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Does a district mandate matter for the behavior of politicians? An analysis of roll-call votes and parliamentary speeches

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Does a district-vote matter for the behavior of politicians? A textual analysis of parliamentary speeches*

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Abstract

In most democracies members of parliament are either elected over a party list or by a district. We use a discontinuity in the German parliamentary system to investigate the causal effect of a district-election on an MP's conformity with her party-line. A district-election does not affect roll call voting behavior causally, possibly due to overall high adherence to party voting. Analyzing the parliamentary speeches of each MP allows us to overcome the high party discipline with regard to parliamentary voting. Using textual analysis and machine learning techniques, we create two measures of closeness of an MP's speeches to her party. We find that district-elected members of parliament do not differ, in terms of speeches, from those of their party-peers who have been elected through closed party lists. However, both speeches and voting correlate with district characteristics suggesting that district-elections allow districts to select more similar politicians.

Keywords: Party-line; Textual Analysis; Regression Discontinuity; Parliamentary Speeches; Voting
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1 Introduction

Plurality voting and proportional representation are the two most common electoral systems through which western democracies determine their members of parliament. The choice of system is relevant not only for political process but influences economic outcomes of the respective country (Lizzeri and Persico, 2001; Persson et al., 1997). For example research suggests that public spending, rent seeking, size of the government, and redistribution vary to a large degree with the electoral system (Milesi-Ferretti et al., 2002; Mueller, 1997; Persson and Tabellini, 1999, 2004). In particular, previous literature predicts that district elected members of the parliament (MPs) are acting in favor of their district whereas closed party list elected MPs are more aligned to the general interest of a party (Carey, 2007; Depauw and Martin, 2009).[1]

This article examines if the behavior of district elected, and party list elected MPs differs. In a mixed member proportional system MPs who are elected through a party list coexists with MPs who are elected via a district vote. Our analysis makes use of the fact that most German politicians run both in a district and on a party list at the same time (dual candidacy strategy), however enter parliament only over one of these. This allows us to employ a regression discontinuity design to quantify the causal effect of a district election on the conformity to the party-line in roll-call elections as well as parliamentary speeches. Considering parliamentary speeches, we use text analysis and machine learning to investigate if parliamentary speeches of district and list elected MPs differ systematically. These methods allow us to assess speeches in a reproducible and objective way that does not rely human coding of language. We base this analysis on two criteria. The type of words and word-combinations used in the speeches and the similarity of the language in the speeches to that of the respective party manifesto.

Using data from three legislative periods (2005-2017), we show that district and list elected candidates do not differ significantly at the margin in terms of voting. Thus the data does not support the hypothesis that winning a district mandate causes MPs to deviate more or less from their party's voting. Yet, data on voting is limited, the majority of votes are no roll-call votes, and additionally party discipline is very high.[2] Hence, voting might not express an MP's actual actions behind the scenes. To address this concern we analyze parliamentary speeches. Here too we find that MPs who won a district marginally and would otherwise have been elected over a party list do not differ in their parliamentary speeches compared to MPs which marginally lost a district and enter parliament over a party list. Neither do they

[1] The choice of political system itself is of course not random and might reflect underlying voter preferences or reflect previous institutions that have been in place in a country see for example Alesina et al. (2001) and Acemoglu et al. (2001).

[2] The average share of MPs voting with their party is around 90%, even if one counts an abstention as a deviation if the party votes positive or negatively.

use a wording closer or further away from the party manifestos. In conclusion we do not find evidence that winning a district has a causal effect on deviations from the party-line either in terms of roll-call votes or in terms of speeches further away from the party average or party manifestos. This result is robust to several specifications of the discontinuity regression.

It may be possible that our non-result of differences in speeches is due to a selective choice of parliamentary speakers. Indeed, Proksch and Slapin (2012) show that the party leadership controls speakers. Also, Bäck and Debus (2017) show that parties selectively exclude speakers on economic topics from districts with worse economic situations. The selection of speakers could explain to ensure a speech close to the party line could explain the similar speeches. Deviations in voting and speeches do however correlate with economic and social characteristics of the district the politician has been elected in. Thus speeches do differ systematically which suggests that they are informative about the policy position of the according member of parliament. Especially the share of unemployed and inhabitants without a secondary degree correlate highly positively with roll call vote deviations and negatively with the similarity of speeches to party average and party manifestos. Note that our observation does not necessarily contradicts the finding of Bäck and Debus (2017) as we do not incorporate the speaking time or frequency of speeches. We conclude that there is no causal effect of a district election on voting or speeches but different districts elect politicians who are different to begin with.

A possible alternative explanation for the non-result and confound to our analysis could be that district elected MPs experience faster career progression (Folke et al., 2016; Meriläinen and Tukiainen, 2018) within a party which incentives conformity with the party-line. This might off-set the effect of a district mandate at the margin.[3] We explore this relationship by investigating if district elected MPs have a higher probability to increase their positioning in the closed party lists over election periods. Exploiting the same discontinuity, we find that district elected MPs do not experience better list positions than list elected MPs. The finding suggests that career progression due to winning a district is not confounding the results.

Previous research in the political science literature has investigated differences between district and list elected candidates. Within the German federal parliament Sieberer (2010); Neuhäuser et al. (2013); Ohmura (2014); Sieberer (2015) explore relations between list and direct elected MPs and voting behavior. Sieberer (2010) compares roll call voting of district and list MPs between 2005 and 2009. The author finds that district MPs are significantly more likely to deviate from a party-line than MPs that are elected via a party list. Neuhäuser et al. (2013) confirm Sieberer (2010) results for the same period of time. Further, they show that the results are robust when controlling for MPs characteristics. The authors argue that directly elected MPs reelection probability is less dependent on the party. Therefore, direct

[3]The question of rank effects has also been discussed in political science, see (Crisp et al., 2013), Anagol and Fujiwara (2016), or André et al. (2017).

