Datasets, Definitions, and Coding Decisions: Assessing the Effect of Electoral Rules

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Abstract

How do dataset coding decisions affect our understanding of how electoral rules shape various social, political and economic phenomena? This paper explores the effects of three coding decisions dataset builders frequently face: case inclusion criteria, unit of analysis selection, and incorrect/conflicting coding. We explore these issues with the introduction of a new dataset on electoral rules, the Political Institutions in Anocracies (PIA) dataset. Our new dataset consists of 1673 elections in 177 countries. This includes 339 additional elections in 169 countries prior to the year 2000 that were not included in Golder (2005) plus 148 elections in 81 countries after 2000 that are not contained in Golder's update (Bormann and Golder, 2013). With this new data we re-evaluate three well-known studies that relied on Golder (2005) to see if these coding decisions affect what the discipline knows about how electoral rules shape corruption, the number of parties, and the formation of domestic terrorist groups. The results show that all three coding decisions change what we know about elections, from as small an outcome as a change in the size of a coefficient to large changes such as no effect for electoral rules or even opposite effects from the original theories. Finally, we find that electoral rules have vastly different effects in anocracies (Polity$\leq$ 5) for all three outcomes explored.

1 Introduction

The institutional revolution in comparative politics has culminated in the creation of several high-quality crossnational datasets that categorize countries into various families and types of political institutions. The most comprehensive and widely used dataset on electoral rules by Golder (2005) has spawned almost 500 citations in just over a decade and enabled scholars to test numerous classic theories as well as develop new theories on how electoral rules shape a variety of social, political and economic phenomena. To what extent do these findings, however, rely on coding decisions in the original dataset? For example, Golder (2005) codes only countries that are categorized as democratic by the ACLP definition of democracy, a strict definition that includes, among other criteria, the need for a change in the winning party. This particular definition excludes some countries that most observers consider to be high-quality democracies, for example Botswana. While there might be theoretical reasons for arguing that electoral rules do not function the same way in democracies that have not had a changeover in power, these are not articulated by most (if not all) of the papers we reviewed. In other words, the results rely–often unwittingly–on the original coding decision made in Golder (2005).

This paper introduces a new dataset on electoral rules, the Political Institutions in Anocracies (PIA) dataset, which categorizes the electoral rules of countries that do not qualify as democracies by Alvaraez, Cheibub, Limongi and Pzerworski's 2000 (ACLP) definition, but which do by other (less strict) definitions. Specifically, PIA includes all countries that, at the time of the election, have a Polity score of at least 0 (on a scale of -10 to 10) or that received at least a 5 on the Freedom House scale (1-

7), i.e. were partially free. This more generous inclusion rule adds 339 new elections prior to the year 2000 in 69 countries. Of these 339 new elections, we include 168 elections in 46 countries that were previously excluded from Golder (2005) because they were not coded as democratic according to Przeworski et al. (2000).

In addition to case inclusion criteria, we examine two additional coding decisions. First, unit of analysis selection. Perhaps the most widely used variables in Golder's dataset are the average district magnitude variables (mean and modal), which were both calculated exclusively for the lower tier. Thus, the approximately 74 elections in 32 countries that have mixed systems completely ignores the influence of the upper tier, which in some countries can be as large as 50 percent of the legislature[1]. PIA explicitly calculates the average district magnitude for both the upper and lower tiers, as well as a weighted average (Bormann and Golder, 2013). It is this tier-weighted measure that we investigate in this paper. Second, and perhaps more importantly, in this massive data collection effort we developed a strong appreciation for the difficulty in verifying the often complex and idiosyncratic details of electoral rules across the world. Some information was extremely difficult to locate and different data sources often conflicted making it difficult to clearly categorize some countries as part of one family of electoral rules over another. We thus also went back and re-checked every election in Golder (2005) and ultimately coded some countries differently. We want to know how incorrect or different categorizations (when sources conflict) affect the discipline's understanding of the effect of electoral rules.

[1]In Golder's recent update of the dataset, he and co-author Borman include average district magnitude for each tier, rectifying this issue and making possible a tier-weighted average of district magnitude

We use PIA to re-evaluate three studies about the effect of electoral rules on corruption, the existence of terrorist groups, and the number of parties (Chang and Golden, 2007; Clark and Golder, 2006; Aksoy and Carter, 2014). When the full set of anocracies are added, the results in all three studies change significantly. Even when we restrict the results to Polity ≥ 6, some important aspects of all three results change. The results on corruption are the least robust, with some suggestion that open-list with high district magnitude is associated with less corruption–the opposite of the original theory. Duverger's law holds pretty tightly, but the effect of ethnic fractionalization in plurality systems completely disappears. Lastly, the results on domestic terrorist groups holds for within-system groups in all specifications, but PR also reduces the existence of anti-system groups contrary to the original theory. The other two coding decisions also affect outcomes.

What this new dataset also allows us to do is assess the effect of political institutions in just anocracies (Polity ≤ 5). Across the board we find that the original theories either completely disappear or act in wildly different ways. Our new dataset, then, presents the possibility of developing new theories on this important set of political regimes. At present, our typologies of political institutions are dichotmized between democracies and autocracies. Amongst democracies, we have a rich set of categorizations we can turn to, from Golder's dataset that we discuss in this paper to Shugart and Carey's Incentives to Cultivate a Personal Vote (ICPV), to measures of proportionality, party nationalization, and so on. Typologies on autocracies are also becoming more sophisticated, and we now know much about how personalist regimes differ from single-party, military, monarchical, and limited competition multi-party

regimes. This last category overlaps significantly with what we refer to in this paper as anocracies. And to date, we know little about how nominally democratic electoral rules function in such regimes.

Our preliminary empirical effort in this direction demonstrates that electoral rules function much differently in anocracies than in full democracies. Ethnic fractionalization reduces the number of parties in plurality systems in anocracies and has no effect in high district-magnitude PR systems. PR and district magnitude also do nothing to discourage the formation of domestic terrorist groups. However, increased executive constraints are associated with more within-system domestic terrorist groups.

The paper proceeds as follows. In the next section we discuss the three types of coding decisions and how they apply to Golder (2005). Next, We describe the new dataset and briefly discuss the variety of electoral rules in anocracies across the world. The methodological section analyzes the theoretical logic and findings of each of the three original studies and then examines how the three coding decisions alter what we know about the effect of electoral rules on each dependent variable. We then discuss the effect of electoral rules within anocracies. The final section concludes.

