Online Appendix for Partisan Manipulation of Dimensionality and Party Polarization in the U.S. Congress

## Analyses for Auxiliary Hypotheses

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The proposed theory on partisan manipulation of dimensionality has three important components, as depicted Figure A-1. The key component is the manipulation itself, which has been empirically tested in the main manuscript. However, at the same time, two auxiliary hypotheses require some attention to address the causes and consequences of manipulation.

First, if the manipulation can be considered to be partisan, it needs to be motivated by the partisan-minded leaders. For example, Representative Howard Smith (D-VA), who was Chairman of the Rules Committee from the 84<sup>th</sup> (1955-56) through 89<sup>th</sup> (1965-1966) Congresses, was infamous for failing to cooperate with liberal Democrats (and the Democratic Party leadership with liberal policy agenda in mind) but instead helping to promote the interests of Southern Democrats (Jones 1968; Manley 1973; Schickler and Pearson 2009). Then, it is likely that restrictive special rules in the House become widely used to promote partisan interests only after the Howard Smith chairmanship.

Similarly, the Robert Byrd leadership in the Senate is equally important because he was the leader who started to utilize complex UCAs in order to promote partisan interests during amending activities on the floor. Therefore, the partisan manipulation of dimensionality in the Senate is more likely to occur after 1970.

Figure A-2 plots the proportion of restrictive rules issued for major legislation in a given Congress. In the upper panel, we see a significant drop of restrictive special rules during Howard Smith Chairmanship (shown as an interval in the middle). However, it



## Figure A-1: Two Auxiliary Hypotheses

bounces back after the 89<sup>th</sup> Congress. To put it differently, the average number of major legislation with the special rules that allow certain amendments only before the 89<sup>th</sup> Congress is 1.70 per Congress and it increases to 3.15 per Congress after Congressman Smith retired from the Rules chairman (t = 2.31, p = 0.03).

The Senate shows similar story. Prior to the Byrd leadership, there was literally no use of complex UCAs that allow certain amendments only. But, it went up significantly afterward. In other words, the average number of major legislation with the restrictive complex UCAs before the 91<sup>st</sup> Congress is 0 per Congress and it increases to 0.92 per Congress after Senator Byrd became the majority leader (t = 2.52, p = 0.03).

In order to incorporate changes over time, I estimate additional regression models that include the bill-level dimensionality as dependent variable (same as in Table 1 and 2), but by different periods. Model 1, 2 and 3 in Table A-1 shows the results before, during and after the Howard Smith Chairmanship in the House, respectively. It turns out that the adoption of modified closed rules is associated with the dominance of the liberal-conservative dimension, both during and after the Smith's control over the Rules Committee. However, it is not the case before the 84<sup>th</sup> Congress. In other words, the manipulation of dimensionality started when Southern Democrats tried to keep civil

Figure A-2: Restrictive Rules Issued for Major Legislation







Senate: Complex UCAs with Certain Amendments Only

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	Model 1	Model 2	Model 3
	Before	During Howard Smith Chairmanship	After
SR – modified closed	0.052	0.129*	0.056*
	(0.039)	(0.056)	(0.027)
SR – closed	omitted	omitted	0.121 (0.074)
Clausen – social welfare	-0.047	0.022	-0.064*
	(0.032)	(0.045)	(0.031)
Clausen – agriculture	0.076	-0.100	-0.031
	(0.071)	(0.081)	(0.046)
Clausen – civil liberties	-0.004	-0.689*	-0.159*
	(0.071)	(0.087)	(0.040)
Clausen – others	-0.047	0.046	-0.005
	(0.039)	(0.088)	(0.045)
Number of introduced bills	0.119	0.061	-0.016
	(0.074)	(0.052)	(0.018)
Number of committees	-0.009	-0.091	-0.009
	(0.033)	(0.049)	(0.011)
(Intercept)	-0.155*	-0.136	-0.012
	(0.077)	(0.074)	(0.028)
N	25	51	110
R <sup>2</sup>	0.33	0.70	0.18
F-statistic	1.21	14.13*	2.81*

Table A-1: Dominance of Liberal-Conservative Dimension, House by Different Periods

Note: OLS; standard errors in parentheses; \*p < 0.05; "(modified) open" is the omitted baseline category for the SR dummies; "government management of the economy" is the omitted baseline category for Clausen dummies.

rights legislation from being scheduled on the floor (although the frequency was low during this period). For sure the negative agenda control was exercised by the Rules Committee for the interests of Southern Democrats. However, at the same time, as the bill becomes more liberal-conservative, Democrats could also hide their internal divisions, which means the negative agenda control for the Democratic Party as a whole. This is consistent with Cox and McCubbins (2005)'s finding that Democrats have constantly low levels of "roll rates" throughout the entire period.

