

Supplementary Appendix for
“Sovereign Credit and Political Survival in Democracies”

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A Sample Country-Years

Table A.1: Countries and Years in the Estimated Sample

Country	Year Begin	Year End	Country	Year Begin	Year End
Argentina	1994	2007	Kenya	2007	2007
Australia	1976	2007	Latvia	1998	2007
Austria	1976	2007	Lithuania	1998	2007
Belgium	1989	2007	Macedonia	2005	2007
Bolivia	1999	2007	Madagascar	2005	2007
Botswana	2002	2007	Mexico	2001	2007
Brazil	1996	2007	Mongolia	2000	2007
Bulgaria	1999	2007	Netherlands	1990	2007
Canada	1976	2007	New Zealand	1977	2007
Chile	1993	2007	Norway	1976	2007
Colombia	1994	2002	P. N. Guinea	2000	2007
Costa Rica	1998	2007	Pakistan	1995	1998
Croatia	2001	2007	Panama	1998	2007
Cyprus	1995	2007	Paraguay	2004	2007
Czech Rep.	1994	2007	Peru	2002	2007
Denmark	1982	2007	Philippines	1994	2007
Dom. Rep.	1998	2007	Poland	1996	2007
Ecuador	2004	2005	Portugal	1989	2007
El Salvador	1997	2007	Romania	1997	2007
Estonia	1998	2007	S. Africa	1995	2007
FRG/Germany	1984	2007	Senegal	2001	2007
Finland	1978	2007	Slovakia	1995	2007
France	1976	2007	Slovenia	1997	2007
Georgia	2006	2007	Spain	1990	2007
Ghana	2004	2007	Sri Lanka	2006	2007
Greece	1989	2007	Sweden	1978	2007
Guatemala	2002	2007	Taiwan	2001	2007
Hungary	1993	2007	Thailand	1990	2005
India	1991	2007	Trinidad-Tobago	1997	2007
Indonesia	2000	2007	Turkey	1993	2007
Ireland	1989	2007	UK	1979	2007
Israel	1989	2007	USA	1976	2007
Italy	1989	2007	Ukraine	2002	2007
Jamaica	2000	2007	Uruguay	1995	2007
Japan	1976	2007	Venezuela	1978	2004
Kenya	2007	2007			

B Ratings Across Divided and Unity Government

Figure B.1: Histogram of S&P Rating by Divided Government

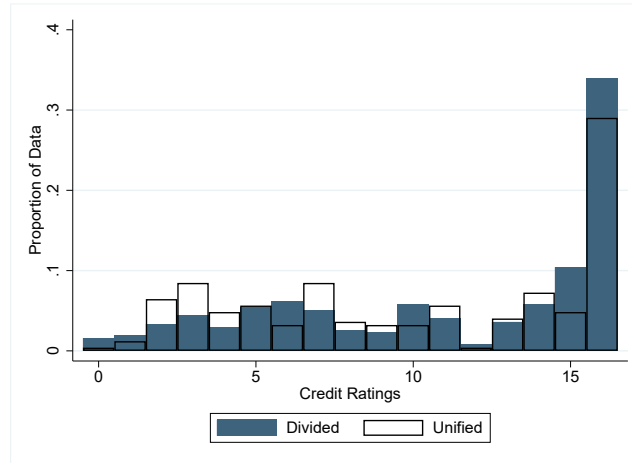
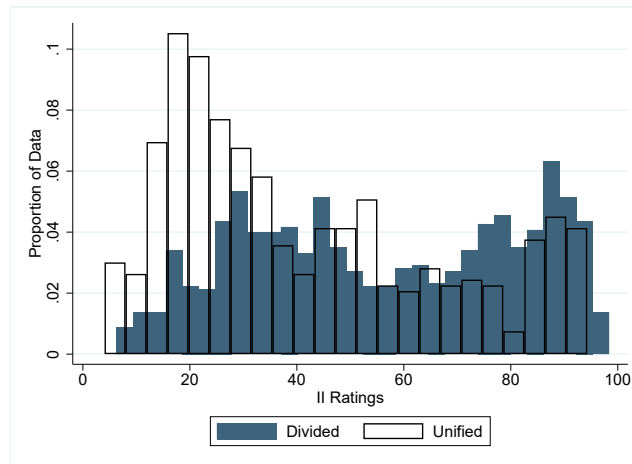


