Don't Stand So Close to Me: Spatial Contagion Effects and Party Competition

Supporting Information

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Contents

1 Overview **3**

2 Hypotheses, Repeated **3**

3 Core Model Specification **3**

4 Cases and Descriptive Statistics **4**

5 Main Results Table, Repeated **6**

6 Pre-Spatial Effects **6**

7 Choice of Dependent Variable **15**

8 Construction of Weights Matrices **15**

9 Spatial Diagnostics **16**

10 Confidence Intervals **19**

11 Alternative Spatial Specifications **19**

1 Overview

In this document we discuss in greater detail a number of decisions that we made in our analyses dealing with the dependent variable, construction of weights matrices, and alternative specifications of the spatial interdependence. We demonstrate the robustness of our results to different specifications and provide some additional details about our analyses. In order to make referential links and to ease the interpretation of the findings in this document, in the following sections we re-present the hypotheses from the main paper together with the main table of results.

2 Hypotheses, Repeated

Our hypotheses about spatial contagion effects are expressed in terms of expectations about the correlation between the vote share of pairs of political parties contingent on their ideological distance from each other:

1. *Spatial Contagion Hypothesis*: The closer a pair of parties are to each other ideologically, the more positively correlated their vote shares will be.
2. *Spatial Contagion Clarity Hypothesis*: Spatial contagion effects will be strongest in low clarity settings.
3. *Clarity of Responsibility "Classic" Hypothesis*: Economic voting will be strongest when responsibility for policy-making is most clear.
4. *Prime Ministerial Hypothesis*: Economic voting will be strongest for the party of the incumbent Prime Minister.

3 Core Model Specification

$$\Delta V_t = f(V_{t-1} + PS_t + PS_{t-1} + G + PM + N + M + GP + C + E + EP + PM \times V_{t-1} + N \times V_{t-1} + PM \times M + PM \times GP + G \times C + PM \times C + G \times E + PM \times E)$$

where

- ΔV_t is that party's vote share at election t minus vote share at election $t-1$
- V_{t-1} is that party's vote share at election $t-1$.
- PS_t represents that party's shift in ideology from election $t-1$ to t and PS_{t-1} represents that party's shift from election $t-2$ to $t-1$. By multiplying these values times -1 for

right parties and +1 for left parties (based on CMP's party family designation), we can get a sense of whether parties are shifting toward the ideological center (Adams and Somer-Topcu 2009a). Positive values indicate shifts toward the center while negative values indicate shifts to more extreme positions.

- G is a dummy variable identifying coalition partners in the last non-caretaker government (i.e., a non-PM party that controls at least one cabinet portfolio) (Woldendorp, Keman and Budge 2000; Seki and Williams *forthcoming*).
- PM is a dummy variable identifying the party of the prime minister.
- N is a dummy variable identifying niche parties; we follow the lead of Adams et al. (2006) in coding those parties in the Communist, Nationalist or Green families as "niche" parties.
- M is a dummy variable identifying elections in which the government parties control a majority of seats in parliament.
- GP is the number of government parties, or those parties that control at least one cabinet portfolio.
- C is the percentage of the time left in the constitutional inter-election period. This variable ranges from 100 to 0, where 100 means that an election just occurred and there is 100% of the maximum length of the election cycle left. A value of 0 means that an election is constitutionally required.
- E is the real GDP per capita growth from Penn World Tables.
- EP is the effective number of parties.

More details on the coding of each of these variables and the expected effect of each are provided in Table S.1.

4 Cases and Descriptive Statistics

Table S.2 provides a listing of the countries and years that we covered in this study. Table S.3 provides the sample descriptive statistics (also divided into high and low clarity systems) for the variables included in our analyses. Figure S.1 depicts variation in distances between pairs of contiguous parties by country. Figure S.2 depicts variation in distances between pairs of contiguous

Table S.1: Independent Variables and Expected Relationships

Independent Variable	**Equation**	**Expectation**	**Operationalization (Sources)**
Vote Share$_{t-1}$	V_{it-1}	- Larger parties lose more	Percentage (CMP)
Party Shift$_t$	PS_t	+ Centrist shifts are rewarded	(rile$_t$-rile$_{t-1}$)×-1 if Right, +1 if Left (CMP)
Party Shift$_{t-1}$	PS_{t-1}	+ Centrist shifts are rewarded	(rile$_{t-1}$-rile$_{t-2}$)×-1 if Right, +1 if Left (CMP)
Coalition Partner	G	Conditional on E, C	Party holds cabinet portfolio (WKB, SW)
Prime Minister	PM	+/- Conditional on E, C, M, GP, V_{t-1}	(WKB, SW)
Niche Party	N	Conditional on V_{t-1}	Communist, Nationalist or Green (CMP)
Majority Government	M	Conditional on PM	(WKB, SW)
Government Parties	GP	Conditional on PM	(WKB, SW)
Time Left in CIEP	C	Conditional on G and PM	Percentage (WKB, CMP)
Real Growth in GDP	E	Conditional on G and PM	(PWT)
PM×Vote$_{t-1}$	$G \times V_{t-1}$	- Large PM parties lose more votes	
Niche×Vote$_{t-1}$	$N \times V_{t-1}$	- Niche parties lose more votes	
PM×Majority	$G \times M$	- High clarity PM parties lose more votes	
PM×Government Parties	$G \times GP$	- Low clarity PM parties lose fewer votes	
Government×CIEP	$G \times C$	+ Early elections benefit government parties more	
Prime Minister×CIEP	$PM \times C$	+ Early elections benefit the PM's party more	
Government×GDP	$G \times E$	+ High growth benefits government parties more	

CMP: Comparative Manifestos Project

WKB: Woldendorp, Keman and Budge (2000)

SW: Seki and Williams (*forthcoming*)

PWT: Penn World Tables 6.1

parties by country with the countries divided according to whether they are usually in the high or low clarity classification. These figures were produced in response to the concern of a reviewer that something other than clarity of responsibility might be driving the differences in the estimated spatial relationships across these sets of cases. In particular, the reviewer thought that the difference between the spatial relationships in high versus low clarity systems might be due to high clarity cases having larger average distances between pairs of neighboring parties. It is the case that that contiguous parties are slightly farther apart in high clarity systems, on average, than in low clarity systems (17.73 compared to 15.12). But if the distance between contiguous parties was driving the difference in ρs (rather than blame attribution), we would expect that all the high clarity systems would consistently have larger distances than the low clarity systems. From Figure S.2 we can see that there is considerable variation within each category of systems, such that there are plenty of high clarity states with shorter average distances than some low clarity states.

