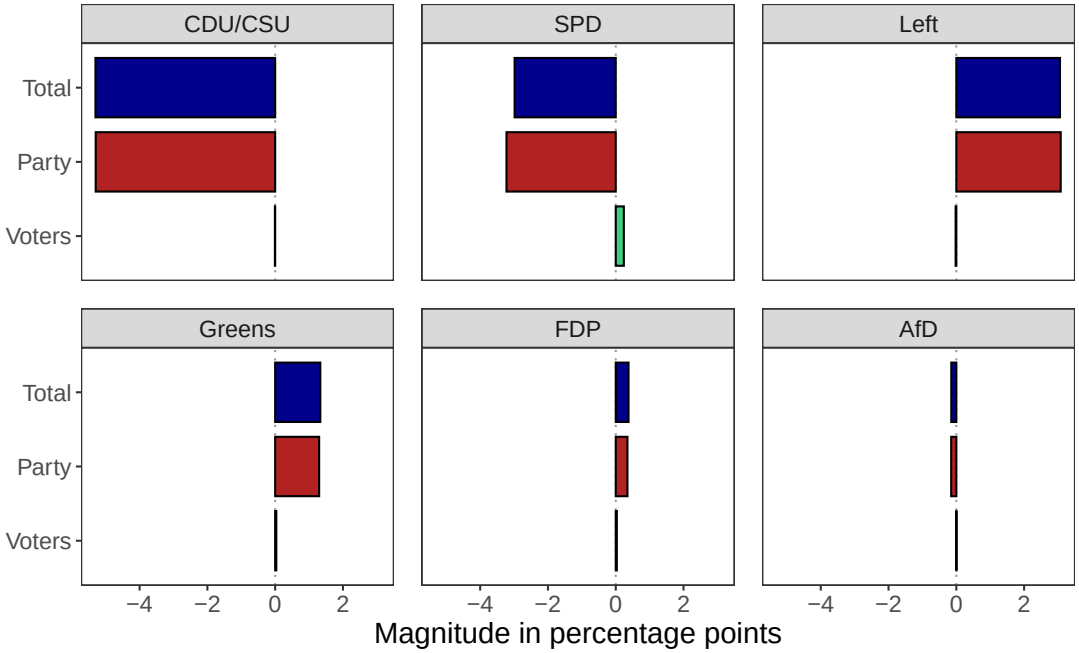
Second, our formulation assumes a linear relationship between candidate and party votes. Figure A5 shows this is a justified approximation in our data by flexibly plotting the relationship between both variables.

7 Results: Decomposition of the Gender Vote Gap

Overall, the results of the decomposition analysis indicate that the difference in vote shares between male and female SMD candidates is driven by differences in party popularity in places where women are nominated. We begin with Figure 4, which presents the results

from the decomposition analysis as a bar chart. The analysis (including the estimation of αs and βs) is done separately for each party, pooling data from all elections. The figure shows the respective contributions of the voters component ($\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M}$) and the party nominations component ($\beta^W(\overline{PV^W} - \overline{PV^M})$) to the total gender vote gap.

Figure 4: Pooled Decomposition Results, 1983-2021



Notes: Figure presents the decomposition described in equation (3), separately by party. The "Party" bar is $\beta^W(\overline{PV^W} - \overline{PV^M})$, representing the contribution of gender-biased party nominations. The "Voters" bar is $[\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M}]$, representing the contribution of voters. They add up to the "Total" gender vote gap ($\overline{CV^W} - \overline{CV^M}$). Negative numbers indicate female candidates underperforming male candidates or a component contributing to underperformance. Table A3 provides the same analysis in table format. Table A4 provides related analysis.

Figure 4 indicates that essentially all the total difference in average vote shares between male and female candidates can be accounted for by women being systematically appointed to districts where they are less popular, as proxied by their vote share. As in Figure 1, we again observe that women running for the CDU/CSU, SPD, and AfD parties generally perform worse than men (the negative "Total" term). For the Left, Greens, and FDP, the reverse is true. For all parties, the party contribution constitutes the largest part of the total differences in electoral performance.

We highlight the *counterfactual* interpretation of the results. For example, the gender vote gap for the CDU/CSU is almost 6 p.p., but our results suggest it would be only 0.17 p.p. if male and female candidates were nominated in equally competitive districts (i.e. if $\overline{PV^W} = \overline{PV^M}$). This can be interpreted as party nominations accounting for 97% of the gender vote gap.

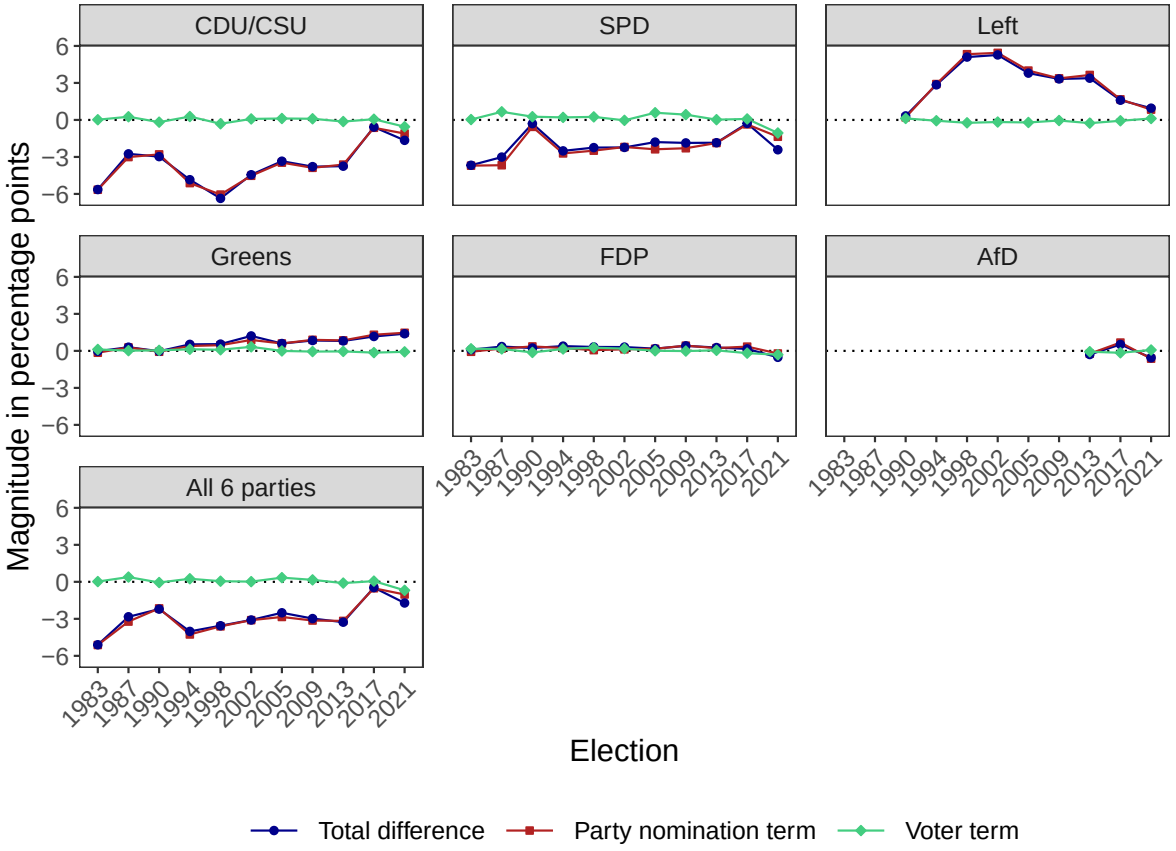
Note also that the party nominations component also accounts for female candidates outperforming their male counterparts in the case of the Left, Greens, and FDP. For these parties, women are (on average) nominated in districts where the respective party vote is larger.

Figure 5 explores whether the role of party nomination strategies has changed over time by presenting decompositions for each party and year in our sample.[11] It echoes Figure 1, with the blue circles ("total") term being exactly the same of what it plotted. It now adds the "party nominations" and "voters" components. For all six parties, the lines and markers indicating the party nomination term are virtually indistinguishable from the total gender vote gap. This indicates that almost all the variation in gender vote gaps across parties and years can be explained by whether female candidates are being nominated to districts where their party is less (or more) popular (as proxied by their party vote share).

Patterns vary across parties. There is an overall closing of the gap for the CDU/CSU, a rise and fall in the positive gap (women overperforming men) for the Left, as well as year-to-year variations for most parties. *All* these patterns can be accounted for by variation in the party nominations component. The "voter" term always being close to zero for all parties is the decomposition counterpart of that: voter behavior conditional on the party vote share accounts for a negligible part of the gender vote gap. Figure A4 replicates Figure 5 separately for West and East Germany. Female candidates perform relatively better in East Germany,

[11] The computation of the decomposition is performed separately for each year and party (i.e., for each party-year combination, Equations (1) and (2) are separately estimated and the appropriate "party" and "voter" terms calculated).

Figure 5: Decomposition Results by Party and Year



Notes: Figure presents the decomposition described in equation (3), separately by party and year. The "Party nomination term" is $\beta^W(\overline{PV^W} - \overline{PV^M})$, representing the contribution of gender-biased party nominations. The "Voter term" is $[\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M}]$, representing the contribution of voters. They add up to the "Total difference" (the gender vote gap $\overline{CV^W} - \overline{CV^M}$). "All 6 parties" is a weighted average of the party-specific gaps (see text for details). Negative numbers indicate female candidates underperforming male candidates or a component contributing to underperformance. Table A5 provides related analysis.

which can be explained by them also systematically running in "better" districts.[12]

Gender gaps in the probability of winning. Table A6 and Figure A6 provide similar analyses, but using an indicator if the SMD candidate won the race as the outcome (instead of vote shares). It thus decomposes the gender gap in the probability of winning. We again find that gaps (and its variation across parties and years) are almost entirely accounted for by the party nominations term. Recall that these gaps are substantial: 16.5 p.p. for the

[12]Tables A4 and A5 present the individual averages and coefficients discussed in Section 6, allowing a step-by-step computation of the decomposition.

CDU/CSU and 8.3 p.p. for the SPD (Figure 2).

Path dependency, incumbency, and open seats. A potential alternative explanation for our results (so far) is that incumbents are often male. Thus a "path dependency" may preclude women from running in safe districts if male incumbents run repeatedly. To assess this possibility, we restrict our sample to *open seats*. Here, biased party nominations cannot stem from the presence of repeat-running incumbents. We define open seats in two ways: i) district-party-years where the candidate previously fielded does not run again and ii) district-party-years where the candidate previously fielded does not run again and the previous candidate was the incumbent (won the district in the previous election). Figure 6 shows that our decomposition results are robust to restricting the sample to either definition of open seats.[13] We thus conclude that male overrepresentation among incumbents cannot explain our results. Section 9 discusses further evidence on open seats.

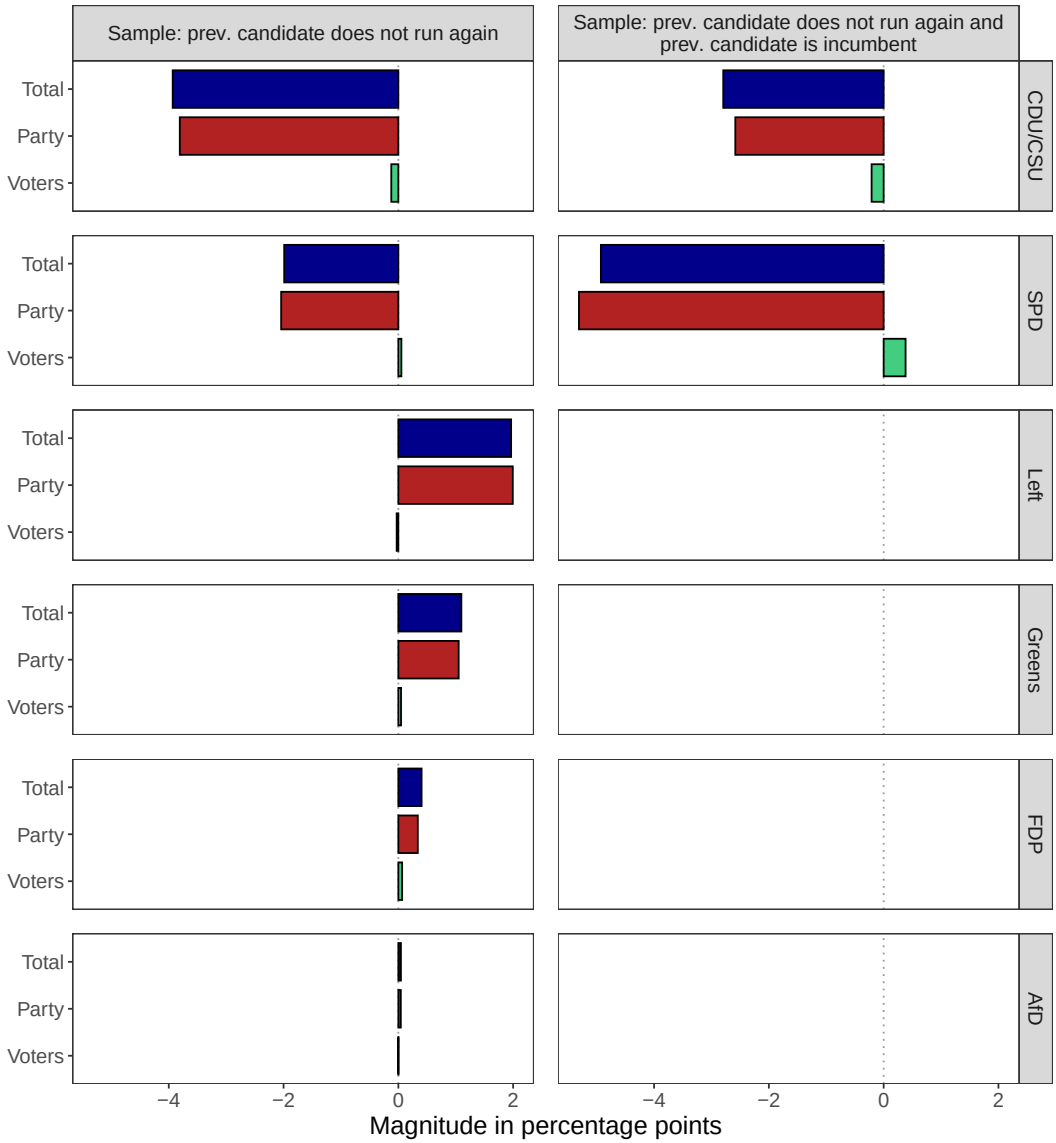
Differences in background characteristics. As discussed in Section 2, gender differences in characteristics (e.g., education or political experience) are a potential explanation for gender vote gaps. The Federal Returning Officer provides three variables to assess candidate characteristics: i) occupation, which we merge to Treiman's Standard International Occupational Prestige Scale (SIOPS) to measure an occupational prestige score; ii) age; and iii) number of times elected to the Bundestag (a proxy for political experience).

Appendix C provides further discussion and concludes that the only characteristic that is both correlated with vote shares and differs by gender is the number of times elected to office. However, the previously discussed Figure 6 indicates that our main results hold for the subset of open seats, where incumbency and previous experience cannot play a role.

Moreover, multiple additional covariates can be added to our decomposition. Each covariate will have a component similar to the party component (e.g., a component measuring how

[13]By the first definition, 63% of observations are open seats (ranging from roughly 40% for the CDU/CSU and SPD to 80% for other parties). By the second definition, 21% and 12% of seats are open for the CDU/CSU and SPD, respectively.

Figure 6: Decomposition Results Only for Open Seats, 1983-2021



Notes: Figure presents the decomposition described in equation (3), separately by party. It only includes open seats defined as: i) district-party-years where the previously fielded candidate is not running again (left) and ii) same definition and the previous candidate was the incumbent (won previous race). Set (ii) is not provided for parties with few or no observations (i.e., which rarely win district races). Interpretation of the bars is the same as in Figure 4.

much differences in age contribute to the gender vote gap). Appendix C provides a formal treatment and discusses how covariates account for a negligible amount of the gender vote gap (Figure A9). Note we include the covariates not only for the candidates themselves but for its opponents, accounting for the possibility that female candidates face systematically

different opponents.

Lastly, Appendix D leverages richer information from GLES surveys on political experience at the local and state levels, education levels, years of party membership, self-reported ideology, campaign budgets, and more. Again, including them as additional variables in the decomposition does not affect the results (Figure A16).[14]

Overall, we conclude that differences in candidate characteristics are unlikely to play a substantial role in our results.

Lagged Party Vote. As a robustness check, Figure A9 shows our main results are robust to using *lagged* party vote (from the previous election) instead of party vote (i.e., PV_{idt-1} instead of PV_{idt}).

