

Appendix

The first portion of the appendix presents some additional descriptive statistics. To provide a more comprehensive view of the trends in inequality across all Brazilian states, Figure 1 shows the time-series of income Gini across all Brazilian states. Table 1 is the basic descriptive statistics for all variables employed in the models. Table 2 presents the average political competition of each Brazilian state — simply calculated as the average margin of victory for all legislative elections from 1998-2015 — while Table 3 presents additional average descriptive statistics on each state party system. Along with legislative political competition, the columns for Table 3 are: party dominance (see below for explanation), average legislative electoral volatility, average governor electoral volatility, and the average percentage of vote share garnered by left-wing parties in legislative elections. All figures were calculated by the author, based on data from the TSE. Electoral volatility is calculated based on the Pedersen index.

Table 4 presents basic descriptive statistics for the states of Pará and Rio Grande do Sul, highlighting the extreme differences on a number of economic, political, and social dimensions. Tables 5 and 6 display the total vote share that was garnered by the top four parties in each state legislative election from 1998-2014.

To show that the relationship between political competition and inequality is not solely driven by repeated observations from a single state, or select number of states, it is possible to analyze an extremely straight-forward cross-sectional relationship between the data (by taking the average values of political competition and inequality for each state). Figure 2 shows the bivariate scatter plot between political competition and inequality. Plotting the data reveals the presence of three outliers — Distrito Federal, Piauí, and Santa Catarina. Although two-way fixed effects models show a robust and statistically significant relationship between political competition and inequality in the main specifications of the article, the inclusion of these outliers in an extremely conservative cross-sectional OLS regression does significantly limit the substantive effects of competition on inequality. Model 1 in Table 7 runs a simple OLS regression on all 27 states, showing a strong relationship — but one that closely misses the threshold for statistical significance — between political competition and inequality. However, when the outliers are excluded, the relationship is statistically significant. This exercise suggests that the relationship between political competition and inequality is generally strong throughout the country — no matter how one slices the data — and is not driven by repeated observations under conditions of time-series cross-sectional data analysis.

Tables 8 and 9 show the results of supplemental analyses with the exclusion of two-way fixed effects. Table 9 shows the straight-forward pooled OLS model. The only major differences in the pooled OLS model in comparison to the main specifications in the article is that some minor changes in the control variables. The log of GDP per capita, commodity production, education, and extractive state capacity are statistically significant in a less conservative statistical environment, while social spending is not. Table 9 employs similar

models to the main specifications, but only including either fixed state or year effects in each model. Models 1-5 include fixed year effects, while Models 6-10 include fixed state effects. Once again, the results are fairly comparable, with only minor changes to some of the relationships between control variables and inequality. The main exception is non-white population. In the pooled OLS models, as well as those that include solely year fixed effects, the relationship is robust and positive. This suggests that, cross-sectionally, states with larger non-white populations are more likely to exhibit higher inequality. However, when state fixed effects are included — the relationship becomes negative, showing that the over-time relationship operates in the other direction: states are generally becoming more mixed and inequality is lessening over time. Most importantly, however, the relationship between political competition and inequality remains statistically significant and robust across all models.

Table 10 employs identical models as the main specifications in the article with the exception of utilizing an alternative measure of party system competition. This alternative measure of competition, ‘party dominance,’ is the total vote share of the most winningest party in *Asamblea Legislativa* elections. In other words, this measure captures the degree to which elections are dominated by one party in comparison to the rest of the party system. In turn, states with consistently high party dominance exhibit party systems where one party wins large margins of victory and plays a predominant role in their respective party system. In contrast, in states where party dominance is lower, party competition is more diffused among a greater number of parties. The results show that party dominance has a positive and statistically significant relationship across all models, indicating that the relationship between party system competition and inequality is robust across multiple dimensions.

