ELECTORAL RULES AS CONSTRAINTS ON CORRUPTION: THE RISKS OF CLOSED-LIST PROPORTIONAL REPRESENTATION

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Abstract

This paper investigates how different electoral rules influence political corruption. We argue that closed-list proportional representation systems are most susceptible to corruption relative to open-list proportional representation and plurality systems. We argue that this effect is due to the way both closed party lists and geographically large districts limit voters' ability to monitor incumbents. We also examine interaction effects between electoral rules and other institutional forms, namely presidentialism, federalism, and bi-cameralism. We test our main predictions, the proposed causal mechanism, and interaction effects empirically on a cross-section of 105 countries, controlling for economic, political, and social background factors. The empirical findings strongly support our theoretical hypothesis that closed-list PR systems, especially together with presidentialism, are associated with higher levels of corruption. This result is robust to different model specifications and deleting influential observations.

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1. Introduction

Elections serve two functions in representative democracies. First, they select political actors who enact public policies in light of constituents' preferences. Second, they permit citizens to hold their representatives accountable and to punish them if they are corrupt or self-serving. In other words, elections provide both *incentives* for politicians to enact a certain kind of policies and *constraints* on politicians' malfeasance. In this paper, we focus on the second of these two functions and investigate how different electoral systems constrain political corruption, holding constant other political, economic, and social background factors.

We study three stylized categories of electoral rules: plurality/majoritarian systems with single-member districts, and two kinds of proportional representation (PR) systems: closed- and open-list. Under a closed list system, party leaders rank candidates, and voters only cast votes for parties. Under an open list, voters both select a party and rank candidates given the party's selection of candidates. We argue that plurality or first-past-the-post systems provide the most stringent constraints on politicians' rent-seeking because they facilitate legislators' direct accountability to the voters. Voters in single-member districts that are geographically relatively small are more capable of observing their representative's performance in office, as well as a lifestyle that may indicate self-dealing. Elections then serve as a means for constituents to oust corrupt representatives. In contrast, closed-list PR systems make it more difficult for voters to monitor politicians' malfeasance in large (often national) districts. In addition, because voters cast their votes for parties, the link between individual politicians' re-election and their performance in office is weakened. Open-list PR falls in between plurality and closed-list PR systems. Despite the absence of grass-root monitoring, each representative's accountability is greater than under a closed list because voters can cast their votes for particular representatives on the list. Thus, the link between re-election and doing well in office is stronger in open- than in closed-list PR.

Although our primary focus is on the methods by which the legislature is chosen, we also recognize that a complete model should include other institutional features of a political system such as presidentialism/parliamentarism, federalism, bi-cameralism, and the strength of parties. Our empirical work incorporates the most important of these other factors.

There exists a new and growing literature that addresses the relationship between political institutions and corruption. Our paper makes several contributions to this developing field. First, it explicitly distinguishes between criminal corruption (embezzlement of funds, bribery) and pork-barrel spending (perfectly legal activity), which tends to be conflated elsewhere (Geddes 1994, Rasmussen and Ramseyer 1994, Bicchieri 1995, Bueno de Mesquita et al. 1999). This distinction is crucial because electoral systems that constrain corruption may encourage pork-barrel spending, and vice versa. Second, on the theoretical side, our causal mechanism linking electoral rules and corruption is different from existing models (Myerson 1993, Holmstrom 1982, Persson and Tabellini 2000, ch. 9). Those models focus on district magnitude or party lists as the driving forces determining the impact of electoral rules on corruption;[1] we emphasize the effect of geographic district size (as opposed to the number of representatives elected per district) and distinguish between closed and open party lists. Third, there is only one other study that has attempted to assess the link between electoral rules and corruption empirically (Persson, Tabellini, and Trebbi 2001). Although we confirm their basic finding that proportional elections are associated with higher corruption levels, we test a different causal mechanism and show that our formulation is better at explaining corruption on an identical sample. Most importantly, we are more attentive to other institutional details that were assumed away by Persson, Tabellini, and Trebbi (2001). In addition to differentiating between closed- and open-list PR, we control for the effects of federalism and presidentialism since they have been shown to influence corruption in two recent papers (Treisman 2000 and Kunicova 2001, respectively). We show that once these institutional factors have been taken into account, the causal variables used by Persson, Tabellini, and Trebbi (2001) lose their explanatory power. Finally, we use a more comprehensive and up-to-date dataset covering up to 105 countries and test the robustness of our results to alternative measures of corruption, different specifications, and to deleting influential observations.

