

Correlates of Subnational Polyarchy: Evidence from Contemporary Brazil

Online Appendix

Section A. Examining the Validity of the ISED Score

This first Section of the Online Appendix assesses the convergent validity of the ISED using three alternative measures of subnational democracy. We begin by outlining the rationale, construction, and coverage of each measure, and then present a series of correlations and descriptive comparisons with the ISED. We use these three additional measures as alternative dependent variables and to build the corresponding diffusion proxies.

Fidalgo's Subnational Electoral Democracy Score (SEDS)

The Subnational Electoral Democracy Score (SEDS) was developed by Fidalgo (2021) to measure subnational electoral democracy across federal countries. It affords coverage of 26 Brazilian states (excluding the Federal District) from 1995 to 2015. The SEDS uses a structural equation model to estimate a latent democracy score from five electoral and legislative indicators, including opposition vote share, executive and legislative vote concentration, party turnover in gubernatorial office, and legislative opposition strength. Higher values indicate more competitive and pluralistic subnational politics. Conceptually, the SEDS focuses on electoral contestation and pluralism across both the executive and legislative arenas.

Gervasoni's Comparative Subnational Democracy Index (CSDI)

The Comparative Subnational Democracy Index (CSDI) was developed by Gervasoni (2018) for comparative analysis of subnational regimes across Latin America. While there is no publicly available dataset for this index, we replicate the measure for Brazil's 27 states from 1994 to 2022 using electoral data from the Superior Electoral Court (TSE). The CSDI combines three components: executive contestation, executive rotation, and legislative contestation. Its defining feature is the inclusion of an incumbency-based alternation component that progressively penalizes consecutive electoral victories by the governing coalition. Unlike the ISED, the CSDI captures only contestation and does not incorporate voter participation.

Giraudy's Subnational Undemocratic Regime Index (SUR)

The SUR Index (SUR) was developed by Giraudy (2015) and is widely used in the literature on subnational authoritarianism. It was recently expanded and made publicly available through the 'Subnational Politics Project' (Giraudy et al. 2025), and for Brazil, only the executive component of the index is currently available. The measure combines electoral contestation (captured through the effective number of parties and the gubernatorial margin of victory) with a turnover component that records whether governing actors are replaced across electoral cycles. Like the CSDI, Giraudy's SUR places considerable weight on alternation in office and is designed to capture the persistence of dominant political coalitions over time. Coverage begins in 1999 and includes all 27 Brazilian states, although some state-term observations are missing.

As we show below, all three measures (the SEDS, the CSDI, and the SUR) are positively correlated with our ISED, producing broadly similar rankings of Brazilian states. States long associated with oligarchic dominance, such as Maranhão, Piauí, and Bahia, consistently score near the bottom of each index, while the more competitive southern states tend to score near the top. Indeed, a principal components analysis (shown below in Figure A0) indicates that a single latent dimension explains 69% of the common variance across measures.

Section A. Examining the Validity of the ISED Score (cont.)

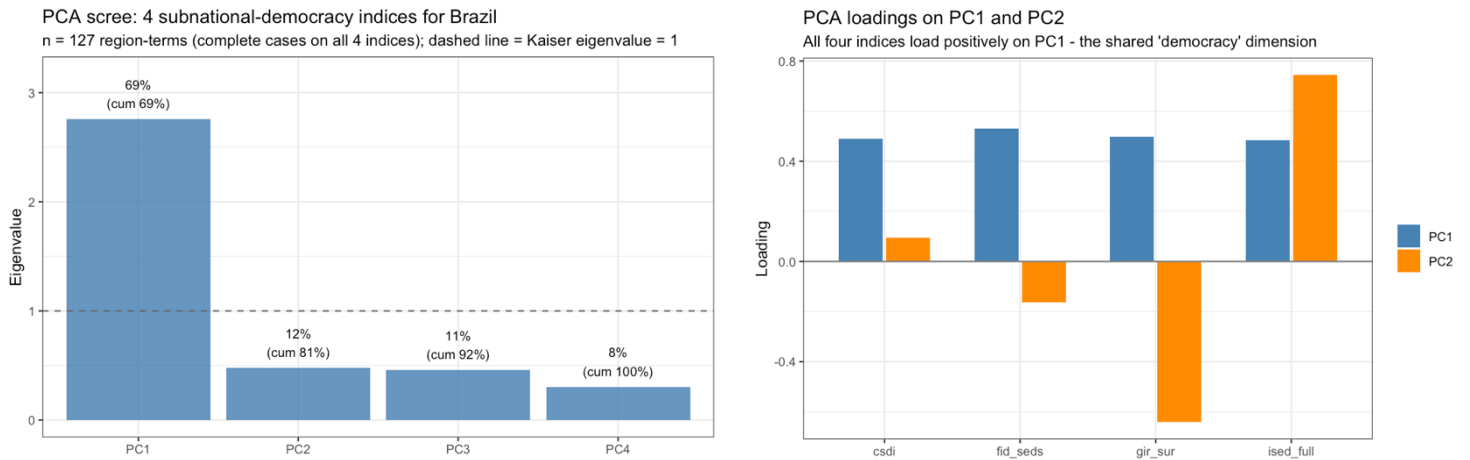


Figure A0. PCA Analysis of Four Distinct Measures of Subnational Democracy

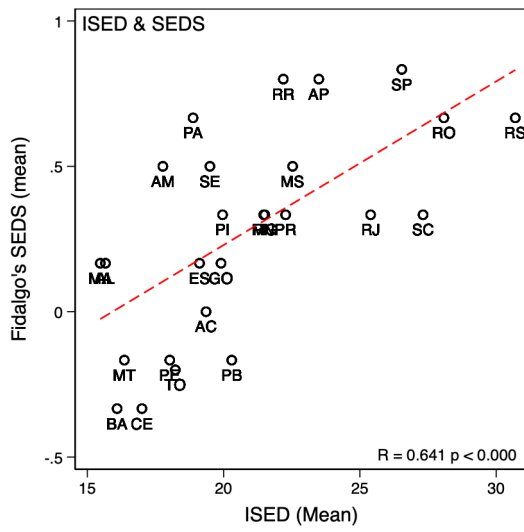
The structure of the residual variation across the four measures is itself informative. While the first principal component accounts for 69% of the common variance, the second explains a further 12% and reveals that the measures do not diverge randomly. Rather, it places the CSDI and SEDS at one pole and the ISED and Giraudy SUR at the other, with the ISED (+0.74) and Giraudy SUR (−0.64) recording the largest and most opposed loadings.

This pattern is broadly consistent with the conceptual distinctions discussed above. The CSDI and SEDS both incorporate information from the legislative arena alongside executive electoral outcomes, whereas the ISED and Giraudy SUR do not. At the same time, the latter pair differ in another important respect: the ISED incorporates voter participation in addition to contestation, while the Giraudy SUR focuses exclusively on executive competition and alternation.

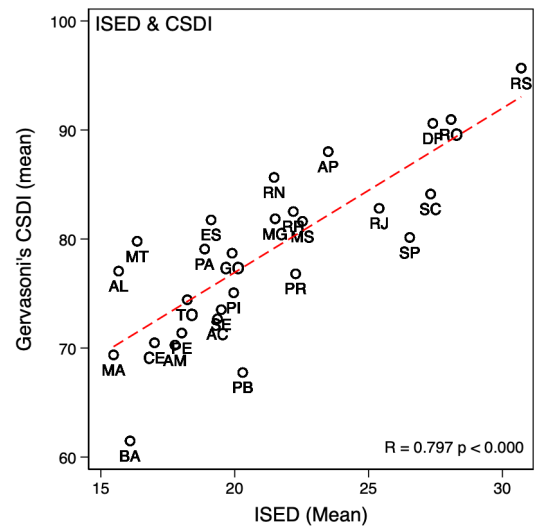
From the perspective of the present study, this PCA finding is reassuring. The dimension along which the ISED differs most clearly from the alternative measures corresponds closely to its incorporation of participation *alongside* contestation, a distinction that follows directly from the Dahlian framework on which the measure is built. Finally, it is worth noting that the PCA is conducted on the 127 state-term observations for which all four measures are available. Because SEDS coverage ends in 2015, these results should be interpreted as characterizing the 1994–2014 period rather than the full window of our study.

Section A. Examining the Validity of the ISED Score (cont.)

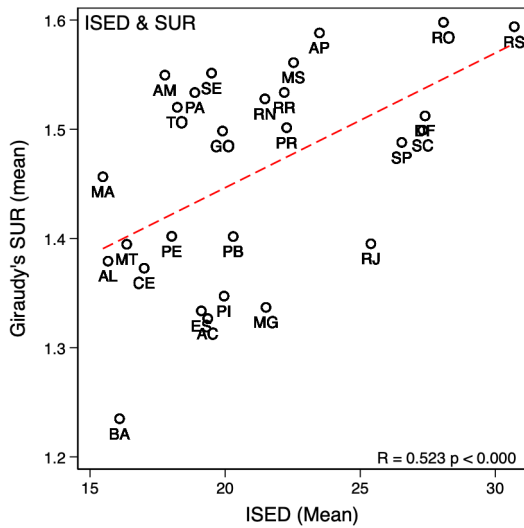
Panel A. ISED-SEDS



Panel B. ISED-CSDI



Panel C. ISED-SUR



Panel D. ISED-Cumulative Exec. Alternations

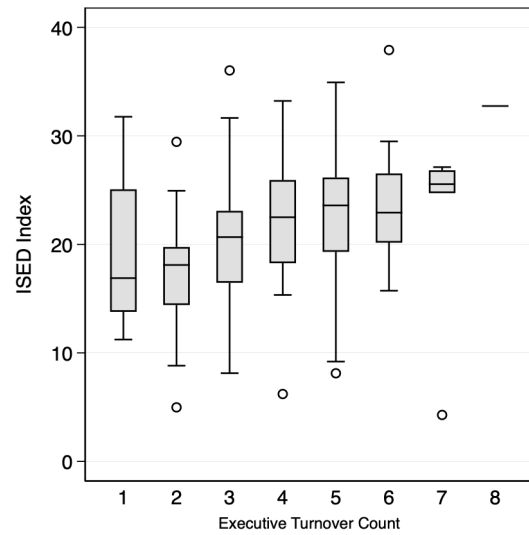


Figure A1: Cross-Validation of the ISED. Contrast with Fidalgo's, Gervasoni's, Giraudy's score & with Cumulative Executive Alternations (1990-2014)

Section A. (cont.)

Table A1. List of Acronyms

Acronym	Meaning	Acronym	Meaning
TSE	<i>Tribunal Superior Eleitoral</i> (Brazil's Superior Electoral Court)	ARENA	<i>Aliança Renovadora Nacional</i> (National Renewal Alliance)
BLS	Brazilian Legislative Survey	MDB	<i>Movimento Democrático Brasileiro</i> (Brazilian Democratic Movement)
ISED	Index of Subnational Electoral Democracy	PDS	<i>Partido Democrático Social</i> (Democratic Social Party)
SEDS	Subnational Electoral Democracy Score	PDT	<i>Partido Democrático Trabalhista</i> (Democratic Labour Party)
2FE	Two-way Fixed Effects	PT	<i>Partido dos Trabalhadores</i> (Workers' Party)
IBGE	<i>Instituto Brasileiro de Geografia e Estatística</i> (Brazilian Institute of Geography and Statistics)	PTB	<i>Partido Trabalhista Brasileiro</i> (Brazilian Labour Party)
HDI	Human Development Index		
VIF	Variance Inflation Factor		
PR	Proportional Representation		

Table A2. List of State Names and State Labels

State Name	Label	State Name	Label
Acre	AC	Paraíba	PB
Alagoas	AL	Paraná	PR
Amapá	AP	Pernambuco	PE
Amazonas	AM	Piauí	PI
Bahia	BA	Rio de Janeiro	RJ
Ceará	CE	Rio Grande do Norte	RN
Distrito Federal	DF	Rio Grande do Sul	RS
Espírito Santo	ES	Rondônia	RO
Goiás	GO	Roraima	RR
Maranhão	MA	Santa Catarina	SC
Mato Grosso	MT	São Paulo	SP
Mato Grosso do Sul	MS	Sergipe	SE
Minas Gerais	MG	Tocantins	TO
Pará	PA		