Figure B.2: Histogram of S&P Rating by Divided Government



C Analysis with *Institutional Investor* Rating

Table C.2: II Rating, Divided Government & Survival

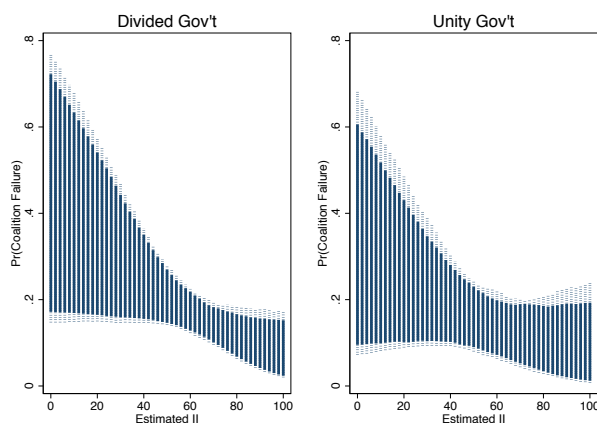
	(1)	(2)	(3)	(4)	(5)	(6)
	All States	All States	Parl.	Prop. Rep.	Shared Frailty	Stratified
II_{t-1}	-0.015*	-0.020*	-0.023*	-0.019*	-0.018*	-0.019*
	(0.0064)	(0.0064)	(0.0098)	(0.0069)	(0.0075)	(0.0064)
$II_{t-1} * \text{Unity Gov't}$		0.068	0.032*	0.020*	0.010	0.0090
		(0.042)	(0.011)	(0.0086)	(0.0071)	(0.0075)
Unity Gov't	-0.56*	-1.10*	-2.65*	-1.13*	-0.97*	
	(0.22)	(0.37)	(0.66)	(0.41)	(0.36)	
GDP percapita $_{t-1}$	0.18*	0.19*	0.25*	0.026	0.0072	0.0093
	(0.083)	(0.086)	(0.11)	(0.020)	(0.016)	(0.019)
Growth	-1.76	-1.77	-2.87	-1.41	-2.42	-2.14
	(1.40)	(1.43)	(2.13)	(1.68)	(1.35)	(1.46)
Parliamentary	0.44*	0.49*			0.43	0.42*
	(0.21)	(0.21)			(0.23)	(0.20)
Proportional Rep.	0.17	0.20			0.21	0.25
	(0.21)	(0.21)			(0.24)	(0.21)
GDP percapita $_{t-1} * \ln(t)$	-0.023*	-0.024*	-0.034*			
	(0.012)	(0.012)	(0.015)			
$II_{t-1} * \text{Unity Gov't} * \ln(t)$		-0.0073				
		(0.0053)				
N	1550	1550	865	1185	1550	1550
Subjects	309	309	167	243	309	309
Failures	223	223	124	177	223	223
theta					0.33	

Standard errors in parentheses

* $p < .05$

Table C.3: This table replicates the results of Table 2 in the manuscript substituting the *Institutional Investor* credit rating.

Figure C.3: Probability Failure Across Instrumented II Rating



Note: Spikes indicate 95th (solid) and 99th (dashed) percentiles around the probability of incumbent coalition failure.

D Endogenous Model

Table D.4: Random Effects Probit Model While Instrumenting Credit Rating

	(7)	(8)
	S&P	Instrumented S&P
$S\&P_{t-1}$	-0.065*	
	(0.022)	
$S\&P_{t-1} * \text{Unity Gov't}$	0.056*	
	(0.022)	
$\widehat{S\&P}_{t-1}$		-0.12*
		(0.032)
$\widehat{S\&P}_{t-1} * \text{Unity Gov't}$		0.064
		(0.035)
Unity Gov't	-0.64*	-0.73*
	(0.24)	(0.34)
GDP percapita $_{t-1}$	0.016	0.022
	(0.010)	(0.012)
Growth	-1.09	-0.53
	(1.07)	(1.14)
Parliamentary	0.16	0.39*
	(0.14)	(0.15)
Proportional Rep.	0.25	0.40*
	(0.17)	(0.16)
ln(time)	0.061	0.070
	(0.10)	(0.12)
Constant	-1.41	-1.37
	(0.79)	(0.87)
$P - value_{res}$		0.703
Partial R^2		0.59
N	996	902

Robust standard errors in parentheses

* $p < .05$

The estimates of this two-stage equation are consistent and unbiased when the instruments covary with the endogenous variable and when the errors of the first stage are orthogonal to the second stage errors. At the bottom of Table D.4, we report that the partial R^2 exceeds the common accepted 0.10 rule of thumb for correlation of the error and endogenous variable. Second, we report the p-value of the error of the first stage of the equation when included in the second stage. The high and insignificant p-value suggests that residuals are orthogonal to the dependent variable, satisfying the final condition for consistent and unbiased estimates.