2 Dataset Coding

Comparative politics is awash with ever more sophisticated crossnational datasets. Yet there are few resources to guide dataset builders in making decisions that may shape the discipline's knowledge of key political factors. We consider three common decisions dataset builders must all make that have important implications for the

discipline's

Two decades ago, a systematic analysis of electoral rules was virtually impossible on a global scale. Most of the compiled data was from Western Europe and data on other regions was spread thin and incomplete in various ways; see for example Hicken and Kasuya (2003. All that changed in 2005 upon the release of Golder's *Democratic Electoral Systems Around the World, 1946-2000* (DESAW). Covering 867 elections in 125 countries, it was the most systematic collection of information on electoral rules to date. DESAW spawned numerous studies that estimated the effect of various aspects of elections on a variety of outcomes, from economic growth to health outcomes to political violence.

The standard of transparency in Golder (2005) was exemplary and the detailed codebook makes any comparative effort, such as ours in this paper, easy. Three coding decisions Golder made in DESAW are crucial to understanding the limitations of interpreting results based on the data. First, Golder (2005) limited the countries included in the dataset to those defined as a democracy by ACLP 2000 who define democracy as "a system in which incumbents lose elections and leave office when the rules so dictate." It includes four components: 1/. the chief executive is elected in "popular elections", 2/. the legislature (by which they mean the lower house) is also popularly elected, 3/. there is more than one party in the system, and 4/. there is alternation in power every third election at least. This definition excludes some interesting cases.

Botswana, which by all international observers have held free and fair elections since independence in 1966. It is the fourth component that excludes Botswana and

many other countries we might otherwise think are democracies, such as Japan under the Liberal Democratic Party in the post-WWII era. This definition also excludes the US under FDR, since he was in office for three terms. The ACLP definition is a broadly accepted, though strict, definition of democracy in Political Science. Many scholars working directly with the ACLP index have strong and explicit theoretical reasons for using it. However, the theoretical justification often gets lost when it is concealed in the inclusion criteria of other datasets. It is not uncommon for scholars to use Golder (2005) and control for democracy using a different dataset on democracy, such as Polity. They may even, for robustness, limit their study to different levels of Polity, unaware that they are already excluding by virtue of their use of Golder all countries, like Botswana, that are already excluded as a non-democracy by ACLP's definition.

A second coding decision made in Golder (2005) was to calculate average district magnitude using only the lower tier. This decision to only collect data at a given level of analysis is one made frequently by dataset builders who are contrained in their time and resources. However, such choices have implications for our understanding of how electoral rules function. Democracies are divided into three main families: proportional representation (PR), majoritarian, and mixed. It is this latter category whose district magnitude is in question here. Mixed systems have some legislators elected by majoritarianism (the lower tier) and some by PR (the upper tier). Germany, for example, elects approximately 50 percent in single-member majoritarian districts. The remainder are elected in a PR upper tier in large regional districts. In the original Golder dataset (Golder, 2005), Germany has an average

district magnitude of 1, which completely ignores the incentives the remaining 50 percent of legislators and their parties face during election time. Mixed systems constitute approximately 13.87 percent of all democracies and thus has the potential for biasing our overall understanding of the effect of district magnitude.

To understand why this is problematic, consider a theory about legislators supplying broad public goods to the electorate when they are elected in geographically-large, broad districts. To code Germany as identical to pure majoritarian system would be to see its legislators as only concerned with their local constituencies, overlooking the 50 percent of legislators responding to the larger PR regions.

The final coding decision is about incorrect categorization or different categorization when sources conflict. It is surprisingly difficult to locate information on electoral systems. Golder (2005) is transparent about these difficulties, and lays out in a detailed codebook the various issues he encountered and provided detailed sources for all decisions made. However, it is not uncommon for two trusted sources to have different information on such things as the number of seats, the district magnitude, the PR quota system, etc. This information is rarely contained in a constitution or clearly and completely laid out in a separate election law. Indeed, some of these details are left to bureaucrats that organize the elections, whether this be an interior ministry or a separate independent electoral commission. Even for currently-used electoral rules around the globe, websites of election commissions (even in advanced industrial countries) do not have all of this information readily available. Golder's codebook (Golder, 2005) reveals sources that vary from official entities to academic publications (journals, books) to websites and even personal communications with

country experts. We consulted many of the same sources and can attest to the fact that even the very best efforts at coding will contain some errata.

As we encountered these issues in our coding of anocracies not contained in (Golder, 2005) we wondered the extent to which such inconsistencies affected how Golder's original variables were coded. We thus painstakingly went back and double-checked every election in Golder 2005. Coders had to turn to the same sources and were not told of the original Golder coding. This effort helped us discover some important reasons for many of the inconsistencies we were finding: in some countries not all seats are contested in each election; in other countries there are some seats which are contested but not filled for a variety of reasons; and lastly, something applicable to anocracies, there are some seats which are simply appointed and not contested at all through elections. This discovery pushed us to create new seat number variables: overall, contested, and filled. These have implications for district magnitudes, especially if the district magnitudes of seats contested in a given election differ from those contested in a subsequent election. Many of the other inconsistencies are small, like single-digit differences in seat numbers, but some are fairly significant. The existence of an upper tier or not, large differences in the size of districts, and the like are potentially results-changing inconsistencies. Ultimately, we made our best efforts to resolve inconsistencies and documented all decisions with screen shots or photocopies of the sources we used, which are available upon request on a case-by-case basis due to copyright restrictions on some sources. We analyze these inconsistencies below and in the empirical section we demonstrate how they change the original findings.

3 The Political Institutions in Anocracies dataset

The Political Institutions in Anocracies dataset provides detailed information on the electoral rules and the number of parties in legislative lower house elections, the number of chambers in the legislative branch, executive type, and degree of constitutional separation. For electoral rules, PIA provides the number of seats on both the lower and upper tiers in the lower house only and categorizes each system's specific rule types for both PR and majoritarian systems. For PR systems, this includes information on the remainder system (stv, droop, d'hondt, hare, imperiali, modified hare, modified sainte-lague, reinforced imperiali, sainte–lague); for majoritarian it provides the exact sub-type (plurality, majority, qualified majority, runoff, alternative vote, limited vote, sntv, borda count); and for mixed systems all the previous information on the majoritarian and PR types plus the sub-type of mixed system (coexistence, superposition, fusion, correction, or conditional).