5 Main Results Table, Repeated

In Table S.4 we replicate Table 1 from the manuscript. To compare the model fit of the SAR model with the non-spatial OLS model, we also include the goodness of fit statistics for the non-spatial OLS (at the bottom of Table S.4). In both systems of clarity of responsibility, the SAR model outperforms the non-spatial OLS model, producing higher adjusted R^2 values (substantially so in the low clarity case), and lower root mean squared error (RMSE), AIC and BIC values.

6 Pre-Spatial Effects

Hypotheses 3 and 4 reflect our expectations that economic voting will be stronger in high clarity elections than low clarity elections and stronger for the PM's party than other parties. Testing these

Table S.2: Sample Countries and Years

Country	**Elections**	**Obs.**	**Time**
Australia	21	71	1951-2001
Austria	15	47	1956-2002
Belgium	16	107	1954-2003
Canada	16	58	1953-2000
Denmark	20	163	1953-2001
Finland	15	82	1951-2003
France	13	63	1956-2002
Germany	13	43	1957-2002
Great Britain	15	43	1951-2005
Greece	8	17	1981-2000
Iceland	16	61	1953-2003
Ireland	15	51	1954-2002
Israel	13	70	1955-1999
Italy	13	80	1953-2001
Japan	13	44	1967-2003
Luxembourg	10	39	1954-1999
Netherlands	16	79	1952-2003
New Zealand	18	46	1951-2002
Norway	13	83	1953-2001
Portugal	9	36	1979-2002
Spain	6	34	1982-2000
Sweden	16	84	1956-2002
Switzerland	13	51	1955-2003

Table S.3: Summary Statistics

	Sample	Min.	Max.	Mean	Std. Dev.	Mode
Vote Change		-28.24	22.73	-0.26	4.34	
	High	-27.02	22.73	-0.46	5.02	
	Low	-28.24	20.7	-0.19	4.09	
Real GDP Per Capita Growth		-5.55	16.31	2.74	2.86	
	High	-3.87	16.31	2.94	3.14	
	Low	-5.55	11.75	2.67	2.75	
Party Shift$_t$		-88.69	97.81	0.31	15.44	
	High	-88.69	97.81	0.64	18.44	
	Low	-62.82	83.36	0.18	14.13	
Party Shift$_{t-1}$		-88.69	89.39	0.48	15.63	
	High	-88.69	83.36	0.47	18.00	
	Low	-62.82	89.39	0.48	14.62	
Time Left in CIEP		0	100	21.19	24.59	
	High	0	100	15.18	19.98	
	Low	0	97.92	23.51	25.79	
Government Party		0	1	0.21	0.41	0
	High	0	1	0.23	0.42	0
	Low	0	1	0.21	0.41	0
PM's Party		0	1	0.21	0.40	0
	High	0	1	0.23	0.42	0
	Low	0	1	0.20	0.40	0
Niche Party		0	1	0.15	0.36	0
	High	0	1	0.13	0.34	0
	Low	0	1	0.16	0.36	0
Majority Government		0	1	0.67	0.47	1
	High	0	1	1	0	1
	Low	0	1	0.54	0.50	1
No. of Gov't Parties		1	9	2.38	1.47	1
	High	1	9	2.55	1.77	1
	Low	1	6	2.31	1.33	1
Vote$_{t-1}$		0.35	54.67	19.27	14.40	
	High	0.46	53.99	21.57	15.25	
	Low	0.35	54.67	18.38	13.97	
Effective No. of Parties		1.54	8.93	3.73	1.36	
	High	1.54	5.93	3.30	1.24	
	Low	2.04	8.93	3.89	1.36	
Distance between Neighbors						
	High	0.01	87.10	17.73	13.70	
	Low	0.01	121.82	15.12	14.13	

Figure S.1: Box-Whisker Plots of Distances between Contiguous Parties by Country: Sorted by Median Distance

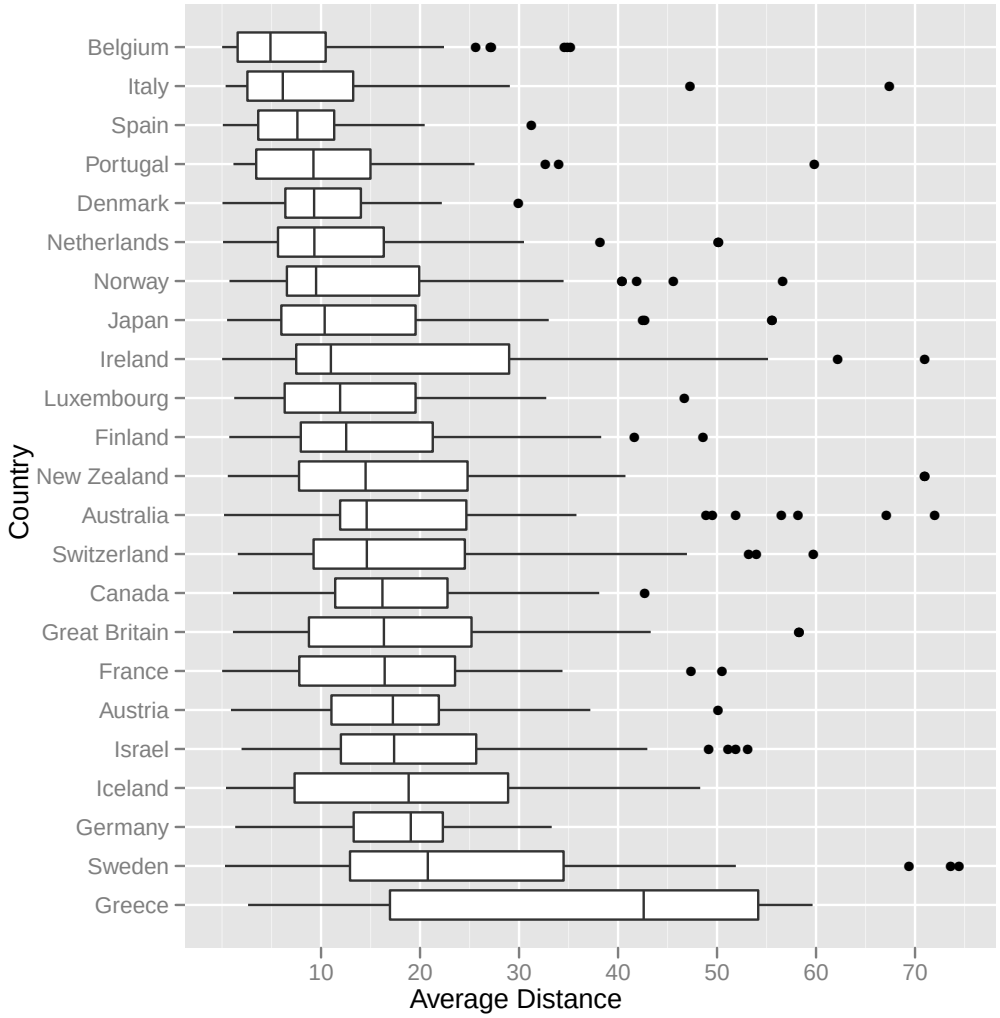


Figure S.2: Box-Whisker Plots of Distances between Contiguous Parties by Country: Sorted by Median Distance and Divided into Low and High Clarity Systems

