Supplementary Materials: How Parties React to Voter Transitions

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A   Cases Included in the Analysis

The majority of our data come from the European Voter project and different waves of the Comparative Study of Electoral Systems (CSES). In some instances we include country specific election studies.

Country	Elec. Date	Num Parties	Party Names
Austria	24/11/2002	4	The Greens, Austrian Social Democratic Party, Austrian Freedom Party, Austrian People's Party
Denmark	04/12/1973	5	Socialist People's Party, Social Democratic Party, Danish Social-Liberal Party, Liberals, Conservative People's Party
Denmark	09/01/1975	8	Danish Communist Party, Socialist People's Party, Social Democratic Party, Danish Social-Liberal Party, Liberals, Christian People's Party, Conservative People's Party, Progress Party
Denmark	15/02/1977	11	Centre Democrats, Justice Party, Left Socialist Party, Danish Communist Party, Socialist People's Party, Social Democratic Party, Danish Social-Liberal Party, Liberals, Christian People's Party, Conservative People's Party, Progress Party

Country	Elec. Date	Num Parties	Party Names
Denmark	23/10/1979	10	Left Socialist Party, Socialist People's Party, Social Democratic Party, Centre Democrats, Danish Social-Liberal Party, Liberals, Christian People's Party, Conservative People's Party, Progress Party, Justice Party
Denmark	08/12/1981	9	Left Socialist Party, Socialist People's Party, Social Democratic Party, Centre Democrats, Danish Social-Liberal Party, Liberals, Christian People's Party, Conservative People's Party, Progress Party
Denmark	10/01/1984	9	Left Socialist Party, Socialist People's Party, Social Democratic Party, Centre Democrats, Danish Social-Liberal Party, Liberals, Christian People's Party, Conservative People's Party, Progress Party
Denmark	08/09/1987	8	Socialist People's Party, Social Democratic Party, Centre Democrats, Danish Social-Liberal Party, Liberals, Christian People's Party, Conservative People's Party, Progress Party

Country	Elec. Date	Num Parties	Party Names
Denmark	10/05/1988	8	Socialist People's Party, Social Democratic Party, Centre Democrats, Danish Social-Liberal Party, Liberals, Christian People's Party, Conservative People's Party, Progress Party
Denmark	12/12/1990	8	Socialist People's Party, Social Democratic Party, Centre Democrats, Danish Social-Liberal Party, Liberals, Christian People's Party, Conservative People's Party, Progress Party
Denmark	21/09/1994	7	Socialist People's Party, Social Democratic Party, Centre Democrats, Danish Social-Liberal Party, Liberals, Conservative People's Party, Progress Party
Denmark	11/03/1998	9	Christian People's Party, Red-Green Unity List, Socialist People's Party, Social Democratic Party, Centre Democrats, Danish Social-Liberal Party, Liberals, Conservative People's Party, Progress Party

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Country	Elec. Date	Num Parties	Party Names
Denmark	20/11/2001	8	Red-Green Unity List, Socialist People's Party, Social Democratic Party, Danish Social-Liberal Party, Liberals, Christian People's Party, Conservative People's Party, Danish People's Party
Denmark	13/11/2007	7	Red-Green Unity List, Socialist People's Party, Social Democratic Party, Danish Social-Liberal Party, Liberals, Conservative People's Party, Danish People's Party
Denmark	15/09/2011	8	Liberal Alliance, Red-Green Unity List, Socialist People's Party, Social Democratic Party, Danish Social-Liberal Party, Liberals, Conservative People's Party, Danish People's Party
Finland	16/03/2003	7	Green Union, Left Wing Alliance, Finnish Social Democrats, Christian Democrats in Finland, National Coalition, Finnish Centre, Swedish People's Party
Finland	18/03/2007	7	Green Union, Left Wing Alliance, Finnish Social Democrats, Christian Democrats in Finland, National Coalition, Finnish Centre, Swedish People's Party

Country	Elec. Date	Num Parties	Party Names
Finland	17/04/2011	8	Green Union, Left Wing Alliance, Finnish Social Democrats, Christian Democrats in Finland, National Coalition, Finnish Centre, True Finns, Swedish People's Party
Germany	28/09/1969	3	Social Democratic Party of Germany, Free Democratic Party, Christian Democratic Union/Christian Social Union
Germany	19/11/1972	3	Social Democratic Party of Germany, Free Democratic Party, Christian Democratic Union/Christian Social Union
Germany	03/10/1976	3	Social Democratic Party of Germany, Free Democratic Party, Christian Democratic Union/Christian Social Union
Germany	05/10/1980	3	Social Democratic Party of Germany, Free Democratic Party, Christian Democratic Union/Christian Social Union
Germany	06/03/1983	3	Social Democratic Party of Germany, Free Democratic Party, Christian Democratic Union/Christian Social Union
Germany	25/01/1987	4	The Greens, Social Democratic Party of Germany, Free Democratic Party, Christian Democratic Union/Christian Social Union

Country	Elec. Date	Num Parties	Party Names
Germany	02/12/1990	3	Social Democratic Party of Germany, Free Democratic Party, Christian Democratic Union/Christian Social Union
Germany	16/10/1994	5	Alliance'90/Greens, Party of Democratic Socialism, Social Democratic Party of Germany, Free Democratic Party, Christian Democratic Union/Christian Social Union
Germany	27/09/1998	5	Alliance'90/Greens, Party of Democratic Socialism, Social Democratic Party of Germany, Free Democratic Party, Christian Democratic Union/Christian Social Union
Germany	18/09/2005	5	Alliance'90/Greens, The Left. Party of Democratic Socialism, Social Democratic Party of Germany, Free Democratic Party, Christian Democratic Union/Christian Social Union
Germany	27/09/2009	5	Alliance'90/Greens, The Left, Social Democratic Party of Germany, Free Democratic Party, Christian Democratic Union/Christian Social Union