8 Evidence on Gender-Biased Gatekeeping

The previous session documents that party nomination strategies account for most of the gender vote gap and its variation across parties and election years. We now present additional evidence to demonstrate that bias among local party gatekeepers likely underlies this result. It relates to the potential of homophily among gatekeepers discussed in section 2. We use data from Eder and Fortin-Rittberger (2017) on the share of female elected representatives at different levels of German local governments during 2002-2013. As discussed in Section 3, it is reasonable to assume that representatives in important local assemblies also exert considerable influence in candidate nomination processes (Detterbeck, 2016). Appendix E provides further discussion.

Further, a key part of the homophily argument is that female gatekeepers are less biased against female candidates. Consequently, we should observe that both the total gender vote gap and the party nomination component should be *less* pronounced in districts where there

[14] A caveat is that GLES is only available for the 2009, 2013, and 2017 elections and only 27.6% of surveyed candidates answer the survey.

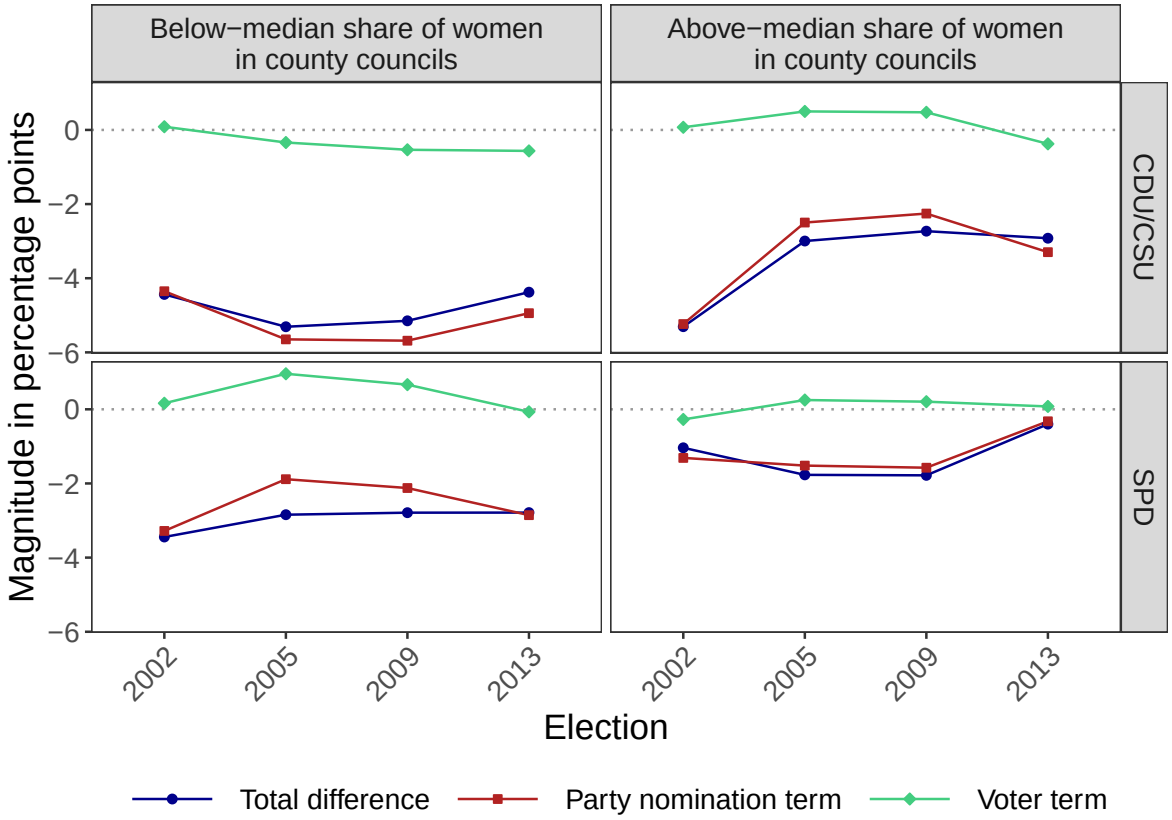
are more women in local assemblies. We test this conjecture using data on county councils. The county is the administrative unit that most directly overlaps with SMD districts. First, we obtain the share of female representatives in county councils for each party and election separately and map counties to electoral districts. We then repeat the main decomposition design at the party-year level, separately for districts where the share of women in county councils is above or below the party-specific nationwide median share of women in county councils.

Figure 7 presents the results. In the vast majority of cases, the total gender vote gap and the party nomination component are smaller for districts where there is a larger share of women in county councils (and presumably more gatekeepers are themselves women). Note that the median female share of city councils is 20% for the CDU/CSU and 30% for the SPD, so most of the "above median" districts are mostly male and gender parity is rare. Figure A10 in Appendix E presents additional results based on the composition of the *city* council (*Stadtrat*) in the largest city in a given electoral district. Results are similar to those in Figure 7, indicating the results are robust if one proxies the gender of local gatekeepers using either county or city councils.

Overall, Figures 7 and A10 suggest that, when gatekeepers themselves are more likely to be women, party nominations are less biased and thus gender vote gaps are smaller. The finding is particularly apparent for the SPD. This is possibly due to the median share of women in county councils for the SPD being about 30%, compared to 20% for the CDU/CSU, and their "above-median" districts being closer to a larger "critical mass" of female gatekeepers.

Overall, the evidence discussed in this section is consistent with a particular mechanism discussed in Section 2: tasted-based discrimination stemming from homophily leads (mostly male) local party elites to nominate women in districts where the party is less popular.

Figure 7: Decomposition Results by Party and Year, Comparing Districts with Smaller or Larger Female Representation in County Councils



Notes: Figure presents the decomposition described in equation (3), separately by party and year. We split the sample in two: cases where the share of female representatives in county councils is above and below the (party-specific) median. The total, party nomination, and voter terms are defined as in Figure 5. Required data is only available for 2002-2013. Figure A10 replicates figure using *municipal* (*city*) councils data.

9 Descriptive Results and Tests of Mechanisms

Having used decomposition analysis to show that biased party nominations account for most of the gender vote gap, we now turn to more standard non-parametric and OLS analyses. The purpose of this section is twofold. First, we provide evidence for the role of party nominations in explaining the gender vote gap using simple non-parametric tests in a manner decoupled from specific assumptions of the decomposition. Second, by distinguishing between safe, competitive, and sure-loss districts, we can further differentiate between different reasons for gendered nomination patterns – taste-based discrimination by local party elites and strategic

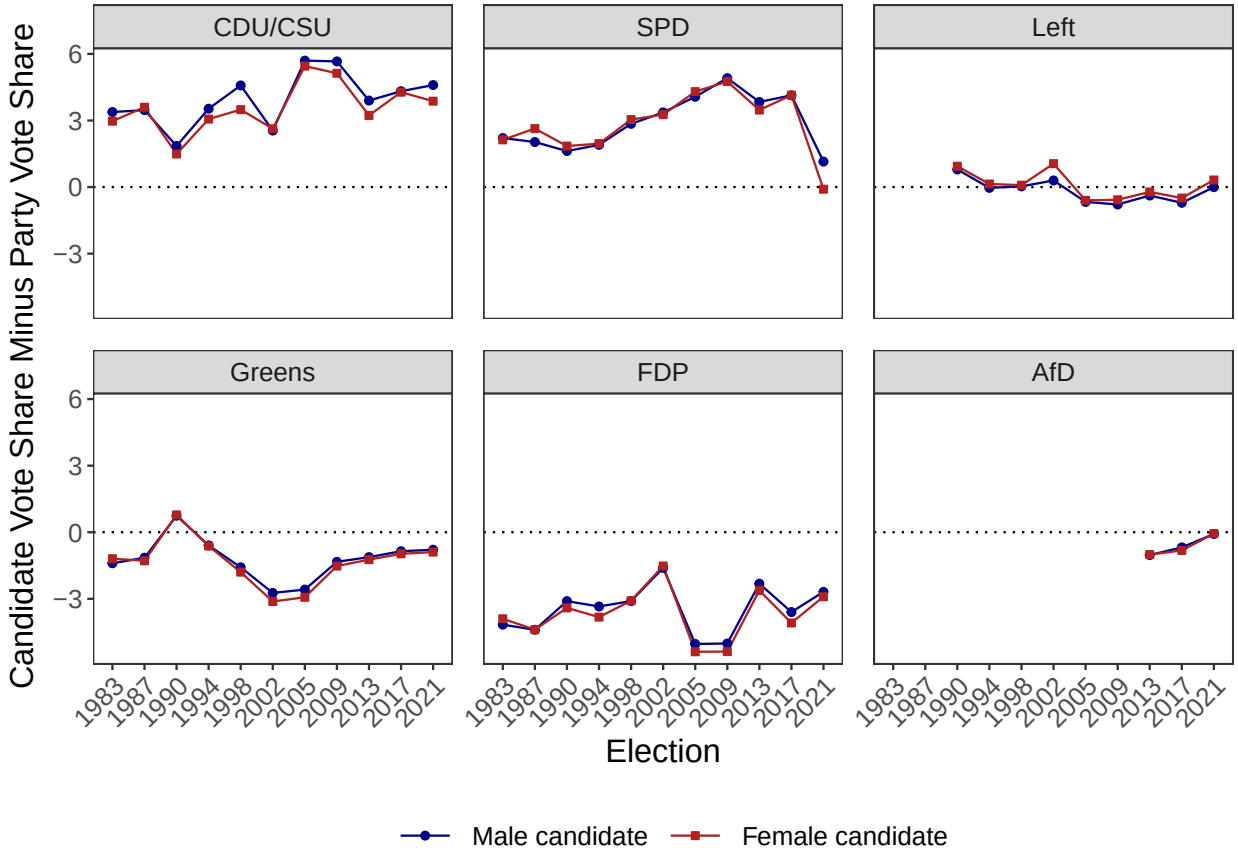
discrimination – and test alternative explanations. To do so, we introduce a new outcome, the within-party difference between SMD candidate and party vote shares in a district. It is closely related to the voter term in the decomposition, as it measures whether the relationship between party and candidate vote shares differs depending on candidate characteristics.

Candidate relative to party performance. First, we focus on between-party and over-time changes in the voter term. While we note that the contribution of voters to the total gender vote gap is comparatively small, it still warrants further investigation. We define a new dependent variable $Y_{idt} = CV_{idt} - PV_{idt}$. It directly measures how SMD candidate i in district d in election year t performs relative to his or her party (keeping constant the district, year, and electorate). It thus can capture whether voters may punish some candidates by giving their SMD vote to a candidate from another party, while still casting their party vote for their preferred party.

Figure 8 presents the average Y_{idt} by party and year, separately for male and female candidates. For the historically dominant CDU/CSU and SPD, we consistently find that candidates receive more votes than their respective parties. For the Greens and FDP, the reverse is true. A potential explanation for this is strategic considerations among voters (Spenkuch, 2018). Since typically only candidates from the CDU/CSU and SPD win SMD races, voters may engage in Duvergerian strategic voting only for the SMD vote (i.e., voting for their preferred party in the list vote, but for their preferred SMD candidate between the CDU/CSU and SPD to avoid "wasting" it).

More importantly, candidate gender seems to play little role in the decision to deviate from the party vote. Across all parties and elections, the difference between candidate and party vote shares Y_{idt} is negligible. Only the CDU/CSU party exhibits a pattern where voters are more likely to deviate from their party preference when the candidate is male. However, this difference remains small compared to the overall gender vote gap that we document in Figure 1. Figures A11 and A12 replicate Figure 8 using only open seats (see Section 7).

Figure 8: Candidate Performance Relative to Party Performance, by Gender



Notes: Figure shows the average percentage point difference between the candidate and party vote in the same district and election, calculated for each party, year, and candidate gender. Positive values on the y-axis indicate that, on average, candidates receive more votes than their respective party list in the same district. Table A8 provides related analysis.

Table A8 provides related analysis in table format.

Nomination patterns by competitiveness. Moving from the contribution of voters to party nomination strategies, we now substantiate the finding that female candidates commonly run in districts where their party is weaker than in districts where male candidates run. More specifically, we explore the relationship between candidate gender and district competitiveness. For each SMD candidate i in district d for election t, we calculate $PV_{idt} - PV_{jdt}^{Max}$, where PV_{idt} is the party vote share for candidate $i's$ party and PV_{jdt}^{Max} is the highest vote share among all remaining parties j in district d and election t, excluding

i's party. If candidate i's party receives the most votes in district d, then $PV_{idt} - PV_{jpt}^{Max}$ will be positive (and negative otherwise). Note this is entirely based on the *party list* vote, and not on SMD votes, thus capturing competitiveness "as predicted from party-list votes." We define district competitiveness as follows:

$$C_{idt} = \begin{cases} \text{Sure loss} & \text{if} \quad -(PV_{idt} - PV_{jdt}^{Max}) > c \\ \text{Safe seat} & \text{if} \quad PV_{idt} - PV_{jdt}^{Max} > c \\ \text{Competitive} & \text{otherwise} \end{cases}$$

A district is a sure loss district if candidate i's respective party vote trails the most-voted party vote by more than c percentage points, while a safe seat is a district when it obtains the most party votes in the district by a margin greater than c.[15]

As there is no straightforward choice of the cutoff c, we estimate models with three cutoffs: 5, 10, and 15 p.p.. The dependent variable is whether the SMD candidate is a woman, explanatory variables are indicators of a district being a safe seat or a sure loss (the competitive ones are the omitted category). The unit of observation is a party-district-year combination. We include district, year, and party fixed effects (when possible).

Table A10 reports the results. Across the three values of the cutoff, the results look similar: Women are least likely to be nominated to safe seats. Using our entire sample, women are between 6.7 and 8.2 p.p. less likely to be nominated to safe seats. Among the individual parties, we find the strongest evidence for differential nomination strategies for the SPD. Female candidates are between 10.7 and 14.5 p.p. less likely to be nominated to safe seats. This is perhaps surprising since, as a center-left party, the SPD is not commonly regarded as the least gender-progressive party. The pattern for the CDU/CSU party is similar, if less severe.

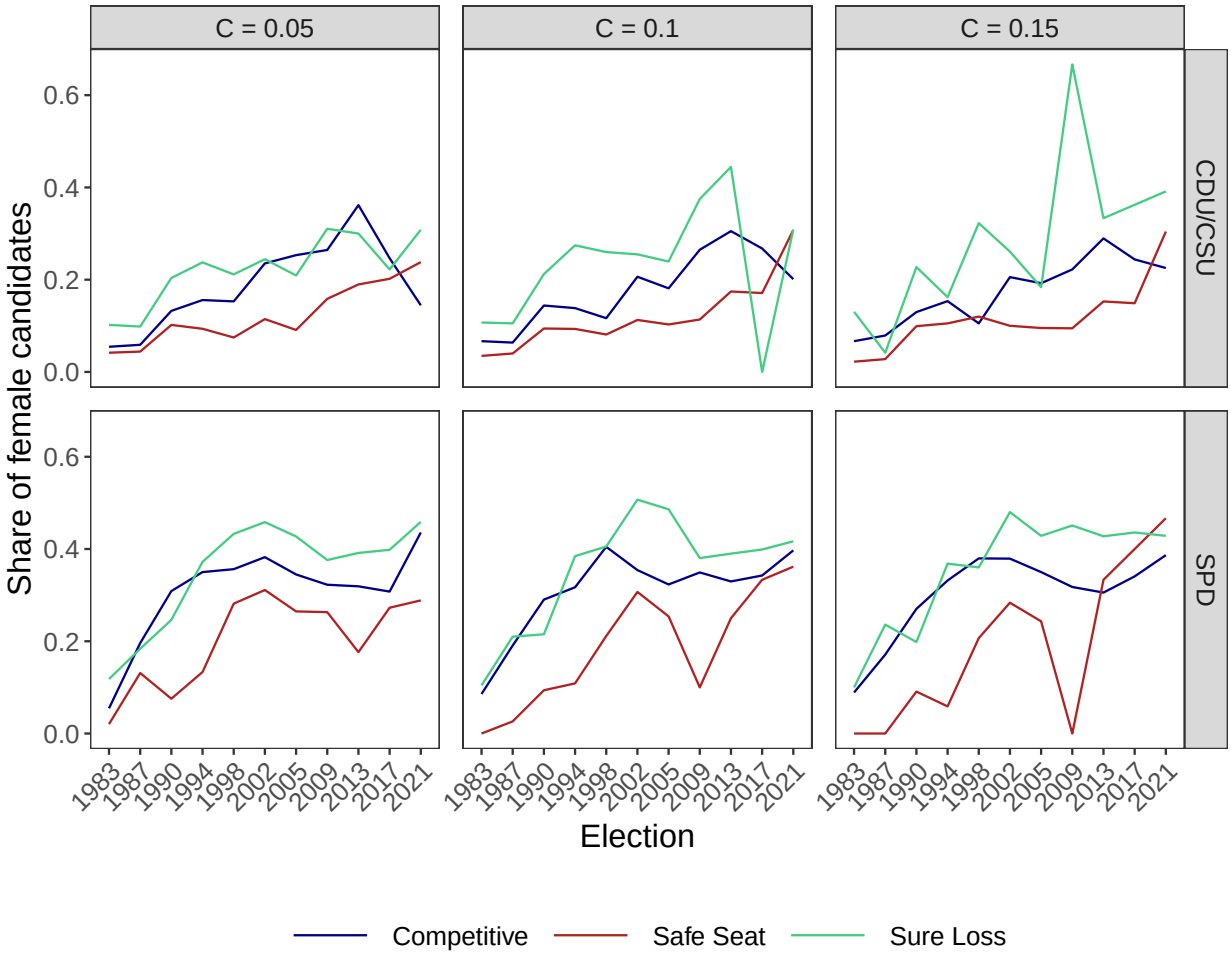
[15]While party vote shares and candidate gender are measured at the same time, technically a party cannot observe the district competitiveness prior to the election. However, competitiveness is predictable to local party officials (based on previous elections and their "on the ground" observations).

