

Online Appendix:
What drives rental votes? How coalitions signals
facilitate strategic coalition voting

Thomas Gschwend, Lukas Stoetzer, Steffen Zittlau

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Email addresses: University of Mannheim, School of Social Science (Thomas Gschwend), Massachusetts Institute of Technology, Department of Political Science (Lukas Stoetzer), University of Mannheim, School of Social Science (Steffen Zittlau)

1. Descriptive statistics

Table 1: Descriptives State Election

Variable	N	Mean	St. Dev.	Min	Max
Vote	643	2.656	0.597	1	3
Rating CDU-FDP	898	3.425	3.411	0	10
Rating CDU	920	2.579	2.618	0	10
Rating FDP	926	4.876	3.201	0	10
Uncertain FDP	983	0.340	0.474	0	1
Party ID FDP	983	0.011	0.105	0	1
Party ID CDU	983	0.119	0.324	0	1
Female	983	0.514	0.500	0	1
Age	983	47.410	14.439	18	81
Education	983	4.061	1.695	1	7
Religion (Christian)	983	0.546	0.498	0	1
Income	869	5.036	1.730	1	12
Pol. Interest	981	6.914	2.565	0	10

Table 2: Descriptives Federal Election

Variable	N	Mean	St. Dev.	Min	Max
Vote	673	2.645	0.570	1	3
Rating CDU-FDP	949	3.752	3.362	0	10
Rating CDU	981	2.936	2.697	0	10
Rating FDP	993	4.859	3.245	0	10
Uncertain FDP	1,211	0.332	0.471	0	1
Party ID FDP	1,211	0.012	0.107	0	1
Party ID CDU	1,211	0.091	0.287	0	1
Female	1,174	0.527	0.499	0	1
Age	1,174	47.315	14.620	18	82
Education	1,137	3.915	1.693	1	7
Religion (Christian)	1,211	0.480	0.500	0	1
Income	898	5.041	1.810	1	12
Pol. Interest	1,044	6.816	2.651	0	10