Then, I also estimate regression models for different periods in the Senate. Model 4 and 5 in Table A-2 shows the results before and after the Robert Byrd leadership in the Senate, respectively. The use of restrictive complex UCAs is associated with the dominance of the liberal-conservative dimension, but only after the 90<sup>th</sup> Congress. However, issue contents, such as agriculture, have influence on the dimensionality before the 90<sup>th</sup> Congress, but not afterward. By and large, we see evidence that partisan strategies are deeply involved in utilizing restrictive rules to manipulate the dimensional structure of major legislation.

The second auxiliary hypothesis tests if the manipulation of dimensionality effectively creates partisan behavior in roll-call voting. For example, some roll-call votes are strongly partisan in that a majority of Democrats vote one way and a majority of

	Model 4	Model 5	
	Before	After	
	Robert Byrd	Robert Byrd	
	Leadership	Leadership	
Cloture	0.022	0.028	
	(0.132)	(0.054)	
UCA – highly unrestrictive	0.093	-0.075	
	(0.075)	(0.102)	
UCA – unrestrictive	0.074	-0.136	
	(0.123)	(0.102)	
UCA – restrictive	0.117	0.270*	
	(0.077)	(0.091)	
UCA – highly restrictive	omitted	-0.059	
	omitted	(0.062)	
Clausen – social welfare	-0.048	0.055	
	(0.071)	(0.058)	
Clausen – agriculture	-0.344*	0.076	
	(0.118)	(0.096)	
Clausen – civil liberties	-0.055	0.071	
	(0.123)	(0.069)	
Clausen – foreign policy	-0.017	0.046	
	(0.073)	(0.079)	
Clausen – others	omitted	-0.352	
	offitted	(0.261)	
Number of introduced bills	-0.056	0.032	
	(0.071)	(0.037)	
Number of committees	-0.045	-0.025	
	(0.076)	(0.017)	
(Intercept)	-0.007	-0.057	
	(0.092)	(0.055)	
Ν	87	91	
$\mathbb{R}^2$	0.14	0.22	
F-statistic	1.11	1.89*	

Table A-2: Dominance of Liberal-Conservative Dimension, Senate by Different Periods

Note: OLS; standard errors in parentheses; \*p < 0.05; "no UCA" is the omitted baseline category for the UCA dummies; "government management of the economy" is the omitted baseline category for Clausen dummies.

Republicans vote the other way (so-called party voting), while others are not necessarily partisan. It is worth examining if the legislation that looks liberal-conservative to congressmen and senators is more likely to be subject to party voting.

I first divide the major legislation into two groups: one with party voting records on the final passage votes and the other with no party voting records. The simple *t*-test for the PRE<sub>12</sub> measure (i.e., dimensional structure for major legislation) between the two groups shows statistically significant differences: *t*-value of -2.27 (p = 0.02) for the House and *t*-value of -1.91 (p = 0.06) for the Senate. The major legislation that is dominated by the liberal-conservative dimension is more likely to be subject to party voting.

	House		Senate	
-	Model 6	Model 7	Model 8	Model 9
Dominance of Liberal-Conservative Dimension	2.088*	2.667*	1.685*	2.723*
	(0.911)	(1.058)	(0.815)	(1.065)
Modified Closed Rule		0.354		
		(0.406)		
After Howard Smith Chairmanship		0.448		
		(0.333)		
Restrictive Complex UCA				5.406*
				(1.228)
After Robert Byrd Leadership				1.601*
				(0.541)
(Intercept)	-0.527*	-0.141	-1.275*	-1.062*
	(0.171)	(0.291)	(0.190)	(0.292)
N	186	186	178	178
AIC	238.56	239.46	182.15	136.86

## Table A-3: Determinants of Party Voting

Note: Logit; standard errors in parentheses; \*p < 0.05.

In Table A-3, I also show several regression results. Here, the dependent variable is whether or not the bill is subject to party voting. The independent variables include the dominance of the liberal-conservative dimension (previously the dependent variable in Table 1 and 2), the adoption of restrictive rules, and the partisan period dummy. In both House and Senate models, the bill is more likely to divide members by the party line when it is largely liberal-conservative.