Online Appendix

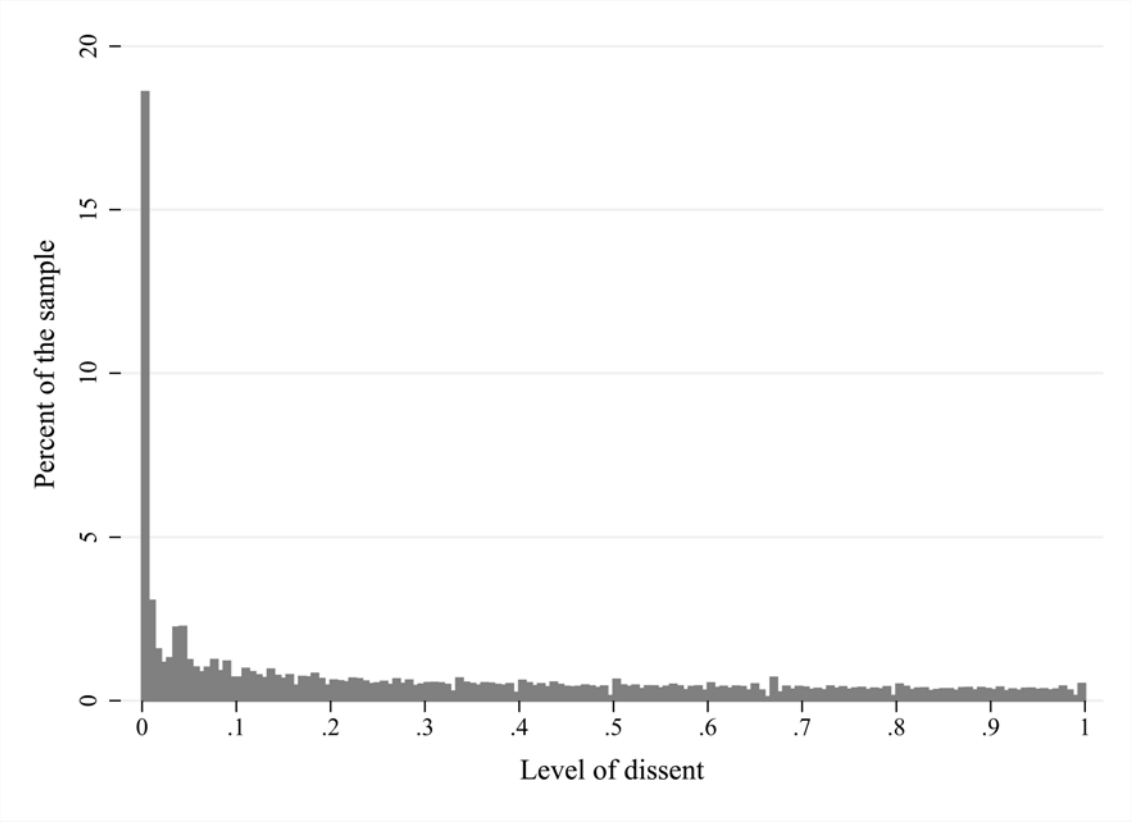
"Dynamic Party Unity: The U.S. Congress in Comparative Perspective"

by Till Weber and Craig A. Parsons, published in the *European Political Science Review*

1) Alternative statistical estimators

Figure A1 shows how the distribution of our dependent variable is bounded from below at 0 and from above at 1. In the paper we explain how this problem is addressed by the two-limit tobit estimator (e.g. following Forgette, who applies tobit to a similar measure of party unity[1]). An alternative solution exploits the fact that each value of the dependent variable represents a fraction of the maximum value. Papke and Wooldridge proposed a generalized linear model for such fractional variables.[2] Using the binomial distribution and a logit link, this estimator applies an S-shape transformation to the dependent variable so that the curve slowly approaches 0 and 1.

