

Party Nominations and Female Electoral Performance: Evidence from Germany *

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

March 28, 2023

Word count: 10,303

Abstract

What accounts for differences in electoral success between male and female candidates? Theoretically, three channels may explain observed patterns: voter discrimination, candidate characteristics, or differences in party popularity in the constituencies where candidates run. To differentiate between these channels, we exploit features of the German electoral system and construct counterfactual gender vote gaps that would occur if male and female candidates were, on average, nominated to run in districts where their parties are equally popular. Using detailed data on all directly elected Bundestag candidates in eleven elections (1983–2021), we document that party nominations can explain the gender vote gaps: female under-performance is due to women systematically running in districts where their party is less popular. In contrast, we do not find evidence that voter bias or candidate characteristics play a substantial role. Our findings highlight the role of parties, not voters, as the primary driver of female under-representation.

*We thank Rachel Brulé, Kate Casey, Torben Iversen, Jochen Rehmert, Daniel Smith, Jörg Spenkuch and seminar and conference participants at APSA, Chicago-Harris, EPSA, Harvard, PECO Washington, Rochester, Stanford, UC Berkeley-Haas, Universidad Torcuato di Tella, King’s College London, and University of Virginia for helpful comments. We further thank Lilia Götz for excellent research assistance.

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

[‡]Center for the Study of Democratic Politics, Princeton University, hhilbig@princeton.edu

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

1 Introduction

Around the world, women are underrepresented in politics. In 2021, only 26% of national parliament members worldwide were female. Amongst European countries, this figure is only 31% (Inter-Parliamentary Union, 2021). This matters for substantive representation – in a variety of contexts, female politicians have been shown to advocate for different policies than their male colleagues (e.g., Brulé, 2020; Chattopadhyay and Duflo, 2004; Clayton and Zetterberg, 2018). It also matters for citizen-state interactions. More equitable representation has been shown to increase trust in government (e.g., Clayton, O’Brien and Piscopo, 2019).

Female under-representation is particularly pronounced in majoritarian systems, compared to systems of proportional representation (Wängnerud, 2009). Why aren’t more women directly elected? One possible 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). Voter evaluate male and female candidates differently (Huddy and Terkildsen, 1993; Lawless, 2004; Sanbonmatsu, 2002; Stout and Kline, 2011). However, recent empirical work suggests that in many countries around the world the average voter no longer discriminates against female candidates on the basis of 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 have on average more of these desirable attributes, female candidates may receive fewer votes but not *because* they are women.

We propose a third explanation, focusing instead on the behavior of political parties:

the systematic nomination of female candidates in “tougher” districts, or electoral areas where their parties are less popular. Since party labels serve as important informational cues to voters (Cox, 1986; Rahn, 1993), candidates who are nominated for direct election 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 which are harder to win.¹

Empirically distinguishing between direct discrimination by voters and systemic discrimination by parties is challenging. To do so, we construct the counterfactual gender vote gaps that would occur if male and female candidates were on average nominated to run in districts where their parties are equally popular.

We examine the case of the German federal parliament (the *Bundestag*). Despite relatively equitable gender attitudes,² only 35% of members of parliament elected in 2021 were women. Zooming in on the two historically largest parties, between 1983 and 2021, female district candidates running for the center-right CDU/CSU were on average 16.5 percentage points less likely to be elected than their male counterparts, compared to 8.3 percentage points for the center-left SPD.

We utilize a feature of the mixed electoral system in Germany to disentangle whether this gender vote gap is due to voter or party behavior: voters simultaneously cast separate “candidate votes” and “party votes” when electing members of parliament (MPs). We use the latter as a proxy for party popularity in a given electoral district. In doing so, we can quantify how much of the difference in average vote shares between male and female candidates (the “gender vote gap”) is driven by parties systematically nominating female candidates to run in districts where their party is less popular, and disentangle it from

¹A 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 the electoral success of existing candidates.

²A 2020 survey found that 90% of Germans consider gender equality to be a “very important” issue (Menasce Horowitz and Fetterlof, 2020).

voters discriminating against female candidates or valuing characteristics more commonly found in male candidates. Our method relies on a version of the Kitagawa-Oaxaca-Blinder decomposition (Oaxaca, 1973a), a method commonly used to study mean outcome differences between groups, which in our context allows us to decompose the gender vote gap between a component driven by party nominations and a component driven by voters’ differential treatment of male and female candidates.

Using a panel of election results covering all districts from eleven federal elections between 1983 and 2021, our decomposition allows us to construct the counterfactual gender vote gaps that had occurred if male and female candidates were (on average) nominated to run in districts where their parties are equally popular (a “party nominations component”) and separate it from a component that can be attributed to voters. Our decomposition can be applied separately and independently to each party and election year.

Our results show that parties’ nomination behavior is the main driver of the gender vote gap. The overall relative under-performance of female candidates arises because the historically two main parties, the center-left Social Democrats (SPD) and the center-right Christian Democrats (CDU/CSU), systematically nominate women to run in districts where their party is less competitive. 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 places where male and female candidates are nominated. Moreover, party nominations explain most of the variation in the gender vote gap across the six parties we study as well as over-time variation within a given party. Importantly, our main conclusions remain the same when restricting the sample to open seats. The result implies that our findings are not merely driven by a path dependency mechanism, where men are likely to be incumbents in safe districts.

In contrast to prior work, we highlight that gender difference in background characteristics or incumbency effects play little to no role for the male-female gender gap. To validate

this finding, we rely on a rich survey data set on candidate background characteristics, including data on prior political experience, involvement in the party, self-reported ideology, educational background and campaign resources. Including these variables in the decomposition does not change our main regarding the effects of party nomination behavior, indicating that differences in candidate background do not explain why women receive fewer votes. To strengthen our main results, we further discuss and test five alternative mechanisms: 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 main findings.

To supplant our results from the decomposition analysis, we then present several additional, descriptive results. First, we find that women are less likely to be nominated to both competitive and *safe* seats than men by the two historically largest parties, suggesting that concerns about the electability of women is an unlikely driver of parties' nomination behavior. Second, we find that candidate gender does not predict the difference between candidate and party votes in a district. Put differently, the female candidates are not systematically less popular than their own party in a given district, lending support to the previous finding that discrimination by voters does not account for the gender vote gap.

Our paper contributes to the literature on under-presentation of women and minorities on several fronts. First, we draw attention to an understudied explanation for female under-representation: parties systematically nominating female candidates to districts where party popularity is lower. Gatekeeping by parties in combination with gendered social networks results to fewer women nominated in places where party organizational capacity is stronger.

Second, we develop a test for this mechanism – our paper is the first to employ a decomposition analysis that allows to separately quantify the contribution of party nomination behavior, discrimination by voters, and gender differences in candidate characteristics. To

our knowledge, the only other paper using decomposition methods to study election outcomes is Dancygier et al. (2015), who study the representation of immigrants in Sweden. Our results indicate that systemic discrimination by parties is the main driver of the gender vote-gap. We find that direct discrimination by voters (i.e., whether voters prefer male versus female candidates, holding all else constant - the type of discrimination that is examined in conjoint experiments)(Schwarz and Coppock, 2022) does not play a role in explaining gender vote gaps in the context we study.

Third, our data spans four decades and allows us to provide new evidence on the dynamics of female electoral success over time, rather than mere snapshots. This allows us to make two contributions. Going beyond the findings from recent survey experiments and meta-analyses (Brooks, 2013; Hayes, Lawless and Baitinger, 2014; Schwarz and Coppock, 2022; Teele, Kalla and Rosenbluth, 2018) showing that voters are *currently* unbiased against women, we provide evidence that at least in the German case, party (rather than voter) behavior explains female under-performance at the ballot box *over the course of four decades*. Further, given the temporal consistency with which party behavior explains lower vote shares among female candidates, we can explain how some parties that historically had substantial gender vote gaps have narrowed them in more recent elections.

Fourth, an analyst (say, an academic or party strategist) that “naively” compared average vote shares for the CDU/CSU and SPD candidates might conclude that nominating male candidates (who on average perform better) is a sensible strategy to improve vote shares and probabilities of winning. However, our results indicate this is unlikely to be the case after taking into account that women are running in tougher districts.

Lastly, our findings also provide guidance for policymakers seeking to increase female representation. They suggest that efforts to address female under-representation are better targeted at party gate-keepers that control nomination procedures – or finding other ways of getting women on the ballot in districts where their parties are relatively popular – than

efforts targeting voter’s attitudes, beliefs, or preferences.

2 Theory

We argue that an important explanation for the apparent gap in electoral success between female and male candidates in first-past-the-post elections is that parties act as gatekeepers and nominate women in constituencies where their party has fewer supporters. We contrast this explanation to two others 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 the relative under-performance of female candidates 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), which could negatively affect the electoral performance of female candidates. 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).

Another explanation for the persistence of gender vote gaps is that candidate gender may be correlated with other 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 at the ballot box *because* they are women, but because they are more likely to lack certain 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 demonstrates that female candidates tend to be *more* qualified and skilled (Anzia and Berry, 2011; Besley et al., 2017).

We propose a third explanation for the gender vote gap: parties nominating female candidates in districts where their party is less popular. Since party strength and the electoral success of direct candidates tend to be highly correlated, this would lead to a relative under-performance of female candidates. This could be due to three reasons. First, party elites may (mistakenly) think that voters are biased against female candidates, thus nominating male candidates in expectation that they will perform better and therefore maximize the party’s seat share. Bateson (2020) calls this phenomenon “strategic discrimination” – withholding support from a candidate due to a belief that *others* will discriminate against them. If lower perceived electability of female candidates is the issue, we would expect to see more male candidates in close races, but not in safe districts where candidate identity is unlikely to affect results. Second, party elites may themselves engage in discrimination and be biased in favor of men. This could arise if party elites are overwhelmingly male and characterized by homophily (in this case, men being biased in favor of men). Indeed, predominantly male gatekeepers have been argued to disadvantage female aspirants in the United States (Niven, 1998; Fox and Lawless, 2010), Canada Cheng and Tavits (2011), and the UK (Rasmussen, 1981). We argue that this may be particularly the case in more desirable districts. If this is true, we would expect to see more male candidates in competitive and safe 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 compete in 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. However, this logic is unlikely to apply in contexts where local party elites are kingmakers and either formally or informally appoint candidates (Sanbonmatsu, 2006). Then, local party elites have control over the competitiveness of the nomination process.

Note that different channels may be offsetting each other – it may, for example, be the case that voters are biased against women *and* that women are more qualified, thus yielding similar vote shares as men (Ashworth, Berry and de Mesquita, 2020; Fulton, 2012), or that their personal characteristics enable women to win seats even in districts where their party is less competitive.

Differentiating between these three mechanisms 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

Electoral Rules. Germany is one of 32 countries worldwide with a mixed electoral system. 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, similarly to the US House of Representatives. Each party fields at most one candidate per district, and the most voted candidate in each electoral district becomes a 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 national vote share. At least half of the Bundestag is elected via the party vote.³ We provide more information on party lists and gender quotas in Appendix Section D.

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 (i.e. how voters in a given district would have cast their ballots had the candidate been male). 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 decision 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 considerations (Spenkuch, 2018). Compared to pure proportional or pure single member district systems, the German case allows us to separate voter preferences for parties from voter preferences for candidates.

Party Nominations and Candidate Selection Procedures. One of the stated goals of German election law is the decentralization of candidate selection, with selection decisions taking place at the local level. German electoral law stipulates that the selection of district candidates should occur at the local level in a sufficiently democratic manner. District candidates are selected by local (district-level) party chapters—either through an election where all members of the local party branch vote (member convention), or through

³The exact number of MPs elected to the Bundestag vary from one year to the other, given the possibility of *overhang mandates* (Überhangmandate) that increase the number of MPs elected via the party vote to accommodate cases where a party’s vote share in the party vote would entitle it to fewer seats than it won via the candidate vote. Parties also must clear a 5% vote share threshold to receive seats via the party vote. See Appendix Section D for more information.

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

an election by delegates who were themselves elected by party members (party delegation).⁵ Prior work has argued that central party organs have little formal or informal influence on district candidate selection (Reiser, 2020*b*) and nominations are a function of local party preferences (Detterbeck, 2016).

At the same time, local 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 (Reiser, 2020*b*). 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 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 prior to the nomination convention (Detterbeck, 2016; Reiser, 2011).

Further, this literature emphasizes that the key players during the informal stage of candidate selection are local party elites. In particular, Detterbeck (2016) discusses how elites use factional linkages to unite party members behind “their” candidate. As a result, aspiring candidates without elite support often drop out prior to the selection convention. This occurs either because they are explicitly discouraged from running or because they realize their chances of nomination are slim.

Historically, delegate conventions were by far the most common selection method. In 2009, 70% of all district candidates of the three largest parties were nominated through delegate conventions (Reiser, 2020*b*). In recent years, more candidates are selected via member conventions (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

⁵Local candidates reside in the districts where they run (Davidson-Schmich, 2016).

competitive than delegate conventions.

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.⁶ The share of women members across parties is very slowly increasing (Höhne, 2020).

4 Data

We use electoral results from the eleven most recent elections in Germany (1983–2021), combined with data on gender and party affiliation of all candidates. The source for the data is the Federal Returning Officer, who supervises elections on the federal level. Our unit of analysis is the electoral district (*Wahlkreis*). In the 2021 election, there were a total of 299 electoral districts (*Wahlkreise*).⁷

The Federal Returning Officer also maintains a list of all candidates, both for constituencies and for the party lists. These candidate lists include information on candidate gender, our main independent variable. In addition, the candidate lists also contain information on candidate age and occupation. We link the candidate lists to electoral results, allowing us to measure the precise electoral performance of all candidates. We limit the sample to candi-

⁶All figures from 2017, see Höhne (2020).

⁷The most recent data can be accessed on <https://www.bundeswahlleiter.de/en/>. The 1980 election is the first election for which the Bundeswahlleiter provides results and candidate characteristics. Since some of our analyses rely on lagged variables, we drop the 1980 election for these analyses. To be consistent, we therefore use the 1983 election as the first election in our data for the remainder of the paper. The number of electoral districts changes over time in our sample (starting from 248 in 1980 it increases to 328 in 1990 following reunification, then reduces back to 299 in 2002 due to a redistricting reform).

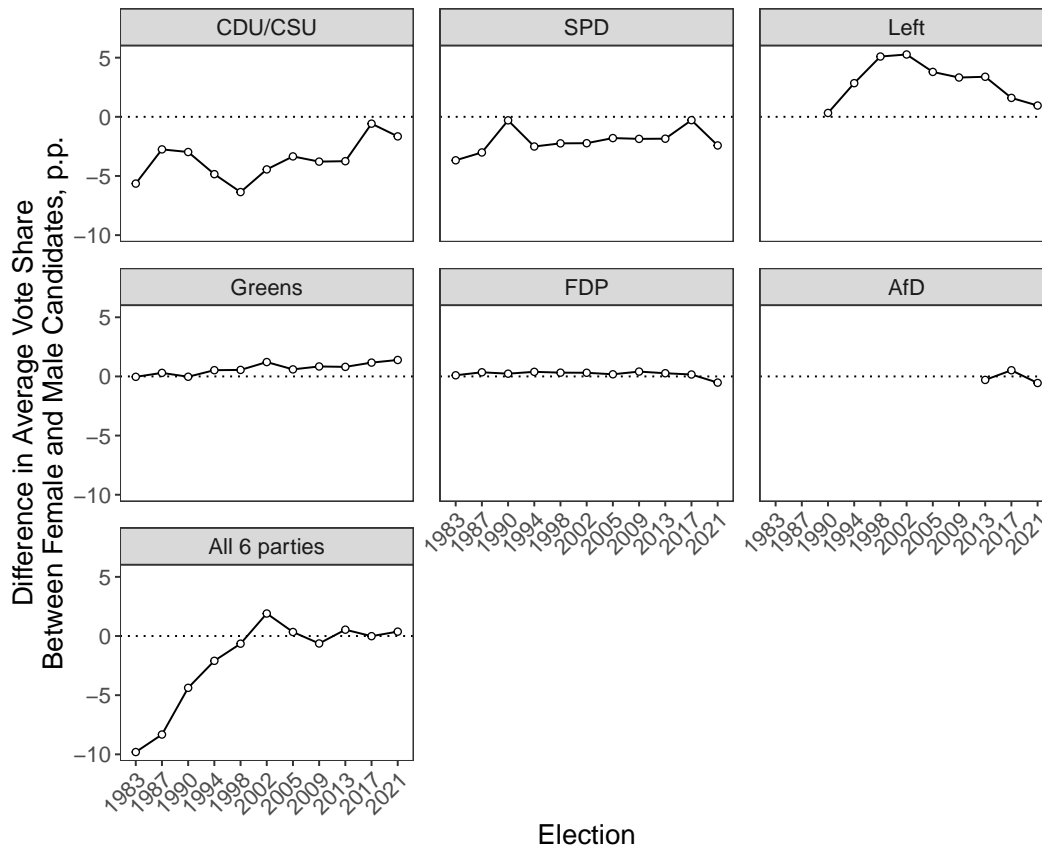
dates of the six largest German parties during this time period: The center-right Christian Democratic Union and its Bavarian sister party, the Christian Social Union (CDU/CSU), the center-left Social Democrats (SPD), the Green Party, the Left Party, the classical liberal FDP and the radical-right AfD.⁸ In 2021, these six parties together obtained 91.3 percent of the party vote.

5 The Gender Vote Gap in Germany

We first present data on the simple gender vote gap, or the average vote share of female district candidates minus the average vote share of male district candidates. We calculate it separately by party and election year and present them on Figure 1. Among the two main parties, we observe that between 1983 and 2021 female candidates who run for the CDU/CSU receive on average 5.3 percentage points fewer votes than their male candidates, compared to 2.99 percentage points for the SPD. The reverse is true for the Left Party, where female candidates receive on average 3.1 percentage points *more* votes than their male counterparts for the years since reunification. For the FDP and Green parties, women do somewhat better than men, but this difference is comparatively small. The gender vote gap decreases over time. In the CDU/CSU, it decreased from its most extreme value of -6.4 percentage points in 1998 to -0.6 percentage points in 2017. Similarly, in the SPD, it decreased from -3.7 percentage points in 1983 to -0.3 percentage points in 2017.

⁸The AfD first competed in 2013, and has been represented in parliament since 2017.

Figure 1: Average difference in electoral performance between female and male district candidates

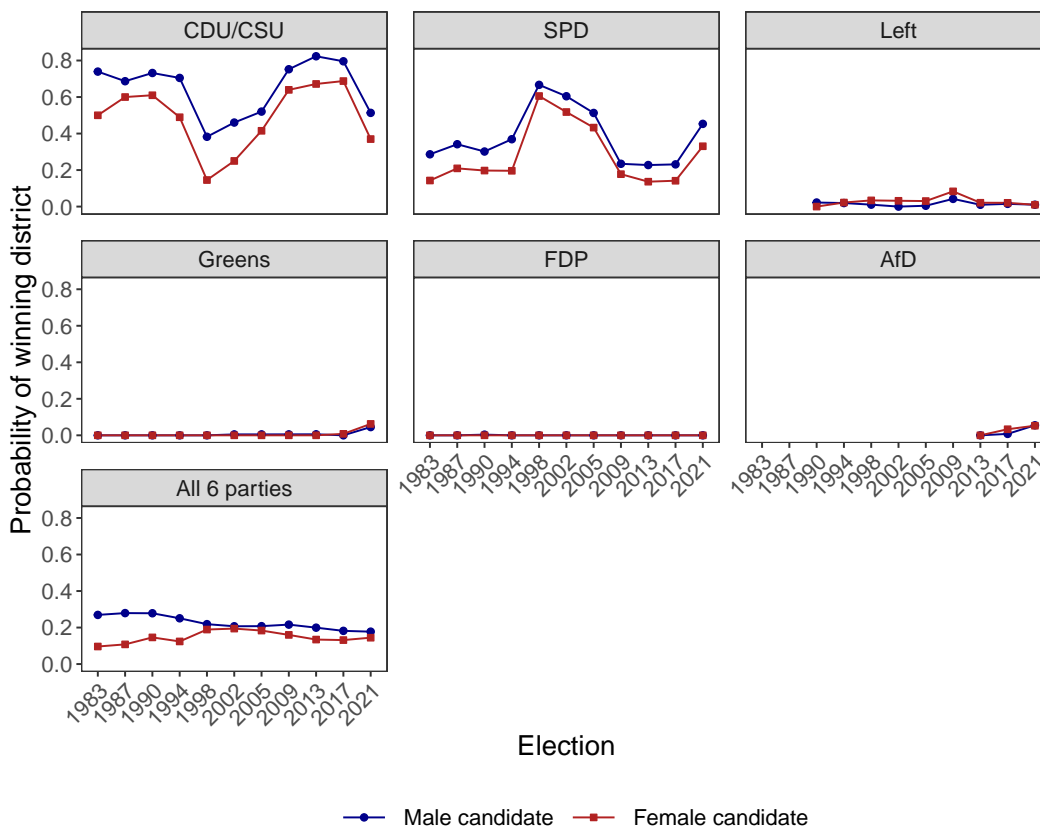


Note: The figure shows the percentage point difference in average vote shares between female and male candidates across eleven elections for six parties. We consider all elections between 1983 and 2021. Elections prior to 1990 are based on West Germany, excluding the GDR. The Left party did not exist in West Germany prior to 1990. We average over vote shares in electoral districts. The panel labeled “all 6 parties” includes all candidates from the six parties shown in the other panels. Negative values on the y-axis indicate that, on average, male candidates receive a larger vote shares than female candidates.