MPs are less reliant on their standing within a party. Sieberer (2015) extends his previous finding by analyzing MPs explanation of votes. He shows that district MPs are more likely to voice reservation to the party-line. However, Sieberer (2015) also concludes that dual candidates (MPs which have been candidates on the list as well as in a district) do not differ in their explanation of vote. Ohmura (2014) challenges Sieberer (2010) and Neuhäuser et al. (2013) by investigating not only how district and list MPs differ but also if dual candidacy plays an important role. Ohmura (2014) analyzes roll call votes from MPs between 2002 and 2013 and shows that dual candidate MPs do not significantly differ in their deviation rate to the party-line. However, Ohmura (2014) shows that pure district MPs are more likely to deviate from the party-line. He argues that the candidacy strategy (i.e. pure district or dual), as well as re-election probability instead of the mandate itself, determines the voting of MPs. Finally, Sieberer (2014) confirms this results analyzing deviation of party-line by MPs with a dual candidacy strategy between 1949 and 2013.

Our research extends the literature in several dimensions. We employ a discontinuity design to evaluate the causal effect of mandate type on the deviation to the party-line with respect to voting and speeches in parliament. Thereby, we add to recent work in political science that uses the regression discontinuity design in election outcomes to establish causality.[4] The regression discontinuity design allows us to draw conclusions about the causal effect of a district election. We establish that being voted into parliament by a district instead of a party list has no causal effect on voting in roll-call votes.

An additional contribution is that we analyze parliamentary speeches in Germany. These can serve to inform about MP's actions in committees behind closed doors and inform about MP-behavior in non roll-call votes, which constitute the majority of all votes in the German Parliament (Sieberer et al., 2018). The use of speeches also addresses the concern that roll-call votes are a selected sample of votes (Carrubba et al., 2008). Parliamentary speeches are one of the most visible activities through which MPs express their policy positions. For example the works of Maltzman and Sigelman (1996) and Proksch and Slapin (2012) underline the importance speeches for MPs and political parties. Within Germany speeches were used in political science and computer science literature. Bernauer and Bräuninger (2009) show that there is substantial intra-party heteroegeneity in parliamentary speeches. Proksch et al. (2019) provide a sentiment approach which recovers government-opposition dynamics. Similiar to our study, Bäck and Debus (2017) compare district elected MPs speeches. They find that district elected MPs deliver fewer speeches in economic debates if the economic situation in their district is worth. We therefore add to the literature of German parliamentary speeches, by connecting two approaches. First, we use speeches as a measure for intra-party differences. Second, we use the measure as an outcome variable within a discontinuity design

[4]See for example Hyytinen et al. (2018) for an overview of recent approaches using regression discontinuity design as well as an empirical test.

to evaluate if a district election affects conformity.

The analysis of parliamentary speeches connects to a growing literature of textual analysis of political speeches based on machine learning mechanisms, see for example Grimmer and Stewart (2013), Martin and Vanberg (2008), and Quinn et al. (2010). Note Gentzkow et al. (2017) for a review of methodologies and different usages in economics.[5] Using these mechanisms provides us with a objective way of comparing speeches compared to an approach that involves hand-coding speeches according to some criteria. Moreover, this method can readily be extended to new data.

We use approaches of computational linguistics and computer science that uses text documents such as speeches to analyze MP's positions. Our textual analysis is related to previous work from Laver et al. (2003) and Slapin and Proksch (2008) who estimate political positions using the word frequencies in party manifestos. Further, Biessmann et al. (2016), Diermeier et al. (2012) and Peterson and Spirling (2018) use machine learning methods to predict party affiliation. In this paper we make use of the term frequency of MP's speeches to estimate distance measure between speeches. Further, we use machine learning methods to evaluate how well one can predict party positions from speeches. In comparison to previous literature we use the estimates as an outcome within our regression discontinuity analysis. The connection of machine learning and methods of causal inference is part of an emerging econometric literature (see e.g. Athey, 2018 as well as Mullainathan and Spiess, 2017).

We also relate to a literature of the effect of political competition. Examples include Strömberg (2008) who evaluates how competition affects campaign spending in US presidential elections or Dal Bó et al. (2009) who shows that increased political competition is associated with a lower probability of political dynasties. Using German data Bernecker (2014) shows that district opposition party MPs who expect a tight race are less absent in parliaments beforehand. We show that MPs do not only face competition in their district but also competition within a party may play an important role.

2 Institutional Background

The German federal parliament is a mixed-member proportional (MMP) representation. Voters of the parliament have two votes. The so called 'first vote' is the district component of the mixed-member proportional representation system. Currently, Germany has 299 districts, and in each district, electors may vote for a distinct candidate. First-past-the-post voting is used, that means for each district one politician enters parliament.

The distribution of the currently seats/members of the parliament (MP) to the different parties is determined by a proportional vote for a party list, called the 'second vote'. More

[5] Gentzkow et al. (2017) describe most of the methodologies used in this paper.

specifically, voters of each state elect one party list. Given the 16 German states the proportion of parties is approximately equal to the shares of second votes aggregated over all states.[6] The direct mandates replaces a list mandate that has been determined by the party lists and second votes.[7]

Candidates on the party lists and direct candidates are not mutually exclusive. Indeed many candidates are on a party list as well as candidates in a district. Manow (2013) shows that a quarter of MPs are pure list or pure district candidates while the others are list as well as direct candidates. Appointment of candidates on the lists and the district is subject to rules. The party lists for each state have to be determined by secret election within parties. Direct candidates are either selected in elections within parties on the district level or have at least 200 signatures from voters within a district.