Figure A1 The distribution of the dependent variable



[1]Forgette, Richard. 2004. "Party Caucuses and Coordination: Assessing Caucus Activity and Party Effects." *Legislative Studies Quarterly* 29(3): 407-30.

[2]Papke, Leslie, and Jeffrey Wooldridge. 1996. "Econometric Methods for Fractional Response Variables with an Application to 401(k) Plan Participation Rates." *Journal of Applied Econometrics* 11(6): 619-32.

Table A1 shows that tobit, fractional logit, and OLS yield similar results. We can thus be confident that our findings are no artifacts of model choice.

In their plain form, all these estimators treat our individual observations as independent. Yet the nesting of votes within caucuses makes this implausible: During a two-year term, all dissent scores of a party in one chamber reflect the same legislators with the same mandates. Ignoring nesting risks biased estimates and inflated significance levels. We therefore also model the hierarchical data structure by estimating random effects for each caucus in each chamber on two levels: the two-year congressional term and the four-year presidency. Besides random intercepts the equation specifies random slopes for the four cycle terms, accounting for heterogeneity in the dynamics of party discipline across terms, chambers and parties. On each level we allow all effects to be correlated.

We were able to estimate this model for the linear case using Stata's -xtmixed-. For the other two estimators we clustered the standard errors by caucus and chamber to account for hierarchical dependence.[3] This also implies that the effective N is much lower than the large number of caucus-votes, and significance tests are meaningful.

Table A1 Robustness tests for the regression estimates in Table 1

Estimator	**Two-limit tobit (from Table 1)**	**Fractional logit**	**OLS**	**Three-level hierarchical**
<u>Congressional politics</u>				
2-year cycle	0.175***	0.126***	0.124***	0.133***
	(0.046)	(0.038)	(0.037)	(0.039)
2-year cycle × 2-year cycle	-0.138***	-0.097***	-0.096***	-0.097***
	(0.041)	(0.033)	(0.033)	(0.037)
Majority party	-0.042**	-0.039**	-0.029*	-0.019
	(0.020)	(0.017)	(0.016)	(0.015)
2-year cycle × Majority party	0.189***	0.150**	0.120**	0.113**
	(0.071)	(0.062)	(0.056)	(0.056)
2-year cycle × 2-year cycle × Majority party	-0.163**	-0.127**	-0.105**	-0.102*
	(0.066)	(0.056)	(0.051)	(0.053)
Change of seat share	-0.246*	-0.164	-0.148	-0.064
	(0.141)	(0.120)	(0.108)	(0.108)
2-year cycle × Change of seat share	1.602***	1.175***	0.981**	0.822*
	(0.526)	(0.452)	(0.407)	(0.440)
2-year cycle × 2-year cycle × Change of seat share	-1.231**	-0.881**	-0.708*	-0.703*
	(0.492)	(0.418)	(0.387)	(0.425)

[3]Stata's -gllamm- can theoretically run a three-level random-slope tobit model, but even powerful computers failed to estimate the mixed equation.