Section B. Regression Results

I. Stepwise Main Regression Models

Table B1. State Random Effects							
Dep. Var: ISED	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Total Population (log)	3.078*** (0.758)	0.0513 (0.483)	-1.385* (0.792)	-1.427* (0.786)	-1.249 (0.899)	-1.393 (0.979)	0.324 (1.519)
HDI		25.32*** (3.080)	24.59*** (4.220)	24.23*** (4.384)	25.13*** (5.192)	18.34*** (6.390)	12.77* (7.513)
Fiscal Transfers per capita (USD-log)			-1.784* (1.037)	-1.800* (1.015)	-1.622* (0.964)	-1.611 (1.103)	-0.574 (2.230)
Electorally Revealed Ideology				-1.988 (4.712)	-1.747 (4.665)	-0.534 (4.650)	-1.739 (6.108)
Elite Pluralism Score					-7.252 (16.56)	-1.854 (17.24)	-15.15 (17.17)
Diffusion Democracy (Lagged & Unweighted)						0.224* (0.124)	0.209 (0.144)
Authoritarian Legacy Proxy							-0.138*** (0.0486)
Observations	291	291	162	162	162	162	138
Number of Clusters	27	27	27	27	27	27	23
State RE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust and clustered standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section B. Regression Results

II. Stepwise Main Regression Models (cont.)

Table B2. Region and Year Fixed Effects

Dep. Var: ISED	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Total Population (log)	-0.132 (0.683)	-0.108 (0.532)	-0.779 (1.556)	-0.765 (1.556)	-0.909 (1.570)	-1.081 (1.606)	0.331 (1.984)
HDI		57.02*** (14.00)	52.52** (21.33)	55.16** (21.65)	54.00** (22.34)	47.05** (21.81)	34.10 (26.85)
Fiscal Transfers per capita (USD-log)			-1.234 (1.809)	-1.252 (1.853)	-1.369 (1.823)	-1.317 (1.950)	0.693 (2.907)
Electorally Revealed Ideology				3.278 (5.802)	3.273 (5.802)	4.004 (5.850)	4.690 (7.012)
Elite Pluralism Score					6.079 (17.42)	8.626 (18.00)	5.772 (21.77)
Diffusion Democracy (Lagged & Unweighted)						0.244* (0.142)	0.227 (0.172)
Authoritarian Legacy Proxy							-0.148* (0.0758)
Observations	291	291	162	162	162	162	138
Number of Clusters	27	27	27	27	27	27	23
State RE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section B. Regression Results

III. Stepwise Main Regression Models (cont.)

Table B3. State and Year Fixed Effects							
Dep. Var: ISED	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Total Population (log)	5.175 (4.486)	6.081 (4.660)	12.89** (5.390)	14.41** (5.244)	14.61** (5.352)	12.10** (5.432)	0.331 (1.984)
HDI		50.60** (23.89)	37.54 (29.27)	55.29* (29.45)	55.01* (29.58)	43.77 (29.10)	34.10 (26.85)
Fiscal Transfers per capita (USD-log)			-2.948 (1.850)	-2.959 (1.919)	-2.945 (1.918)	-2.840 (2.114)	0.693 (2.907)
Electorally Revealed Ideology				11.63* (6.687)	11.72* (6.596)	11.91* (6.649)	4.690 (7.012)
Elite Pluralism Score					-4.709 (24.77)	-3.248 (26.12)	5.772 (21.77)
Diffusion Democracy (Lagged & Unweighted)						0.224 (0.142)	0.227 (0.172)
Authoritarian Legacy Proxy							-0.148* (0.0758)
Observations	291	291	162	162	162	162	138
R-squared	0.340	0.360	0.198	0.222	0.223	0.234	0.201
Number of Clusters	27	27	27	27	27	27	23
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Region
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section C1. Robustness Checks

Our complementary assessment of the evidence drawn from contemporary Brazil confirms that subnational variation in polyarchy is strongly associated with *socioeconomic development*, *the influence of contiguous states*, and the *weight of local authoritarian legacies*. For instance, looking at models in which we use all other available measures of subnational democracy as our alternate dependent variable, and despite variation in statistical significance across individual specifications,¹ these factors stand out for the consistency and stability with which they display coefficients that are aligned with theory, and for being the factors that most frequently attain statistical significance across the full set of additional tests. This, in combination with the multiverse sensitivity analyses presented in Section C2, along with the results presented in Table 3 and in Figure 5 of the main text, gives us confidence of the positive association between our dependent variable and democratic diffusion and development, as well as of the negative influence of local authoritarian legacies. Substantively, the magnitude of the effect for the estimates obtained with this alternative dependent variable (visualized below in Figure C1) is larger for development (2.4z) and democratic diffusion (0.18z), and roughly the same for authoritarian legacies (-0.29z).

In addition to our primary results, one striking finding obtained from this secondary analysis concerns political ideology. As mentioned in the main corpus of the paper, when comparing *between* states, voter progressivism is indeed associated with more democratic subnational outcomes, but *within* states, right-leaning electoral preferences are associated with higher levels of polyarchy. Our secondary analysis reveals that, while in more left-friendly Brazilian states, electoral participation tends to be higher, the positive effects of conservative ideology reported in Table 3 are driven by effects on electoral competition. That is, in more right-leaning state electorates, unsuccessful gubernatorial candidates obtain larger aggregate vote shares in first-round elections. The mechanisms underlying this pattern remain speculative. We reason that one possibility is that right-friendly environments are more hospitable to small, catch-all, clientelistic parties, and therefore more conducive to party-system fractionalization (Zucco & Power, 2021). In such environments, random personalistic bids for the governorship would be less constrained by the local party system, thereby inflating our contestation sub-index. Another possibility is that a dominant conservative candidate stimulates more robust, yet insufficiently coordinated, challenges by local aspirants to the governorship. Regardless of the precise mechanism, both interpretations operate through electoral competition rather than broader dimensions of democratic governance.

¹ For example, in models that use Fidalgo's SEDS as the dependent variable, the coefficient for development drops under an RE specification, the coefficient for diffusion is indistinguishable from zero under the 2-FE model, and the estimate for authoritarian legacies drops under the model that controls for region and year specific effects.

Section C1. Robustness Checks (cont.)

Importantly, we note that when ideology is assessed against Giraudy’s (2015) measure of subnational democracy (which incorporates executive constraints in an effort to capture checks on power alongside electoral outcomes), the relationship is one in which right-leaning electorates are associated with lower levels of democracy. These ISED- and SUR-based findings are therefore not contradictory. Rather, they suggest that ideology’s relationship with democracy may be dimension-specific: conservative electoral environments may be associated with patterns of political competition that sometimes increase contestation scores, while at the same time being less conducive to the accountability and constraint dimensions captured by Giraudy’s SUR measure. Consistent with this interpretation, and given that the directional consistency observed with the SUR measure is not replicated when using either the ISED or Gervasoni’s CSDI, we conclude that ideology is not among the robust correlates identified in this study. Instead, its association with subnational democracy appears contingent on both measurement choice and the specific democratic dimension under consideration.

In addition to examining the subcomponents of the ISED, and those of Fidalgo’s SEDS, we conducted several additional robustness checks. First, we proxied development not only with HDI but also with GDP per capita (USD log), and with the Value of the Primary Sector as a Share of a state-level GDP. We transformed the fiscal transfers variable from a per capita measure to transfers as a share of state-level GDP, and we also examined models using both the Total and the per capita Fiscal Transfers (USD) in their logged and absolute scales. We further tested a population-weighted diffusion score, and evaluated our electorally revealed ideology proxy built with and without imputed values for parties not present in the BLS dataset. We also report models including state-specific and region-specific linear time trends. As further controls, we incorporated proxies for democratic habituation—measured as the cumulative number of years since the national democratic transition—and a measure of “national democratic stock” developed by Edgell et al. (2020), which is an additive index of previous years’ values on V-Dem’s Electoral Democracy Index (EDI), discounted by a factor (δ). In addition, to examine the assumptions underlying the RE estimators, we conducted a Mundlak (1978) decomposition. Finally, as discussed in Section D, we also examined in detail the validity of our EPS construct, and tested alternative estimations related to elite pluralism. While results across these alternative specifications vary in their strength and precision, they do not substantively alter the conclusions presented in the main text.

In brief, we assessed the robustness of our results using seven complementary strategies: (i) lagging the independent variables; (ii) employing alternative proxies for key independent variables; (iii) examining the subcomponents of the ISED; (iv) re-estimating the models using alternative measures of subnational democracy; (v) examining the subcomponents of our primary alternative SEDS measure; (vi) testing sensitivity to linear unit-specific (state or region) time trends and evaluating the random-effects assumption through a Mundlak (1978) decomposition; as well as by (vii) conducting a formal all-combinations multiverse analysis. The results of the first six strategies are summarized in the tables below. The results of the Mundlak decomposition are shown and discussed at the end of this Section (C1), and the findings of the multiverse approach are discussed subsequently in Section C2.

Section C1. Robustness Checks (cont.)

Table C0. Summary of Main Results and Robustness Checks															
	Main Analysis				Robustness Checks										
	Random Effects	Region & Year FE	State & Year FE		Lagged Indep. Vars.	ISED Sub.Comp.	ISED Sub. Part.	Alternative Dep. Var	Alt. DV Exec. Comp.	Alt. DV Leg. Comp.	Alt. DV Leg. Comp. (Seats)	Alt. Indep. Vars. Proxies	Additional Controls	State-Specific Times Trends	Region-Specific Time Trends
Socioeconomic Development	2	2	2		2	0	2	2	0	2	2	1	2	2	2
Fiscal Transfers	1	0	0		0	0	1	2	2	0	2	2	1	0	0
Ideology	0	0	-1		0	-1	2	2	-1	0	2	0	0	0	0
Elite Pluralism	0	0	0		0	0	-1	0	0	2	2	1	1	0	0
Democratic Diffusion	1	1	1		0	1	2	2	1	2	0	0	0	1	1
Authoritarian Legacy	2	2	n/a		2	2	2	2	1	1	1	2	2	n/a	2

As a theoretically agnostic algorithm, the multiverse analysis in Section C2 provides a *complementary* all-combinations test across 2,592 model specifications that formally quantifies the robustness and sign-stability of each predictor across the full space of estimator and control-set choices.

Key:

2	Reached statistical significance in expected direction.	0	Not significant & coefficient shows inconsistent signs
1	Not significant but coefficient consistently in expected direction	-1	Significant and coefficient with opposite sign to the one theorized.

Section C1. Robustness Checks (cont.)

I. Estimations Using Lagged Independent Variables

Table C1. Regression Checks with Dependent Variables Lagged by One Electoral Cycle										
Dep. Var: ISED	State and Year FE						Random State Effects		Region and Year FE	
	(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)	(D)
Total Population (log) <i>t-1</i>	1.014 (5.381)	1.125 (5.383)	2.743 (7.372)	2.682 (7.409)	3.102 (7.797)	3.542 (7.509)	-0.708 (0.850)	-0.122 (1.680)	-0.0576 (1.232)	-0.0134 (1.710)
HDI <i>t-1</i>		32.96 (24.21)	22.33 (30.75)	21.61 (30.36)	21.03 (30.72)	22.95 (32.26)	17.34*** (6.521)	14.37* (8.217)	39.85** (17.71)	14.14 (24.37)
Fiscal Transfers per capita (USD-log) <i>t-1</i>			0.688 (1.482)	0.688 (1.485)	0.718 (1.499)	0.671 (1.564)	-1.329 (1.114)	-2.335 (2.516)	0.359 (1.640)	-1.000 (2.715)
Electoral Reveal Ideology (high=right) <i>t-1</i>				-0.468 (6.180)	-0.280 (6.287)	0.0507 (6.425)	2.793 (3.710)	2.041 (4.533)	-5.013 (3.511)	-5.172 (3.194)
Elite Pluralism Score <i>t-1</i>					-9.892 (24.68)	-10.97 (23.31)	-20.70 (17.36)	-26.75 (18.63)	-0.209 (15.15)	-4.263 (14.61)
Diffusion Democracy (Lagged & Unweighted)						-0.0448 (0.159)	0.0264 (0.102)	-0.0255 (0.103)	-0.0227 (0.143)	-0.0246 (0.145)
Authoritarian Legacy Proxy								-0.124** (0.0501)		-0.194*** (0.0643)
Observations	267	267	162	162	162	162	162	138	162	138
R-squared	0.331	0.338	0.055	0.055	0.056	0.056				
Number of Clusters	27	27	27	27	27	27	27	23	27	23
State FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Region	Region
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section C1. Robustness Checks (cont.)