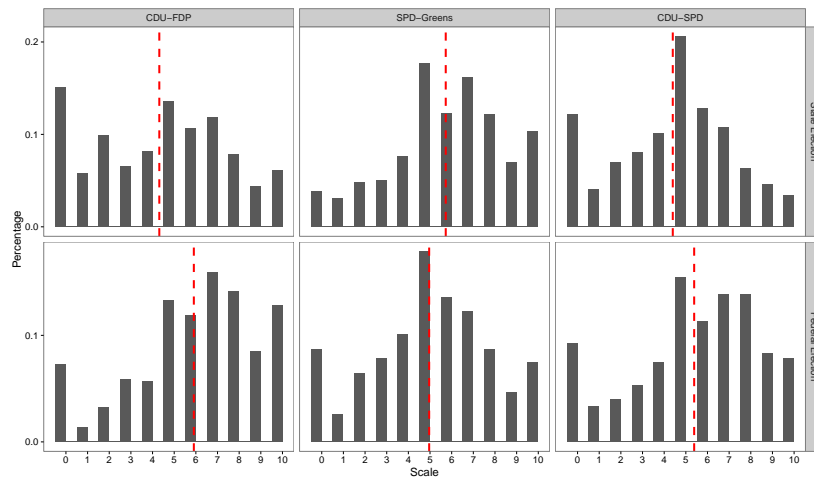


Figure 1: Distribution of perceived coalition likelihoods

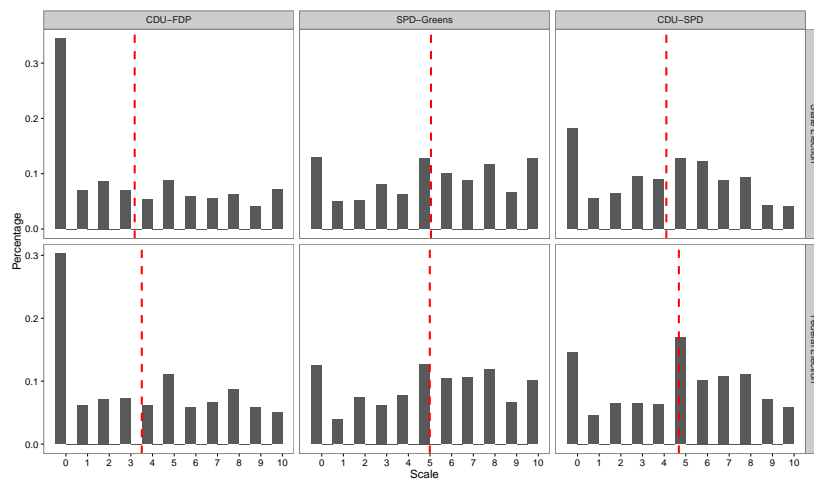


Figure 2: Distribution of Rating coalitions

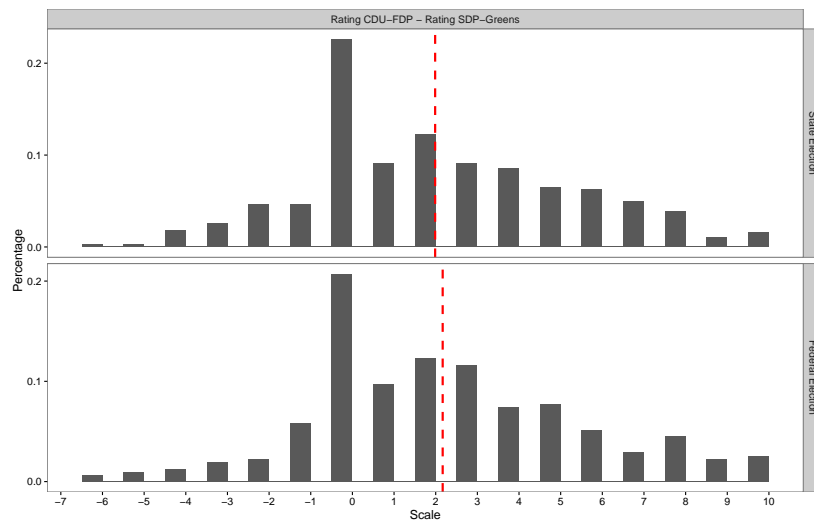


Figure 3: Distribution of Difference in Coalition Rating between CDU-FDP and SPD-Greens in State and Federal election among CDU supporter

2. Robustness

2.1. *Sample split in the state election*

We also estimate the model for two sub-samples in the state election. We subset the data for respondents with above-median and below-median news-attention. For the federal election (as described in the main text) we find that respondents who report low attention to the news, behave as expected by the rental-vote model but voters with high news-attention do not. We attribute this finding to the inconsistent coalition signals.

In the state election, where the signals are consistent with the rental-vote logic, we expect no differences between the groups. In both sub-samples our model should identify rental votes. Table 3 reports the estimates for the state election. We see a similar pattern for the two sub-sets. In both samples, the effect of coalition preference is stronger on the likelihood to vote FDP rather than on CDU (relative to the baseline). Additionally, in both samples the interaction effect (between a CDU-FDP coalition preference and an individual's uncertainty whether the FDP gets into parliament) is stronger for the FDP than for the CDU. Thus, in both cases the FDP gains substantially more votes from uncertain voters with strong CDU-FDP coalition preference than the CDU. What differs is the direct effect of uncertainty. Although not significant in both cases, it is generally stronger in the high-attention sample, than in the low-attention sample. In predicted probabilities this yields a clear difference between uncertain and not uncertain voters. We would like to note, that the small sample-size potentially affects these estimates substantially.

Table 3: Results from the rental vote model for the subsamples of low- and high-news attention in the state election.