continued

Just won majority	-0.088***	-0.076***	-0.066***	-0.073***
	(0.014)	(0.012)	(0.012)	(0.011)
Just lost majority	0.065***	0.056***	0.047***	0.041***
	(0.017)	(0.015)	(0.013)	(0.011)
Procedural vote	0.009	0.003	0.004	-0.005
	(0.019)	(0.016)	(0.016)	(0.005)
Majority party × Procedural vote	-0.057**	-0.068***	-0.054***	-0.049***
	(0.023)	(0.020)	(0.019)	(0.007)
Presidential politics				
4-year cycle	-0.130	-0.100	-0.105	-0.176**
	(0.101)	(0.092)	(0.073)	(0.071)
4-year cycle × 4-year cycle	0.075	0.051	0.060	0.141**
	(0.092)	(0.086)	(0.067)	(0.066)
Issue divisiveness	0.453***	0.389***	0.386***	0.354***
	(0.082)	(0.071)	(0.067)	(0.040)
4-year cycle × Issue divisiveness	0.608**	0.448*	0.502**	0.525***
	(0.303)	(0.264)	(0.234)	(0.180)
4-year cycle × 4-year cycle × Issue divisiveness	-0.547**	-0.390	-0.444**	-0.515***
	(0.266)	(0.238)	(0.205)	(0.170)
Just won presidency	-0.042***	-0.035***	-0.038***	-0.047***
	(0.016)	(0.012)	(0.013)	(0.011)
Just lost presidency	-0.005	-0.003	-0.003	-0.008
	(0.013)	(0.011)	(0.011)	(0.011)
President's party	0.038***	0.036***	0.032***	0.035***
	(0.010)	(0.008)	(0.008)	(0.008)
Vote on foreign policy	0.004	0.014*	0.013*	0.014***
	(0.010)	(0.008)	(0.008)	(0.003)
President's party × Vote on foreign policy	-0.042***	-0.039***	-0.039***	-0.042***
	(0.013)	(0.011)	(0.011)	(0.005)
Control variables				
Senate	0.014*	0.025***	0.026***	0.035***
	(0.008)	(0.007)	(0.007)	(0.007)
Years since 1933	0.004***	0.004***	0.002***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Years since 1933 × Years since 1933	-8 E-5***	-7 E-5***	-5 E-5***	-5 E-5***
	(1 E-5)	(1 E-5)	(8 E-6)	(8 E-6)
Democrats	0.003	0.003	0.002	0.003
	(0.008)	(0.007)	(0.006)	(0.008)
Random effects				in Table A2
Constant	0.092***		0.158***	0.169***
	(0.031)		(0.025)	(0.022)
Model performance				
Adjusted R2			0.119	
Residual standard deviation				0.286
Deviance		42163		
Pseudo R2	0.128			
F	99***		97***	
Chi2		1539***		2258***
Log pseudolikelihood	-42149	-44331	-16318	-15879
AIC	84355	88715	32690	31838
BIC	84619	88970	32945	32216

Marginal effects with robust standard errors in parentheses, clustered by caucus-term.
N = 93,446 (caucus votes) | 152 (caucus-terms) | 76 (caucus-presidencies).
Significance: *.1 **.05 ***.01

Table A2 Variability of random effects for the hierarchical linear model from Table A1

Level 2 (caucus-term) N=152	
SD(Intercept)	0.056
	(0.008)
SD(2-year cycle)	0.230
	(0.029)
SD(2-year cycle * 2-year cycle)	0.216
	(0.027)
Cor(Intercept with 2-year cycle)	-0.791
	(0.078)
Cor(Intercept with 2-year cycle * 2-year cycle)	0.645
	(0.122)
Cor(2-year cycle with 2-year cycle * 2-year cycle)	-0.970
	(0.012)
Level 3 (caucus-presidency) N=76	
SD(Intercept)	0.053
	(0.011)
SD(4-year cycle)	0.216
	(0.044)
SD(4-year cycle * 4-year cycle)	0.201
	(0.040)
Cor(Intercept with 4-year cycle)	-0.760
	(0.112)
Cor(Intercept with 4-year cycle * 4-year cycle)	0.641
	(0.162)
Cor(4-year cycle with 4-year cycle * 4-year cycle)	-0.977
	(0.016)

Robust standard errors in parentheses.