Although every MP in the German parliament has a free mandate and is formally not bound by a specific party-line, the mixed-member proportional representation has the intention to implement alternative incentive structure for direct MPs. Therefore direct candidates should represent the interests of a district which may deviate from the interest of a national wide party-line (see for example Scarrow, 2001). Nevertheless, the fact that the majority of MPs are dual candidates (list as well as district) such that a defeat of a candidate within a district is not necessarily connected to a loss of the membership within the parliament.

3 Predictions

In this paper we test three hypothesis we derived from previous literature. Our main research question investigates the relationship between mandate types and deviation of the party-line both with respect to voting and to speeches. Hypothesis 3 investigates a potential confounding effect, namely that politicians who win a district gain influence influence in their party (possibly inducing them to act more in accordance with their party-line).

Hypothesis 1. *Members of parliament elected over a district-vote are more likely to deviate from the party-line in parliamentary roll-call votes than MPs elected over a party-list.*

Hypothesis 2. *The speeches of members of parliament elected over a district-vote differ from the speeches of MPs elected over a party-list. The wording of the speeches have (i) a higher distance from the speeches of their party members, and (ii) a higher distance from the*

[6] In detail, the distribution of seats in parliament is determined by the Sainte-Lague method. Note, that due to the possibility of overhang seats (in case the number of direct mandates is larger than the number of seats coming from the second votes), as well as adjustment seats to reduce the possibility of strategic voting, the size of the German parliament may vary between election periods.

[7] Should a party win more direct seats than it won party seats, other parties receive overhang-seats keeping representation relative to the party vote-shares.

manifesto of their party.

Hypothesis 3. *Politicians winning a district-election marginally, are more likely to have a better (lower) list position in the next election cycle as compared to politicians loosing a district-election marginally.*

4 Data

We connect four data sources which cover a period from October 2005 to October 2017. That means we have data from three elections of the federal parliament and three legislation periods. Firstly, we received data about the MPs and their direct vote shares within a district if applicable from a German nongovernmental organization (*Abgeordnetenwatch.de*). Secondly, we use data from MP's roll call voting[8] which is publicly available from the German parliament (*Bundestag*). We connect the data with the list positions from elected and non-elected candidates, and socio-economic statistics on the district level which we received from the federal electoral management body (*Bundeswahlleiter*).[9] Thirdly, we receive party manifests for all parties represented by MPs for the three legislation periods by Lehmann et al. (2017). Finally, we use parliament protocols from the German parliament (*Bundestag*).

4.1 Information Retrieval from Speeches

To measure the differences between speeches, we use the parliamentary protocols. We consider each verbal speech within the plenary hall as well as each registered interposed question of MPs. Note that we exclude the president, as well as the vice presidents (one for each party) of the German federal parliament, as they are leading and controlling the debates and formal procedures, which deviates from the role of other MPs. For similar reasons we exclude speeches of the ministers and federal chancellor of the government. We use conventional methods of information retrieval.[10] To convert text into a quantifiable measure, for each sentence we separate all words spoken. We stem each word to obtain the word's root form and then exclude most common words of the German language (commonly called stopwords by the literature). We use the stemmed words to, for each text, create a vector that with

[8] Note that we do not consider secret votings within the parliament. Note that secret votings are uncommon and solely used for personnel decisions.

[9] Note that for the election in September 2017 we collected the list positions manually from party websites on the state level.

[10] Our approach is closely related to text analyses in the literature. For a detailed discussion and a guideline see Gentzkow et al. (2017).

the count of words the text contains.[11] We then weight each element of the vector by the term frequency as well as the inverse document frequency of that word. This is a standard transformation with the purpose to decrease the relevance of words used by almost all MPs as well as words that are very rarely used which would otherwise be prone to over-fitting. As a result, the presented information retrieval methods give us a vector of weighted term frequencies for each MP. Finally, we can include any combinations of subsequent words in the methodology above. That means a term refers to any single word used and not excluded by the methods above as well as the combination of any two (or more) subsequent words (after stemming and excluding stopwords).

We use these vectors to build two measures of similarity of the MPs' speeches to their respective party. Our first approach is to determine how similar the words an MP uses in her speeches are to the words used in the other speeches of her party in terms of the distance of the words used. We compute the cosine similarity of an MP's vector of term frequencies to the average vector of the MP's own party. Our second approach captures how close a member of parliament's speeches align to his or her party's policy position as measured by the party's election manifesto. We use the party-manifestos to build a measure of how well an MP's party-affiliation can be predicted based on her speeches.

To get a measure of distance of an MP's speech to all other speeches of the same party, we use the cosine similarity. In detail, let A and B be the term frequency vector of two MPs for in an election period. The cosine similarity is then defined as

$$\cos(\theta) = \frac{\mathbf{A} \cdot \mathbf{B}}{\|\mathbf{A}\|_2 \|\mathbf{B}\|_2} = \frac{\sum_{i=1}^{n} A_i B_i}{\sqrt{\sum_{i=1}^{n} A_i^2} \sqrt{\sum_{i=1}^{n} B_i^2}},$$

which ranges from 0 to 1. A higher value refers to a higher similarity between the two documents. Given our data we calculate for the cosine similarity for a MP in an election period to all other MPs within the same party and the same election period. Afterwards, we take the average of all cosine similarities. We interpret the final value as the average similarity of one MP to all other party members within a period. Again, the measure takes values between 0 and 1, where higher values refers to a high similarity to the speeches of all other party members.