	Subsample 1:		Subsample 2:	
	Low Attention to News		High Attention to News	
Rating Party	0.46 (0.12)		0.46 (0.12)	
Party ID	1.80 (0.67)		1.88 (0.59)	
	FDP	CDU	FDP	CDU
Constant	-12.67 (4.14)	-4.11 (1.61)	-11.15 (3.82)	-5.17 (2.02)
Rating CDU-FDP	1.01 (0.36)	0.23 (0.13)	0.69 (0.25)	0.27 (0.11)
Uncertain FDP	-5.28 (4.76)	-2.20 (1.63)	-4.15 (3.50)	-2.85 (3.50)
Rating CDU-FDP × Uncertain FDP	0.96 (0.59)	0.51 (0.28)	0.68 (0.50)	0.62 (0.31)
Female	1.17 (0.95)	0.36 (0.58)	-0.72 (0.87)	-0.11 (0.55)
Age	0.02 (0.04)	-0.01 (0.02)	0.04 (0.03)	0.00 (0.02)
Education	0.53 (0.31)	0.07 (0.18)	-0.05 (0.27)	-0.08 (0.17)
Religion	1.06 (0.99)	-0.00 (0.57)	-0.62 (0.87)	-0.02 (0.56)
Income	0.05 (0.29)	0.04 (0.17)	0.25 (0.27)	-0.06 (0.16)
Pol. Interest	-0.45 (0.28)	-0.23 (0.13)	0.10 (0.23)	-0.00 (0.15)
Log-Lik	-71.5		-76.36	
N	211		261	

Note: Table reports point estimates with standard errors in parentheses. Estimates are obtained by maximizing the likelihood numerically using Broyden-Fletcher-Goldfarb-Shanno algorithm as implemented in R's 3.0.2 `optim` function.

2.2. Alternative model specification: use CDU supporter only

In this section we test the robustness of our results using a different modeling approach. The approach closely follows the specification in Meffert and Gschwend's 2010 paper, in which they analyzed rental voting in Austria. Their focus is on rental votes from potential ÖVP voters for the BZÖ as junior coalition partner. The authors' model specification concentrates on a subset of respondents that potentially could vote for the ÖVP. To identify these voters they use those respondents that report the highest rating for the ÖVP. The choice situation for these voters is then simplified as either voting for the ÖVP, BZÖ or any other party using multinomial logit models. Similar to our specification, the utility for the ÖVP and BZÖ is a function of the rating for the coalition and the interaction between the uncertainty that the BZÖ will enter parliament and coalition rating.

We estimate the same model for respondents from Lower Saxony interviewed in the context of the federal and the state election. In our example, we use a subset of respondents that report their maximum rating for the CDU. For those respondents we model the choice between the CDU, FDP or any other party as a function of the CDU party rating, CDU-FDP coalition rating and interaction between uncertainty that the FDP enters and the coalition rating using a multinomial logit model.

To identify rental-votes the model should yield the same results for the interaction effect as in our model - the combined effect of coalition rating should be larger for the FDP, than the CDU in both context. We find that the combined interaction effect is stronger in the state election ($0.26 + 0.85$) compared to the federal election ($-0.38 + 1.25$). Where in the federal election the estimated interaction effect is even negative which means that the FDP potentially gains more votes through coalition preferences from those that are not uncertain compared to those who are uncertain about the FDP chances to get into parliament. Interestingly, the estimates for a baseline model without an interaction are quite alike. Additionally, only in the state election we would choose to include an interaction based on a likelihood ratio test. The results should be

interpreted with some caution, however, as the sample size decreases strongly and most estimates entail strong uncertainty. Still, the alternative model specification confirms that the two elections yield contrasting results for the rental vote model. We are only able to identify rental votes in the state election.

We further attempted to run the model on the attention to the news subsets. Those who indicate that they barely follow news (50% percentile) and those that follow the news. One drawback of restricting analysis to only potential CDU voters is the loss in observations: Our sample already contains only a subset of voters who gave their highest rating to the CDU. Further dividing the sample and dropping respondents with missing self-reported news consumption leaves use with only 73 observations for the low-attention and 79 for higher attention, among which only a small portion votes for the FDP. This makes it impossible to draw any inference.