2) Chamber differences

Here we elaborate our core model with closer attention to differences between Congress's houses. Table A3 presents separate tobit regressions for House and Senate votes. One might expect weaker party effects in the Senate where majority agenda control is less institutionalized and members serve staggered 6-year terms. We find, though, that the model's general structure is similar in both chambers. This makes basic sense: legislators in both arenas grapple with our model's core collision of constituency and party. Moreover, party effects should spill over across chambers, as House leaders' efforts to preserve a party label are less effective if their party's

Senators dissent. These considerations fit with other work that extends the House-based search for party effects into the Senate.[4]

Yet the chambers are quite different arenas, and our three cyclical interactions vary between them in theoretically meaningful ways. The interaction of Change of seat share with Cycle is stronger for the House. This seems reasonable given that Change of seat share reflects caucus heterogeneity. Heterogeneity should be more important in the House: Since Senators' state constituencies are much larger than Representatives' districts, fewer Senators must cater to outlier constituencies. Thus caucus heterogeneity is less challenging for Senate leaders.[5]

The interaction of Majority status with Cycle follows the opposite pattern, with stronger effects in the Senate. This may seem surprising, since the House Majority Leader enjoys more powers than her Senate counterpart. Senators are more independent, however, making cyclical strategies even more important for their leaders. House leaders better control their troops in general, but Senate leaders depend more on shifting dissent when they cannot avoid it altogether. Senators' greater independence shows disproportionately in the middle of a term.

A similar logic explains the Senate's stronger interaction of Issue divisiveness with Cycle. Its higher general divisiveness makes cyclical strategies more important on a four-year schedule, too. Interestingly, though, the *main* effect of Issue divisiveness is stronger for the House. This yields the vertical distances between lines in Figure 4c. The stronger the effect, the more dissent on an issue carries into the next term. Dissent in the House is thus "stickier" than in the Senate. The reason, we believe, again reflects caucus heterogeneity and legislator independence. Senators are more independent but represent less distinct constituencies, and caucus heterogeneity creates "stickier" dissent than independence. Senators take more independent positions, but when they see reasons to align, their less distinct constituencies make this less costly. House members are less independent from the party, with two-year terms that approach a permanent campaign; their dissent reflects more distinct constituencies that impose higher costs for toeing the party line.

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[4]Forgette, Richard, and Brian Sala. 1999. "Conditional Party Government and Member Turnout on Senate Recorded Votes, 1873-1935." *Journal of Politics* 61(2): 467-84.

Snyder, James Jr., and Tim Groseclose. 2000. "Estimating Party Influence in Congressional Roll-Call Voting." *American Journal of Political Science* 44(2): 193-211.

Smith, Steven. 2007. *Party Influence in Congress*. Cambridge: Cambridge University Press.

Monroe, Nathan, Jason Roberts, and David Rohde, eds. 2008. *Why Not Parties? Party Effects in the United States Senate*. Chicago: University of Chicago Press.

Lee, Frances. 2010. *Beyond Ideology: Politics, Principles, and Partisanship in the U.S. Senate*. Chicago: University of Chicago Press.

[5]Staggered Senatorial re-election also makes seat-share changes less extreme and so lessens average implications of the cycle.