E Potential Confounders

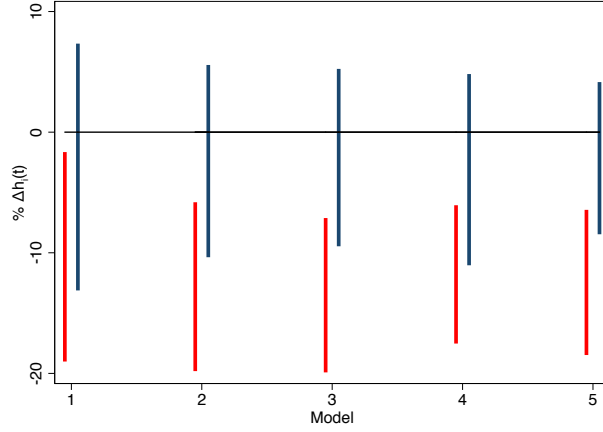
Table E.5: Testing Potential Confounders

	(1)	(2)	(3)	(4)	(5)
$S\&P_{t-1}$	-0.12*	-0.14*	-0.15*	-0.13*	-0.14*
	(0.058)	(0.048)	(0.044)	(0.039)	(0.041)
$S\&P_{t-1} * \text{Unity Gov't}$	0.078	0.11*	0.13*	0.094*	0.11*
	(0.051)	(0.045)	(0.046)	(0.048)	(0.045)
Unity Gov't	-0.98*	-1.27*	-1.38*	-1.19*	-1.29*
	(0.49)	(0.46)	(0.47)	(0.43)	(0.44)
GDP percapita $_{t-1}$	0.017	0.022	0.038*	0.030	0.029
	(0.030)	(0.026)	(0.017)	(0.018)	(0.019)
Growth	-1.87	-1.73	-0.61	-0.54	-0.75
	(2.37)	(2.14)	(1.86)	(1.95)	(1.87)
Parliamentary	0.64	0.65*	0.42	0.49	0.42
	(0.36)	(0.30)	(0.26)	(0.26)	(0.29)
Proportional Rep.	0.76	0.64	0.58	0.57	0.56
	(0.53)	(0.35)	(0.35)	(0.33)	(0.33)
Budget balance/GDP	-0.11				
	(0.083)				
Expenditure/GDP		0.10			
		(0.11)			
Debt/GDP			-0.0046		
			(0.0046)		
Rate of Inflation				0.0085*	
				(0.0041)	
Judicial Independence					0.0092
					(0.64)
N	725	786	946	949	977
Subjects	157	173	198	193	199
Failures	96	112	126	128	133

Standard errors in parentheses

* $p < .05$

Figure E.4: First Difference Corresponding with Table E.5



Note: Red and blue Spikes indicate 95th percentiles around divided and unity government, respectively, calculated from 1,000 simulations. Model numbers correspond to those presented in Table D.5

Table E.6: Credit Rating, Num. of Government Parties & Survival

	(1) All States	(2) Parl.	(3) Prop. Rep.	(4) All States
$S\&P_{t-1}$	-0.089*	-0.11*	-0.10*	-0.13*
	(0.041)	(0.042)	(0.046)	(0.047)
$S\&P_{t-1} * \text{Unity Gov't}$				0.11*
				(0.048)
$\#ofParties * S\&P_{t-1}$	-0.0084	-0.0065	-0.0012	-0.0019
	(0.012)	(0.011)	(0.014)	(0.012)
Unity Gov't				-1.20*
				(0.47)
$\# of Parties$	0.100	0.086	0.066	0.043
	(0.077)	(0.081)	(0.088)	(0.081)
GDP percapita $_{t-1}$	0.029	0.026	0.036	0.030
	(0.019)	(0.024)	(0.020)	(0.019)
Growth	-1.19	-0.25	-0.32	-0.89
	(1.83)	(2.69)	(2.14)	(1.84)
Parliamentary	0.40			0.43
	(0.26)			(0.28)
Proportional Rep.	0.45			0.54
	(0.24)			(0.34)
N	1006	671	785	993
Subjects	204	125	169	199
Failures	135	90	114	133
theta				

Standard errors in parentheses

* $p < .05$

This analysis table shows that the effect of credit rating is constant across the number of government parties (Model 1 uses the entire sample, Models 2 & 3 restrict the sample to parliamentary and proportional representation systems) and that our results are robust to potential confounding by the conditional relationship between credit rating and the number of government parties (Model 4).