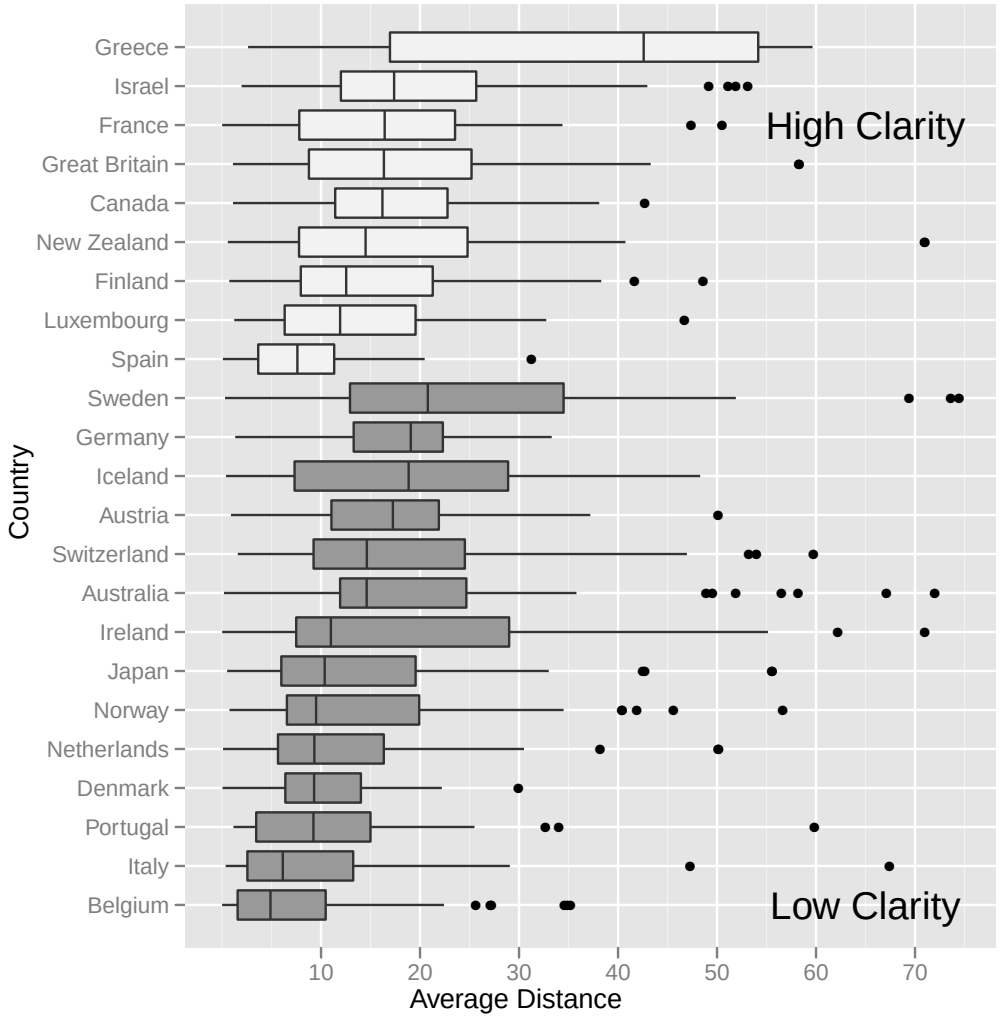


Table S.4: Spatial Autoregressive (SAR) Results of Spatial Contagion Effects across Elections with High and Low Clarity of Responsibility (Main results table, repeated)

Variable	**High Clarity**		**Low Clarity**	
	β	S.E.	β	S.E.
Real GDP Per Capita Growth	-.26**	(.10)	-.01	(.06)
Coalition Party×Growth	.46***	(.17)	-.08	(.10)
PM's Party×Growth	.53***	(.19)	.26**	(.11)
Party Shift$_t$	.004	(.01)	.014*	(.008)
Party Shift$_{t-1}$	.01	(.01)	.03***	(.009)
Time Left in CIEP	-.03**	(.01)	-.01*	(.006)
Coalition Party×Time Left	.06***	(.03)	.03***	(.01)
PM's Party×Time Left	.09***	(.03)	.05***	(.01)
Coalition Party	-4.09***	(.98)	-1.42**	(.51)
Prime Minister's Party	6.94**	(3.19)	1.20	(1.78)
Niche Party	-.12	(1.19)	.44	(.54)
Majority Government			.12	(.32)
Number of Gov't Parties	.15	(.21)	.15	(.15)
PM's Party×No. of Gov't Parties	-.96**	(.42)	-.11	(.35)
Vote$_{t-1}$	.001	(.02)	-.03**	(.01)
PM's Party×Vote$_{t-1}$	-.31***	(.07)	-.08**	(.04)
Niche Party×Vote$_{t-1}$	-.13	(.09)	-.07*	(.04)
PM's Party×Majority			-.13	(.72)
Effective No. of Parties	-.24	(.29)	-.18	(.12)
Constant	2.64**	(1.01)	1.17**	(.54)
ρ	-.004***	(.001)	-.012***	(.001)
Adjusted R^2		.24		.16
RMSE		4.26		3.67
AIC		2321		5646
BIC		2397		5750
N		398		1030
Tests of Spatial Interdependence				
Moran's I		-.29***		-.37***
Geary's C		1.41***		1.43***
LM		10.95***		109.0***
Wald Test		16.65***		48.15***
OLS Fit				
Adjusted R^2		.21		.07
RMSE		4.45		3.91
AIC		2336		5753
BIC		2408		5852

Note: $***= p < .01$, $**= p < .05$, $*= p < .1$ *(p-values are reported for two-tailed z-tests despite most of our hypotheses being directional)*

conditional hypotheses requires interactive specifications, which in turn means that the interpretation of these relationships is better illustrated with marginal effects (Brambor, Clark and Golder 2006). We can examine the interactive relationship between *real GDP per capita growth*, *coalition partner*, and *PM party* with the following equation: $\hat{Y} = \beta_0 + \beta_1 GDP + \beta_2 G + \beta_3 PM + \beta_4 GDP \times G + \beta_5 GDP \times PM$. In a simple OLS model, the marginal effect of *real GDP per capita growth* on *vote change* depends on whether the party is an opposition party ($\frac{\partial Y}{\partial GDP} = \beta_1$), coalition partner ($\frac{\partial Y}{\partial GDP} = \beta_1 + \beta_4 G$), or is the party that controls the PM ($\frac{\partial Y}{\partial GDP} = \beta_1 + \beta_5 PM$). In an SAR model, the effect of any covariate—including these "pre-spatial marginal effects"—on the dependent variable is filtered through the spatial multiplier, $(\mathbf{I} - \rho\mathbf{W})^{-1}$. Table S.5 shows the *pre-spatial* marginal effects for all of the interactive relationships (in the manuscript only the interactive relationship of *real GDP per capita* is presented). The first two columns show the variable (X) and modifying variable (Z) while the last two columns show the estimated marginal effect (with its 90% confidence interval in brackets) for the high clarity and the low clarity models.

