Forecasting Bloc Support in German Federal Elections:
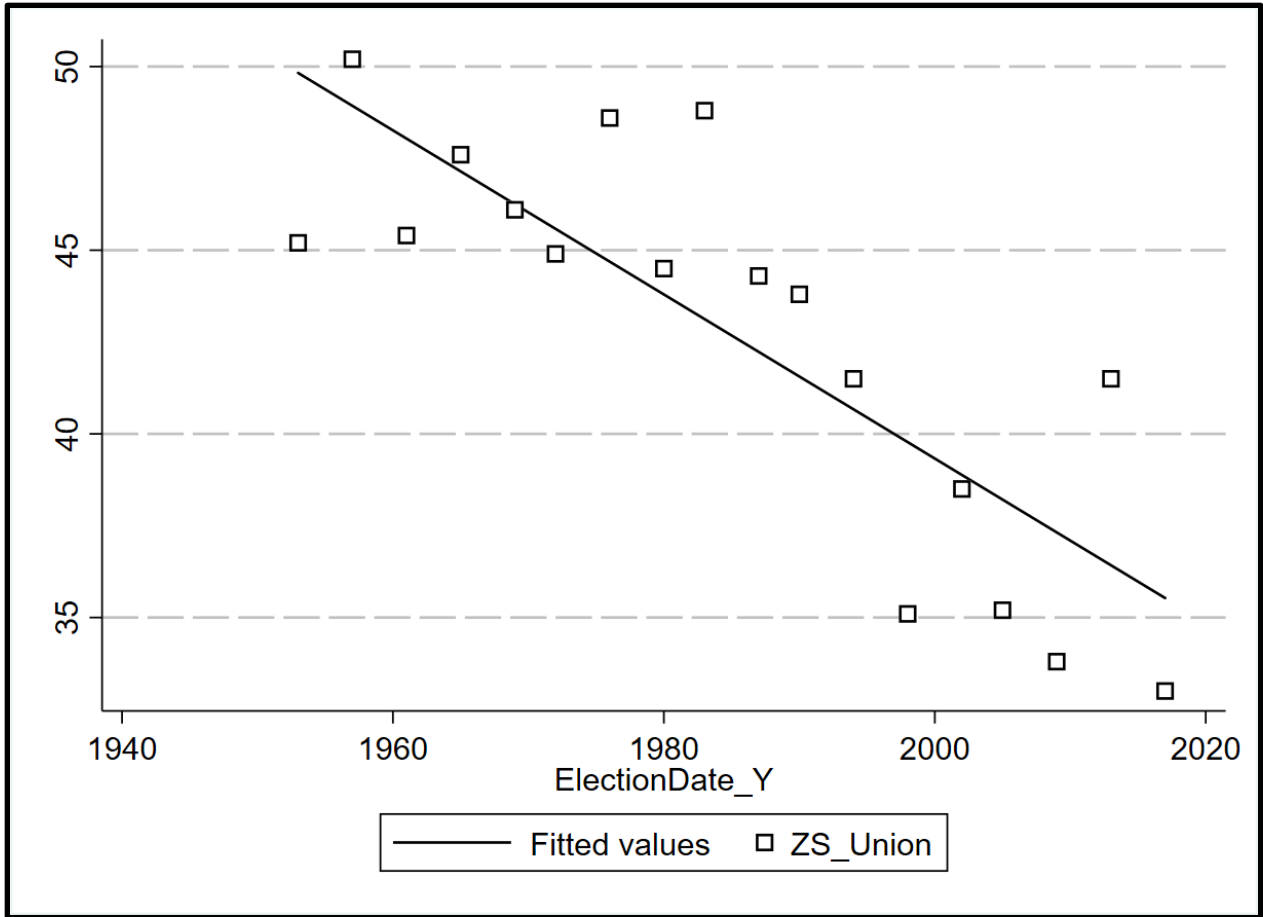## A Political History Model