II.1 ISED Subcomponents: Competition

Table C2.A Regression Checks with Subcomponent of Main Dependent Variable

Dep. Var: Electoral Competition (ISED)	State and Year FE						State Random Effects		Region & Year FE	
	(1'')	(2'')	(3'')	(4'')	(5'')	(6)	(A'')	(B'')	(C'')	(D'')
Total Population (log)	2.815 (5.884)	3.226 (6.133)	20.80** (9.848)	24.13** (9.640)	23.49** (9.621)	23.14** (9.464)	-1.618 (1.885)	0.854 (3.435)	-0.269 (2.985)	1.837 (3.908)
HDI		22.95 (33.05)	-1.223 (52.76)	37.63 (54.76)	38.52 (55.38)	27.14 (53.93)	8.481 (10.08)	1.572 (11.44)	35.25 (43.08)	7.960 (50.35)
Fiscal Transfers per capita (USD-log)			-2.340 (3.167)	-2.364 (3.273)	-2.409 (3.329)	-2.120 (3.512)	-1.786 (1.941)	-0.994 (4.992)	-1.583 (3.378)	0.692 (5.278)
Electorally Revealed Ideology (high=right)				25.46* (13.97)	25.17* (13.90)	25.41* (14.29)	11.94 (9.509)	10.80 (12.88)	10.82 (12.59)	13.16 (15.22)
Elite Pluralism Score					15.04 (49.40)	14.71 (51.41)	14.02 (30.16)	-10.12 (33.52)	28.46 (37.62)	16.81 (45.67)
Diffusion Competition (Lagged & Unweighted)						0.200 (0.141)	0.177 (0.135)	0.160 (0.152)	0.164 (0.137)	0.219 (0.177)
Authoritarian Legacy Proxy								-0.204** (0.0818)		-0.263** (0.131)
Observations	291	291	162	162	162	162	162	138	162	138
R-squared	0.134	0.135	0.080	0.114	0.115	0.126				
Number of Clusters	27	27	27	27	27	27	27	23	27	23
State FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Region	Region
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section C1. Robustness Checks (cont.)

II.2 ISED Subcomponents: Participation

Table C2.B. Regression Checks with Subcomponent of Main Dependent Variable

Dep. Var: Electoral Participation (ISED)	State and Year FE						Random State Effects		Region and Year FE	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Total Population (log)	6.196 (4.910)	7.807 (4.582)	-0.368 (5.107)	-0.608 (5.215)	0.211 (5.570)	-2.366 (5.961)	-1.115* (0.609)	-0.698 (0.857)	-1.948** (0.908)	-1.264 (1.396)
HDI		89.94*** (27.91)	79.65** (34.57)	76.84** (36.02)	75.70* (37.53)	64.38 (42.99)	33.57*** (6.900)	26.44*** (6.515)	61.58*** (17.54)	74.13** (32.62)
Fiscal Transfers per capita (USD-log)			-3.243** (1.369)	-3.242** (1.360)	-3.183** (1.385)	-3.291** (1.443)	-1.268* (0.746)	-0.992 (1.322)	-1.061 (1.341)	0.189 (2.601)
Electorally Revealed Ideology (high=right)				-1.838 (3.567)	-1.472 (3.558)	-1.490 (3.503)	-15.24*** (3.080)	-18.65*** (3.128)	-4.764* (2.617)	-6.084** (3.084)
Elite Pluralism Score					-19.30 (16.67)	-17.59 (16.68)	-16.10* (8.930)	-17.87** (9.037)	-9.464 (9.118)	-5.595 (12.98)
Diffusion Participation (Lagged & Unweighted)						0.191 (0.171)	0.156* (0.0816)	0.208*** (0.0785)	0.154 (0.121)	0.000216 (0.110)
Authoritarian Legacy Proxy								-0.0836** (0.0416)		-0.0185 (0.0754)
Observations	291	291	162	162	162	162	162	138	162	138
R-squared	0.748	0.790	0.657	0.657	0.661	0.664				
Number of Clusters	27	27	27	27	27	27	27	23	27	23
State FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Region	Region
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section C1. Robustness Checks (cont.)

Among the alternative operationalizations of subnational democracy available in the literature, the SEDS is our primary comparison. Since both are purpose-built electoral measures that treat competitive pluralism symmetrically, its conceptual proximity to the ISED makes it the most meaningful direct test of whether our results are sensitive to the specific index chosen. Results using Gervasoni's CSDI and Giraudy's SUR index, which approach electoral democracy from more distant conceptual angles, are reported in Section C2 as part of our broader multiverse analysis.

III. Alternative Dependent Variable: SEDS (Fidalgo 2018, 2021)

Fidalgo's Subnational Electoral Democracy Scale (SEDS) provides a cross-national, state-year measure of electoral democracy. The SEDS operationalises subnational electoral democracy as a latent trait reflected in five electoral indicators spanning three domains: executive contestation, turnover, and legislative control. These indicators are aggregated via a structural equation model (SEM) that estimates the latent subnational democracy score, with higher values indicating more electorally democratic subnational units.

Like our ISED, the SEDS is purpose-built to measure variation in electoral democracy and—crucially—treats the dispersion of electoral support symmetrically, regardless of whether incumbents or challengers hold majorities, aligning more closely with Dahlian conceptions of pluralist competition.

The SEDS differs from our main DV in one key aspect: it explicitly combines executive and legislative electoral information, including legislative party-system dispersion and the opposition's aggregate seat share. In Brazil, where institutional incentives encourage ticket splitting and legislative elections follow proportional representation with open lists (in contrast to majoritarian/plurality executive contests), divergences between the SEDS- and ISED-based results may therefore reflect not only differences in operationalisation, but also systematic differences in mass and elite behaviour across executive versus legislative arenas.

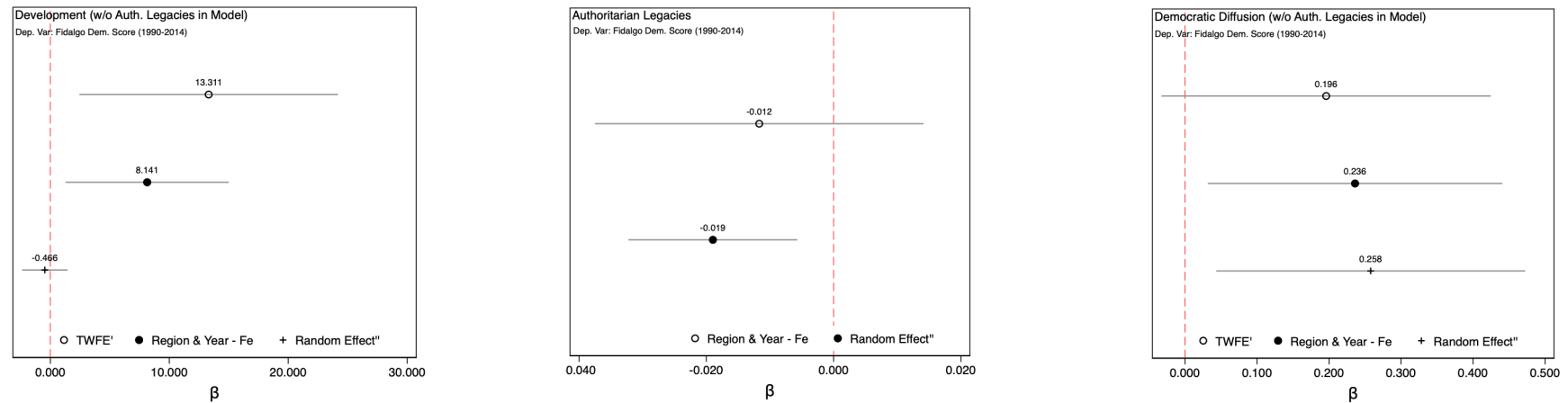


Figure C1. Primary Replication with Alternative Measure of Subnational Polyarchy

Section C1. Robustness Checks (cont.)

III. Alternative Dependent Variable: SEDS (Fidalgo 2018, 2021)

Table C3. Regression Checks with Alternative Dependent Variable

Dep. Var: Subnational Polyarchy (Fidalgo: SEDS)	State and Year FE						State Random Effects		Region & Year FE	
	(1')	(2')	(3')	(4')	(5')	(6')	(A')	(B')	(C')	(D')
Total Population (log)	2.064** (0.877)	1.965** (0.898)	1.004 (0.993)	0.822 (1.023)	0.739 (1.099)	-0.698 (1.280)	-0.507** (0.201)	-0.448** (0.195)	-0.332 (0.224)	-0.379 (0.274)
HDI		11.76** (4.315)	13.51*** (4.380)	12.46** (4.523)	12.49** (4.543)	13.31* (6.731)	-0.466 (1.231)	-1.607 (1.362)	8.141* (4.410)	7.069 (4.647)
Fiscal Transfers per capita (USD-log)			-0.0476 (0.311)	-0.0723 (0.315)	-0.0875 (0.323)	-1.377* (0.778)	-0.764*** (0.235)	-0.996*** (0.228)	-0.681** (0.328)	-0.902* (0.470)
Electorally Revealed Ideology (high=right)				-0.804 (0.653)	-0.843 (0.647)	-2.139** (0.847)	-1.582** (0.721)	-1.824*** (0.606)	-1.461** (0.679)	-1.828** (0.777)
Elite Pluralism Score					1.082 (2.514)	2.842 (3.375)	3.280 (2.349)	1.651 (2.207)	2.634 (2.603)	2.593 (3.163)
Diffusion SEDS. Fidalgo (Lagged & Unweighted)						0.196 (0.142)	0.258* (0.138)	0.101 (0.139)	0.236* (0.132)	0.227 (0.153)
Authoritarian Legacy Proxy								-0.0190** (0.00853)		-0.0117 (0.0166)
Observations	153	153	130	130	130	96	96	84	96	84
R-squared	0.277	0.321	0.363	0.369	0.369	0.404				
Number of Clusters	26	26	26	26	26	24	24	21	24	21
State FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Region	Region
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section C1. Robustness Checks (cont.)

IV.1 Seds Subcomponents: Executive Competition (HH Index)

Table C4.1 Regression Checks with Subcomponent of Alternative Dependent Variable										
Dep. Var: Executive Competition (Fidalgo)	State and Year FE						State Random Effects		Region and Year FE	
(1-HH Index)	(1)	(2)	(3)	(4)	(5)	(6)	(A)	(B)	(C)	(D)
Total Population (log)	-0.0345 (0.109)	-0.0378 (0.114)	-0.0349 (0.182)	-0.0258 (0.175)	-0.0143 (0.182)	-0.172 (0.210)	-0.0202 (0.0300)	0.00132 (0.0223)	0.00914 (0.0299)	0.0137 (0.0304)
HDI		0.734 (0.534)	1.176 (0.796)	1.229 (0.893)	1.225 (0.903)	0.676 (0.969)	-0.00162 (0.159)	-0.0587 (0.170)	0.558 (0.609)	0.458 (0.643)
Fiscal Transfers per capita (USD-log)			-0.0433 (0.0411)	-0.0420 (0.0400)	-0.0399 (0.0434)	-0.121 (0.118)	-0.0460 (0.0416)	-0.0452* (0.0262)	-0.0235 (0.0493)	-0.0227 (0.0541)
Electorally Revealed Ideology (high=right)				0.0403 (0.131)	0.0456 (0.126)	-0.107 (0.116)	-0.154* (0.0884)	-0.124 (0.0865)	-0.134* (0.0784)	-0.119 (0.0829)
Elite Pluralism Score					-0.150 (0.486)	0.429 (0.577)	0.303 (0.361)	0.102 (0.298)	0.312 (0.471)	0.369 (0.489)
Diffusion SEDS. Fidalgo (Lagged & Unweighted)						0.0339 (0.0244)	0.0270 (0.0210)	0.0217 (0.0249)	0.0369 (0.0258)	0.0397 (0.0268)
Authoritarian Legacy Proxy								-0.00103 (0.000882)		-0.00139 (0.00215)
Observations	179	179	130	130	130	96	96	84	96	84
R-squared	0.153	0.167	0.157	0.158	0.159	0.220				
Number of Clusters	26	26	26	26	26	24	24	21	24	21
State FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Region	Region
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Robust standard errors in parentheses										
*** p<0.01, ** p<0.05, * p<0.1										

Section C1. Robustness Checks (cont.)