These differential vote shares translate into a higher probability of being elected for male candidates in the two largest parties. Figure 2 shows the probability of getting elected for male and female district candidates over time. For the CDU/CSU and SPD, female district candidates were, respectively, 16.5 and 8.3 percentage points less likely to be elected than their male counterparts in the period we studied. As is evident from the relatively flat lines hovering over zero, the four smaller parties studied here, the AfD, Left, Greens and FDP,

win very few district mandates.⁹

Figure 2: Probability of getting elected for female and male district candidates



Note: The figure shows the probability of winning the district for female and male candidates across ten elections for six parties. We consider all elections between 1983 and 2021. Elections prior to 1990 are based on West Germany, excluding the GDR. The Left party did not exist in West Germany prior to 1990. The panel labeled “all 6 parties” includes all candidates from the six parties shown in the other panels.

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 standard Kitagawa-Oaxaca-Blinder decomposition, a method commonly used to study mean difference between two groups,

⁹While these four parties rarely elect district candidates via the candidate vote, they do obtain representation in the Bundestag via the party vote. For example, they obtained 41.4% of seats in the 2021 election.

particularly within labor economics.¹⁰ We decompose the overall gender vote gap into two parts: The contribution of political parties and the contribution of voters.

Intuitively, the application of the method to our case can be described as follows: Female and male candidate vote shares can be modeled as a function of party vote shares – voters who support a party likely also support the candidate of that party. However, some voters may split their tickets, so party vote shares will not explain all of the variation in candidate 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, we can run:

$$CV_{idt}^W = \alpha^W + \beta^W PV_{idt}^W + \epsilon_{idt} \quad (1)$$

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

The same equation can be estimated using only male candidates:

$$CV_{idt}^M = \alpha^M + \beta^M PV_{idt}^M + \epsilon_{idt} \quad (2)$$

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: $\overline{CV^W} - \overline{CV^M}$. Note this average can be taken for many sub-samples (e.g., only one particular election year or region, only one particular party,

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

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:

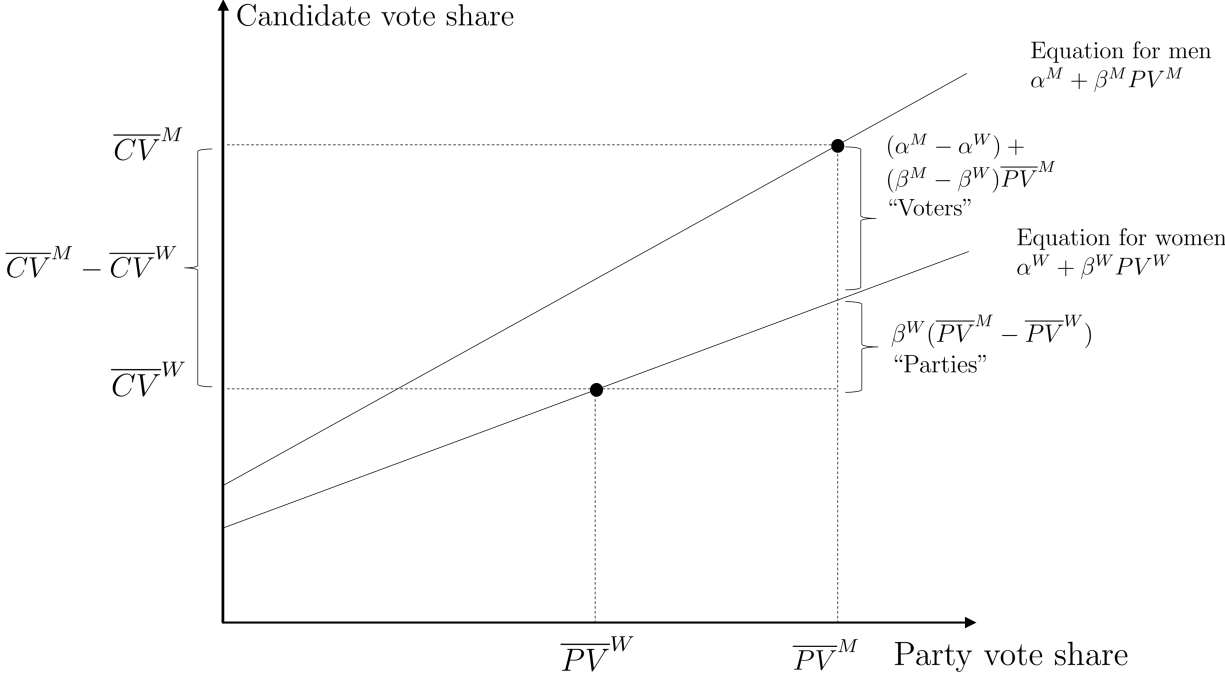
$$\begin{aligned} \overline{CV^W} - \overline{CV^M} &= \alpha^W + \beta^W \overline{PV^W} - \alpha^M - \beta^M \overline{PV^M} = \\ &= \alpha^W + \beta^W \overline{PV^W} - \alpha^M - \beta^M \overline{PV^M} + \beta^W \overline{PV^M} - \beta^W \overline{PV^M} = \\ &= [\alpha^W - \alpha^M + (\beta^W -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

The term in brackets $[\alpha^W - \alpha^M + (\beta^W - \beta^M) \overline{PV^M}]$ can thus be interpreted as the part of the differential performance between female and male candidates that is attributed to voters. More precisely, if voters are equally likely to cast a candidate vote that “differs” from the party vote when the 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 in brackets 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 district 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 their party vote.

The second term $\beta^W (\overline{PV^W} - \overline{PV^M})$ is the part of differences in candidate vote shares that can be attributed to parties. More precisely, it isolates the part of the vote share difference 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 is equally popular (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 is less popular. As before, this measure also provides the answer to a counterfactual thought exercise: how much larger or smaller would the candidate gender vote gap be if parties nominated men and women in districts where the parties are equally popular (as measured by the party vote share). Figure 3 summarizes the logic of this decomposition analysis graphically.

Figure 3: Decomposition



Decomposition Assumptions. Before presenting decomposition results, we discuss two additional analyses supporting its underlying assumptions: linearity and the “direction of causality” between candidate votes and party votes.

First, our formulation assumes the relationship between candidate vote and party vote share is linear. To make sure that this assumption is justified, we flexibly plot the relationship between party vote shares and candidate vote shares in Figure B10, Figure B11 and Figure B12. Overall, the relationship is not only linear but close to the 45-degree line. When we disaggregate the relation by parties and election years in Figure B11, we find that the

FDP and the Left deviate somewhat from a perfectly linear relationship in some ranges of the relationship. However, the deviations are relatively small for those two parties, and all but absent for the other four. Therefore, we argue that the linear functional form which we specify above approximately captures the relationship between party and candidate vote shares.¹¹

Second, it should be noted that our decomposition does not require equations (1) and (2) to have a causal interpretation. They quantify the relationship between candidate and party vote and allow us to predict average female candidate vote shares if women ran in districts with similar average party votes as men (see Figure 3) in a descriptive exercise. What is key to our interpretation is that party votes provide a suitable proxy for party preferences.

What would potentially complicate the interpretation of our decomposition would be if candidate gender had a causal impact on party votes (i.e., a party nominating a female candidate to a district caused a reduction in its party vote). While this is theoretically possible (e.g., voters may update their views on the party once they see the gender of its nominee), we provide evidence suggesting that candidate gender has little to no effect on party votes. We use a difference-in-differences framework exploiting that the fielding of new candidates sometimes mean the candidate gender switches between two elections, holding party and electoral district constant. The results are discussed in further detail in Appendix Section B.9.¹²

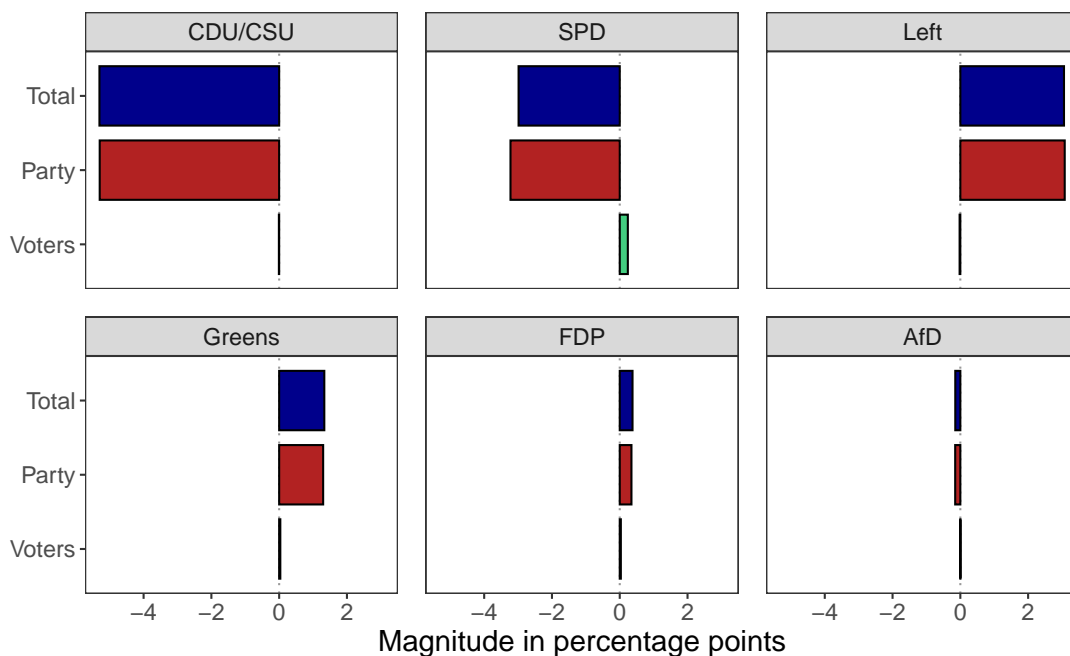
¹¹Note also that the relationship for the CDU/CSU and SPD are above the 45-degree line (implying they receive more candidate votes than party votes on average), while the opposite is true for the Greens and FDP. We return to this issue in more detail when discussing Figure 7 in Section 6.

¹²An example of a situation where candidate characteristics affect the party vote in mixed systems is discussed in Hainmueller and Kern (2008), who show that candidate incumbency increases party vote shares.

7 Results: Decomposition of the Gender Vote Gap

The results of the decomposition analysis indicate that the difference in vote shares between male and female district candidates is driven by differences in party popularity in places where women candidates are nominated. Figure 4 presents the results from the decomposition analysis as a bar chart. The analysis (including the estimation of α s and β s) is done separately for each party. 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. It pools data across eleven elections between 1983 and 2021.

Figure 4: Pooled decomposition results



Note: The figure summarizes the results of the decomposition analysis outlined in section 6. We consider all elections between 1983 and 2021. Elections prior to 1990 are based on West Germany, excluding the GDR. The “Voters” bar is the $[\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M}]$ term, representing the contribution of voters to the total gender vote gap. The “Party” bar is the $\beta^W(\overline{PV^W} - \overline{PV^M})$ term, representing the contribution of the parties. The final “Total” bar is the total gender vote gap, i.e. $\overline{CV^W} - \overline{CV^M}$.

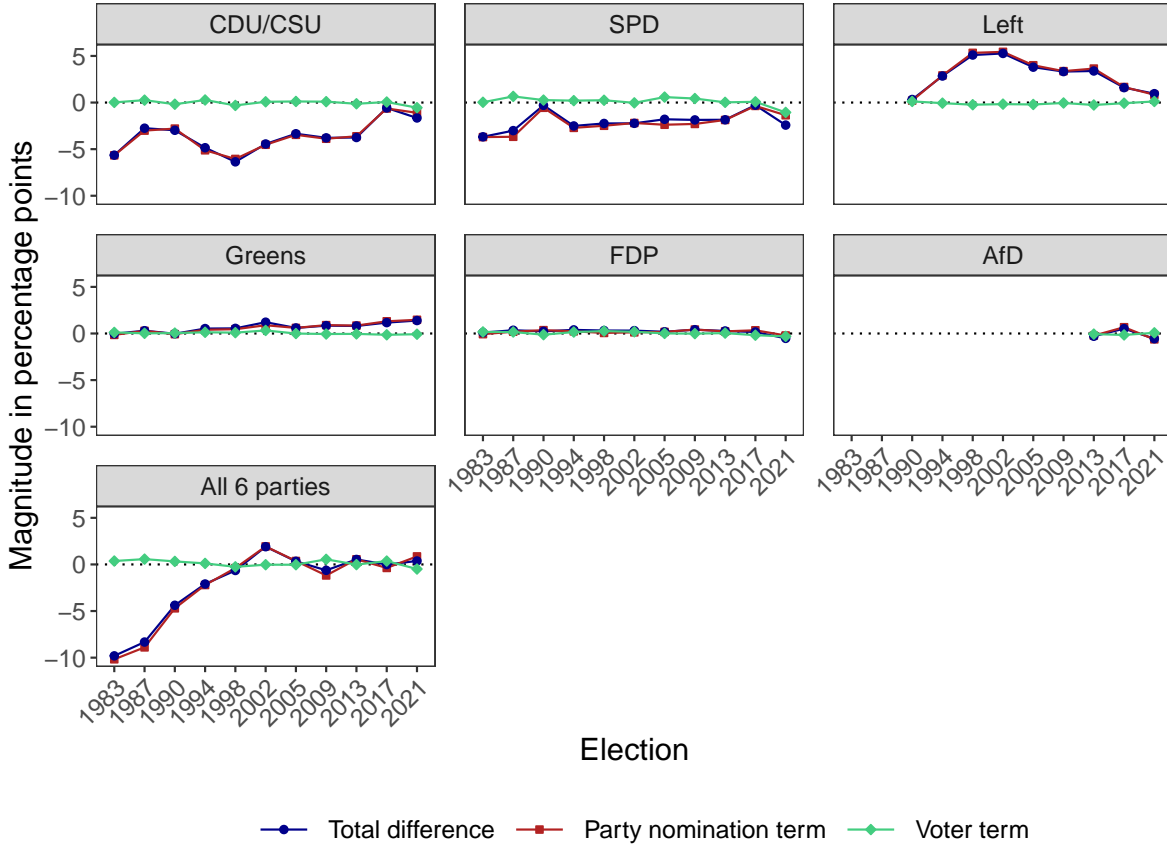
Figure 4 indicates that essentially all the total difference in average vote shares between male and female candidates can be explained by the latter being systematically appointed

to districts where they are less popular. As in Figure 1, we again observe that women candidates running for the CDU/CSU, SPD, and AfD parties generally perform worse than men, as can be seen from 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. For example, in the case of the CDU/CSU, the difference between male and female candidates would be at most 0.17 percentage points if male and female candidates were nominated in equally competitive districts (i.e. if $\overline{PV^W} = \overline{PV^M}$). This constitutes only 3% of the total gender vote gap that we observe. 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 to districts where the respective party vote is larger.

Figure 5 visualizes the same three terms for each party over time.¹³ It echoes the Figure 1, but adds the "party nominations" and "voters" component. For all six parties, the lines and markers indicating the party nomination term is 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, compared to their male counterparts. We highlight that the time patterns are varied across parties. For example, 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 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.

¹³The 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 over time



Note: The figure plots the party term, voter term and the total gender gap over time. We consider all elections between 1983 and 2021. The ‘Voter’ term equals $[\alpha^W - \alpha^M + (\beta^W - \beta^M)PV^M]$, representing the contribution of voters to the total gender vote gap. The ‘Party’ term is $\beta^W(PV^W - PV^M)$, representing the contribution of the parties. The ‘Total’ line is the total gender vote gap, i.e. $\overline{CV}^W - \overline{CV}^M$.

Table ?? in the Appendix presents the results of the decomposition analysis in table format, while C8 contains estimates by year. Both tables include all parameters discussed in Section 6.

Differences in background characteristics. As we discuss in section 2, the fact that female district candidates receive fewer votes than male candidates could be explained by differences in background characteristics. If other characteristics voters care about, such as education and political experience, systematically vary by gender, we may mis-attribute observed differences in candidates’ vote shares to gender discrimination, when they are really

driven by, say, a preference for more experienced candidates. We now investigate differences in candidate characteristics by gender.

While comprehensive data on candidate (as opposed to delegate) characteristics is difficult to obtain, we leverage three variables to assess the qualifications of male and female candidates. First, the federal elections office provides data on the occupation of each candidate at the time of the election for our entire period of observation (1983-2021). We merge this data with Treiman’s Standard International Occupational Prestige Scale (SIOPS) to obtain the occupational prestige score for each candidate. Second, we calculate age from the year of birth, which is included in the official candidate data. Third, we calculate time in office—which is often viewed as an important proxy of experience, and argued to be correlated with competence—by merging candidate names to those of elected Parliamentarians.

As an additional robustness check, we employ richer candidate background information that is based on a survey of candidates in the 2009, 2013 and 2017 elections (Schmitt-Beck et al., 2010, see section C.3 for more details). Among others, this data allows us to observe a larger number of prior political activities at the local and state level, education levels, years of party membership, self-reported ideology and campaign budgets. We do, however, not use this data for our main analyses, as it covers only three elections, and only one quarter of surveyed candidates completed the survey.

Table B1 presents summary statistics on candidate characteristics. Overall, female candidates have more prestigious occupations (slightly less so in the center-right parties, the CDU-CSU and FDP), are of the same age, and—unsurprisingly, in light of our results—have held office for fewer terms. To more systematically address whether marginal differences in candidate characteristics are correlated with electoral success, we regress candidate vote share on gender, occupational prestige, age, and the number of terms held office. Party vote share serves as control. Figure B13 summarizes the results. The only characteristics consistently correlated with vote share is prior experience in office (positive). Thus, to the

extent that candidate characteristics lower female vote shares, this is likely the result of party behavior in past elections.