The information we provide on the number of seats is divided into several categories. We found that these categories helped overcome many of the inconsistencies we were finding previously. Thus, we provide separate information on the number of overall seats in the legislature versus those that were contested in that election. In addition, we provide separate information on how many of the contested seats were filled in the election. For most elections, all available seats are contested and filled. But there are several exceptions that caused us to separate out the data like this. Further, in the realm of anocracies there were many countries which had appointed seats, i.e. those that were not filled through the electoral process.

As stated above, we allow for a generous inclusion criteria: any election that

receives a 1 from ACLP, or is equal to or greater than 0 on Polity's -10 to 10 scale, or is less than or equal to five (i.e. at least partly free) on Freedom House's scale in the same year of the election. This last inclusion criteria caused us the most problems. Many of these elections bore such little resemblance to democratic elections that basic data was not even available. Nevertheless, we were diligent in trying to be as complete as possible. As a result we added 339 elections in 169 countries. This included 171 elections for 123 countries that had some elections already appearing in Golder's original dataset plus 168 elections in 46 countries that were completely new. A list of all original countries and their associated election years are presented in Table 1. In total, we have 1673 elections in 177 countries for the period 1946-2012.

Following, we briefly compare the variety of electoral rules in anocracies to those in full democracies. We follow Polity's definition of full democracy, which is a Polity score of 6 or above. First, anocracies have different ratios of the three main families of electoral rules: 50.7 percent of anocracies have majoritarian rules, 34.9 percent PR rules, and 13.5 percent mixed. This compares to 28.2 percent majoritarian, 55.2 percent PR, and 15 percent mixed in full democracies.

In terms of sub-groups of each type, 45 percent of the majoritarian systems have a district magnitude of one compared to 79 percent in full democracies. There seems to be a preference for multi-member majoritarian rules in anocracies, at least amongst those that choose this family type in the first place. Although most of the majoritarian family is simple plurality type (50.2%), 43.4 percent are majority, qualified majority or runoff. The remainder use SNTV (4.9%) or the alternative vote (1.5%). This is different than full democracies who seem less willing to experiment

Table 1: Anocracies Added

	Country Name	Years	Country Name	Years
1	Angola	'92	Kuwait	'75, '81, '90, '92, '96, '99
2	Azerbaijan	'90	Lesotho	'93, '98
3	Belarus	'90	Liberia	'85, '97
4	Bosnia-Herzegovina	'96, '98, '00	Malaysia	'59, '64, '69, '74, '78, '82, '86, '90, '95, '99
5	Botswana	'69, '74, '79, '84, '89, '94, '99	Maldives	'75, '79, '84, '89, '94, '99
6	Burkina Faso	'78, '92, '97	Monaco	'73, '93, '98
7	Burundi	'93	Morocco	'77, '84, '93, '97
8	Cambodia	'93, '98	Mozambique	'94, '99
9	Cameroon	'97	Paraguay	'73, '78, '83, '88, '89, '91, '93, '98
10	Congo (DRC)	'60	Samoa	'67, '70, '73, '76, '79, '82, '85, '88, '91, '96
11	Cote D'Ivoire	'00	Senegal	'78, '83, '88, '93, '98
12	Djibouti	'97	Seychelles	'93, '98
13	Egypt	'50, '76, '79, '84, '87, '90	Singapore	'59, '63, '68, '72, '76, '80, '84, '88, '91, '97
14	Equatorial Guinea	'68, '93, '99	Swaziland	'72
15	Ethiopia	'73, '95, '00	Syria	'54, '77, '81
16	Fiji	'72, '77, '77, '82, '87, '92, '94, '99	Tanzania	'95, '00
17	Gabon	'90, '96	Togo	'99
18	Gambia	'66, '72, '82, '87, '92, '97	Tonga	'72, '75, '78, '81, '84, '87, '90, '93, '96, '99
19	Georgia	'90, '92, '95, '99	Tunisia	'89
20	Guinea-Bissau	'94, '99	Tuvalu	'81, '85, '89, '93, '93, '98
21	Iran (Persia)	'80, '84, '00	Yemen	'93, '97
22	Jordan	'89, '93, '97	Serbia	'00
23	Kenya	'61, '63, '92, '97	Zimbabwe	'80, '85, '90, '95

with majoritarian sub-types outside the popular plurality type (77.1% plurality, 16.1 percent majority/qualified/runoff, and 6.8 percent other).

For PR systems, the average district magnitude is 12.18 (median of 5.30) for anocracies compared to 27.33 (median of 9.33) for full democracies. The distribution of remainder systems is somewhat similar, with 94% (anocracies) 80.1% (democracies) adopting the three main types–droop, d'hondt, or hare. Mixed systems, however, seem to be fairly similar between anocracies and democracies. The average size of the PR tier in anocracies is 27.4% percent compared to 30.6% percent in full democracies. Most mixed systems, lastly, are dependent (correction/condition) systems (6.8% percent), which is much lower than the 31% percent in full democracies.

In sum, it appears that anocracies have a strong bias towards majoritarian electoral rules. Even when they use PR, they choose low-magnitude districts, which decreases the proportionality. When they use mixed systems, they rarely choose dependent tiers, which would make them closer to PR rules and correct malapportionment. The potential reasons for this and a more in-depth analysis of the dataset are analyzed in a separate paper.

We also follow Golder in calculating the number of parties at the national level. The average number of electoral parties in anocracies is 3.54 compared to 4.08 in full democracies. This breaks up to be 3.56 in majoritarian systems, 3.72 in PR systems, and 3.22 in mixed systems. Clearly, there are much fewer parties in anocracies, which is not so surprising given the much higher proportion of majoritarian systems.

So how do these differences translate to the three studies we selected?[2] By in-

[2]Our selection criteria was simply to choose the three most-cited studies according to Google scholar that had used the Golder dataset

cluding countries defined as democracies by other indices do we change what we know about corruption, the number of parties, or the formation of terrorist groups? Do political institutions in anocracies simply not function at all because anocratic leaders simply bypass them, or is there something systematic about and different from democracies about the way they use nominally identical institutions? It is to these studies that we now turn.