Country	Elec. Date	Num Parties	Party Names
Germany	22/09/2013	5	Alliance'90/Greens, The Left, Social Democratic Party of Germany, Free Democratic Party, Christian Democratic Union/Christian Social Union
Germany	24/09/2017	6	Alliance'90/Greens, The Left, Social Democratic Party of Germany, Free Democratic Party, Christian Democratic Union/Christian Social Union, Alternative for Germany
Ireland	24/05/2007	6	Green Party, Labour Party, Progressive Democrats, Familiy of the Irish, Soldiers of Destiny, We Ourselves
Ireland	26/02/2016	5	Green Party, Labour Party, Familiy of the Irish, Soldiers of Destiny, We Ourselves
Netherlands	29/11/1972	6	Labour Party, Democrats'66, People's Party for Freedom and Democracy, Catholic People's Party, Anti-Revolutionary Party, Christian Historical Union
Netherlands	25/05/1977	3	Labour Party, Democrats'66, People's Party for Freedom and Democracy
Netherlands	26/05/1981	4	Labour Party, Democrats'66, People's Party for Freedom and Democracy, Christian Democratic Appeal

Country	Elec. Date	Num Parties	Party Names
Netherlands	08/09/1982	4	Labour Party, Democrats'66, People's Party for Freedom and Democracy, Christian Democratic Appeal
Netherlands	21/05/1986	4	Labour Party, Democrats'66, People's Party for Freedom and Democracy, Christian Democratic Appeal
Netherlands	06/09/1989	4	Labour Party, Democrats'66, People's Party for Freedom and Democracy, Christian Democratic Appeal
Netherlands	03/05/1994	5	Green Left, Labour Party, Democrats'66, People's Party for Freedom and Democracy, Christian Democratic Appeal
Netherlands	06/05/1998	5	Green Left, Labour Party, Democrats'66, People's Party for Freedom and Democracy, Christian Democratic Appeal
Netherlands	15/05/2002	6	Green Left, Socialist Party, Labour Party, Democrats'66, People's Party for Freedom and Democracy, Christian Democratic Appeal
Netherlands	22/01/2003	8	Green Left, Socialist Party, Labour Party, Democrats'66, People's Party for Freedom and Democracy, Christian Democratic Appeal, Christian Union, List Pim Fortuyn

Country	Elec. Date	Num Parties	Party Names
Netherlands	09/06/2010	6	Green Left, Socialist Party, Labour Party, People's Party for Freedom and Democracy, Christian Democratic Appeal, Christian Union
Netherlands	12/09/2012	8	Green Left, Socialist Party, Labour Party, Democrats'66, People's Party for Freedom and Democracy, Christian Democratic Appeal, Christian Union, Party of Freedom
Norway	07/09/1969	6	Socialist People's Party, Norwegian Labour Party, Liberal Party, Christian People's Party, Conservative Party, Centre Party
Norway	09/09/1973	6	Socialist People's Party, Norwegian Labour Party, Liberal Party, Christian People's Party, Conservative Party, Centre Party
Norway	11/09/1977	6	Socialist Left Party, Norwegian Labour Party, Liberal Party, Christian People's Party, Conservative Party, Centre Party
Norway	14/09/1981	7	Progress Party, Socialist Left Party, Norwegian Labour Party, Liberal Party, Christian People's Party, Conservative Party, Centre Party

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Country	Elec. Date	Num Parties	Party Names
Norway	08/09/1985	7	Socialist Left Party, Norwegian Labour Party, Liberal Party, Christian People's Party, Conservative Party, Centre Party, Progress Party
Norway	11/09/1989	7	Socialist Left Party, Norwegian Labour Party, Liberal Party, Christian People's Party, Conservative Party, Centre Party, Progress Party
Norway	13/09/1993	7	Socialist Left Party, Norwegian Labour Party, Liberal Party, Christian People's Party, Conservative Party, Centre Party, Progress Party
Norway	16/09/1997	7	Socialist Left Party, Norwegian Labour Party, Liberal Party, Christian People's Party, Conservative Party, Centre Party, Progress Party
Norway	10/09/2001	7	Socialist Left Party, Norwegian Labour Party, Liberal Party, Christian People's Party, Conservative Party, Centre Party, Progress Party
Norway	12/09/2005	7	Socialist Left Party, Norwegian Labour Party, Liberal Party, Christian People's Party, Conservative Party, Centre Party, Progress Party

Country	Elec. Date	Num Parties	Party Names
Norway	14/09/2009	7	Socialist Left Party, Norwegian Labour Party, Liberal Party, Christian People's Party, Conservative Party, Centre Party, Progress Party
Spain	09/03/2008	4	United Left, Spanish Socialist Workers' Party, People's Party, Convergence and Union
Sweden	20/09/1964	5	Communist Party of Sweden, Social Democratic Labour Party, People's Party, Right Party, Centre Party
Sweden	15/09/1968	5	Left Communists Party, Social Democratic Labour Party, People's Party, Right Party, Centre Party
Sweden	20/09/1970	5	Left Communists Party, Social Democratic Labour Party, People's Party, Moderate Coalition Party, Centre Party
Sweden	16/09/1973	5	Left Communists Party, Social Democratic Labour Party, People's Party, Moderate Coalition Party, Centre Party
Sweden	19/09/1976	5	Left Communists Party, Social Democratic Labour Party, People's Party, Moderate Coalition Party, Centre Party

Country	Elec. Date	Num Parties	Party Names
Sweden	16/09/1979	5	Left Communists Party, Social Democratic Labour Party, People's Party, Moderate Coalition Party, Centre Party
Sweden	19/09/1982	5	Left Communists Party, Social Democratic Labour Party, People's Party, Moderate Coalition Party, Centre Party
Sweden	15/09/1985	5	Left Communists Party, Social Democratic Labour Party, People's Party, Moderate Coalition Party, Centre Party
Sweden	18/09/1988	5	Left Communists Party, Social Democratic Labour Party, People's Party, Moderate Coalition Party, Centre Party
Sweden	15/09/1991	6	Green Ecology Party, Left Party, Social Democratic Labour Party, Liberal People's Party, Moderate Coalition Party, Centre Party
Sweden	18/09/1994	7	Green Ecology Party, Left Party, Social Democratic Labour Party, Liberal People's Party, Christian Democratic Community Party, Moderate Coalition Party, Centre Party