The remainder of this paper is organized as follows. Section 2 discusses the importance of distinguishing between corruption and pork-barrel spending. Section 3 presents our basic theoretical argument about the link between electoral rules and corruption, and Section 4 places this theoretical framework in a richer institutional context. Section 5 explicitly states our hypotheses, and Section 6 describes the data used to test them. Section 7 presents the results of the regression analysis. Section 8 concludes.

2. Corruption versus Pork-Barrel Spending

A standard definition of corruption is "misuse of public office for private gain" (cf. Bardhan 1997; Rose-Ackerman 1999; Treisman 2000; Sandholtz and Koetzle 2000; Lambsdorff 1998). Yet, some authors broaden this definition to include "rent extraction" by public officials, which tends to subsume other activities of politicians, from direct embezzlement of funds for private gain through "paying off" political supporters to maximize their chances of re-election. An example of such work is Bueno de Mesquita et al. (1999). The authors formulate and empirically test a formal model in which politicians stay in office by offering public goods that benefit everyone and private goods that benefit only their core supporters. The latter is considered corruption and is influenced by institutions in both autocracies and democracies. For other arguments conflating corruption and targeted public spending, see Geddes (1994), Rasmussen & Ramseyer (1994), and Bicchieri (1995).

We believe that it is analytically wrong to conflate corruption, an illegal activity, and politically targeted public spending, a perfectly legal activity. This is especially ill-advised when analyzing the impact of electoral rules on corruption. Some electoral systems, although enabling voters to monitor legislators' behavior, also give incentives to politicians to use a legitimate means of political competition – provision of narrowly targeted public services, or so-called pork-barrel projects. These are the dual issues of incentives and constraints that we discuss in this and the following section.

First, electoral rules differ in the *incentives* they give to politicians to offer broad-based public goods or narrowly focused pork-barrel spending. An electoral system based on geographic representation will encourage spending targeted to particular districts at the expense of more inclusive public goods. In contrast, when the competition for votes is more broad-based, candidates and political parties will find it more electorally beneficial to run on national public goods platforms. This is consistent with the existing theoretical models of public finance and electoral systems. Persson and Tabellini (1999) argue that in plurality systems, politicians only need to please swing voters in marginal districts, not the population as a whole. Hence, there will be disproportionately more geographically targeted pork-barrel and fewer universal public goods in plurality systems as compared to PR. The same theoretical result comes from a different model developed by Lizzeri and Persico (2001).

To see the logic of this argument, consider our three stylized electoral systems: majoritarian/plurality with single member districts (PLURALITY); nationwide, closed-list proportional representation (CLPR) where party leaders rank candidates and voters only select political parties; and open-list proportional representation (OLPR) where voters can cast their votes for a particular candidate on a party list. Electoral competition in PLURALITY systems has a local, geographic basis. National issues such as war and peace or moral issues such as abortion may, of course, sway voters, but incumbents will also want to claim that they have "brought home the bacon" to their constituents. Unless national political parties are very strong, incumbents are likely to make a nonpartisan appeal for reelection arguing that they have been able to obtain targeted benefits. In contrast, under CLPR, politicians have an incentive to provide broad-based public goods so long as the parties' constituencies are widely dispersed so that it is difficult to target narrow benefits to one's supporters. In OLPR systems, there are no ready-made geographical constituencies as in PLURALITY systems, but a candidate may try to appeal to particular group of voters by becoming their advocate within the party and later bragging about his or her success. Thus, there will be more targeting in OLPR than CLPR, but less than in PLURALITY. Furthermore, the type of targeting is likely to single out different groups.