Table E.7: Credit Rating, Divided Government & Survival Across Partisanship

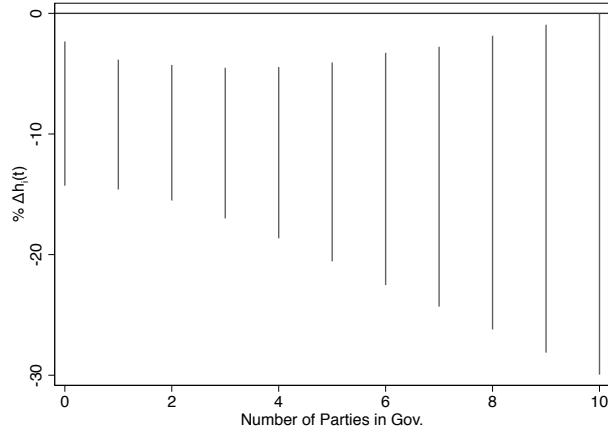
	(1)	(2)
Unity Gov.	-0.75 (0.54)	-1.56* (0.49)
Left Gov.	-1.43 (0.78)	
Divided, Not Left, $S\&P_{t-1}$	-0.13* (0.049)	
Divided, Left, $S\&P_{t-1}$	-0.13* (0.044)	
Unity, Not Left, $S\&P_{t-1}$	-0.059 (0.048)	
Unity, Not Left, $S\&P_{t-1}$	0.041 (0.066)	
Unity Gov. * Left Gov.	1.34 (0.95)	
Right Gov.		1.25 (0.68)
Divided, Not Right, $S\&P_{t-1}$		-0.13* (0.044)
Divided, Right, $S\&P_{t-1}$		-0.15* (0.046)
Unity, Not Right, $S\&P_{t-1}$		0.023 (0.048)
Unity, Right, $S\&P_{t-1}$		-0.11* (0.052)
Unity Gov. * Right Gov.		-0.99 (0.73)
GDP percapita $_{t-1}$	0.027 (0.020)	0.028 (0.019)
Growth	-0.88 (1.77)	-0.71 (1.84)
Parliamentary	0.46 (0.28)	0.46 (0.28)
Proportional Rep.	0.58 (0.34)	0.56 (0.35)
N	996	996
Subjects	200	200
Failures	134	134
theta		

Standard errors in parentheses

* $p < .05$

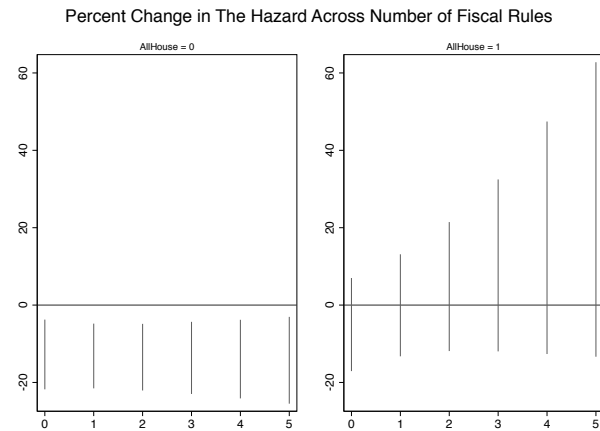
Note: We use the Database of Political Institutions coding of partisanship to indicate left and right executives.