IV.2 SEDS Subcomponents: Legislative Configuration (HH Index)

Table C4.2 Regression Checks with Subcomponent of Alternative Dependent Variable										
Dep. Var: Legislative Competition (Fidalgo) (1-HH Index)	State and Year FE						State Random Effects		Region and Year FE	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Total Population (log)	0.144** (0.0631)	0.140*** (0.0475)	0.0405 (0.0779)	0.0322 (0.0729)	0.0288 (0.0748)	-0.0298 (0.0969)	-0.0208* (0.0124)	-0.0148 (0.0128)	-0.0181 (0.0142)	-0.0114 (0.0161)
HDI		1.052*** (0.214)	0.971** (0.384)	0.923** (0.380)	0.924** (0.384)	0.526 (0.422)	0.254*** (0.0892)	0.249** (0.0985)	0.152 (0.232)	0.0628 (0.241)
Fiscal Transfers per capita (USD-log)			-0.0103 (0.0123)	-0.0114 (0.0130)	-0.0120 (0.0131)	-0.0269 (0.0363)	-0.0130 (0.0197)	-0.00941 (0.0204)	-0.0291 (0.0237)	-0.0229 (0.0320)
Electorally Revealed Ideology (high=right)				-0.0368 (0.0546)	-0.0383 (0.0520)	-0.0429 (0.0500)	-0.0706 (0.0454)	-0.0608 (0.0549)	-0.0788 (0.0493)	-0.0903 (0.0612)
Elite Pluralism Score					0.0439 (0.188)	-0.0385 (0.204)	0.526*** (0.140)	0.502*** (0.143)	0.311* (0.170)	0.277 (0.184)
Diffusion SEDS. Fidalgo (Lagged & Unweighted)						0.0163* (0.00929)	0.00272 (0.00556)	0.00541 (0.00704)	0.0191** (0.00836)	0.0205** (0.00920)
Authoritarian Legacy Proxy								0.000443 (0.000474)		0.000271 (0.000864)
Observations	179	179	130	130	130	96	96	84	96	84
R-squared	0.807	0.833	0.509	0.512	0.513	0.457				
Number of Clusters	26	26	26	26	26	24	24	21	24	21
State FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Region	Region
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes
Robust standard errors in parentheses										
*** p<0.01, ** p<0.05, * p<0.1										

Section C1. Robustness Checks (cont.)

IV.3 SEDS Subcomponents: Share of Legislative Seats Held by Opposition

Table C4.3 Regression Checks with Alternative Dependent Variable

Dep. Var: Legislative Competition (Fidalgo) (Share of Leg. Seats by Opposition)	State and Year FE						State Random Effects		Region and Year FE	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Total Population (log)	0.194* (0.0958)	0.186* (0.0934)	0.0602 (0.226)	0.0135 (0.204)	-0.0069 (0.198)	-0.273 (0.235)	-0.091*** (0.0264)	-0.089*** (0.0309)	-0.01*** (0.0247)	-0.11*** (0.0350)
HDI		1.642*** (0.454)	2.252*** (0.719)	1.980** (0.769)	1.987** (0.789)	1.889** (0.674)	0.449** (0.203)	0.373 (0.248)	0.559 (0.492)	0.143 (0.558)
Fiscal Transfers per capita (USD-log)			0.0372 (0.0397)	0.0308 (0.0391)	0.0271 (0.0391)	-0.192* (0.108)	-0.0993** (0.0392)	-0.106** (0.0452)	-0.147*** (0.0407)	-0.170*** (0.0588)
Electorally Revealed Ideology (high=right)				-0.207 (0.133)	-0.217 (0.132)	-0.270* (0.139)	-0.170*** (0.0604)	-0.116 (0.0754)	-0.177** (0.0732)	-0.144 (0.0906)
Elite Pluralism Score					0.265 (0.502)	0.0614 (0.746)	0.777** (0.322)	0.774** (0.361)	0.355 (0.421)	0.391 (0.518)
Diffusion SEDS. Fidalgo (Lagged & Unweighted)						0.00349 (0.0231)	-0.00982 (0.0182)	-0.0165 (0.0226)	0.0126 (0.0236)	0.00996 (0.0274)
Authoritarian Legacy Proxy								-0.000822 (0.00101)		-0.00195 (0.00216)
Observations	179	179	130	130	130	96	96	84	96	84
R-squared	0.483	0.509	0.204	0.231	0.233	0.296				
Number of Clusters	26	26	26	26	26	24	24	21	24	21
State FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Region	Region
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The consistency of our core results across the ISED and SEDS, two measures that share similar conceptual foundations while differing in their coverage of electoral arenas, provides a meaningful first test of robustness. To extend this test further, Section C2 reports a full multiverse analysis spanning 2,592 model specifications across six hypotheses, three types of estimator, and three dependent variables—including the CSDI and the Giraudy SUR index, whose distinct operationalizations of electoral quality allow us to assess whether the paper's findings survive comparison with measures that weigh incumbency, rotation, and legislative accountability differently. The cross-DV results in Section C2 should be read as a complement to, not a replacement for, the SEDS comparison: together they trace a conceptual gradient from the measure most similar to the ISED to the measures most distant from it.

Section C1. Robustness Checks (cont.)

V.1 Alternative Proxies for Selected Independent Variables & Additional Controls

Here, we begin by presenting a set of baseline models that assess the effects of alternative operationalizations for selected independent variables and additional controls, while holding total population size and socioeconomic development constant. We then present saturated models which combine these alternative operationalizations. Finally, we also present results with state and region-specific time trends, as well as the results of the Mundlak decomposition. Specifically, we examine the following:

- i)** To address potential biases arising from incomplete data coverage, we use an inverse distance weighted (IDW) interpolation to impute missing values for the variables captured in the main models.
- ii)** Fiscal transfers measured not per capita (as in the main models), but alternatively operationalized as (a) the total volume of transfers (logged), (b) transfers as a share of state GDP, (c) the total volume of transfers (unlogged), and (d) per capita transfers in their original, unlogged form.
- iii)** Alternative operationalizations of our elite pluralism score. While the main models use the full pool of nominated candidates, here we (a) estimate values based only on the pool of elected candidates, and (b) include a measure capturing the difference between the main score and this new version. This allows us to assess whether elite composition exerts its “effects” primarily at the stage of electoral success rather than nomination—e.g., if members of a closed elite are disproportionately likely to secure office. As described in Section D we also built a “magnitude-adjusted” Effective Number of Surnames as an alternative proxy for elite pluralism.
- iv)** Our diffusion score weighted by the average combined value of neighboring states.
- v)** Development proxied by a) GDP per capita, and by b) the value of primary sector activities as a share of state-level GDP instead of the Human Development Index (HDI).
- vi)** Two new proxies for democratic experience: (a) a measure of democratic habituation, defined as the cumulative number of years since the national democratic transition in 1985, and (b) the democratic stock index developed by Edgell et al. (2020), which aggregates past values of the V-Dem Electoral Democracy Index (EDI) at a discounted rate (δ). Higher values of δ give previous scores more weight. As such, the index captures the historical strength of democratic institutions in any country-year.
- vii)** Results with state- and region-specific time trends.
- viii)** Results of the Mundlak decomposition.

Section C1. Robustness Checks (cont.)

V.1 Alternative Proxies for Selected Independent Variables & Additional Controls

Table C.5 Baseline Models: Interpolated Values, Alternative Proxies & Additional Controls																
Baseline Models Dep. Var: ISED	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
HDI	50.60** (23.89)															
GDP per capita (log)		4.87 (3.64)														
Primary Sector as % of GDP			2.84 (21.82)													
Federal Transfers as % of GDP				-0.14 (0.31)												
Federal Transfers Total (log)					-49.54* (26.47)											
Electorally Revealed Ideology (Raw)						-1.79 (3.94)										
Electorally Revealed Ideology (Imputed)							-1.30 (3.65)									
Elite Pluralism Score								-2.30 (13.20)								
Elite Pluralism Score (Elected Only)									-27.15 (20.84)							
Elite Pluralism Score (Difference)										-13.19 (10.65)						
“Seat-Adjusted” Effective Number of Surnames											0.023* (0.013)					
Diffusion Democracy (Lagged & Weighted)												1.41 (1.99)				
Auth. Legacy Proxy													-0.12** (0.053)			
Democratic Habituation (N years since 1985 national transition)														-0.32 (0.24)		
Democratic Stock (Delta — 0.25)															-25.41 (18.58)	
Democratic Stock (Delta — 0.70)																-21.85 (15.98)
Observations	291	291	291	291	291	281	281	291	291	291	290	258	252	291	291	291
R-squared	0.360	0.345	0.340	0.361	0.364	0.361	0.361	0.360	0.366	0.363	0.370	0.342	0.389	0.360	0.360	0.360
Number of Clusters	27	27	27	27	27	27	27	27	27	27	27	27	23	27	27	27

Except for Models 1, 2 & 3, all models control for HDI and population size. Except for Model 13 all models include state and year FEs. Model 13 includes region and year FEs.

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Section C1. Robustness Checks (cont.)

V.2 Alternative Proxies for Selected Independent Variables & Additional Controls

Table C6.A Replication of Models in Table 3

Dep. Var: ISED	Model 6	Model B		Model D	
	(2FE)	(RE)		(Region & Year FE)	
	(1)	(2)	(3)	(4)	(5)
Total Population (log)	0.413 (7.636)	1.564* (0.900)	1.551* (0.906)	0.736 (1.083)	0.736 (1.083)
HDI	53.12** (24.18)	28.80*** (3.604)	22.21** (10.90)	57.76*** (20.26)	57.76*** (20.26)
Federal Transfers as % of GDP	-0.286 (0.343)	0.178 (0.110)	0.147 (0.125)	0.174 (0.132)	0.174 (0.132)
Elect. Rev. Ideology (high=right)	1.703 (3.586)	-0.437 (3.836)	-1.373 (3.860)	2.685 (3.556)	2.685 (3.556)
Elite Pluralism Score	-8.456 (17.55)	-25.05* (13.60)	-27.69* (14.37)	-10.29 (14.36)	-10.29 (14.36)
Dem. Diff. (Lagged & Weighted)	0.704 (2.061)	-0.167 (0.858)	0.00755 (0.918)	-0.384 (1.783)	-0.384 (1.783)
Authoritarian Legacy		-0.115** (0.0503)	-0.131** (0.0547)	-0.112** (0.0546)	-0.112** (0.0546)
Dem. Habituation (n-years since nat. trans. 1985)			0.0725 (0.125)		-0.117 (0.190)
Observations	249	212	212	212	212
Number of Clusters	27	23	23	23	23
State FE	Yes	No	No	Region	Region
Year FE	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table C6.B Replication of Models in Table 3

Dep. Var: ISED	Model 6	Model B		Model D	
	(2FE)	(RE)		(Region & Year FE)	
	(1)	(2)	(3)	(4)	(5)
Total Population (log)	-2.324 (7.506)	1.142 (1.080)	1.483* (0.901)	1.016 (1.228)	1.016 (1.228)
GDP per capita (log)	2.446 (4.310)	2.731 (1.897)	-0.192 (2.125)	4.726 (3.264)	4.726 (3.264)
Federal Transfers as % of GDP	-0.451 (0.368)	0.0914 (0.141)	0.0436 (0.131)	0.190 (0.184)	0.190 (0.184)
Elect. Rev. Ideology (high=right)	0.347 (3.502)	-2.102 (4.220)	-3.996 (3.832)	0.883 (3.390)	0.883 (3.390)
Elite Pluralism Score	-4.881 (18.65)	18.04 (15.66)	-28.59* (14.61)	-12.44 (15.62)	-12.44 (15.62)
Dem. Diff. (Lagged & Weighted)	0.326 (2.118)	0.427 (0.989)	0.570 (0.865)	-0.545 (1.779)	-0.545 (1.779)
Authoritarian Legacy		-0.0922 (0.0936)	-0.188** (0.0734)	-0.134* (0.0730)	-0.134* (0.0730)
Dem. Habituation (n-years since nat. trans. 1985)			0.288*** (0.0398)		0.368*** (0.0636)
Observations	249	212	212	212	212
Number of Clusters	27	23	23	23	23
State FE	Yes	No	No	Region	Region
Year FE	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section C1. Robustness Checks (cont.)