When pork-barrel spending is conflated with corruption, one would conclude that PLURALITY systems are more susceptible to corruption because they give incentives for pork-barrel spending. However, having made an explicit distinction between the two, we arrive at a different prediction. As we argue in the following section, the same features of electoral systems that give incentives for pork-barrel spending also *constrain* political corruption.

3. Electoral Constraints: Monitoring Corruption

Elections serve as a monitoring device to hold politicians accountable. Different electoral rules vary in their monitoring capacity and hence create stronger or weaker constraints on politicians. In individual-centered systems, particular politicians are more directly accountable to voters than in the party-centered systems. In PLURALITY systems, candidates are elected by geographic constituencies. Given that the candidates are accountable to a distinct constituency, elections can serve as a monitoring device in reducing corruption and self-dealing. In contrast, CLPR systems lack that element because the

individual politicians are first accountable to the party and then to voters. This means that elections are not as effective at constraining individuals. In contrast, they may be more effective at constraining parties. If one assumes that corruption is best constrained by targeting individuals, not parties, then one would expect more corruption in CLPR systems than in PLURALITY. This is a central assumption behind our research and will be discussed in detail below.

The key idea is that PLURALITY systems by design are more transparent to grass-root monitoring by voters than are CLPR systems. This is consistent with the "career-concern model" of Holmstrom (1982) and its extension to rents and corruption by Persson and Tabellini (2000, ch. 9). Their argument is that voting over individual candidates creates a direct link between individual performance and reappointment, which gives incentives to incumbents to avoid corruption. Our argument is that this "incentive to avoid corruption" is simply the flip-side of the constraint imposed by voters, who are able, by the design of PLURALITY systems, to hold their representatives accountable. Voters in a district have direct contact with their representative and hence more information about the candidates they elect. They can see the lifestyle of their representative and hence make more realistic guesses about the corrupt rents he or she may be pocketing. Note that if the way to monitor incumbents is to observe them and their families going about their daily lives, then PLURALITY systems with small districts are clearly more effective than large, often national districts in CLPR. For such monitoring to be effective, neither the number of representatives per district nor the number of voters per representative ought to be especially important. Instead, one possibility is that districts that are geographically small are less subject to corruption because voters are more likely to observe their representative. This is, of course, a rather coarse measure of a complex phenomenon, but we show below that the average land area of electoral districts has a surprisingly robust association with corruption. Large, spread out districts that encompass many thousands of square miles appear to limit voters' ability to monitor their elected representatives.

In contrast, there is no such direct link between voters and elected politicians in CLPR systems. Voters choose among party lists, and a politician's chance of re-election depends mainly on his or her ranking on the list. The lists are commonly drawn up by party leaders, so the ranking will reflect criteria such as party loyalty or effort within the party. As Holmstrom (1982) and Persson and Tabellini (2000) argue, incentives to perform well and

avoid corruption are weaker in such a system. In addition, we suggest that it is easier to hide corruption from voters in CLPR systems. Given that citizens vote for parties and do not have much say about the identity of the the party representatives, politics in CLPR systems is less personality-centered than politics in PLURALITY systems. Hence, electoral campaigns are not so much focused on the personal characteristics of the politicians running for office. Appeals are made to voters across geographic regions based on policy issues and the track record of the party on that particular issue, while the individual politicians (and their track records) are "black-boxed" in the closed party list. In addition, on a very basic level, it is easier to hide corrupt rents if a politician is "accountable" to a broad national constituency as opposed to the voters in his home district who directly observe his lifestyle. Although this can be mitigated by investigative journalism, grass-root monitoring by home constituents is absent. So, holding the freedom of press constant, we would expect that information about individual kick-backs to politicians would be less readily available in CLPR systems than in PLURALITY systems, both because of the absence of grass-roots monitoring and the fact that elections are fought more on party than personality characteristics.

This is not to suggest that the voters in CLPR do not care about whether their leaders are corrupt. Instead, our argument is that the system is designed so that voters have difficulty directly observing the corruption of politicians. Coupled with the fact that electoral campaigns are centered less around individual characteristics and more around party platforms and track records (cf. Shugart and Carey 1995), voters are less likely to find out about the corrupt dealings of their leaders.