APPENDICES
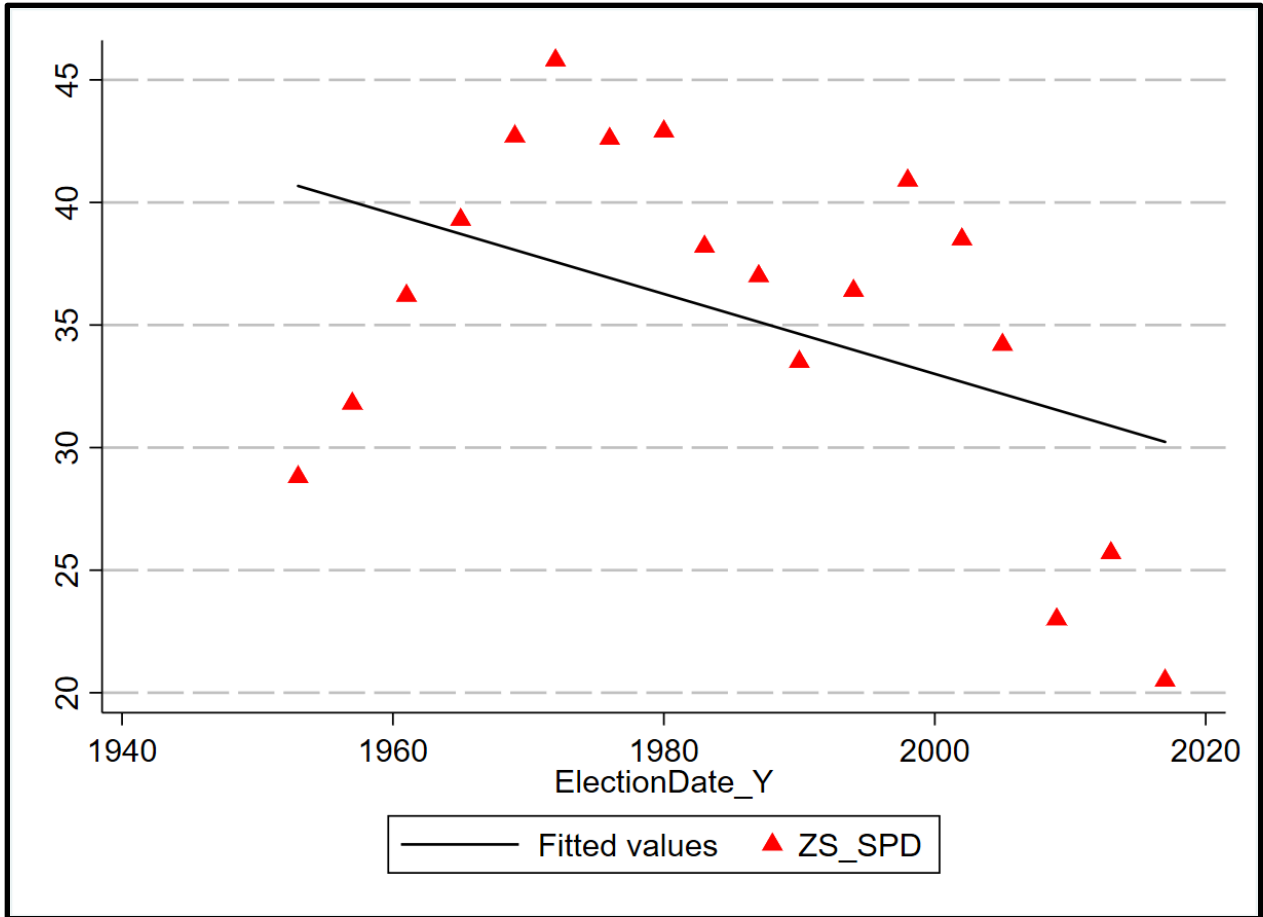
Table A1 Summary Statistics for variables included in models explaining list vote share (*zweitstimme*) of the Union, SPD, and All Others in 18 German Federal Elections 1953-2017
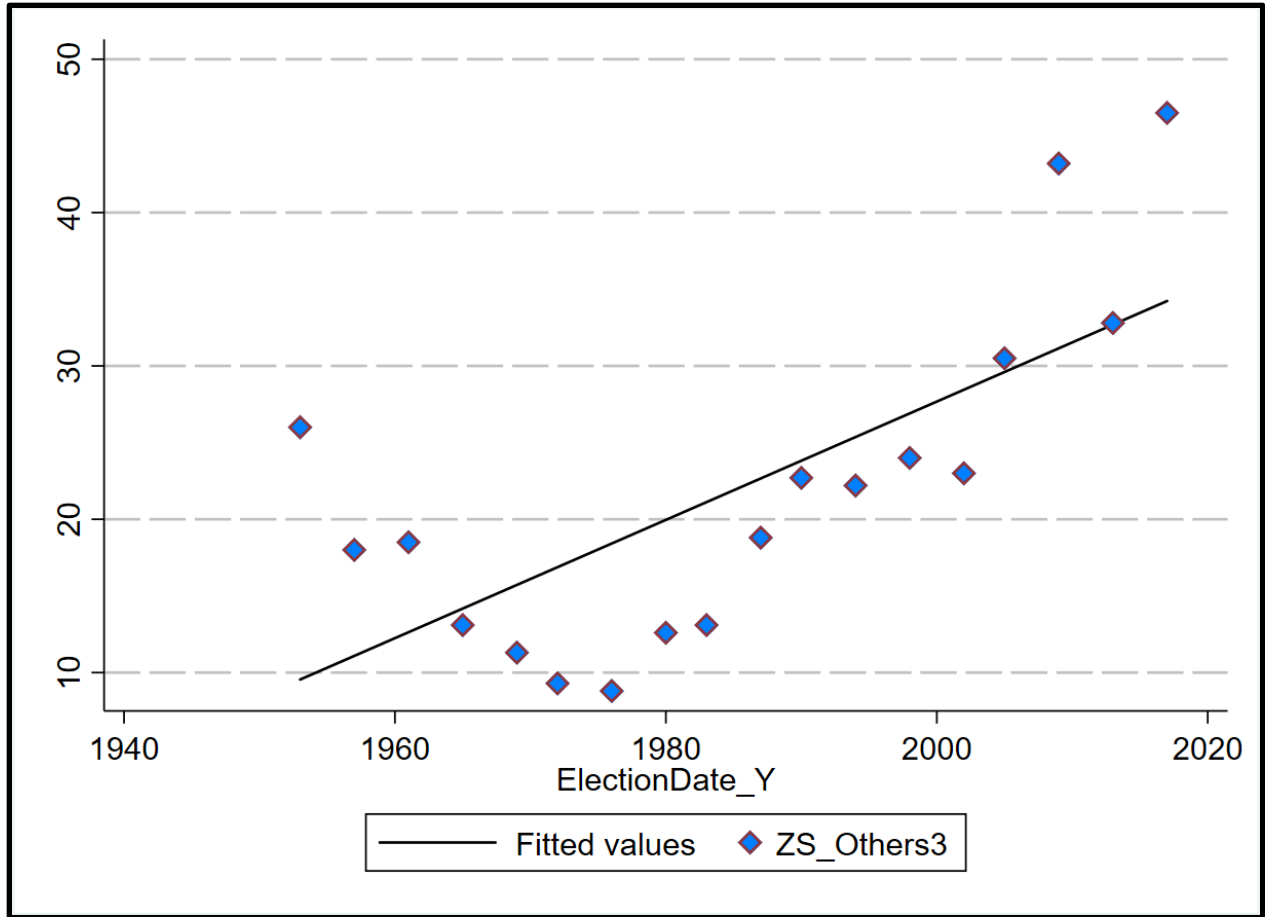
Variable	N	M	S/d	Min	Max
Vote Share: Union	18	42.667	5.407	33.0	50.2
Vote Share: SPD	18	35.444	11.625	20.5	45.8
Vote Share: All Others	18	21.911	10.834	8.8	46.5
Vote Share: CDU	18	33.967	4.157	26.8	39.7
Vote Share: CSU	18	8.700	1.545	6.2	10.6
Vote Share Previous Federal Election: Union	18	42.556	11.216	31.0	50.2
Vote Share Previous Federal Election: SPD	18	35.928	10.433	23.0	45.8
Vote Share Previous Federal Election: Others	18	21.539	10.024	8.8	43.2
Vote Share Previous Federal Election: CDU	18	33.878	4.332	25.2	39.7
Vote Share Previous Federal Election: CSU	18	8.678	10.024	5.8	10.6
Outgoing Federal Government: Grand Coalition	18	0.166	11.190	0	1
No. Land Minister Presidents $_{t-6:}$ Union	18	6.556	1.723	4	11
No. Land Minister Presidents $_{t-6:}$ SPD	18	6.333	1.908	4	9
No. Land Minister Presidents $_{t-6:}$ Others	18	0.333	0.686	0	2
Unified Germany	18	0.444	2.338	0	1
One-Step-Ahead 1994	18	0.611	0.502	0	1
One-Step-Ahead 1998	18	0.667	0.485	0	1
One-Step-Ahead 2002	18	0.722	0.461	0	1
One-Step-Ahead 2005	18	0.778	0.428	0	1
One-Step-Ahead 2009	18	0.833	0.384	0	1
One-Step-Ahead 2013	18	0.889	0.323	0	1
One-Step-Ahead 2017	18	0.944	0.236	0	1