Figure E.5: First Difference of S&P Across Number of Parties in Government



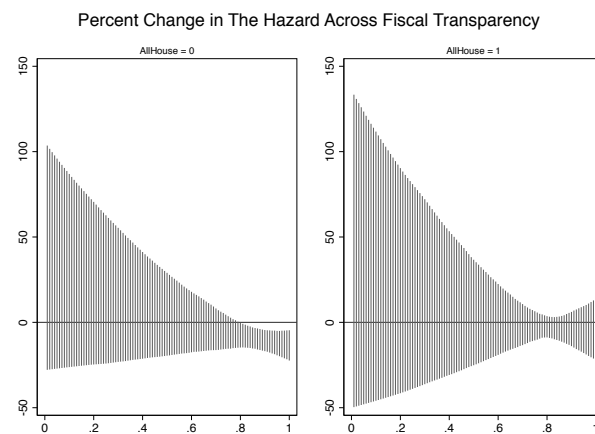
Note: Bars indicate the 95% confidence intervals around the marginal effect of S&P rating calculated from 1,000 simulations. The results correspond with Model 1 of Table D.6

Figure E.6: Interaction with Unity Government and the Number of Fiscal Rules



Note: Spikes indicate the 95% confidence intervals around the percent change in the hazard. Estimates reflect a model in which S&P Rating, unity government and number of fiscal rules were interacted including lower order interactions. The first and second panels show the percent change in the hazard resulting from a 1-unit increase in S&P under divided government and unity government respectively. The fiscal rules variable indicates the sum of fiscal rules coded from 1985-2012 as coded by Schaechter et al. (2012).

Figure E.7: Interaction with Unity Government and Fiscal Transparency



Note: Spikes indicate the 95% confidence intervals around the percent change in the hazard. Estimates reflect a model in which S&P Rating, Unity Government and Fiscal Transparency were interacted including lower order interactions. The first and second panels show the percent change in the hazard resulting from a 1-unit increase in S&P under divided government and unity government respectively. The fiscal transparency variable indicates the percentage of financial statistics reported to the IMF as collected by Hollyer, Rosendorff and Vreeland (2014). While the graph shows that under divided government (allhouse=0), the relationship is only significant above 0.8, it is worth noting that over 50% of the observations are between 0.8 and 1.0 on the transparency measure.

Table E.8: Credit Rating, Divided Government & Survival: Excluding Countries that Never Experience Divided Government

	(1)	(2)	(3)	(4)	(5)	(6)
	All States	All States	Parl.	Prop. Rep.	Shared Frailty	Stratified
$S\&P_{t-1}$	-0.10*	-0.13*	-0.18*	-0.12*	-0.12*	-0.13*
	(0.043)	(0.043)	(0.048)	(0.043)	(0.037)	(0.043)
$S\&P_{t-1} * \text{Unity Gov't}$		0.10*	0.15*	0.15*	0.10*	0.10*
		(0.046)	(0.061)	(0.050)	(0.048)	(0.048)
Unity Gov't	-0.033	-0.99*	-1.88*	-1.16*	-0.97	
	(0.27)	(0.45)	(0.78)	(0.51)	(0.54)	
GDP percapita $_{t-1}$	0.022	0.025	0.030	0.033	0.022	0.027
	(0.020)	(0.020)	(0.025)	(0.021)	(0.016)	(0.019)
Growth	-2.05	-1.76	0.055	0.38	-1.91	-1.78
	(2.04)	(2.11)	(2.67)	(2.23)	(1.90)	(2.16)
Parliamentary	0.45	0.44			0.45	0.46
	(0.26)	(0.26)			(0.25)	(0.26)
Proportional Rep.	0.37	0.53			0.54	0.56
	(0.28)	(0.33)			(0.30)	(0.31)
N	926	926	622	752	926	926
Subjects	190	190	119	162	190	190
Failures	131	131	87	113	131	131
theta					0.058	

Standard errors in parentheses

* $p < .05$

F Robustness to ARCHIGOS Failure DV

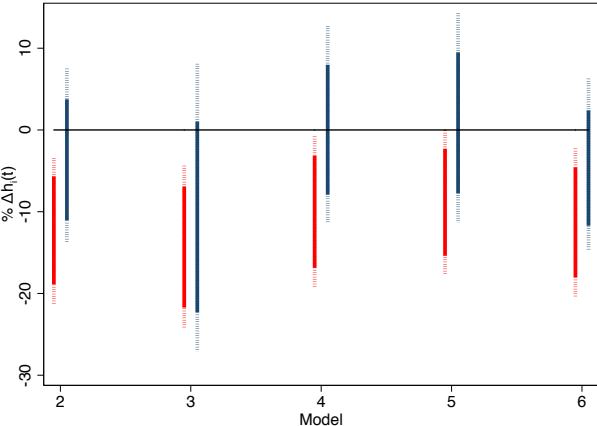
Table F.9: Credit Rating, Divided Government & Survival Using ARCHIGOS Coding of Leader Failure