V.2 Alternative Proxies for Selected Independent Variables & Additional Controls

Table C6.C Replication of Models in Table 3

Dep. Var: ISED	Model 6	Model B		Model D	
	(2FE)	(RE)		(Region & Year FE)	
	(1)	(2)	(3)	(4)	(5)
Total Population (log)	-3.904 (6.735)	1.263 (1.128)	1.403 (0.983)	0.667 (1.286)	0.667 (1.286)
Primary Sector as % of GDP	2.311 (22.17)	13.60 (12.04)	-3.673 (10.41)	-21.31* (12.15)	-21.31* (12.15)
Federal Transfers as % of GDP	-0.514 (0.336)	0.0116 (0.119)	0.0462 (0.117)	0.114 (0.153)	0.114 (0.153)
Elect. Rev. Ideology (high=right)	0.0500 (3.458)	-2.887 (4.078)	-3.762 (3.595)	0.0102 (3.332)	0.0102 (3.332)
Elite Pluralism Score	-5.605 (18.49)	22.77 (16.27)	-28.06** (13.89)	-12.99 (13.76)	-12.99 (13.76)
Dem. Diff. (Lagged & Weighted)	0.272 (2.058)	0.949 (1.045)	0.478 (0.932)	-0.503 (1.731)	-0.503 (1.731)
Authoritarian Legacy		-0.161** (0.0770)	-0.181*** (0.0533)	-0.148*** (0.0532)	-0.148*** (0.0532)
Dem. Habituation (n-years since nat. trans. 1985)			0.290*** (0.0362)	0.389*** (0.0654)	0.389*** (0.0654)
Observations	249	212	212	212	212
Number of Clusters	27	23	23	23	23
State FE	Yes	No	No	Region	Region
Year FE	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table C6.D Replication of Models in Table 3

Dep. Var: ISED	Model 6	Model B		Model D	
	(2FE)	(RE)		(Region & Year FE)	
	(1)	(2)	(3)	(4)	(5)
Total Population (log)	-2.454 (7.268)	0.357 (0.912)	0.378 (0.850)	-1.380 (0.893)	-1.380 (0.893)
HDI	60.38** (24.30)	24.53*** (3.824)	23.07** (9.953)	70.24*** (20.22)	70.24*** (20.22)
Federal Transfers as % of GDP	-0.362 (0.328)	0.0593 (0.129)	0.0494 (0.145)	0.0904 (0.123)	0.0904 (0.123)
Elect. Rev. Ideology (high=right)	2.083 (3.418)	-0.864 (3.640)	-1.101 (3.694)	3.833 (3.459)	3.833 (3.459)
ENS Seat-Corrected	0.0300** (0.0118)	0.00502 (0.0105)	0.00397 (0.00958)	0.0272** (0.0110)	0.0272** (0.0110)
Diffusion Democracy (Lagged & Weighted)	0.708 (2.031)	-0.310 (0.927)	-0.267 (0.971)	-0.777 (1.789)	-0.777 (1.789)
Auth. Legacy Proxy		-0.106 (0.0654)	-0.112* (0.0671)	-0.0426 (0.0651)	-0.0426 (0.0651)
Dem. Habituation (n-years since nat. trans. 1985)			0.0179 (0.109)		-0.300 (0.189)
Observations	248	211	211	211	211
Number of Clusters	27	23	23	23	23
State FE	Yes	No	No	Region	Region
Year FE	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section C1. Robustness Checks (cont.)

V.2 Alternative Proxies for Selected Independent Variables & Additional Controls

Table C6. E Replication of Models in Table 3

Dep. Var: ISED	Model 6	Model B		Model D	
	(2FE)	(RE)		(Region & Year FE)	
	(1)	(2)	(3)	(4)	(5)
Total Population (log)	2.152 (5.258)	0.682 (1.210)	-0.148 (1.274)	-0.122 (1.381)	-0.122 (1.381)
GDP per capita (log)	4.621 (3.653)	0.545 (1.687)	1.677 (1.871)	4.378 (3.092)	4.378 (3.092)
Federal Transfers Total (log)	-67.44*** (21.11)	-47.85 (37.59)	-25.51 (39.35)	-36.96 (55.58)	-36.96 (55.58)
Elect. Rev. Ideology (high=right)	-0.390 (3.460)	-3.831 (4.028)	-1.072 (4.341)	1.534 (3.501)	1.534 (3.501)
ENS Magnitude-Corrected	0.0250** (0.0115)	0.0388*** (0.01000)	0.0371*** (0.00927)	0.0205** (0.00945)	0.0205** (0.00945)
Diffusion Democracy (Lagged & Weighted)	0.399 (2.058)	0.288 (1.083)	0.544 (1.092)	-1.080 (1.685)	-1.080 (1.685)
Authoritarian Legacy Proxy		-0.0571 (0.0826)	-0.0236 (0.0866)	-0.116 (0.0707)	-0.116 (0.0707)
Democratic Stock (Delta — 0.25)			11.62*** (2.609)		31.98*** (6.985)
Observations	248	211	211	211	211
Number of Clusters	27	23	23	23	23
State FE	Yes	No	No	Region	Region
Year FE	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table C6. F Replication of Models in Table 3

Dep. Var: ISED	Model 6	Model B		Model D	
	(2FE)	(RE)		(Region & Year FE)	
	(1)	(2)	(3)	(4)	(5)
Total Population (log)	0.561 (5.928)	-0.400 (1.088)	-0.701 (1.050)	-2.218 (1.376)	-2.218 (1.376)
HDI	59.37** (27.47)	24.23*** (3.736)	18.19*** (4.923)	65.85*** (23.71)	65.85*** (23.71)
Federal Transfers per capita (log)	-1.759 (1.709)	-0.821 (1.468)	-1.034 (1.491)	-0.888 (2.316)	-0.888 (2.316)
Elect. Rev. Ideology (high=right)	1.411 (3.505)	-1.177 (3.519)	-1.038 (3.666)	3.917 (3.345)	3.917 (3.345)
ENS Magnitude-Corrected	0.0297** (0.0118)	0.00725 (0.0100)	0.0128 (0.00941)	0.0287*** (0.0106)	0.0287*** (0.0106)
Diffusion Democracy (Lagged & Weighted)	0.785 (2.002)	-0.719 (0.930)	-0.434 (1.002)	-0.970 (1.690)	-0.970 (1.690)
Authoritarian Legacy Proxy		-0.0929 (0.0656)	-0.0830 (0.0681)	-0.0483 (0.0622)	-0.0483 (0.0622)
Democratic Stock (Delta — 0.70)			4.553 (2.896)		-20.55 (17.09)
Observations	248	211	211	211	211
Number of Clusters	27	23	23	23	23
State FE	Yes	No	No	Region	Region
Year FE	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section C1. Robustness Checks (cont.)

V.2 Alternative Proxies for Selected Independent Variables & Additional Controls

Table C6. G Replication of Models in Table 3

Dep. Var: ISED	Model 6	Model B		Model D	
	(2FE)	(RE)		(Region & Year FE)	
	(1)	(2)	(3)	(4)	(5)
Total Population (log)	-2.582 (7.268)	1.069 (1.092)	0.627 (0.918)	0.951 (1.077)	0.951 (1.077)
GDP per capita (log)	2.312 (4.390)	2.017 (1.998)	-0.567 (2.205)	5.129 (3.357)	5.129 (3.357)
Federal Transfers as % of GDP	-0.447 (0.363)	0.102 (0.169)	-0.0657 (0.156)	0.190 (0.171)	0.190 (0.171)
Elect. Rev. Ideology (high=right)	0.208 (3.503)	-1.522 (4.224)	-4.142 (3.792)	0.924 (3.483)	0.924 (3.483)
EPS (All Candidates, All Surnames)	-28.91 (28.78)	48.81*** (18.24)	-9.122 (18.25)	-20.97 (15.80)	-20.97 (15.80)
Diffusion Democracy (Lagged & Weighted)	0.311 (2.064)	0.284 (0.966)	0.507 (0.927)	-0.537 (1.749)	-0.537 (1.749)
Auth. Legacy Proxy		-0.0980 (0.0995)	-0.189** (0.0827)	-0.133* (0.0722)	-0.133* (0.0722)
Democratic Habituation (N years since 1985 transition to democracy)			0.259*** (0.0392)	0.372*** (0.0585)	0.372*** (0.0585)
Observations	249	212	212	212	212
Number of Clusters	27	23	23	23	23
State FE	Yes	No	No	Region	Region
Year FE	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table C6. H Replication of Models in Table 3

Dep. Var: ISED	Model 6	Model B		Model D	
	(2FE)	(RE)		(Region & Year FE)	
	(1)	(2)	(3)	(4)	(5)
Total Population (log)	0.144 (7.320)	0.988 (0.855)	0.871 (0.876)	0.688 (0.938)	0.688 (0.938)
HDI	54.08** (23.95)	26.63*** (3.515)	23.71** (11.63)	59.12*** (20.56)	59.12*** (20.56)
Federal Transfers as % of GDP	-0.275 (0.336)	0.108 (0.122)	0.0693 (0.141)	0.169 (0.128)	0.169 (0.128)
Elect. Rev. Ideology (high=right)	1.611 (3.625)	-0.619 (3.687)	-1.357 (3.817)	2.727 (3.616)	2.727 (3.616)
EPS (All Candidates, All Surnames)	-33.64 (27.83)	-12.14 (18.46)	-15.31 (19.28)	-19.63 (16.02)	-19.63 (16.02)
Diffusion Democracy (Lagged & Weighted)	0.713 (2.016)	-0.190 (0.872)	-0.0708 (0.932)	-0.356 (1.732)	-0.356 (1.732)
Auth. Legacy Proxy		-0.115** (0.0579)	-0.122* (0.0627)	-0.115** (0.0514)	-0.115** (0.0514)
Democratic Habituation (N years since 1985 transition to democracy)			0.0334 (0.125)	-0.123 (0.185)	-0.123 (0.185)
Observations	249	212	212	212	212
Number of Clusters	27	23	23	23	23
State FE	Yes	No	No	Region	Region
Year FE	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section C1. Robustness Checks (cont.)

V.2 Alternative Proxies for Selected Independent Variables & Additional Controls

Table C6. I Replication of Models in Table 3

Dep. Var: ISED	Model 6	Model B		Model D	
	(2FE)	(RE)		(Region & Year FE)	
	(1)	(2)	(3)	(4)	(5)
Total Population (log)	-2.588 (7.273)	0.999 (1.099)	0.682 (0.950)	0.955 (1.092)	0.955 (1.092)
GDP per capita (log)	2.242 (4.453)	1.718 (2.167)	-0.509 (2.239)	5.193 (3.391)	5.193 (3.391)
Federal Transfers as % of GDP	-0.438 (0.354)	0.0897 (0.173)	-0.0590 (0.163)	0.190 (0.173)	0.190 (0.173)
Elect. Rev. Ideology (high=right) (No Imputed)	-0.353 (3.859)	-3.730 (4.118)	-2.759 (3.758)	1.500 (3.542)	1.500 (3.542)
EPS (All Candidates, All Surnames)	-29.10 (28.93)	47.91*** (18.21)	-9.297 (18.78)	-20.62 (16.03)	-20.62 (16.03)
Diffusion Democracy (Lagged & Weighted)	0.307 (2.065)	0.301 (0.944)	0.538 (0.951)	-0.537 (1.761)	-0.537 (1.761)
Auth. Legacy Proxy		-0.104 (0.101)	-0.188** (0.0849)	-0.133* (0.0729)	-0.133* (0.0729)
Dem. Habituation (n-years since nat. trans. 1985)			0.253*** (0.0406)		0.373*** (0.0592)
Observations	249	212	212	212	212
Number of Clusters	27	23	23	23	23
State FE	Yes	No	No	Region	Region
Year FE	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table C6. J Replication of Models in Table 3

Dep. Var: ISED	Model 6	Model B		Model D	
	(2FE)	(RE)		(Region & Year FE)	
	(1)	(2)	(3)	(4)	(5)
Total Population (log)	0.180 (7.337)	1.038 (0.876)	0.927 (0.900)	0.688 (0.946)	0.688 (0.946)
HDI	53.80** (24.45)	26.76*** (3.719)	25.55** (11.56)	59.26*** (20.36)	59.26*** (20.36)
Federal Transfers as % of GDP	-0.265 (0.328)	0.115 (0.123)	0.0809 (0.144)	0.168 (0.127)	0.168 (0.127)
Elect. Rev. Ideology (high=right) (No Imputed)	1.235 (4.015)	0.706 (3.572)	0.229 (3.711)	3.052 (3.622)	3.052 (3.622)
EPS (All Candidates, All Surnames)	-33.79 (27.94)	-11.60 (18.68)	-15.29 (19.72)	-19.34 (16.06)	-19.34 (16.06)
Diffusion Democracy (Lagged & Weighted)	0.702 (2.023)	-0.179 (0.882)	-0.0834 (0.947)	-0.350 (1.738)	-0.350 (1.738)
Auth. Legacy Proxy		-0.115* (0.0592)	-0.118* (0.0631)	-0.116** (0.0509)	-0.116** (0.0509)
Dem. Habituation (n-years since nat. trans. 1985)			0.0150 (0.123)		-0.120 (0.182)
Observations	249	212	212	212	212
Number of Clusters	27	23	23	23	23
State FE	Yes	No	No	Region	Region
Year FE	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section C1. Robustness Checks (cont.)

