

Online Appendix: How Many Seats in Congress is Control of Redistricting Worth?

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A Online Appendix

A.1 Additional Figures

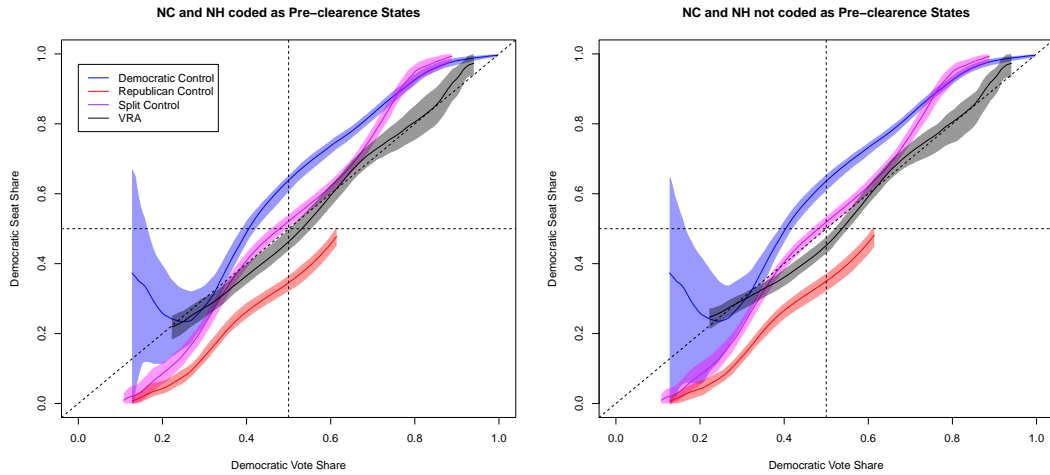


Figure A.1: *The Vote-Seat Curve and Preclearance, Alternative Coding of Preclearance States* — Curves are estimated using locally-constant Kernel regression. Shaded regions are 95% confidence bands, estimated using the non-parametric bootstrap. In the left panel, New Hampshire and North Carolina—partially covered states with many counties subject to preclearance—were coded as preclearance states. In the right panel, New Hampshire and North Carolina were not coded as preclearance states.

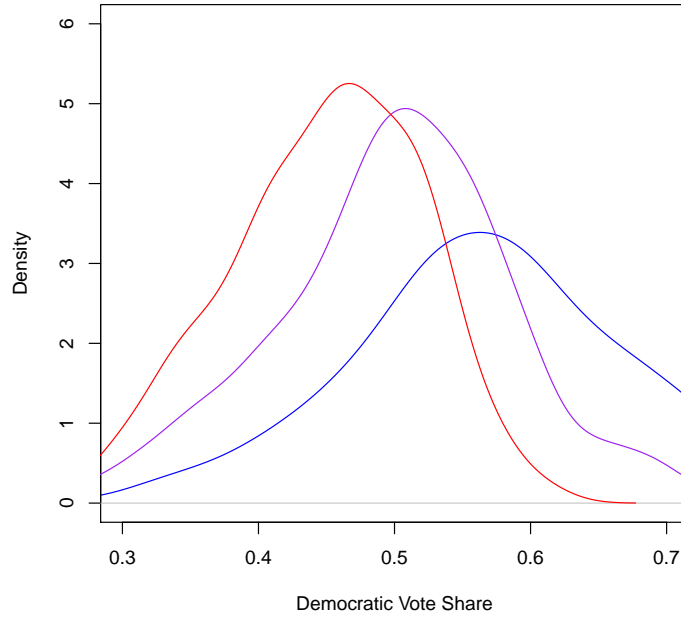


Figure A.2: *Density of House Democratic Vote Share by Regime — Curves are estimated using Kernel density estimation.*