Figure A1 Union (CDU and CSU combined) list vote share (*Zweitstimme*) in 18 German Federal Eletions 1953-2017.

Figure A2 SPD list vote share (*Zweitstimme*) in 18 German Federal Eletions 1953-2017.

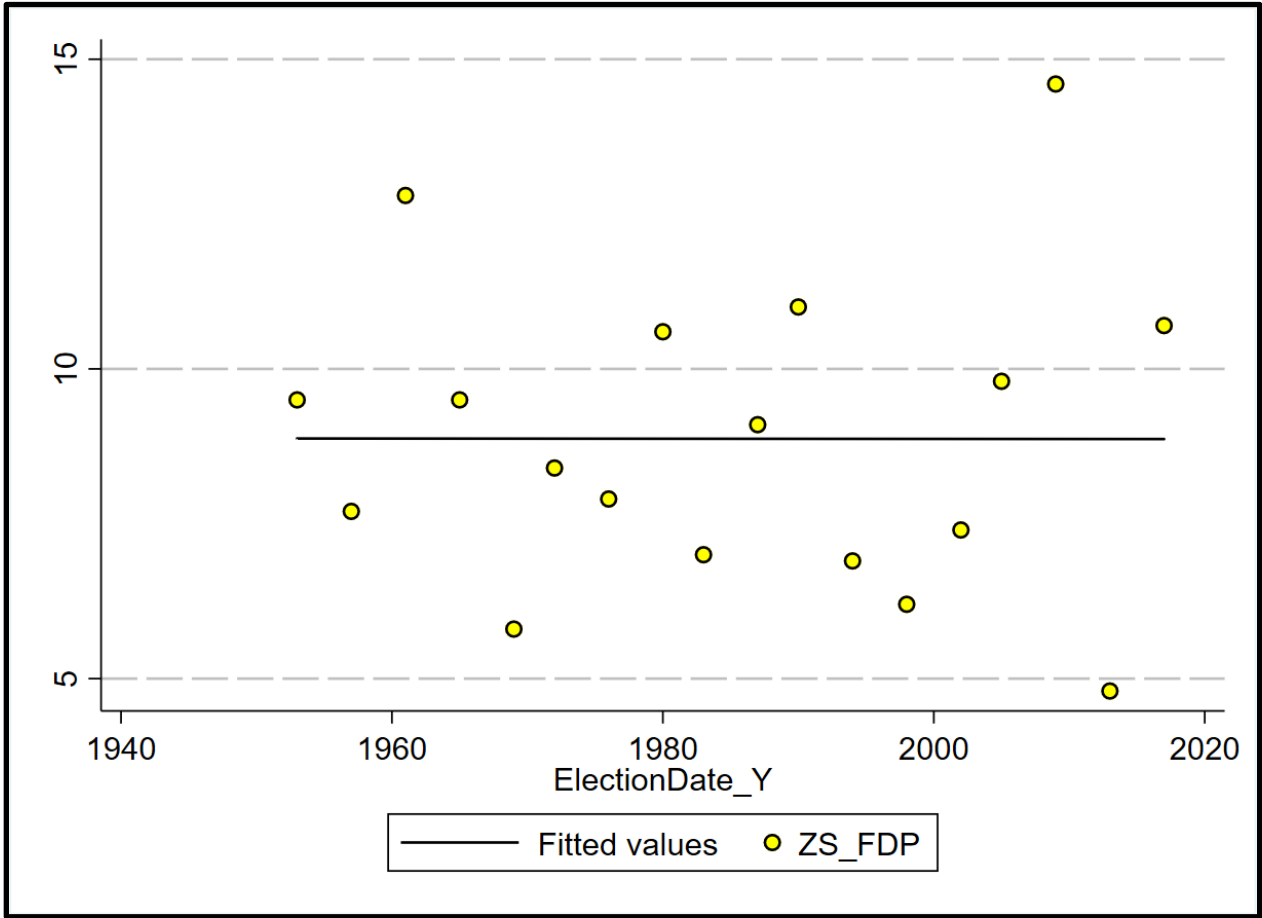**Figure A3** All others (excluding CDU, CSU, and SPD) list vote share (*Zweitstimme*) in 18 German Federal Eletions 1953-2017.