For the second measure we make use of the election manifestos parties write before the election of the federal parliament. We stem and vectorize the manifestos in the same way as the speeches and use them to build a measure of how close an MP's language resembles the language of her party's manifesto compared to the other manifestos. We measure the closeness

[11] This results in a vector that has the size of all distinct words occurring in any speech. Naturally, for a single speech most entries in such vector are zero.

to the party's manifesto by the probability with which a speech can be predicted as belonging to the MP's party by a classifier trained on all sentences of all parties manifestos. In other words, we measure how close an MP talks to it's own party's issues and policy standpoints relative to the other parties as defined in the parties' manifestos. Hence, if getting elected in a district makes MPs deviate further from their party-line, we should observe a downward break in the predictability of speeches by MPs who are just below the discontinuity at which MPs just won or lost a district election. Contrasting to the first measure, this can be regarded as an inter-party measure, as it captures the distance of speeches to the own party's manifesto relative to the other parties' manifestos. In the following we describe this strategy more in detail.

To create the measure, we train a classifier on the sentences of the election manifestos. We use the trained classifiers to predict for each MP which party she belongs to, based on her speeches. Then we take the predicted probability of the party the MP actually belongs to as a measure for the closeness of this MP's speeches to the her party's manifesto.

Thus the classifier we use has to be able to solve multinomial prediction problem with discrete features. In addition we need a classifier that yields not only predictions but a probability score which takes values from 0 to 1, where 1 is highest similarity (100% predicted probability) and 0 the lowest similarity (0% predicted probability). We found that a penalized logistic regression does the best job as classifier in this situation. This is probably due to the sparseness and high-dimensional data as well as the fact that the data we use for predictions (speeches) differs considerably from the train data (manifestos), we chose the hyper-parameters as to maximize accuracy of the predictions. We provide technical details of the prediction problem and our solution, as well as assessment of the most predictive words in the Online Appendix.

5 Descriptive Analysis

Table 1 shows summary statistics of the number of MPs, the number of district elected MPs and the average district vote share. Note that each column refers to one of the three election period where the 16th legislature period covers the months between October 2005 and October 2009, the 17th period the month between October 2009 and October 2013 and the 18th period the covers the month between October 2013 and October 2017. The two big parties, conservatives (CDU/CSU[12]) and socialdemocrats (SPD), are the majority of MPs in the German parliament. These two parties win almost all direct mandates.

[Table 1 about here.]

[12]The CDU/CSU is a party union where the CSU operates solely in the federal state Bavaria. The CDU/CSU can be seen as the main conservative party within Germany. The SPD is the social democratic party of Germany.

Table 2 describes the variables describing politician's behavior. Using roll call data we measure the party-line as the majority vote within a party. In general, a MP has the option to agree, refuse or abstain a vote. Furthermore, a MP could generally do not attend a voting within the parliament. We do not consider MPs which are not attending and treat these observations as missing values. In order to evaluate the party-line we take the majority vote (agreement, refusal or abstention) of a party. In case an MPs votes against the majority of a party he deviates from the party-line.

The second segment describes the average similarity of politician's speeches to other party members measured by the cosine similarity. A higher value describes a higher similarity. The third segment shows the average closeness of speeches to the manifestos predicted with the multinomial logistic regression.

[Table 2 about here.]

6 Identification Strategy

To provide first evidence regarding our hypotheses, we use an ordinary least squares regression in which we regress the outcome variable on a dummy indicating whether a member of parliament entered over a district or over a list. This is meant to give first evidence and possibly to confirm findings from previous papers. The following equation details this regression.

$$y_{p,i,t} = \alpha \; d^{won}_{p,i,t} + \beta \; Z_{p,i,t} + \varepsilon_{p,i,t}, \tag{1}$$

where $y_{p,i,t}$ is the outcome variable, $d^{won}_{p,i,t}$ is a dummy variable that takes the value one when a politician won a district, $Z_{p,i,t}$ is a vector of control variables, and $\varepsilon_{p,i,t}$ is the robust standard error. The basic least square regression may result in a biased estimator for several reasons. First, MPs who won a district election with a high margin may differ systematically to those MPs in the parliament who lost a district. For example, MPs who won the district with a high margin may have different career outlooks within a party. Such unobservable characteristic may influence the behavior of MPs. Formally we expect that the regressor is correlated with the unobservables and $E[\varepsilon|d^{won}, Z] \neq 0$, such that our estimates are not unbiased.

To investigate our hypotheses and avoid biased estimates we employ a regression discontinuity design as the main identification strategy. The forcing variable in this design is the relative margin by which a member of parliament won or lost a district election[13]. We denote

[13]The margin by which the according member won/lost divided by the vote-share of the first and second placed competitor.

this variable as $m_{p,i,t}$, where p is the member of parliament, i the district, and t the election period. We restrict our sample to politicians who a) entered the German federal parliament over a list or b) entered over a district-mandate, but had a list position sufficiently high, such that they would have entered over the list if they had not won their district. This restriction ensures that we avoid any selection bias which could arise from only observing winners but not losers of an election.

We argue that close enough to the cut-off where a politician just won or lost the district election, and hence entered the federal parliament with a district- or a list-mandate the assignment of the vote-share is quasi random. That means that the identifying assumption is that politicians below the cut-off do not differ in any relevant dimension from politicians above the cut-off. Our RDD specification is as below,

$$y_{p,i,t} = \alpha \; d_{p,i,t}^{won} + \beta \; f(m_{p,i,t}) + \varepsilon_{p,i,t}, \tag{2}$$

where $y_{p,i,t}$ is the outcome variable, $d_{p,i,t}^{won}$ is a dummy whether a politician won a district or not, $f(m_{p,i,t})$ are different polynomials of the forcing variable described above, and $\varepsilon_{p,i,t}$ is the robust standard error. We limit the observations in the regression in two ways. Firstly, only members of parliament are included who have or could have entered the parliament through their party list. Secondly, we limit the regression to observations with the forcing variable within a certain margin around zero.