Figure 9 shows that women are least likely to be nominated to safe seats, relative to competitive or sure-loss ones. It plots the share of female candidates conditional on district competitiveness. We limit the sample to the two historically largest parties that have non-trivial shares of safe seats. The results reinforce our conclusion from the decomposition strategy. For the SPD, the female share in safe seats is initially low but converges to that of competitive districts. As a general pattern, we find that party nominations initially penalize female candidates. However, this pattern closes over time, mirroring the decline in the gender vote gap shown in Figure 1.

The results in Table A10 and Figure 9 also provide a test of the mechanisms discussed in Section 2: taste-based discrimination by local party chapters and "strategic discrimination" (Bateson, 2020). One potential explanation for our finding that women are less likely to be nominated in districts they can win is that parties nominate their (perceived) strongest candidates in competitive races, and these are more likely to be men. However, this is inconsistent with the evidence discussed above: the lowest share of female candidates are nominated in *safe* (not competitive) districts, where candidate strength is less likely to matter.

Instead, gender balance is greatest in districts where parties have little hope of winning. While we cannot test it directly, this is consistent with a hypothesis that state and national party chapters make efforts to nominate more women in SMD elections and local party chapters comply when it is least costly and consequential.

Figure 9: Share of Female SMD Candidates, by District Competitiveness



Notes: Figure shows the share of female SMD candidates by party, election, and classification of district competitiveness (see text for details), for the CDU/CSU and SPD (top and bottom rows, respectively). Cutoff c for defining district as competitive, safe, or sure loss are 5 p.p., 10 p.p., and 15 p.p. (in columns). Table A10 provides related analysis.

10 Discussion of Alternative Explanations

We contend that our main results are consistent with a mechanism whereby discrimination by party gatekeepers is strongest in districts where a given party is popular, leading to women being nominated relatively more often in districts that are difficult or impossible to win. In this section, we discuss four potential alternative or complementary explanations to our results: i) parties anticipating voter preferences, ii) bias against outsiders *per se*, iii) strategic voting, and iv) unequal aspirant entry.[16]

First, parties may strategically nominate women in districts with more progressive gender attitudes, as they anticipate voters would otherwise punish female candidates (Le Barbanchon and Sauvagnat, 2022). *A priori*, it may appear that, if parties correctly anticipate that voters punish female candidates at the ballot box in certain places and if such gender norms are correlated with party votes, that would confound our decomposition results. However, it is not logically possible that progressive gender attitudes are positively correlated with the vote shares of all parties simultaneously.

For example, suppose that the safe seats for the CDU/CSU are in less gender-progressive locations. By definition, a safe seat for the CDU/CSU is a sure-loss seat to the SPD (or any other party). This implies that the SPD's sure loss seats are in less gender progressive areas. But our evidence is that SPD nominates relatively more women in sure loss seats, which is the opposite direction of "anticipating voter bias." This logic applies generally: since vote shares add up to one, it is not possible that progressive gender bias and party vote shares are positively correlated for all parties. Moreover, while attitudes and beliefs about gender should change only slowly over time, we see temporal variation in the gender gaps in the data that we can explain with variation in nomination strategies.

[16]Note that one potential threat to the interpretation of our decomposition – SMD candidate gender affecting the party votes – is discussed in Section 6 and Appendix B. We do not find any evidence that female SMD candidates reduce their party vote share

Appendix C further probes the potential role of voters' gender attitudes. It includes different measures of gender equality as additional covariates in the decomposition and shows that our results are virtually unchanged. See Figure A9 in particular.[17]

Second, the effects we uncover may not be about bias by local party chapters against women *per se*, but against outsiders or nontraditional candidates in general. To explore this hypothesis, we examine whether we see similar nomination patterns for younger candidates, who are presumably just beginning their political careers. Figure A17 shows there is little to no evidence that younger candidates are nominated to tougher districts, suggesting that the nomination behavior we observe may be unique to female candidates.[18]

Third, we explore whether strategic voting affects our results. It is not conceptually clear why strategic voting would generate the results we find. Figure 8 shows deviations between the party and candidate votes are similar for male and female candidates. In any case, we directly test if female vote shares are systematically harmed by strategic voting considerations using a strategy inspired by (Spenkuch, 2018). We test if the gaps between candidate votes and party votes are larger for women, subsetting our sample to SMD candidates who are among the top two competitors in a district. Table A9 summarizes the results. We find no evidence that strategic voting considerations are stronger for women.

Fourth, it may be the case that the effects we observe are due to unequal aspirant entry, with women not throwing their hats in the ring in more competitive *nomination* contests in the first place. As the chances of winning a seat increase, stronger candidates may contend for the nomination and potential female aspirants may opt out, potentially against the wishes and best intentions of the local party leadership. We deem this explanation unlikely for two reasons. First, German local party elites have the power to shape the list of nominees by identifying, encouraging, and training potential aspirants (Davidson-

[17]The measures are a gender equality index calculated by the Federal Government according to EU guidelines (including measures of economic, political, educational, and health equality), the share of women in full-time employment, and the gender wage gap.

[18]We define candidates as "young" if they are in the bottom tercile of the candidate age distribution (42 or younger). We obtain similar results using a definition based on the bottom quartile (39 or younger).

Schmich, 2016). Thus, whether women feel that they stand a chance is a function of the behavior of local party elites. Second, while systematic data on *potential* candidates is difficult to obtain due to the decentralized nature of candidate nominations, existing surveys suggest that unequal aspirant entry is unlikely to be driving our results. Leveraging a survey conducted with over 4,800 active party members in 2016/2017, Höhne (2020) shows that female party members are no less engaged in local party activities. Since local engagement is a precondition for advancement within the party, Höhne (2020) concludes that the female under-representation in higher offices is not endogenous to a lack of effort or ambition among female party members. Based on original surveys with hundreds of German party members, Hoecker (1986) and Davidson-Schmich (2016) arrive at the same conclusion at different moments in time.

11 Conclusion

Why do women continue to be underrepresented in many parliaments around the world, and particularly so in single-member districts (SMD)? We shed light on the issue examining the case of Germany. Despite ranking tenth place globally in terms of egalitarian gender opportunities (Forum, 2020) and after 16 years of experience with a popular female chancellor, women constitute only 35% of Parliamentarians and 26% of the 299 representatives elected via SMD. Using candidate-district-level data spanning eleven elections between 1983 and 2021, we find that SMD candidates are not only more likely to be male, but female SMD candidates also receive fewer votes and are less likely to be elected than male candidates. This gender vote gap is driven by candidates from the two biggest parties, the center-left SPD and the center-right CDU/CSU. We then investigate its sources.

While several papers have studied the role of voter discrimination or differences in male and female candidate characteristics, we propose an underappreciated mechanism–biased party nominations–is likely to play a key role. Female candidates are systematically nom-

inated to run in "tougher" districts where their party is less popular. We deploy a novel application of decomposition methods from labor economics to quantify its role. It exploits unique features of the German electoral system to construct counterfactual gender vote gaps representing the scenario where male and female candidates are nominated to districts where their parties have equal popularity.

We document that female underperformance, and its variation across parties and election years, is explained almost entirely by women running in districts where their party is less popular. In contrast, we find no evidence that voter bias or candidate characteristics play a role.

We conclude with two considerations about the implications of our results. The first concerns its contribution to the literature on gender gaps. Our results reinforce an expanding body of evidence suggesting the causes of female underrepresentation lie in parties and not voters. Concurrently, the mechanism we propose complements and adds nuance to other previously studied channels. For example, female aspirants may be deterred from running for office if they expect to be nominated in districts that are harder to win. In other words, while our results are conditional on who runs for office, they have implications for the pool of candidates who decide to run.

The second consideration regards potential policy implications, in particular for efforts to increase female representation in politics. Amongst others, common recommendations to increase female representation include internal recruitment targets as well as increased provision of resources and mentoring and training for female political aspirants (see e.g. Brechenmacher, 2018; UNDP, 2021; IPU, 2022). While well-meaning, these recommendations may not succeed if parties retain the discretion to only nominate women in districts where they are less likely to succeed. The same is true for quotas for the number of female candidates if such quotas do not guarantee that women are nominated in districts where they can actually win. Rather, our findings call for changes to *how* candidates are selected.

In particular, such recommendations may include gender parity targets for committees that select candidates and more transparent selection procedures.

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Online Appendices for: Biased Party Nominations as a Source of Women's Electoral Underperformance

The following appendices are not intended for print publication.

A Additional Information on the German Electoral System

State party lists: Each party forms a list of candidates for the party vote (Zweitstimme). The number of candidates that are elected via the list depends on the share of party votes that each party receives in a given state (proportional representation).[1] The total number of MPs that are elected through the list in a given state is equal to the number of single-member districts (SMDs). In theory, this means that half of all MPs are elected through lists, and the other half are elected through single-member districts. In practice, however, there may be less directly elected SMD MPs than list-elected MPs, as we discuss in more detail below ("overhang mandates").

Only parties with more than 5% of the country-wide party list votes are represented. Candidates can run simultaneously in a single-member district and be on a party list. Candidates on party lists are ranked (with their rank determined by parties before the election) and their order determines the eventual selection of MPs. For example, if a party in a given state can elect five list members, the five top-ranked list candidates will be chosen. In cases where list candidate also runs in a district and wins this district, the list candidate is skipped in this process. Every candidate that wins a district-level election via candidate votes gains a seat.

The German ballot (see Figure A1) shows only the top five candidates per list in each state. Unlike the case of SMD candidates, it does not include information on the profession or place of residence of the candidates. The names of all list candidates are public information, but voters have to actively seek out this information if they want to know who is on the list beyond the top five candidates. Since the party list is decided at the state level, all voters in a given state see the same candidates' information on the party vote side of their ballot.

Overhang mandates: The party list vote determines the total number of seats in parliament that a party is entitled to. However, district elections may lead to a situation where the party wins more districts than it is entitled to based on its party vote. If this is the case, the additional SMD seats are considered overhang mandates (*Überhangmandate*). The party will receive these additional seats in parliament, resulting in a seat allocation that is not aligned with the proportional vote anymore.

This system has existed since the foundation of the Federal Republic of Germany, but was reformed in 2009. After the Constitutional Court ruled the former system unconstitutional, the current system uses balance mandates (*Ausgleichsmandate*). These are assigned to parties (via party list members) to recover the proportionality that is lost due to the overhang mandates. Both overhang and balance mandates can increase the total number of Bundestag members. For example, the parliament elected in 2022 has 736 members, when it was technically possible that only 598 would have been elected (299 of them directly).

Since both balance and overhang mandates are seats assigned to politicians on party lists, they have no direct bearing on our empirical design, as the number of directly elected representatives is always equal to the number of districts (currently 299). This applies under both the pre- and post-2009 reform.

Gender quotas: There is no legislation imposing gender quotas in Germany, but some parties have instituted gender quotas (ranging from 33% to 50%) for the party leadership and candidates on party lists. SMD candidates (the main focus of this paper) are exempt from these quotas. The

[1] The exact method to distribute seats proportionally changed over time, with the Hare-Niemeyer method used before 2008 and the Saint-Laguë/Schepers method after.

Green party was the first to institute a 50% quota for women in 1979 for party lists and the party leadership. The Left party has a similar quota. In 1988, the SPD adopted a quota stipulating that 40% of all leadership posts are reserved for women. The CDU/CSU instituted a non-binding quota called the *Frauenquorum* in 1996, stipulating that one-third of party offices should be held by women. If internal elections fail to reach this goal, they are declared invalid and have to be repeated, and additional candidates may be put on the ballot. However, if the repeat elections again fail to reach the quota, they are still declared valid and party offices are filled as determined by the internal election.

Female representation in party lists. While the focus of the paper is female representation among the SMD candidates, we end this appendix discussing the state-level party lists for context.

The share of elected candidates via party lists that are female is larger than via SMDs. This can be seen in Figure A13, which provides this data at the party-by-year level. First, smaller parties (in particular the Left and Greens) elect MPs primarily via party lists and have a higher share of female candidates than the CDU/CSU and SPD, which dominate the SMD races. However, the latter two parties present an upward trend in the share of female party-list-elected members, with the SPD nearing parity in recent elections. Second, Figure A14 shows that most parties, on average, rank female candidates higher than male candidates in their lists. The exceptions being the CDU/CSU and AfD (as well as the SPD in the 1983-1990 period).

Note that the smaller gender disparities in party list versus SMD elections is consistent with our proposed argument and mechanism, where biased nominations by *district-level* officials play a key role.

B Does Candidate Gender Affects *Party List* Votes?

This appendix analyzes an assumption of our method discussed in Section 6: if the gender of the SMD candidate from party p affects the party list vote of p, it would muddle the interpretation of our results.

We provide evidence suggesting there is little reason to believe this is the case. We exploit the fact that our data includes multiple instances when the *the same party* fielded a female SMD candidate after having fielded a man in the previous election *in the same district*. This allows us to estimate a difference-in-differences design that estimates the effect of SMD candidate gender on party vote, holding constant party, district, and year effects.

Due to a redistricting reform, matching districts between 1998 and 2002 is unfeasible, so we split our sample into two periods (1980-1998 and 2002-2021). For each party-district-year (our level of observation), we select all cases where i) a male SMD candidate was replaced by a female SMD candidate between any two consecutive elections and ii) a male SMD candidate was fielded in all elections in the period. This provides us with "treatment" and "control" groups, respectively, in a staggered difference-in-differences setting, which we estimate using the Callaway and Sant'Anna (2021) estimator.[2] Our estimates thus exploit 447 separate "events" (cases where (i) occurs) and

[2]The design is "staggered" since the year of treatment varies by party and district. A sizable econometric literature advises against simply estimating OLS regressions with year and district fixed effects. See Callaway and Sant'Anna (2021) for further discussion. Our results are robust to different estimation methods. We also impose the condition that once a female candidate is nominated by a party in a given district, the candidate gender in all subsequent elections in the period remains female.

889 "controls" (cases where (ii) occurs). As for each case we use data for two elections before and after the time of the event, our total sample size is 5,344. Standard errors are clustered at the district level.

Figure A15 presents the results in an "event study" plot, estimated separately for each party and period (and also pooling all six parties). The outcome (y-axis) is the standardized party vote share. To make effects comparable across parties and periods, we divide the dependent variable (party vote share) by its party-specific standard deviation (separately for both periods). Time zero represents when a switch from male to female candidate occurred. In a given panel, the two leftmost markers being close to zero indicate "parallel trends": control and treatment units were evolving similarly regarding their party vote (conditional on year and district fixed effects). The two rightmost markers being close to zero suggest that a switch in candidate gender did not affect party vote.

Overall, the results give us little reason to assume that SMD candidate gender has a causal effect on party vote shares. Virtually all coefficients are insignificant and their substantive magnitude is also small, except in cases with smaller samples and noisier estimates (e.g., the AfD). Measured in vote shares, the estimates for the CDU/CSU and SPD translate to an effect of 0.55 p.p. and 0.16 p.p., respectively, which is negligible (roughly just 1% of their average party vote shares of 38% and 32%, respectively).

Pooling all parties provides us with the case with the most power to find effects. However, we find fairly precise zeros, corroborating the overall interpretation that SMD candidate gender does not affect party list votes.[3]

C The Role of Additional Covariates

This appendix discusses the role of additional covariates in explaining our results. It first provides a brief description of gender differences in the three main charateristics we observe in the data (age, occupation, and experience in office) differ by gender.

Then we discuss how additional covariates can be added to the decomposition, which informs the results in Figures A9 and A16.

Gender differences in age, occupation, and experience in office. Sections 4 and 7 discusses how we observe age, occupational prestige scores, and number of times elected to the Bundestag for all candidates in our sample. Table A2 presents summary statistics on candidate characteristics. Female candidates have more prestigious occupations (slightly less so for the CDU/CSU and FDP), are of the same age, and have held office for fewer terms, relative to male candidates. Figure A7 shows their evolution over time by party and gender.