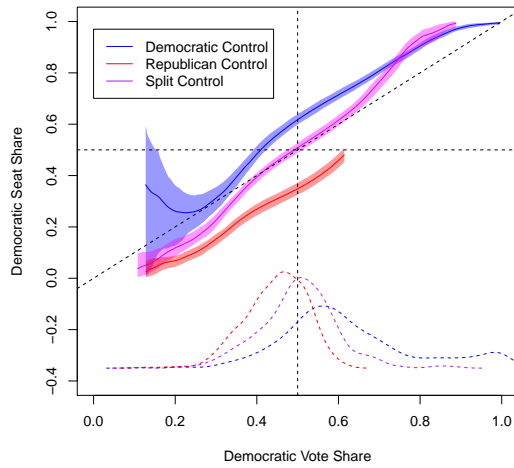


Figure A.3: *Vote-Seat Curve and Density of House Democratic Vote Share by Regime — Solid curves (representing the vote-seat curve by regime) are estimated using Kernel density estimation and dashed curves (representing the density of House Democratic vote share by regime) are estimated using Kernel density estimation.*

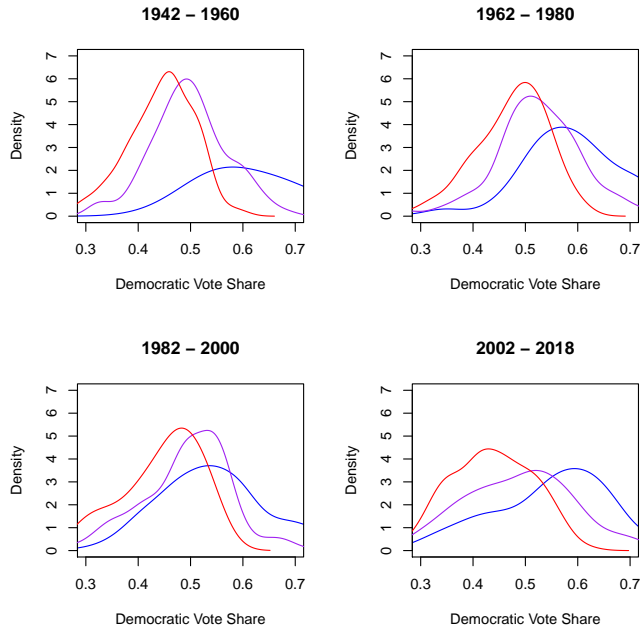


Figure A.4: *Density of House Democratic Vote Share by Regime, Disaggregated by Time Period — Curves are estimated using Kernel density estimation.*