7 Results

7.1 Deviation from the Party Voting

In this subsection we present the results of the analysis regarding the deviation of different politicians from the parties voting line in parliamentary roll-call votes. Table 3 presents the results of an ordinary least squares regression and Table 4 the results of the regression discontinuity analysis.

Specification (1) in Table 3 shows the results of a naive regression as specified in Equation 1. Specifications (3) and (4) limit the sample to observations from members of parliament who either did enter over a party list or would have entered over a party list if they had lost their district election. Specification (2) and (4) add state, party, and session fixed effects as controls. Specification (4) thus includes both fixed effects and prevents selection effects and is hence our preferred specification. As the table shows, the coefficient is not stable across the regressions and does change sign once the regression includes fixed effects, yet it is small in all regressions. This suggests care when interpreting the results. Our preferred specification suggests that the more politicians receive winning a district election are 1.85 percentage points more likely to deviate in roll-call votes.

[Table 3 about here.]

To investigate a causal relation between a district election and deviations in roll-call votes in parliament, we use the discontinuity at the cutoff where a candidate marginally lost or won their district election. Table 4 displays the results of the discontinuity regression as specified in Equation 2. In specification (1) only the averages are compared on a bandwidth of 5 percentage points around zero. Specification (2) adds the linear margin of the vote share on a bandwidth of 10 percentage points around zero. Specification (3) adds a second order polynomial and increases the bandwidth to 50.[14] Finally specification (4) adds a third order polynomial and increases the margin even further to 50 percentage points.[15] The bandwidth of the last two specifications is such that the majority of all observations are used, and only the tails are cut-off to avoid a bias due to over-fitting at the borders.

[Table 4 about here.]

Notably, the coefficients are positive in all specifications and larger than in the OLS, however, none or weakly significant. This does not allow to draw strong conclusions from the specification[16].

We do not find sufficient evidence that MPs who entered parliament over a district are more prone to deviate from the party-line in their voting, compared to MPs who entered parliament over a party list. Moreover deviations in general are very low.

Finding 1 *Entering parliament over a district election instead of their party's list does not cause MPs to vote against their party-line more often.*

7.2 Speeches

Next we present the results regarding the analysis of the deviation from the party average in the different speeches. We will present the results for the described two measures, the distance of the words used in the speech to the party average. And the likelihood with which a predictor calibrated on the election manifestos of all parties predicts the speech as coming from the according party of the MP. Table 5 and 7 show the results of an ordinary OLS regression and Table 6 and 8 the results of the regression discontinuity design.

[Table 5 about here.]

Table 5 shows that an OLS regression predicts a significantly negative correlation of winning a district mandate and the similarity of speeches in parliament with speeches of the

[14] Note that we increase the bandwidth to show robustness to the result in the first model.
[15] Altering the bandwidth slightly for either specification does not change the result.
[16] In the Online Appendix we display the discontinuity graphically.

own party. However, adding controls increases the coefficients and results are insignificant. The size of the coefficient is small compared to the average within party similarity.

[Table 6 about here.]

In contrast, Table 6 shows that, at the margin of just winning or loosing a district, there is no significant effect of winning a district on the closeness of an MP's speeches to her party peer's speeches. The coefficients are all small and positive however not significant. This suggests that there is no discontinuity in the cosine similarity of speeches at the margin of just being district elected or not.

The second measure we investigate is the manifesto-similarity of speeches, which measures how close an MP's speeches are towards their own party's manifesto relative to the other parties' manifestos.[17] Table 7 shows the identical OLS regressions for the predictability measure. Here specifications (1) and (3) are significantly negative, however as for the similarity measure the coefficient turns positive and insignificant once controlling for the party, state, and session fixed effects.

[Table 7 about here.]

Table 8 then shows the result of the regression discontinuity regression for the predictability measure. Here all coefficients are small, negative and non-significant. The results suggests that there is no discontinuity in speech behavior according to the predictability measure.[18]

[Table 8 about here.]

Finding 2 *Entering parliament over a district election instead of their party's list does not cause MPs to use a wording further away from the speeches of their party peers or further away from their party's manifesto relative to the other manifestos.*

7.3 Future List Position

In this subsection we present the results of the analysis the effect of winning a district election on the future position on the party list. We define the change of a list position as of a MP from the position in election t to the next election, i.e. $\Delta_t = P_t - P_{t+1}$. A MP with a positive

[17] In the Online Appendix we show a fitted polynomial and the binned sample average of the speech similarity measure around the voting cut-off. Visual inspection of the Figure supports the conclusion that there is no discontinuity.

[18] In the Online Appendix we show a fitted polynomial and the binned sample average of predictability around the voting cutoff. Visual inspection of the Figure seems to confirm the conclusion that there is no discontinuity.

δ_t means that a politician is in a better position to get reelected over the list.[19] Table 9 presents the results of an ordinary least squares regression and Table 10 the results of the regression discontinuity analysis.

[Table 9 about here.]

Investigating the results, an OLS regression does not suggest a strong relationship. Only specification (4) suggests a negative relationship, which would mean that winning a district correlates with a worse position on a list.

This result is not supported by the analysis of the potential discontinuity shown in Table 10. The table shows that all coefficients are non-significant, which suggests that no relationship exists between marginally winning or loosing a district and the future list position.[20]

[Table 10 about here.]