Country	Elec. Date	Num Parties	Party Names
Sweden	21/09/1998	7	Green Ecology Party, Left Party, Social Democratic Labour Party, Liberal People's Party, Christian Democrats, Moderate Coalition Party, Centre Party
Sweden	15/09/2002	7	Green Ecology Party, Left Party, Social Democratic Labour Party, Liberal People's Party, Christian Democrats, Moderate Coalition Party, Centre Party
Sweden	17/09/2006	7	Green Ecology Party, Left Party, Social Democratic Labour Party, Liberal People's Party, Christian Democrats, Moderate Coalition Party, Centre Party
Sweden	19/09/2010	7	Green Ecology Party, Left Party, Social Democratic Labour Party, Liberal People's Party, Christian Democrats, Moderate Coalition Party, Centre Party
Sweden	14/09/2014	8	Green Ecology Party, Left Party, Social Democratic Labour Party, Liberal People's Party, Christian Democrats, Moderate Coalition Party, Sweden Democrats, Centre Party
United Kingdom	31/03/1966	3	Labour Party, Liberal Party, Conservative Party

Country	Elec. Date	Num Parties	Party Names
United Kingdom	18/06/1970	3	Labour Party, Liberal Party, Conservative Party
United Kingdom	10/10/1974	3	Labour Party, Liberal Party, Conservative Party
United Kingdom	28/02/1974	3	Labour Party, Liberal Party, Conservative Party
United Kingdom	03/05/1979	3	Labour Party, Liberal Party, Conservative Party
United Kingdom	09/06/1983	2	Labour Party, Conservative Party
United Kingdom	11/06/1987	3	Labour Party, Liberal Party, Conservative Party
United Kingdom	09/04/1992	3	Labour Party, Liberal Democrats, Conservative Party
United Kingdom	01/05/1997	3	Labour Party, Liberal Democrats, Conservative Party
United Kingdom	05/05/2005	3	Labour Party, Liberal Democrats, Conservative Party
United Kingdom	06/05/2010	3	Labour Party, Liberal Democrats, Conservative Party

Table 1: Elections and Parties included in the Analysis

B Statistical Model and Measurement

B.1 Spatial Lags based on Voter Transitions

We rely on dynamic spatial econometric models (see e.g. Elhorst, 2014, Chapter 4) to estimate the effect of voter transitions on party behaviour. In spatial econometric models a weighting matrix $\mathbf{W}$ permits us to specify which parties party A is hypothesized to adapt to (see e.g. Böhmelt et al., 2016). The equation of our dynamic spatial lag model is given by:

$$\mathbf{y}_t = \phi \mathbf{y}_{t-1} + \rho \mathbf{W} \mathbf{y}_t + \delta_\mathbf{1} \mathbf{z_{t-1}} \mathbf{W} \mathbf{y}_t + \delta_\mathbf{0} \mathbf{z_{t-1}} + \mathbf{X}_t \boldsymbol{\beta}' + \boldsymbol{\epsilon_t}, \tag{1}$$

where t is a counter for every election in a country since 1970. $\mathbf{y}_t$ is a column vector with parties' positions. $\mathbf{W}$ is the spatial weight matrix with parameter ρ capturing the spatial auto-regressive effects that help us to evaluate if the other parties influence a party's position as we propose. $\mathbf{z_{t-1}}$ is a column vector that measures the vote change in the preceding election and $\delta_\mathbf{1}$ captures the moderating effect of this vote change. The vector with a temporally lagged dependent variable is denoted by $\mathbf{y}_{t-1}$ such that ϕ captures temporal auto-correlation. $\mathbf{X}$ is a matrix with our control variables and $\boldsymbol{\beta}'$ a row vector with the corresponding regression weights, including the intercept. Gaussian i.i.d. errors are included in the equation using $\boldsymbol{\epsilon}_t$.

We follow previous applications of the model to study party positioning and estimate the spatial lag model using spatial ordinary least squares (see Williams, 2014; Williams and Whitten, 2015; Böhmelt et al., 2016). Following Neumayer and Plümper (2016), we specify each element of $\mathbf{W}_{jt}$ according to the theoretical considerations about what constitutes a meaningful dependence between any pair of parties. As our focus is on domestic competition,we define $\mathbf{W}$ as a block-diagonal matrix where each element is a $p_{jt} \times p_{jt}$ matrix that captures the dependencies

among p_{jt} parties that compete in an election in some country j at time t. This global structure of **W** reflects our theoretical model that a party's strategic choice depends on the parties in their electoral environment.

We theorized that parties should react to losses to other parties. In order to measure these transitions, we assembled different post-election surveys that include questions about respondents' vote choice in the last general election and vote-recall questions regarding the election preceding it. Based on the transition data we determine the weights of any pair of parties based on the percentage of voters who switched votes between those parties in the prior election at $t-1$. The basic transition matrices, containing estimates for vote swings among any pair of parties, are simple cross-tabulations of these two items, taking into account the appropriate sampling weights. We cross-tabulate so that the number of vote recalls at the preceding election are given in the columns, while vote intention is depicted in the rows of this matrix. Subtracting the Matrix with the transpose gives a count of vote transfers in the survey. To conceptualize the total transfers in the survey we condition them with respect to the total number of respondents who recall that they voted for the party in the preceding election ($t-2$). The percentage entries thereby tell us how much of their previous election result a party won or lost from any other party in the past election. A more detailed example is given in section B.3.

We hypothesized that during an electoral campaign (at t), parties react more strongly to the strategic choices of those competitors that they have lost votes to at $t-1$. In order to test this hypothesis we only include the negative net transfers in a weight matrix, **W**. The values of our weight matrix are thus directly interpretable as the net percentage of previous voters who decided to vote for another party.