In the high clarity settings, the pre-spatial estimated marginal effect of *real GDP per capita growth* for opposition parties is negative, while the estimated marginal effect for PM parties is positive. Both of these results are in the expected direction and statistically significant at conventionally-accepted levels (they are also statistically different from each other at the 90% confidence level). Although coalition partners benefit from growth, this effect is not statistically distinguishable in high clarity elections from the effect for the PM's party.[1] In contrast, opposition parties in the low clarity elections are not hurt by *real GDP per capita growth* (since the marginal effect is not significant), and coalition partners do not benefit. In low clarity elections, the only statistically significant effect of growth is on the party of the Prime Minister. As expected, this effect is positive. Together these results provide strong support for Hypothesis 3 and somewhat mixed support for Hypothesis 4.

[1]We cannot reject the null hypothesis that the marginal effect for coalition partners and the PM's party are equal (F = 0.09, p-value = 0.76).

Table S.5: Pre-Spatial Marginal Effects for Interactive Relationships

X Variable	Z Variable(s)	High Clarity	Low Clarity
Real GDP Per Capita Growth	Opposition	-0.257***	-0.014
		[-0.419, -0.095]	[-0.110, 0.082]
	Coalition Partner	0.203	-0.089
		[-0.025, 0.431]	[-0.233, 0.055]
	Prime Minister	0.269*	0.243***
		[0.002, 0.536]	[0.095, 0.392]
Time Left in CIEP	Opposition	-0.031*	-0.011*
		[-0.059, -0.003]	[-0.021, -0.001]
	Coalition Partner	0.026	0.024**
		[-0.005, 0.057]	[0.006, 0.042]
	Prime Minister	0.061***	0.036***
		[0.023, 0.099]	[0.018, 0.054]
Vote Share$_{t-1}$	Mainstream Non-PM	0.001	-0.031**
		[-0.035, 0.037]	[-0.052, -0.010]
	Niche	-0.133	-0.104***
		[-0.275, 0.009]	[-0.173, -0.035]
	Prime Minister	-0.314***	-0.116***
		[-0.418, -0.210]	[-0.172, -0.060]
No. of Gov't Parties	Non-PM	0.155	0.153
		[-0.192, 0.502]	[-0.093, 0.399]
	Prime Minister	-0.806***	0.043
		[-1.446, -0.166]	[-0.515, 0.601]
Majority Government	Non-PM		0.119
			[-0.401, 0.639]
	Prime Minister		-0.014
			[-1.096, 1.068]

Notes: $*** = p < .01$, $** = p < .05$, $* = p < .1$ (one-tailed). Brackets contain 90% confidence intervals. Marginal effects reported are $\beta_X + (\beta_{XZ} \times Z)$

We also estimated a set of interactive terms to test for the benefits of opportunistic election timing. As expected, increasing the *time left in CIEP*—representing an early election—reduces opposition parties' expected vote shares and increases the PM's parties' expected vote. These results are statistically significant in both high and low clarity elections. The effect of early elections on the Prime Minister's party is slightly higher in the high clarity system compared to low clarity system. To illustrate these substantive effects, consider the electoral impact of calling a snap election halfway through the election cycle rather than letting time expire (i.e., increasing *time left in CIEP* from 0 to 50) in a high clarity system. While opposition parties, *ceteris paribus*, stand to lose 1.55% (i.e., 50×-0.031), the PM's party will gain 3.05% (i.e., 50×0.061). This effect is slightly lower in the low clarity systems, as the opposition parties are predicted to lose 0.55% (i.e., 50×-0.011) while the PM's party will gain 1.8% (i.e., 50×0.036).[2]

The next two interactions demonstrate that PM parties (in high and low clarity systems) and niche parties (in low clarity systems) with larger vote shares in the previous election (*Vote Share*$_{t-1}$) experience statistically larger losses at the current election than opposition parties. In neither case does the type of government (*majority*) moderate the extent to which PM parties lose or gain votes. We also see that PM parties, on average, lose more votes if they are in coalition governments in high clarity elections. In low clarity elections, consistent with the literature, we find lower costs of governing.

[2]Two potential explanations for these differences across settings come to mind: first, that executives in high clarity settings face fewer *ex ante* veto players that might block strategic parliamentary dissolution (Strom and Swindle 2002), and second, executives can call elections when they are clearly accountable for strong performance. As impressive as these effects are, we have reasons to believe that the true effects are much larger. For our purposes in this paper, we were mainly interested in controlling for the potential impact of early elections. We thus lumped all early elections together. The head of state might act as a brake in the dissolution process (i.e., Schleiter and Morgan-Jones 2009), and early elections might occur as a result of opportunistic election timing (Kayser 2005), or a successful no-confidence motion (Williams 2011). In future work we plan to explore these possibilities through a more nuanced specification of election timing and the forces that drive election timing.

7 Choice of Dependent Variable

Our dependent variable is the change in vote share for each party from election $t-1$ to election t. An alternative would be to select vote share at election t as the dependent variable and use the lagged version (vote share at election $t-1$) as a control variable. While these models are similar, we selected the former because of fears that the latter dependent variable would be non-stationary, which could introduce spurious relationships (Granger and Newbold 1974). Indeed, when we estimate party-specific[3] Dickey-Fuller tests, we fail to reject the null hypothesis of a unit root in 85.5% of the cases.[4]

8 Construction of Weights Matrices

To test our hypotheses, we need to vary *which* parties are spatially connected and *to what extent*, which is done through modifying the weights matrix ($\mathbf{W}$). An example from two consecutive Canadian elections (1972 and 1974) will shed light on how we test the hypotheses via the weights matrix. Figure S.3 shows the calculation of the weights matrix for the model of the absolute distance between all parties. First, consider the left-right positions for the four parties in the CMP data for the two elections. The same four parties contested each election and were identical in the ordering of their positions from left to right (though their *relative* positions changed). The second table provides the relative positions of each party in reference to the other parties in the system. For example, the element in the first row, second column ($-26.4 - -12.5$) is the position of the first party (New Democratic Party) minus the second party (Conservatives) in the 1972 general election. These values are directional, though this may be transformed for the non-directional hypotheses.