To sum up, the robustness checks of alternative specifications confirm the difference of the two elections with regard to the rental-vote logic. Beyond that, we believe that our approach which bases inference on the complete sample, yields more fruitful insights.

Table 4: Alternative model specification: Rental vote model for CDU supporters only.

	State Election				Federal Election			
	Model 1		Model 2		Model 1		Model 2	
	FDP	CDU	FDP	CDU	FDP	CDU	FDP	CDU
Constant	-10.37 (2.37)	-4.09 (1.09)	-10.33 (2.98)	-4.14 (1.20)	-7.11 (2.99)	-6.92 (1.64)	-8.67 (3.92)	-7.00 (1.69)
Rating CDU	0.22 (0.23)	0.32 (0.11)	0.23 (0.24)	0.35 (0.12)	-0.12 (0.37)	0.64 (0.18)	-0.14 (0.38)	0.64 (0.18)
Rating CDU-FDP	0.93 (0.20)	0.27 (0.07)	0.85 (0.26)	0.15 (0.07)	1.08 (0.34)	0.26 (0.09)	1.25 (0.44)	0.26 (0.11)
Uncertain FDP			-0.92 (3.11)	-1.12 (0.94)			3.03 (4.31)	0.12 (1.05)
Rating CDU-FDP × Uncertain FDP			0.26 (0.37)	0.32 (0.15)			-0.38 (0.52)	-0.01 (0.17)
Female	-0.33 (0.57)	-0.10 (0.35)	-0.36 (0.58)	-0.11 (0.36)	0.85 (0.79)	0.68 (0.47)	0.91 (0.80)	0.69 (0.48)
Age	0.03 (0.02)	0.01 (0.01)	0.03 (0.02)	0.01 (0.01)	0.02 (0.03)	0.04 (0.02)	0.02 (0.03)	0.04 (0.02)
Education	0.21 (0.17)	-0.03 (0.11)	0.23 (0.18)	-0.02 (0.12)	-0.17 (0.26)	0.12 (0.14)	-0.14 (0.27)	0.12 (0.14)
Religion	0.11 (0.55)	0.05 (0.35)	0.13 (0.55)	0.09 (0.36)	-0.03 (0.76)	0.29 (0.46)	-0.01 (0.76)	0.29 (0.47)
Income	-0.03 (0.04)	-0.04 (0.03)	-0.03 (0.04)	-0.03 (0.03)	-0.08 (0.24)	-0.02 (0.13)	-0.07 (0.24)	-0.02 (0.13)
Pol. Interest	-0.14 (0.14)	0.07 (0.08)	-0.15 (0.14)	0.07 (0.09)	-0.14 (0.22)	-0.14 (0.13)	-0.13 (0.22)	-0.14 (0.13)
Log-Lik	-164.26		-160.04		-101.1		-100.73	
N	231		231		186		186	
p-value Lik Ratio			0.08				0.95	

Note: Table reports point estimates with standard errors in parentheses. Estimates are obtained by maximizing the likelihood numerically using Broyden-Fletcher-Goldfarb-Shanno algorithm as implemented in R's 3.0.2 `optim` function.

2.3. Alternative measurement strategy: folded uncertainty measurement

In this section we test the robustness of our main result, when using a different measurement of respondents' expectation whether the FDP enters parliament. Instead of following the lead of prior research on this and creating a dummy for respondents, we subtract 5 from the 11 point scale and fold it in the middle (by taking absolute values). This creates a measurement where values of zero describe respondents who are most uncertain, and with increasing values ascribed to respondents with more confidence that the FDP either enters or does not enter. Employing this measurement, we estimate the same four models as in the main text.