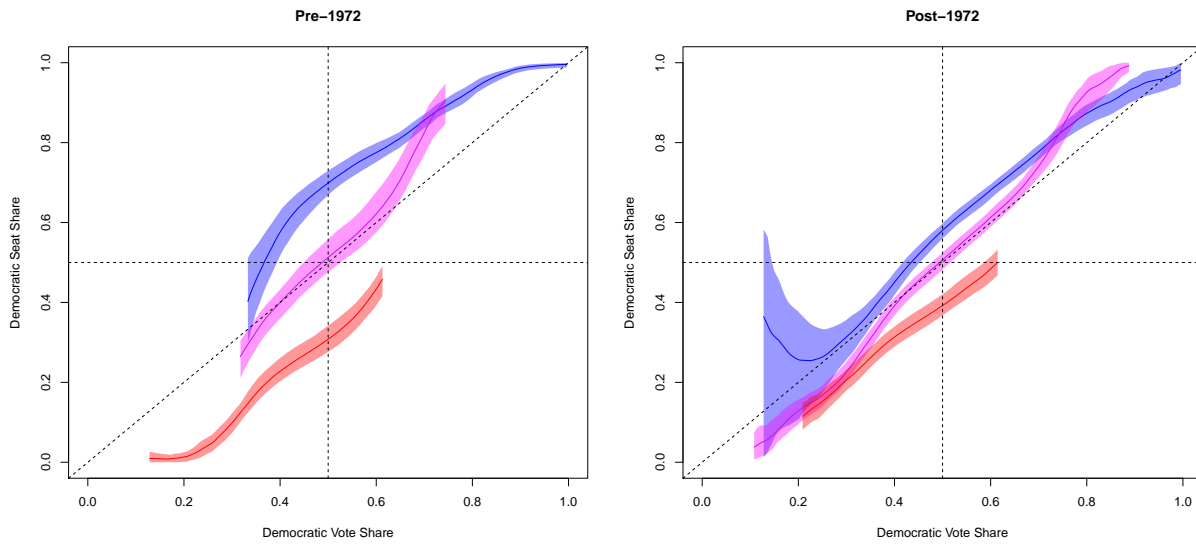


Figure A.5: *Vote-Seat Curve by State and Year, Disaggregated by Time Period (pre and post the effect of Baker v. Carr) — Curves are estimated using locally-constant Kernel regression. Shaded regions are 95% confidence bands, estimated using the non-parametric bootstrap.*