4 Inclusion Criteria

4.1 Chang and Golden

We begin with Chang and Golden (2007) who examine the effect of open-list versus closed-list PR systems on corruption. Prior studies had shown that closed-list PR was associated with more corruption than majoritarian or open-list PR electoral rules. In contrast, Chang and Golden (2007) argue that this depends on the district magnitude. Where it is large, open-list PR's feature that allows voters to change the ranking of candidates on the list provides strong incentives to campaign on a personal vote, emphasizing personal characteristics and providing narrow resource distribution to small and parochial groups in society. In contrast, district magnitude in closed-list systems is good for reducing corruption because it makes it increasingly harder for individuals to campaign on the personal vote. They must rely on the party label.

Chang and Golden (2007) support their theory with data from 38 pure-PR plus 4 mixed systems (42 total), which include a proportion of the legislature elected by PR.

Given issues of data missingness in both the dependent variable and control variables, this number drops to 39 in the basic model with no controls (see Table refcg2) and to just 32 with the full set of controls (see Table refcgrep). Our full sample has 51 countries in the model with all the controls, including nine new countries in Table 2 plus Paraguay, Sri Lanka and Malta, which Chang and Golden lost due to data missingness. Table 3 shows the means of our sample versus theirs. Overall corruption rates are slightly higher. Transparency International (TI) is on a scale of 0-10 with 10 being the cleanest and 0 being the most corrupt. The mean district magnitude is also much smaller, though the percent of open-list is similar. The population of protestants and degree of trade openness are the other two variables that are slightly lower in our larger sample than the original.

Table 2: Anocracies Included

	Country Name	Polity	ACLP
1	El Salvador	7	1
2	Greece	10	1
3	Guatemala	5.5	1
4	Honduras	6	1
5	Hungary	10	1
6	Indonesia	6	1
7	Liberia	0	0
8	Mexico	7	0.5
9	Yugoslavia (Serbia)	7	1

Table 3: Change in Means

Variable	C & G	S & S	Polity ≥ 2	Polity ≥ 4	Polity ≥ 6	Polity < 6
TI	4.3	3.07	3.31	3.34	3.44	1.03
District Magnitude	24.49	21.94	21.86	22.23	22.84	21.69
Open-list	0.33	0.31	0.3	0.3	0.3	0.25
DM x Open-list	7.31	6.81	6.97	7.12	7.18	2.87
Parliamentarism	2.14	2.02	2	2	2.02	1.5
ENEP	4.75	4.54	4.67	4.69	4.73	3.23
Protestant	20.74	18.18	17.24	17.55	18.23	6.65
Long-term Democracy	0.36	0.29	0.28	0.28	0.3	0
Federalism	0.19	0.2	0.21	0.22	0.23	0
log(GDP PC)	3.85	3.43	3.54	3.54	3.55	2.55
British Colony	0.14	0.12	0.11	0.11	0.09	0.25
Trade openness	39.33	32.5	35.27	35.63	36.6	11.82

We replicate the original results in columns 1 of Table 4 and 5. In column 2 is the model with our 51-country sample. In the model with no controls, all the coefficients take ont he same sign, but are all smaller and statistically insignificant (except for district magnitude, which is significant at the 10% level). In Table 5 with the full set of controls, the coefficients have different signs on both district magnitude and the interaction, and only the interaction is statistically significany. This suggests that open list systems reduce corruption when district magnitude is large, the exact opposite of the original Chang and Golden theory. However, when we restrict this to full democracies (Polity ≥ 6) in column 5, the interaction is no longer significant. The findings in Chang and Golden (2007) are thus highly sensitive to the addition of the countries in Table 2.

Even when we control for mixed systems in Table 6 the results are similar. We

did this because 3 of the 9 new countries we added are mixed systems.

In sum, our results suggest a reexamination of PR systems and their effect on corruption.

Table 4: Selway and Self vs Chang and Golden

	Dependent variable:	
	TI Corruption	
	C & G Model 2	S & S
District Magnitude	-0.0199^{**}	-0.0132^{*}
	(0.0088)	(0.0077)
Open-list	-2.1994^{**}	-0.8953
	(0.9591)	(0.8190)
DM x Open-list	0.0441^{***}	0.0116
	(0.0105)	(0.0095)
Constant	5.1602^{***}	3.5646^{***}
	(0.5914)	(0.4736)
Observations	39	51
R^2	0.1516	0.0456
Note:	*p<0.1; **p<0.05; ***p<0.01	

Table 5: Selway and Self vs Chang and Golden

	Dependent variable:				
			TI Corruption		
	C & G	S & S	Polity ≥ 2	Polity ≥ 4	Polity ≥ 6
District Magnitude	-0.0087^{***}	0.0027	0.0045	0.0040	0.0002
	(0.0032)	(0.0063)	(0.0071)	(0.0072)	(0.0046)
Open-list	-1.5331^{***}	-0.0721	-0.0559	-0.1276	-0.0597
	(0.4476)	(0.7034)	(0.7690)	(0.7671)	(0.7315)
DM x Open-list	0.0207^{***}	-0.0169^{*}	-0.0180	-0.0174	-0.0133
	(0.0061)	(0.0100)	(0.0110)	(0.0110)	(0.0099)
Parliamentarism	-0.2702	-0.3182	-0.3526	-0.3071	-0.3467
	(0.2273)	(0.3425)	(0.3868)	(0.3781)	(0.3717)
ENEP	0.1935^{***}	0.5086^{***}	0.4858^{***}	0.4782^{***}	0.4683^{***}
	(0.0711)	(0.1280)	(0.1562)	(0.1556)	(0.1570)
Protestant	-0.0105^{*}	-0.0109	-0.0119	-0.0131	-0.0130
	(0.0060)	(0.0070)	(0.0101)	(0.0101)	(0.0089)
Long-term Democracy	-2.1485^{***}	-2.9572^{***}	-2.8196^{***}	-2.7958^{***}	-2.9268^{***}
	(0.6650)	(0.6650)	(0.8712)	(0.8662)	(0.8217)
Federalism	0.8599	0.6938	0.7182	0.6222	0.4867
	(0.5418)	(0.8140)	(0.8898)	(0.9000)	(0.8940)
log(GDP PC)	-2.7552^{*}	0.5926^{***}	0.5127^{**}	0.5201^{**}	0.5465^{**}
	(1.4921)	(0.1992)	(0.2586)	(0.2495)	(0.2498)
British Colony	-0.0261	-0.2977	-0.4258	-0.4979	0.3604
	(0.4388)	(0.8231)	(1.0497)	(1.0660)	(0.6992)
Trade openness	0.0080	0.0062	0.0049	0.0026	-0.0037
	(0.0089)	(0.0123)	(0.0178)	(0.0185)	(0.0193)
Constant	15.4923^{***}	0.2203	0.6817	0.7948	1.1935
	(4.8828)	(1.0821)	(1.7033)	(1.7124)	(1.7977)
Observations	32	51	47	46	44
R^2	0.9172	0.5575	0.4977	0.5070	0.5462