Now, consider OLPR systems. They share one feature with PLURALITY systems: voters can cast their votes for particular candidates, albeit within a party. This strengthens the link between performing well in office and getting re-elected in comparison to CLPR systems. However, the first feature of PLURALITY systems – geographically relatively small single-member districts – is absent in OLPR systems. This disables grass-root monitoring by voters. On balance, then, OLPR systems fall in between CLPR and PLURALITY systems – politicians have more incentives to perform well in office than in CLPR, but the voters cannot monitor their representatives as closely as in PLURALITY.

Our emphasis so far has been on voters' ability to monitor politicians' corruption. Now, consider our key assumptions. We assume that political corruption is reflected in increased wealth for individual politicians and that corruption can be constrained by electoral

systems that facilitate monitoring by voters. This method of control will, however, be ineffective if strong party leaders can extort payoffs from private firms in return for favors and can keep the payoffs for themselves without sharing the gains with the rank and file. Then, corrupt payoffs could inflate the cost of major public projects in a way that is invisible to ordinary voters who pay higher taxes as a result but have little direct knowledge of corruption. Thus, one needs to consider a second type of monitoring: rank and file oversight of party leaders. Although we do not directly test this aspect of political behavior, we argue that plurality systems are also better at this type of monitoring. Because individual members each have a constituency backing them, they have some bargaining power vis à vis party leaders. If we assume that incumbents are harmed by high taxes relative to public benefits and if individual representatives cannot be corrupt without losing their seats, then they will pressure their leaders to be honest. Conversely, under closed-list PR, individual members have little independent political clout to exert pressure on corrupt leaders. In both systems, corrupt leaders are constrained by the costs of corruption at election time, but only under plurality rule are the rank and file also a check on their leaders.

Our research is a contribution to the literature on the comparative benefits of PR versus PLURALITY in constraining corruption. Persson, Tabellini, and Trebbi (2001) identify two strains of the literature that offer conflicting predictions about which of these electoral rules should be better at controlling politicians' malfeasance. First, the "party list effect" (Holmstrom 1982, Persson and Tabellini 2000, ch.9) implies that the larger the proportion of representatives elected to party lists, the more corruption due to weakened individual accountability. This is broadly consistent with our theoretical framework, although it our claim that closed party lists are particularly harmful.

Second, there is a "barriers to entry effect" (Myerson 1993; Ferejohn 1986; Persson, Rolland, and Tabellini 2000) that is conceptually different from our theoretical framework. Here, the emphasis is on the availability of honest challengers willing to take on a corrupt incumbent. If politics is multidimensional, voters find it easier to vote out corrupt politicians if honest candidates, whom the voters like on other issues as well, are willing to enter into the competition for public office. The less expensive it is for a challenger to take on the incumbent, the more likely one is to appear in response to voter dissatisfaction. This seems a plausible claim, but problems arise in operationalizing this concept for empirical testing.

The number of parties or competing candidates appears to be a poor proxy because it says nothing about the effectiveness of any individual challenger.

In their empirical work, however, Persson, Tabellini and Trebbi (2001) use the number of representatives elected per district (district magnitude) as a proxy for barriers to entry into political competition. They assume that lower "barriers to entry" occur in districts with the large district magnitudes that are common in PR systems. Hence, according to this argument, PR should lead to less corruption. According to these authors, the effects work in opposite directions: PR systems have districts of larger magnitudes and, at the same time, a large proportion of the legislators elected on party lists. Empirically, however, Persson, Tabellini, and Trebbi (2001) find that the "party list" effect is stronger than the "barriers-to-entry" effect and hence PLURALITY systems are better than PR at containing corruption.