To systematically assess which candidate characteristics are correlated with electoral success,

[3]Coefficients on this panel are calculated by taking averages across party coefficients (plotted in other panels) for the appropriate period and event-time. To calculate variances, we assume that period-party-specific estimates are independent (an assumption that plays no role in determining the coefficients themselves, only on the confidence intervals). This approach is preferable than pooling data from all parties and re-estimating the difference-in-differences design. When estimated separately for each party, the control group is composed of other districts and elections where the same party fielded male candidates consistently. If data from multiple parties were pooled, the same district and election could provide multiple treatment and control units simultaneously, complicating the interpretation of results.

we regress candidate vote share on the three variables, while using party vote share as control. Table A7 provides the results, for all parties and the CDU/CSU and SPD separately. Moreover, Figure A8 presents the results from similar regressions ran separately for each year.

The overall conclusion from the regressions is that the only characteristic consistently correlated with vote share is prior experience in office (a positive correlation). While this at first would suggest previous experience and incumbency could play a potential role in our results, Figure 6 discussed in Section 7 indicates that our main results hold for the subset of open seats, where incumbency and previous experience cannot play a role.

Adding covariates to the decomposition. We adjust our the decomposition from Section 6 by adding a set of K additional covariates denoted by $X^g_{1,idt}, X^g_{2,idt}, ..., X^g_{K,idt}$ for candidate i of gender g in district d at election year t. Using only female candidates, one can estimate the following equation via OLS:

$$CV^W_{idt} = \alpha^W + \beta^W PV^W_{idt} + \sum_{j=1}^{K} \gamma^W_j X^W_{j,idt} + \epsilon_{idt} \tag{4}$$

where γ^W_j denote a set of K coefficients on the X_j variables, with $j = 1, 2, ..., K$. Exactly as before, CV^W_{idt} is the candidate vote share and PV_{idt} is the party list vote share. The same equation can be estimated using only male candidates:

$$CV^M_{idt} = \alpha^M + \beta^M PV^M_{idt} + \sum_{j=1}^{K} \gamma^M_j X^M_{j,idt} + \epsilon_{idt} \tag{5}$$

Following the same logic of Section 6, the decomposition formula is now:[4]

$$\begin{aligned}
&\overline{CV^W} - \overline{CV^M} = \alpha^W + \beta^W \overline{PV^W} + \sum_{j=1}^{K} \gamma^W_j \overline{X^W_j} - \alpha^M - \beta^M \overline{PV^M} - \sum_{j=1}^{K} \gamma^M_j \overline{X^M_j} = \\
&= [\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M} + \sum_{j=1}^{K} (\gamma^W_j - \gamma^M_j)\overline{X^M_j}] + \beta^W(\overline{PV^W} - \overline{PV^M}) + \sum_{j=1}^{K} \gamma^W_j (\overline{X^W_j} - \overline{X^M_j})
\end{aligned} \tag{6}$$

where the term $\beta^W(\overline{PV^W} - \overline{PV^M})$ has the same interpretation discussed in Section 6.

There are now K additional terms that have a similar interpretation conditional on what the variable X_j measures. For example, if X_j is candidate age, then $\gamma^W_j(\overline{X^W_j} - \overline{X^M_j})$ measures the part of the gender vote gap attributed to gender differences in candidate age. It captures a counterfactual thought exercise of how much the gender vote gap would reduce if male and female candidates had, on average, similar ages. The $[\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M} + \sum_{j=1}^{K}(\gamma^W_j - \gamma^M_j)\overline{X^W_j}]$ term has a similar interpretation as the "voters" term (Section 6). A key difference is that it is now based on deviations between party and candidate vote conditional not only on PV but also

[4] As before, the derivation uses the OLS property of $\overline{CV^g} = \alpha^g + \beta^g \overline{PV^g} + \sum_{j=1}^{K} \gamma^g_j \overline{X^g_j}$ for $g \in \{M, W\}$. The step between the two lines is only algebraically rearranging terms after adding $(\beta^W \overline{PV^M} + \sum_{j=1}^{K} \gamma^W_j \overline{X^M_j}) - (\beta^W \overline{PV^M} + \sum_{j=1}^{K} \gamma^W_j \overline{X^M_j}) = 0$ to right hand side.

all the X_j variables.

Lastly, we reiterate the *decomposition* aspect of the method. All the terms on the right hand side of equation (6) add up exactly to $\overline{CV^W} - \overline{CV^M}$. This implies that if the covariates account for a large share of the gender vote gap, the party nominations cannot account for almost all the gender vote gap. When it does (as Figures A9 and A16 suggest), it is through a combination of gender differences in covariates ($\overline{X_j^W} - \overline{X_j^M}$) and/or its explanatory power on CV, conditional on PV, being small (the γ_js).

Results. The top row of Figure A9 provides results based on the decomposition with additional covariates. We include not only the three observable candidate characteristics (age, occupational prestige, times elected to office) but also its average value for other SMD candidates in the same district and year. We thus control for differences in characteristics of the candidate herself and her challengers (e.g., accounting for the possibility that female candidates face systematically different opponents). As before, the party nomination term accounts for the gender vote gap and its variation over time across parties.

The bottom row adds as covariates a set of variables capturing gender attitudes in the district: a gender equality index ("Gleichstellungsindex", 2013), the share of women in full time employment (2013), and the gender wage gap (2009). Since these controls were measured in either 2009 and 2013, we only include elections after 2000. See Section 10 for further discussion. To make it as comparable as possible to other figures, we omit the covariates term $\sum_{j=1}^{K} \gamma_j^W (\overline{X_j^W} - \overline{X_j^M})$ from the Figure A9, and present the gender vote gap and the party and voters components.

The middle row presents a separate robustness test, using lagged party vote (i.e., PV_{idt-1} instead of PV_{idt}). See Section 7 for further discussion.

D Additional Results using GLES Covariates

This appendix provides further information on the German Longitudinal Election Study (GLES) data described in Section 4 and presents results discussed in Section 7. While it provides a richer set of candidate characteristics, it covers only three elections (2009, 2013, and 2017) and only 27.6% of SMD candidates completed the survey to an extent we can observe their characteristics.[5]

Specifically, we use the following GLES variables: highest educational attainment, employment status, marital status, years of party membership, left-right self-placement, and campaign budget. We also use seven variables on prior political activities: being employed in the party, holding local party office, holding state-level party office, being a local representative, being a state representative, being a mayor, and being a member of the state government (all binary indicators).

Table A11 lists the variables and their averages by gender. Relative to male candidates, women have on average more political experience (particularly at the state and local level). They also have been party members 0.8 longer on average and place themselves further left. Female candidates are less likely to hold vocational degrees and conversely more likely to hold MA-equivalent degrees. However, they are 15.9 p.p. less likely to be full-time employed. They are also more likely to be single or divorced.

[5]Overall, we 1,363 observations (candidate-district-year combinations) in our GLES-supplemented dataset, compared to 15,988 in the "main" dataset.

Figure A16 presents decomposition results. It follows the formula of equation (6) in Appendix C using all variables in Table A11 as additional covariates (X_js). Across all parties, the vast majority of the gender vote gap can be explained by the party nominations component. Results are less precise since the sample is smaller (only three elections and only a fraction of candidates answer the survey), but largely corroborate our main results. To make it as comparable as possible to other figures, we omit the covariates term $\sum_{j=1}^{K} \gamma_j^W(\overline{X_j^W} - \overline{X_j^M})$ from the figure and present the gender vote gap and the party and voters components.

E Additional Results on Gender-Biased Gatekeeping

This appendix provides further info on the analysis discussed conceptually in Section 2 and empirically in Section 8. It relates to how our results may be driven by a mechanism involving homophily among male party gatekeepers. As discussed in Sections 3 and 8, locally elected officials are influential in candidate selection, and using its gender composition is a reasonable proxy for the gender composition of local party gatekeepers.

We use data from Eder and Fortin-Rittberger (2017), which provides us with the share of female representatives in both city and council legislatures at different points in time, which we can match to the 2002, 2005, 2009, and 2013 elections.[6] The data is party-specific, so it varies at the party-district-year level. Specifically, we observe the share of women of a given party in a city or county council as a share of all representatives from the same party.

We limit the analysis to CDU/CSU and SPD since they are the parties with substantial gender vote gaps (Figure 5). Moreover, we can consistently observe their share of women in local councils (smaller parties are often not represented in them). The median female share in local councils is approximately 20% for the CDU/CSU and 30% for the SPD, with little variation across the period we observe them. Note this implies most of the "above median" districts are still male-dominated and gender parity is rare. Moreover, it is not feasible for us to estimate effects only on cases where the local council has a female majority.

Figure 7 implements our decomposition similarly to Figure 5 analysis, but separately for electoral districts with above-median and below-median female representation in *county* councils. Figure A10 does the same for *city* councils. We discuss the results in Section 8.

[6] Data for later periods is not available and for earlier periods only cover a subset of the country.

F Additional Tables and Figures

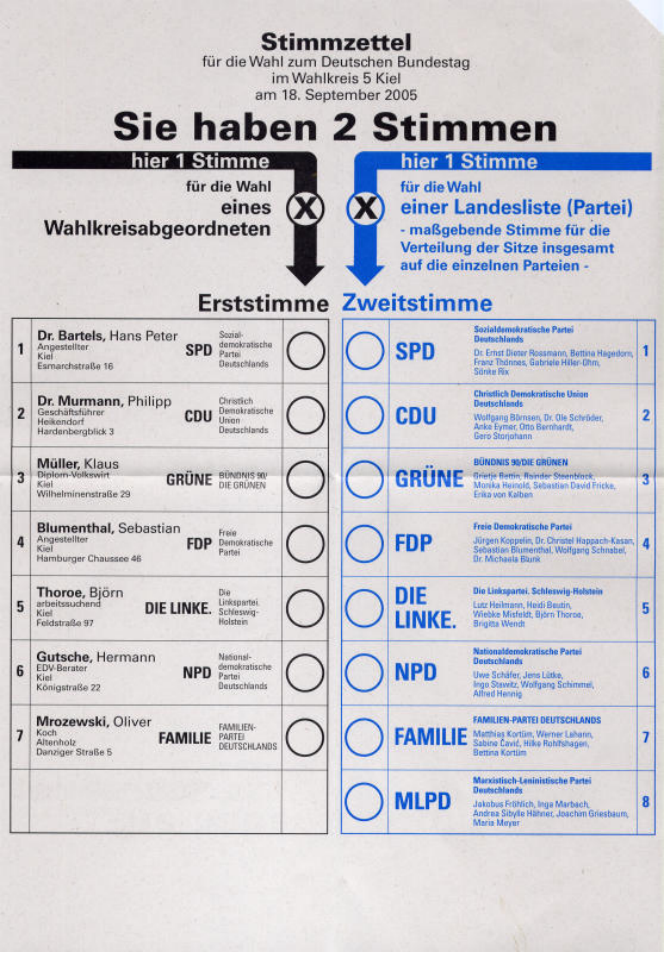


Figure A1: Example of a Bundestag Election Ballot

Notes: The image shows a German ballot with the single-member district (candidate) vote on the left and the party list vote on the right.

Table A1: Number of District Races (Observations), by Party and Candidate Gender

	All Parties	CDU/CSU	SPD	Left	Greens	FDP	AfD
Elections in sample	1983-2021	1983-2021	1983-2021	1990-2021	1983-2021	1983-2021	2013-2021
Races with a female candidate	3,960	550	1,015	636	1,104	569	86
Races with a male candidate	12,028	2,723	2,258	1,636	2,061	2,699	651

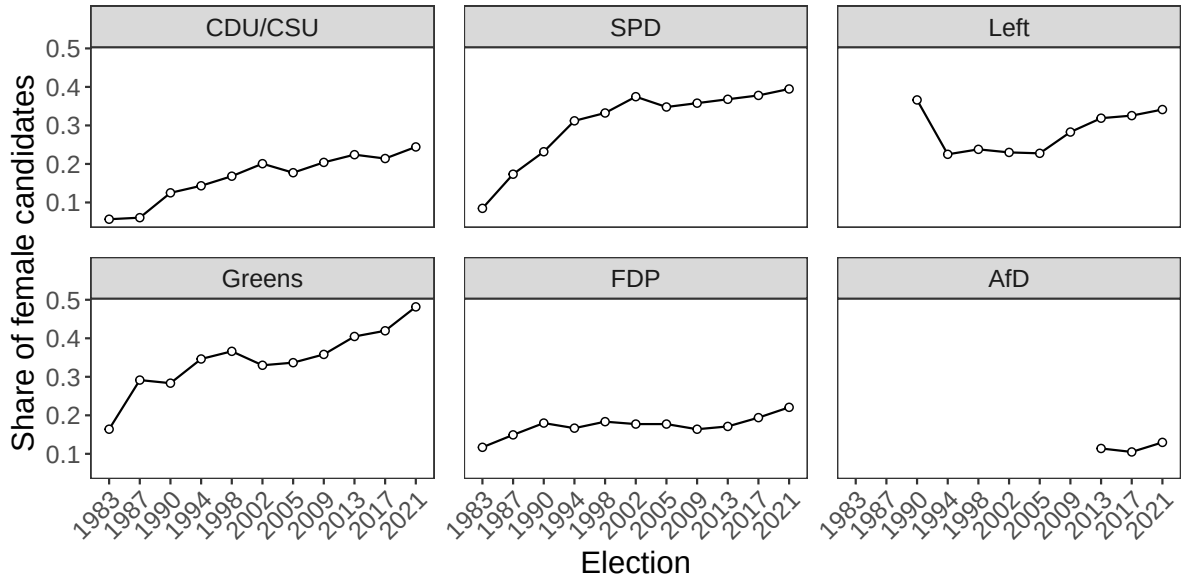
Notes: The table contains the years a party is observed in our sample, as well as the number of races (district-year pairs) where it fielded a male or female SMD candidate for the district mandate.

Table A2: Summary Statistics for Main Sample

	All Parties	CDU/CSU	SPD	Left	Greens	FDP	AfD
			Candidate vote				
Male candidate	20.21	42.54	36.02	7.06	6.61	5.37	9.65
Female candidate	18.51	37.23	33.03	10.12	7.95	5.75	9.5
Full sample	19.79	41.65	35.09	7.91	7.08	5.44	9.63
			Party vote				
Male candidate	19.85	38.61	33.16	7.32	7.86	8.84	10.17
Female candidate	18.17	33.55	30.09	10.15	9.33	9.37	10.02
Full sample	19.43	37.76	32.21	8.12	8.37	8.93	10.15
			SES (ISEI08, 0–100)				
Male candidate	59.77	57.39	60.8	54.62	62.83	62.08	59.77
Female candidate	61.43	57.23	60.7	62.23	64.75	59.84	58.73
Full sample	60.18	57.37	60.77	56.75	63.5	61.69	59.65
			Age in years				
Male candidate	46.88	49.71	48.25	46.13	42.32	45.54	52.17
Female candidate	46.39	49.19	48.48	46.26	43.73	44.93	48.85
Full sample	46.76	49.62	48.32	46.17	42.81	45.43	51.79
			Times elected previously				
Male candidate	0.61	1.4	1.05	0.1	0.13	0.25	0
Female candidate	0.55	1.01	1	0.3	0.25	0.24	0
Full sample	0.59	1.34	1.03	0.15	0.17	0.25	0

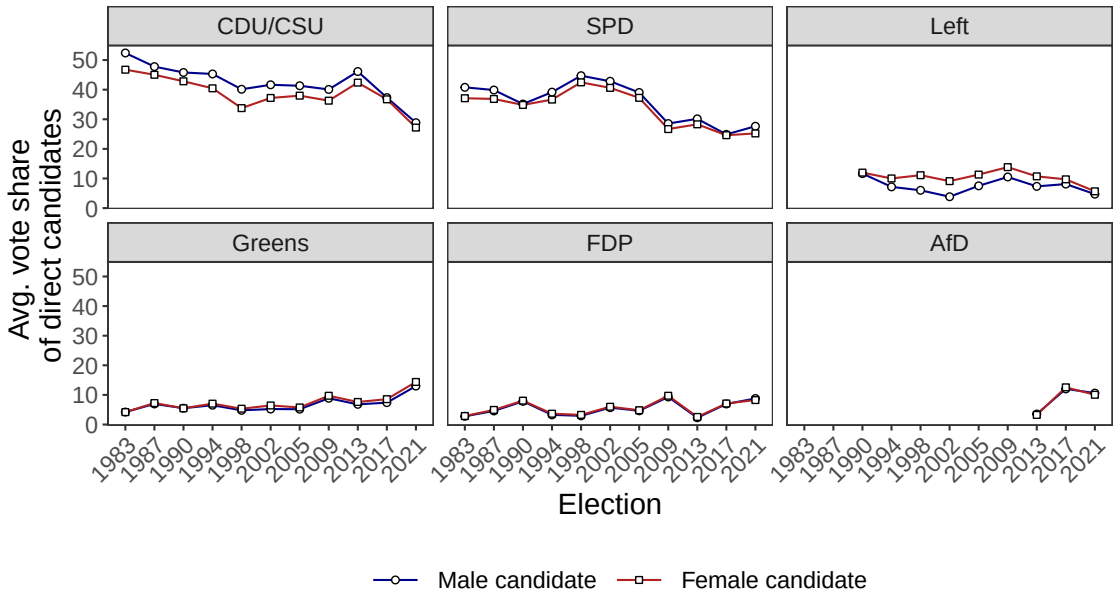
Notes: Table presents average candidate and party vote shares, as well as candidate characteristics, separately by party and candidate gender.