[3] In order to get a time series with a sufficient number of observations, we limit our sample to only those parties that have competed in at least four consecutive elections.

[4] There are a number of panel unit-root tests, but only a few allow for unbalanced panels. Of the two tests that allow for unbalanced panels (Fisher-type tests, and the Im-Pesaran-Shin test), both have null hypotheses that *all* the panels have unit roots. It is therefore quite easy to reject this null hypothesis in favor of mean stationarity.

Note that the diagonal elements are all zero (since it is each party's distance from itself) and the off-diagonal blocks representing other elections are left blank. In neither case will these values influence the spatial lag for that election. Based on the expectation that the relative ideological proximity of all parties is important, we modify the values in the second table (i.e., by taking the absolute value of the distance) to create the weights matrix.

In the construction of the other weights matrices, we either square the distance between relevant parties (curvilinear), or we restrict the distances to be only between ideologically-contiguous parties. For example, in Figure S.4 we show how to calculate the weights matrix of the absolute distance between ideologically-contiguous parties in the two Canadian elections. Notice that the two most extreme parties (New Democratic Party and Social Credit) only have one ideologically-contiguous neighbor, and the ideological positions of only two parties are relevant of each party. Otherwise, the transformation of the raw left-right scores into elements of the matrix is similar.

9 Spatial Diagnostics

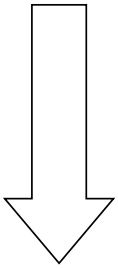
At the bottom of Table S.4 we present a series of tests for spatial autocorrelation. In the high clarity elections, the different statistical hypothesis tests for spatial autocorrelation provide strong evidence of spatial autocorrelation. As reported above, we clearly have an estimated ρ value that is statistically significantly different from zero at conventionally-accepted standards ($p < 0.001$ in a two-tailed Z-test). All four tests (Moran's I, Geary's C, Lagrange Multiplier, and Wald test) allow us to reject the null hypothesis of spatial independence (all at $p < .01$). Moreover, the SAR model represents an improvement in model fit over the non-spatial OLS model.

The results for the low clarity elections also provide strong evidence of spatial dependence and thus support for Hypotheses 1 and 2. The estimated ρ value is more than three times the size of the ρ value for the high clarity elections and has a a hefty Z-statistic of -10.7 ($p < .001$). As

Figure S.3: An Example of the Calculation of the Weights Matrix for Relative Ideological Proximity (Absolute Distance)

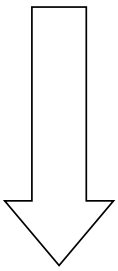
Canadian Party Positions for Elections in 1972 and 1974

Election Date	**Party**	**Left-Right**
October 30, 1972	New Democratic Party	-26.4
	Conservatives	-12.5
	Liberals	-10.4
	Social Credit	10.9
July 8, 1974	New Democratic Party	-28.4
	Conservatives	2.2
	Liberals	3.4
	Social Credit	10.9



Relative Ideological Proximity Calculation

0	-26.4- -12.5	-26.4- -10.4	-26.4- 10.9				
-12.5- -26.4	0	-12.5- -10.4	-12.5-10.9				
-10.4- -26.4	-10.4- -12.5	0	-10.4- 10.9				
10.9- -26.4	10.9- -12.5	10.9- -10.4	0				
				0	-28.4-2.2	-28.4-3.4	-28.4-10.9
				2.2- -28.4	0	2.2-3.4	2.2-10.9
				3.4- -28.4	3.4-2.2	0	3.4-10.9
				10.9- -28.4	10.9- 2.2	10.9-3.4	0



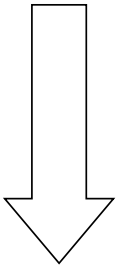
Linear Weights Matrix (Absolute Distance)

0	13.9	16	37.3	0	0	0	0
13.9	0	2.1	23.4	0	0	0	0
16	2.1	0	21.3	0	0	0	0
37.3	23.4	21.3	0	0	0	0	0
0	0	0	0	0	30.6	31.8	39.3
0	0	0	0	30.6	0	1.2	8.7
0	0	0	0	31.8	1.2	0	7.5
0	0	0	0	39.3	8.7	7.5	0

Figure S.4: An Example of the Calculation of the Weights Matrix for Ideologically-Contiguous Parties (Absolute Distance)

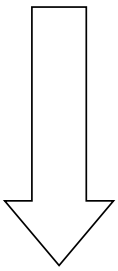
Canadian Party Positions for Elections in 1972 and 1974

Election Date	Party	Left-Right
October 30, 1972	New Democratic Party	-26.4
	Conservatives	-12.5
	Liberals	-10.4
	Social Credit	10.9
July 8, 1974	New Democratic Party	-28.4
	Conservatives	2.2
	Liberals	3.4
	Social Credit	10.9



Ideological Proximity (Contiguous) Calculation

0	-26.4- -12.5	0	0				
-12.5- -26.4	0	-12.5- -10.4	0				
0	-10.4- -12.5	0	-10.4- 10.9				
0	0	10.9- -10.4	0				
				0	-28.4-2.2	0	0
				2.2- -28.4	0	2.2-3.4	0
				0	3.4-2.2	0	3.4-10.9
				0	0	10.9-3.4	0



Contiguous Weights Matrix (Absolute Distance)

0	13.9	0	0	0	0	0	0
13.9	0	2.1	0	0	0	0	0
0	2.1	0	21.3	0	0	0	0
0	0	21.3	0	0	0	0	0
0	0	0	0	0	30.6	0	0
0	0	0	0	30.6	0	1.2	0
0	0	0	0	0	1.2	0	7.5
0	0	0	0	0	0	7.5	0

we can see from the bottom-right section of Table S.4, all four of the other diagnostic tests for spatial independence are similarly convincing. The adjusted R^2 for this model is a substantial improvement over the non-spatial OLS model (0.16 compared to 0.07) with the same specification (where ρ is restricted to equal zero).