Table A3 Estimation by chamber

Estimator	Both chambers (from Table 1)	House only	Senate only
Congressional politics			
2-year cycle	0.175***	0.195***	0.151*
	(0.046)	(0.051)	(0.082)
2-year cycle × 2-year cycle	-0.138***	-0.157***	-0.112*
	(0.041)	(0.051)	(0.065)
Majority party	-0.042**	-0.028	-0.059*
	(0.020)	(0.024)	(0.034)
2-year cycle × Majority party	0.189***	0.135	0.265**
	(0.071)	(0.091)	(0.114)
2-year cycle × 2-year cycle × Majority party	-0.163**	-0.120	-0.223**
	(0.066)	(0.086)	(0.100)
Change of seat share	-0.246*	-0.320**	-0.122
	(0.141)	(0.158)	(0.252)
2-year cycle × Change of seat share	1.602***	1.723***	1.340
	(0.526)	(0.606)	(0.974)
2-year cycle × 2-year cycle × Change of seat share	-1.231**	-1.274**	-1.090
	(0.492)	(0.575)	(0.895)
Just won majority	-0.088***	-0.062***	-0.111***
	(0.014)	(0.014)	(0.021)
Just lost majority	0.065***	0.079***	0.053**
	(0.017)	(0.018)	(0.026)
Procedural vote	0.009	0.021	-0.007
	(0.019)	(0.023)	(0.027)
Majority party × Procedural vote	-0.057**	-0.066**	-0.036
	(0.023)	(0.027)	(0.037)
Presidential politics			
4-year cycle	-0.130	-0.089	-0.169
	(0.101)	(0.117)	(0.173)
4-year cycle × 4-year cycle	0.075	0.025	0.118
	(0.092)	(0.115)	(0.146)
Issue divisiveness	0.453***	0.557***	0.325***
	(0.082)	(0.082)	(0.120)
4-year cycle × Issue divisiveness	0.608**	0.392	0.760*
	(0.303)	(0.349)	(0.457)
4-year cycle × 4-year cycle × Issue divisiveness	-0.547**	-0.351	-0.661*
	(0.266)	(0.343)	(0.384)
Just won presidency	-0.042***	-0.058***	-0.020
	(0.016)	(0.017)	(0.027)
Just lost presidency	-0.005	-0.025**	0.021
	(0.013)	(0.011)	(0.024)
President's party	0.038***	0.041***	0.032*
	(0.010)	(0.010)	(0.018)
Vote on foreign policy	0.004	0.002	0.002
	(0.010)	(0.011)	(0.016)
President's party × Vote on foreign policy	-0.042***	-0.035**	-0.049**
	(0.013)	(0.015)	(0.022)

continued

Control variables			
Senate	0.014*		
	(0.008)		
Years since 1933	0.004***	0.006***	0.002*
	(0.001)	(0.001)	(0.001)
Years since 1933 × Years since 1933	-8 E-5***	-1 E-4***	-7 E-5***
	(1 E-5)	(1 E-5)	(2 E-5)
Democrats	0.003	0.006	-0.004
	(0.008)	(0.009)	(0.014)
Constant	0.092***	0.019	0.194***
	(0.031)	(0.031)	(0.047)
Model performance			
Pseudo R2	0.128	0.146	0.098
F	99***	133***	43***
Log pseudolikelihood	-42149	-19783	-22071
AIC	84355	39620	44196
BIC	84619	39859	44431
N	93446	50326	43120

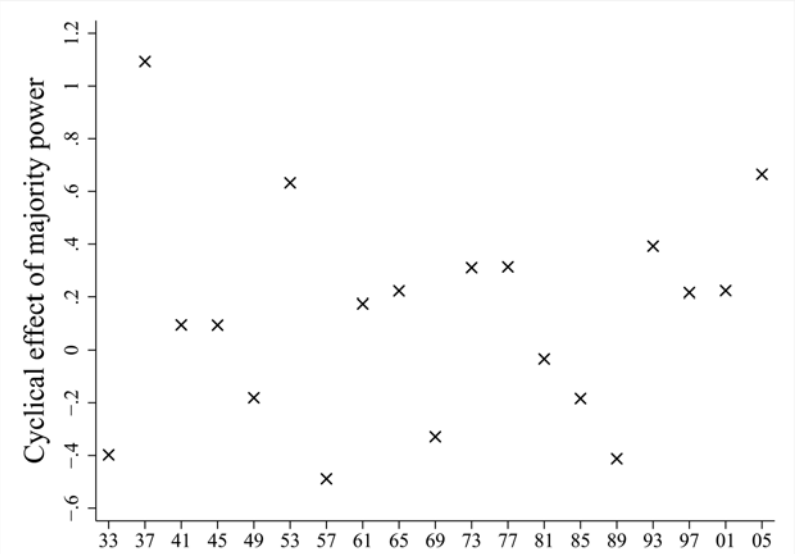
Marginal effects with robust standard errors in parentheses, clustered by caucus-term.
Significance: *.1 **.05 ***.01