Note: *p<0.1; **p<0.05; ***p<0.01

Table 6: Selway and Self vs Chang and Golden - Controlling for Mixed System

	Dependent variable:				
	TI Corruption				
	C & G	S & S	Polity ≥ 2	Polity ≥ 4	Polity ≥ 6
District Magnitude	-0.0092^{***}	0.0050	0.0077	0.0072	0.0039
	(0.0035)	(0.0069)	(0.0078)	(0.0079)	(0.0062)
Open-list	-1.5958^{***}	-0.1291	-0.1412	-0.1916	-0.1500
	(0.4696)	(0.5691)	(0.6046)	(0.6184)	(0.6091)
DM x Open-list	0.0215^{***}	-0.0160^{*}	-0.0179^{*}	-0.0175^{*}	-0.0143
	(0.0065)	(0.0090)	(0.0102)	(0.0102)	(0.0098)
Mixed System	-0.1988	1.8031^{***}	1.8872^{***}	1.8267^{***}	1.5695^{**}
	(0.3793)	(0.5609)	(0.5793)	(0.6065)	(0.6728)
Constant	15.7493^{***}	0.4601	0.8990	0.9759	1.2634
	(5.2654)	(1.1145)	(1.6310)	(1.6394)	(1.7144)
Controls Included	Yes	Yes	Yes	Yes	Yes
Observations	32	51	47	46	44
R^2	0.9177	0.6285	0.5841	0.5878	0.6059
Note:					*p<0.1; **p<0.05; ***p<0.01

4.2 Clark and Golder

We add 38 countries and 195 elections to the replication of the test of Duverger's Law in Clark and Golder (2006). Duverger's theory states that social heterogeneity will increase the number of parties, but only in systems that are permissive (high district magnitude). In restrictive systems, especially single-member district plurality systems, social heterogeneity should have a lower and possibly even no effect on the number of parties. This is the old adage that plurality systems tend towards a two-party system.

As one of the longest-standing theories in the study of political institutions, the good news is that the original results are very robust, but only when the weakest democracies (Polity < 2) are excluded. At Polity ≥ 6 the model is quite similar to the original other than the slope of the interaction is gentler. Duverger's law thus seems to have an effect even in less than perfect democracies. One difference is the effect of ethnic heterogeneity in single-member district plurality systems. This is the coefficient on *Ethnic*, which is the marginal effect of ethnic fractionalization when the log of district magnitude is 0, i.e. when district magnitude is 1. This seems to imply that ethnic fractionalization has no increasing effect on the party system in plurality systems. Duverger's original theory was that the electoral system put brakes on the number of parties, but that social heterogeneity would still matter even in plurality systems. Our results here suggest that is not the case. The coefficient on ethnic fractionalization is tiny and insignificant in our all models in columns 2 through 5.

Table 7: Anocracies Included

	Country Name	Polity	ACLP	Country Name	Polity	ACLP
1	Angola	0	0	Madagascar (Malagasy)	-6	0
2	Bosnia-Herzegovina		0	Malaysia	5	0
3	Botswana	6.571	0	Monaco		
4	Burkina Faso	-1.333	0	Morocco	-7.500	0
5	Burundi	0	1	Mozambique	5	0
6	Cambodia	1.500	0	Paraguay	-2.429	0.429
7	Cameroon	-4	0	Samoa		0
8	Congo (DRC)	0	0	Senegal	-1.200	0
9	Cote D'Ivoire	4	0	Seychelles		0
10	Djibouti	-6	0	Singapore		
11	Egypt	-6	0	Swaziland	0	0
12	Equatorial Guinea	-5	0	Tanzania	-1	0
13	Fiji	6.125	0.375	Tonga		0
14	Gambia	5.500	0	Tunisia	-5	0
15	Guinea-Bissau	5	0	Tuvalu		
16	Kenya			Yemen	-2	
17	Lesotho	4	0	Yugoslavia (Serbia)	7	1
18	Liberia	-3	0	Zimbabwe	-1.750	0

Table 8: Change in Means

Variable	C & G	S & S	Polity ≥ 2	Polity ≥ 4	Polity ≥ 6	Polity < 6
ENEP	3.92	3.74	3.94	3.91	3.95	3.39
Ethnic	1.85	2.13	2	1.96	1.83	2.93
log(Magnitude)	1.35	Inf	Inf	1.6	1.64	Inf
UpperSeats	15.21	13.33	15.58	15.99	17.1	10.01
Ethnic x UpperSeats	21.67	20.42	19.1	19.74	20.64	20.44
Ethnic x log(Magnitude)	2.4	Inf	Inf	2.65	2.65	Inf

Table 9: Selway and Self vs Clark and Golder

	Dependent variable:					
	Effective Number of Electoral Parties					
	C & G	S & S	Polity ≥ 2	Polity ≥ 4	Polity ≥ 6	Polity < 6
Ethnic	0.17^{*}	-0.01	0.02	0.07	0.18	-0.12^{***}
	(0.10)	(0.03)	(0.05)	(0.06)	(0.12)	(0.03)
log(Mag)	0.29^{**}	0.39^{***}	0.23^{*}	0.30^{**}	0.30^{*}	-0.22
	(0.15)	(0.08)	(0.14)	(0.14)	(0.18)	(0.14)
UpperSeats	0.01^{***}	0.01^{**}	0.02^{***}	0.02^{***}	0.02^{***}	0.002
	(0.003)	(0.004)	(0.005)	(0.005)	(0.01)	(0.01)
Ethnic$*$UpperSeats	-0.005^{***}	-0.003^{**}	-0.01^{***}	-0.01^{***}	-0.01^{***}	-0.002
	(0.001)	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)
Ethnic$*$log(Mag)	0.10	-0.03	0.14	0.11	0.14	0.01
	(0.10)	(0.04)	(0.09)	(0.09)	(0.11)	(0.03)
Constant	2.97^{***}	3.28^{***}	3.19^{***}	2.99^{***}	2.77^{***}	3.98^{***}
	(0.21)	(0.12)	(0.14)	(0.15)	(0.24)	(0.29)
Observations	559	759	648	619	558	201
R^2	0.13	0.07	0.12	0.15	0.17	0.04
Note:						*p<0.1; **p<0.05; ***p<0.01