	(1)	(2)	(3)	(4)	(5)	(6)
	All States	All States	Parl.	Prop. Rep.	Shared Frailty	Stratified
$S\&P_{t-1}$	-0.11*	-0.14*	-0.16*	-0.11*	-0.097*	-0.13*
	(0.043)	(0.045)	(0.052)	(0.046)	(0.043)	(0.045)
$S\&P_{t-1} * \text{Unity Gov't}$		0.096*	0.039	0.11*	0.10*	0.074
		(0.044)	(0.075)	(0.051)	(0.050)	(0.046)
Unity Gov't	-0.054	-0.92*	-0.44	-0.84	-1.07	
	(0.28)	(0.44)	(1.02)	(0.48)	(0.56)	
GDP percapita $_{t-1}$	0.018	0.022	0.030	0.028	-0.0013	0.018
	(0.018)	(0.018)	(0.018)	(0.017)	(0.018)	(0.018)
Growth	-1.21	-1.06	0.98	-0.65	-1.17	-1.21
	(1.95)	(2.10)	(3.34)	(2.13)	(2.01)	(2.04)
Parliamentary	0.51	0.49			0.48	0.50
	(0.28)	(0.27)			(0.31)	(0.27)
Proportional Rep.	0.57*	0.78*			0.85*	0.84*
	(0.28)	(0.34)			(0.37)	(0.34)
N	733	733	480	559	733	733
Subjects	184	184	114	153	184	184
Failures	135	135	88	113	135	135
theta					0.50	

Standard errors in parentheses

* $p < .05$

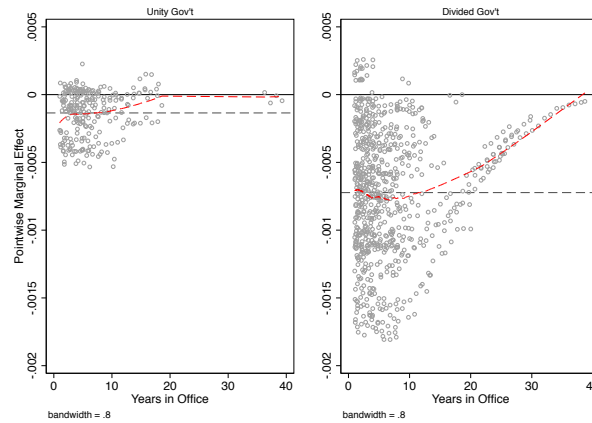
Figure F.8: First Difference of S&P Rating in Divided and Undivided Governments Using ARCHIGOS Coding of Leader Failure



Note: Red and blue Spikes indicate 99th (dashed) and 95th (solid) percentiles around divided and unity government respectively.

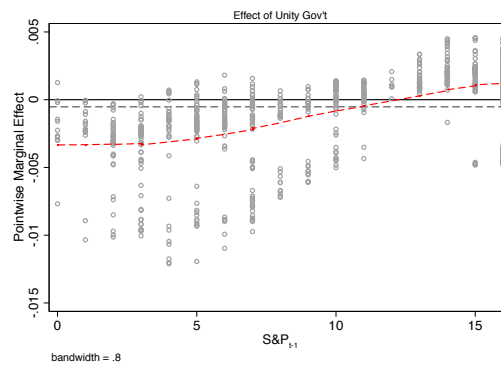
G Additional Non-Parametric Robustness Checks

Figure G.9: Pointwise Marginal Effect of S&P Across Years in Office for Unity and Divided Government



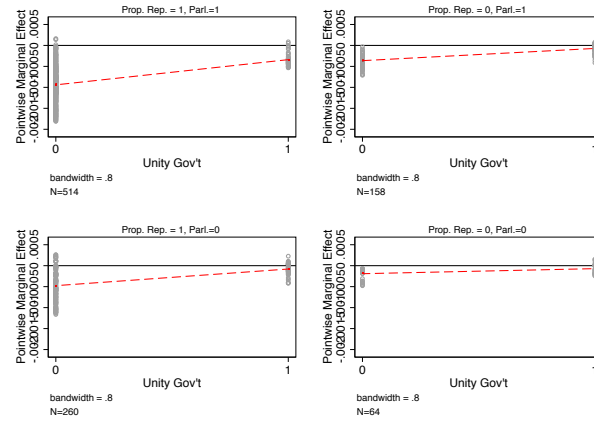
Note: Kernel estimates of the probability of incumbent failure. Each point represents the marginal effect of S&P for a single observation in the sample. The dashed grey lines represent the mean marginal effect in each subgroups and the dashed red lines represent the Lowess curve.