We argue that this may not simply be a case of one effect dominating another but may reflect a weakness in the way the theory has been tested. The barriers-to-entry theory is an application of economic arguments from industrial organization to the realm of politics. The basic point that a competitive political system with easy entry limits corruption seems a valid one (Rose-Ackerman 1978). It is not obvious, however, that multi-member districts produce benefits similar to those of markets with many competing firms. What we question is the claim, implied by the empirical work, that competition is greater the larger is the district magnitude. True, a plurality system with single-member districts will often produce only two parties. However, one opposition party with a credible chance of winning the election ought to be sufficient to give the incumbent an incentive to limit self-dealing, and the marginal cost of fielding a candidate is likely to be low for such an established party. Furthermore, multi-member districts selecting legislators by PR may indeed produce many more viable parties, but no party may have much incentive to monitor the corruption of incumbents because a scandal is a "public good" for all opposition parties. The incentive to free ride off the scandal-mongering of others could mean that the impact of competitive politics on corruption monitoring could actually fall as the number of parties increased. In short, the argument that corruption monitoring will increase with the number of political opponents does not seem convincing. The main concern under plurality rule is the likelihood that some districts will be captured by members of a single party who can exploit their position for private gain. This appears to have been Myerson's (1993) primary concern

and may indeed be more of a problem in PLURALITY than in PR systems. However, it is not well captured by a measure of district magnitude.

In short, although an active opposition can help check corruption under any set of electoral rules, we argue that PLURALITY rule has two features to recommend it. First, it encourages voters to monitor individual representatives and provides them with some of the information needed to do so. It also encourages individual politicians to insist on the integrity of their leaders. Second, when plurality rule produces two viable parties, each political grouping has an incentive to ferret out the corruption of the other because it can reap all the political benefits of the resulting scandal. The free rider problem that arises in multi-party systems is avoided.

4. Richer Institutional Settings

Our main focus in this paper is the effect of electoral systems on corruption. So far, we have abstracted from other institutional features of political systems. However, the interactions between electoral rules and other aspects of the political system also appear to be important in determining the incidence of corruption. We consider the effect of the most important of these features in this section beginning with the distinction between presidential and parliamentary systems and then discussing federalism and bi-cameralism.

4.1 Presidential and Parliamentary Systems

Presidential systems are apparently more corrupt, on balance, than parliamentary system. A cross-country study by Jana Kunicova (2001) demonstrates this empirically. The theoretical argument for this result has three parts. First, in most presidential systems, presidents have many legislative, agenda-setting, and veto powers that give them almost the status of an "elected autocrat." Second, presidents only need to get re-elected to enjoy control rights over public resources, while the members of parliamentary governments, besides being re-elected, also need to get into the governing coalition. The uncertainty about the coalition dynamics constrains politicians in parliamentary systems. Finally, the future is less important for presidents than for parliamentary cabinets due to the term limits. All presidential systems place restrictions on the re-election of presidents, while term limits are virtually unknown in parliamentary systems. So, the re-election constraint is not always

binding for the presidential executive, which then creates more incentives for rent-extraction.

Our interest in presidentialism, however, goes deeper than this. We argue that presidentialism interacts with electoral rules to produce distinctive patterns. To see this, we need to consider the effect of presidentialism on legislative parties. Clearly, a powerful, separately elected president has a distinct impact on the incentives facing legislators and legislative parties. As Matthew Shugart (1999) argues, a strong president has the effect of weakening legislative parties. For example, in a plurality system a parliamentary form of government strengthens political parties since they need to be organized enough to form a government. However, if party discipline is very strong, individual legislators may lack much independent power, and thus, voters have less incentive to monitor particular representatives. The supposed anti-corruption benefits of plurality voting may be reduced in parliamentary plurality (Westminster) systems in comparison with presidential plurality systems with weaker parties. However, if the president is corrupt, then it is impossible to make a general prediction about the overall level of corruption. In a presidential-parliamentary system, the existence of a president increases corruption but the legislators' greater responsiveness to their constituents should limit corruption.

The joint effect of CLPR and presidentialism is more straightforward. CLPR would still produce strong parties in a presidential system, and the legislative majority would bargain with the president about policy. However, the party leadership may have more room for rent-seeking in presidential CLPR systems because the parties do not have the obligation of actually running the country. So, presidential CLPR systems should be more corrupt than parliamentary CLPR systems.