Figure A4 FDP list vote share (*Zweitstimme*) in 18 German Federal Elections 1953-2017.

Table B1 Incumbent Government Composition in Germany by election 1953-2017

Election Year	Incumbent Government Composition by Party
1953	CDU; CSU; FDP; DP
1957	CDU; CSU; FDP; DP; GB
1961	CDU; CSU; DP
1965	CDU; CSU; FDP
1969	**CDU; CSU; SPD**
1972	SPD; FDP
1976	SPD; FDP
1980	SPD; FDP
1983	CDU; CSU; FDP
1987	CDU; CSU; FDP
1990	CDU; CSU; FDP
1994	CDU; CSU; FDP
1998	CDU; CSU; FDP
2002	SPD; Green;
2005	SPD; Green;
2009	**CDU; CSU; SPD**
2013	CDU; CSU; FDP
2017	**CDU; CSU; SPD**

Note: **BOLD** indicates grand coalitions.

Vote Share: Union

This variable measures the list share of the total valid vote (*zweitstimme*) achieved by the Christian Democratic Union (CDU) and Christian Social Union (CSU) combined in German Federal Elections.

Vote Share: SPD

This variable measures the list share of the total valid vote (*zweitstimme*) achieved by the Social Democratic Party (SPD) combined in German Federal Elections.

Vote Share: All Others

This variable measures the list share of the total valid vote (*zweitstimme*) achieved by all other parties combined (FDP; Greens; Die Linke; and all others) in German Federal Elections.

Vote Share Previous Federal Election: Union

This variable measures the list share of the total valid vote (*zweitstimme*) achieved by the Christian Democratic Union (CDU) and Christian Social Union (CSU) in the previous German Federal Election.

Vote Share Previous Federal Election: SPD

This variable measures the list share of the total valid vote (*zweitstimme*) achieved by the Social Democratic Party (SPD) in the previous German Federal Election.

Vote Share Previous Federal Election: All Others

This variable measures the list share of the total valid vote (*zweitstimme*) achieved by all other parties combined (FDP; Greens; Die Linke; and all others) in the previous German Federal Election.

Outgoing Federal Government: Grand Coalition

This variable measure whether the outgoing Federal Government is a Grand Coalition or not. When the Outgoing Federal Government is a Grand Coalition, we code it as 1 and 0 for all else.

No. Land Minister Presidents $_{t-6}$ Union

This variable measures the number of Land Minister Presidents held by the Christian Democratic Union (CDU) or the Christian Social Union (CSU) combined six months prior to election day.

No. Land Minister Presidents $_{t-6}$ SPD

This variable measures the number of Land Minister Presidents held by the Social Democratic Party (SPD) six months prior to election day.

No. Land Minister Presidents $_{t-6}$ All Others

This variable measures the number of Land Minister Presidents held by all others six months prior to election day.

Unified Germany

This variable measure whether the Federal Election was in a Unified Germany or not. Elections in a Unified Germany (from 1990 onwards) are coded 1 and all others are coded 0.