Finding 3 *Entering parliament over a district election instead of their party's list does not cause MPs to have a higher list position in the election for the following legislation period.*

8 Correlations with Socioeconomic Characteristics

We proceed to evaluate if district-elected MPs behavior is correlated with socioeconomic characteristics of the district. Previous research has shown that parties selectively choose parliamentary speakers. Therefore it may be possible that speeches are very similar in general (Bäck and Debus, 2017). Thus, it could be possible that speeches are not representative. We show that socioeconomic characteristics of districts are correlated. We believe that the result shows that speeches are a suitable indicator of the position of an MP as districts select MPs with similar positions.

We first evaluate if the margin between winner and loser for politician at legislature period in a district is correlated with key socioeconomic characteristics. The characteristics include *the population density, the share of male in population, the share of German citizens, the share of population older than 60 years old, the unemployment share, the share of cars per 1000 inhabitants, the share of population without a lowest secondary degree.*[21] We also investigate the correlation of the socioeconomic characteristic with the behavior of politicians (roll-call voting, cosine similarity of speeches, and manifesto-closeness of speeches).

[19] On average politicians increase their list positions over time. Additional statistics are in the summary statistics in Online Appendix.

[20] In the Online Appendix, we show potential discontinuity graphically. Visual inspection of the figure confirms the result that no discontinuity exists.

[21] In the Online Appendix we provide some summary statistics.

[Table 11 about here.]

Table 11 shows the Pearson correlation coefficients. Note first that the coefficients are based on all MPs from the conservative and social-democratic parties. We investigate the correlation with the absolute value of the marginal vote share, i.e. the absolute value of the second to the first and first to second in terms of votes. The intuition is that we would like to explore the correlation of the district characteristics with marginal vote share across party.

One observes that all but one off the characteristics are correlated with the marginal vote share. In districts with more cars, lower unemployment, higher share of males, higher share of German citizens and lower share of population without a secondary degree the vote differential between the two candidates is larger.

Second, we explore the correlation between the deviation of the party-line and the district characteristics. We observe that especially those characteristics associated for social disadvantages are correlated with roll call deviations. MPs deviate more from the party-line the higher the unemployment and the higher the share of population without secondary degree.

Third, we consider our measure of speeches The higher share of males is correlated with less deviations. Next we evaluating the correlation of the speeches with the district characteristics. Here we see a similar pattern across the cosine similarity, and the closeness measures to the party manifestos predicted with machine learning methods. A higher unemployment share as well as a higher share of population without a secondary degree is correlated with more deviation from the party-line. We conclude that especially in socially disadvantaged districts MPs deviate from the party-line.

9 Discussion

This paper investigates whether winning a district seat causes a change in an MP's adherence to a party-line in three dimensions among the members of the German mixed-member parliament. Firstly, we investigate whether MPs who are elected by a district deviate more often from their party-line in roll-call votes than MPs who enter parliament over a party list. Secondly, we evaluate whether the speeches of these MPs differ more from those of their peers and the manifesto of their party. Thirdly, we rule out that winning a district seat increases an MP's position on a party list in future elections which could possibly confound the results of the first two questions we analyze.

We don't find evidence that MPs who marginally won a district election deviate more often from the party-line in roll-call votes or speeches than their peers who marginally lost a district election. In other words, entering parliament through over a district does not cause MPs to deviate further from their party-line. Our findings suggest that a mixed-member parliamentary system binds all MPs, even MPs elected by a district, to a strong party

discipline as it is common for systems with relative representation. In contrast, district elected MPs do not have the same degree of accountability to their district as their counterparts in a majoritarian parliamentary system does.

In relation to research that demonstrates how semi-open lists promote careers of politicians who score many personal votes, we show that the same type of career progression does not occur for politicians who win their district election in a mixed-member parliament. A possible reason for this is that in each district a party only has a single candidate. An explanation for the absence of the effect in German system is that here every party only sends one candidate into a municipality election whereas an open or semi-open list setting allows competition among members of the same party. Hence, unlike in an open list election, a candidate in a district cannot demonstrate her popularity relative of other members within the same party.

Finally, the correlation of speeches with district characteristics demonstrates that districts with different socio-economic characteristics select different MPs. Hence, an advantage of the mixed-member parliemantary system seems to be that it allows the parliament to reflect the economic interests of heterogeneous districts.

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Table 1: Summary Statistics of Parliament and their Members

Summary Variables	Period 16	Period 17	Period 18
No of MPs	640	653	658
No of MPs, Conservatives	238	245	323
No of MPs, Socialdemocrats	228	154	205
No of Distict MPs	299	299	299
No of Distict MPs, Conservatives	150	218	236
No of Distict MPs, Socialdemocrats	145	64	58
Avg. District Vote Share, Conservatives	43.31	41.37	45.72
	(9.96)	(7.35)	(8.33)
Avg. District Vote Share, Socialdemocrats	41.1	31.69	32.26
	(8.77)	(8.62)	(8.94)

Each statistic is divided across into the three different election periods. We show statistics for all MPs and those MPs of the two major parties (Conservatives: CDU/CSU fraction and Socialdemocrats: SPD). Note, that the number if MPs is fixed, however, some MPs exit and other enter within election periods. The average district vote share is the average vote share across those MPs that have been candidates in a district. Standard deviations are shown in parentheses.