4.3 Aksoy and Carter

Lastly, we turn to Aksoy and Carter (2014) on the emergence of domestic terrorist groups. They find that both the existence of a proportional representation system and higher levels of district magnitude in democracies significantly decrease the likelihood that within-system terrorist groups (groups that seek change through affecting policy rather than overthrowing the regime) emerge. Within-system groups are affected by the ease of attaining influence in electoral politics. Accordingly, the permissiveness of electoral institutions should influence the behavior of within-system groups. In contrast, electoral institutions should not influence the calculus of anti-system groups since the goals of such groups are not achievable via representation within the existing political system.

As showin Table 10, we add 42 countries to Askoy and Carter's 2014 original study, almost doubling the number of observations. Table **??** shows the results on within-system groups. The results are almost identical in magnitude as well as significance. PR and higher district mangitude decreases the likelihood of their emergence. Table 12 shows the effect of district magnitude on the emergence of anti-system groups. Here the results are a little different, with district magnitude also shown to decrease the emergence of these groups, which was not predicted by Askoy and Carter's original theory.

In Table 13 we show what happens when we use the average district magnitude of both tiers for mixed systems in our sample. The size of the coefficient in the original model is identical. Ours goes down slightly, but is still the same direction and significance.

Table 10: Anocracies Included

	Country Name	Polity	ACLP	Country Name	Polity	ACLP
1	Paraguay	-2.143	0.429	Ethiopia	-5.208	0
2	Czechoslovakia	-4.810	0.190	Angola	0	0
3	Yugoslavia (Serbia)	7	1	Mozambique	5	0
4	Bosnia-Herzegovina		0	Zimbabwe	-2.800	0
5	Latvia	8	1	Lesotho	5.750	0
6	Georgia	4.667	0	Botswana	6.667	0
7	Guinea-Bissau	3.833	0	Swaziland	0	0
8	Gambia	3.833	0	Morocco	-7.500	0
9	Senegal	-1.136	0	Tunisia	-3.667	0
10	Niger	2	0.500	Sudan	-6.500	0
11	Cote D'Ivoire	4	0	Iran (Persia)	-4	0
12	Burkina Faso	-4.870	0	Egypt	-6.211	0
13	Liberia	-1.875	0	Syria	-9	0
14	Togo	-2	0	Jordan	-2.500	0
15	Cameroon	-4	0	Kuwait		0
16	Gabon	-4.182	0	Taiwan	0.857	0.238
17	Congo (DRC)	-6.357	0	Cambodia	1	0
18	Kenya	-5.793	0.103	Laos	0	0
19	Tanzania	-1	0	Malaysia	3.793	0
20	Burundi	-1.167	0.500	Singapore	-2	0
21	Djibouti	-2	0	Fiji	6.571	0.381

Table 11: Change in Means

Variable	A & C	S & S	Polity ≥ 2	Polity ≥ 4	Polity ≥ 6	Polity < 6
All types	0.08	0.08	0.12	0.12	0.13	0.05
Anti-system	0.04	0.04	0.05	0.05	0.06	0.03
Within-system	0.02	0.02	0.04	0.04	0.05	0.01
log(Magnitude)	1.35	1.46	1.53	1.53	1.62	1.27
log(GDPPC)	7.92	7.83	8.59	8.63	8.75	7.36
Ethnic	0.42	0.42	0.36	0.35	0.32	0.47
Banned Parties	0.51	0.55	0.24	0.24	0.21	0.72
Federal	0.35	0.35	0.52	0.53	0.54	0.25
Political Participation	26.91	24.88	61.11	63.85	72.84	0.23
Executive Constraint	4.06	3.89	6.26	6.37	6.53	2.53
Political Competition	4.99	4.66	8.63	8.72	9.17	2.38

Table 12: Selway and Self vs Aksoy and Carter Table 4: Model V

	Dependent variable:					
	Emergence of Terror: Anti-system types					
	A & C	S & S	Polity ≥ 2	Polity ≥ 4	Polity ≥ 6	Polity < 6
log(Mag)	-0.16	-0.17^{**}	-0.16^{*}	-0.21^{**}	-0.22^{*}	0.01
	(0.10)	(0.08)	(0.10)	(0.11)	(0.11)	(0.14)
Exec Constraints	-0.02	0.02	-0.05	-0.06	-0.17	0.14
	(0.15)	(0.08)	(0.15)	(0.19)	(0.20)	(0.10)
Pol comp	-0.06	-0.03	0.03	-0.003	-0.09	-0.19^{*}
	(0.13)	(0.07)	(0.11)	(0.12)	(0.16)	(0.10)
Pol par	0.0001	-0.001	-0.001	-0.0004	-0.004	-0.18
	(0.01)	(0.005)	(0.01)	(0.01)	(0.01)	(29.68)
Federal	-0.17	-0.01	0.04	-0.05	-0.03	-0.09
	(0.30)	(0.22)	(0.28)	(0.29)	(0.30)	(0.38)
log(GDPPC)	0.37^{*}	0.27^{**}	0.37^{*}	0.38^{*}	0.52^{**}	0.13
	(0.23)	(0.13)	(0.20)	(0.21)	(0.24)	(0.19)
Ethnic	0.33	-0.27	0.16	0.06	0.09	-0.79
	(0.57)	(0.42)	(0.54)	(0.58)	(0.61)	(0.67)
Banned	0.10	-0.08	-0.04	-0.02	0.04	-0.03
	(0.32)	(0.24)	(0.31)	(0.31)	(0.33)	(0.40)
Constant	-2.84	-2.39^{*}	-3.39^{**}	-2.93^{*}	-2.76	-1.21
	(1.78)	(1.26)	(1.67)	(1.68)	(1.77)	(2.01)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,204	2,393	1,505	1,441	1,257	1,121
Log Likelihood	-230.87	-423.85	-267.67	-254.78	-231.67	-175.97
Akaike Inf. Crit.	541.74	927.69	615.35	589.57	543.34	431.94