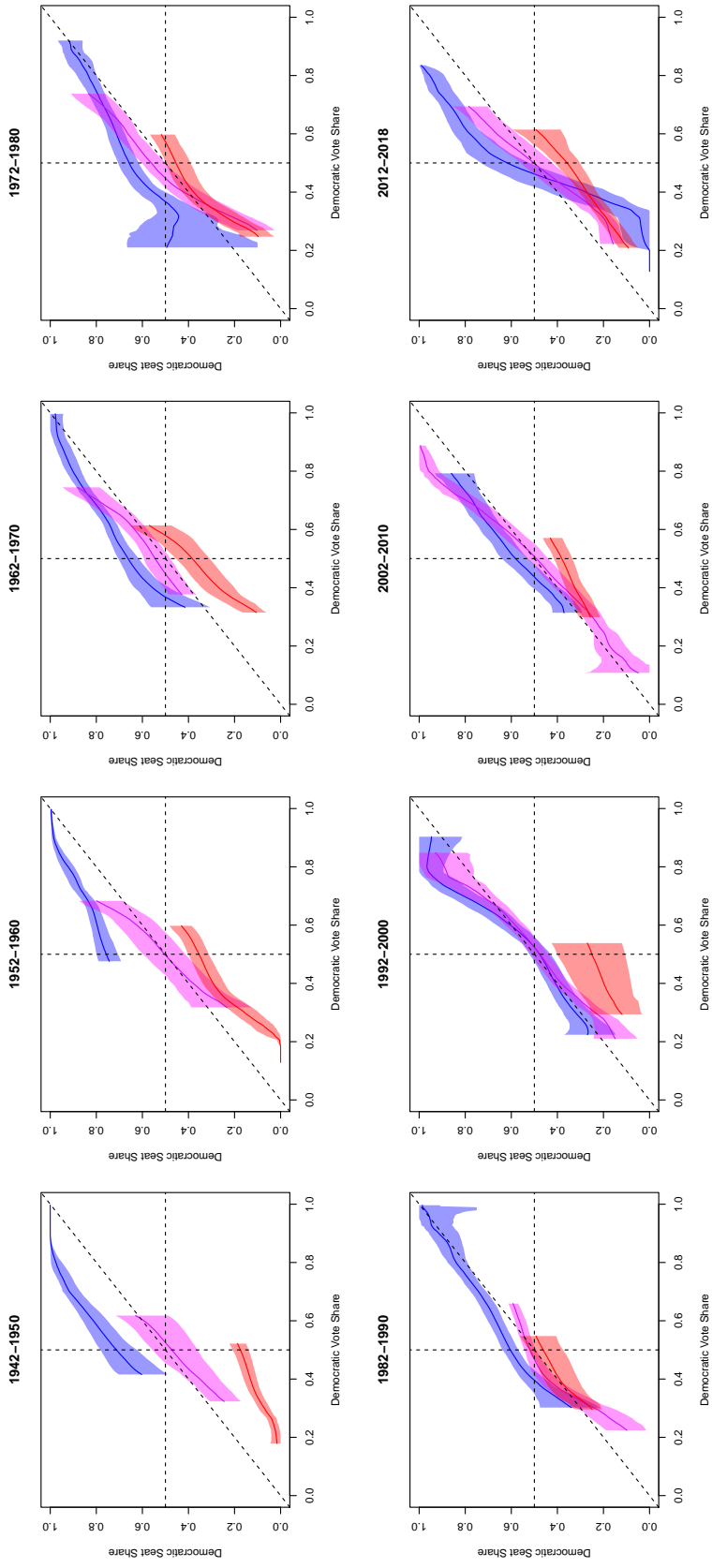


Figure A.6: *Vote-Seat Curve by State and Year, Disaggregated by Time Period (time periods between decennial censuses)*
 — Curves are estimated using locally-constant Kernel regression. Shaded regions are 95% confidence bands, estimated using the non-parametric bootstrap.

A.2 Alternative Specifications

In this appendix, we show that the main conclusions we found using nonparametric methods continue to hold using two parametric methods. In Table 1, we estimate a linear model where vote share is transformed as suggested in equation 2 in the paper. Vote share transformed is denoted as “Responsiveness” in the table. The constant term denotes the expected seat share when vote share is 50% under split control. The Democratic and Republican control dummies denote the difference in vote share between these regimes and split control when vote share is 50%. In discussing the results, we largely ignore the responsiveness coefficient and its’ interactions because they are both difficult to interpret and can be affected by extrapolating outside the sample. In column (1), the constant term is not statistically distinguishable from 0.5, indicating that under split control, we observe no bias when aggregating 80 years of data. This continues to be true in columns (2) through (5), indicating that we do not observe bias under split control in any of the time periods we analyze. The signs of the coefficients of Democratic control and Republican control are consistent with expectations, but the benefit of control has varied considerably over time. The Democratic Party benefited greatly from redistricting prior to 1980, but the benefit is only 2.7% of seats in the modern period. The Republican Party saw their benefit decrease over time, but in the modern period it has ticked up to 4.8%.

Table 2 expands on these results and controls for year, a dummy for the preclearance requirement of the VRA, and the presence of a redistricting commission, interacted appropriately with the other variables in the model. To make the coefficients easier to interpret, the year variable refers to the number of years since 1942. Here, the constant term reflects the bias under split control, in 1942, in a state with no redistricting commission, not subject to preclearance, when vote share is 50%. Under this case, there is no detectable bias. Under these same conditions, but under Democratic control, the Democratic Party would gain an extra 30% of the seats. The Republican Party would gain 11% of the seats. The year term

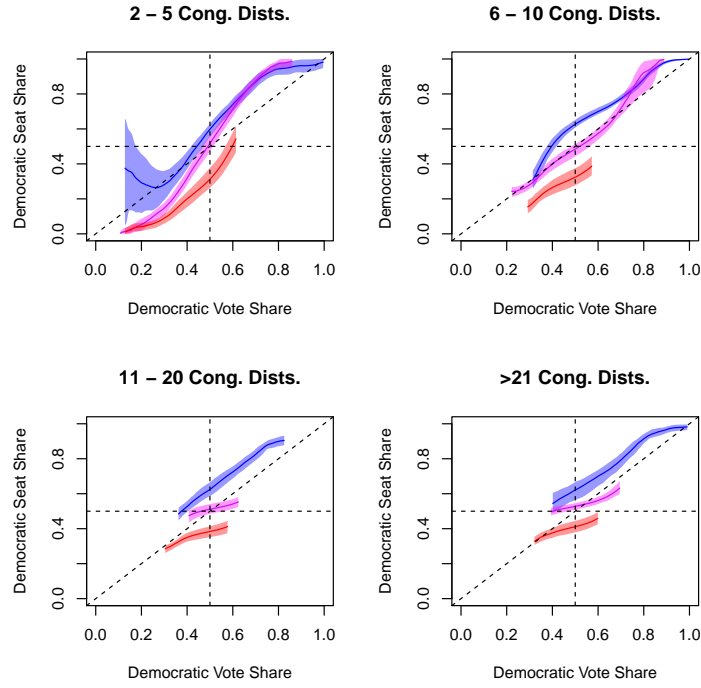


Figure A.7: *Vote-Seat Curve by State and Year, Disaggregated by Number of Congressional Districts* — Curves are estimated using locally-constant Kernel regression. Shaded regions are 95% confidence bands, estimated using the non-parametric bootstrap.