Figure G.10: Pointwise Marginal Effect of Unity Gov't Across S&P



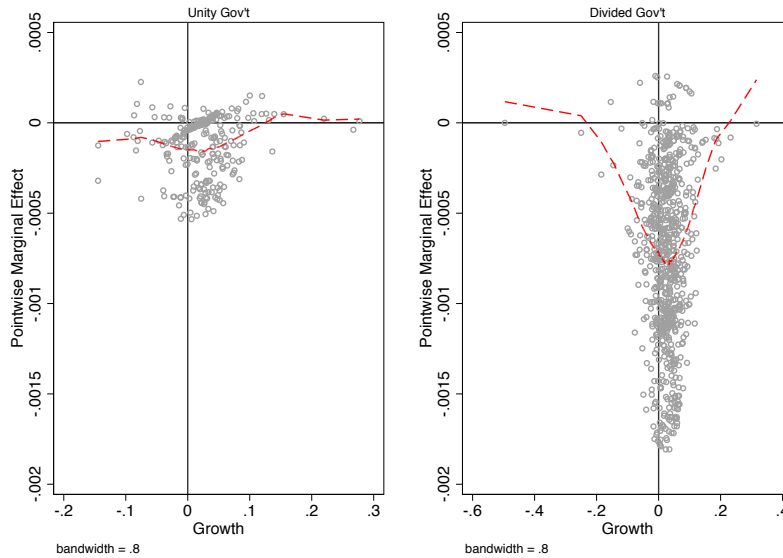
Note: Kernel estimates of the probability of incumbent failure. Each point represents the marginal effect of Unity Government for a single observation in the sample. The dashed grey lines represent the mean marginal effect in each subgroups and the dashed red lines represent the Lowess curve.

Figure G.11: Pointwise Marginal Effect of S&P Across Unity and Divided Government for Different Electoral Institutions



Note: Kernel estimates from model similar to Table 4: Model 6. Each point represents the marginal effect of S&P for a single observation in the sample. The dashed red lines represent the Lowess curve.

Figure G.12: Pointwise Marginal Effect of S&P Across Growth Under Unity and Divided Government



Note: Kernel estimates from model similar to Table 4: Model 6. Each point represents the marginal effect of S&P for a single observation in the sample. The dashed red lines represent the Lowess curve.

H Multiple Imputation

Table H.10: Multiple Imputation Analysis

	(1)	(2)
	All States	All States
$S\&P_{t-1}$	-0.059 (0.031)	-0.074* (0.034)
$S\&P_{t-1} * \text{Unity Gov't}$		0.060 (0.041)
Unity Gov't	-0.48* (0.20)	-1.07* (0.43)
GDP percapita $_{t-1}$	0.00073 (0.018)	0.0026 (0.018)
Growth	-2.81* (1.26)	-2.66* (1.26)
Parliamentary	0.50* (0.19)	0.50* (0.19)
Proportional Rep.	0.18 (0.19)	0.26 (0.22)
N	1896	1896
Subjects	356	356
Failures	255	255
<i>First Difference of $S\&P_{t-1}$</i>		
Unity Government		-1.19 [-7.49, 5.14]
Divided Government		-6.89 [-12.09, -1.63]

Standard errors in parentheses

* $p < .05$

Multiple imputation employed by using OECD membership and GDP growth data (not percapita growth as used in the analysis). The estimates use 10 draws from the posterior distribution of the missing data conditional on the observed data. We present the first difference of S&P and the 95% confidence intervals around the mean (retrieved from 10,000 draws of the beta and covariance matrices) at the bottom of the table to demonstrate the substantive effect under unity and divided government.

References

- Hollyer, James R., Peter Rosendorff and James Raymond Vreeland. 2014. “Measuring Transparency.” *Political Analysis* 22(4):413–34.
- Schaechter, Andrea, Tidiane Kinda, Nina Budina and Anke Weber. 2012. “Fiscal Rules in Response to the Crisis: Toward the ”Next Generation” Rules, A New Dataset.” *IMF Working Paper* .