Note: *p<0.1; **p<0.05; ***p<0.01

Table 13: Selway and Self vs Aksoy and Carter Table 4: Model VI

	Dependent variable:					
	Emergence of Terror: Within-system Groups					
	A & C	S & S	Polity ≥ 2	Polity ≥ 4	Polity ≥ 6	Polity < 6
log(Mag)	-0.46^{***}	-0.35^{***}	-0.32^{**}	-0.31^{**}	-0.36^{**}	-0.14
	(0.15)	(0.12)	(0.13)	(0.13)	(0.14)	(0.26)
Exec Constraints	-0.05	0.20^{*}	-0.02	-0.15	-0.25	0.44^{**}
	(0.20)	(0.12)	(0.20)	(0.22)	(0.23)	(0.17)
Pol comp	0.19	0.08	0.26	0.26	-0.03	-0.15
	(0.19)	(0.09)	(0.17)	(0.17)	(0.19)	(0.18)
Pol par	-0.003	-0.01	-0.01	-0.01	-0.02^{**}	-0.21
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(206.40)
Federal	0.07	0.27	0.26	0.23	0.11	0.82
	(0.34)	(0.28)	(0.32)	(0.32)	(0.33)	(0.67)
log(GDPPC)	0.35	0.32^{*}	0.36	0.44^{*}	0.72^{***}	-0.33
	(0.27)	(0.17)	(0.24)	(0.24)	(0.27)	(0.40)
Ethnic	0.32	-0.53	0.18	0.39	0.46	-2.93^{**}
	(0.69)	(0.58)	(0.69)	(0.71)	(0.72)	(1.25)
Banned	-0.45	-0.19	-0.17	-0.14	0.12	0.01
	(0.48)	(0.34)	(0.43)	(0.43)	(0.43)	(0.66)
Constant	-5.96^{***}	-5.99^{***}	-6.72^{***}	-6.53^{***}	-5.63^{***}	1.13
	(2.16)	(1.73)	(2.05)	(2.03)	(2.18)	(3.68)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,204	2,393	1,505	1,441	1,257	1,121
Log Likelihood	-176.11	-271.56	-203.86	-202.22	-188.03	-55.45
Akaike Inf. Crit.	432.22	623.11	487.73	484.45	456.07	190.91

Note: *p<0.1; **p<0.05; ***p<0.01

5 Levels of Analysis

We now turn to assessing the effect of the second coding decision: levels of analysis. Table 14 shows these results for all three studies. In these regressions we estimate the full set of controls as in the tables above, but only show the relevant institutional variables here. The first column for each study is the original result. The second column is the same number of countries and observations as the original model simply with the district magnitude variable switched out. As a reminder, the original district magnitude variable is the average district magnitude of the lower tier. The one we replace it with is the average district magnitude of both tiers. This should only change the score for mixed systems.

We begin with Chang and Golden. Switching out the district magnitude does nothing to the sign or significance of the original result. However, the size of the coefficient on average magnitude halves, and the coefficient on the interaction is 200 times smaller. Such a result would have led a much more tempered conclusion of the effect of open list PR when district magnitude is high.

The coefficients on the number of parties study, however, are much more robust. They barely change in size or significance. The interaction between ethnic fractionalization and distrcit mangitude is about 25% higher, which suggests that permissive systems increase the number of parties even more strongly than Clark and Golder find. Otherwise, this change in district magnitude variable has little effect. This could be because the original model at elast controls for the existence of an upper tier.

Lastly we turn Askoy and Carter. Like the Clark and Golder model, changing

to average district magnitude of both tiers does not change the overall finding on within-system groups. Higher district magnitude still decreases the likelihood of their emergence. The magnitude of the coefficient is, however, about 25% smaller.

In sum, we can see that this second coding decision mostly seems to bias the size of the coefficients. It is most significant in the Chang and Golden study, which is understandable given the smaller number of countries. Were we to have chosen a study specifically about mixed systems, however, the bias might have completely changed the signs and significance of the coefficients.

Table 14: Varying Coding of District Magnitude

	Dependent variable:					
	Corruption		ENEP		Within-system groups	
	OLS		*OLS*		*logistic*	
	C & G	S & S	C & G	S & S	A & C	S & S
Avg Mag	-0.009^{***}	-0.005^{*}	0.304^{***}	0.316^{*}	-0.460^{***}	-0.369^{***}
	(0.003)	(0.003)	(0.003)	(0.171)	(0.149)	(0.138)
Open	-1.533^{***}	-1.169^{***}				
	(0.448)	(0.389)				
Open*Avg Mag	0.021^{***}	0.0001^{***}				
	(0.006)	(0.00003)				
Ethnic			0.172	0.187^{*}		
				(0.105)		
Ethnic*Upper			-0.005	-0.006^{**}		
				(0.002)		
Ethnic*Avg Mag			0.099	0.125		
				(0.112)		
Constant	15.492^{***}	15.510^{***}	2.949	2.819^{***}	-5.962^{***}	-5.750^{***}
	(4.883)	(5.096)	(4.883)	(0.216)	(2.159)	(2.112)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	32	32	554	554	1,204	1,204
R^2	0.917	0.906	0.132	0.160		

Note: *p<0.1; **p<0.05; ***p<0.01

6 Incorrect Coding & Conflicting Sources

The third coding decision test evaluates the differences in coding between Golder and us for specific countries. Many of the inconsistencies are tiny. However, some examples of larger ones are as follows: Switzerland's average district magnitude is 9.1 for Golder, ours is 7.7; Golder has 9.2 for Estonia, while we have 26.3; and for South Africa Golder has 44.4, but we have 111.11. Why such large differences in coding? EXPLAIN HERE. Table 16 in the appendix shows countries in the Chang and Golden study with a comparison of the district magnitudes. Most are the same of very close, but several are different enough as to potentially effect outcomes.