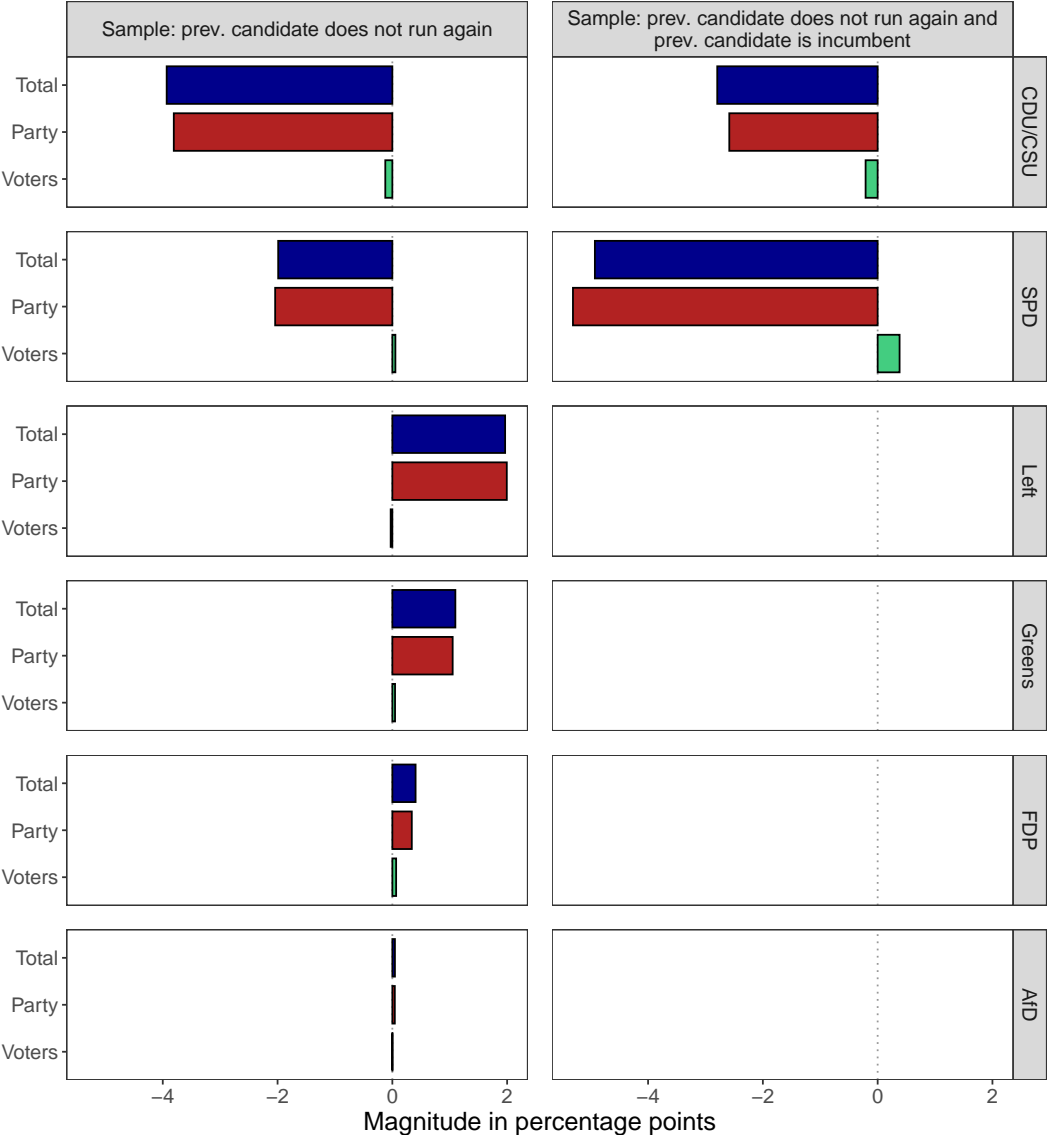
To probe further whether path dependency explains the gender vote gap, we restrict our sample to *open seats*, which we define in two ways. First, as the set of district-party-elections where the candidate previously fielded does not run again and second, as the set of district-party-elections where the candidate previously fielded does not run again and the previous candidate was the incumbent, i.e. won the district in the previous election. As shown in Figure 6, the results from the decomposition analysis are robust to restricting the sample to either definition of open seats. We conclude that the gender vote gap cannot be fully explained by path dependency.

As a final step, we re-run our main decomposition with these additional background characteristics. We additionally include the average age, occupational prestige and time in office for all other candidates in the district, which accounts for the possibility that female candidates face systematically different opponents. As shown in Figure C18 in the appendix, our main findings are robust to including candidate and challenger characteristics as covariates – the nominations to weaker districts remain the main driver of the gender gap in electoral success. Based on this, we conclude that differences in politically relevant background characteristics are not the main driver of female-male differences in electoral performance.

8 Descriptive Results

After establishing that differences in party popularity account for the largest share of the total gender vote gap, we now examine two additional points to supplement the main results. First, we introduce a new outcome, the within-party difference between candidate vote shares and the party vote in a given district. It is closely related to the vote term in the decomposition,

Figure 6: Pooled decomposition results for the subset of open seats (using two definitions)



Note: The figure summarizes the results of the decomposition analysis outlined in section 6. We consider all elections between 1983 and 2021. Elections prior to 1990 are based on West Germany, excluding the GDR. We use two samples, (i) the set of district-party-elections where the candidate previously fielded does not run again and (ii) the set of district-party-elections where the candidate previously fielded does not run again and the previous candidate was the incumbent, i.e. won the district in the previous election. For set (ii), we only consider the CDU/CSU and SPD parties, since there are too few or no observations for the remaining parties. The ‘Voters’ bar is the $[\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PVM}]$ term, representing the contribution of voters to the total gender vote gap. The ‘Party’ bar is the $\beta^W(\overline{PV^W} - \overline{PV^M})$ term, representing the contribution of the parties. The final ‘Total’ bar is the total gender vote gap, i.e. $\overline{CV^W} - \overline{CV^M}$.

as it measures whether the relationship between party and candidate vote shares differs conditional on candidate gender. Second, we take a closer look at party nomination behavior

by modeling candidate gender as a function of district competitiveness.

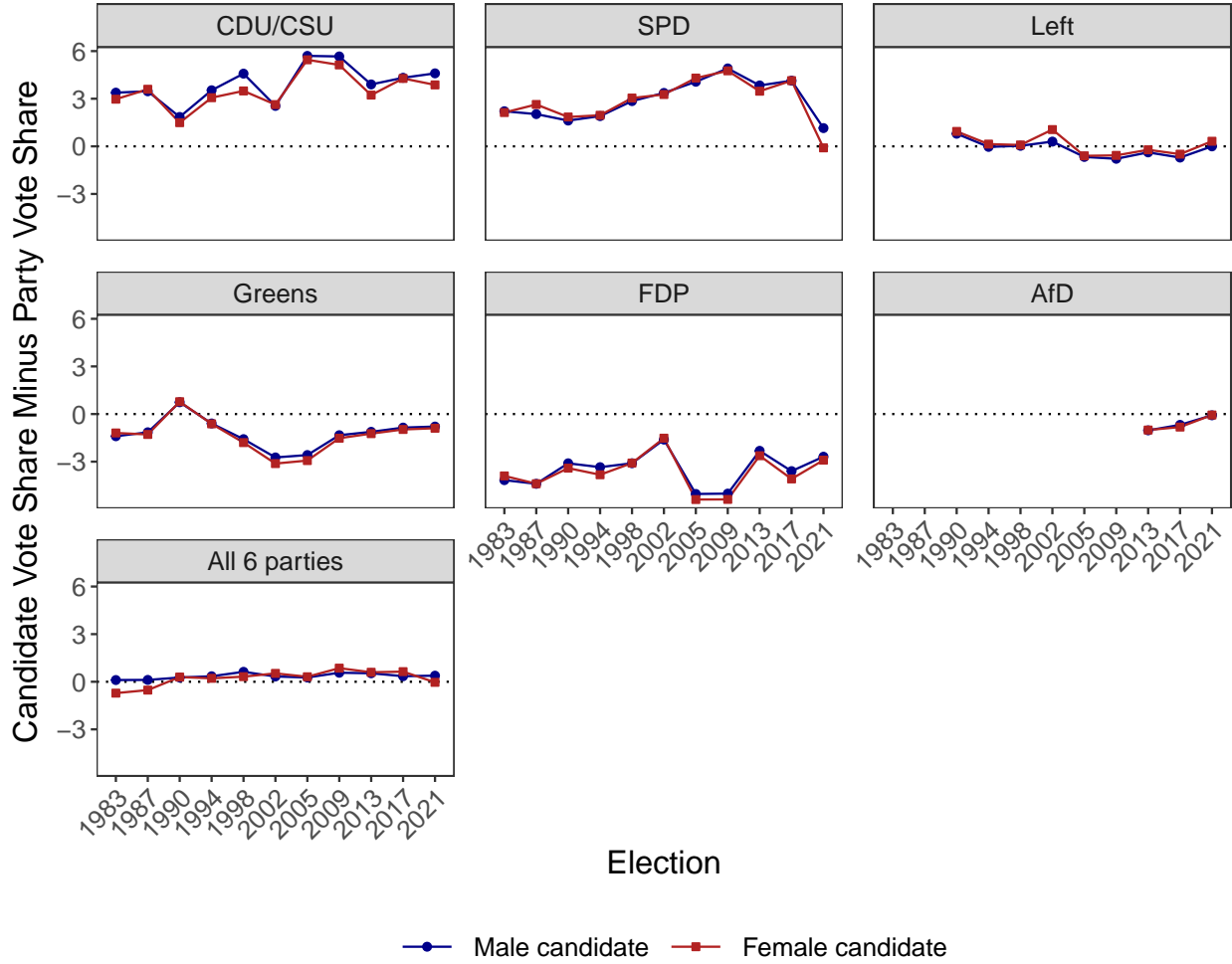
Candidate relative to party performance. First, we focus on between-party and over-time changes in the voter term. While we note that the contribution of voters to the total gender vote gap is comparatively small, it still warrants further investigation. We define a new dependent variable $Y_{idt}^g = CV_{idt}^g - PV_{idt}^g$. It directly measures how candidate i of gender g in district d in election year t performs relative to his or her party. The intuition is that voters may punish candidates whose characteristics they do not condone by giving their district vote (*Erststimme*) to another candidate from an allied party, while still casting their party vote (*Zweitstimme*) for their preferred party.

In Figure 7, we examine changes in Y_{idt}^g conditional on election and party. For the larger SPD and CDU/CSU parties, we consistently find that candidates receive more votes than their respective parties. For the Green and FDP parties, the reverse is true. A potential explanation for this are strategic considerations among voters. Typically, only candidates from the CDU/CSU, SPD and, in some instances, Left parties are popular enough to win districts. Therefore, strategic voters may deviate from their party preference for the smaller parties, as straight ticket voting would mean giving a vote to a candidate who will certainly not win the district.

Candidate gender seems to play little role for the decision to deviate from the party vote. Across all parties and elections, the difference between candidate and party vote shares Y_{idt} is similar. 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.

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 estimate a series of models where candidate gender is a function

Figure 7: Candidate performance relative to party performance



Note: The figure shows the percentage-point difference between candidate and party vote for a given candidate, across eleven elections for six parties. We consider all elections between 1983 and 2021. Elections prior to 1990 are based on West Germany, excluding the GDR. The Left party did not exist in West Germany prior to 1990. We average over all electoral districts. Positive values on the y-axis indicate that, on average, candidates receive more votes than their respective party in the same district.

of the district competitiveness. For each 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. The variable PV_{jdt}^{Max} is the highest vote share among all remaining parties $j \neq c$ in district d and election t . If candidate i 's party receives the most votes in district d , then $PV_{idt} - PV_{jdt}^{Max}$ will be positive, and negative otherwise. We define district competitiveness as follows:

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

A district is a sure loss district if party p trails the winning party by more than i percentage points, while a safe seat is a district when party p wins the district (based on party vote) by a margin greater than i . The party vote shares and the candidate gender are measured at the same point in time, which technically means that a party cannot observe the district competitiveness prior to the election. However, competitiveness is likely correlated over time, so the measurement error in the model should be manageable. Since there is no straightforward choice of the cutoff i , we estimate the same model for three different values of the cutoff: 5, 10 and 15 percentage points. In all models, the unit of observation is a district-party-year combination. The outcome measures whether candidate i in district d in election t is a woman. The previously defined district competitiveness measure C_{idt} is the independent variable, and we include fixed effects when possible.

In Table 1, we report the results of regressing the nomination of a female candidate on district competitiveness. As before, we pool all elections since 1983. Across the three values of the cutoff, the results look similar: In districts that can be considered ‘safe’, women are between 6.8 and 8.2 percentage points less likely to be nominated when we pool across all parties. Among the individual parties, we find the strongest evidence for differential nomination strategies for the SPD. Female candidates are between 8.9 and 13.4 percentage points less likely to be nominated to safe seats, compared to men. We consider these results to be somewhat surprising. As a center-left party, the SPD is not commonly regarded as the least progressive party when it comes to female representation. The pattern for the CDU/CSU party is similar, if less severe. While our estimates for the individual party are often imprecise, the CDU/CSU and SPD estimates mirror our findings in the decomposition:

Table 1: Likelihood of nominating a female district candidate & competitiveness

	Female candidate ($c=5p.p.$)						
	All parties	CDU/CSU	SPD	FDP	Greens	Left party	AfD
Safe seat (vs. competitive)	0.067 (0.015)	0.030 (0.023)	0.107 (0.027)		0.056 (0.168)	0.029 (0.111)	0.115 (0.146)
Sure loss (vs. competitive)	0.019 (0.015)	0.017 (0.024)	0.072 (0.025)	0.126 (0.022)	0.108 (0.080)	0.075 (0.056)	0.072 (0.087)
Party FE	Yes	No	No	No	No	No	No
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Election FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	15988	3,273	3,273	3,268	3,165	2,272	737
R-squared	0.089	0.270	0.257	0.168	0.158	0.218	0.537
	Female candidate ($c=10p.p.$)						
Safe seat (vs. competitive)	0.070 (0.015)	0.032 (0.022)	0.128 (0.030)	0.074 (0.077)	0.101 (0.188)	0.120 (0.155)	0.144 (0.282)
Sure loss (vs. competitive)	0.018 (0.014)	0.037 (0.027)	0.093 (0.026)	0.052 (0.072)	0.127 (0.054)	0.075 (0.051)	0.064 (0.045)
Party FE	Yes	No	No	No	No	No	No
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Election FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	15,988	3,273	3,273	3,268	3,165	2,272	737
R-squared	0.089	0.270	0.257	0.168	0.159	0.219	0.538
	Female candidate ($c=15p.p.$)						
Safe seat (vs. competitive)	0.082 (0.015)	0.048 (0.022)	0.145 (0.033)		0.428 (0.031)	0.360 (0.148)	
Sure loss (vs. competitive)	0.002 (0.014)	0.052 (0.036)	0.071 (0.029)	0.038 (0.041)	0.092 (0.049)	0.077 (0.041)	0.143 (0.061)
Party FE	Yes	No	No	No	No	No	No
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Election FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	15,988	3,273	3,273	3,268	3,165	2,272	737
R-squared	0.088	0.271	0.253	0.168	0.159	0.220	0.541

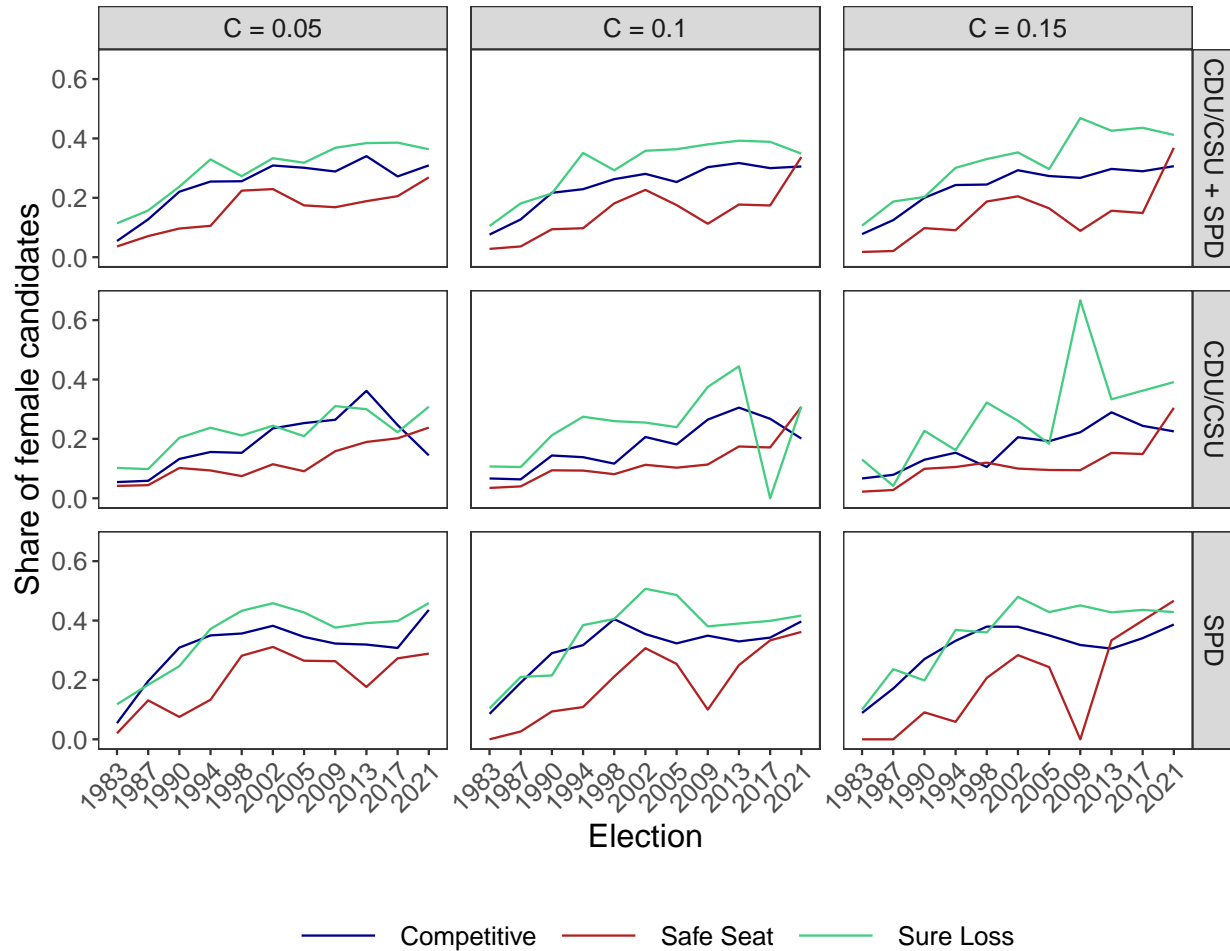
Note: OLS. The binary outcome variable takes value 1 if a female candidate is nominated by a party in a district, 0 otherwise. The unit of observation is a district-party-year combination. A district is a sure loss district if party i trails the winning party by more than c percentage points, while a safe seat is a district when party i wins the district (based on party vote) by a margin greater than c . The cutoff c is set to be 5 percentage points in the top panel, 10 percentage points in the middle panel, and 15 percentage points in the bottom panel. Missing coefficients indicate that the party in question was never in a 'safe seat' position for a given cutoff. Standard errors are clustered at the level of the electoral district. $^* p < .001$; $^* p < .01$; $^* p < .05$

The two largest parties tend to nominate female candidates in districts where the party is weaker, resulting in worse electoral outcomes for female candidates.

We visualize the probability of nominating a female candidate conditional on district competitiveness in Figure 8. We limit our sample to the two parties that exhibit the largest gender vote gaps: The CDU/CSU and the SPD. The results reinforce our conclusion from the decomposition strategy. For the SPD, we find that the probability of being nominated to safe seats is initially low for female candidates, but slowly converges to that that of being

nominated in competitive districts. For the CDU/CSU, the probability of being nominated in sure loss districts decreases over time. As a general pattern, we find that party nominations initially penalize female candidates. However, this pattern slowly disappears over time, mirroring the decline in the gender vote gap shown in Figure 1.

Figure 8: Likelihood of nominating a female district candidate and district competitiveness



Note: The figure shows the proportion of female district candidates by party, election and district competitiveness. We consider all elections between 1983 and 2021. Elections prior to 1990 are based on West Germany, excluding the GDR.

9 Alternative Explanations

In this section, we discuss five potential alternative explanations to our results: strategic voting, parties anticipating voter preferences, parties viewing male candidates as more competitive, bias against outsiders *per se*, and unequal aspirant entry.

First, we examine whether strategic voting affects our results. Since women are more often nominated in constituencies where their party is not a serious contender for the district mandate, voters may split their ticket strategically by voting for their preferred party in their party vote and for a more competitive candidate with their candidate vote in order to avoid wasting the latter. While it is not clear conceptually why these would generate the decomposition results we find, we further test if female vote shares are systematically harmed by strategic voting considerations using a strategy inspired by (Spenkuch, 2018). We test if the gap between candidate votes and party votes are larger for women, subsetting our sample to district candidates who are among the top two competitors in a district. Table B4 summarizes the results. We find no evidence that strategic voting considerations are stronger for women.

Second, it may be the case that parties strategically only nominate women in districts with more progressive gender norms and values, as they anticipate voters would otherwise punish their (female) candidate (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, this is unlikely to be the case since we observe similar nomination patterns across the two main parties. While it may be plausible that the conservative CDU/CSU is less competitive in districts with more progressive attitudes, it is implausible for the center-left SPD. To further probe the sensitivity of our results to this issue, we include measures of gender equality as covariates in our decomposition analysis

and show that our results hold. These are a gender equality index,¹⁴ the share of women in full time employment, and the gender wage gap. While we do not have direct measures of voter attitudes towards female politicians disaggregated by district, we expect such voter attitudes to be correlated with realized gender equality. As can be seen in the bottom panel of Figure C18, our results are virtually unchanged after including these covariates. Lastly, 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.

Third, it is possible that parties simply nominate the strongest candidates in competitive races, and that those are more likely to be male. However, this would not explain why we see the highest share of male candidates in the *safe* districts (see Figure 8). Moreover, some parties such as the Left, FDP, AfD, and Greens are rarely competitive in district races, but our decomposition indicate that the “party component” is able to account for the evolution of gender vote gaps over time.

Fourth, 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 party career, as for female candidates. As can be seen in Figure B7, we find no evidence that younger candidates are nominated in tougher districts, suggesting that the nomination behavior we observe is unique to women candidates.