To interpret the results from the model estimates in terms of adaption, we propose to use - what we call - the marginal rate of adaption. The marginal rate

of adaption is calculated as change of Party A's Position with changes in Party B's times Party B's position and thereby how strongly party A adapts to party B. In mathematical terms it can be calculated from the model as: $\left(\frac{\partial y_{At}}{\partial y_{Bt}}\right) y_{Bt} = (\rho w_{AB} + \delta_1 z_{At-1} w_{AB}) y_{Bt}$, where w_{AB} are the net vote losses from A to B, z_{At-1} a dummy if a party lost sufficiently in the last election, and the δ_1, ρ the estimates from the model. For a similar quantity of interest see Whitten, Williams and Wimpy (2019) equation 15.
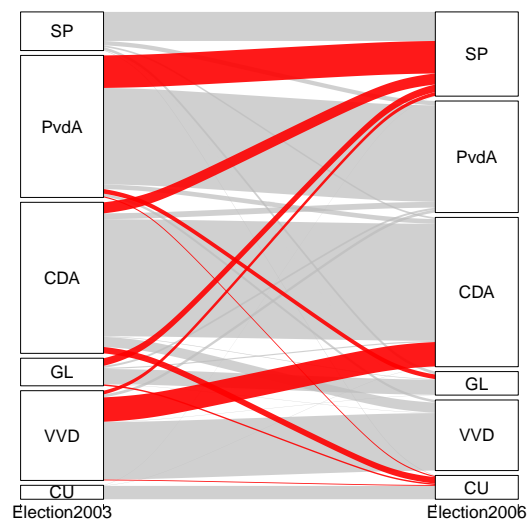
B.2 Example of Voter Transitions

The river-plot in Figure 1 shows an example of the transitions for the German Federal Election 2009 and Dutch General Election of 2006. The transitions, first of all, indicate that a vast share of voters do not switch. In Germany 77% vote for the same party, in the Netherlands 71%. We highlight streams of voters that constitute a particular strong vote loss for the parties by coloring all transitions with a net loss of more than 5% of the original result. After four years in a Grand coalition, the major two parties in Germany lost votes to their smaller challengers. The Social-democrats gave up a substantial share of votes to the Linke, the Greens and the FDP. The CDU/CSU lost considerable amounts of voters to the FDP. In the Dutch Elections, the CDA was able to remain the largest party after the end of the second Balkenende cabinet. As the right panel of Figure 1 highlights, the party was able to compensate the relative losses to the CU and SP with large vote gains from the VVD. The Socialist Party saw substantial gains in the 2006 elections, most of which came from the PvdA.

The transitions build the foundation of our weight matrix and test our argument. In the German Federal elections of 2009 the SPD lost 14% of their past voters to the LINKE, which in our theory should be a clear signal for the 2013 election to
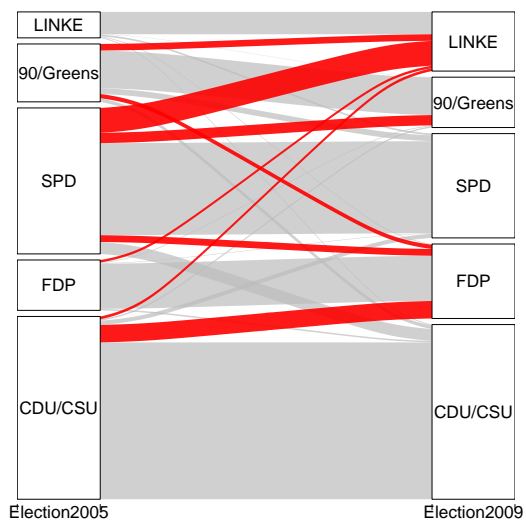
(a) Germany Transitions 2004 to 2009 (b) Netherlands Transitions 2003 to 2006

Figure 1: Voter transitions between major parties in Germany from 2005 to 2009 election and in the Netherlands between the 2003 to 2006 election. Transitions that constitute more than 5% net loss of a party's orginal vote share are highlighted in red.

adapt to this party's position. Indeed, we can see that the SPD shifted its left-right positions further to the left in 2013.

B.3   Example of Weight Matrix Construction

Figure 2 shows an example of how we construct the vote loss weight matrix for the German Federal elections of 2009. We start with tabulating the weighted vote intentions and vote recalls between the major parties. We use survey weights whenever available from the original source. In the left top matrix, the columns constitute the 2009 election in the columns and the previous election (Federal Election of 2005) in the rows. Each entry describes the weighted number of respondents. E.g. 431 respondents voted for the CDU/CSU in both elections, while 33 respondents switched from the SPD to the CDU/CSU. In this matrix, the off-diagonal elements contain the transitions from and to a party. The columns are the wins for a party from another party, and the rows are the losses. Consequentially, we can calculate the net transitions by subtracting the matrix with its transpose. The resulting net transfers for our example, are presented in the top right matrix. The matrix contains zeros on the diagonals and the net transitions on the off-diagonals. It shows that, for example, the CDU/CSU won net 21 respondents from the SPD, which shows up as a positive value in the CDU/CSU column, but as a negative value in the SPD column. Based on this, we construct the weight matrix by concentrating on relative losses to the last result. We, therefore, sum up the respondents who recall to vote for a party in the previous election and divide the columns with this total. E.g. 401 respondents recall that they voted for the SPD in the last election. A net loss of 21 to the CDU/CSU corresponds to the 5% we see in the matrix in the SPD columns. Only losses are included in the final weight matrix and are transformed to be positive. The values in the final weight matrix have an intuitive