PARAMETERS USED FOR 2021 FORECAST

The 2021 forecast are based on the following values for model parameters:

Table B2 Model Parameters for 2021 German Federal election forecast

	Union	SPD	All Others
Vote Share Previous Federal Election	33.0	20.5	46.5
Outgoing Federal Government: Grand Coalition	1	1	1
No. Land Minister Presidents $_{t-6}$	7	7	2
Unified Germany	1	1	1

APPENDIX C SUPPLEMENTARY ANALYSIS

Table C1 Within-sample forecasts of the Union (CDU and CSU combined) list vote share (*Zweitstimme*) in 18 German Federal Elections 1953-2017

	Forecast	Official Result	Error Forecast – Official Result	Absolute Error
1953	44.3	45.2	*-0.9*	*0.9*
1957	47.0	50.2	*-3.2*	*3.2*
1961	47.8	45.4	*2.4*	*2.4*
1965	47.1	47.6	*-0.5*	*0.5*
1969	43.2	46.1	*-2.9*	*2.9*
1972	46.8	44.9	*1.9*	*1.9*
1976	47.0	48.6	*-1.6*	*1.6*
1980	47.5	44.5	*3.0*	*3.0*
1983	47.3	48.8	*-1.5*	*1.5*
1987	47.6	44.3	*3.3*	*3.3*
1990	39.6	43.8	*-4.2*	*4.2*
1994	39.2	41.5	*-2.3*	*2.3*
1998	38.9	35.1	*3.8*	*3.8*
2002	38.0	38.5	*-0.5*	*0.5*
2005	39.5	35.2	*4.3*	*4.3*
2009	35.4	33.8	*1.6*	*1.6*
2013	37.5	41.5	*-4.0*	*4.0*
2017	34.3	33.0	*1.3*	*1.3*

Source of estimates: Union Model in Table 1 of paper.

Note: Mean Absolute Error (MAE) within-sample = 2.410; Median Absolute Error within-sample = 2.321.

Table C2 Within-sample forecasts of the SPD list vote share (*Zweitstimme*)
in 18 German Federal Elections 1953-2017

	Forecast	Official Result	Error Forecast – Official Result	Absolute Error
1953	32.3	28.8	*3.5*	*3.5*
1957	30.3	31.8	*-1.5*	*1.5*
1961	34.3	36.2	*-1.9*	*1.9*
1965	37.7	39.3	*-1.6*	*1.6*
1969	38.0	42.7	*-4.7*	*4.7*
1972	44.5	45.8	*-1.3*	*1.3*
1976	45.1	42.6	*2.5*	*2.5*
1980	42.7	42.9	*-0.2*	*0.2*
1983	41.1	38.2	*2.9*	*2.9*
1987	39.3	37.0	*2.3*	*2.3*
1990	35.1	33.5	*1.6*	*1.6*
1994	34.2	36.4	*-2.2*	*2.2*
1998	36.4	40.9	*-4.5*	*4.5*
2002	39.9	38.5	*1.4*	*1.4*
2005	32.8	34.2	*-1.4*	*1.4*
2009	23.9	23.0	*0.9*	*0.9*
2013	26.1	25.7	*0.4*	*0.4*
2017	24.3	20.5	*3.8*	*3.8*

Source of estimates: SPD Model in Table 1 of paper.

Note: Mean Absolute Error (MAE) within-sample = 2.150; Median Absolute Error within-sample = 1.750.

Table C3 Within-sample forecasts of the All Others list vote share (*Zweitstimme*)
in 18 German Federal Elections 1953-2017

	Forecast	Official Result	Error Forecast – Official Result	Absolute Error
1953	27.3	26.0	*1.3*	*1.3*
1957	19.3	18.0	*1.3*	*1.3*
1961	14.2	18.5	*-4.3*	*4.3*
1965	14.4	13.1	*1.3*	*1.3*
1969	20.6	11.3	*9.3*	*9.3*
1972	10.9	9.3	*1.6*	*1.6*
1976	9.9	8.8	*1.1*	*1.1*
1980	9.7	12.6	*-2.9*	*2.9*
1983	11.5	13.1	*-1.6*	*1.6*
1987	11.8	18.8	*-7.0*	*7.0*
1990	23.9	22.7	*1.2*	*1.2*
1994	25.8	22.2	*3.6*	*3.6*
1998	25.5	24.0	*1.5*	*1.5*
2002	26.4	23.0	*3.4*	*3.4*
2005	25.9	30.5	*-4.6*	*4.6*
2009	38.4	43.2	*-4.8*	*4.8*
2013	37.0	32.8	*4.2*	*4.2*
2017	42.0	46.5	*-4.5*	*4.5*

Source of estimates: All Others Model in Table 1 of paper.