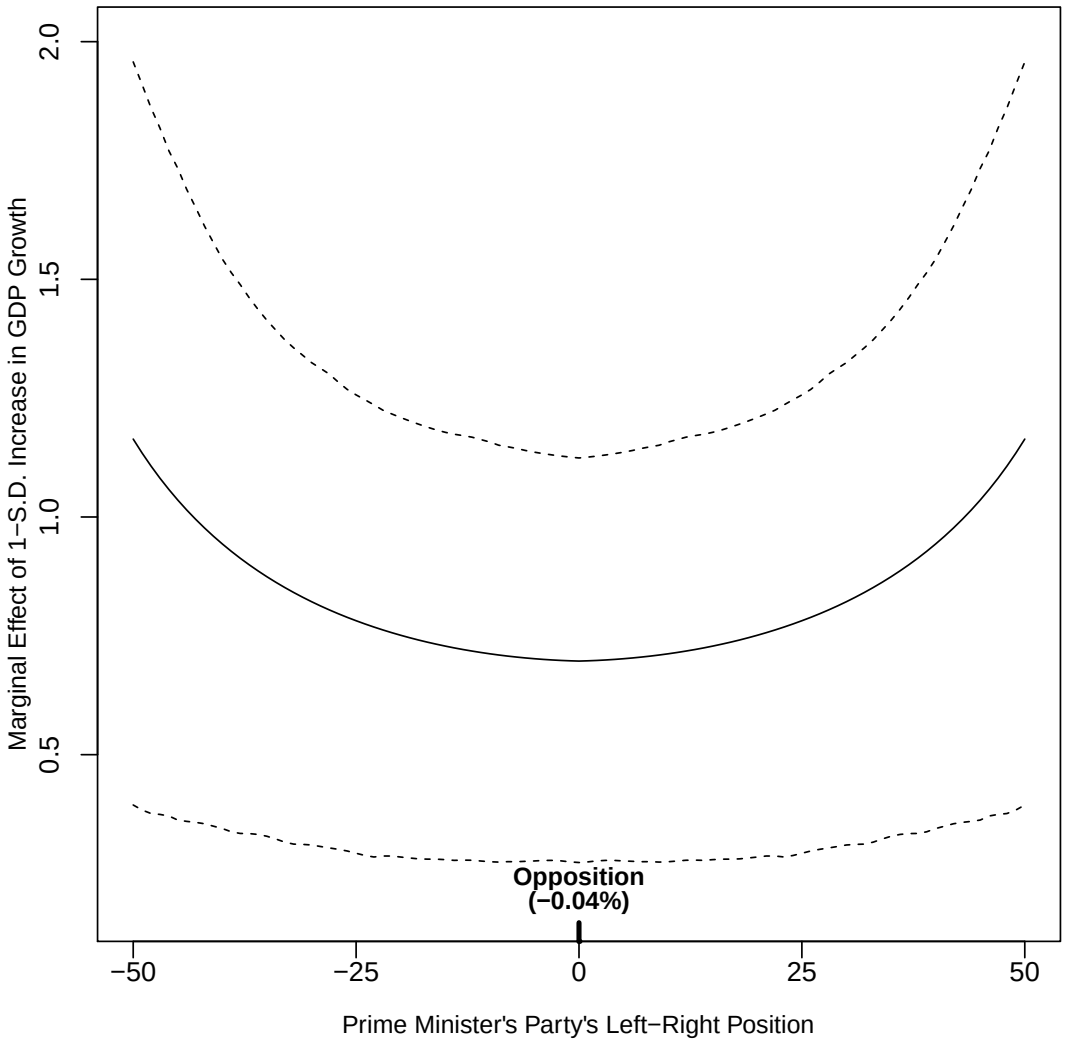
10 Confidence Intervals

In Figures S.5-S.7 we provide the predicted effects and 90% confidence intervals, calculated via simulation techniques.

11 Alternative Spatial Specifications

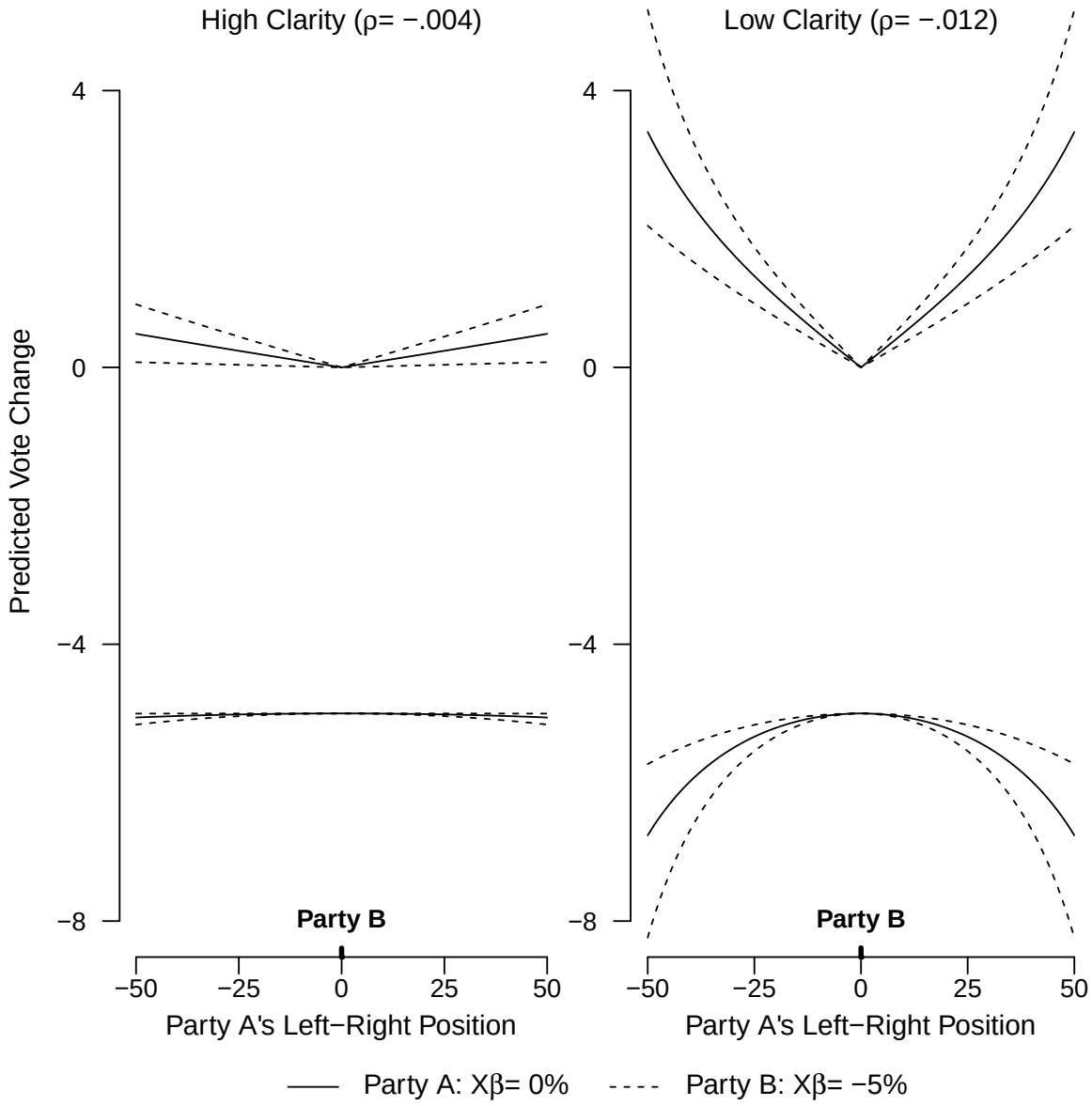
The literature on strategic party competition has suggested that parties might be spatially interconnected in a number of different ways based on whether voters' utility functions decline linearly or curvilinearly, and whether parties' strategies depend on only ideologically-contiguous neighbors or all parties in the system. In the manuscript we presented the model with a weights matrix specifying the absolute ideological distance between ideologically-contiguous neighbors. In Tables S.6-S.8 we present the SAR models for high and low clarity systems based on the absolute distance between all parties (Table S.6), squared distance between all parties (Table S.7), and the absolute distance between ideologically-contiguous parties (Table S.7). In all three variations of the weights matrix, we see support for stronger spatial contagion effects in the low clarity systems compared to high clarity.