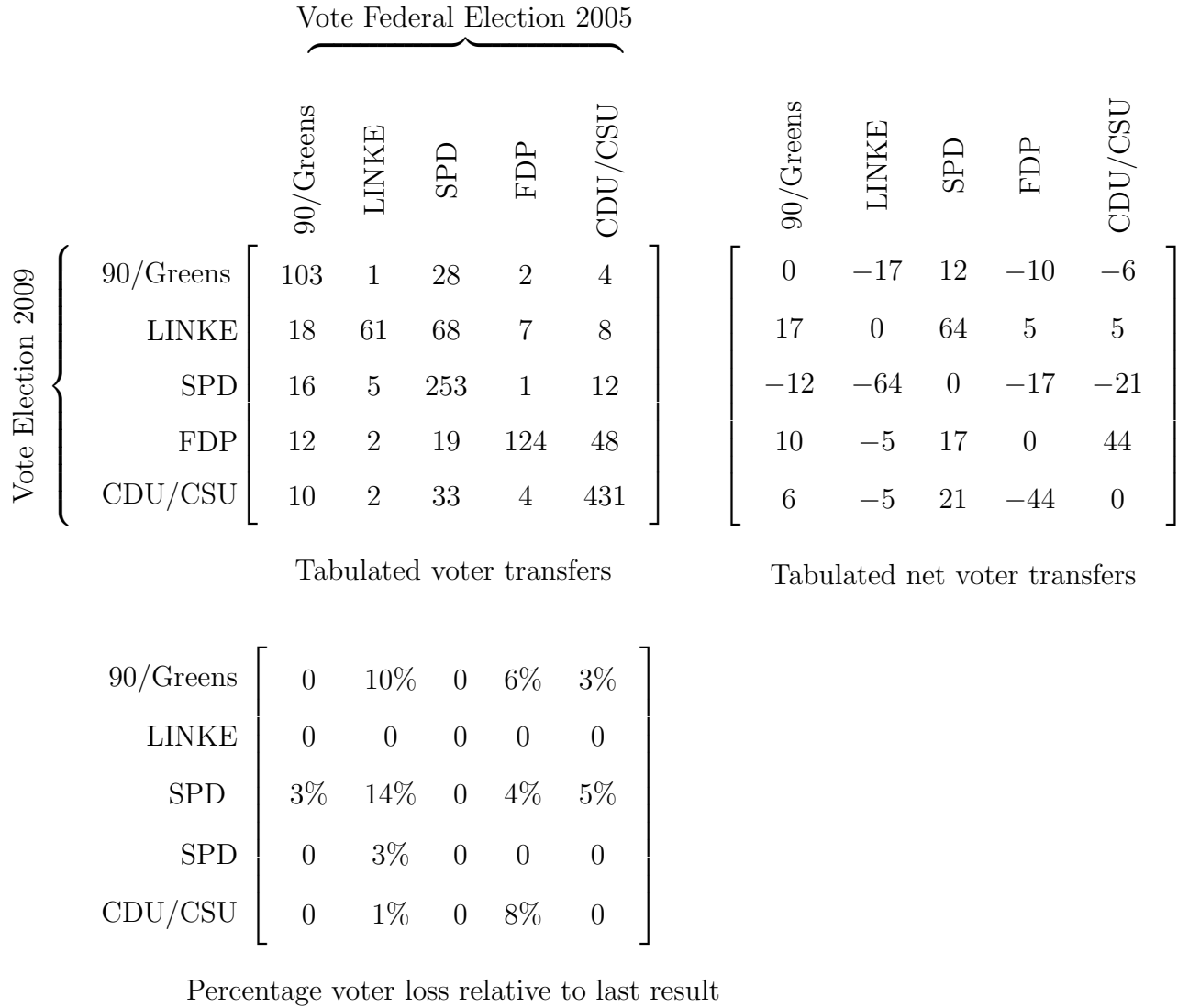interpretation: the SPD lost 5% of its previous voters to the CDU/CSU.

Vote Federal Election 2005

Tabulated voter transfers

Vote Election 2009		90/Greens	LINKE	SPD	FDP	CDU/CSU
	90/Greens	103	1	28	2	4
	LINKE	18	61	68	7	8
	SPD	16	5	253	1	12
	FDP	12	2	19	124	48
	CDU/CSU	10	2	33	4	431

Tabulated net voter transfers

90/Greens	LINKE	SPD	FDP	CDU/CSU
0	−17	12	−10	−6
17	0	64	5	5
−12	−64	0	−17	−21
10	−5	17	0	44
6	−5	21	−44	0

	90/Greens	LINKE	SPD	FDP	CDU/CSU
90/Greens	0	10%	0	6%	3%
LINKE	0	0	0	0	0
SPD	3%	14%	0	4%	5%
SPD	0	3%	0	0	0
CDU/CSU	0	1%	0	8%	0

Percentage voter loss relative to last result

Figure 2: Example of Weight matrix calculations for the 2009 German Federal Election

B.4 Validation of Voter Transitions

In order to validate our measure of voter transitions, we compare the survey estimates we obtain of the total gains and losses to the overall vote differences actually observed in these elections. Figure 3 plots the vote difference on the x-axis and the vote difference we estimate form the survey on the y-axis. We observe a strong relationship between the two measures. The correlation coefficient is 0.82. Considering that we do not include transitions to and from non-voters and smaller parties in our estimate of the overall vote difference, this constitutes a high correlation. While this only validates the margins of the weight-matrix, it clearly shows that the collection of surveys are reliable in picking up the overall transitions. It is also similar to the type of information that parties have at hand when making their strategic decisions.
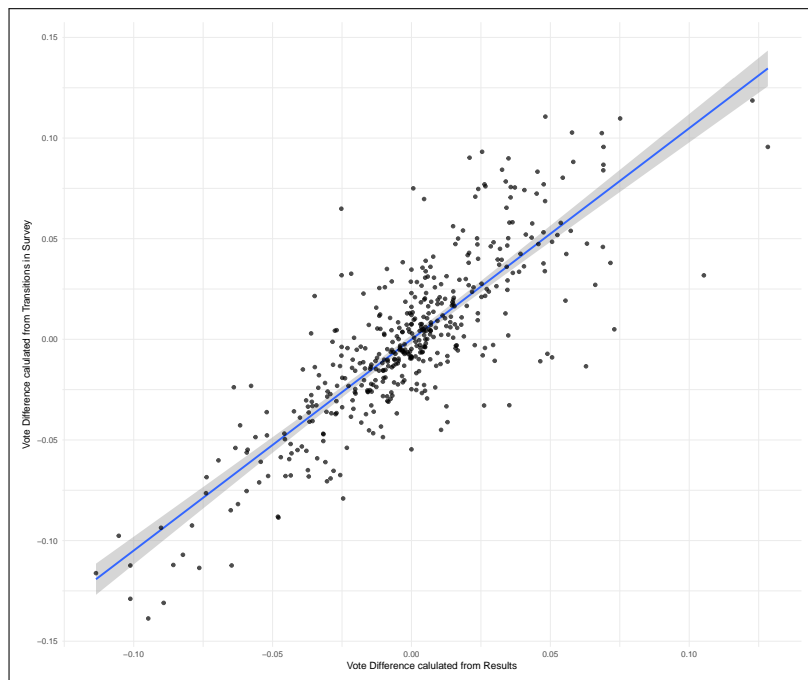