Note: Mean Absolute Error (MAE) within-sample = 3.308; Median Absolute Error within-sample = 3.175.

Table C4 Seemingly Unrelated Regression (SUR) models explaining vote share (*Zweitstimme*) of the CDU, CSU, SPD, and All Others in German Federal Elections 1953-2017

	CDU	CSU	SPD	All Others
Vote Share Previous Federal Election	0.129	0.112	0.793***	0.468**
	(0.143)	(0.119)	(0.098)	(0.161)
Outgoing Fed Government: Grand Coalition	-3.044[+]	-0.859*	-3.775[*]	8.880**
	(1.570)	(0.460)	(1.613)	(2.598)
No. Land Minister Presidents $_{t-6}$	0.209	0.123	1.806***	1.208
	(0.381)	(0.108)	(0.505)	(2.011)
Unified Germany	-5.467***	-2.600***	-8.543***	9.511***
	(1.489)	(0.460)	(1.952)	(2.453)
Constant	31.160***	8.224***	-0.066	5.716[*]
	(5.763)	(1.015)	(4.783)	(2.651)
R^2	0.614	0.845	0.873	0.858
Root Mean Square Error (RMSE)	2.509	0.590	2.476	3.968
N elections	18			
AIC/BIC	315.4618/333.2693			

Note: Entries are unstandardized coefficients of seemingly unrelated regression (SUR) with standard errors in parentheses. += $p<0.1$; * = $p<0.05$; ** = $p<0.01$; *** = $p<0.001$. Root Mean Square Error (RMSE) also referred to as Standard Error of Estimate (SEE).

Table C5 Seemingly Unrelated Regression (SUR) models explaining vote share (*Zweitstimme*) of the Union, SPD, and All Others in German Federal Elections 1953-2017: Naïve Models

	Union	SPD	All Others
Vote Share Previous Federal Election	0.593***	0.789***	0.738***
	(0.127)	(0.142)	(0.117)
Constant	17.439**	7.110	6.019*
	(5.507)	(5.194)	(2.981)
R^2	0.223	0.634	0.582
Root Mean Square Error (RMSE)	4.632	4.201	6.807
Mean Absolute Error (MAE) within-sample	3.675	3.315	5.120
N elections		18	
AIC/BIC		254.8566/260.1988	

Note: Entries are unstandardized coefficients of seemingly unrelated regression (SUR) with standard errors in parentheses. += $p<0.1$; * = $p<0.05$; ** = $p<0.01$; *** =$p<0.001$. Root Mean Square Error (RMSE) also referred to as Standard Error of Estimate (SEE).

Table C6 OLS models explaining vote share (*Zweitstimme*) of the Union, SPD, and All Others in 18 German Federal Elections 1953-2017

	Union	SPD	All Others
Vote Share Previous Federal Election	0.062	0.811***	0.355
	(0.156)	(0.119)	(0.229)
Outgoing Federal Government: Grand Coalition	-3.872[+]	-3.585[+]	8.506*
	(1.946)	(1.902)	(3.090)
No. Land Minister Presidents $_{t-6}$	-0.159	1.743**	2.756
	(0.520)	(0.508)	(2.932)
Unified Germany	-7.499**	-9.552**	10.592**
	(2.056)	(2.365)	(3.140)
Constant	45.033***	-2.515	7.216
	(7.410)	(5.855)	(3.856)
N	18	18	18
R^2	0.762	0.876	0.861
Adjusted R^2	0.689	0.838	0.818
Root Mean Square Error (RMSE)	3.015	2.877	4.618
Durbin Watson Statistic	2.824	1.533	1.834
AIC	99.94506	93.26763	110.3057

Note: Entries are unstandardized coefficients with standard errors in parentheses. += $p<0.1$; * = $p<0.05$; ** = $p<0.01$; *** = $p<0.001$. Root Mean Square Error (RMSE) also referred to as Standard Error of Estimate (SEE).