Fifth, 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 enter the race, and potential female aspirants may opt out of running, potentially against the wishes and best intentions of the local party leadership. We deem this explanation

¹⁴The gender equality index is calculated by the Federal Government according to EU guidelines. It includes measures of economic, political, educational, and health equality.

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-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.

10 Conclusion

How can we explain the fact that women continue being under-represented in many parliaments around the world? We examine the case of Germany, where despite ranking in tenth place globally in terms of egalitarian gender opportunities (Forum, 2020) and a popular female chancellor for the past 16 years, women constitute only 35% of Parliamentarians and 26% of the 299 directly elected district representatives. Using district level data spanning twelve elections between 1983 and 2021, we find that district candidates are not only more likely to be male, female district candidates also receive fewer votes 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.

Female under-performance at the ballot box may be due to three reasons: First, voters may discriminate against female candidates. Second, parties could systematically nominate

female candidates to districts where the party is weaker. Third, female candidates may perform worse on other dimensions voters care about, such as for example competence, occupational prestige, or experience in office. As so often, the crucial inference problem is that we cannot observe the counterfactual: we do not know how a male candidate would have performed in places where a woman is nominated, and vice versa. Given the unique nature of the German electoral system, we use the party vote share as a proxy for true voter preferences, regardless of gender, and use a decomposition approach from labor economics to disentangle whether the gender vote gap is due to voter or party behavior.

We find evidence for party discrimination, but not for voter discrimination. Nomination to districts where the party is weaker accounts entirely for the relative under-performance of female candidates for the two largest parties. For the smaller FDP, Left, and Green parties, we find that female candidates tend to receive more votes than male candidates. Likewise, this is driven by nominations to districts where their parties receive more support. We do not find evidence suggesting that the gender vote gap is driven by omitted variable bias or strategic voting. We conclude that party nomination strategies account for the largest part of the gender vote gap in Germany. Our findings are consistent with qualitative evidence suggesting that German parties pay greater attention to considerations such as gender parity when the district mandate in a district is out of reach (Reiser, 2020a).

References

- Anzia, Sarah F and Christopher R Berry. 2011. “The Jackie (and Jill) Robinson effect: Why do congresswomen outperform congressmen?” *American Journal of Political Science* 55(3):478–493.
- Ashworth, Scott, Christopher R Berry and Ethan Bueno de Mesquita. 2020. Sources of Women’s Underrepresentation in US Politics: A Model of Election Aversion and Voter

- Discrimination. Technical report Working paper.
- Bateson, Regina. 2020. "Strategic discrimination." *Perspectives on Politics* 18(4):1068–1087.
- Bauer, Nichole M. 2015. "Emotional, sensitive, and unfit for office? Gender stereotype activation and support female candidates." *Political Psychology* 36(6):691–708.
- Besley, Timothy, Olle Folke, Torsten Persson and Johanna Rickne. 2017. "Gender quotas and the crisis of the mediocre man: Theory and evidence from Sweden." *American Economic Review* 107(8):2204–42.
- Blinder, Alan S. 1973. "Wage discrimination: reduced form and structural estimates." *Journal of Human resources* pp. 436–455.
- Brooks, Deborah Jordan. 2013. *He runs, she runs: Why gender stereotypes do not harm women candidates*. Princeton University Press.
- Brulé, Rachel E. 2020. *Women, power, and property: The paradox of gender equality laws in India*. Cambridge University Press.
- Callaway, Brantly and Pedro HC Sant'Anna. 2021. "Difference-in-differences with multiple time periods." *Journal of Econometrics* 225(2):200–230.
- Chattopadhyay, Raghavendra and Esther Duflo. 2004. "Women as policy makers: Evidence from a randomized policy experiment in India." *Econometrica* 72(5):1409–1443.
- Cheng, Christine and Margit Tavits. 2011. "Informal Influences in Selecting Female Political Candidates." *Political Research Quarterly* 64(2):460–471.
- Clayton, Amanda, Diana Z O'Brien and Jennifer M Piscopo. 2019. "All male panels? Representation and democratic legitimacy." *American Journal of Political Science* 63(1):113–129.
- Clayton, Amanda and Pär Zetterberg. 2018. "Quota shocks: Electoral gender quotas and government spending priorities worldwide." *The Journal of Politics* 80(3):916–932.
- Cox, Gary W. 1986. "The Development of a Party-Orientated Electorate in England, 1832–

- 1918.” *British Journal of Political Science* 16(2):187–216.
- Dancygier, Rafaela M, Karl-Oskar Lindgren, Sven Oskarsson and Kåre Vernby. 2015. “Why are immigrants underrepresented in politics? Evidence from Sweden.” *American Political Science Review* 109(4):703–724.
- Darcy, Robert and James R Choike. 1986. “A formal analysis of legislative turnover: Women candidates and legislative representation.” *American Journal of Political Science* pp. 237–255.
- Darcy, Robert and Sarah Slavin Schramm. 1977. “When women run against men.” *Public Opinion Quarterly* 41(1):1–12.
- Davidson-Schmich, Louise K. 2016. The German Political Recruitment Process. In *Gender Quotas and Democratic Participation: Recruiting Candidates for Elective Offices in Germany*. University of Michigan Press.
URL: <http://www.jstor.org/stable/10.3998/mpub.8137405.7>
- Detterbeck, Klaus. 2016. “Candidate Selection in Germany: Local and Regional Party Elites Still in Control?” *American Behavioral Scientist* 60(7):837–852.
- Dolan, Kathleen. 2004. “Voting for Women: How the Public Evaluates Women Candidates. Boulder, CO.”.
- Fortin, Nicole, Thomas Lemieux and Sergio Firpo. 2011. Decomposition methods in economics. In *Handbook of labor economics*. Vol. 4 Elsevier pp. 1–102.
- Forum, World Economic. 2020. Global Gender Gap Report. Technical report World Economic Forum.
- Fox, Richard L and Jennifer L Lawless. 2010. “If only they’d ask: Gender, recruitment, and political ambition.” *The Journal of Politics* 72(2):310–326.
- Fulton, Sarah A. 2012. “Running backwards and in high heels: The gendered quality gap and incumbent electoral success.” *Political Research Quarterly* 65(2):303–314.

- Geys, Benny and Karsten Mause. 2014. "Are Female Legislators Different? Exploring Sex Differences in German MPs' Outside Interests." *Parliamentary Affairs* 67(4):841–865.
- Hainmueller, Jens and Holger Lutz Kern. 2008. "Incumbency as a source of spillover effects in mixed electoral systems: Evidence from a regression-discontinuity design." *Electoral Studies* 27(2):213–227.
- Hayes, Danny, Jennifer L Lawless and Gail Baitinger. 2014. "Who cares what they wear? Media, gender, and the influence of candidate appearance." *Social Science Quarterly* 95(5):1194–1212.
- Hoecker, Beate. 1986. "Frauen in der Politik: Gängige Hypothesen zum Präsenzdefizit auf dem empirischen Prüfstand in Bremen." *Zeitschrift für Parlamentsfragen* 17(1):65–82.
URL: <http://www.jstor.org/stable/24222516>
- Höhne, Benjamin. 2020. "Mehr Frauen Im Bundestag? Deskriptive Repräsentation Und Die Innerparteiliche Herausbildung Des Gender Gaps." *Zeitschrift für Parlamentsfragen* 51(1):105–125.
- Huddy, Leonie and Nayda Terkildsen. 1993. "Gender Stereotypes and the Perception of Male and Female Candidates." *American Journal of Political Science* 37(1):119–147.
- Inter-Parliamentary Union. 2021. "Women in Parliaments: World and Regional Averages." .
URL: www.ipu.org
- Kanthak, Kristin and Jonathan Woon. 2015. "Women don't run? Election aversion and candidate entry." *American Journal of Political Science* 59(3):595–612.
- Kelley, Jonathan and Ian McAllister. 1984. "Ballot paper cues and the vote in Australia and Britain: alphabetic voting, sex, and title." *Public Opinion Quarterly* 48(2):452–466.
- Kitagawa, Evelyn M. 1955. "Components of a difference between two rates." *Journal of the American Statistical Association* 50(272):1168–1194.
- Lawless, Jennifer L. 2004. "Women, war, and winning elections: Gender stereotyping in the

- post-September 11th era.” *Political Research Quarterly* 57(3):479–490.
- Lawless, Jennifer L and Richard L Fox. 2005. *It Takes a Candidate: Why Women Don't Run for Office*. Cambridge University Press.
- Le Barbanchon, Thomas and Julien Sauvagnat. 2022. “Electoral competition, voter bias, and women in politics.” *Journal of the European Economic Association* 20(1):352–394.
- Menasce Horowitz, Juliana and Janell Fetterlof. 2020. “Many around the World Say Women’s Equality Is Very Important.”
URL: <https://www.pewresearch.org/fact-tank/2017/01/19/many-around-the-world-say-womens-equality-is-very-important/>
- Niven, David. 1998. “Party Elites and Women Candidates.” *Women & Politics* 19(2):57–80.
- Oaxaca, Ronald. 1973a. “Male-Female Wage Differentials in Urban Labor Markets.” *International economic review* pp. 693–709.
- Oaxaca, Ronald. 1973b. “Male-female wage differentials in urban labor markets.” *International economic review* pp. 693–709.
- Palmer, Barbara and Dennis Simon. 2010. *Breaking the political glass ceiling: Women and congressional elections*. Routledge.
- Preece, Jessica and Olga Stoddard. 2015. “Why women don’t run: Experimental evidence on gender differences in political competition aversion.” *Journal of Economic Behavior & Organization* 117:296–308.
- Rahn, Wendy M. 1993. “The role of partisan stereotypes in information processing about political candidates.” *American Journal of Political Science* pp. 472–496.
- Rasmussen, Jorgen. 1981. “Female political career patterns & leadership disabilities in Britain: The crucial role of gatekeepers in regulating entry to the political elite.” *Polity* 13(4):600–620.
- Reeves, Justin and Daniel J Smith. 2019. *Getting to Know Her: Information and Gender*

- Bias in Preferential Voting Systems. Technical report Working Paper.
- Reiser, Marion. 2011. Wer entscheidet unter welchen Bedingungen über die Nominierung von Kandidaten? Die innerparteilichen Selektionsprozesse zur Aufstellung in den Wahlkreisen. In *Die Parteien nach der Bundestagswahl 2009*, ed. Oskar Niedermayer. Wiesbaden: VS Verlag für Sozialwissenschaften pp. 237–259.
- Reiser, Marion. 2020a. *Innerparteilicher Wettbewerb bei der Kandidatenaufstellung: Ausmaß { Organisation { Selektionskriterien*. Springer.
- Reiser, Marion. 2020b. Lokale und Regionale Demokratie. In *Handbuch Demokratie*, ed. Andreas Kost, Peter Massing and Marion Reiser. Wochenschau-Verlag.
- Sanbonmatsu, Kira. 2002. “Gender Stereotypes and Vote Choice.” *American Journal of Political Science* 46(1):20–34.
- Sanbonmatsu, Kira. 2006. *Where women run: Gender and party in the American states*. University of Michigan Press.
- Schmitt-Beck, Rüdiger, Hans Rattinger, Sigrid Roßteutscher and Bernhard Weßels. 2010. Die Deutsche Wahlforschung Und Die German Longitudinal Election Study (GLES). In *Gesellschaftliche Entwicklungen Im Spiegel Der Empirischen Sozialforschung*. Springer pp. 141–172.
- Schüttemeyer, Suzanne S and Roland Sturm. 2005. “Der Kandidat–das (fast) unbekannte Wesen: Befunde und Überlegungen zur Aufstellung der Bewerber zum deutschen Bundestag.” *Zeitschrift für Parlamentsfragen* pp. 539–553.
- Schwarz, Susanne and Alexander Coppock. 2022. “What Have We Learned about Gender from Candidate Choice Experiments? A Meta-Analysis of Sixty-Seven Factorial Survey Experiments.” *The Journal of Politics* 84(2):000–000.
- Schwindt-Bayer, Leslie A. 2005. “The incumbency disadvantage and women’s election to legislative office.” *Electoral Studies* 24(2):227–244.

- Spenkuch, Jörg L. 2018. "Expressive vs. strategic voters: An empirical assessment." *Journal of Public Economics* 165:73–81.
- Stokes, Donald E. 1962. "Party loyalty and the likelihood of deviating elections." *The Journal of Politics* 24(4):689–702.
- Stout, Christopher T. and Reuben Kline. 2011. "I'm Not Voting for Her: Polling Discrepancies and Female Candidates." *Political Behavior* 33(3):479–503.
- Teele, Dawn Langan, Joshua Kalla and Frances Rosenbluth. 2018. "The ties that double bind: social roles and women's underrepresentation in politics." *American Political Science Review* 112(3):525–541.
- Wängnerud, Lena. 2009. "Women in Parliaments: Descriptive and Substantive Representation." *Annual Review of Political Science* 12(1):51–69.

Appendices

A	Context	A2
B	Additional Tables and Figures	A3
B.1	Electoral performance and candidate characteristics by gender and party, 1983–2021	A3
B.2	Proportion of female candidates, 1983–2021	A4
B.3	Candidate characteristics by gender, party and election	A6
B.4	Candidate age and district competitiveness	A9
B.5	Gap between candidate and party vote	A10
B.6	Candidate performance rel. to party performance – open seats	A11
B.7	Candidate and party vote shares	A13
B.8	Candidate vote share and candidate characteristics	A15
B.9	Candidate gender and party vote shares – difference-in-difference	A17
B.10	Party list summary statistics	A19
C	Additional Decomposition Results	A21
C.1	Decomposition results – East & West Germany	A24
C.2	Decomposition results – robustness	A25
C.3	Decomposition results – additional individual-level covariates	A26
C.4	Decomposition results – winning districts	A29
D	Additional information on the German electoral system	A31

A Context

Stimmzettel
für die Wahl zum Deutschen Bundestag
im Wahlkreis 5 Kiel
am 18. September 2005

Sie haben 2 Stimmen

hier 1 Stimme

für die Wahl eines
Wahlkreisabgeordneten

↓ **X** ↓

Erststimme

hier 1 Stimme

für die Wahl einer
Landesliste (Partei)

- maßgebende Stimme für die
Verteilung der Sitze insgesamt
auf die einzelnen Parteien -

↓ **X** ↓

Zweitstimme

1	Dr. Bartels, Hans Peter Angestellter Kiel Esmarchstraße 16	SPD	Sozial- demokratische Partei Deutschlands	<input type="radio"/>
2	Dr. Murmann, Philipp Geschäftsführer Heikendorf Hardenbergblick 3	CDU	Christlich Demokratische Union Deutschlands	<input type="radio"/>
3	Müller, Klaus Diplom-Volkwirt Kiel Wilhelminenstraße 29	GRÜNE	BÜNDNIS 90/ DIE GRÜNEN	<input type="radio"/>
4	Blumenthal, Sebastian Angestellter Kiel Hamburger Chaussee 46	FDP	Freie Demokratische Partei	<input type="radio"/>
5	Thoroé, Björn arbeitssuchend Kiel Feldstraße 97	DIE LINKE.	Die Linkspartei Schleswig- Holstein	<input type="radio"/>
6	Gutsche, Hermann EDV-Berater Kiel Königstraße 22	NPD	National- demokratische Partei Deutschlands	<input type="radio"/>
7	Mrozewski, Oliver Koch Altenholz Danziger Straße 5	FAMILIE	FAMILIEN- PARTEI DEUTSCHLANDS	<input type="radio"/>
				<input type="radio"/>
		SPD	Sozialdemokratische Partei Deutschlands Dr. Ernst Dieter Rossmann, Bettina Hegedors, Franz Thönnies, Gabriele Häfner-Olm, Sünke Rex	<input type="radio"/>
		CDU	Christlich Demokratische Union Deutschlands Wolfgang Börsner, Dr. Ole Schröder, Anke Eymer, Otto Bernhardt, Gero Storjohann	<input type="radio"/>
		GRÜNE	BÜNDNIS 90/DIE GRÜNEN Britje Böttin, Rainer Steenblock, Monika Heinold, Sebastian David Fricke, Erika von Kalben	<input type="radio"/>
		FDP	Freie Demokratische Partei Jürgen Koppeln, Dr. Christel Happach-Kasan, Sebastian Blumenthal, Wolfgang Schnabel, Dr. Michaela Burck	<input type="radio"/>
		DIE LINKE.	Die Linkspartei. Schleswig-Holstein Lutz Heilmann, Heidi Beutin, Wiebke Meisfeld, Björn Thoroé, Brigitta Wendt	<input type="radio"/>
		NPD	Nationaldemokratische Partei Deutschlands Uwe Schäfer, Jens Laska, Inga Stewitz, Wolfgang Schimmel, Alfiad Hennig	<input type="radio"/>
		FAMILIE	FAMILIEN-PARTEI DEUTSCHLANDS Matthias Kortim, Werner Lahann, Sabine Cavid, Hike Röhnhagen, Bettina Kortim	<input type="radio"/>
		MLPD	Marxistisch-Leninistische Partei Deutschlands Jakobus Fröhlich, Inge Marbach, Andrea Sibylle Hähner, Joachim Griesbaum, Marie Meyer	<input type="radio"/>
				<input type="radio"/>

Figure A1: German ballot

Note: The image shows a German ballot with the candidate vote on the left and the party vote on the right.

B Additional Tables and Figures

B.1 Electoral performance and candidate characteristics by gender and party, 1983–2021

Table B1: Electoral performance and candidate characteristics by gender and party, 1983–2021

	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: Candidate and party vote shares as well as candidate characteristics, split by party and candidate gender. Each cell is the average given a party / gender combination. The summary stats are based on district-level results from all federal elections between 1983 and 2021. The results are not weighted by district size.

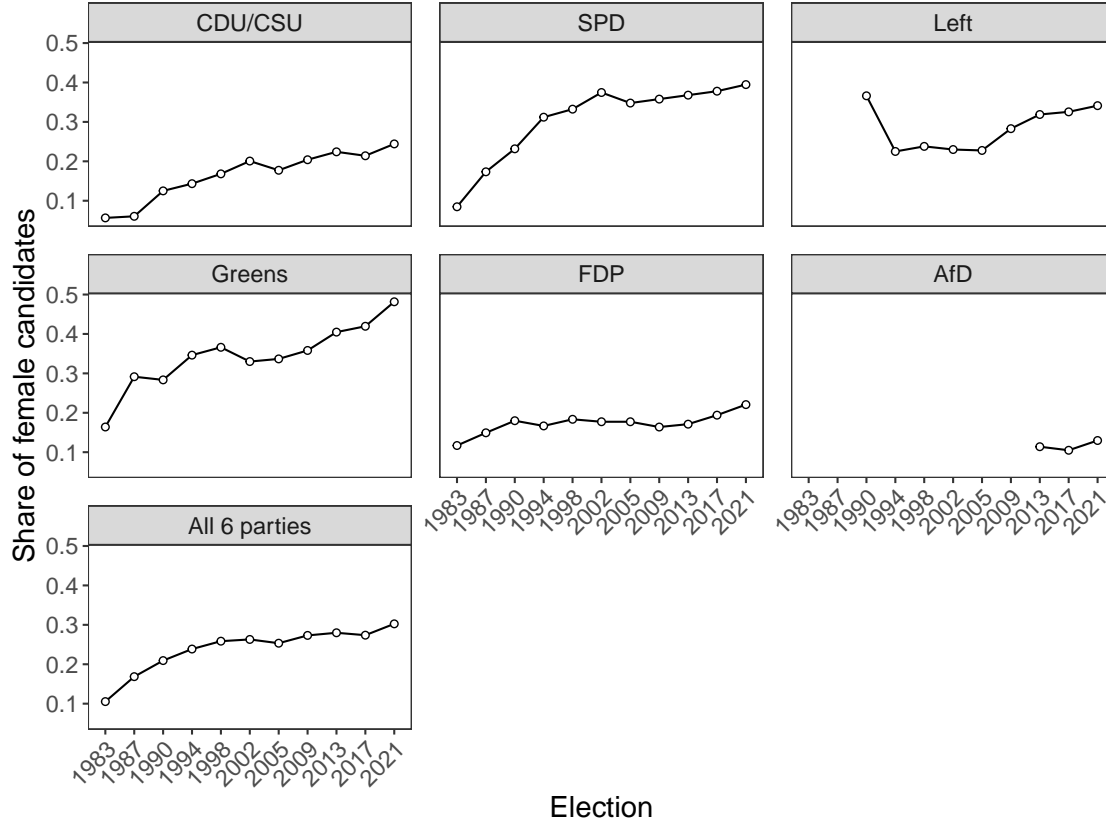
Table B2: Number of district races by party and candidate gender, 1983–2021

	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 (i) the number of elections for which we observe district candidates from a given party, (ii) the number of races in which the party fielded a female candidate and (iii) the number of races in which the party fielded a male candidate.