3) Long-term trends

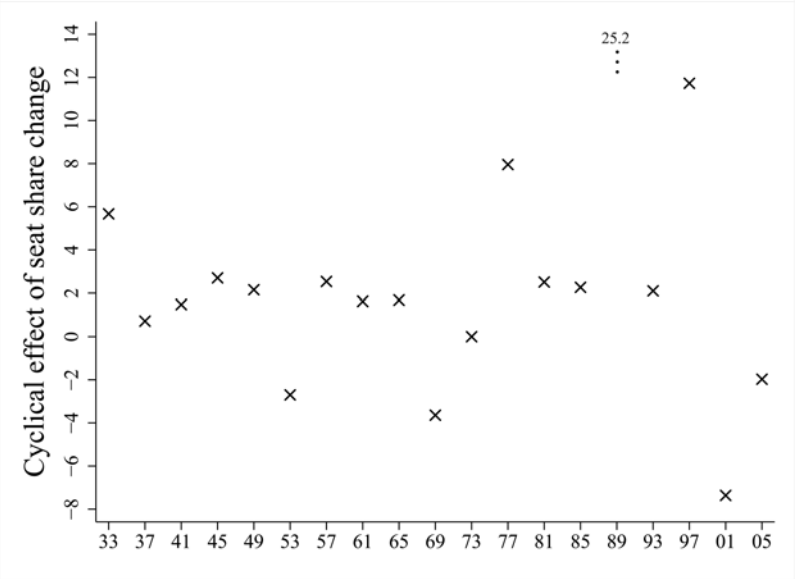
Consider now our findings in the long term. Figure A2 presents aggregated statistics of the three interactions with cycle and cycle-squared (of Majority status, Change of seat share, and Issue divisiveness) separately for each four-year period. The strength of these interactions can be interpreted as indicators of party effects. We find clear variation by presidency, but no clear trends. Our model applies more or less equally well since the New Deal across "textbook," "reform" and "post-reform" Congresses. Even before the decline in overall dissent, roll-call voting displayed systematic party-driven cycles.

This observation need not contradict broadly-accepted views that today's parties are stronger than in the past. Cycles of dissent could be largely separable from historical evolutions. When dissent is high, even weak parties try to converge for elections; as parties become stronger and more homogeneous, they eke out further increments of unity to trace similar cycles. Yet our analysis does challenge strong claims of a "party-less" Congress before the 1980s. Legislators have responded to cyclical incentives to unity, either horizontally factoring party considerations into individual electoral chances or vertically recognizing party leaders' leverage, for a long time. In fact, our argument suggests that the weakest parties may do little besides display this cycling.

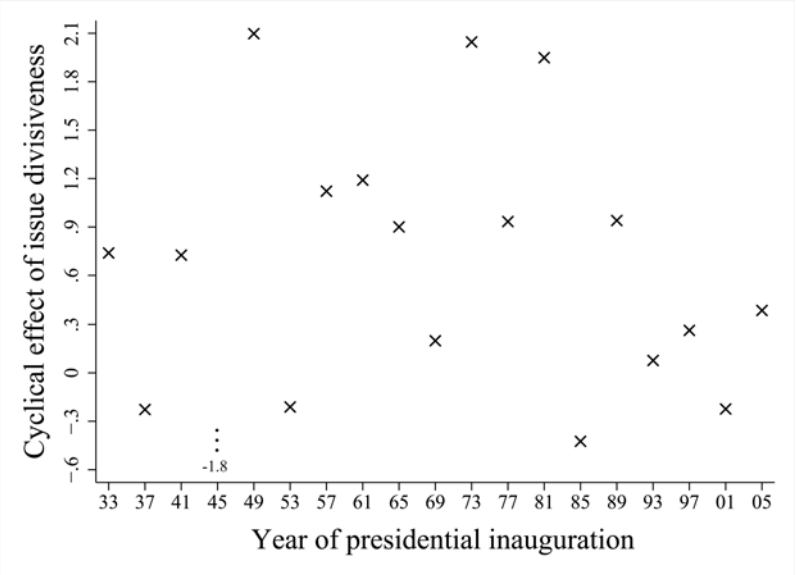
Figure A2 Aggregated strength of interactions with cycle by presidency