Figure 3: Comparsion of vote difference from the election to vote difference from the surveys
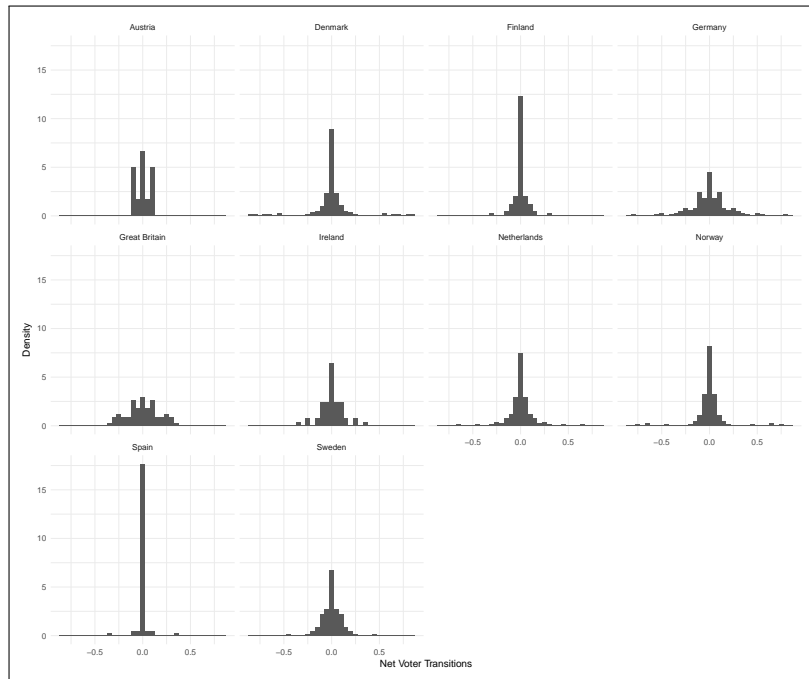
Figure 4: Distribution of net voter transitions in different countries

B.5   Distribution of Net Transfers

To further investigate our measure of vote transfers we plot the distribution for the different countries under study in Figure 4. By design the distribution of net vote transfers is symmetric and centered around zero. Most values can be found between 0.1 and -0.1 percentage net transfers, but we also observe cases with much stronger exchanges that create a clear signal to the party. The spread of the distribution varies between countries mostly because some countries have longer time-series.

C   Additional Material Main Results

C.1   Marginal Effects Plot

Figure 5 show the marginal effect of the spatial lag for the two subsets of vote change. In line with our expectations, only parties with strong vote loss to shift their position strategically adjust their policy profile in accordance with parties that they have lost votes to. The Figure shows that the spatial lag has a positive effect among parties that lost more than 5.8% of the previous vote share, but no effect for the rest of the parties.