V.2 Alternative Proxies for Selected Independent Variables & Additional Controls: Fiscal Transfers

Table C6.K Regression Check with Absolute (unlogged) Fiscal Transfers per Capita

Dep. Var: Subnational Polyarchy (ISED)	State and Year FE						State Random Effects		Region & Year FE	
	1	2	3	4	5	6	A	B	C	D
Total population (log)	5.175 (4.486)	6.081 (4.660)	13.80** (5.989)	15.33** (5.525)	15.41*** (5.471)	12.67** (5.464)	-0.494 (1.373)	-0.0513 (1.742)	-1.103 (1.787)	-0.123 (2.194)
HDI		50.60** (23.89)	50.36* (27.07)	67.77** (27.25)	67.65** (27.42)	55.23* (27.86)	16.50** (6.636)	12.71* (6.642)	52.27*** (17.66)	34.03 (26.22)
Fiscal Transfers per capita (USD)			-0.0297* (0.0157)	-0.0283 (0.0177)	-0.0281 (0.0178)	-0.0289 (0.0182)	3.03e-05 (0.0103)	-0.00833 (0.0166)	-0.00743 (0.0132)	-0.00180 (0.0195)
Electoral Reveal Ideology (high=right)				11.35* (6.611)	11.39* (6.543)	11.57* (6.572)	-0.177 (4.862)	-2.215 (6.408)	3.877 (5.834)	4.294 (7.416)
Elite Pluralism Score					-1.835 (23.53)	-0.146 (24.79)	-7.245 (18.61)	-12.51 (18.79)	10.56 (18.37)	7.387 (24.00)
Diffusion Democracy (Lagged & Unweighted)						0.237 (0.142)	0.225* (0.126)	0.213 (0.139)	0.255* (0.143)	0.216 (0.163)
Authoritarian Legacy Proxy								-0.148*** (0.0555)		-0.155** (0.0727)
Observations	291	291	162	162	162	162	162	138	162	138
R-squared	0.340	0.360	0.200	0.223	0.224	0.236				
Number of Clusters	27	27	27	27	27	27	27	23	27	23
State FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Region	Region
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section C1. Robustness Checks (cont.)

V.2 Alternative Proxies for Selected Independent Variables & Additional Controls: Fiscal Transfers

Table C6.L Regression Check with Absolute (unlogged) Total Fiscal Transfers										
Dep. Var: Subnational Polyarchy (ISED)	State and Year FE						State Random Effects		Region & Year FE	
	1	2	3	4	5	6	A	B	C	D
Total population (log)	5.175 (4.486)	6.081 (4.660)	13.34** (5.917)	15.02** (5.870)	15.23** (6.100)	13.34** (6.081)	-0.394 (0.799)	1.275 (0.891)	-0.629 (0.960)	0.0278 (1.377)
HDI		50.60** (23.89)	44.38 (32.36)	62.85* (31.81)	62.89* (32.03)	54.33 (31.86)	16.95** (6.785)	13.44** (6.830)	50.69*** (18.25)	33.24 (27.02)
Fiscal Transfers Total (USD)			-2.01e-09 (1.98e-09)	-1.76e-09 (1.77e-09)	-1.67e-09 (1.90e-09)	-7.39e-10 (1.89e-09)	-4.07e-10 (1.55e-09)	-2.15e-09 (1.82e-09)	6.43e-10 (1.74e-09)	-0 (1.73e-09)
Electoral Revealed Ideology (high=right)				11.51 (6.762)	11.58* (6.661)	11.85* (6.714)	-0.309 (4.799)	-2.174 (5.802)	3.364 (5.889)	4.225 (6.779)
Elite Pluralism Score					-3.713 (25.14)	-3.300 (26.38)	-6.257 (17.50)	-10.66 (16.20)	6.501 (18.15)	6.572 (21.46)
Diffusion Democracy (Lagged & Unweighted)						0.224 (0.146)	0.222* (0.128)	0.186 (0.141)	0.252* (0.147)	0.216 (0.166)
Authoritarian Legacy Proxy								-0.153*** (0.0529)		-0.154** (0.0763)
Observations	291	291	162	162	162	162	162	138	162	138
R-squared	0.340	0.360	0.190	0.214	0.214	0.225				
Number of Clusters	27	27	27	27	27	27	27	23	27	23
State FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Region	Region
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section C1. Robustness Checks (cont.)

VI.1 Main Models with State Specific Time Trends.

Table C7.A State and Year Fixed Effects with State-Specific Time Trends

Dep. Var: Subnational Polyarchy (ISED)	Observed						Interpolated					
	(1)	(2)	(3)	(4)	(5)	(6)	(1')	(2')	(3')	(4')	(5')	(6')
Total Population (log)	-12.95 (28.89)	-12.97 (26.71)	-7.612 (37.14)	-12.69 (36.86)	-13.63 (35.83)	-9.549 (36.87)	-12.95 (28.89)	-12.97 (26.71)	-13.37 (26.93)	-10.52 (28.25)	-10.12 (27.78)	-20.90 (34.88)
HDI		109.9** (50.84)	88.31 (91.75)	103.5 (88.84)	106.4 (94.01)	89.64 (90.35)		109.9** (50.84)	108.7** (51.28)	109.9** (52.74)	109.4* (53.69)	160.6*** (54.10)
Fiscal Transfers per capita (USD-log)			-1.662 (3.011)	-1.953 (2.838)	-2.038 (2.818)	-2.466 (3.126)			-1.014 (2.153)	-0.637 (2.441)	-0.666 (2.430)	-1.518 (2.756)
Electorally Revealed Ideology (high=right)				15.52 (10.15)	15.43 (10.08)	16.44 (10.18)				1.449 (3.987)	1.464 (3.974)	4.530 (3.609)
Elite Pluralism Score					6.401 (41.61)	8.090 (43.44)					-3.848 (20.78)	0.0283 (22.19)
Dem Diff. (Lagged & Unweighted)						0.287 (0.177)						0.0264 (0.141)
Observations	291	291	162	162	162	162	291	291	291	281	281	249
R-squared	0.454	0.474	0.297	0.328	0.328	0.342	0.454	0.474	0.474	0.474	0.474	0.468
Number of Clusters	27	27	27	27	27	27	27	27	27	27	27	27
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State-Specific Linear Times Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust and clustered standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section C1. Robustness Checks (cont.)

VI.2 Main Models with Region Specific Time Trends.

Table C7. B Region and Year Fixed Effects with Region-Specific Time Trends

Dep. Var: Subnational Polyarchy (ISED)	Observed							Interpolated						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(1')	(2')	(3')	(4')	(5')	(6')	(7')
Total Population (log)	-0.297 (0.711)	-0.236 (0.577)	-0.617 (1.661)	-0.604 (1.665)	-0.730 (1.719)	-0.871 (1.721)	0.395 (2.112)	-0.297 (0.711)	-0.236 (0.577)	-1.049 (1.111)	-0.954 (1.167)	-1.041 (1.142)	-0.788 (1.111)	1.043 (1.516)
HDI		45.04*** (15.40)	52.14** (24.31)	54.32** (24.83)	53.19** (25.52)	50.83** (25.22)	36.11 (38.23)		45.04*** (15.40)	30.99 (23.56)	29.35 (24.02)	27.69 (24.09)	38.51* (23.03)	36.50 (26.96)
Fiscal Transfers per capita (USD-log)			-0.611 (1.926)	-0.633 (1.978)	-0.730 (1.973)	-0.746 (2.027)	0.964 (3.124)			-1.736 (1.589)	-1.410 (1.596)	-1.455 (1.580)	-1.356 (1.574)	1.706 (2.199)
Electorally Revealed Ideology (high=right)				3.327 (5.417)	3.351 (5.425)	3.927 (5.566)	4.694 (6.945)				-2.439 (3.822)	-2.308 (3.819)	-1.683 (3.750)	4.028 (3.741)
Elite Pluralism Score					5.196 (18.48)	7.200 (19.21)	5.369 (22.94)					5.012 (12.02)	0.653 (12.88)	-9.586 (17.16)
Dem Diff. (Lagged & Unweighted)						0.214 (0.136)	0.226 (0.173)						0.0490 (0.108)	0.0356 (0.124)
Auth. Legacy Proxy							-0.143* (0.0855)							-0.148** (0.0662)
Observations	291	291	162	162	162	162	138	291	291	291	281	281	249	212
Number of Clusters	27	27	27	27	27	27	23	27	27	27	27	27	27	23
State FE	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region	Region
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Region-Specific Linear Times Trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Section C1. Robustness Checks (cont.)

VII. Mundlak Decomposition: Assessing Correlated Random Effects Estimation

Because authoritarian legacies are time-invariant, they cannot enter our two-way fixed effects specifications (which absorb all between-state variation) and are thus estimated via random effects (RE), a specification that preserves cross-sectional identification.

RE estimation assumes that the unobserved state-specific component is uncorrelated with the observed regressors. This assumption warrants formal scrutiny in our setting. For example, Brazilian states in the Northeast are simultaneously characterized by stronger authoritarian legacies and lower levels of development, meaning our two strongest predictors share a geographic concentration that could, in principle, reflect a common unobserved state characteristic rather than the independent effects we attribute to each.

We test this assumption using the correlated random effects procedure developed by Mundlak (1978). The procedure augments the standard RE model by adding the within-state long-run mean of each time-varying regressor as an additional covariate. These group means are designed to absorb any systematic relationship between stable state-level factors and the time-varying regressors.

Critically for our purposes, if the group means are jointly insignificant, the standard RE specification is appropriate. If, on the other hand, the group means are jointly significant, this would indicate that unobserved time-invariant state characteristics are contaminating the estimates and that the RE approach is misspecified.

Table C.8 presents the results. We estimate two versions of the Mundlak model: one without and one with region fixed effects. A joint test of the six group means yields $\chi^2(6) = 6.16$ ($p = 0.41$) in the baseline specification and $\chi^2(6) = 10.49$ ($p = 0.11$) with region fixed effects. In neither case can we reject the null that the group means are jointly zero. In other words, these results provide no evidence that the standard RE assumption is violated in our data. Consequently, they increase our confidence in that the estimates reported in Table 3 of the main text, as well as the accompanying RE estimates of this appendix (i.e. Table B.1), are not systematically biased by omitted time-invariant state characteristics.

Beyond the formal assumption test, the Mundlak estimates also speak directly to the stability of our substantive findings. The coefficient on authoritarian legacies remains virtually unchanged across specifications, moving only from -0.138 in the baseline RE model to -0.142 in the Mundlak specification with region fixed effects. The democratic diffusion coefficient is similarly stable, increasing modestly from 0.209 in the baseline RE model to 0.245 and 0.236 in the two Mundlak specifications while remaining positive throughout. The HDI coefficient likewise remains positive in all models and is, if anything, somewhat larger in the Mundlak specifications than in the baseline RE model, consistent with the possibility that the inclusion of the group means absorbs confounding variation that partially suppresses the estimated development effect in standard RE.

In sum, the principal difference between the Mundlak and baseline RE specifications concerns statistical precision rather than substantive conclusions. Standard errors increase noticeably once the group means are introduced, a predictable consequence of the substantial collinearity between the original regressors and their state-level averages. The resulting loss of conventional statistical significance therefore reflects reduced estimation efficiency in a correction that the joint tests indicate was unnecessary, rather than instability in the underlying relationships. Taken together, these results provide little evidence that the estimated effects of authoritarian legacies, democratic diffusion, and socioeconomic development are being driven by omitted time-invariant state characteristics.