Figure A2: Proportion of Female SMD candidates Over Time



Notes: The figure shows the proportion of female SMD candidates by party and election in our main sample.

Figure A3: SMD Candidates' Vote Shares by Gender, Party, and Year



Notes: Figure shows average vote shares for male and female SMD candidates, separately for each party and election.

Table A3: Decomposition Results

Party	Voters (p.p.)	Party (p.p.)	Total Gap (p.p.)
SPD	0.239	-3.224	-2.985
CDU/CSU	-0.008	-5.295	-5.303
Greens	0.034	1.298	1.332
FDP	0.032	0.345	0.377
Left	-0.021	3.080	3.059
AfD	0.003	-0.152	-0.149

Notes: Table presents the decomposition described in equation (3), separately by party. It provides the table counterpart to Figure 5. The "Party" term is $\beta^W(\overline{PV^W} - \overline{PV^M})$, representing the contribution of gender-biased party nominations. The "Voters" term is $[\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M}]$, representing the contribution of voters. They add up to the "Total" gender vote gap $(\overline{CV^W} - \overline{CV^M})$. Negative numbers indicate female candidates underperforming male candidates or a component contributing to underperformance. Table A4 provides the individual coefficients and averages that enter the terms.

Table A4: Decomposition Results by Party: Individual Components

Party	α^W	α^M	β^W	β^M	$\overline{PV^M}$	$\overline{PV^W}$	$\overline{CV^M}$	$\overline{CV^W}$	Parties	Voters	Total
SPD	1.498	2.021	1.048	1.025	33.164	30.088	36.019	33.034	-3.224	0.239	-2.985
CDU/CSU	2.128	4.081	1.046	0.996	38.614	33.553	42.538	37.235	-5.295	-0.008	-5.303
Greens	-0.325	-0.422	0.887	0.895	7.862	9.326	6.613	7.946	1.298	0.034	1.332
FDP	-0.347	-0.833	0.651	0.702	8.840	9.370	5.372	5.749	0.345	0.032	0.377
Left	-0.948	-0.720	1.090	1.062	7.325	10.150	7.057	10.116	3.080	-0.021	3.059
AfD	-1.009	-0.912	1.048	1.039	10.170	10.025	9.650	9.501	-0.152	0.003	-0.149

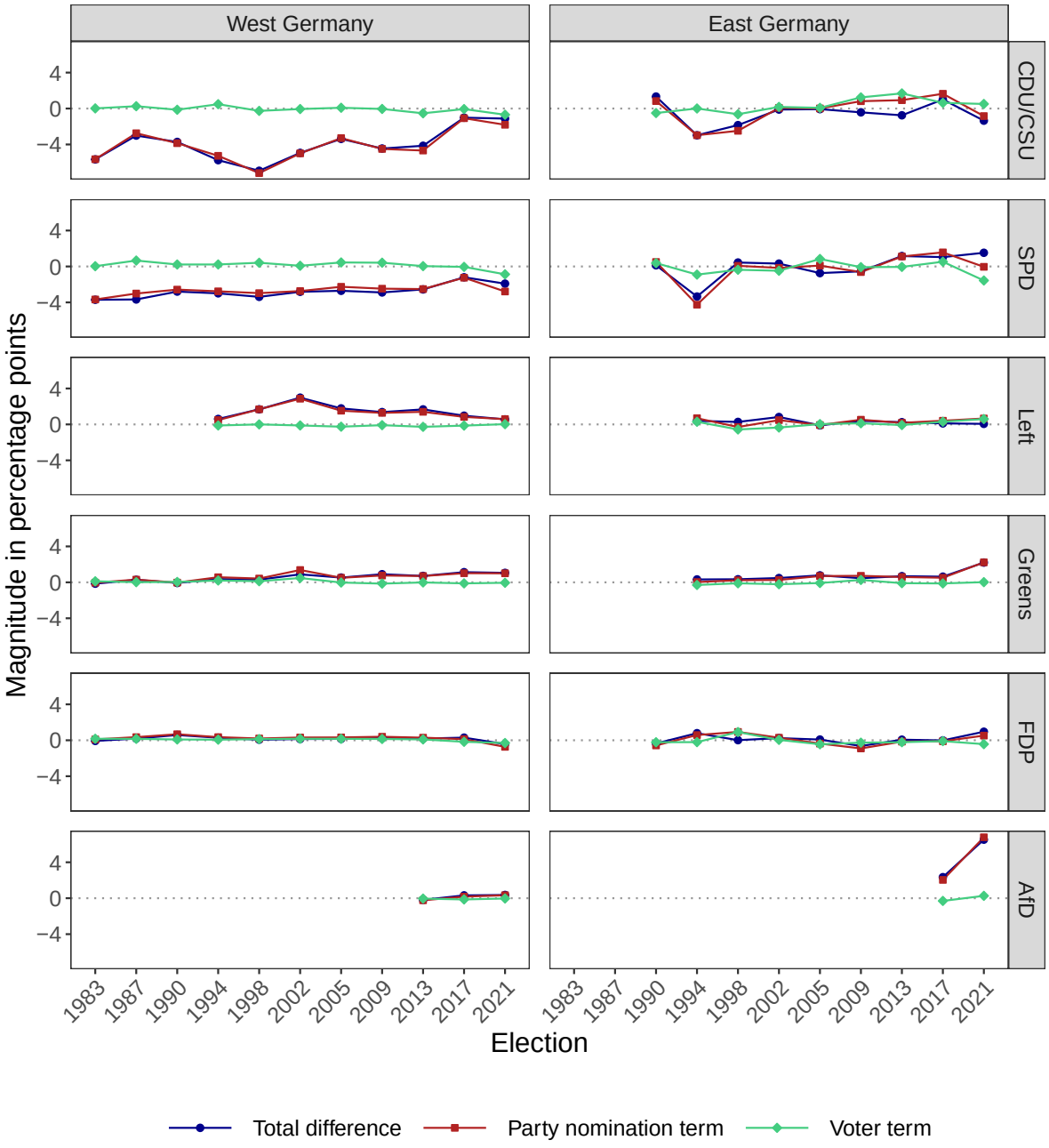
Notes: Table presents the individual components (estimated coefficients and averages) that enter the decomposition described in equation (3), separately for each party. It allows to calculate the terms in Figure 4 and Table A3.

Table A5: Decomposition Results by Party and Year: Individual Components

		α^F	α^M	β^F	β^M	$\overline{PV^M}$	$\overline{PV^F}$	$\overline{CV^M}$	$\overline{CV^F}$	Party	Voters	Total
1983	SPD	1.04	0.99	1.03	1.03	38.58	34.98	40.78	37.11	-3.71	0.03	-3.67
1987	SPD	2.14	1.82	1.01	1.00	37.84	34.23	39.88	36.86	-3.67	0.66	-3.01
1990	SPD	-0.44	-0.19	1.07	1.05	33.52	32.99	35.14	34.84	-0.56	0.26	-0.30
1994	SPD	-0.09	0.84	1.06	1.03	37.26	34.70	39.16	36.66	-2.71	0.20	-2.51
1998	SPD	2.17	1.48	1.02	1.03	41.87	39.43	44.72	42.47	-2.49	0.25	-2.24
2002	SPD	2.12	2.85	1.03	1.01	39.48	37.34	42.84	40.61	-2.19	-0.03	-2.23
2005	SPD	-1.44	-2.04	1.17	1.18	34.97	32.95	39.04	37.25	-2.38	0.58	-1.80
2009	SPD	-2.70	-1.21	1.34	1.26	23.65	21.93	28.56	26.69	-2.29	0.43	-1.86
2013	SPD	-2.97	-1.48	1.26	1.20	26.31	24.82	30.15	28.30	-1.87	0.02	-1.85
2017	SPD	-1.32	-1.56	1.27	1.27	20.76	20.48	24.90	24.61	-0.36	0.08	-0.28
2021	SPD	-4.18	-6.26	1.16	1.28	26.50	25.32	27.64	25.23	-1.36	-1.06	-2.42
1983	FDP	0.003	-0.16	0.42	0.42	6.94	6.77	2.78	2.87	-0.07	0.17	0.10
1987	FDP	-0.26	-0.09	0.56	0.52	8.98	9.32	4.58	4.93	0.19	0.16	0.35
1990	FDP	0.38	-2.11	0.67	0.91	10.93	11.47	7.83	8.06	0.36	-0.13	0.23
1994	FDP	1.64	1.39	0.27	0.28	6.61	7.47	3.26	3.65	0.23	0.15	0.39
1998	FDP	1.99	1.15	0.20	0.30	6.04	6.34	2.94	3.26	0.06	0.26	0.32
2002	FDP	1.77	1.36	0.56	0.59	7.31	7.53	5.70	6.01	0.12	0.18	0.31
2005	FDP	1.54	1.34	0.32	0.34	9.68	10.21	4.64	4.82	0.17	0.01	0.18
2009	FDP	1.48	1.65	0.55	0.54	14.32	15.09	9.31	9.72	0.42	-0.01	0.41
2013	FDP	0.52	0.42	0.39	0.41	4.60	5.18	2.29	2.56	0.23	0.04	0.27
2017	FDP	1.19	0.98	0.53	0.56	10.53	11.19	6.94	7.10	0.34	-0.18	0.16
2021	FDP	0.53	-0.73	0.69	0.83	11.47	11.17	8.79	8.27	-0.21	-0.31	-0.52
1983	Greens	0.83	0.89	0.62	0.59	5.61	5.37	4.21	4.18	-0.15	0.12	-0.03
1987	Greens	1.74	1.11	0.65	0.72	8.10	8.54	6.95	7.25	0.28	0.02	0.30
1990	Greens	0.30	0.85	1.10	0.98	4.77	4.71	5.51	5.49	-0.07	0.04	-0.03
1994	Greens	1.51	0.91	0.72	0.79	7.12	7.67	6.52	7.05	0.40	0.13	0.53
1998	Greens	1.05	0.11	0.60	0.74	6.37	7.14	4.79	5.34	0.46	0.09	0.55
2002	Greens	1.14	0.49	0.55	0.60	7.96	9.56	5.22	6.43	0.89	0.33	1.21
2005	Greens	0.23	-0.84	0.64	0.78	7.76	8.70	5.17	5.77	0.60	-0.004	0.60
2009	Greens	-0.07	-1.46	0.87	1.01	10.20	11.23	8.87	9.71	0.90	-0.06	0.84
2013	Greens	-0.56	-1.81	0.92	1.09	7.93	8.85	6.81	7.62	0.85	-0.04	0.81
2017	Greens	-1.15	-0.59	1.02	0.97	8.25	9.53	7.39	8.56	1.31	-0.14	1.17
2021	Greens	-0.62	-1.35	0.98	1.04	13.77	15.27	12.98	14.37	1.47	-0.08	1.39
1983	CDU/CSU	-0.62	2.96	1.08	1.01	49.01	43.78	52.40	46.75	-5.66	0.02	-5.64
1987	CDU/CSU	1.71	3.82	1.05	0.99	44.31	41.43	47.78	45.03	-3.01	0.26	-2.75
1990	CDU/CSU	-1.33	0.39	1.07	1.03	43.95	41.34	45.80	42.83	-2.79	-0.18	-2.98
1994	CDU/CSU	-3.28	0.43	1.17	1.07	41.77	37.40	45.31	40.46	-5.12	0.27	-4.85
1998	CDU/CSU	-0.99	2.14	1.15	1.07	35.55	30.28	40.13	33.77	-6.05	-0.31	-6.36
2002	CDU/CSU	2.64	3.91	1	0.96	39.10	34.57	41.65	37.20	-4.53	0.08	-4.44
2005	CDU/CSU	1.67	2.08	1.12	1.10	35.62	32.52	41.32	37.98	-3.46	0.12	-3.35
2009	CDU/CSU	-0.91	0.44	1.19	1.15	34.41	31.16	40.07	36.29	-3.88	0.10	-3.79
2013	CDU/CSU	-3.66	-1.87	1.18	1.14	42.23	39.15	46.13	42.38	-3.62	-0.13	-3.75
2017	CDU/CSU	-1.70	-2.69	1.18	1.21	32.99	32.46	37.31	36.74	-0.64	0.06	-0.58
2021	CDU/CSU	-0.55	0.33	1.19	1.18	24.26	23.33	28.85	27.20	-1.10	-0.55	-1.65
1990	Left	-0.54	-0.76	1.13	1.14	10.87	11.05	11.66	11.99	0.21	0.12	0.33
1994	Left	-0.74	-0.59	1.09	1.08	7.21	9.88	7.17	10.02	2.91	-0.06	2.85
1998	Left	-0.54	-0.38	1.06	1.07	5.98	11.02	6.01	11.11	5.33	-0.23	5.10
2002	Left	-0.60	-0.18	1.21	1.13	3.54	8.05	3.84	9.11	5.44	-0.17	5.27
2005	Left	-1.48	-0.94	1.07	1.03	8.19	11.91	7.52	11.32	4.00	-0.21	3.80
2009	Left	-1.78	-1.42	1.08	1.06	11.30	14.41	10.51	13.84	3.37	-0.05	3.32
2013	Left	-1.66	-1.45	1.13	1.14	7.72	10.94	7.34	10.72	3.65	-0.26	3.38
2017	Left	-2.58	-1.97	1.20	1.14	8.82	10.21	8.11	9.71	1.67	-0.07	1.60
2021	Left	-1.42	-1.25	1.32	1.26	4.72	5.35	4.72	5.67	0.84	0.12	0.95
2013	AfD	0.16	-0.22	0.72	0.82	4.57	4.25	3.54	3.24	-0.23	-0.07	-0.30
2017	AfD	-1.17	-0.92	1.03	1.02	12.72	13.38	12.04	12.55	0.68	-0.15	0.52
2021	AfD	-1.01	-0.56	1.09	1.04	10.69	10.11	10.61	10.05	-0.63	0.07	-0.56

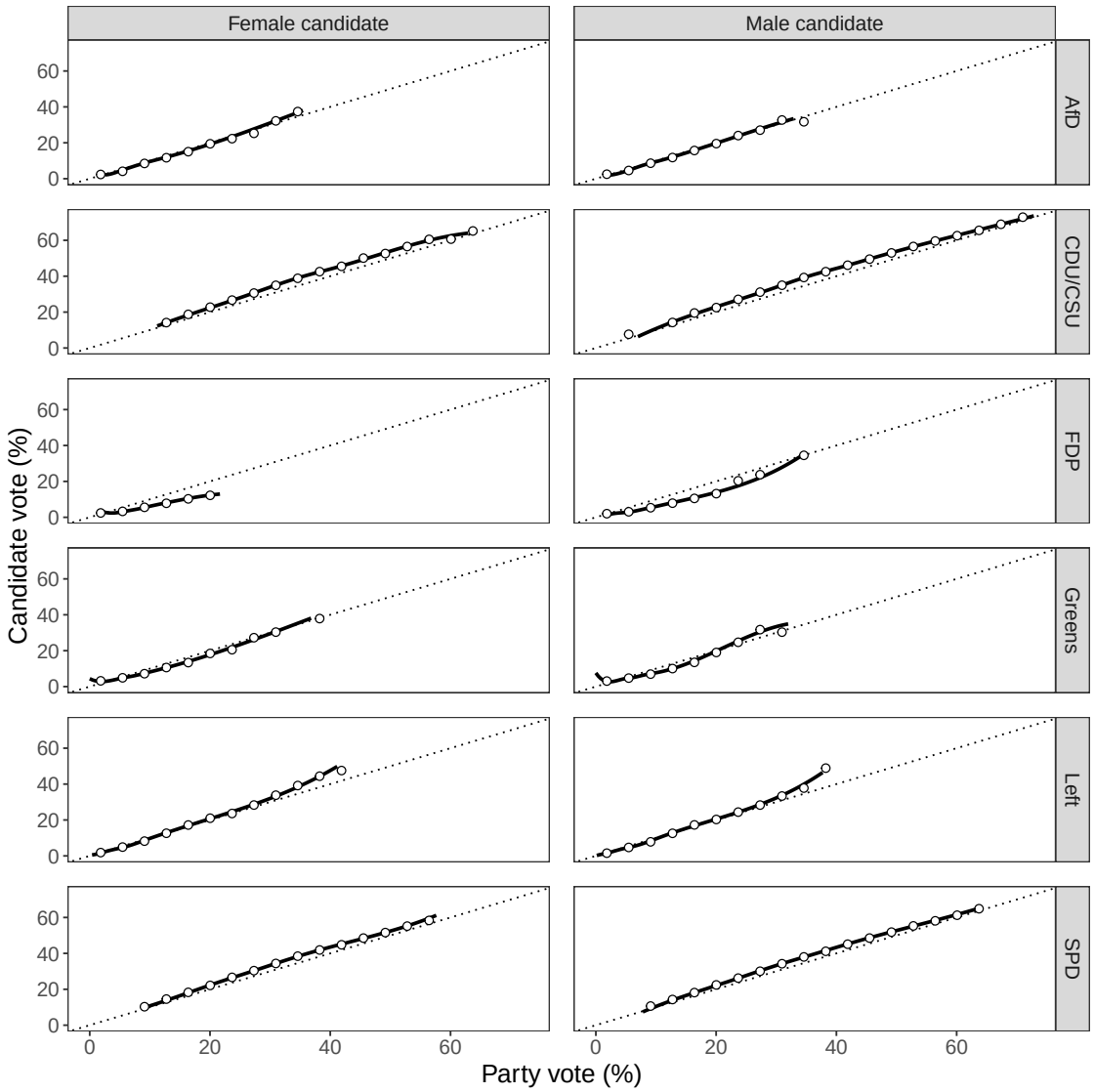
Notes: Table presents the individual components (estimated coefficients and averages) that enter the decomposition described in equation (3), separately by party and year. It allows to calculate the terms in Figure 5.