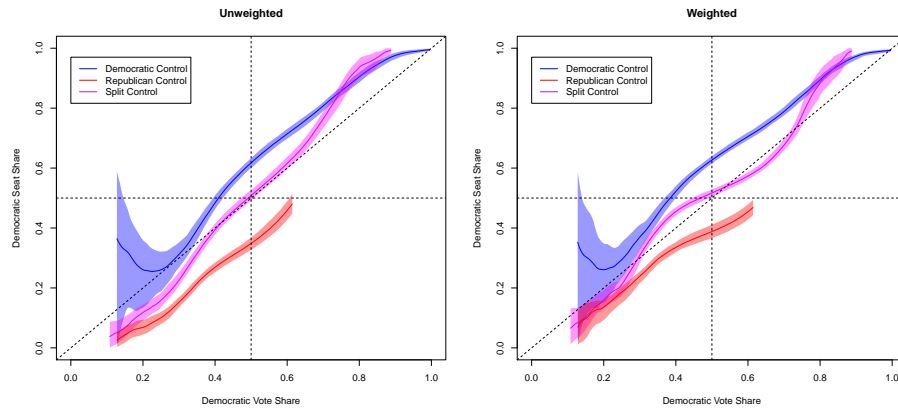


Figure A.8: *Vote-Seat Curve by State and Year, Unweighted vs. Weighted* — Curves are estimated using locally-constant Kernel regression. Shaded regions are 95% confidence bands, estimated using the non-parametric bootstrap.

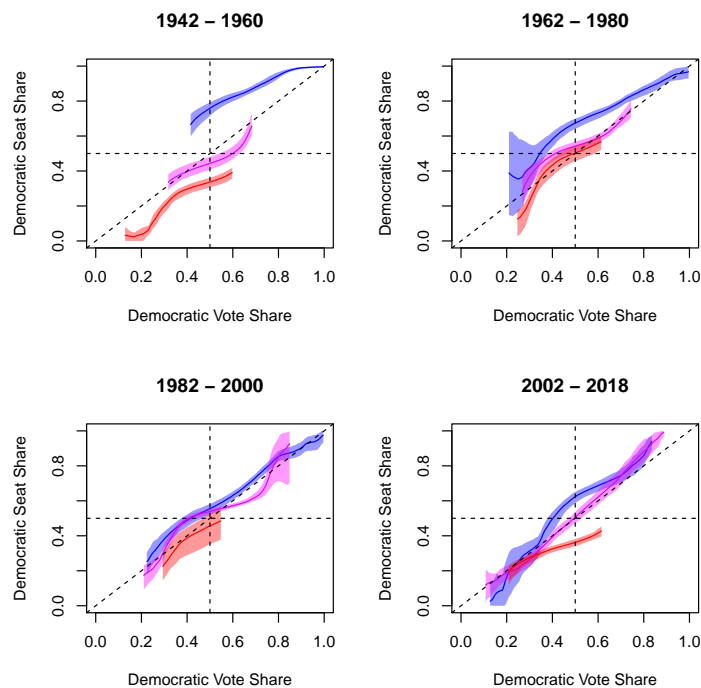


Figure A.9: *Vote-Seat Curve by State and Year, Disaggregated by Time Period and Weighted by Number of Congressional Districts* — Curves are estimated using locally-constant Kernel regression. Shaded regions are 95% confidence bands, estimated using the non-parametric bootstrap.