Table C8. Mundlak Decomposition of RE Estimators

Dep. Var: Subnational Polyarchy (ISED)	Table B1(Col. 7) RE Baseline	Mundlak (No Region FE)	Mundlak Region Fe)
Total Population (log)	0.324 (1.519)	7.736 (10.26)	12.16 (10.58)
HDI	12.77* (7.513)	40.90 (34.30)	40.86 (34.27)
Fiscal Transfers per capita (USD-log)	-0.574 (2.230)	1.021 (3.570)	1.223 (3.579)
Electorally Revealed Ideology (high=right)	-1.739 (6.108)	8.234 (8.290)	8.651 (8.322)
Elite Pluralism Score	-15.15 (17.17)	11.82 (29.64)	14.71 (29.14)
Dem Diff. (Lagged & Unweighted)	0.209 (0.144)	0.245 (0.173)	0.236 (0.178)
Authoritarian Legacy Proxy	-0.138*** (0.0486)	-0.0995 (0.0870)	-0.142 (0.0891)
N	138	138	138

Note: State-level group means are included as technical controls and are not reported. Standard errors clustered by state. The attenuation of the authoritarian legacies coefficient in Mundlak specifications reflects collinearity between the group means and the time-invariant legacy variable,

Section C2. Multiverse Analysis

We complement the specification-by-specification robustness checks presented in Section C1 with a formal all-combinations multiverse analysis following Young and Cumberworth (2025).

Rather than selecting a single preferred specification or a limited set of alternatives, the multiverse approach systematically estimates the focal coefficient of theoretical interest across every possible combination of defensible modelling choices. This is a sensitivity analysis toolkit proposed by Young and Cumberworth (2025) that characterizes how sensitive our conclusions are to modelling choices.

To be clear, the multiverse approach (Young and Cumberworth 2025) does not generate theoretical conclusions, nor can it serve to present primary results as it is a theoretically agnostic set of algorithms. It simply characterizes how sensitive conclusions that emerge from theoretically motivated models are to specification uncertainty. Our anchor throughout is the theoretically informed specifications presented in Table 3: the set of models we have argued for on substantive grounds, using the appropriate to examine our hypotheses.

The multiverse systematically varies (i) estimator, (ii) the dependent variable used as well as (iii) the inclusion of covariates, thus examining all possible combinations across the model space.

The multiverse spans six hypotheses blocks (H1–H6), three dependent variables (ISED, CSDI, and Giraudy’s SUR), and three estimator classes: two-way fixed effects (2FE), random effects (RE), and region-plus-year fixed effects (RFE).

The result is a total of 2,592 model specifications spanning six hypotheses and three dependent variables, yielding distributions of 32 to 160 estimates per hypothesis-DV pair. While the code for this and all other robustness checks will be made available with the replication package of the paper, to ease the interpretation of results, in Table C2. 1 we summarize them in percentages. Specifically, we ask: across this full distribution, how consistently does the coefficient carry the expected sign, and in what share of specifications does it reach conventional levels of statistical significance?

Results using our primary dependent variable (ISED)

Among the three predictors identified in the main text as correlates of subnational electoral democracy, authoritarian legacies (H3) displays a strong overall profile. Across all 64 specifications, the coefficient is negative in 94% of models and significant at conventional levels in 72% of them. Within the region-plus-year fixed effects family, the coefficient is negative and significant in all 32 specifications.

Socioeconomic development (H1) has an equally strong profile, as it is sign-stable in 100% of the 160 specifications and reaches significance in 78% of them. Importantly, not only is the coefficient stable in magnitude across the distribution, but also, within the random effects model family (which preserves the between-state variation through which long-run structural development operates), the significance rate reaches 98%.

Democratic diffusion (H6) is sign-stable in 99% of models. Its significance is concentrated in the random-effects specifications, where the between-state variation through which diffusion operates is preserved. More specifically, in the random effects specifications, the coefficient for diffusion reaches conventional significance in 67% of cases. Even within the two-way fixed-effects specifications, which absorb between-state variation (and should by construction attenuate the diffusion signal) 31% of models reach conventional significance. While in the region-year FE specifications, significance drops considerably, this is consistent with the fact that region dummies may also absorb precisely the regional geographic clustering that constitutes diffusion’s spatial channel.

Section C2. Multiverse Analysis (cont.)

Table C2.1 Summary of Results of Multiverse Sensitivity Analysis

Hypothesis	Estimator	N-Models	ISED		CSDI		SUR	
			Sign Stable (%)	Significance (%)	Sign Stable (%)	Significance (%)	Sign Stable (%)	Significance (%)
H1: HDI	Combined	160	100	78	91	58	98	59
	2FE	32	100	44	100	38	94	19
	RE	64	100	98	100	100	3	88
	RFE	64	100	75	23	27	100	50
H3: Auth. Legacies	Combined	64	94	72	72	6	56	20
	RE	32	88	44	44	13	13	16
	RFE	32	100	100	100	0	100	25
H6: Diffusion	Combined	160	99	35	100	16	80	36
	2FE	32	100	31	100	0	100	0
	RE	64	100	67	100	41	100	89
	RFE	64	97	5	100	0	50	0
H2: Fiscal Transfers	Combined	160	56	23	45	18	48	36
	2FE	32	100	63	100	0	38	0
	RE	64	44	25	100	44	100	91
	RFE	64	53	0	63	0	100	0
H4: Elite Pluralism	Combined	160	55	3	26	12	11	24
	2FE	32	66	0	100	0	19	0
	RE	64	75	8	84	17	81	59
	RFE	64	70	0	100	13	100	0
H5: Ideology	Combined	160	46	6	56	1	100	84
	2FE	32	63	0	100	0	100	88
	RE	64	78	3	78	3	100	94
	RFE	64	94	13	89	0	100	72

Total Models: $[(160 \times 5) + 64] \times 3 = 2,592$

Notes: 160 models with different estimators for 5 hypotheses; 64 models for 1 hypothesis, all repeated for each of the three dependent variables examined here.

Section C2. Multiverse Analysis (cont.)

In contrast, just as in Section C1, the three predictors treated as null findings in the main text display substantially weaker profiles in this multiverse sensitivity extension.

Fiscal transfers (H2) are consistently negative within the two-way fixed effects family but become sign-unstable across estimators, with the coefficient changing sign in a substantial share of RE and Region-FE specifications. Similarly, in the region fixed effects model space the coefficient for this variable is sign-unstable and significant in none of the 64 models evaluated. This mirrors the estimator sensitivity observed in Table 3 of the main analyses. Elite pluralism (H4) retains the expected sign in only 55% of specifications and reaches significance in 3%. For its part, Ideology (H5) retains the expected sign in 46% of models and reaches significance in 6%.

Taken together, the ISED multiverse reveals a clear distinction between the paper's positive and null findings. Development, authoritarian legacies, and democratic diffusion remain highly stable across the specification space, whereas fiscal transfers, elite pluralism, and ideology exhibit either sign instability, limited statistical support, or both.

Results with alternative dependent variables

The results for socioeconomic development (H1) and democratic diffusion (H6) remain highly consistent across alternative measures. Development retains the expected sign in 91–98% of specifications across the CSDI and Giraudy SUR and reaches significance in all random-effects specifications using the CSDI. Diffusion is sign-stable in 100% of random-effects specifications for both alternative measures and reaches significance in 41% of CSDI models and 89% of Giraudy SUR models.

The coefficient for authoritarian legacies (H3) shows signs of being more sensible to the choice of DV. Sign stability declines from 94% under the ISED to 72% under the CSDI and 56% under the Giraudy SUR. This gradient is consistent with differences in what the measures capture. Historically, ARENA/PDS organisational strength was most directly associated with lower participation and weaker electoral contestation, dimensions that receive greater weight in the ISED than in the alternative measures. The weaker performance of the legacy variable under the CSDI and Giraudy SUR therefore reflect differences in conceptualization and measurement. As such, we treat this result as interpretable heterogeneity rather than as an unexplained inconsistency: we firmly believe it is telling us something real about the mechanism through which these legacies are likely to operate, not casting doubt on the finding itself.

Summary

The full multiverse of 2,592 models reinforces the central conclusions of the paper. The three variables identified as the principal correlates of subnational electoral democracy in Brazil—socioeconomic development, authoritarian legacies, and democratic diffusion—display high levels of sign stability across the specification space and substantially stronger significance profiles than the remaining predictors. By contrast, fiscal transfers, elite pluralism, and ideology exhibit either sign instability, weak statistical support, or both. Overall, the multiverse suggests that the paper's main findings are not driven by particular modelling choices but persist across a broad range of defensible specifications.

Section D. Elite Pluralism Score (EPS)

Extensive evidence shows that political families often contribute to the concentration of power and reduce the diversity of candidates and elected officials, both nationally and locally. While most empirical studies on political families and dynasties focus on identifying kinship links among candidates and officeholders (Bragança et al., 2015; Geys & Smith, 2017; Rocha, 2022), our approach considers the presence of political families relative to the total pool of candidates or elected officials. Our rationale is straightforward: the *greater* the presence of political families, the *lower* the pluralism among the governing elite.

Unlike other contexts (Muraoka, 2018; Rahman, 2013), Brazil lacks a national database of political kinship. We therefore follow a widely used and validated strategy in the literature on political dynasties: identifying the probability of family membership based on shared surnames (Bragança et al., 2015; Geys, 2017; Mendoza et al., 2016; Oliveira & Souza, 2022; Querubin, 2016). Admittedly, some individuals may share a surname without being related. Nonetheless, it is reasonable to assume that surname similarity is a valid proxy for kinship among politicians. In this respect, our measures are designed to capture the extent to which the state-level political elite is plural or diverse, based on surname heterogeneity. Importantly, we assess pluralism not only among elected officials but also among candidates—acknowledging that political families may exert influence over candidate selection processes (Van Coppenolle, 2014).

In contrast to countries like the Philippines, where many surnames are unique and clearly signal familial ties, Brazil has a high concentration of common surnames—such as Silva or Santos—that do not necessarily indicate kinship. To mitigate the risk of false positives from such common surnames, we implement several corrective steps. Following Bragança et al. (2015), we exclude the 10 most frequent surnames from our sample. In addition, to avoid mistakenly identifying compound given names (e.g., ‘Luiz Inácio’ or ‘Jair Messias’) as surnames—a frequent issue in Brazilian Portuguese where such names are typically not hyphenated—we rely on the “Nomes do Brasil” database from the Brazilian Institute of Geography and Statistics (IBGE), which lists the 10 most common given names of individuals born up to 2010 based on the 2010 census. This allows us to more accurately distinguish between given names and surnames.

Once the data are cleaned, we begin by calculating the distribution of surnames per state for all candidates running in regular and first-round elections for the following offices: state deputy, federal deputy, senator, governor, and vice-governor. Then we construct a surname-based inequality measure per state using a Gini coefficient, estimated via the relative mean absolute deviation approach. This method calculates pairwise differences and normalizes them by the mean, thus avoiding issues related to cumulative shares and ensuring a non-negative numerator (Atkinson, 1970). Consequently, our Elite Pluralism Score (EPS) ranges from 0 to 1, with higher values indicating greater pluralism. Based on this approach, we construct three proxies for elite pluralism:

1. A measure based on surname distribution among all candidates for the five state-level offices listed above;
2. A measure based only on elected officials for those same positions; and
3. A third proxy calculated as the difference between the elected and candidate-based measures.

Our main analyses rely on the first proxy, while the second and third are included in Section C of this appendix as robustness checks. Below, we present a table tallying the number of aspirants captured in our estimations, as well as two graphs showing the average EPS by region and by state.