Figure S.5: Marginal Effect of Real GDP Per Capita Growth on Prime Minister's Party Vote Share across Relative Ideological Positioning with 90% Confidence Intervals: Low Clarity Model in Table 1



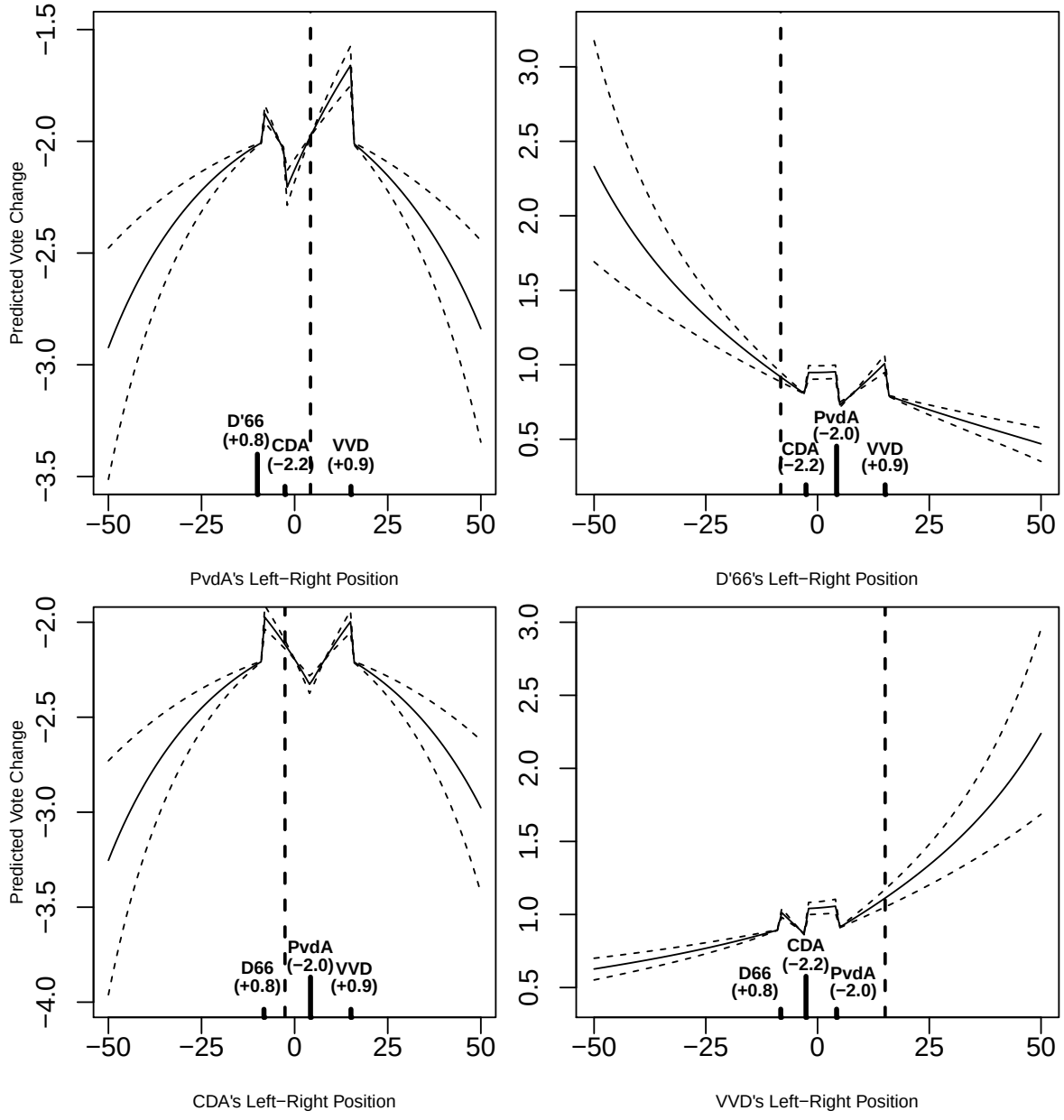
Note: Figure depicts the marginal effect of a one-standard deviation increase in *real GDP per capita growth* (2.87%) on the Prime Minister's party's vote share as its position varies relative to a stationary opposition party (at point 0). Since the opposition party's pre-spatial marginal effect is a reduction in votes (-0.04%), the PM's party stands to gain from distancing itself from the opposition. Dashed lines represent 90% confidence intervals.

Figure S.6: Spatial Contagion Effects in a Two-Party System Where Party A's Ideology Varies and Party B's Ideology = 0 with 90% Confidence Intervals: High and Low Clarity Models in Table 1



Note: Figure shows the predicted vote change for Party A (solid line) and Party B (dashed line) given Party A's position (varies) relative to Party B's position (stationary at point 0) for elections with high clarity (left panel) and low clarity (right panel). The pre-spatial effects are such that Party A is expected to maintain its vote share while Party B loses 5%. Party B's predicted vote change (dashed line) varies solely based on feedback through the relative distance in the weights matrix caused by Party A's position. Dashed lines represent 90% confidence intervals.

Figure S.7: Predicted Vote Change for Each of the Four Dutch Parties in the 1994 General Elections, Varying Ideological Position with 90% Confidence Intervals: Low Clarity Model in Table 1



Note: Panels depict how the predicted vote change for each of the four Dutch parties in the 1994 general election varies according to its left-right position. The left-right positions and pre-spatial effects (in parentheses) are shown for the non-focal parties in each scenario, while the vertical line depicts the focal party's actual position in the 1994 general election. Predicted values are based on an absolute linear distance, neighbors-only weights matrix. Dashed lines represent 90% confidence intervals.