Finally, Table 11 tests the relationship between gubernatorial margin of victory and inequality. Similarly to Table 10, Models 1-5 employ identical specifications as those in the article with the exception of exchanging legislative margin of victory for the gubernatorial counterpart. Gubernatorial margin of victory shows no clear relationship with levels of inequality, and when the full models are employed in Model 5, the direction of the relationship becomes positive. Model 6 inserts legislative margin of victory back into the model, effectively converting gubernatorial margin of victory as a control. With gubernatorial margin of victory as a control, the relationship between legislative margin of victory and inequality remains nearly identical, suggesting that the relationship between party system competition and inequality is driven predominantly at the legislative level.

Figure 1: Inequality (Gini), All Brazilian States 2001-2015

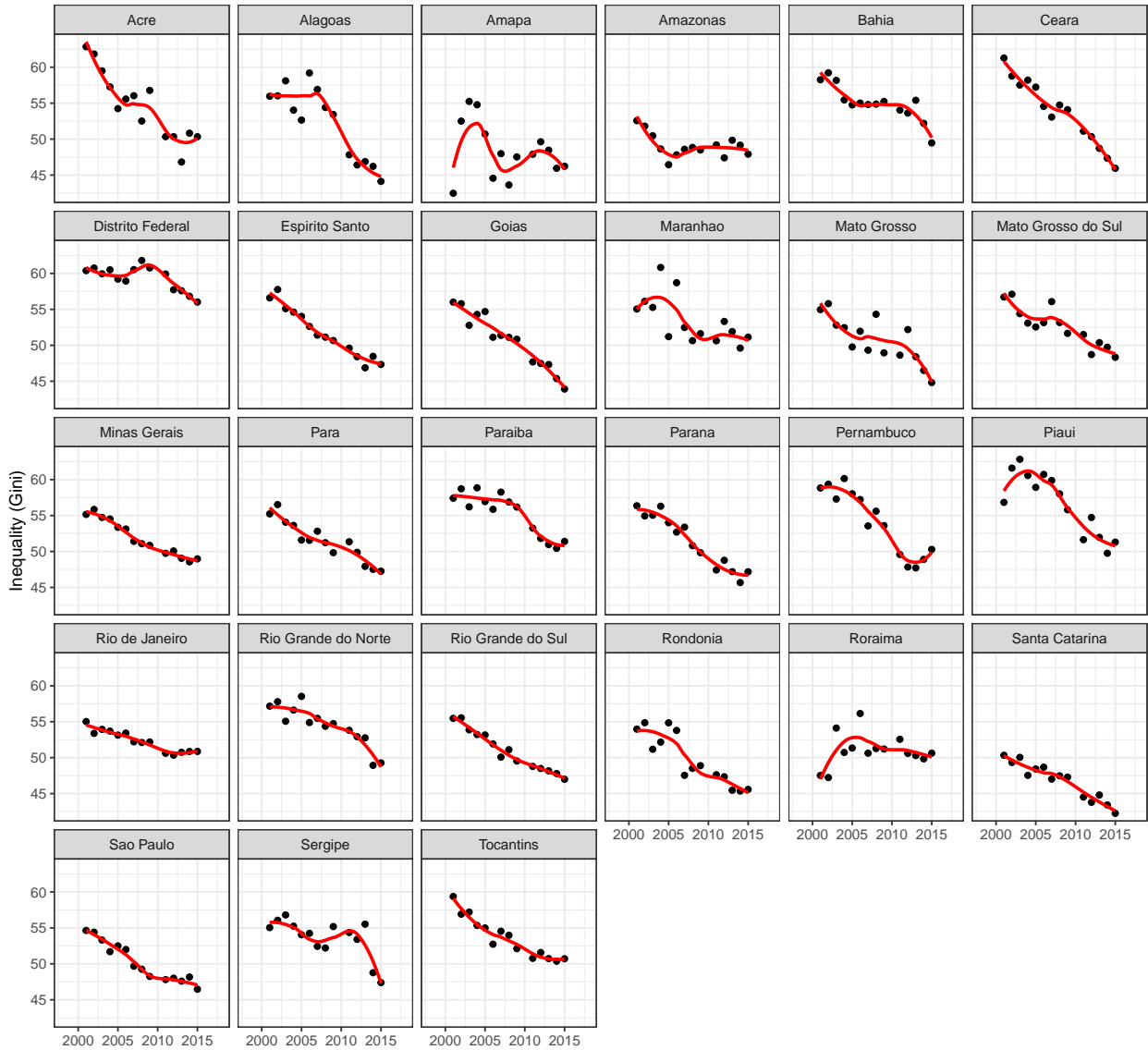


Table 1: Descriptive Statistics, All Variables

	Mean	Std. Dev.	Min.	Max.	N
Inequality	52.43	4.11	42.25	62.85	378
Margin of Victory (Legislative)	0.06	4.11	$7.16e^{-6}$	0.32	486
Political Alignment	1.26	0.76	0	2	459
Strength of Left	0.35	0.12	0.04	0.74	486
Left Governor	0.35	0.47	0	1	486
PT Organization	0.37	0.42	$7.04e^{-3}$	2.24	405
GDP per capita (log)	3.94	0.31	3.14	4.79	365
Commodity Production	4.48	7.04	0.02	36.46	405
Education	41.06	14.00	10.70	73.00	459
Non-White Population	60.65	18.48	7.78	8.30	378
Civil Society Density (log)	6.27	0.34	5.27	7.26	405
Social Spending	0.40	0.05	0.27	0.54	351
Extractive State Capacity	1.29	1.18	0.08	7.54	351

Table 2: Average Political Competition, All States

	Margin of Victory (Vote Share Difference, in %)