C.2   Multy Party Competition

Figure 6 illustrates the example with three competing parties from the main text. The plot shows the marginal rate of adaption if party A lost 15% of her voters from the previous election to a Party B and a Party C. In the left Panel Party B & C are on opposite sides of Party A. Here the marginal rate of adaption cancel each other out and are indistinguishable from zero. This is in line with our argument, as this pattern of vote loss bares no clear signal in which direction Party A should alter its position. The right Panel shows what happens if both, Party B and C, are on the same side of Party A. Here the marginal rate of adaption is amplified, as loosing to two competitors on the same side sends a clear signal.
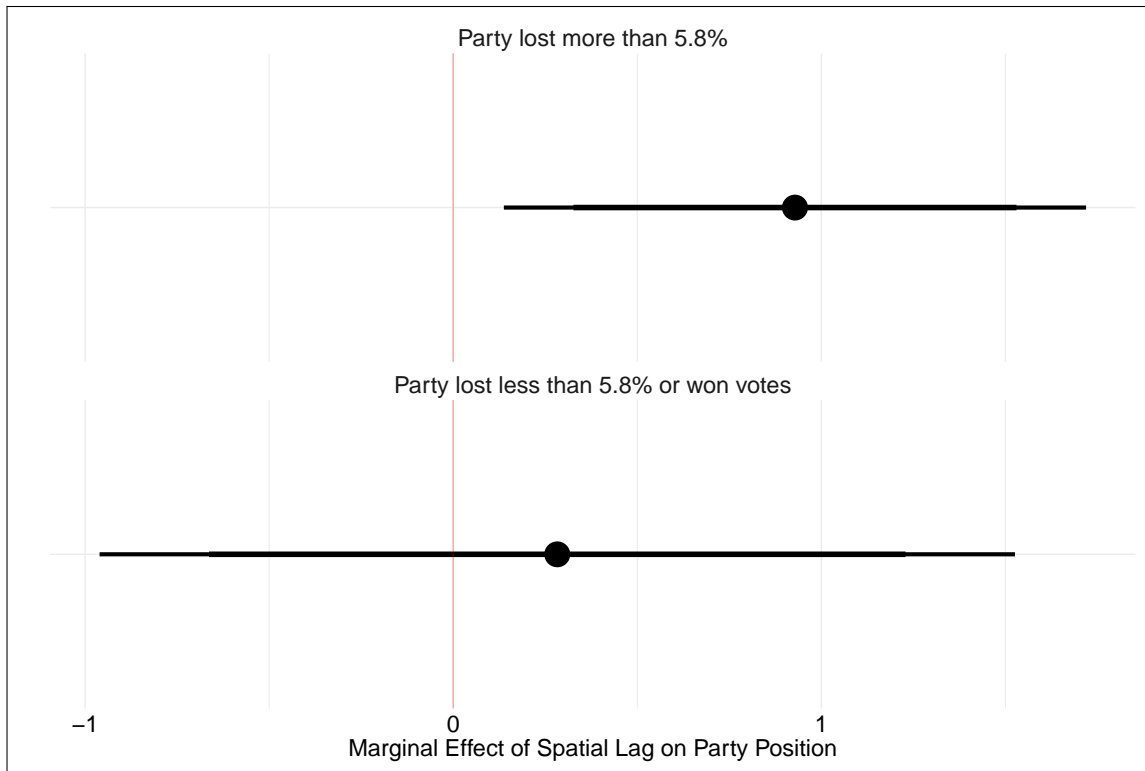
Figure 5: Marginal effect of the spatial lag (other parties' position multiplied net vote loss to this party) over the range of the relative vote difference in the past election. The graph shows the marginal effects from a model that interacts the effect with dummies for quartiles of relative vote change (intervals)
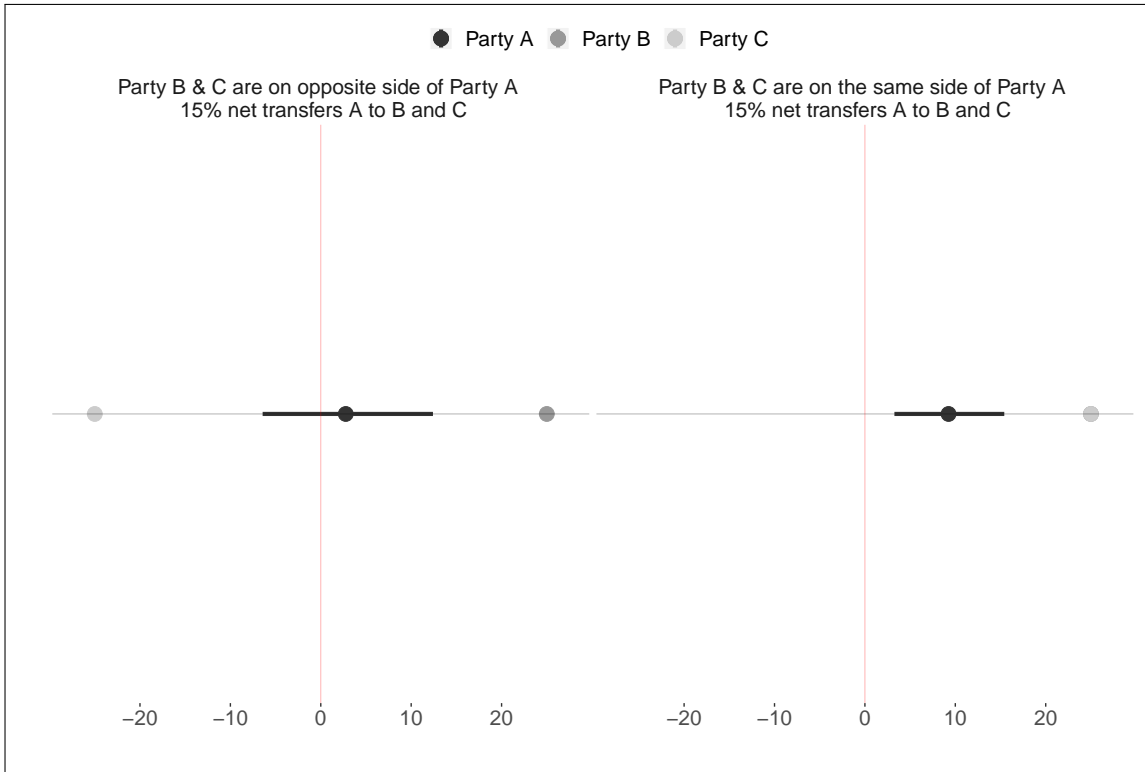
Figure 6: Example how parties are expected to adapt position to competitors with multiple parties. In the examples Party A lost votes to Party B and C in a preceding election.

D Robustness Checks

The first robustness check acknowledges that all parties in a given system might react to the position of the median voter rather than to each other's strategic choices. This perspective offers an alternative mechanism why parties move in the same direction: instead of reacting to competitors they follow public opinion. In order to minimize the possibility that our main results are affected by this, we control for the electorate's mean left-right shift in a country as measured in the Eurobarometer. The Eurobarometer covers a long period of the countries included in our study, however, due to the limited availability of Data for Norway, and Sweden in earlier years, the number of observations available for the analysis drops significantly when including the mean position shift as a control. The results in Appendix D.2 document that this alternative mechanism does not challenge our theorized mechanism. The spatial effect is almost unaffected by including the left-right shifts from the Eurobarometer data.

Alternative specifications of the spatial matrix to analyze reaction of political parties are built on their ideological closeness (Williams, 2014; Williams and Whitten, 2015). This could provide an alternative mechanism for our findings. It is likely that parties especially lose votes to ideologically close competitors. Instead of reacting to vote net loss, they react to similar parties, such that the relationship we observe is spurious. In order to test for this alternative mechanism we construct two additional spatial weight matrices, one similar to Williams (2014) and one indicating the spatial neighbors calculated from the rile index. We include both in our specification and report the results in Appendix D.3. The results show that the inclusion does not alter our main findings. In particular the marginal effect among the lowest 33% of vote change is almost unchanged.

On a more substantial note, we analyze the difference between mainstream parties and niche parties. We re-estimate the main model specification for a subset

of mainstream parties and for niche parties. The results in Appendix D.4 show that our findings hold for the sub-set of mainstream parties. If mainstream parties lost votes in the last elections they are likely to adapt their position to parties they lost votes too. We find no significant effects for niche parties, but this might have to do with the relatively small sample size.

Finally, the specification of our main analysis includes country fixed effects and thereby relies on the average deviations of a party's position from the country average in the period under study. In a more restrictive specification we analyze the variation around a parties average position including party fixed effects. Appendix D.5 reports that with this specification we find support for the second hypothesis. Only parties that lost a considerable amount of votes in the past election react to voter transitions. We further estimated the models using the log-rile (Lowe et al., 2011) index as an alternative measure of party positions from the manifesto data. The results are unaffected by this as Appendix D.1 highlights.