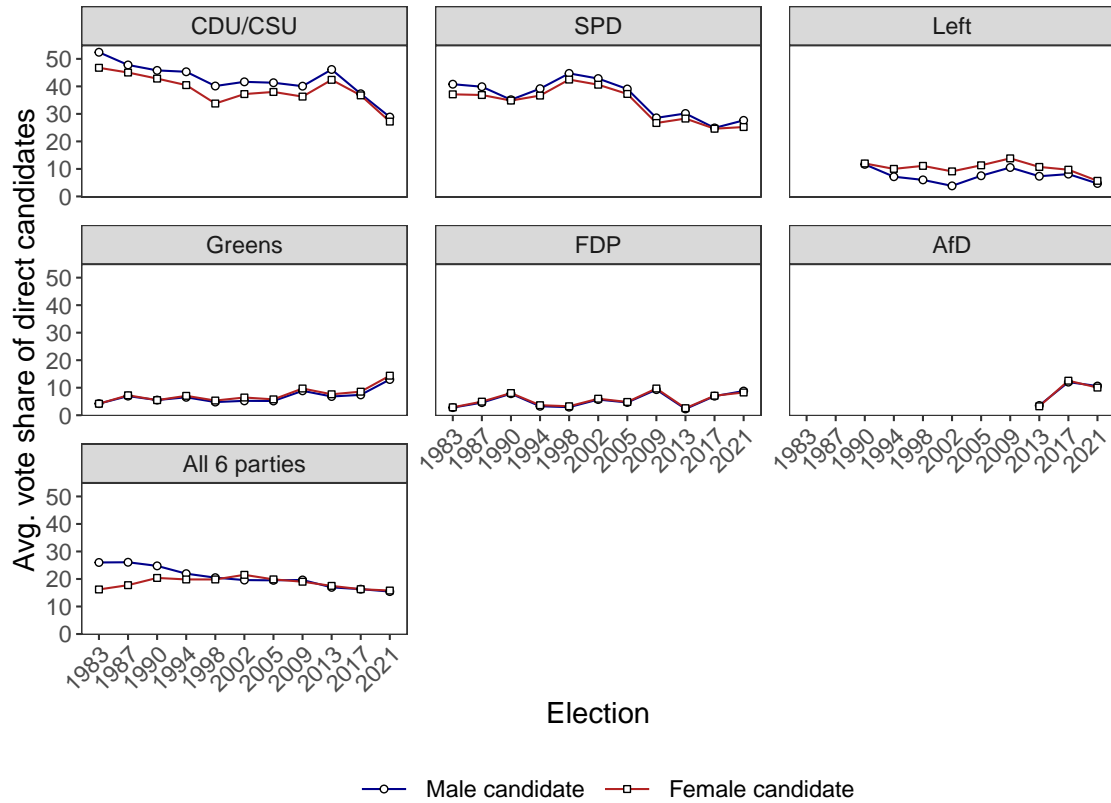
B.2 Proportion of female candidates, 1983–2021

Figure B2: Proportion of female candidates over time



Note: The figure shows the proportion of female district candidates by party and election. We consider all elections between 1983 and 2021. Elections prior to 1990 are based on West Germany, excluding the GDR. The panel labeled ‘all 6 parties’ includes all candidates from the six parties shown in the other panels.

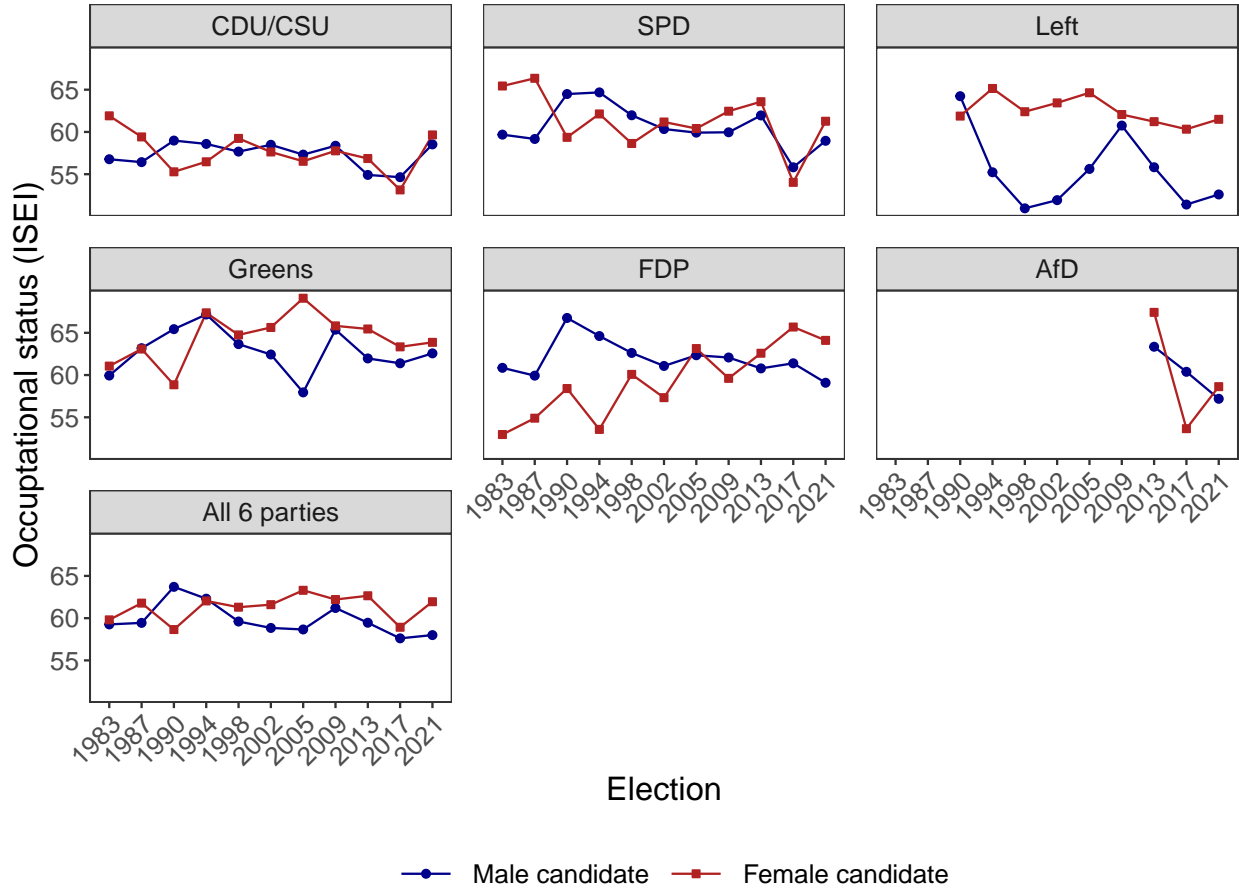
Figure B3: Candidate performance by gender and party



Note: The figure shows vote shares for male and female district candidates, across eleven elections for six parties. We consider all elections between 1983 and 2021. Elections prior to 1990 are based on West Germany, excluding the GDR. The Left party did not exist in West Germany prior to 1990. We average over all electoral districts.

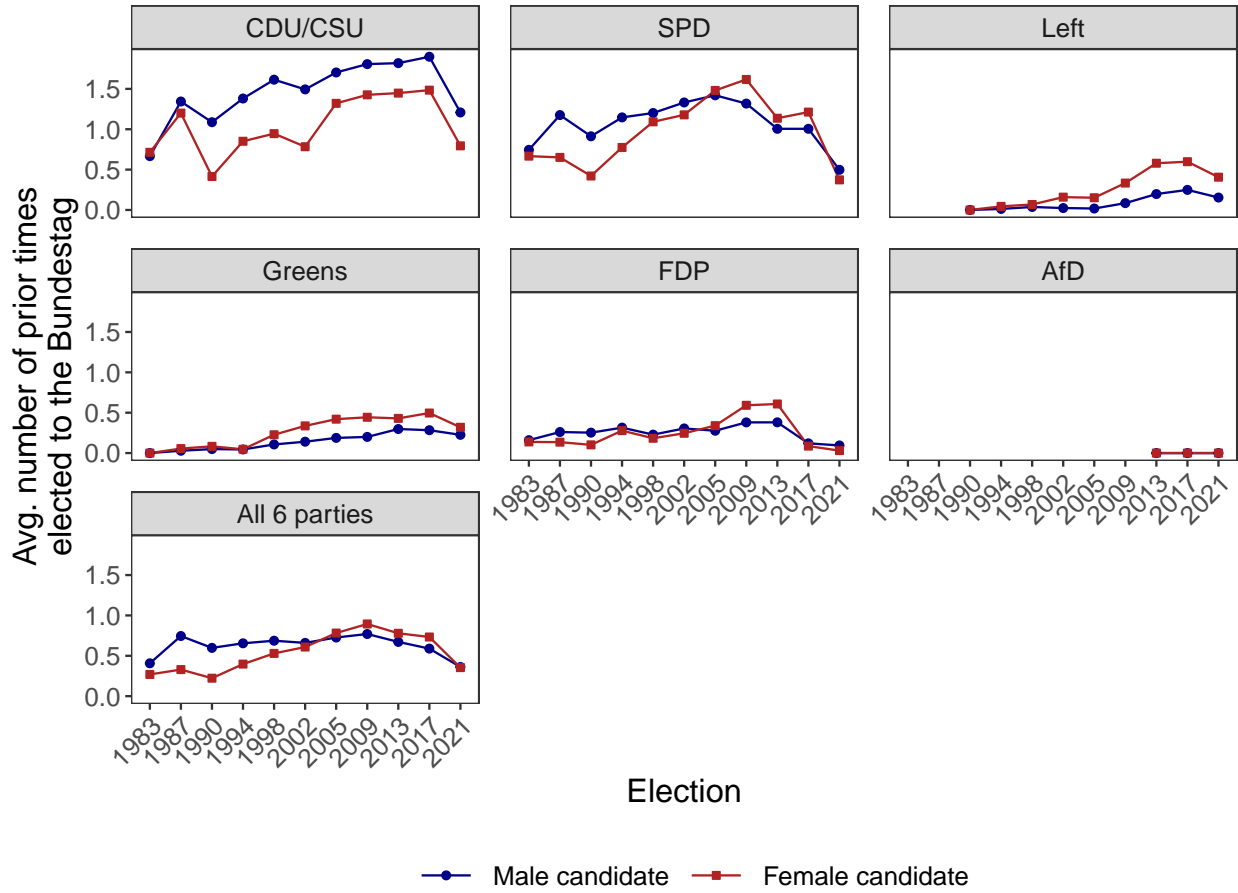
B.3 Candidate characteristics by gender, party and election

Figure B4: Occupational status by gender and party



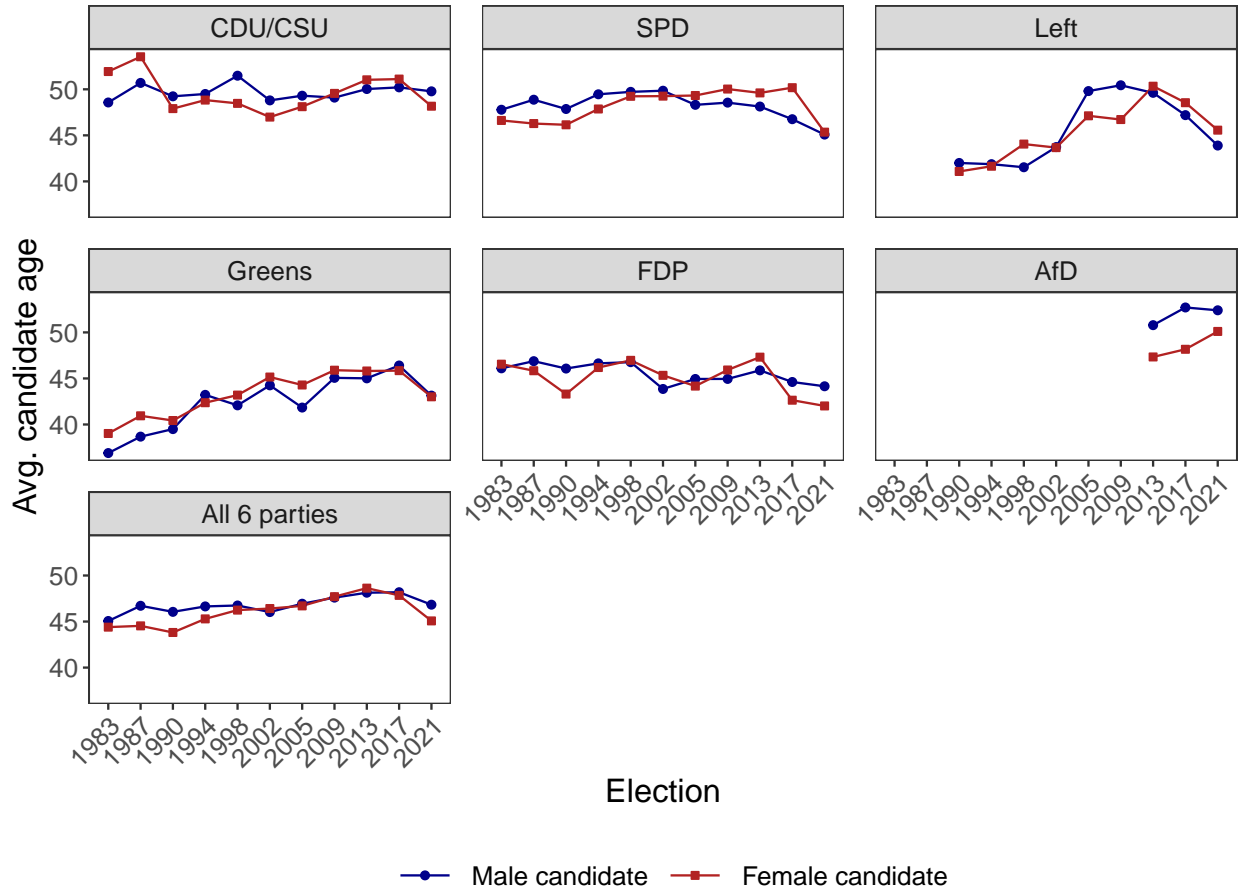
Note: The figure shows average occupational status for male and female district candidates, across eleven elections for six parties. We consider all elections between 1983 and 2021. Elections prior to 1990 are based on West Germany, excluding the GDR. The Left party did not exist in West Germany prior to 1990. We average over all electoral districts.

Figure B5: Times elected previously, by gender and party



Note: The figure shows average times elected to parliament previously, for male and female district candidates, across eleven elections for six parties. We consider all elections between 1983 and 2021. Elections prior to 1990 are based on West Germany, excluding the GDR. The Left party did not exist in West Germany prior to 1990. We average over all electoral districts.

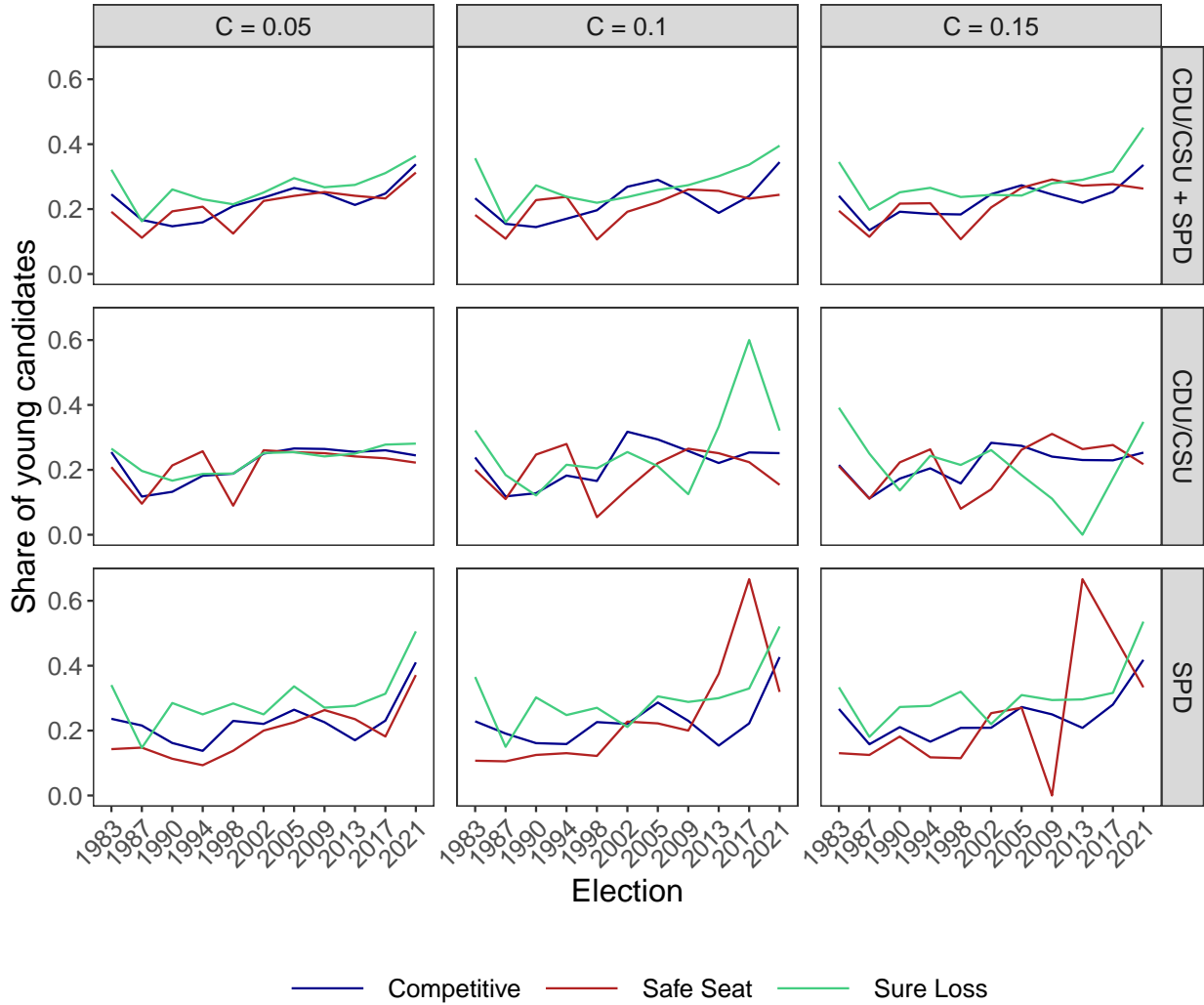
Figure B6: Candidate age, by gender and party



Note: The figure shows average candidate age, for male and female district candidates, across eleven elections for six parties. We consider all elections between 1983 and 2021. Elections prior to 1990 are based on West Germany, excluding the GDR. The Left party did not exist in West Germany prior to 1990. We average over all electoral districts.

B.4 Candidate age and district competitiveness

Figure B7: Likelihood of nominating a young district candidate by district competitiveness



Note: The figure shows the proportion of young district candidates by party, election, and district competitiveness. We consider all elections between 1983 and 2021. Elections prior to 1990 are based on West Germany, excluding the GDR. The definition of ‘young’ candidates is based on the bottom tercile of the candidate age distribution – young candidates are 42 or younger. We note that these patterns are very similar for the bottom quartile of the candidates age distribution, which includes candidates 39 and younger.