Table S.6: Spatial Autoregressive (SAR) Results of Spatial Contagion Effects across Elections with High and Low Clarity of Responsibility: All Parties, Absolute Distance

Variable	**High Clarity**		**Low Clarity**	
	β	S.E.	β	S.E.
Real GDP Per Capita Growth	-0.26**	(0.010)	-0.031	(0.060)
Coalition Party×Growth	0.46***	(0.169)	-0.030	(0.109)
PM's Party×Growth	0.574**	(0.193)	0.297**	(0.112)
Party Shift$_t$	0.007	(0.013)	0.013	(0.009)
Party Shift$_{t-1}$	0.016	(0.014)	0.029***	(0.009)
Time Left in CIEP	-0.027	(0.017)	-0.014**	(0.006)
Coalition Party×Time Left	0.052**	(0.026)	0.037***	(0.013)
PM's Party×Time Left	0.089**	(0.029)	0.056***	(0.013)
Coalition Party	-4.103***	(1.004)	-1.836***	(0.531)
Prime Minister's Party	7.422***	(3.262)	0.189	(1.858)
Niche Party	0.412	(1.209)	0.294	(0.559)
Majority Government			0.157	(0.329)
Number of Gov't Parties	0.158	(0.215)	0.173	(0.155)
PM's Party×No. of Gov't Parties	-0.998**	(0.430)	0.056***	(0.013)
Vote$_{t-1}$	0.004	(0.023)	-0.036**	(0.013)
PM's Party×Vote$_{t-1}$	-0.332***	(0.067)	-0.072*	(0.038)
Niche Party×Vote$_{t-1}$	-0.113	(0.091)	-0.069	(0.045)
PM's Party×Majority			-0.389	(0.752)
Effective No. of Parties	-0.234	(0.293)	-0.216*	(0.129)
Constant	2.595**	(1.036)	1.605***	(0.564)
ρ	-0.0001	(0.0006)	-0.002***	(0.0005)
Adjusted R^2		0.21		0.084
RMSE		4.35		3.833
AIC		2338		5733
BIC		2413		5837
N		398		1030
Tests of Spatial Interdependence				
Moran's I		-0.023		-0.067**
Geary's C		1.197*		1.065
LM		0.033		6.494**
Wald Test		0.063		22.27***

Note: $***= p < .01$, $**= p < .05$, $*= p < .1$ *(p-values are reported for two-tailed z-tests despite most of our hypotheses being directional)*

Table S.7: Spatial Autoregressive (SAR) Results of Spatial Contagion Effects across Elections with High and Low Clarity of Responsibility: All Parties, Squared Distance

Variable	**High Clarity**		**Low Clarity**	
	β	S.E.	β	S.E.
Real GDP Per Capita Growth	-0.267**	(0.010)	-0.031	(0.061)
Coalition Party×Growth	0.459**	(0.169)	-0.026	(0.110)
PM's Party×Growth	0.576**	(0.193)	0.293**	(0.113)
Party Shift$_t$	0.007	(0.013)	0.013	(0.009)
Party Shift$_{t-1}$	0.017	(0.014)	0.031***	(0.009)
Time Left in CIEP	-0.026	(0.017)	-0.015**	(0.006)
Coalition Party×Time Left	0.050*	(0.026)	0.039***	(0.013)
PM's Party×Time Left	0.087***	(0.029)	0.055***	(0.013)
Coalition Party	-4.120***	(1.002)	-1.852***	(0.536)
Prime Minister's Party	7.598**	(3.255)	0.136	(1.877)
Niche Party	0.599	(1.208)	0.396	(0.564)
Majority Government			0.156	(0.332)
Number of Gov't Parties	0.179	(0.214)	0.162	(0.157)
PM's Party×No. of Gov't Parties	-1.048**	(0.429)	0.029	(0.371)
Vote$_{t-1}$	0.007	(0.023)	-0.035**	(0.013)
PM's Party×Vote$_{t-1}$	-0.335***	(0.067)	-0.073*	(0.038)
Niche Party×Vote$_{t-1}$	-0.108	(0.091)	-0.078*	(0.046)
PM's Party×Majority			-0.413	(0.759)
Effective No. of Parties	-0.248	(0.292)	-0.207	(0.130)
Constant	2.632**	(1.034)	1.647***	(0.570)
ρ	0.000008	0.000007	-0.00001	-0.000008
Adjusted R^2		0.21		0.065
RMSE		4.343		3.872
AIC		2336		5754
BIC		2412		5857
N		398		1030
Tests of Spatial Interdependence				
Moran's I		0.046		-0.020
Geary's C		1.229		0.991
LM		0.808		0.386
Wald Test		1.312		1.357

Note: $***= p < .01$, $**= p < .05$, $*= p < .1$ *(p-values are reported for two-tailed z-tests despite most of our hypotheses being directional)*

Table S.8: Spatial Autoregressive (SAR) Results of Spatial Contagion Effects across Elections with High and Low Clarity of Responsibility: Contiguous Parties, Squared Distance

Variable	**High Clarity**		**Low Clarity**	
	β	S.E.	β	S.E.
Real GDP Per Capita Growth	-0.261***	(0.10)	-0.023	(0.059)
Coalition Party×Growth	0.467**	(0.168)	-0.028	(0.108)
PM's Party×Growth	0.568***	(0.193)	0.277***	(0.112)
Party Shift$_t$	0.005	(0.013)	0.015	(0.009)
Party Shift$_{t-1}$	0.014	(0.014)	0.031***	(0.009)
Time Left in CIEP	-0.029*	(0.017)	-0.014**	(0.006)
Coalition Party×Time Left	0.056**	(0.026)	0.037**	(0.013)
PM's Party×Time Left	0.091**	(0.029)	0.052***	(0.013)
Coalition Party	-4.200***	(1.002)	-1.702***	(0.529)
Prime Minister's Party	7.248**	(3.248)	0.696	(1.852)
Niche Party	-0.224	(1.209)	0.431	(0.556)
Majority Government			0.139	(0.328)
Number of Gov't Parties	0.169	(0.213)	0.146	(0.155)
PM's Party×No. of Gov't Parties	-0.986**	(0.427)	-0.046	(0.366)
Vote$_{t-1}$	0.003	(0.023)	-0.034**	(0.013)
PM's Party×Vote$_{t-1}$	-0.328***	(0.067)	-0.081**	(0.038)
Niche Party×Vote$_{t-1}$	-0.128	(0.091)	-0.076*	(0.045)
PM's Party×Majority			-0.266	(0.749)
Effective No. of Parties	-0.266	(0.292)	-0.186	(0.129)
Constant	2.713**	(1.034)	1.439**	(0.563)
ρ	-0.00002*	0.00001	-0.0001***	(0.00002)
Adjusted R^2		0.214		0.091
RMSE		4.334		3.818
AIC		2335		5725
BIC		2411		5828
N		398		1030
Tests of Spatial Interdependence				
Moran's I		-0.203		-0.314***
Geary's C		1.237		1.218
LM		1.548		8.051***
Wald Test		2.982*		30.986***

Note: $***= p < .01$, $**= p < .05$, $*= p < .1$ *(p-values are reported for two-tailed z-tests despite most of our hypotheses being directional)*

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