Acre	0.08 (8%)
Alagoas	0.10 (10%)
Amapá	0.03 (3%)
Amazonas	0.04 (4%)
Bahia	0.12 (12%)
Ceará	0.14 (14%)
Distrito Federal	0.03 (3%)
Espirito Santo	0.01 (1%)
Goías	0.08 (8%)
Maranhão	0.07 (7%)
Mato Grosso	0.04 (4%)
Mato Grosso do Sul	0.06 (6%)
Minas Gerais	0.04 (4%)
Pará	0.02 (2%)
Paraíba	0.11 (11%)
Parana	0.07 (7%)
Pernambuco	0.08 (8%)
Piauí	0.04 (4%)
Rio de Janeiro	0.07 (7%)
Rio Grande do Norte	0.05 (5%)
Rio Grande do Sul	0.03 (3%)
Rondônia	0.03 (3%)
Roraima	0.01 (1%)
Santa Catarina	0.05 (5%)
São Paulo	0.05 (5%)
Sergipe	0.04 (4%)
Tocantins	0.08 (8%)

Table 3: Additional Descriptive Statistics (Averages) of State Party Systems

	Leg. Comp.	Party Dom.	Leg. Elect. Vol.	Gov. Elect. Vol.	% Left
Acre	0.08	0.20	30.78	34.15	0.46
Alagoas	0.10	0.25	44.93	65.74	0.50
Amapá	0.03	0.14	31.33	59.12	0.38
Amazonas	0.04	0.17	35.26	91.91	0.27
Bahia	0.12	0.25	22.73	28.70	0.31
Ceará	0.14	0.27	35.60	42.36	0.30
Distrito Federal	0.03	0.15	26.61	56.97	0.42
Espirito Santo	0.01	0.12	27.33	85.66	0.44
Goias	0.08	0.25	25.41	47.30	0.21
Maranhão	0.07	0.20	34.43	38.77	0.30
Mato Grosso	0.04	0.21	34.75	72.67	0.30
Mato Grosso do Sul	0.04	0.22	25.23	41.31	0.38
Minas Gerais	0.04	0.17	23.43	39.73	0.37
Pará	0.02	0.18	23.66	32.17	0.34
Paraíba	0.11	0.28	25.08	43.79	0.23
Parana	0.07	0.22	26.36	59.73	0.35
Pernambuco	0.08	0.20	29.55	52.76	0.47
Piauí	0.04	0.23	23.52	59.21	0.36
Rio de Janeiro	0.07	0.19	32.73	63.28	0.35
Rio Grande do Norte	0.05	0.22	33.10	71.41	0.35
Rio Grande do Sul	0.03	0.20	13.87	26.32	0.56
Rondônia	0.03	0.14	31.66	57.35	0.34
Roraima	0.01	0.12	37.32	71.22	0.24
Santa Catarina	0.05	0.24	18.92	41.78	0.23
São Paulo	0.05	0.22	19.30	21.90	0.41
Sergipe	0.04	0.18	33.23	47.69	0.32
Tocantins	0.08	0.25	28.68	36.24	0.23