B.5 Gap between candidate and party vote

Table B3: Vote gap betw. male and female candidates

	Vote gap (percentage points)						
	All parties	CDU/CSU	SPD	Left	Greens	FDP	AfD
Female candidate (0/1)	0.107 (0.043)	0.296 (0.110)	0.134 (0.102)	0.115 (0.070)	0.120 (0.068)	0.112 (0.078)	0.064 (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, male candidates	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 are displayed in parentheses. The dependent variable is the candidate vote minus party vote. Positive coefficients indicate that female candidates receive more votes than their party, relative to men. ***p < .001; **p < .01; *p < .05

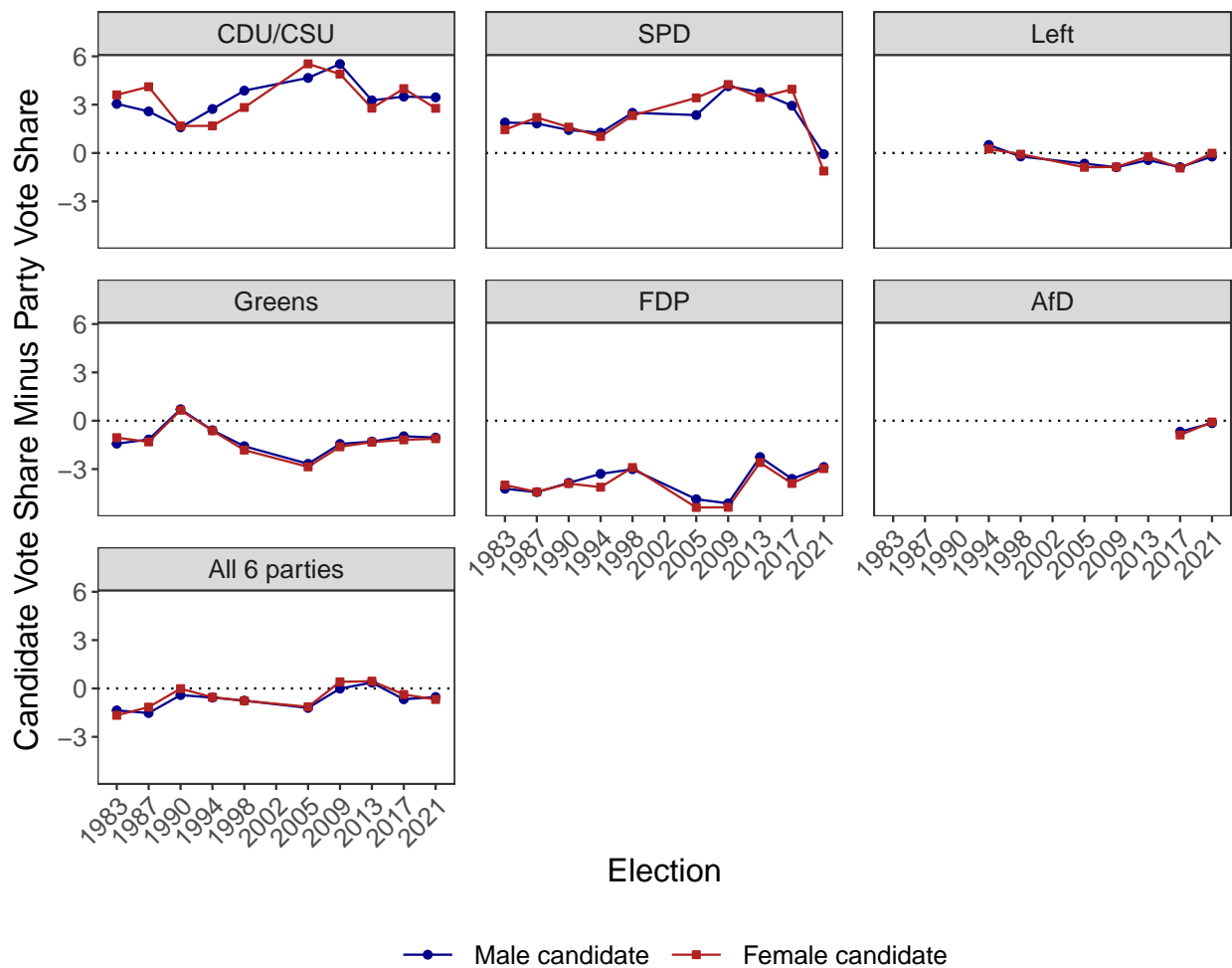
Table B4: Vote gap betw. male and female candidates conditional on candidate rank

	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 (0.283)		0.291 (0.077)		0.170 (0.379)		0.200 (0.111)		0.276 (0.322)		0.186 (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 are displayed in parentheses. The dependent variable is the candidate vote minus party vote. Positive coefficients indicate that female candidates receive more votes than their party, relative to men. We subset the data conditional on the rank that a given candidate achieves in his or her electoral district. ***p < .001; **p < .01; *p < .05

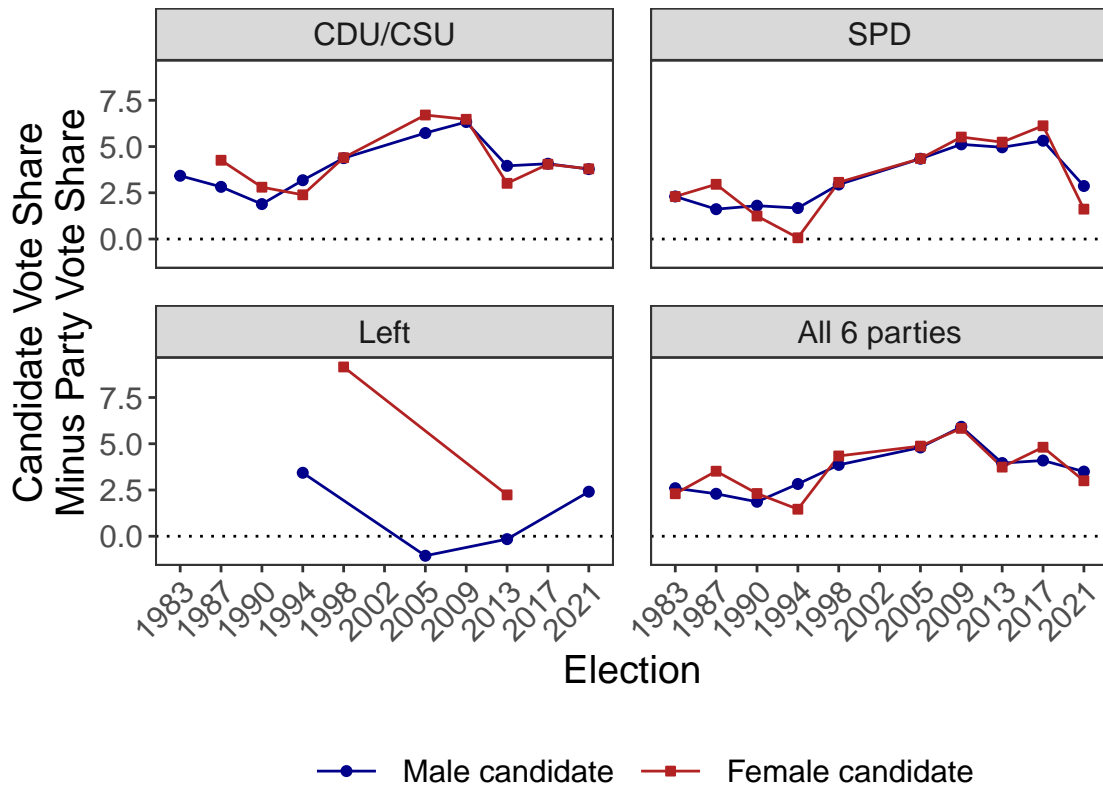
B.6 Candidate performance rel. to party performance – open seats

Figure B8: Candidate performance relative to party performance – open seats (first definition)



Note: The figure shows the percentage-point difference between candidate and party vote for a given candidate, across ten elections for six parties. We consider all elections between 1983 and 2021, excluding the 2002 elections. Elections prior to 1990 are based on West Germany, excluding the GDR. The Left party did not exist in West Germany prior to 1990. We average over all electoral districts for which there are open-seat candidates. Positive values on the y-axis indicate that, on average, candidates receive more votes than their respective party in the same district.

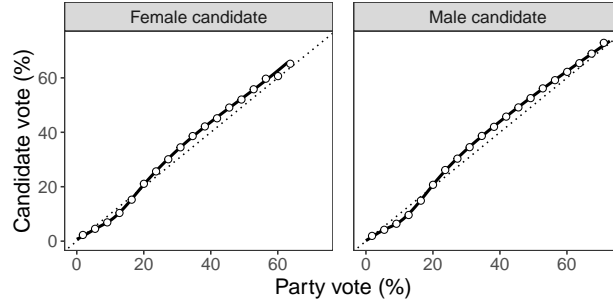
Figure B9: Candidate performance relative to party performance – open seats (second definition)



Note: The figure shows the percentage-point difference between candidate and party vote for a given candidate, across ten elections for six parties. We consider all elections between 1983 and 2021, excluding the 2002 elections. Elections prior to 1990 are based on West Germany, excluding the GDR. The Left party did not exist in West Germany prior to 1990. We average over all electoral districts for which there are open-seat candidates. Positive values on the y-axis indicate that, on average, candidates receive more votes than their respective party in the same district.

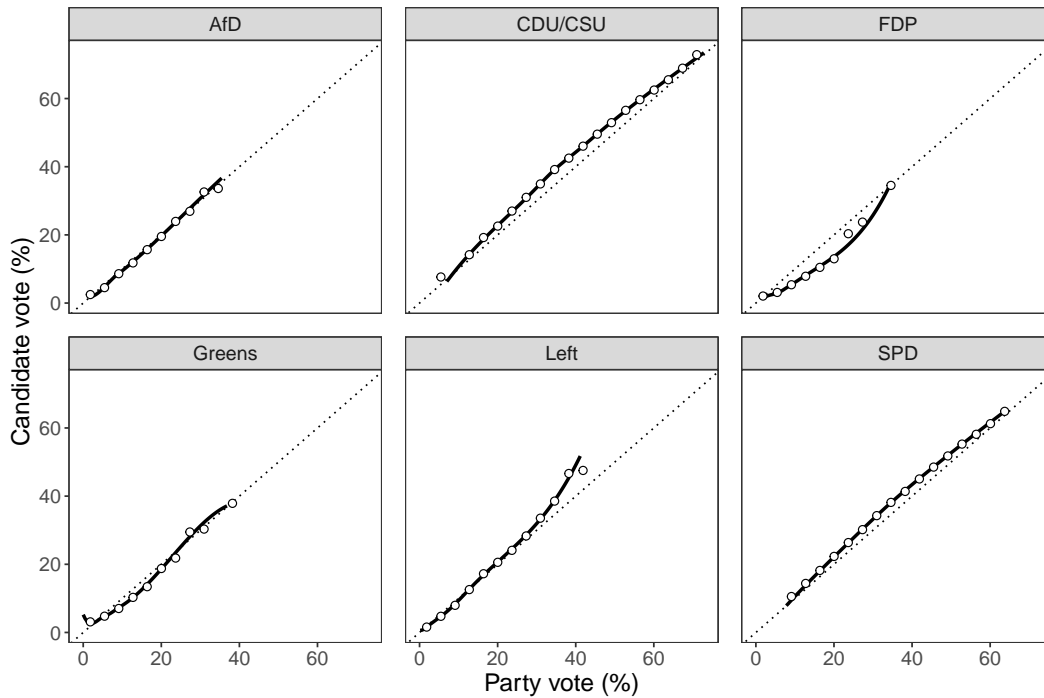
B.7 Candidate and party vote shares

Figure B10: Candidate and party vote shares



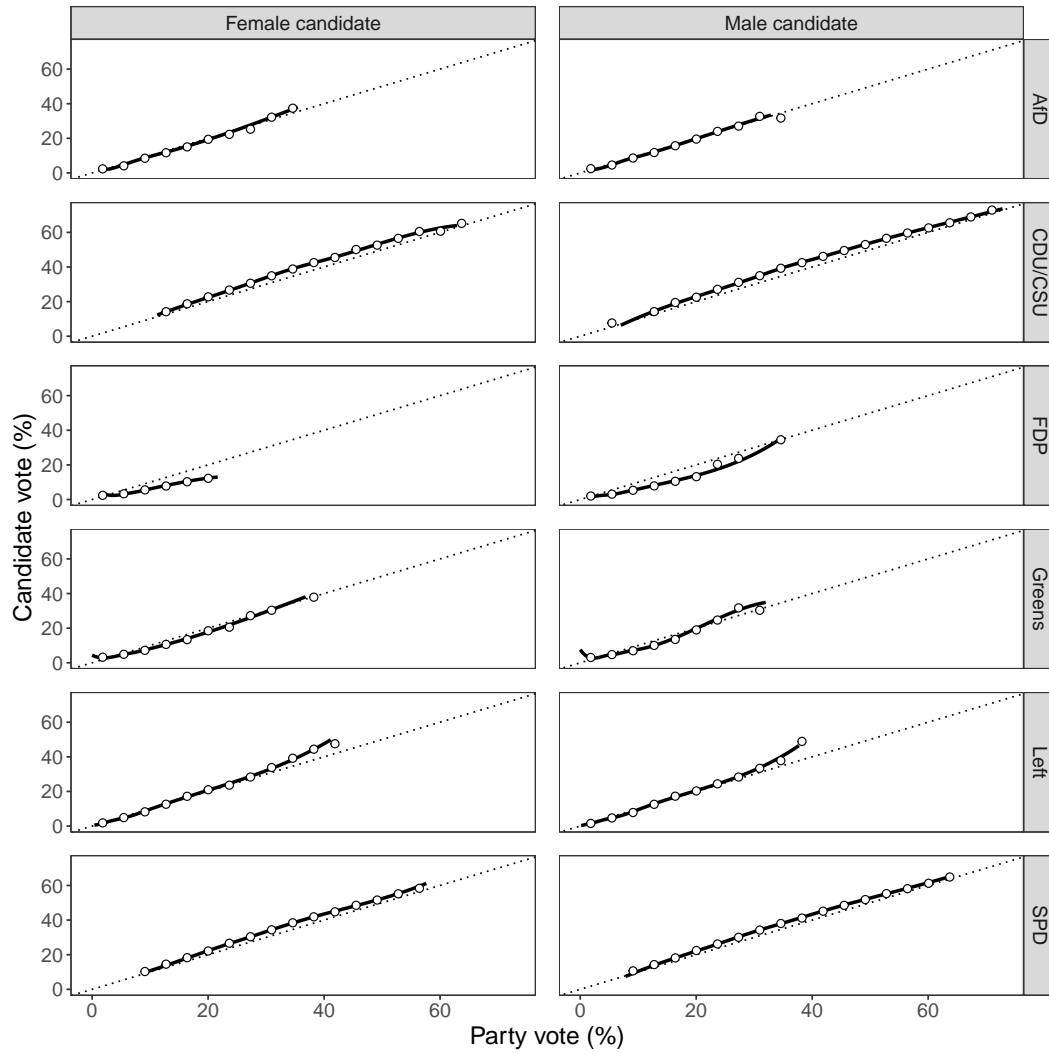
Notes: Party and Candidate vote shares. Circles represent conditional means of candidate vote shares. We plot the relationship for female and male candidates separately. The dotted line has slope one and intercept zero. We use a local polynomial regression to estimate the conditional mean of candidate vote shares as a function of party vote shares.

Figure B11: Candidate and party vote shares by party



Notes: Party and candidate vote shares conditional on candidate party. Circles represent conditional means of candidate vote shares. The dotted line has slope one and intercept zero. We use a local polynomial regression to estimate the conditional mean of candidate vote shares as a function of party vote shares.

Figure B12: Candidate and party vote shares by party and candidate gender



Notes: Party and candidate vote shares conditional on candidate party and candidate gender. Circles represent conditional means of candidate vote shares. The dotted line has slope one and intercept zero. We use a local polynomial regression to estimate the conditional mean of candidate vote shares as a function of party vote shares.

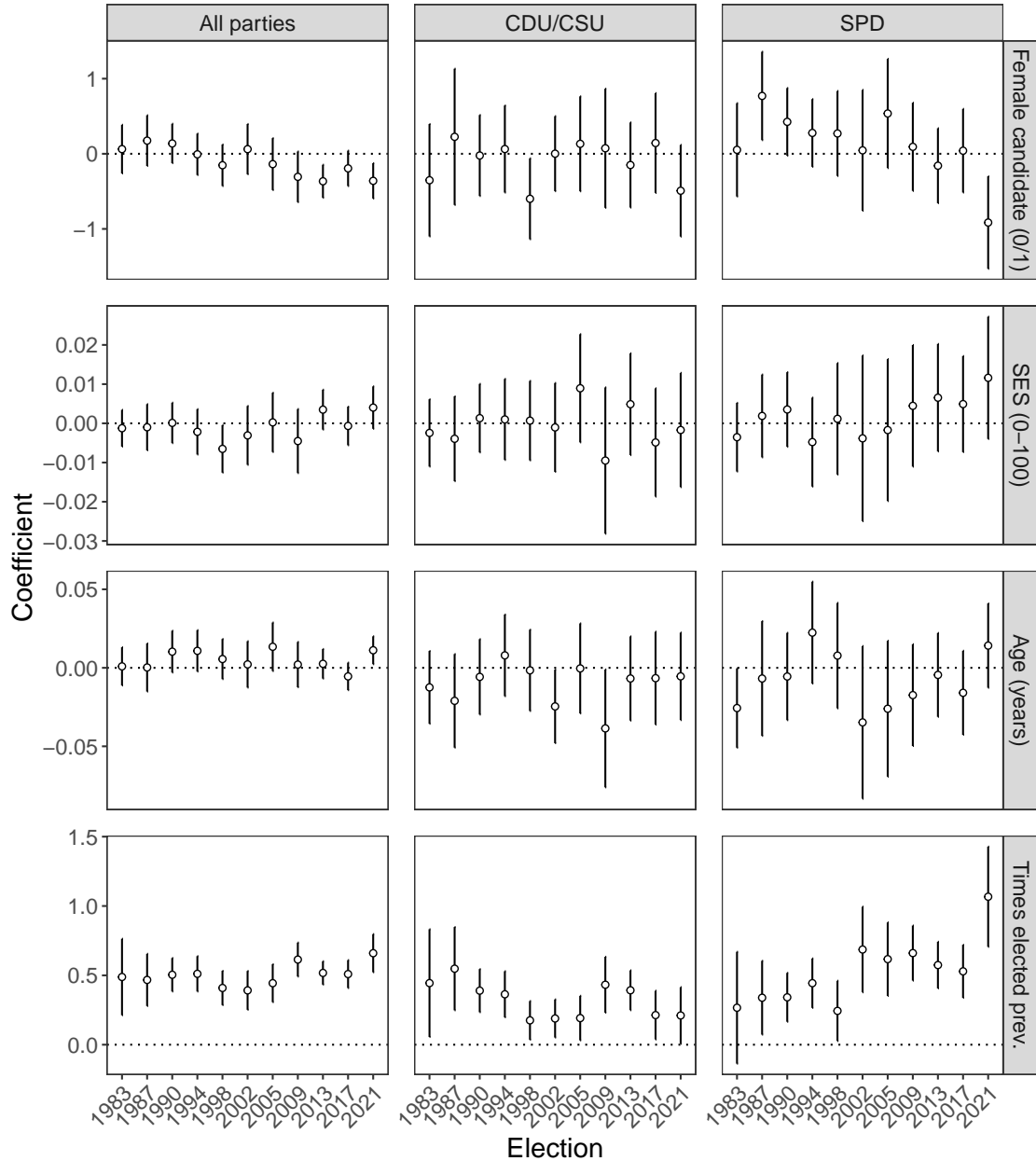
B.8 Candidate vote share and candidate characteristics

Table B5: 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*** (0.002)	0.995*** (0.002)	1.084*** (0.006)	1.066*** (0.006)	1.087*** (0.008)	1.075*** (0.008)
Female candidate		-0.084** (0.042)		-0.070 (0.105)		0.022 (0.097)
SES (ISEI08)		-0.001 (0.001)		-0.004** (0.002)		0.003 (0.002)
Age		-0.0004 (0.002)		-0.018*** (0.005)		-0.001 (0.005)
Times elected prev.		0.540*** (0.018)		0.327*** (0.028)		0.514*** (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 are displayed in parentheses. The dependent variable is the candidate vote share. The independent variables are party 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 five major parties. $p < .001$; $p < .01$; $p < .05$

Figure B13: Effects of candidate characteristics on candidate vote shares



Notes: The figure shows coefficients from regression candidate vote share on party vote share in the same district, as well as four candidate characteristics. We re-estimate models 2, 4 and 6 from table B5 separately for each election and then show the coefficients by year and party. The independent variables are party vote share (percentage points), 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. Since we do not have candidate data for the period prior to 1980, the ‘times elected’ variable is truncated from above for the first few elections in the 1980s. We therefore note that caution should be exercised when examining over-time changes in the coefficients, as the range of the variable changes. We omit the party vote share coefficients. Vertical bars represent 95% confidence intervals.

B.9 Candidate gender and party vote shares – difference-in-difference

In this section, we analyze whether party vote shares are affected by the gender of the district candidate that is nominated in a given district. In doing so, we utilize the fact that fielding new candidates sometimes means that the candidate gender changes from male to female between two elections, holding party and electoral district constant.

Due to a redistricting reform, we split the sample into two periods, 1980–1998 and 2002–2021. Between 1998 and 2002, a large number of districts were renamed. This makes it harder to assign unambiguous district identifiers that do not change over time when comparing districts across these two periods. We therefore split the sample, and report results separately for each time period.