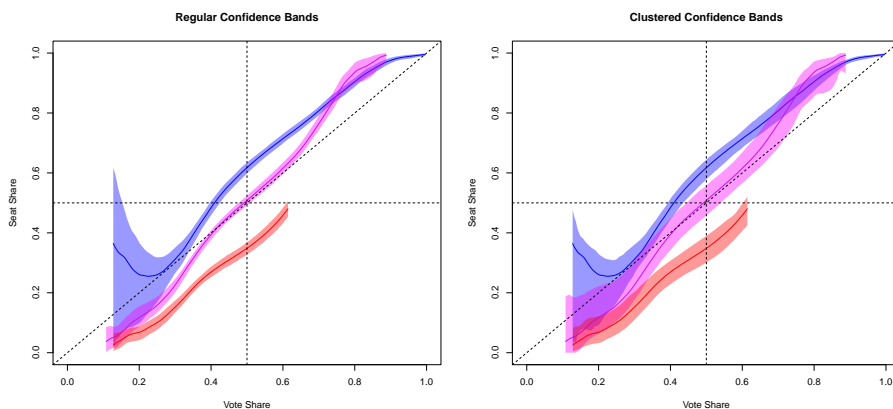


Figure A.10: *Vote-Seat Curve, Regular vs. Clustered Confidence Bands* — Curves are estimated using locally-constant Kernel regression. Shaded regions are 95% confidence bands, estimated using the non-parametric bootstrap. In the left panel, the bootstrap sampled individual data points with replacement. In the right panel, the bootstrap sampled state-decades (running from a year ending in 2 through a year ending in 0) with replacement.

indicates that there is no trend in bias under split control. The Democratic * Year term indicates that the Democratic advantage has been decreasing by half a percent a year. The Republican * Year indicates that the Republican advantage has been increasing by a tenth of a percent a year. Note, however, that this specification imposes linear change in the advantage of control, while the results we have found so far indicate that this assumption is likely violated. The Democratic Party does 1.1% worse under redistricting commissions (relative to no commissions) under split control, though this effect is not statistically significant. The Democratic Party does 14.3% better under redistricting commissions when they control state government, which is entirely inconsistent with claims by reformers that commissions will produce more neutral outcomes. Preclearance states under split control see the Democratic Party lose 8.6% of the seats. Under Democratic control, preclearance only costs the Democratic Party 2.6% of the seats, while under Republican control, they gain 1.9% of the seats. We find largely similar results when disaggregating over time, with one exception—disaggregating reveals the fact that the Democratic benefit from redistricting dropped suddenly rather than gradually and that the benefit to Republican control first decreased, but has recently increased.

	(1)	(2)	(3)	(4)	(5)
Sample:	All Years	1942-1960	1962-1980	1982-2000	2002-2018
Independent Variables:					
Constant	0.502*** (0.007)	0.502*** (0.019)	0.503*** (0.014)	0.492*** (0.009)	0.503*** (0.013)
Dem. Control	0.127*** (0.015)	0.286*** (0.031)	0.116*** (0.023)	0.024+ (0.015)	0.027 (0.023)
Rep. Control	-0.069*** (0.013)	-0.131*** (0.029)	-0.029 (0.023)	-0.042 (0.039)	-0.048* (0.024)
Responsiveness	0.528*** (0.027)	0.910*** (0.061)	0.658*** (0.037)	0.486*** (0.032)	0.435*** (0.036)
Responsiveness * Dem. Control	-0.400*** (0.035)	-0.858*** (0.062)	-0.442*** (0.043)	-0.121** (0.043)	0.010 (0.053)
Responsiveness * Rep. Control	0.045 (0.048)	-0.391*** (0.104)	0.129 (0.082)	0.038 (0.097)	0.060 (0.058)
N	1685	420	444	434	387
R-Squared	0.638	0.773	0.676	0.687	0.723