Table 4: Descriptive Statistics (Averages) of Pará and Rio Grande do Sul

	Pará	Rio Grande do Sul
<i>Margin of Victory (Legislative)</i>	0.02	0.03
<i>Party Dominance</i>	0.20	0.18
Political Alignment	0.94	1.47
Strength of Left	0.36	0.55
Left Governor	0.22	0.44
PT Organization	0.32	0.86
GDP per capita (log)	3.79	4.16
Commodity Production	1.85	16.29
Education	28.89	48.45
Non-White Population	78.09	17.30
Civil Society Density (log)	6.69	5.67
Social Spending	0.45	0.39
Extractive State Capacity	0.63	2.43

Table 5: Legislative Electoral Results (% of Total Vote Share), Pará

	1998	2002	2006	2010	2014
Partido do Movimento Democrático Brasileiro (PMDB)	21.0	18.9	12.0	16.3	14.5
Partido da Social Democracia Brasileira (PSDB)	21.4	16.1	20.5	13.4	14.1
Partido dos Trabalhadores (PT)	9.4	12.7	12.1	15.1	10.1
Partido Trabalhista Brasileiro (PTB)	9.7	10.5	10.5	7.3	3.2

Notes: Data calculated by author. Source: Tribunal Superior Eleitoral (TSE).

Table 6: Legislative Electoral Results (% of Total Vote Share), Rio Grande do Sul

	1998	2002	2006	2010	2014
Partido Democrático Trabalhista (PDT)	12.4	11.9	12.8	12.3	13.8
Partido do Movimento Democrático Brasileiro (PMDB)	18.3	14.6	16.7	15.9	13.5
Partido Progressista Brasileiro/Partido Progressista (PPB/PP)	21.8	17.1	16.7	12.3	13.4
Partido dos Trabalhadores (PT)	16.9	21.2	16.3	23.7	17.5

Notes: Data calculated by author. Source: Tribunal Superior Eleitoral (TSE).

Figure 2: Bivariate Plots of Cross-Sectional Political Competition and Inequality, with and without outliers