D.1   Results using the log-Rile Index

	Model 1 log-Rile	Model 2 log-Rile	Model 3 log-Rile
W_{Losses} Rile	0.50***	0.60***	0.70***
	(0.16)	(0.23)	(0.26)
Rile (t-1)	0.58***	0.58***	0.58***
	(0.04)	(0.04)	(0.04)
W_{Losses} Rile × Vote Change (t-1)		0.39	
		(1.42)	
W_{Losses} Rile ×			
Vote Change (t-1) highest 66 %			−0.76
			(0.47)
Vote Change (t-1) low			−0.80***
			(0.06)
Vote Change (t-1) high			−0.95***
			(0.04)
Av. log-Rile Shift (t-1)	−0.21***	−0.21***	−0.21***
	(0.04)	(0.04)	(0.04)
R^2	0.69	0.69	0.69
Adj. R^2	0.68	0.68	0.68
Num. obs.	414	414	413

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 2: The reaction of parties to voter transtions. The table shows the results of spatial lag models estimated with OLS. The dependent variable of the model is the CMP log-rile index. Each specification includes country-fixed effects.

D.2 Controlling for Public Opinion Shifts

	Model 1 Rile	Model 2 Rile	Model 3 Rile
W_{Losses} Rile	0.89**	0.82	1.07***
	(0.38)	(0.58)	(0.26)
Rile (t-1)	0.74***	0.75***	0.74***
	(0.04)	(0.04)	(0.04)
W_{Losses} Rile × Vote Change (t-1)		−0.49	
		(1.89)	
W_{Losses} Rile ×			
Vote Change (t-1) highest 66 %			−0.58
			(0.82)
Vote Change (t-1) low			−26.56***
			(7.44)
Vote Change (t-1) high			−26.37***
			(6.92)
Public Opinion Shift	8.43**	8.34**	8.18**
	(3.77)	(3.97)	(3.74)
Avg. Rile Shift (t-1)	−0.26*	−0.26*	−0.26*
	(0.14)	(0.15)	(0.15)
R^2	0.66	0.66	0.66
Adj. R^2	0.64	0.64	0.64
Num. obs.	253	253	253

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 3: The reaction of parties to voter transtions, controlling for public opinion shifts. The table shows the results of spatial lag models estimated with OLS. The dependent variable of the model is the CMP rile index. Each specification includes country-fixed effects.

D.3 Controlling for Reaction to Close Parties

	Model 1 Rile	Model 2 Rile	Model 3 Rile	Model 4 Rile	Model 5 Rile	Model 6 Rile
W_{Losses} Rile	0.61***	0.58*	0.80***	0.46**	0.41	0.65***
	(0.17)	(0.30)	(0.19)	(0.19)	(0.30)	(0.21)
$W_{Distance}$ Rile	0.00**	0.00**	0.00**			
	(0.00)	(0.00)	(0.00)			
$W_{Neighbors}$ Rile				0.10**	0.10**	0.10**
				(0.04)	(0.04)	(0.04)
Rile (t-1)	0.72***	0.72***	0.72***	0.70***	0.69***	0.69***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
W_{Losses} Rile × Vote Change (t-1)		−0.18			−0.35	
		(1.33)			(1.22)	
W_{Losses} Rile ×						
Vote Change (t-1) highest 66 %			−0.62			−0.60
			(0.60)			(0.57)
Vote Change (t-1) low			−24.23***			−22.17***
			(4.07)			(3.59)
Vote Change (t-1) high			−25.52***			−23.37***
			(3.55)			(2.98)
Avg. Rile Shift (t-1)	−0.19**	−0.19**	−0.19**	−0.19**	−0.19**	−0.20**
	(0.09)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
R^2	0.66	0.66	0.66	0.66	0.66	0.67
Adj. R^2	0.65	0.65	0.65	0.65	0.65	0.65
Num. obs.	454	454	453	454	454	453

***$p < 0.01$, **$p < 0.05$, *$p < 0.1$

Table 4: The reaction of parties to voter transtions, controlling for reaction to close parties. The table shows the results of spatial lag models estimated with OLS. The dependent variable of the model is the CMP rile index. Each specification includes country-fixed effects

D.4 Difference between Mainstream and Niche Parties

	Model 1 Niche Parties	Model 2 Niche Parties	Model 3 Main. Parties	Model 4 Main. Parties
W_{Losses} Rile	0.64	0.61	0.56*	0.83**
	(0.35)	(0.46)	(0.25)	(0.30)
Rile (t-1)	0.83***	0.83***	0.69***	0.69***
	(0.04)	(0.05)	(0.03)	(0.04)
W_{Losses} Rile ×				
Vote Change (t-1) highest 66 %		0.29		−0.84
		(1.14)		(0.78)
Vote Change (t-1) high		−0.34		−1.89
		(3.41)		(1.30)
R^2	0.77	0.77	0.57	0.57
Adj. R^2	0.75	0.75	0.55	0.55
Num. obs.	144	144	310	309

***$p < 0.005$, **$p < 0.01$, *$p < 0.05$

Table 5: The reaction of parties to voter transtions for Mainstream Parties and Niche. The table shows the results of spatial lag models estimted with OLS. The dependent variable of the model is the rile index from the Party Manifesto. each specifcation includes country-fixed effects.

D.5 Party Fixed Effects Specification

	Model 1 Rile	Model 2 Rile	Model 3 Rile
W_{Losses} Rile	0.51	0.51	0.77*
	(0.31)	(0.45)	(0.32)
Rile (t-1)	0.30***	0.30***	0.29***
	(0.06)	(0.06)	(0.06)
W_{Losses} Rile × Vote Change (t-1)		−0.29	
		(1.71)	
W_{Losses} Rile × Vote Change (t-1) highest 66 %			−0.74
			(0.72)
Vote Change (t-1) low			2.79*
			(1.32)
R^2	0.10	0.11	0.12
Adj. R^2	−0.06	−0.06	−0.05
Num. obs.	472	454	453

$^{***}p < 0.005$, $^{**}p < 0.01$, $^{*}p < 0.05$

Table 6: The reaction of parties to voter transtions, including party fixed effects. The table shows the results of spatial lag models estimated with OLS. The dependent variable of the model is the CMP rile index. Each specification includes country-fixed effects

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