Figure A4: Decomposition Results Separately for West and East Germany



Notes: Figure presents the decomposition described in equation (3), separately by party and year. We further split the sample into West and East Germany, thus replicating Figure 5 separately for the two regions. The "Party nomination term" is $\beta^W(\overline{PV^W} - \overline{PV^M})$, representing the contribution of gender-biased party nominations. The "Voter term" is $[\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M}]$, representing the contribution of voters. They add up to the "Total difference" (the gender vote gap $\overline{CV^W} - \overline{CV^M}$).

Figure A5: Relationship Between Candidate and Party Vote Shares



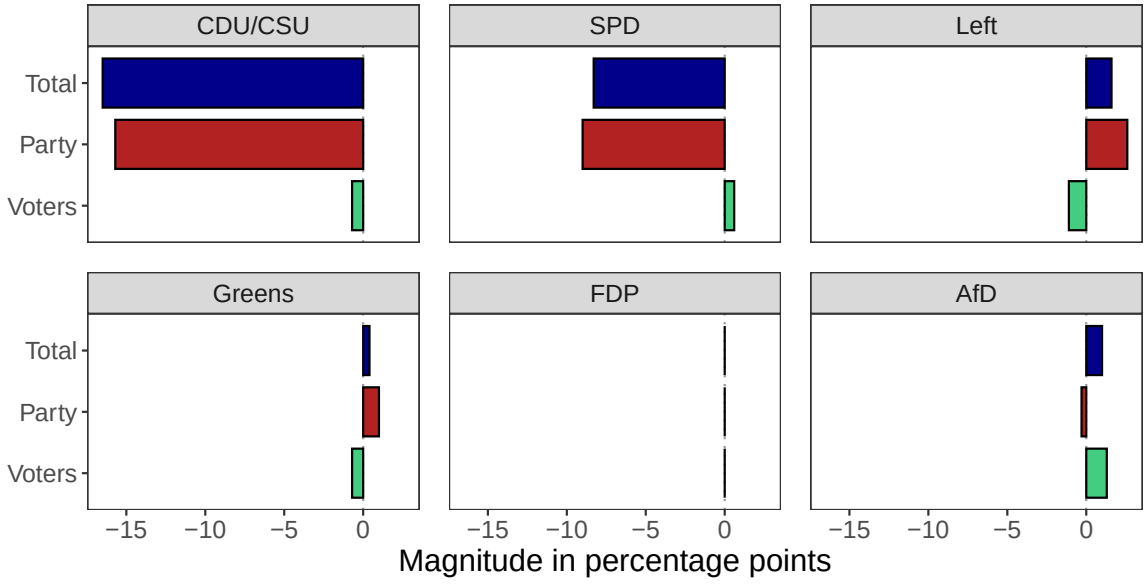
Notes: Figure presents a binned scatterplot, separately for each party and candidate gender. Circles represent conditional means of candidate vote shares (i.e., the figure is constructed by dividing the x-axis into equal-sized bins and plotting the average values of both variables in each bin). Solid lines are local polynomial regressions. Dotted lines represent the 45-degree line (slope equal one and intercept equal zero). Note also that the relationship for the CDU/CSU and SPD are above the 45-degree line, implying they receive more candidate votes than party votes on average (see also Figure 8).

Table A6: Decomposition Results for Probability of Winning the Single-Member District Race

Party	Voters	Party	Total Gap
SPD	0.006	-0.090	-0.083
CDU/CSU	-0.007	-0.157	-0.165
Greens	-0.007	0.010	0.004
FDP	0	0	0
Left	-0.011	0.026	0.016
AfD	0.013	-0.003	0.010

Notes: Table presents the decomposition described in equation (3) using an indicator equal to one if the candidate won the race (instead of vote shares) as the dependent variable. It does so separately by party, thus replicating Table A3 for the gender gap in the probability of winning. The "Party" term is $\beta^W(\overline{PV^W} - \overline{PV^M})$, representing the contribution of gender-biased party nominations. The "Voters" term is $[\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M}]$, representing the contribution of voters. They add up to the "Total" gender vote gap in the probability of winning. Negative numbers indicate female candidates underperforming male candidates or a component contributing to underperformance. Figure A6 provides the figure counterpart.

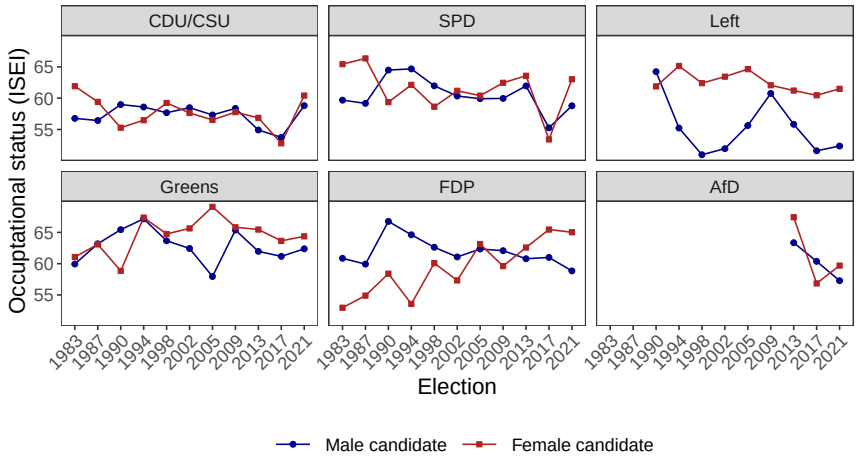
Figure A6: Decomposition Results for Probability of Winning the Single-Member District Race



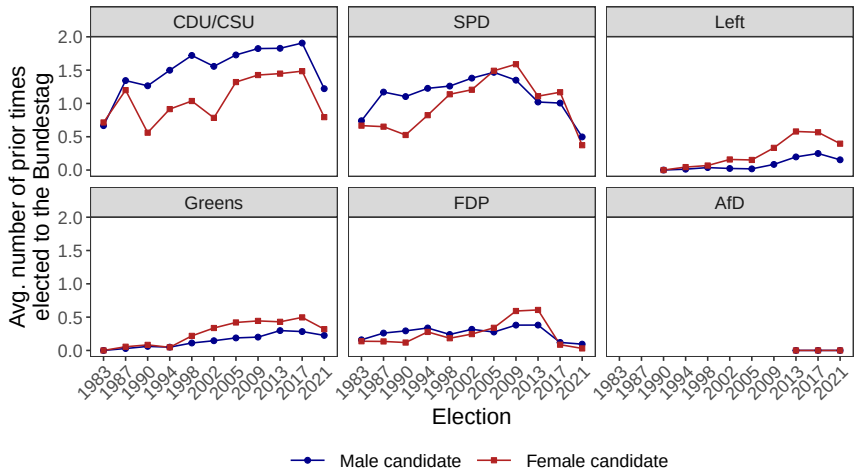
Notes: Figure presents the decomposition described in equation (3) using an indicator equal to one if the candidate won the race (instead of vote shares) as the dependent variable. It does so separately by party, thus replicating Figure 4 for the gender gap in the probability of winning. The "Party" bar is $\beta^W(\overline{PV^W} - \overline{PV^M})$, representing the contribution of gender-biased party nominations. The "Voters" bar is $[\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M}]$, representing the contribution of voters. They add up to the "Total" gender vote gap in the probability of winning. Negative numbers indicate female candidates underperforming male candidates or a component contributing to underperformance. Table A6 provides the figure counterpart.

Figure A7: Average Candidate Characteristcs, by Party and Year

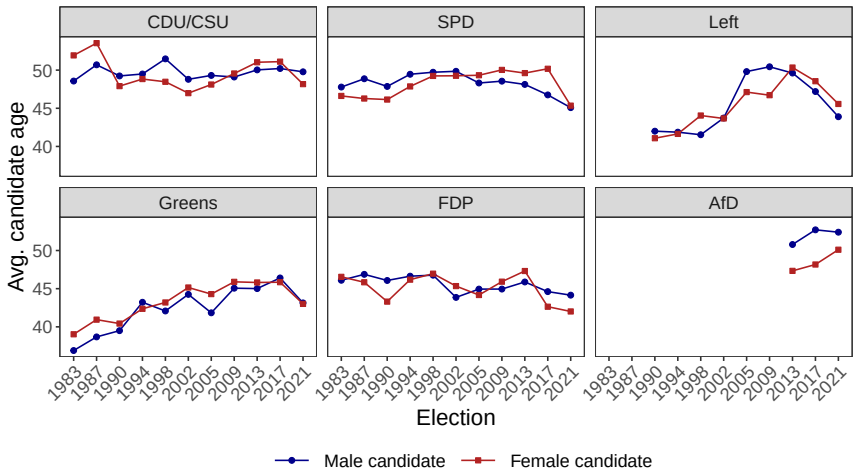
(a) Occupational Status



(b) Number of Times Previously Elected to the Bundestag



(c) Age



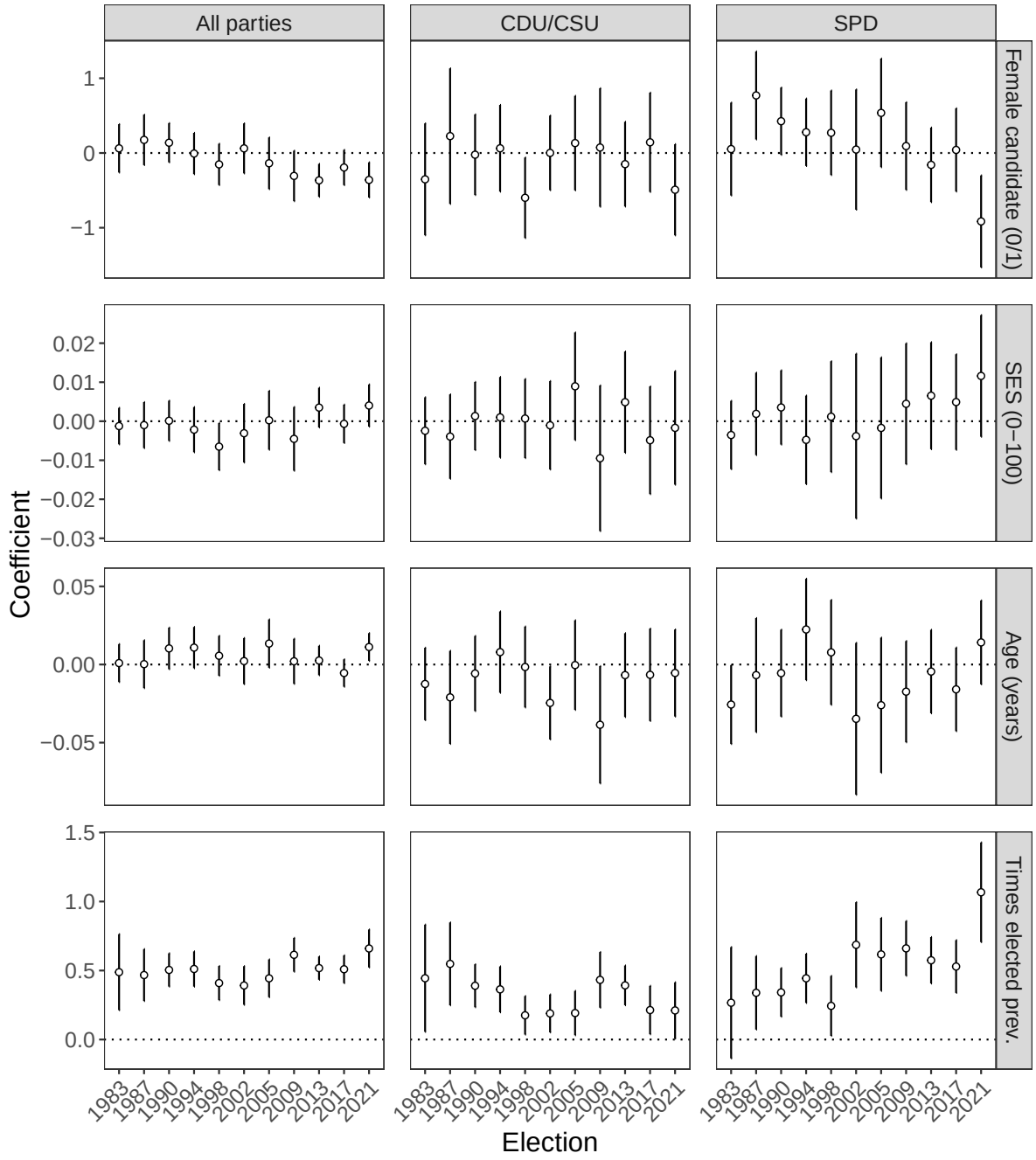
Notes: Each panel shows the relevant average candidate characteristic, calculated separately for each party, year, and candidate gender.

Table A7: Candidate Vote Share and Candidate Characteristics

	Candidate vote share (%, 0-100)					
	All parties		CDU/CSU		SPD	
	(1)	(2)	(3)	(4)	(5)	(6)
Party vote share	1.009***	0.995***	1.084***	1.066***	1.087***	1.075***
	(0.002)	(0.002)	(0.006)	(0.006)	(0.008)	(0.008)
Female candidate		−0.084**		−0.070		0.022
		(0.042)		(0.105)		(0.097)
SES (ISEI08)		−0.001		−0.004**		0.003
		(0.001)		(0.002)		(0.002)
Age		−0.0004		−0.018***		−0.001
		(0.002)		(0.005)		(0.005)
Times elected prev.		0.540***		0.327***		0.514***
		(0.018)		(0.028)		(0.036)
Electoral District FE	Yes	Yes	Yes	Yes	Yes	Yes
Election FE	Yes	Yes	Yes	Yes	Yes	Yes
Party FE	Yes	Yes	No	No	No	No
Observations	15,988	15,988	3,273	3,273	3,273	3,273
R^2	0.984	0.985	0.971	0.972	0.962	0.965