Table 2: Summary Statistics of MP's Parliamentary Behavior

Summary	Period 16	Period 17	Period 18
Roll Call Deviation			
Avg Voting Deviation	0.14	0.1	0.11
	(0.11)	(0.1)	(0.12)
Avg Voting Deviation, Conservatives	0.16	0.06	0.09
	(0.11)	(0.08)	(0.1)
Avg Voting Deviation, Socialdemocrats	0.15	0.14	0.13
	(0.1)	(0.11)	(0.13)
Cosine Similarity			
Avg Cosine Similarity	0.39	0.43	0.39
	(0.09)	(0.08)	(0.08)
Avg Cosine Similarity, Conservatives	0.35	0.42	0.35
	(0.08)	(0.08)	(0.08)
Avg Cosine Similarity, Socialdemocrats	0.36	0.42	0.39
	(0.07)	(0.07)	(0.07)
Manifesto Closeness			
Avg Manifesto Closeness	0.37	0.49	0.39
	(0.38)	(0.37)	(0.22)
Avg Manifesto Closeness, Conservatives	0.43	0.66	0.5
	(0.33)	(0.29)	(0.2)
Avg Manifesto Closeness, Socialdemocrats	0.04	0.11	0.24
	(0.11)	(0.16)	(0.13)

Each statistic is divided across into the three different election periods. We show statistics for all MPs and those MPs of the two major parties (Conservatives: CDU/CSU fraction and Socialdemocrats: SPD). The first segment describes the average deviation of politicians from the party majority. The second segment describes the cosine similarity of speeches. The third segment shows the average closeness of speeches to the party manifestos. All outcomes lay between between zero and one. For the roll call deviation a value of one means a deviation from the party majority in all voting. For the cosine similarity a value of 1 means that the speeches of a candidate is the same to party colleagues. For the Manifesto closeness a one and can be interpreted as the predictability by the machine learning method (Logistic Regression). A MP's party is perfectly predictable from his speeches and the closeness to the party manifesto. Standard deviations are shown in parentheses.

Table 3: OLS Winning a District Election on Voting against the party-line.

	(1) Simple	(2) with controls	(3) No selection	(4) with controls
Won district	-0.0222***	0.00993	-0.0120*	0.0185**
	(0.00520)	(0.00625)	(0.00728)	(0.00840)
Observations	1,931	1,865	1,423	1,423
R-squared	0.009	0.111	0.002	0.109
State FE		YES		YES
Party FE		YES		YES
Session FE		YES		YES

Robust standard errors in parenthesis *** p<0.01 ** p<0.05 * p<0.1

Linear Least Square regression. One observation corresponds to a politician within one election period. The dependent variable is percentage of deviations in roll-call votes measured in comparison to the majority vote within the party. Wondistrict is a dummy that takes the value one if a politician won their district. State fixed effects are fixed effects for the 16 German federal states, Party fixed effects for the party of a MP, and Session fixed effects for an election period. In Models (3) and (4) we only consider MPs who either entered the parliament over a party list or entered over a district-election, but would have entered over a party list if they had lost their district.

Table 4: Regression Discontinuity Design: Winning a District Election on voting against the party-line.

	(1) Average BW 5	(2) Linear BW 10	(3) 2nd-Pol BW 40	(4) 3rd-Pol BW 40
Won district	0.0453	0.0592	0.0450*	0.0537
Observations	161	309	931	931
Robust Std. Error	0.0574	0.0581	0.0320	0.0404
Robust p-value	0.120	0.109	0.0940	0.120

Robust standard errors *** p<0.01 ** p<0.05 * p<0.1

Regression Discontinuity Design. One observation corresponds to a politician within one election period. The dependent variable is percentage of deviations in roll-call votes measured in comparison to the majority vote within the party. Model (1) only the average are compared on a bandwidth of 5 percentage points around a winning margin of zero. Model (2) ads the linear margin of the voteshare on a bandwidth of 10 percentage points around zero. Model (3) adds a second order polynomial and increases the bandwidth to 50. Finally Model (4) adds a third order polynomial and increases the margin even further to 50 percentage points.

Table 5: OLS Winning a District Election on the Cosine Distance to Party Average.

	(1) Simple	(2) with controls	(3) No selection	(4) with controls
Won district *dummy*	-0.0347*** (0.00391)	0.00654 (0.00434)	-0.0328*** (0.00531)	0.00752 (0.00548)
Observations	1,882	1,818	1,392	1,392
R-squared	0.040	0.315	0.027	0.344
State FE		YES		YES
Party FE		YES		YES
Session FE		YES		YES

Robust standard errors in parenthesis *** p<0.01 ** p<0.05 * p<0.1

Linear Least Square regression. One observation corresponds to a politician within one election period. The dependent variable is the cosine similarity measure of a politician where 1 corresponds two an identical similarity between an individual politicians and other party MPs. Wondistrict is a dummy that takes the value one if a politician won their district. State fixed effects are fixed effects for the 16 German federal states, Party fixed effects for the party of a MP, and Session fixed effects for an election period. In Models (3) and (4) we only consider MPs who either entered the parliament over a party list or entered over a district-election, but would have entered over a party list if they had lost their district.

Table 6: Regression Discontinuity Design: Winning district election on the Cosine Distance to Party Average.

	(1) Average BW 5	(2) Linear BW 10	(3) 2nd-Pol BW 40	(4) 3rd-Pol BW 40
Won district	0.0243	0.0309	0.0266*	0.0445
Observations	152	296	914	914
Robust Std. Error	0.0264	0.0269	0.0175	0.0207
Robust p-value	0.161	0.204	0.0108	0.0562

Robust standard errors *** p<0.01 ** p<0.05 * p<0.1

Regression Discontinuity Design. One observation corresponds to a politician within one election period. The dependent variable is the cosine similarity measure of a politician where 1 corresponds two an identical similarity between an individual politicians and other party MPs. Model (1) only the average are compared on a bandwidth of 5 percentage points around a winning margin of zero. Model (2) ads the linear margin of the voteshare on a bandwidth of 10 percentage points around zero. Model (3) adds a second order polynomial and increases the bandwidth to 50. Finally Model (4) adds a third order polynomial and increases the margin even further to 50 percentage points.