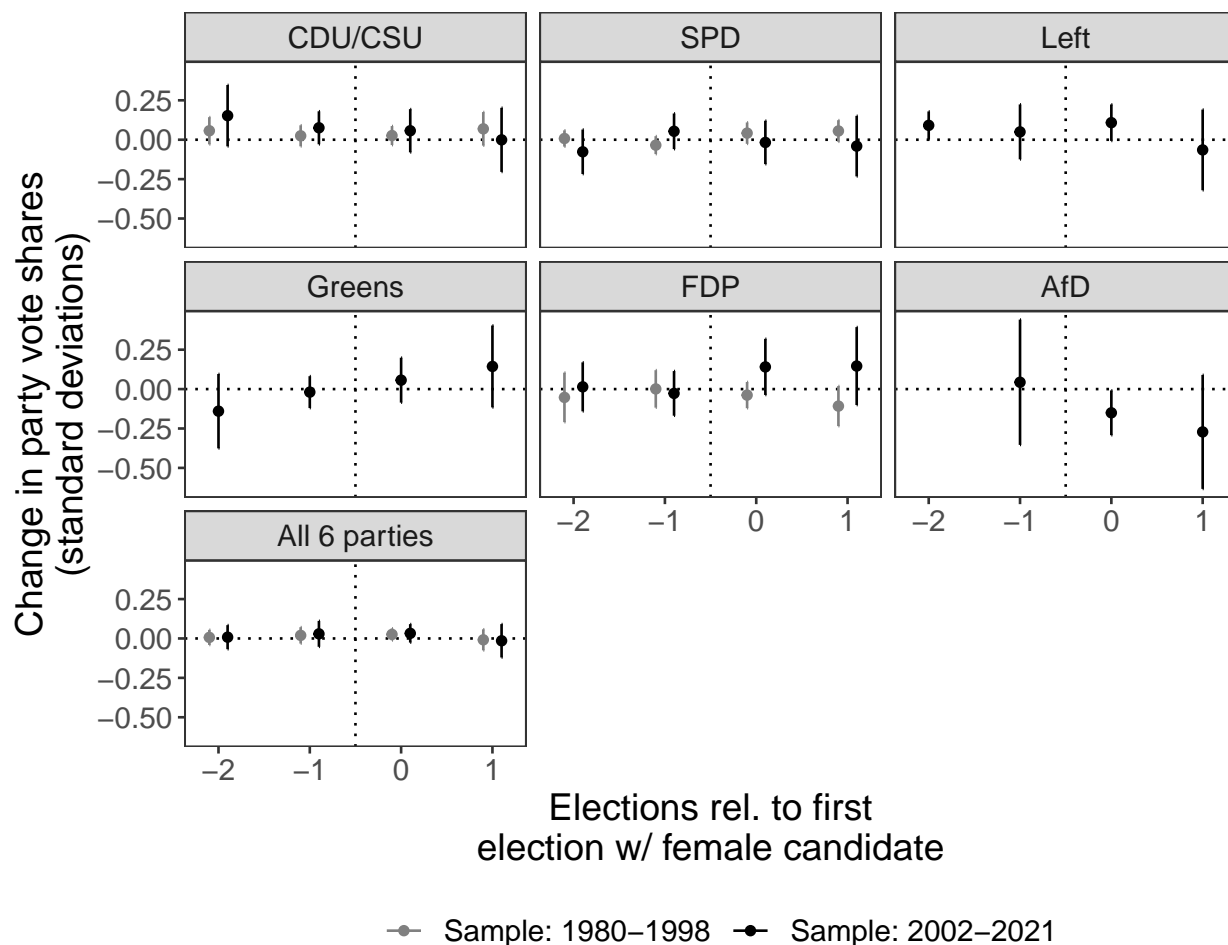
For a given party during each time period, we then select consider all districts were either (i) a male candidates was fielded in all elections or (ii) a male candidate was replaced by a female candidates between any two consecutive elections.¹⁵ This gives us a setting where the treatment (the entry of a female candidate) is staggered across elections. We therefore use the estimator proposed by Callaway and Sant’Anna (2021), which allows us to econometrically address issues related to the staggered nature of the treatment.

In figure B14, we present the results in an “event study” plot. Time zero represents the election where a switch from male to female candidate occurred, with the figure showing the effect on party vote shares relative to the two prior elections and the one election after the switch. Overall, the results give us little reason to assume the candidate gender has a causal effect on party vote shares. For the CDU/CSU, SPD, FDP and Greens, we observe small and insignificant changes in party vote shares after a woman replaces a male candidate. This holds both for the pre-2002 and the post-2002 period.¹⁶ For the Left party and the AfD, estimates are noisier and we observe marginally significant results. The substantive magnitude of the effects we observe is small. Measured in percentage points, the estimates shown in figure B14 translate to an increase in party vote shares by 0.55 percentage points for the CDU/CSU, and a decrease of 0.16 percentage points for the SPD for the first period in which a female candidates runs. As a percentage of the average absolute election-on-election change in party vote shares, this equals 8.8% for the CDU/CSU, and -2.9% for the SPD.

¹⁵We additionally impose the condition that once a female candidate is nominated by a party in a given district, the candidate gender in all subsequent elections remains female.

¹⁶We note that we only present estimates for the CDU/CSU, FDP and SPD for the period prior to 2002, as the other parties fielded fewer or no candidates in these elections.

Figure B14: Difference-in-differences estimates of the effect of nominating a female candidate on party vote shares



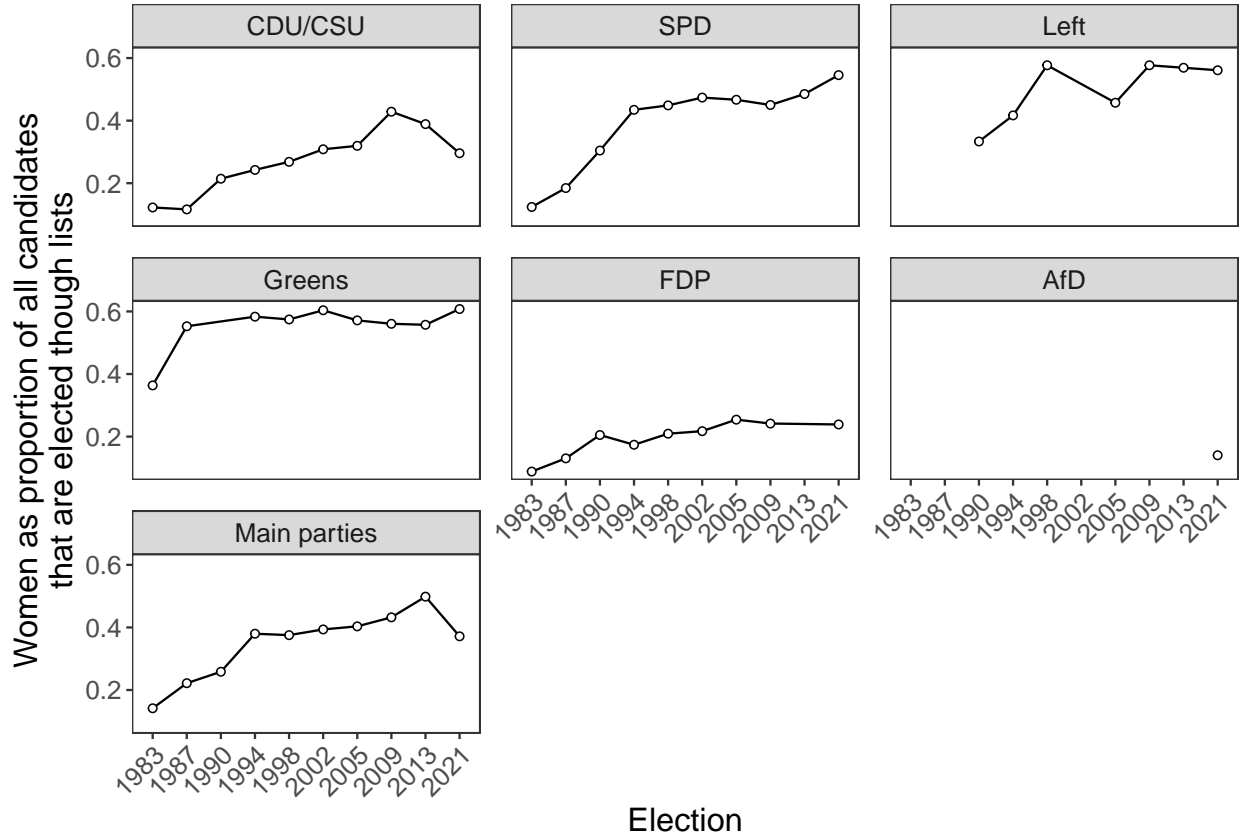
Notes: The figure shows estimates based on the estimator proposed by Callaway and Sant’Anna (2021). The outcome is the (standardized) party vote share for a given party. We present average effects conditional on the time of exposure to the treatment. The treatment is defined as the entry of a female district candidate after the previous candidate was a man. We present effect estimates in standard deviations. Negative values on the x-axis indicate elections prior to the the entry of the female candidate.

We also average these coefficients across all main parties, which is given in the bottom panel of figure B14, which similarly points to null effects.¹⁷ Overall, the results presented in figure B14 indicate that candidate gender does not have a substantial effect on party vote shares.

¹⁷We note that this is based on averaging estimates across parties and periods. To calculate variances, we assume that period-party-specific estimates are independent – we note that a violation of this assumption would affect standard errors but not the averages across coefficients.

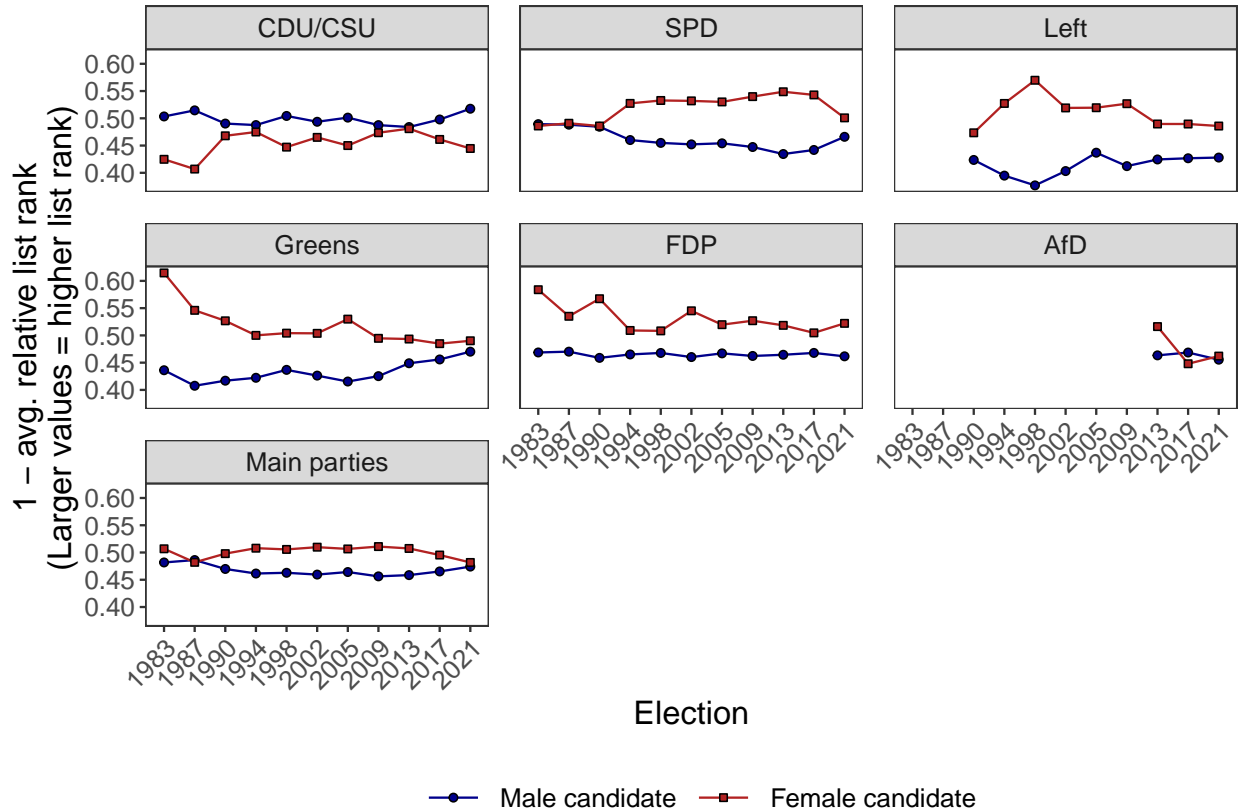
B.10 Party list summary statistics

Figure B15: Likelihood of getting elected through party lists for women



Notes: The plot shows the number of women candidates who enter parliament through their party list, as a share of all candidates from the indicated party that enter parliament through party lists (this equals $P(\text{Female candidate} | \text{Candidate enters parliament through list})$). 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 run in districts.

Figure B16: Average relative list position by gender, party, and election



Notes: The plot shows 1 - average relative list rank for female and male candidates separately, for all elections since 1983. 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 $R_{idt}^{\text{relative}} = \frac{R_{idt}}{\max R_{i,dt}}$. 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. The panel labeled 'all 6 parties' includes all candidates from the six parties shown in the other panels.

C Additional Decomposition Results

Table C6: 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: The table contains the results of the decomposition analysis outlined in section 6. The first column is the $[\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M}]$ term, representing the contribution of voters to the total gender vote gap. The second column is the $\beta^W(\overline{PV^W} - \overline{PV^M})$ term, representing the contribution of the parties. The final column is the total gender vote gap, i.e. $\overline{CV^W} - \overline{CV^M}$, which is also the sum of the second and third columns. Positive values in the fourth columns indicate that women candidates are more successful than male candidates. The unit of observation is the electoral district. We consider all elections between 1983 and 2021. Elections prior to 1990 are based on West Germany, excluding the GDR. Across all district-party-year combinations, about 23% of candidates are women.

Table C7: Decomposition Results: Additional Detail

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: The table shows detailed decomposition results for all elections since 1983. The 'Voters' term is $\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M}$ and the 'Parties' term is $\beta^W(\overline{PV^W} - \overline{PV^M})$. Elections prior to 1990 are based on West Germany, excluding the GDR.

Table C8: Decomposition Results: By Year (1983–2021)

		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
1983	All 6 parties	-2.96	-3.28	1.13	1.13	25.89	16.91	26.00	16.20	-10.18	0.37	-9.81
1987	All 6 parties	-3.41	-3.64	1.16	1.15	25.96	18.28	26.08	17.75	-8.90	0.57	-8.33
1990	All 6 parties	-1.06	-1.65	1.07	1.08	24.50	20.09	24.77	20.39	-4.71	0.33	-4.38
1994	All 6 parties	-2.15	-2.27	1.12	1.12	21.59	19.62	21.93	19.84	-2.21	0.11	-2.10
1998	All 6 parties	-2.45	-2.22	1.14	1.14	19.86	19.51	20.48	19.83	-0.39	-0.26	-0.65
2002	All 6 parties	-2.19	-1.53	1.13	1.10	19.27	20.98	19.61	21.51	1.93	-0.03	1.90
2005	All 6 parties	-4.76	-4.38	1.26	1.24	19.25	19.54	19.52	19.86	0.37	-0.03	0.34
2009	All 6 parties	-4.28	-4.93	1.28	1.29	19.07	18.15	19.64	19.01	-1.18	0.55	-0.63
2013	All 6 parties	-2.34	-2.09	1.17	1.16	16.42	16.89	16.96	17.49	0.55	-0.02	0.54
2017	All 6 parties	-3.34	-3.49	1.25	1.24	15.95	15.65	16.30	16.29	-0.38	0.36	-0.01
2021	All 6 parties	-1.49	-2.31	1.09	1.18	15.05	15.84	15.43	15.80	0.86	-0.49	0.37

Notes: The table shows detailed decomposition results for all elections since 1983. The 'Voters' term is $\alpha^W - \alpha^M + (\beta^W - \beta^M) \overline{PV^M}$ and the 'Parties' term is $\beta^W (\overline{PV^W} - \overline{PV^M})$. Elections prior to 1990 are based on West Germany, excluding the GDR.

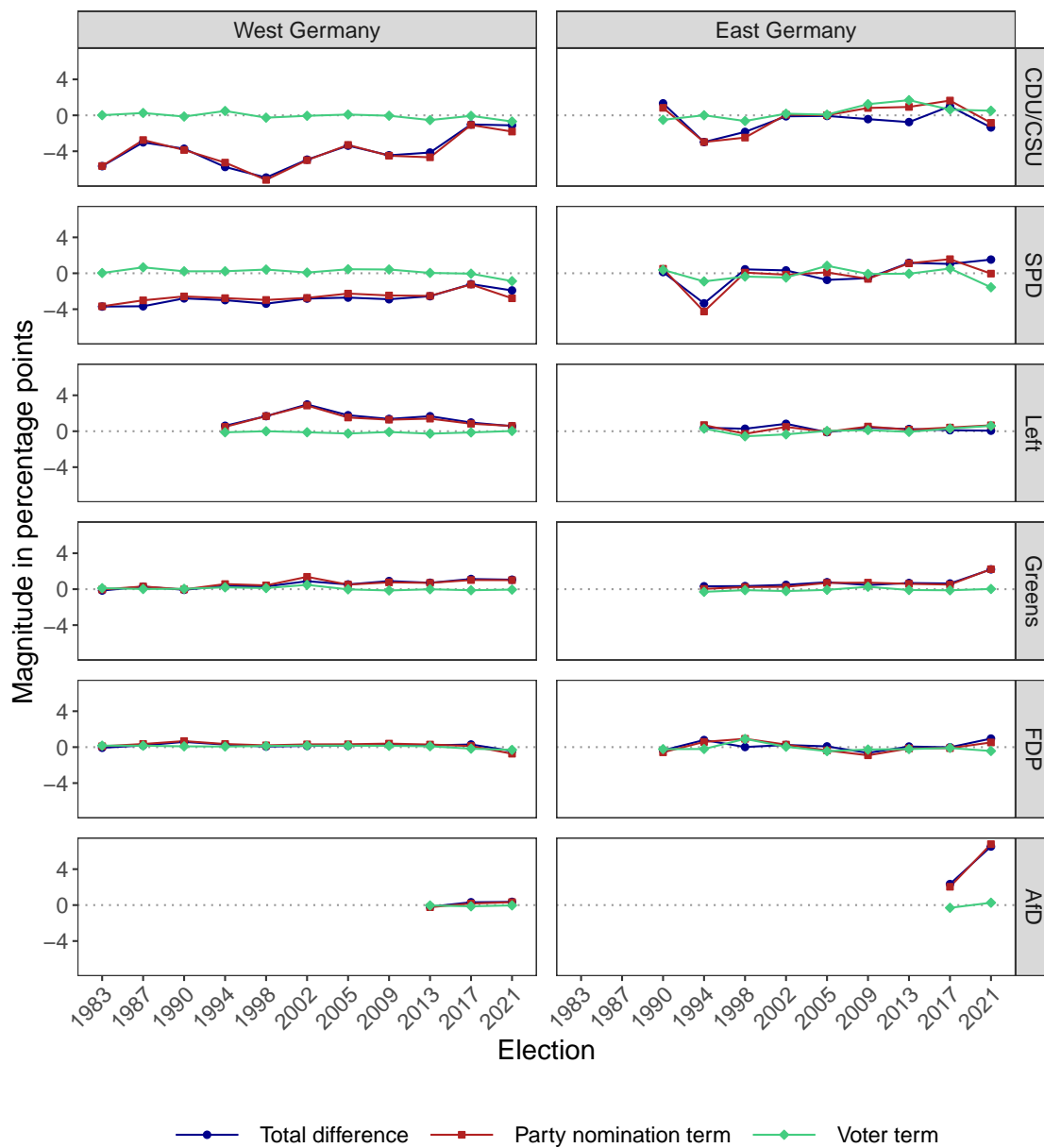
Table C9: Decomposition Results: By party and competitiveness

Party	District type	C=0.05				C=0.1				C=0.15			
		Voters	Party	Total	N	Voters	Party	Total	N	Voters	Party	Total	N
SPD	Competitive	0.193	-2.061	-1.867	774	0.256	-1.967	-1.711	1491	0.055	-1.782	-1.727	2081
SPD	Safe seat	-0.110	-2.846	-2.955	793	-0.391	-3.542	-3.932	499	-0.040	-3.061	-3.101	317
SPD	Sure loss	0.379	-0.927	-0.548	1706	0.317	-0.778	-0.461	1283	0.491	-1.089	-0.599	875
CDU/CSU	Competitive	-0.064	-1.687	-1.751	780	-0.173	-2.599	-2.772	1515	-0.097	-2.977	-3.075	2110
CDU/CSU	Safe seat	-0.124	-4.051	-4.175	1616	-0.144	-3.564	-3.708	1197	-0.127	-3.587	-3.714	811
CDU/CSU	Sure loss	-0.287	-2.482	-2.769	877	-0.036	-1.937	-1.972	561	-0.003	-2.776	-2.779	352
Left	Competitive	-0.301	-0.076	-0.377	67	0.152	0.007	0.158	147	0.271	-0.415	-0.144	267
Left	Safe seat	1.756	3.937	5.693	13		2.526		6				0
Left	Sure loss	0.006	2.604	2.609	2192	-0.008	2.243	2.235	2119	-0.020	1.821	1.801	2003

Notes: The table contains the results of the decomposition analysis outlined in section 6. The first column is the $[\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M}]$ term, representing the contribution of voters to the total gender vote gap. The second column is the $\beta^W(\overline{PV^W} - \overline{PV^M})$ term, representing the contribution of the parties. The third column is the total gender vote gap, i.e. $\overline{CV^W} - \overline{CV^M}$, which is also the sum of the second and third columns. Positive values in the fourth columns indicate that women candidates are more successful than male candidates. The unit of observation is the electoral district. We consider all elections between 1983 and 2021. We split the sample according to the competitiveness categories outlined in the main body of the paper. We run the same analyses for three different competitiveness cutoffs, as indicated in the first line of the table. Elections prior to 1990 are based on West Germany, excluding the GDR.