For the third test, we re-run the original models simply replacing the average district magnitude of the lower tier that they use with our average district magnitude of the lower tier variable. The results are shown in Table 15. Again, the original results are on the left and ours on the right (note that the number of observations is identical in the comparison). For Chang and Golden, we see similar results as in the previous section. The size of the interaction is significantly lower, though still retaining statistical significance. For Clark and Golder the coefficients are very close to the original results. The coefficient on the interaction term is about 10% bigger, but otherwise the model is quite robust to these changes. For Askoy and Carter, the difference is quite small, with the coefficient being only about 10% smaller. Since the errors are randomly distributed, we think, overall they have the smallest effect on this study, which has the largest number of observations.

Table 15: Varying Coding of District Magnitude - Unweighted Distrit Magnitude

	Dependent variable:					
	Corruption		ENEP		Within-system groups	
	OLS		*OLS*		*logistic*	
	C & G	S & S	C & G	S & S	A & C	S & S
Avg Mag	-0.009^{***}	-0.005^{*}	0.304^{***}	0.287^{*}	-0.460^{***}	-0.411^{***}
	(0.003)	(0.003)	(0.003)	(0.166)	(0.149)	(0.150)
Open	-1.533^{***}	-1.144^{***}				
	(0.448)	(0.384)				
Open*Avg Mag	0.021^{***}	0.0001^{***}				
	(0.006)	(0.00003)				
Ethnic			0.172	0.178^{*}		
				(0.105)		
Ethnic*Upper			-0.005	-0.005^{***}		
				(0.002)		
Ethnic*Avg Mag			0.099	0.109		
				(0.108)		
Constant	15.492^{***}	15.137^{***}	2.949	2.946^{***}	-5.962^{***}	-5.768^{***}
	(4.883)	(5.201)	(4.883)	(0.213)	(2.159)	(2.141)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	32	32	554	554	1,204	1,204
R^2	0.917	0.905	0.132	0.130		

Note: *p<0.1; **p<0.05; ***p<0.01

7 Electoral Rules in Anocracies

In this section, we examine the results of the previous replications when we restrict our analysis to just anocracies as defined by Polity, which are countries that receive less than 6. Since there are insufficient anocracies in the Chang and Golden replication, we begin with Clark and Golder. In column 6 of Table 9 we estimate the model for just anocracies (Polity < 6) and observe very different effects. Ethnic fractionalization reduces the number of parties in plurality systems, but as district magnitude increases this effect disappears. Stoll argues something to this effect, when she says that fractionalization will lead to more parties up to a certain point. However, further increases in fractionalization will actually lead to a decline in the number of parties as elites create parties that reach out beyond a single group. But as electoral rules become more permissive, the incentive to create these broader parties disappears. Although our model does not estimate a squared term on fractionalization, this is a possible explanation for what we are seeing in anocracies, especially given that the mean fractionalization score as shown in column 6 of Table 8 is by far the highest. Why might this happen under FPTP in anocracies and not full democracies seems like a fruitful avenue of future research.

Next we return to Askoy and Carter. In column 6 of Tables 12 and 13 we see that the size of the coefficient on district magnitude shrinks for both anti-system groups and within-system groups in anocracies. Clearly, the mechanisms of finding voice within the electoral system do not operate on within-system groups in anocracies.

8 Conclusion

We have shown that three types of coding decisions modify our understanding of the effect of electoral rules on corruption, the number of parties and the formation of domestic terrorist groups. Just by broadening the inclusion criteria of the dataset we cast significant doubt on the finding that high-magnitude open-list PR systems are bad for corruption, that ethnic fractionalization increases the number of parties at all in plurality systems, and that district magnitude has no effect on the emergence of anti-system terrorist groups. By switching levels of analysis, we change the size of coefficients on important variables of all three studies, though the original findings are robust. The effect of coding errors/inconsistencies has a small effect, but again diminishes the size of the coefficient on the interaction term in Chang and Golden quite significantly. Overall, because the coding of errors is random, the effect tends not to be that large on the two studies that have a large number of observations.

Our results also demonstrate that electoral rules in anocracies operate very differently. Ethnic fractionalization reduces the number of parties in plurality systems in anocracies and has no effect in high district-magnitude PR systems. PR and district magnitude also do nothing to discourage the formation of domestic terrorist groups. However, increased executive constraints are associated with more within-system domestic terrorist groups.

In sum, we have shown that coding decisions made during the building of datasets can have significant effects on our understanding of how electoral rules function.

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9 Appendix I

Table 16: Comparison of District Magnitude

Country Name	C & G	S & S	Difference	Country Name	C & G	S & S	Difference
Paraguay	4.400	4.444	-0.044	Czech Republic	25	25	0
Ireland	4	4.049	-0.049	Namibia	72	78	-6
Brazil	19	19	0	Spain	6.900	6.731	0.169
Nicaragua	7.600	7.847	-0.247	Latvia	20	20	0
Argentina	10.700	10.708	-0.008	Taiwan	11.500	12.999	-1.499
Romania	7.800	7.798	0.002	Norway	10	8.250	1.750
Poland	16.700	16.741	-0.041	Uruguay	5.200	5.211	-0.011
Bolivia	3.800	3.809	-0.009	Denmark	10.500	14.620	-4.120
Dominican Republic	5	4.967	0.033	Finland	14.200	13.333	0.867
Switzerland	9.100	7.692	1.408	Sweden	13.900	13.853	0.047
Colombia	5	4.879	0.121	Netherlands	150	150	0
South Africa	44.400	111.111	-66.711	Sri Lanka	11.500	11.499	0.001
Austria	20.300	5.169	15.131	Ecuador	7.400	5.575	1.825
Slovakia	150	150	0	New Zealand	25.800	24.858	0.942
Belgium	7.500	7.500	0	Venezuela	6.900	3.341	3.559
Estonia	9.200	26.303	-17.103	Peru	118	4.800	113.200
Germany	11.200	11.354	-0.154	Malta	5	4.971	0.029
Costa Rica	8.100	8.143	-0.043	Portugal	10.500	10.455	0.045
Iceland	7.900	7.643	0.257	Israel	120	120	0
Chile	2	2	0	Bulgaria	7.700	7.742	-0.042
Luxembourg	16	15	1	Turkey	7	6.587	0.413