The results are unchanged by the decision: Only in the state election there is substantial difference in the effect of the coalition rating between certain and uncertain voters. Table 5 shows the estimates for the four models. The effect parameter for Rating CDU-FDP in this specification is the effect among those who are most uncertain. According to the discussion of rental votes in the text, the effect parameter should, thus, be stronger for the FDP compared to the CDU. This is only the case for the state election (Model 2), but not in the federal election (Model 4), where the parameter estimates cannot be statistically distinguished from one another. This can be concluded from overlapping confidence intervals in federal election (C.I. of effect for FDP [0.25, 1.09]; C.I. of effect for CDU [0.07, 0.55]) but not in the state estimates (C.I. of effect for FDP [0.84, 1.8]; C.I. effect CDU [0.33, 0.81]). Moreover, the difference significantly decreases the more certain a respondent in the state election survey gets, but not so for respondents of the federal election survey. Although in both cases the parameter is higher for the FDP and lower for the CDU, the interaction effects are only statistically significant for the state election (Model 2). This highlights that only in the state election there is an identifiable difference between certain and uncertain voters, even when using an alternative measurement of voter's expectations.

Table 5: Alternative measurement strategy using folded measurement of voters' expectations: Rental vote model for Lower Saxony state and federal election.

	State Election				Federal Election			
	Model 1		Model 2		Model 3		Model 4	
Party Rating	0.50 (0.08)		0.53 (0.08)		0.79 (0.10)		0.81 (0.11)	
Party ID	1.46 (0.34)		1.47 (0.35)		2.38 (0.47)		2.49 (0.48)	
	FDP	CDU	FDP	CDU	FDP	CDU	FDP	CDU
Constant	-11.40 (1.92)	-5.54 (1.01)	-14.11 (2.37)	-7.28 (1.22)	-8.24 (1.85)	-6.66 (1.11)	-9.05 (2.14)	-6.98 (1.24)
Rating CDU-FDP	0.86 (0.15)	0.27 (0.06)	1.32 (0.24)	0.57 (0.12)	0.48 (0.12)	0.26 (0.07)	0.67 (0.21)	0.31 (0.12)
Uncertain FDP			0.85 (0.68)	0.49 (0.19)			0.25 (0.55)	0.09 (0.22)
Rating CDU-FDP × Uncertain FDP (folded scale)			-0.17 (0.08)	-0.11 (0.03)			-0.08 (0.07)	-0.03 (0.04)
Female	-0.09 (0.52)	-0.11 (0.32)	0.06 (0.54)	-0.08 (0.32)	1.08 (0.60)	0.11 (0.34)	0.93 (0.60)	0.09 (0.34)
Age	0.02 (0.02)	0.01 (0.01)	0.02 (0.02)	0.00 (0.01)	-0.01 (0.02)	0.01 (0.01)	-0.01 (0.02)	0.01 (0.01)
Education	0.11 (0.17)	-0.03 (0.10)	0.07 (0.17)	-0.01 (0.10)	0.04 (0.18)	0.02 (0.11)	-0.00 (0.19)	0.03 (0.11)
Religion	0.30 (0.52)	-0.12 (0.32)	0.50 (0.53)	-0.06 (0.33)	-1.14 (0.57)	-0.18 (0.36)	-1.05 (0.58)	-0.16 (0.36)
Income	0.08 (0.16)	0.00 (0.09)	0.08 (0.16)	0.03 (0.10)	0.06 (0.18)	0.02 (0.10)	0.11 (0.18)	0.02 (0.10)
Pol. Interest	-0.01 (0.12)	-0.04 (0.07)	0.01 (0.13)	-0.05 (0.07)	-0.13 (0.13)	-0.21 (0.08)	-0.12 (0.13)	-0.21 (0.09)
Log-Lik	-199.53		-191.85		-173.96		-171.73	
N	557		550		574		568	
2* Lik Ratio			15.36				4.48	
P-value			0				0.107	

Note: Table reports point estimates with standard errors in parentheses. Estimates are obtained by maximizing the likelihood numerically using Broyden-Fletcher-Goldfarb-Shanno algorithm as implemented in R's 3.0.2 `optim` function.