Table 7: OLS Winning a District Election on Manifesto-closeness of Speeches.

	(1) Simple	(2) with controls	(3) No selection	(4) with controls
Won district	-0.00932	-0.0129	0.0202	-0.00006
dummy	(0.0153)	(0.0145)	(0.0195)	(0.0180)
Observations	1,882	1,818	1,392	1,392
R-squared	0.000	0.386	0.001	0.366
State FE		YES		YES
Party FE		YES		YES
Session FE		YES		YES

Robust standard errors in parenthesis *** p<0.01 ** p<0.05 * p<0.1

Linear Least Square regression. One observation corresponds to a politician within one election period. The dependent variable is the predictability score of a MP to his party manifesto. A one corresponds to a perfect predictability. Wondistrict is a dummy that takes the value one if a politician won their district. State fixed effects are fixed effects for the 16 German federal states, Party fixed effects for the party of a MP, and Session fixed effects for an election period. In Models (3) and (4) we only consider MPs who either entered the parliament over a party list or entered over a district-election, but would have entered over a party list if they had lost their district.

Table 8: Regression Discontinuity Design: Winning a District Election on Manifesto-closeness of Speeches.

	(1) Average BW 5	(2) Linear BW 10	(3) 2nd-Pol BW 40	(4) 3rd-Pol BW 40
Won district	-0.0527	-0.0744	-0.0708	-0.0610
Observations	152	296	914	914
Robust Std. Error	0.101	0.104	0.0699	0.0826
Robust p-value	0.847	0.864	0.383	0.460

Robust standard errors *** p<0.01 ** p<0.05 * p<0.1

Regression Discontinuity Design. One observation corresponds to a politician within one election period. The dependent variable is the predictability score of a MP to his party manifesto. A one corresponds to a perfect predictability. Model (1) only the average are compared on a bandwidth of 5 percentage points around a winning margin of zero. Model (2) ads the linear margin of the voteshare on a bandwidth of 10 percentage points around zero. Model (3) adds a second order polynomial and increases the bandwidth to 50. Finally Model (4) adds a third order polynomial and increases the margin even further to 50 percentage points.

Table 9: OLS of Winning a District Election on List Position in next Election.

	(1) Simple	(2) with controls	(3) No selection	(4) with controls
Won district	0.0799	-0.344	-0.783	-1.155**
	(0.353)	(0.396)	(0.481)	(0.516)
Observations	1,249	1,249	1,003	1,003
R-squared	0.000	0.044	0.005	0.084
State FE		YES		YES
Party FE		YES		YES
Session FE		YES		YES

Robust standard errors in parenthesis *** p<0.01 ** p<0.05 * p<0.1

Linear Least Square regression. One observation corresponds to a politician within one election period. The dependent variable is the list change of a MP to the next period, i.e. $\Delta_t = P_t - P_{t+1}$. *A MP with a positive* Δ_t *means that a politician is in a better position to get reelected over the list. Wondistrict is a dummy that takes the value one if a politician won their district. State fixed effects are fixed effects for the 16 German federal states, Party fixed effects for the party of a MP, and Session fixed effects for an election period. In Models (3) and (4) we only consider MPs who either entered the parliament over a party list or entered over a district-election, but would have entered over a party list if they had lost their district.*

Table 10: RDD of Winning a District Election on List Position in next Election.

	(1) Average BW 5	(2) Linear BW 10	(3) 2nd-Pol BW 50	(4) 3rd-Pol BW 50
Won district	0.0857	-0.0252	0.432	0.405
Observations	173	327	424	940
Robust Std. Error	1.963	1.999	1.292	1.409
Robust p-value	0.786	0.767	0.653	0.569

Robust standard errors *** p<0.01 ** p<0.05 * p<0.1

Regression Discontinuity Design. One observation corresponds to a politician within one election period. The dependent variable is the list change of a MP to the next period, i.e. $\Delta_t = P_t - P_{t+1}$. *A MP with a positive* Δ_t *means that a politician is in a better position to get reelected over the list. Model (1) only the average are compared on a bandwidth of 5 percentage points around a winning margin of zero. Model (2) ads the linear margin of the voteshare on a bandwidth of 10 percentage points around zero. Model (3) adds a second order polynomial and increases the bandwidth to 50. Finally Model (4) adds a third order polynomial and increases the margin even further to 50 percentage points.*

Table 11: Correlation with socioeconomic characteristics

	Margin	Roll Call Dev.	Cosine Sim	Menifesto Closeness
Pop. density (Persons per sqm)	-0.215***	0.044	-0.011	-0.066*
Share male	0.250***	-0.102***	-0.006	0.049
Share German citizens	0.137***	-0.054*	0.000	0.065*
Share older than 60 years	0.018	-0.077**	-0.036	0.072**
Cars per thousand pop.	0.382***	-0.005	-0.034	0.070*
Unemployment share	-0.326***	0.090***	-0.142***	-0.170***
Share without secondary degree	-0.184***	0.099***	-0.078*	-0.125***

Each row corresponds to different socioeconomic characteristics of a district. One observation is the politician and the district of nomination. We calculate the Pearson correlation coefficients to the absolute marginal vote share, the roll call voting deviation, the cosine similarity, the closeness to the manifestos predicted by the multinomial logistic regression.