C.1 Decomposition results – East & West Germany

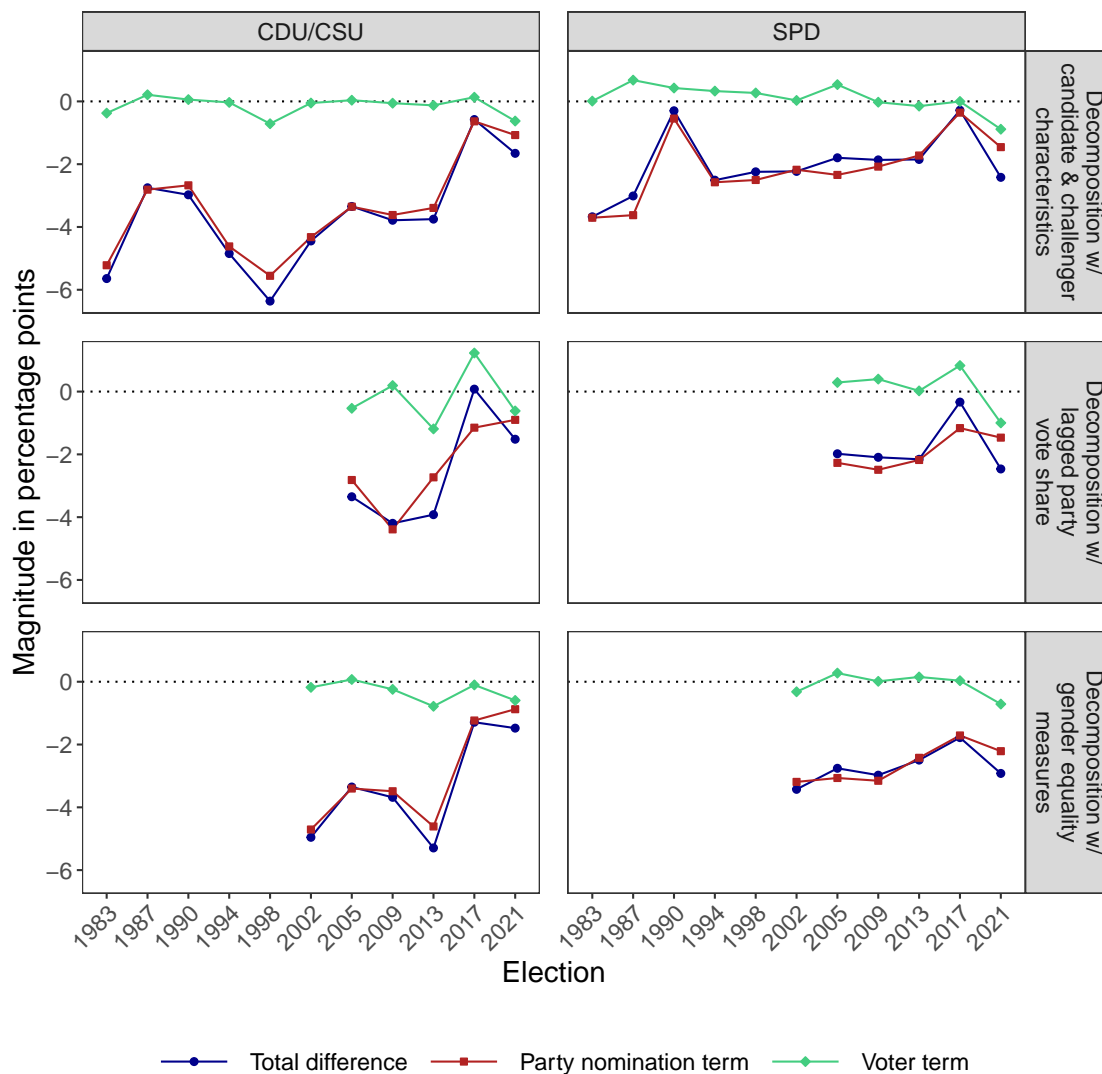
Figure C17: Decomposition results for East and West Germany



Note: The figure plots the party term, voter term and the total gender gap. We consider all elections between 1983 and 2021. The ‘Voter’ term equals $[\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PVM}]$, representing the contribution of voters to the total gender vote gap. The ‘Party’ term is $\beta^W(\overline{PV^W} - \overline{PV^M})$, representing the contribution of the parties. The ‘Total’ line is the total gender vote gap, i.e. $\overline{CV^W} - \overline{CV^M}$. We split the sample into East and West Germany.

C.2 Decomposition results – robustness

Figure C18: Decomposition results with additional covariates and lagged party vote share



Note: The figure plots the party term, voter term and the total gender gap. We consider all elections between 1983 and 2021. The ‘Voter’ term equals $[\alpha^W - \alpha^M + (\beta^W - \beta^M)\overline{PV^M}]$, representing the contribution of voters to the total gender vote gap. The ‘Party’ term is $\beta^W(\overline{PV^W} - \overline{PV^M})$, representing the contribution of the parties. The ‘Total’ line is the total gender vote gap, i.e. $\overline{CV^W} - \overline{CV^M}$. The two 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. 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.

C.3 Decomposition results – additional individual-level covariates

As discussed in the main body of the paper, one reason for differences in electoral performance could be differences in candidate background characteristics. We primarily address these concerns through data on candidate age, occupational prestige, and prior time in office (see also section 6). Arguably, these three variables do not capture all relevant background characteristics. As a result, we rely on the German Longitudinal Election Study (GLES, see ?), which includes a survey of candidates for the 2009, 2013 and 2017 elections. These surveys include numerous additional background variables. However, we face the drawback that, depending on the election, only about 27.6% of candidates respond to the survey.¹⁸

Beyond the three main covariates that we obtain from candidate lists, we further use the following variables from the GLES candidate survey: highest educational attainment, employment status, marital status, years of party membership, left-right self placement and campaign budget. Further, we include 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 of these variables are binary, and indicate whether respondents were or currently are in these positions. The final variable we include is the mean across the political activity variables. We present summary statistics on these variables in table C10.

Based on table C10, we observe that female candidates, on average, have more political experience than men, particularly with respect to state and local legislative experience. We further show that female candidates have, on average, been party members for about 0.8 years more than men, and place themselves further left than men. Regarding education, we observe that female candidates are slightly less likely to hold vocational degrees, and conversely more likely to hold MA-equivalent degrees. Female candidates are almost 16 percentage points less likely to be full-time employed – rather, they are more likely to be part-time employed or full-time politicians. Finally, we observe the female candidates are less likely to be married than male candidates, and more likely to be single or divorced.

In figure C19, we present decomposition results after including the additional GLES variables. Overall, the results again show that across all parties, the relative electoral differences between male and female candidates can be explained by nominations to districts where their party is stronger or weaker. While we only have data for about one quarter of candidates in three recent elections, this result again suggests that differences in candidate background are not the main driver of male-female difference in vote share.

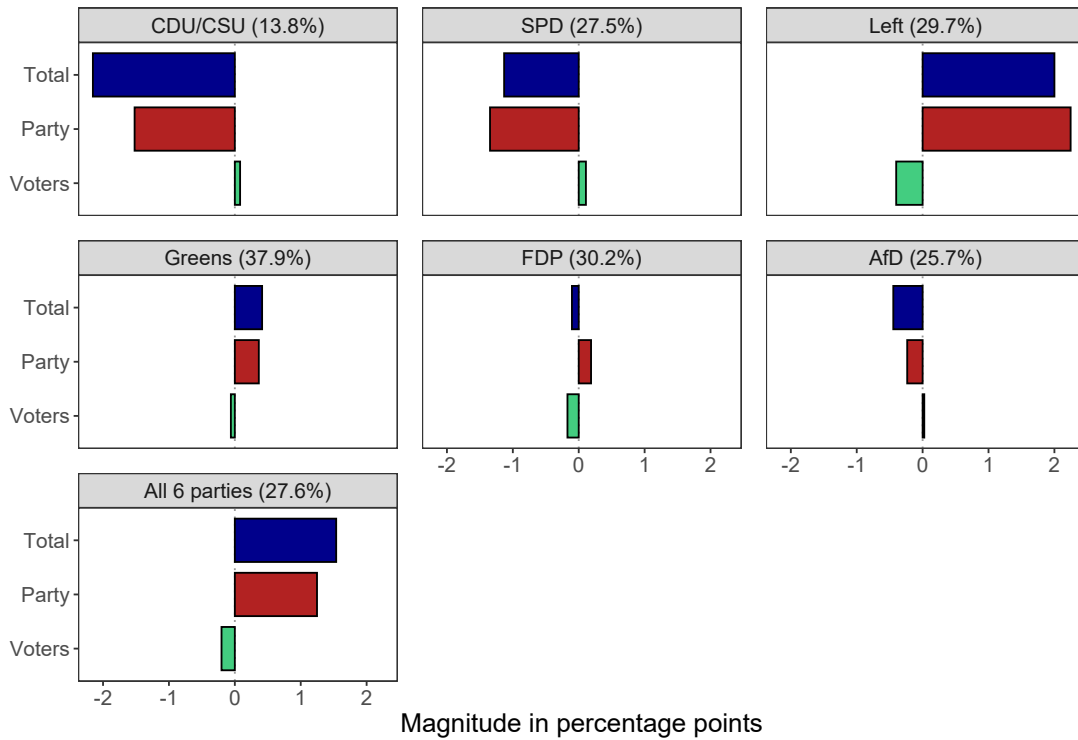
¹⁸This number is based on candidates for which we do not have missing data for the relevant covariates.

Table C10: Summary statistics for the GLES data

Variable	Female cand.	Male cand.	Diff.	p-value
Prior political activities:				
Employed by other party member	0.176	0.140	0.036	0.020
Held local party office	0.708	0.737	-0.029	0.129
Held national party office	0.121	0.091	0.030	0.021
Mayor	0.022	0.031	-0.009	0.211
Local representative	0.584	0.545	0.039	0.068
State representative	0.102	0.047	0.055	0
State government member	0.017	0.010	0.006	0.165
Mean across activities	0.248	0.235	0.013	0.025
Other political variables:				
Length of party membership (years)	14.397	13.579	0.818	0.095
Campaign budget (Euros)	16,007.650	15,278.780	728.866	0.395
Left-right placement (1-11)	4.003	4.792	-0.790	0
Highest educational attainment				
None	0.033	0.014	0.019	0.001
Hauptschule	0	0.001	-0.001	0.393
Realschule	0	0.001	-0.001	0.393
Abitur	0.017	0.021	-0.005	0.454
Vocational education	0.234	0.274	-0.040	0.038
Undergrad degree	0.044	0.039	0.005	0.562
Grad degree (MA)	0.518	0.470	0.047	0.028
Grad degree (PhD)	0.121	0.143	-0.022	0.137
Student	0.033	0.036	-0.003	0.703
Years of education	15.548	15.643	-0.095	0.524
Employment status				
Full-time employed	0.479	0.638	-0.159	0
Not in labor market	0.099	0.068	0.031	0.007
Part time employed	0.152	0.071	0.080	0
Full-time politician	0.215	0.119	0.096	0
Retired	0.033	0.059	-0.026	0.007
Unemployed	0.022	0.044	-0.022	0.008
Marital status:				
Divorced	0.091	0.053	0.038	0
Married	0.683	0.757	-0.074	0
Single	0.201	0.180	0.022	0.201
Widowed	0.025	0.010	0.015	0.004

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. The number of female candidates in the sample is 726, the number of male candidates is 1994.

Figure C19: Pooled decomposition results with additional GLES covariates



Note: The figure summarizes the results of the decomposition analysis outlined in section 6. We include additional covariates from the GLES candidate survey, 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.

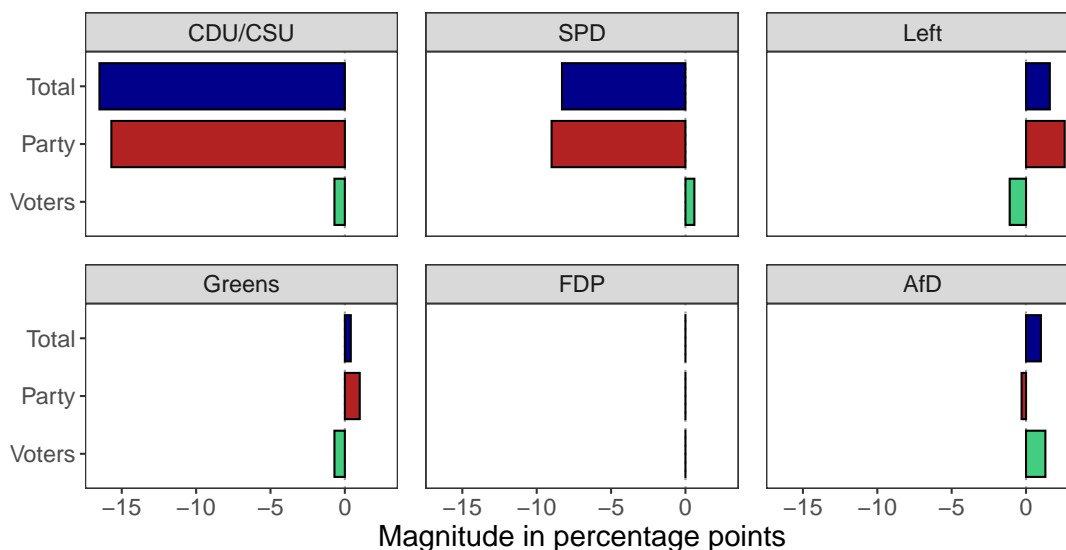
C.4 Decomposition results – winning districts

Table C11: Decomposition Results – winning districts

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

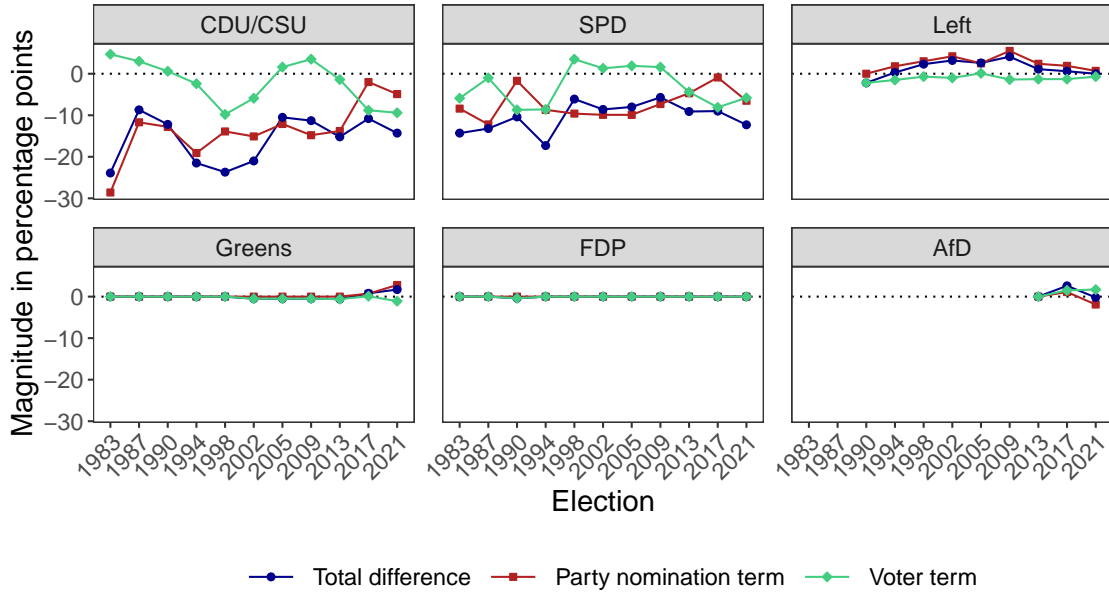
Notes: The table contains the results of the decomposition analysis outlined in section 6. Instead of the candidate vote share, we decompose the probability of winning the district. The first column is the $[\alpha^W - \alpha^M + (\beta^W - \beta^M)PV^M]$ term, representing the contribution of voters to the total gender election gap. The second column is the $\beta^W(PV^W - PV^M)$ term, representing the contribution of the parties. The final column is the total gender election gap, i.e. $CV^W - CV^M$, which is also the sum of the second and third columns. Positive values in the fourth columns indicate that women candidates are more successful than male candidates. The unit of observation is the electoral district. We consider all elections between 1983 and 2021. Elections prior to 1990 are based on West Germany, excluding the GDR. Across all district-party-year combinations, about 25% of candidates are women.

Figure C20: Pooled decomposition results for winning in districts



Note: The figure summarizes the results of the decomposition analysis outlined in section 6. Instead of the candidate vote share, we decompose the probability of winning the district. We consider all elections between 1983 and 2021. Elections prior to 1990 are based on West Germany, excluding the GDR. The 'Voters' bar is the $[\alpha^W - \alpha^M + (\beta^W - \beta^M)PV^M]$ term, representing the contribution of voters to the total gender election gap. The 'Party' bar is the $\beta^W(PV^W - PV^M)$ term, representing the contribution of the parties. The final 'Total' bar is the total gender election gap, i.e. $\frac{P(\text{Win district})^W}{P(\text{Win district})^M}$. Exact quantities are given in table C11

Figure C21: Main decomposition results for winning in districts



Note: The figure plots the party term, voter term and the total gender gap. Instead of the candidate vote share, we decompose the probability of winning. We consider all elections between 1983 and 2021. The 'Voter' term equals $[\alpha^W - \alpha^M + (\beta^W - \beta^M) \overline{PV^M}]$, representing the contribution of voters to the total gender vote gap. The 'Party' term is $\beta^W (\overline{PV^W} - \overline{PV^M})$, representing the contribution of the parties. The 'Total' line is the total gender election gap, i.e. $\frac{P(\text{Win district})^W}{P(\text{Win district})^M}$.

D 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. The total number of MPs that are elected through the list in a given state is equal to the number of single-member districts. 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 more directly elected MPs than list-elected MPs, as we discuss in more detail below (“overhang mandates”).

The party list vote further determines which parties are represented in parliament. Only parties that gain more than 5% of the country-wide party list votes are represented. Notably, candidates can run in a single-member district and can simultaneously be on a party list. Candidates on party lists are ranked (with their rank determined before the election) and their order determines the eventual selection of MPs. For example, if a party in a given state can elect 5 candidates from the list to the parliament, the 5 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 when it comes to selecting MPs from the list. Every candidate that wins a district-level election (via candidate votes) obtains a seat at the parliament.

The German ballot (see Figure A1) shows only the top five candidates per list in each state. Unlike the case of district candidates, it does not include information on the profession or place of residence of the candidates. The names of all list candidates is 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 vote (also called list vote) determines the 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 direct seats are considered “Überhangmandate”, or overhang mandates – the party will receive these additional seats in parliament, resulting in a seat allocation that is not aligned with the proportional vote anymore.

Importantly, this system has existed since the foundation of the Federal Republic of Germany, but was reformed beginning with the 2013 federal election. After the Constitutional Court ruled the former system unconstitutional, the current (post-2009) system uses “Ausgleichsmandate” (balance mandates). These balance mandates are assigned to parties to recover the proportionality that is lost due to the overhang mandates. Note that both

overhang and balance mandates lead to an increase in the total number of members of the Bundestag. 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 mentioned above.

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 state party lists. Single member district candidates (the main focus of this paper) are exempt from these quotas. The Green party was the first to institute a quota for women in 1979 for party lists and the party leadership, where half of all posts have to go to women. The Left Party (*Die Linke*), founded in 2007, has a similar quota. In 1988, the social democratic SPD adopted a quota which stipulated that 40% of all leadership posts are reserved for women. The CDU/CSU party 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.