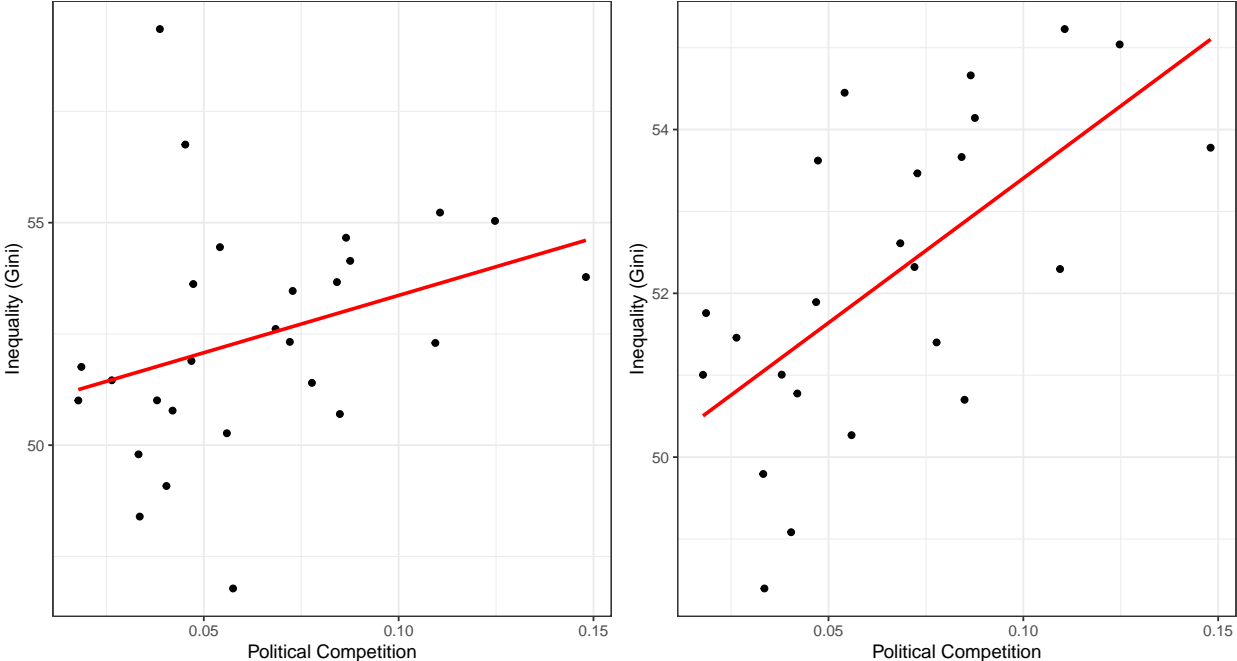


Table 7: Collapsed Cross-Sectional Model, Inequality

	(1)	(2)
Political Competition	25.764 (15.245)	35.301* (9.077)
Observations	27	24
R ²	0.103	0.407
Adjusted R ²	0.067	0.380

Notes: Dependent variable is Gini. Standard errors in parentheses. * $p \leq .05$.

Table 8: Pooled OLS Models

	(1)	(2)	(3)	(4)	(5)
Margin of Victory (Legislative)	15.540*			15.203*	8.194*
	(3.515)			(3.508)	(3.142)
Political Alignment		-0.117		-0.095	-0.194
		(0.282)		(0.285)	(0.247)
Strength of Left			3.130	3.327	5.057*
			(1.729)	(1.931)	(1.750)
Left Govenor				-0.662	-1.223*
				(0.510)	(0.441)
PT Organization				-1.130*	0.243
				(0.536)	(0.677)
GDP per capita (log)					-4.216*
					(1.021)
Commodity Production					-0.113*
					(0.039)
Education					-0.069*
					(0.024)
Non-White Population					0.085*
					(0.020)
Civil Society Density (log)					-5.425*
					(0.791)
Social Spending					8.116*
					(3.503)
Extractive State Capacity					0.971*
					(0.264)
Observations	378	351	378	351	284
R ²	0.049	0.0005	0.009	0.067	0.450
Adjusted R ²	0.047	-0.002	0.006	0.054	0.426

Notes: Dependent variable is Gini. Standard errors in parentheses. * $p \leq .05$.