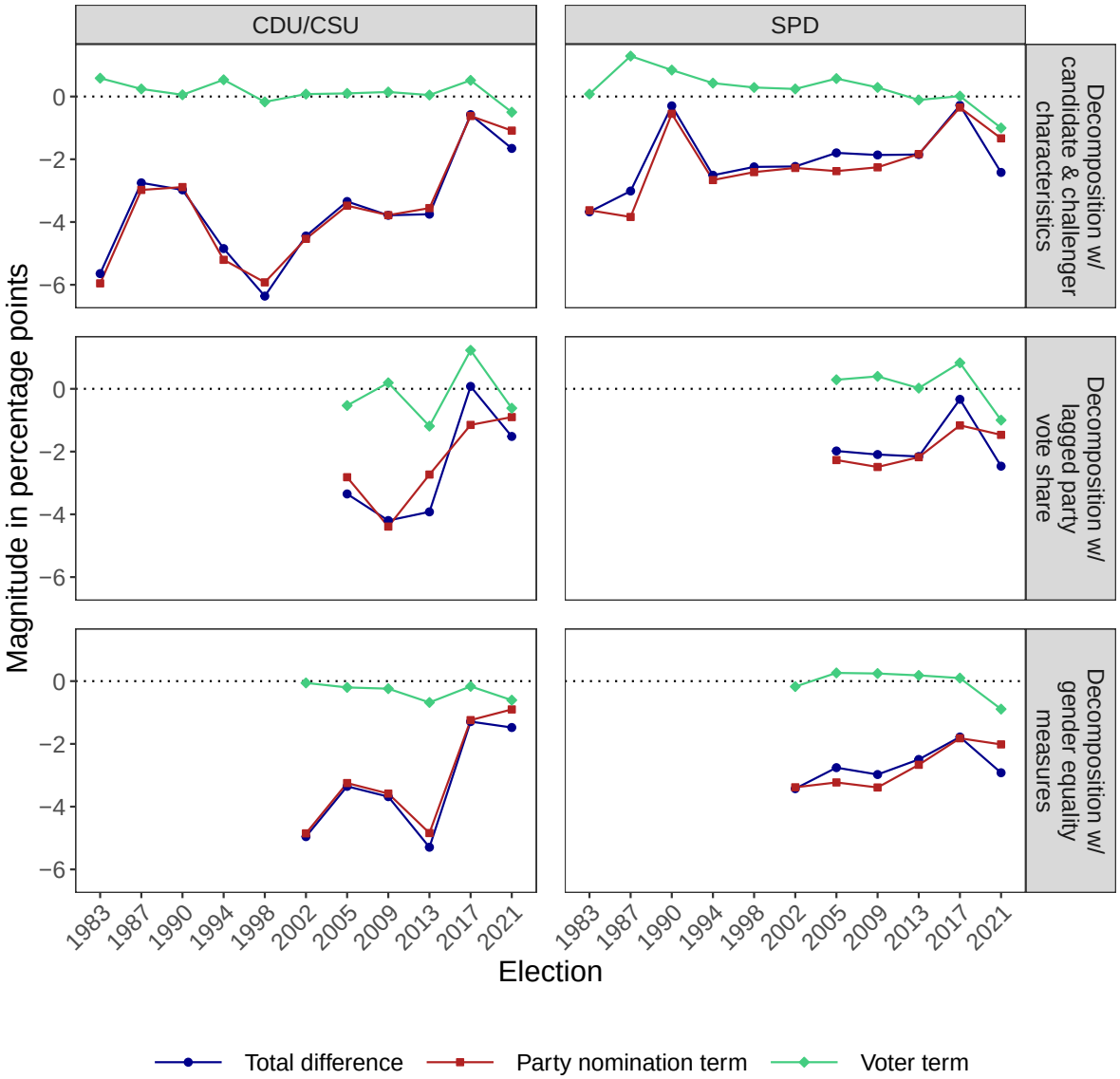
Notes: Standard errors in parentheses. The unit of observation is a district-party-year combination. The dependent variable is the SMD candidate vote share. The independent variables are party list vote share, candidate gender, socio-economic status (based on the ISEI08 measures), candidate age in years, and the number of times the candidate previously served in parliament. Both candidate and party vote shares are measured in percent on a scale from 0–100. A coefficient of one for the party vote share means that one additional percentage point of party vote shares is associated with one additional percentage point of candidate vote share. The first two columns show results for all parties, which include all six major parties. ***p < .001; **p < .01; *p < .05

Figure A8: Candidate Vote Share and Candidate Characteristics, by Year



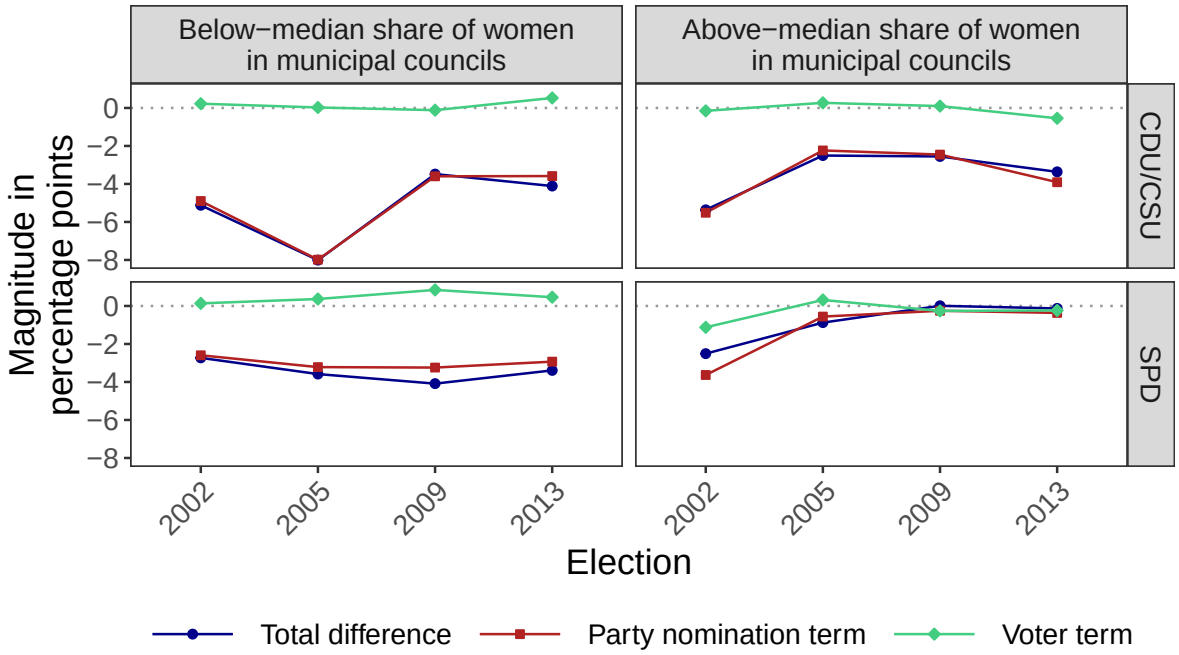
Notes: The figure shows estimates from re-estimating models 2, 4 and 6 from Table A7 separately for each election. Dots represent coefficients and vertical bars the 95% confidence intervals, presented separately by year and party. The unit of observation is a district-party-year combination. The dependent variable is the SMD candidate vote share. The independent variables are party list vote share, candidate gender, socio-economic status (based on the ISEI08 measures), candidate age in years, and the number of times the candidate previously served in parliament. Both candidate and party vote shares are measured in percent on a scale from 0–100. A coefficient of one for the party vote share means that one additional percentage point of party vote shares is associated with one additional percentage point of candidate vote share. Since we do not have candidate data before 1980, the 'times elected' variable is truncated for the first few elections in the 1980s. Thus caution should be exercised when examining over-time changes in such coefficients.

Figure A9: Decomposition results with additional covariates and lagged party vote share



Notes: Figure presents the decomposition described in equation (6), separately by party and year. The "Party nomination term" is $\beta^W(\overline{PV^W} - \overline{PV^M})$, representing the contribution of gender-biased party nominations. The "Voter term" is $[\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M} + \sum_{j=1}^{K}(\gamma_j^W - \gamma_j^M)\overline{X_j^M}]$, representing the contribution of voters. Together with the $\sum_{j=1}^{K}\gamma_j^W(\overline{X_j^W} - \overline{X_j^M})$ term, which is omitted from the graph, they add up to the "Total difference" (the gender vote gap $\overline{CV^W} - \overline{CV^M}$).
The top row panels are based on a decomposition with additional controls for candidate and challenger characteristics. The middle row panels use party vote share from the previous election, rather than the current one (without additional covariates X_j. It is only provided for 2005-2021 since a redistricting reform makes it unfeasible to track districts across elections before. The bottom row panels include controls for gender equality measures at the district level, a gender equality index ("Gleichstellungsindex", 2013), the share of women in full-time employment (2013), and the gender wage gap (2009). Since these controls were measured in either 2009 and 2013, we only include elections after 2000. See Appendix C for further information.

Figure A10: Decomposition Results by Party and Year, Comparing Districts with Smaller or Larger Female Representation in Municipal (City) Councils



Notes: Figure presents the decomposition described in equation (3), separately by party and year. We split the sample in two: cases where the share of female representatives in municipal (city) councils is above and below the (party-specific) median. The total, party nomination, and voter terms are defined as in Figure 5. Required data is only available for 2002-2013. Figure 7 replicates this figure using *county* councils data.

Table A8: Differences in Candidate-Party Vote Gap between Male and Female Candidates

	Vote gap (percentage points)						
	All parties	CDU/CSU	SPD	Left	Greens	FDP	AfD
Female candidate (0/1)	−0.107**	−0.296***	−0.134	0.115*	−0.120*	−0.112	0.064
	(0.043)	(0.110)	(0.102)	(0.070)	(0.068)	(0.078)	(0.079)
Party FEs	Yes	No	No	No	No	No	No
Election FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	15,988	3,273	3,273	2,272	3,165	3,268	737
Prop. female candidates	0.25	0.17	0.31	0.28	0.35	0.17	0.12
Mean vote gap, males	0.367	3.924	2.855	-0.268	-1.249	-3.468	-0.52
R^2	0.604	0.404	0.426	0.437	0.410	0.474	0.726

Notes: Standard errors in parentheses. The unit of observation is a district-party-year. The dependent variable is the vote gap (SMD candidate vote share minus party vote shares). It is measured in percpercent on a scale from 0–100. Positive coefficients indicate that female candidates receive more votes than their party, relative to men (e.g., a coefficient of -0.100 implies women have vote gaps that are 0.1 p.p. smaller than men, on average). ***p < .001; **p < .01; *p < .05

Table A9: Differences in Candidate-Party Vote Gap between Male and Female Candidates, by Candidate Rank

	Vote gap (percentage points)					
	CDU/CSU and SPD		**CDU/CSU**		**SPD**	
	Cand. 3rd or worse	Cand. 1st or 2nd	Cand. 3rd or worse	Cand. 1st or 2nd	Cand. 3rd or worse	Cand. 1st or 2nd
Female candidate (0/1)	−0.020	−0.291***	0.170	−0.200*	−0.276	−0.186*
	(0.283)	(0.077)	(0.379)	(0.111)	(0.322)	(0.106)
Party FEs	Yes	Yes	No	No	No	No
Election FEs	Yes	Yes	Yes	Yes	Yes	Yes
District FEs	Yes	Yes	Yes	Yes	Yes	Yes
Observations	313	6,233	102	3,171	211	3,062
Prop. female candidates	0.33	0.23	0.3	0.16	0.35	0.31
Mean vote gap, male candidates	0.799	3.555	1.599	3.986	0.388	3.015
R^2	0.693	0.293	0.906	0.422	0.824	0.438

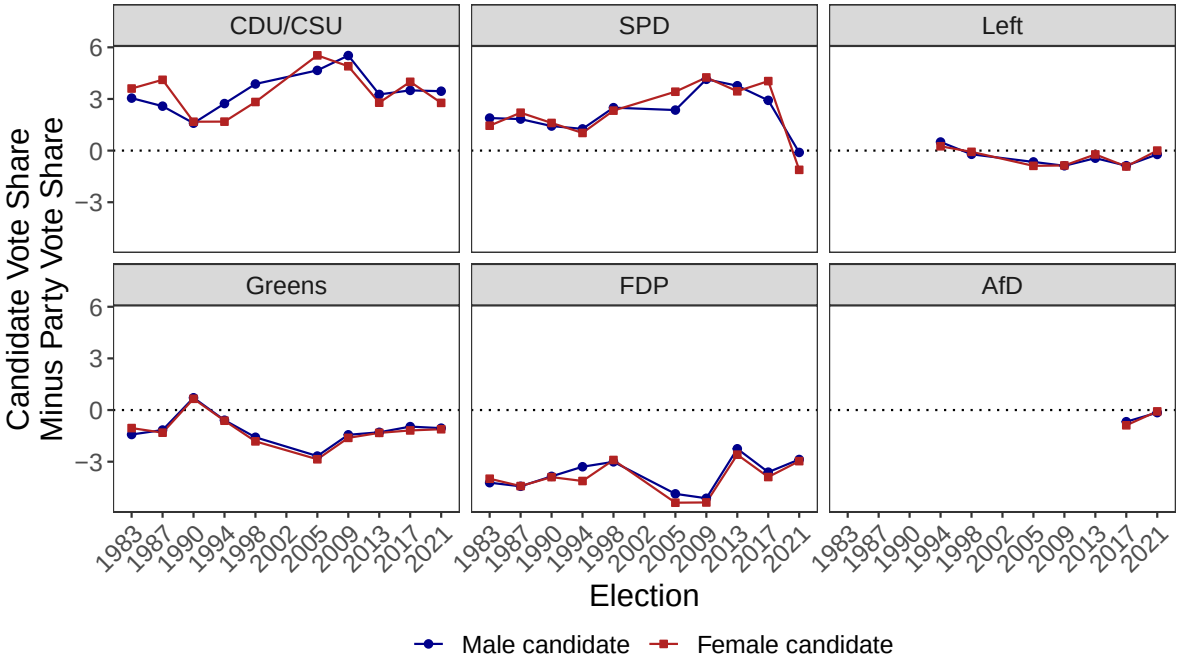
Notes: Standard errors in parentheses. The unit of observation is a district-party-year. The dependent variable is the vote gap (SMD candidate vote share minus party vote share). It is measured in percent on a scale from 0–100. Positive coefficients indicate that female candidates receive more votes than their party, relative to men (e.g., a coefficient of -0.100 implies women have vote gaps that are 0.1 p.p. smaller). We subset the data conditional on the rank that a given candidate achieves in her/his electoral district. ***p < .001; **p < .01; *p < .05

Table A10: Probability of Nominating a Female Candidate, by District Competitiveness

	Female candidate (c=5p.p.)			
	All parties	**CDU/CSU + SPD**	**CDU/CSU**	**SPD**
Safe seat (vs. competitive)	−0.067***	−0.059***	−0.030	−0.107***
	(0.015)	(0.015)	(0.023)	(0.027)
Sure loss (vs. competitive)	0.019	0.040*	0.017	0.072**
	(0.015)	(0.016)	(0.024)	(0.025)
Party FE	Yes	Yes	No	No
District FE	Yes	Yes	Yes	Yes
Election FE	Yes	Yes	Yes	Yes
N	15,988	6,546	3,273	3,273
R-squared	0.089	0.179	0.270	0.257
	Female candidate (c=10p.p.)			
Safe seat (vs. competitive)	−0.070***	−0.059***	−0.032	−0.128***
	(0.015)	(0.015)	(0.022)	(0.030)
Sure loss (vs. competitive)	0.018	0.057***	0.037	0.093***
	(0.014)	(0.015)	(0.027)	(0.026)
Party FE	Yes	Yes	No	No
District FE	Yes	Yes	Yes	Yes
Election FE	Yes	Yes	Yes	Yes
N	15,988	6,546	3,273	3,273
R-squared	0.089	0.179	0.270	0.257
	Female candidate (c=15p.p.)			
Safe seat (vs. competitive)	−0.082***	−0.078***	−0.048*	−0.145***
	(0.015)	(0.016)	(0.022)	(0.033)
Sure loss (vs. competitive)	0.002	0.057**	0.052	0.071*
	(0.014)	(0.019)	(0.036)	(0.029)
Party FE	Yes	Yes	No	No
District FE	Yes	Yes	Yes	Yes
Election FE	Yes	Yes	Yes	Yes
N	15,988	6,546	3,273	3,273
R-squared	0.088	0.179	0.271	0.253

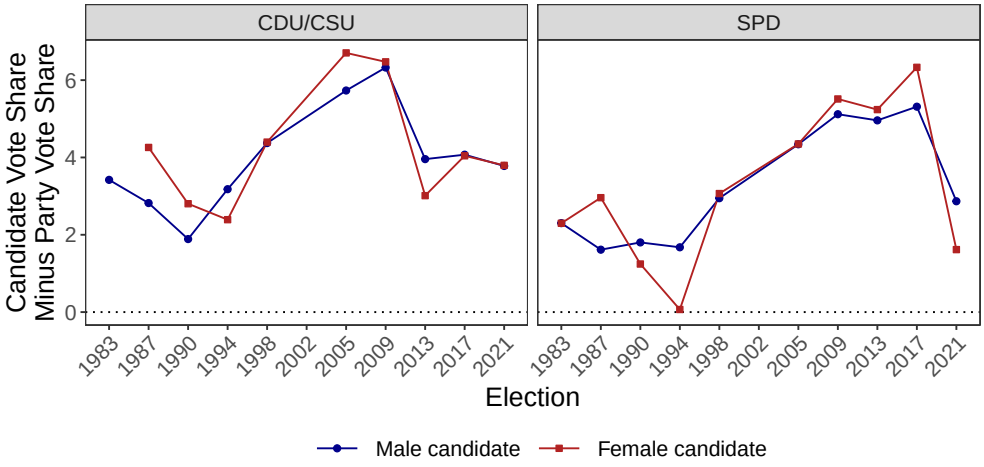
Notes: Standard errors clustered at the district level in parenthesis. The binary dependent variable takes value = 1 if a female candidate is nominated. The unit of observation is a district-party-year. Sure loss is a binary variable = 1 if the respective party trails the most-voted party by more than c percentage points. Safe seat is similarly defined for cases when the party is the most-voted in the district by a margin greater than c. Both variables are defined using party list votes (and not SMD candidate votes). The cutoff c is set to be 5 p.p., 10 p.p., and 15 p.p. in the top, middle, and bottom panels, respectively. ***p < .001; **p < .01; *p < .05

Figure A11: Candidate Performance Relative to Party Performance – Open Seats (First Definition)



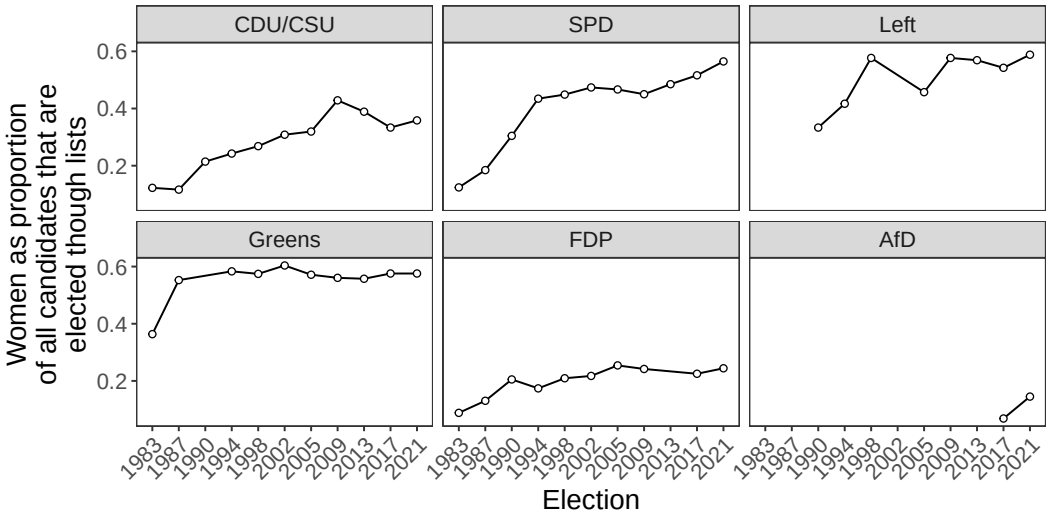
Notes: Figure shows the average percentage point difference between the candidate and party vote in the same district and election, calculated for each party, year, and candidate gender. It only includes open seats defined as district-party-elections where the previously fielded candidate is not running again. Positive values on the y-axis indicate that, on average, candidates receive more votes than their respective party list in the same district.