Table 1: Effect of Control of Redistricting on Vote Seat Curve, Basic Model — Heteroskedasticity-robust standard errors in parentheses. + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Sample:	(1)	(2)	(3)	(4)	(5)
	All Years	1942-1960	1962-1980	1982-2000	2002-2018
Independent Variables:					
Constant	0.498*** (0.017)	0.502*** (0.019)	0.503*** (0.014)	0.498*** (0.009)	0.510*** (0.014)
Dem. Control	0.299*** (0.032)	0.286*** (0.031)	0.116*** (0.023)	0.008 (0.018)	0.002 (0.037)
Rep. Control	-0.110*** (0.029)	-0.131*** (0.029)	-0.029 (0.023)	-0.003 (0.034)	-0.085** (0.026)
Year	0.000 (0.000)				
Dem. Control * Year	-0.005*** (0.001)				
Rep. Control * Year	0.001+ (0.001)				
Redist. Com.	-0.011 (0.036)				0.117 (0.088)
Redist. Com. * Dem. Control	0.154** (0.052)				-0.053 (0.099)
Redist. Com. * Rep. Control	0.014 (0.049)				-0.092 (0.094)
Preclearance	-0.086 (0.061)			-0.174** (0.053)	-0.057 (0.082)
Preclearance * Dem. Control	0.060 (0.064)			0.205*** (0.057)	0.057 (0.092)
Preclearance * Rep. Control	0.105 (0.077)			-0.047 (0.129)	0.155 (0.103)
Responsiveness	0.868*** (0.048)	0.910*** (0.061)	0.658*** (0.037)	0.495*** (0.034)	0.428*** (0.041)
Responsiveness * Dem. Control	-0.856*** (0.053)	-0.858*** (0.062)	-0.442*** (0.043)	-0.118* (0.051)	0.026 (0.074)
Responsiveness * Rep. Control	-0.272** (0.104)	-0.391*** (0.104)	0.129 (0.082)	0.195 (0.131)	0.021 (0.069)
Responsiveness * Year	-0.007*** (0.001)				
Responsiveness * Dem. Control * Year	0.012*** (0.001)				
Responsiveness * Rep. Control * Year	0.006** (0.002)				
Responsiveness * Redist. Com.	-0.025 (0.114)				0.207 (0.182)
Responsiveness * Redist. Com. * Dem. Control	-0.044 (0.122)				-0.250 (0.200)
Responsiveness * Redist. Com. * Rep. Control	0.104 (0.135)				-0.036 (0.196)
Responsiveness * Preclearance	-0.122 (0.119)			-0.321** (0.116)	-0.036 (0.148)
Responsiveness * Preclearance * Dem. Control	0.116 (0.122)			0.272* (0.125)	-0.079 (0.188)
Responsiveness * Preclearance * Rep. Control	0.037 (0.155)			-0.184 (0.245)	0.136 (0.207)
N	1685	420	444	434	387
R-Squared	0.714	0.773	0.676	0.705	0.732

Table 2: Effect of Control of Redistricting on Vote Seat Curve, Additional Interactions — Heteroskedasticity-robust standard errors in parentheses. ⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

	(1)	(2)	(3)	(4)	(5)
Sample:	All Years	1942-1960	1962-1980	1982-2000	2002-2018
Independent Variables:					
Constant	-0.011 (0.026)	-0.045 (0.065)	0.038 (0.053)	0.012 (0.044)	-0.003 (0.063)
Dem. Control	0.244*** (0.045)	0.642*** (0.153)	0.380*** (0.092)	0.127+ (0.069)	0.080 (0.104)
Rep. Control	-0.227*** (0.044)	-0.301*** (0.089)	-0.150+ (0.087)	0.001 (0.197)	-0.305** (0.093)
Responsiveness	2.409*** (0.105)	3.236*** (0.335)	2.583*** (0.242)	2.018*** (0.182)	2.336*** (0.171)
Responsiveness * Dem. Control	-0.441*** (0.134)	-1.214** (0.410)	-1.058*** (0.282)	-0.194 (0.237)	-0.036 (0.275)
Responsiveness * Rep. Control	0.240 (0.179)	0.304 (0.457)	0.687 (0.419)	0.775 (0.789)	-0.654* (0.276)
N	1685	420	444	434	387