Table 9: Pooled OLS Models with Separate Fixed Effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Margin of Victory (Legislative)	10.795* (2.857)			9.520* (2.829)	9.492* (3.049)	11.903* (3.360)			11.036* (3.299)	6.402* (2.585)
Political Alignment		-1.389* (0.264)		-1.384* (0.276)	-0.633* (0.291)		0.940* (0.249)		0.881* (0.252)	-0.084 (0.216)
Strength of Left			3.533* (1.399)	4.457* (1.554)	5.274* (1.675)			0.590 (2.044)	-1.770 (2.064)	0.834 (1.676)
Left Governor				-0.855* (0.418)	-1.217* (0.436)				-0.703 (0.442)	-0.695 (0.362)
PT Organization				-1.044* (0.424)	0.459 (0.663)				0.594 (2.508)	0.339 (2.113)
GDP per capita (log)					0.672					-6.059* (1.449)
Commodity Production					(1.364)					0.005 (0.053)
Education					-0.073 (0.038)					-0.047 (0.035)
Non-White Population					-0.048* (0.023)					-0.243* (0.062)
Civil Society Density (log)					0.097* (0.020)					-2.457 (1.616)
Social Spending					-4.313* (0.820)					-8.381* (3.714)
Extractive State Capacity					10.609* (3.377)					0.029 (0.245)
Observations	378	351	378	351	284	378	351	378	351	284
State Fixed Effects	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No
R ²	0.413	0.399	0.400	0.438	0.521	0.421	0.454	0.401	0.479	0.769
Adjusted R ²	0.390	0.376	0.377	0.409	0.480	0.377	0.409	0.354	0.428	0.734

Notes: Dependent variable is Gini. Standard errors in parentheses. State and year dummies not included in table. * $p \leq .05$.

Table 10: Political Determinants of Inequality in Subnational Brazil, 1998-2015

	(1)	(2)	(3)	(4)	(5)
Party Dominance	6.712*			6.544*	8.480*
	(2.592)			(2.812)	(3.423)
Political Alignment		-0.351		-0.464*	-0.359
		(0.204)		(0.215)	(0.243)
Strength of Left			1.250	1.264	-0.050
			(1.291)	(1.401)	(1.692)
Left Governor				-0.502	-0.586
				(0.301)	(0.369)
PT Organization				1.239	2.085
				(1.645)	(2.174)
GDP per capita (log)					-6.787
					(4.040)
Commodity Production					-0.025
					(0.053)
Education					-0.057
					(0.036)
Non-White Population					-0.202*
					(0.065)
Civil Society Density (log)					3.697
					(2.369)
Social Spending					-8.525*
					(3.690)
Extractive State Capacity					0.303
					(0.266)
Observations	378	351	378	351	284
State Fixed Effects	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
R ²	0.794	0.782	0.791	0.788	0.786
Adjusted R ²	0.770	0.755	0.766	0.758	0.742

Notes: Dependent variable is Gini. Standard errors in parentheses. State and year dummies not included in table. * $p \leq .05$.

Table 11: Political Determinants of Inequality in Subnational Brazil, 1998-2015

	(1)	(2)	(3)	(4)	(5)	(6)
Margin of Victory (Legislative)						6.041* (2.611)
Margin of Victory (Gubernatorial)	-0.138 (0.873)			-0.078 (0.924)	1.323 (1.093)	0.900 (1.098)
Political Alignment		-0.351 (0.204)		-0.487* (0.216)	-0.359 (0.246)	-0.339 (0.244)
Strength of Left			1.250 (1.291)	1.022 (1.420)	-0.736 (1.718)	-0.439 (1.707)
Left Governor				-0.540 (0.303)	-0.702 (0.371)	-0.715* (0.368)
PT Organization				0.519 (1.658)	1.680 (2.197)	2.341 (2.195)
GDP per capita (log)					-7.839 (4.086)	-7.499 (4.051)
Commodity Production					-0.009 (0.053)	0.008 (0.053)
Education					-0.052 (0.037)	-0.051 (0.037)
Non-White Population					-0.214* (0.066)	-0.224* (0.066)
Civil Society Density (log)					2.787 (2.371)	3.086 (2.353)
Social Spending					-7.139 (3.701)	-8.320* (3.703)
Extractive State Capacity					0.331 (0.270)	0.307 (0.267)
Observations	378	351	378	351	284	284
State Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R ²	0.790	0.782	0.791	0.784	0.782	0.787
Adjusted R ²	0.765	0.755	0.766	0.754	0.737	0.742

Notes: Dependent variable is Gini. Standard errors in parentheses. State and year dummies not included in table. * $p \leq .05$.