Figure A12: Candidate Performance Relative to Party Performance – Open Seats (Second Definition)



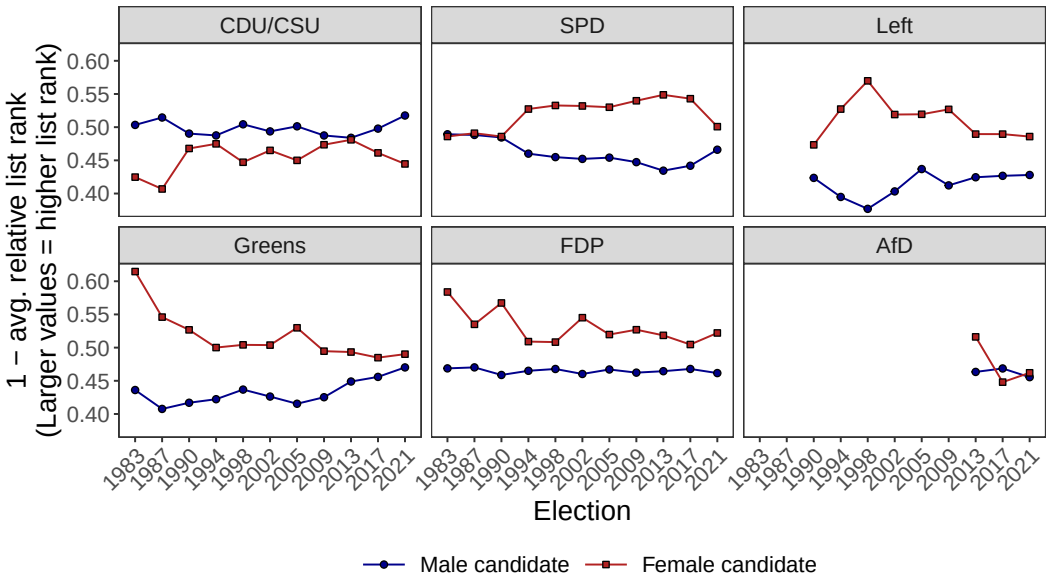
Notes: Figure shows the average percentage point difference between the candidate and party vote in the same district and election, calculated for each party, year, and candidate gender. It only includes open seats defined as district-party-elections where the previously fielded candidate is not running again and the previous candidate was the incumbent and won the previous race. Positive values on the y-axis indicate that, on average, candidates receive more votes than their respective party list in the same district.

Figure A13: Likelihood of Being Elected Through Party Lists for Women



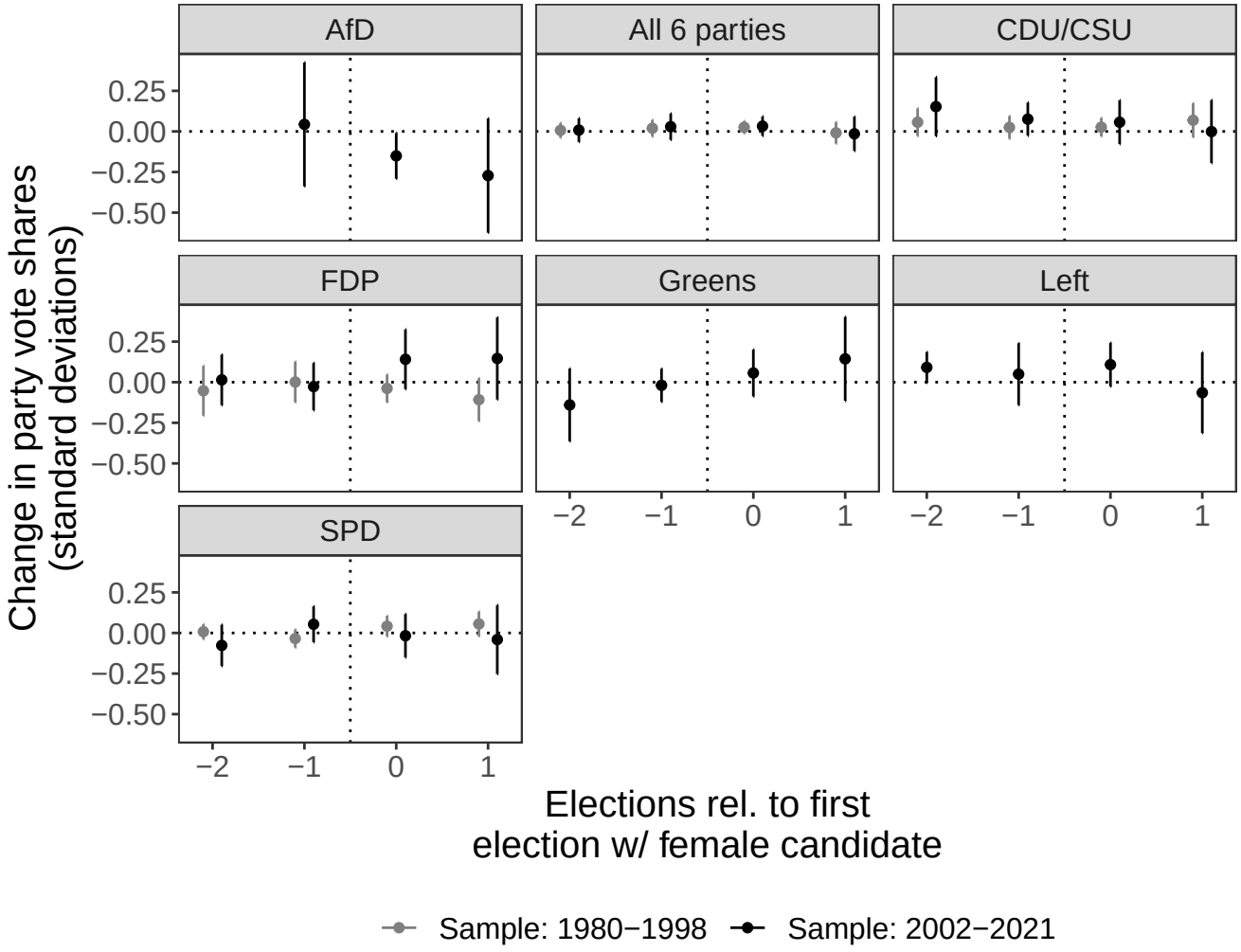
Notes: Figure presents the number of female candidates elected to parliament through a party list, as a share of all candidates from the party that were elected through such party lists (i.e., $P(\text{Female candidate}|\text{Candidate enters parliament through list})$). Entering parliament through party lists is defined as (i) being in any list position higher or equal to the position of the lowest-ranked candidate on the list who enters parliament and (ii) not winning a district, for those candidates that are on list and also run in districts. This number is missing for the FDP in 2013 since the FDP to enter parliament in 2013.

Figure A14: Male and Female Average Relative Position (Rank) in Party Lists



Notes: The plot shows 1 - average list position (rank). It calculates such average separately by gedner, party, and election year. Since state party lists differ in lengths, we normalize the candidate position by dividing the list rank R_{idt} of candidate i in election t and party p by the lowest possible list rank such that $R_{itp}^{\text{relative}} = \frac{R_{itp}}{\max R_{itp}}$. We reverse this scale such that a value of one indicates the highest list rank, and a value of zero indicates that a candidate is at the bottom of the state party list.

Figure A15: Difference-in-differences Estimates of the Effect of Nominating a Female SMD candidate on Party List Votes



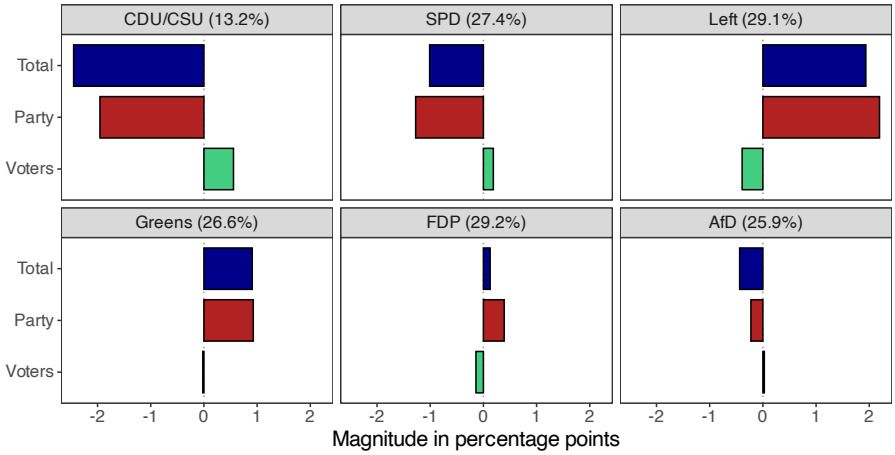
Notes: Figure shows event-study estimates based on the Callaway and Sant'Anna (2021) estimator. The outcome (y-axis) is the standardized party vote share (divided by its party and period-specific standard deviation). Treatment is defined as the switch from a male to a female SMD candidate. Dots represent point estimates and lines represent standard errors clustered at district level. Negative values on the x-axis represent elections before the entry of the female candidate at time zero. Sample is split in two periods (1980-1998 and 2002-2021) since redistricting reform makes it unfeasible to match districts between the 1998 and 2002 elections. Total sample size is 5,344, based on 447 separate "events" and 889 "controls." Coefficients on the "all 6 parties" panel are calculated by taking averages across party coefficients (plotted in other panels) for the appropriate period and event-time. See Appendix B for further information.

Table A11: Summary Statistics – GLES Data

Variable	Female cand.	Male cand.	Diff.	p-value
Prior political activities:				
Employed by other party member	0.166	0.141	0.025	0.269
Held local party office	0.719	0.737	-0.018	0.533
Held national party office	0.112	0.091	0.020	0.284
Mayor	0.021	0.034	-0.013	0.241
Local representative	0.592	0.542	0.050	0.115
State representative	0.100	0.048	0.051	0.001
State government member	0.015	0.010	0.005	0.444
Mean across activities	0.250	0.239	0.011	0.194
Other political variables:				
Length of party membership (years)	14.776	13.729	1.047	0.157
Campaign budget (Euros)	16,887.330	15,824.060	1,063.271	0.414
Left-right placement (1-11)	4.003	4.835	-0.832	0
Highest educational attainment				
None	0.036	0.015	0.021	0.024
Hauptschule	0	0.001	-0.001	0.546
Realschule	0	0.001	-0.001	0.546
Abitur	0.009	0.011	-0.002	0.766
Vocational education	0.251	0.289	-0.038	0.189
Undergrad degree	0.048	0.042	0.006	0.621
Grad degree (MA)	0.495	0.461	0.034	0.289
Grad degree (PhD)	0.124	0.140	-0.016	0.467
Student	0.036	0.040	-0.003	0.784
Years of education	15.447	15.563	-0.116	0.604
Employment status				
Full-time employed	0.468	0.628	-0.159	0
Not in labor market	0.106	0.068	0.037	0.030
Part time employed	0.142	0.064	0.078	0
Full-time politician	0.233	0.132	0.100	0
Retired	0.030	0.063	-0.033	0.025
Unemployed	0.021	0.045	-0.024	0.053
Marital status:				
Divorced	0.094	0.058	0.035	0.029
Married	0.674	0.748	-0.074	0.009
Single	0.205	0.183	0.023	0.368
Windowed	0.027	0.011	0.016	0.040

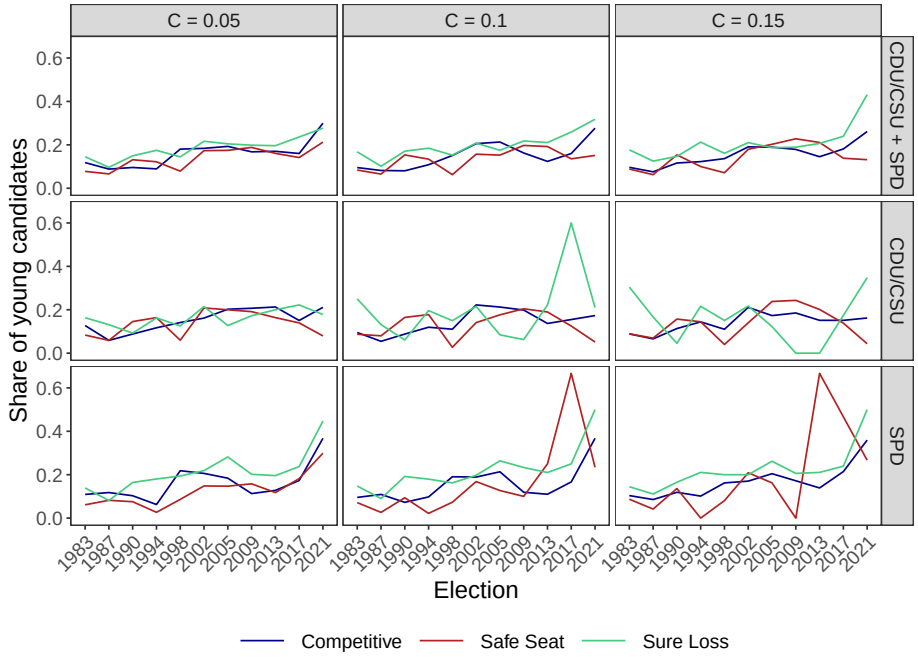
Notes: The table contains summary statistics on the additional individual-level covariates that we obtain from the GLES survey. We also present difference between female and male candidates, as well as the associated p-values. All variables except for the three variables listed under "other political variables" and years of education are binary. The GLES data covers the 2009, 2013 and 2017 elections. Number of observations (candidate-district-year combinations) is 1,363.

Figure A16: Decomposition Results with Additional GLES Covariates



Notes: Figure presents the decomposition described in equation (6), separately by party. The "Party" bar is $\beta^W(\overline{PV^W} - \overline{PV^M})$, representing the contribution of gender-biased party nominations. The "Voters" bar is $[\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M} + \sum_{j=1}^{K}(\gamma_j^W - \gamma_j^M)\overline{X_j^M}]$, representing the contribution of voters. Together with the $\sum_{j=1}^{K}\gamma_j^W(\overline{X_j^W} - \overline{X_j^M})$ term, which is omitted from the graph, they add up to the "Total" gender vote gap $(\overline{CV^W} - \overline{CV^M})$. We include additional covariates from the GLES candidate survey listed in Table A11, which are observed for the 2009, 2013 and 2017 elections. For each party, we indicate the share of valid survey responses across the three elections in parentheses. See Appendix D for further information.

Figure A17: Share of Young SMD candidates, by District Competitiveness



Notes: Figure shows the share of "young" SMD candidates by party, election, and classification of district competitiveness (see Section 9 for details), for the CDU/CSU and SPD (top and bottom rows, respectively). Cutoff c for defining district as competitive, safe, or sure loss are 5 p.p., 10 p.p., and 15 p.p. (in columns). The definition of "young" candidates is based on the bottom tercile of the candidate age distribution: 42 or younger. Patterns are similar if the bottom quartile of the candidates' age distribution (39 and younger) was used. Note this replicates Figure 9 using "young" instead of female candidates.