Table D1. EPS – Tally of Candidate Type (N)

	ALL		ELECTED
Deputado Distrital	5,430	DEPUTADO DISTRITAL	150
Deputado Estadual	99,798	DEPUTADO ESTADUAL	6,882
Deputado Federal	45,375	DEPUTADO FEDERAL	3,381
Suplentes	3,834	SUPLENTES	216
Governador	1,515	GOVERNADOR	192
Senador	1,774	SENADOR	270
Vice-Governador	1,576	VICE-GOVERNADOR	84
TOTAL	159,302	TOTAL	11,175

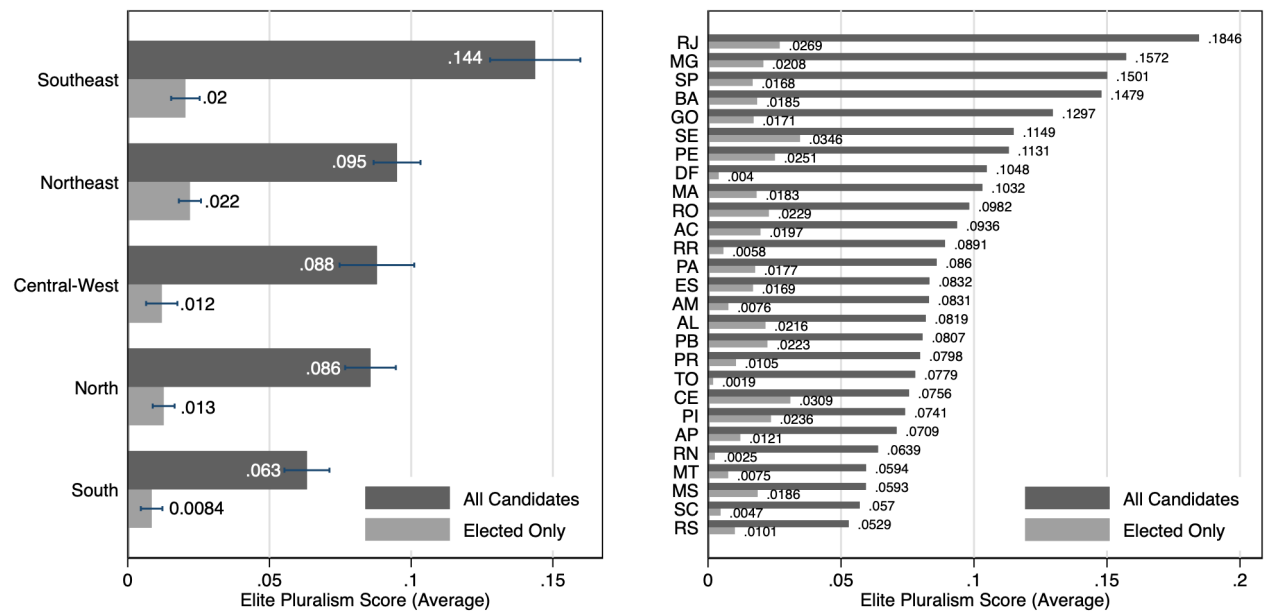


Figure D1. Average Cross-Section Variation in Elite Pluralism.

Note: Unweighted average values for the observed period.

While the Southeast is identified as the most plural region on average, a careful observer may note that, contrary to conventional expectations regarding clientelism and political machines, the Northeast emerges as the runner-up. Similarly, at the state level, scholars of Brazilian politics may find it surprising that Bahia is ranked above Santa Catarina or Rio Grande do Sul. To strengthen confidence in our elite pluralism construct, we therefore conduct two additional exercises: (i) we replicate our estimations *without* excluding the ten most common surnames, and (ii) we construct a Magnitude-Adjusted Effective Number of Surnames (correcting for the number of seats available in each subnational political system) as an alternative robustness proxy for elite pluralism.

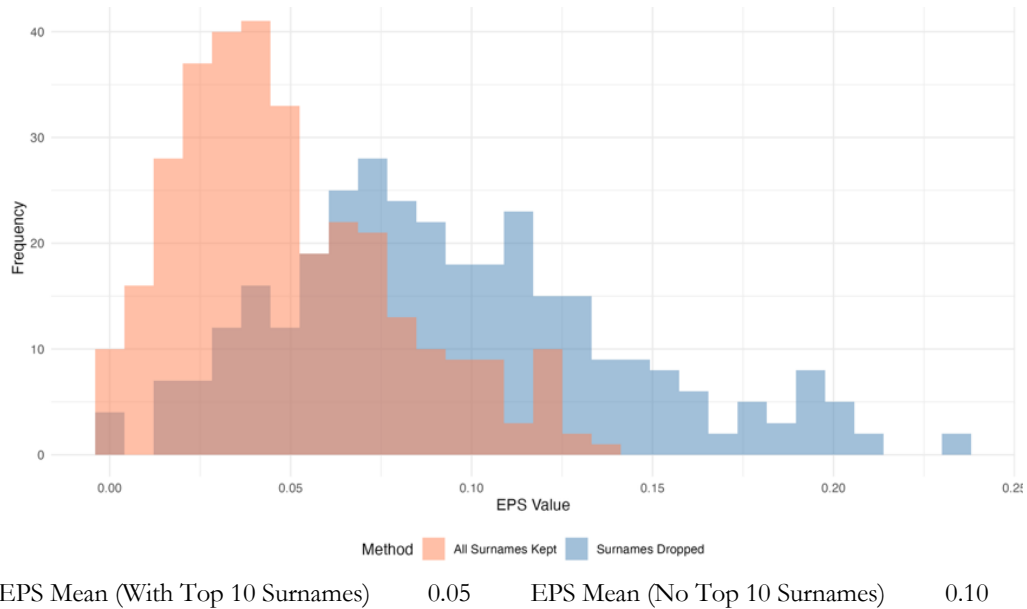


Figure D2. Contrasting Approximations to the EPS Score

As noted above, our main variable of analysis—the Elite Pluralism Score (EPS)—is based on a Gini-like calculation over surname shares. Excluding the most common surnames reduces the risk of false positives when using surnames as a proxy for kinship, but it may also affect the distributional properties of the index. Reintroducing the full set of surnames allows us to examine whether the variable behaves in theoretically expected ways under the full sample. Because the most frequent surnames are, by definition, highly homogeneous, their inclusion should mechanically reduce measured elite pluralism. Figure D2 contrasts the EPS proxy with and without dropping the ten most common surnames and shows that the measure behaves accordingly, with the mean declining from 0.10 to 0.05 when the full surname sample is retained.

Although proxying kinship through surnames is unavoidable with our data, it is also necessary to assess whether some of the patterns captured by the EPS may be driven by the mathematical properties of the index or by features of the institutional environment. In particular, our dataset pools candidates across multiple contests—federal deputy, state deputy, senator, vice-governor, and governor—thereby embedding variation in the institutional opportunity structure of subnational political systems into the measurement process. Since Brazilian states differ in the number of available seats across these offices, larger institutional arenas may mechanically generate higher levels of surname fragmentation, independently of underlying elite recruitment dynamics. Consequently, the EPS may partly reflect differences in institutional scale (i.e. number of available seats) rather than purely differences in elite pluralism.

To further probe this issue, we first compute an Effective Number of Surnames (ENS) as an alternative robustness measure. Treating each surname as a categorical label, and following the logic of Laakso and Taagepera (1979), we estimate ENS as the inverse of the Herfindahl–Hirschman Index of surname shares. This alternative proxy is constructed using the same data cleaning procedures as the EPS, with the exception that it retains the full set of surnames, including the most common ones.

Finally, to account explicitly for the potential mechanical effects of institutional opportunity structure—particularly variation in the number of available seats across offices and

states—we implement a seat-product correction following Taagepera (2007), Li and Shugart (2016), and Golosov (2009), generating a magnitude-adjusted Effective Number of Surnames. This corrects for the asymmetries of state-level candidate pools in Brazil, wherein, for example, the district magnitude states can range from a floor of 8 seats in the Chamber of Deputies (affecting 11 states) to a ceiling of 70 (affecting only São Paulo). The higher the district magnitude, the larger the supply of candidates, and the greater the potential for surname variation.

Conceptually, this adjustment standardizes observed surname fragmentation by the level of pluralism institutionally expected given the seat structure across each state-year. This approach allows us to evaluate whether the substantive patterns identified by the EPS persist once we use a score with different mathematical properties and once the differences in institutional opportunity—i.e., the number of political “slots” available across subnational systems—are taken into account.

Formally,

$$ENS_{it}^{SeatCorrected} = ENS_{it} / \tilde{N}_{it}$$

Where $\tilde{N}$ is calculated by:

- 1) Estimating weight for the offices included in the analysis: $w_{kit} = \frac{N_Seats_{kit}}{Total\ Seats_{it}}$
- | | |
|-----|--|
| k | Office type (gov, v-g, state dep., etc...) |
| i | State (AM, SP, RR...) |
| t | Time (election-year) |
- 2) Then taking a weighted average of how large each electoral arena is, giving more importance to offices with more seats (Taagepera 2007).

$$QuasiM_{it} = \exp\left(\sum_k (w_{kit}) * \ln(N_Seats_{kit}^2)\right)$$

Quasi-M = Taagepera’s effective seat-product proxy

- 3) Finally, the measure is scaled by

$$\tilde{N} = QuasiM_{it}^{1/6}$$

The correlation between our core Elite Pluralism Score (EPS) and the alternative proxies is reported in Table D2, while Figure D3 illustrates the association between the EPS and the seat-adjusted ENS. The correlations are consistently strong, positive, and statistically significant, which builds confidence in our core measure and suggests that the EPS is not capturing idiosyncratic noise specific to a particular operationalization of surname dispersion.

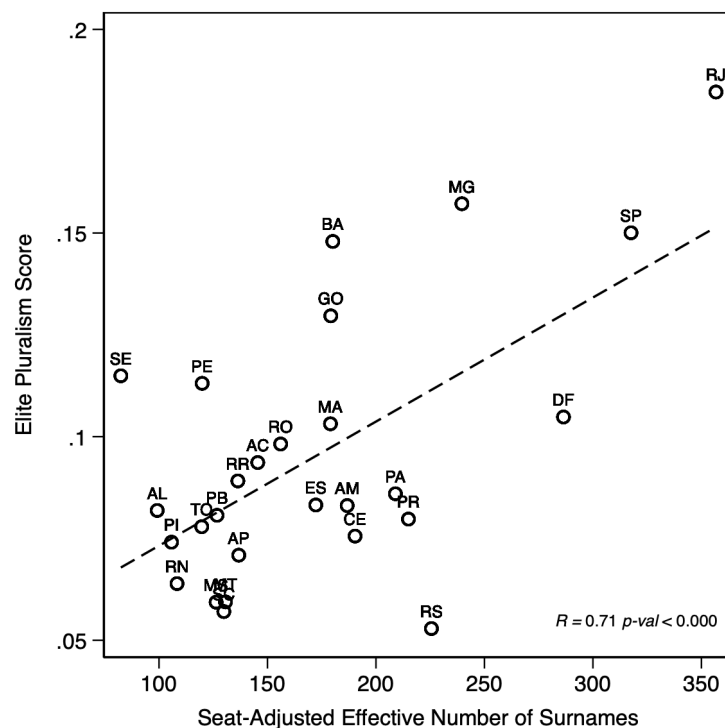
At the same time, the alternative proxies cannot eliminate substantive cross-state differences, and some rankings continue to depart from conventional priors. For instance, even under the seat-adjusted ENS, Bahia is still identified as exhibiting a more plural political arena than Santa Catarina.

Table D2. Correlations between Proxies of Elite Pluralism

	Elite Pluralism Score (EPS) (Main Proxy)	EPS (All Surnames)	Effective Number of Surnames (ENS)	'Seat- Adjusted' ENS
Elite Pluralism Score (EPS) (Main Proxy)				
EPS (All Surnames)	0.84***			
Effective Number of Surnames (ENS)	0.71***	0.61***		
'Seat-Adjusted' ENS	0.71***	0.54***	0.95***	

This pattern may initially appear counterintuitive from the standpoint of familiar accounts of clientelism, party machines, or regional political “traditions,” but the fact that it persists across alternative proxies indicates that it is not merely an artifact of the EPS construction or of institutional opportunity structure.

These findings therefore motivate, rather than settle, a broader research agenda on the sources of subnational variation in elite pluralism. In some contexts, greater surname dispersion may reflect not elite renewal per se, but fragmentation among elite-challenging groups or the coexistence of multiple localized elite networks. A useful next step would be to examine how these patterns relate to economic and demographic development. Historical processes such as immigration, industrialization, and the formation of local labor markets (e.g. Dean 1969; Lesser 2013) may shape the social bases of elite recruitment and, consequently, levels of surname dispersion. There is ample space for an agenda examining how kinship structures, political cliques, and dynastic patterns emerge across subnational political arenas, and how they relate to broader trajectories of subnational political change. Taken together, these robustness exercises reinforce that our results are not driven by a particular specification of the index or by mechanical features of institutional opportunity structure, but instead reflect persistent and substantively meaningful patterns of variation in subnational elite pluralism that warrant further exploration.

**Figure D3.** Elite Pluralism: Two Proxies.

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