a) with majority/minority



b) with change of seat share



c) with issue divisiveness

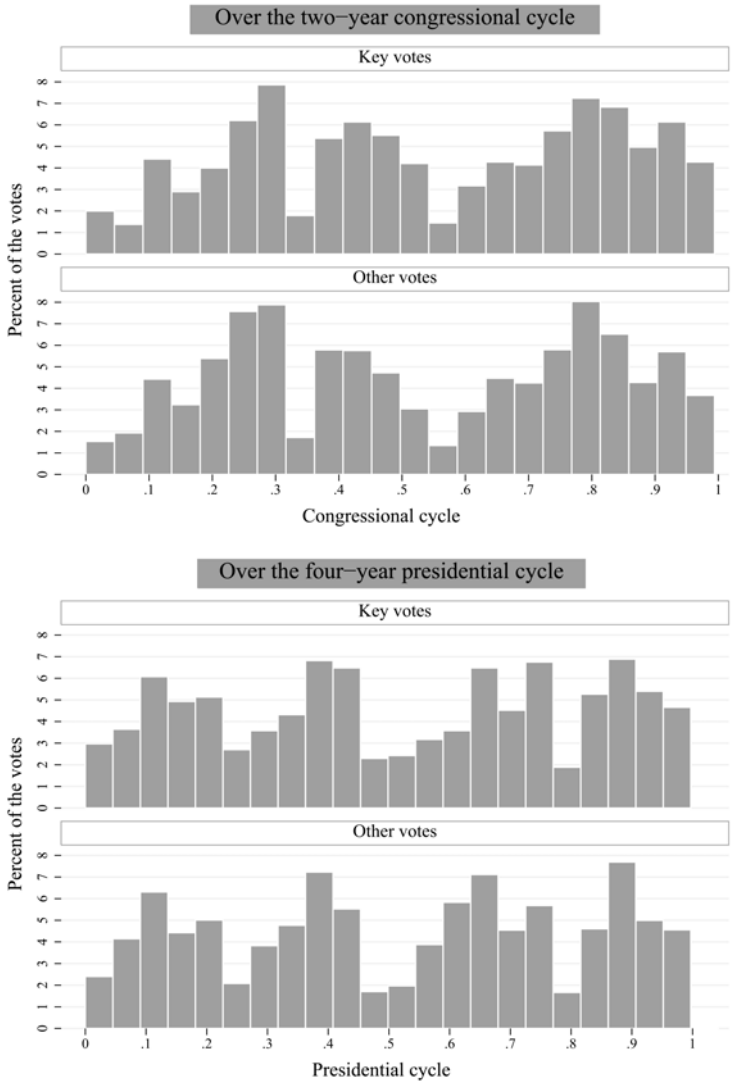
The plotted values reflect separate model runs for each four-year period. Coefficients of the interactions with cycle were saved and the sign-adjusted mean calculated for each pair. Values above 0 support our hypotheses.

4) Distinguishing "Key Votes"

Do party-driven cycles affect important legislation? Most consequential votes might take place close to midterm and thus escape cyclical party influence. To assess this possibility we consult Congressional Quarterly's collection of roll-call votes that reflect "a matter of major controversy, a test of presidential or political power, or a decision of potentially great impact on the nation and lives of Americans." The 1945-2008 period included 1,486 "key votes" (3.3% of the total).[6]

Figure A3 shows the distribution of "key votes" across congressional and presidential terms. Rather than clustering at midterm, their distribution mirrors the overall distribution. Cyclical party effects are evident in regard even to the biggest decisions made on Capitol Hill.

Figure A3 Frequency of CQ key votes and normal votes over time



[6]Key vote values for 1933-1944, which CQ did not collect, were imputed from the data for other years.