Table 3: Effect of Control of Redistricting on Vote Seat Curve, Basic Model — Heteroskedasticity-robust standard errors in parentheses. ⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

The results in Tables 3 and 4 are largely similar, but are considerably more difficult to interpret. In column (1) of Table 3, we find that the Democratic Party gained 6.0% of the seats when they controlled the redistricting process and the Republican Party gained 5.6% of the seats when they controlled the redistricting process, in a state where the House vote was evenly divided among the parties. Under split control, the Democratic Party gained 49.7% of the seats when they received 50% of the votes. We continue to find that the Democratic advantage decreased over time and that the Republican advantage first decreased and then increased. We continue to find that the preclearance requirement hurt the Democratic Party in states with Democratic control and split control, while slightly benefiting them in Republican controlled states. We continue to find no support for the theory that redistricting commissions insulate the redistricting process from partisan influences. In short, our main findings continue to hold in Tables 1-4.

	(1)	(2)	(3)	(4)	(5)
Sample:	All Years	1942-1960	1962-1980	1982-2000	2002-2018
Independent Variables:					
Constant	-0.030 (0.058)	-0.045 (0.065)	0.038 (0.053)	0.021 (0.046)	-0.033 (0.073)
Dem. Control	0.697*** (0.120)	0.642*** (0.153)	0.380*** (0.092)	0.024 (0.087)	-0.147 (0.168)
Rep. Control	-0.222* (0.089)	-0.301*** (0.089)	-0.150+ (0.087)	0.001 (0.213)	-0.334** (0.112)
Year	0.001 (0.001)				
Dem. Control * Year	-0.011*** (0.003)				
Rep. Control * Year	-0.001 (0.002)				
Redist. Com.	-0.030 (0.222)				0.501 (0.579)
Redist. Com. * Dem. Control	-0.015 (0.344)				-0.348 (0.660)
Redist. Com. * Rep. Control	0.162 (0.291)				-0.273 (0.612)
Preclearance	-0.344* (0.171)			-0.815** (0.290)	-0.152 (0.229)
Preclearance * Dem. Control	0.348+ (0.190)			1.020*** (0.309)	0.380 (0.336)
Preclearance * Rep. Control	0.236 (0.241)			0.223 (0.763)	0.150 (0.291)
Responsiveness	2.872*** (0.265)	3.236*** (0.335)	2.583*** (0.242)	2.074*** (0.200)	2.480*** (0.203)
Responsiveness * Dem. Control	-1.074** (0.329)	-1.214** (0.410)	-1.058*** (0.282)	0.101 (0.299)	0.637 (0.483)
Responsiveness * Rep. Control	1.164** (0.412)	0.304 (0.457)	0.687 (0.419)	2.450 (1.629)	-0.486 (0.374)
Responsiveness * Year	-0.008 (0.005)				
Responsiveness * Dem. Control * Year	0.015* (0.007)				
Responsiveness * Rep. Control * Year	-0.017+ (0.009)				
Responsiveness * Redist. Com.	0.213 (0.886)				1.107 (1.721)
Responsiveness * Redist. Com. * Dem. Control	0.162 (1.079)				-1.747 (1.886)
Responsiveness * Redist. Com. * Rep. Control	-0.091 (1.164)				-0.676 (1.887)
Responsiveness * Preclearance	-1.145** (0.405)			-1.632* (0.645)	-0.899 (0.555)
Responsiveness * Preclearance * Dem. Control	0.408 (0.446)			0.906 (0.715)	-0.861 (0.934)
Responsiveness * Preclearance * Rep. Control	-0.010 (0.621)			-1.617 (2.205)	0.023 (0.753)
N	1685	420	444	434	387

Table 4: Effect of Control of Redistricting on Vote Seat Curve, Additional Interactions — Heteroskedasticity-robust standard errors in parentheses. ⁺ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.