Finally, OLPR produces weak parties in both presidential and parliamentary regimes, but the parties will be even weaker under a presidential system since they need not form a government. Given the extreme weakness of the parties, the President can easily "divide and conquer" and, therefore, can obtain more benefits than with a set of relatively stronger parties whose leaders bargain with the president. Therefore, with a corrupt president, we would expect OLPR presidential systems to be more corrupt than OLPR parliamentary systems. However, the comparison between presidential OLPR and presidential CLPR is an empirical question – both are corrupt, but a priori we do not have a way of telling whether

the absolute strength of the parties under CLPR or their absolute weakness under OLPR is worse. All we can predict is that neither extreme is optimal for corruption control.

To sum up, the effect of presidentialism on corruption should be controlled for in our empirical cross-country investigation. The interaction between presidentialism and electoral rules is rather complicated. Presidential CLPR and OLPR systems are predicted to be even more corrupt than their parliamentary counterparts. PLURALITY systems may be may be almost as corrupt as PR systems under parliamentary government because parties need to be strong enough to form governments and may underplay links to local constituents. The precise interaction between presidentialism and electoral rules is, however, an empirical question that we investigate in the later sections of this paper.

4.2 Federalism and Bi-Cameralism

In spite of arguments to the contrary, recent empirical work shows that federal systems are more corrupt than unitary ones (Treisman 2000, Kunicova 2001). The key to this result seems to be, not decentralization per se, but a federal structure that divides authority between overlapping governments. Shleifer and Vishny (1993) suggest that the relatively balanced power of central and subnational officials over the tax or "bribe" base in a given region leads to over-extraction. Others argue that in federal systems, there is a need to exchange favors to overcome decentralized authority (cf. Wilson 1970, p. 304).[2]

The interaction between federalism and electoral rules is difficult to disentangle, mainly because most federal systems have bi-cameral legislatures in which chambers are often selected by different methods and have varying degrees of power over legislation. Therefore, in our empirical effort to isolate the effect of electoral rules on corruption, we control for federalism and for those cases of bi-cameralism that use different electoral rules for their chambers. Unlike our empirical tests that distinguish presidential and parliamentary systems we do not attempt to develop the possible interactions between federal structure and electoral rules.

5. Hypotheses

Our discussion of institutional structure and corruption in sections 3 and 4 leads to the following testable hypotheses:

H1 *Existence of a relationship between electoral rules and corruption.* Ceteris paribus, CLPR systems are more corrupt than OLPR and PLURALITY systems. This should hold controlling for other institutional factors, especially federalism and presidentialism, as well as for background factors such as the level of economic and political development.

H2 *Causal mechanism.* Ceteris paribus, the geographical size of districts (rather than district magnitude) and the proportion of representatives elected on closed party lists are the driving forces that make CLPR systems most corrupt.

H3 *Interaction effects.* Presidential PR systems are expected to be more corrupt than their parliamentary counterparts. We predict the CLPR presidential systems will be especially corrupt relative to other types of government structures. Presidential PLURALITY systems may be more or less corrupt than Westminster systems (that is, parliamentary system using plurality rule). We have no clear predictions about OLPR except that presidential systems should be more corrupt than parliamentary ones.

6. Data

6.1 Corruption

Corruption is difficult to define, systematically observe, and measure. Yet in recent years, several indices have been developed that claim to capture a substantial degree of information on abuse of political and bureaucratic power across countries. We rely on two indices that both measure perception of corruption, but use different aggregation methodology: the Corruption Perception Index (CPI), compiled by Transparency International (Lamsdorff 1998), and the Control of Corruption Index (CORRWB), also known as GRAFT, compiled by the World Bank (Kaufamann, Kraay, and Zoido-Lobaton 1999). We prefer the CORRWB measure, but report the results using CPI in the Appendix. Below, we compare these two indices.

Transparency International (TI) has published its annual CPI ranking of countries since 1995, although two earlier measures (averages for 1980-85 and 1988-92) are also available. TI defines corruption in a standard way as "the abuse of public office for private gain." It is a "poll of polls" that aggregates surveys of perceived corruption across countries based on the views of business people, risk analysts, investigative journalists, and the general

public. The index aggregates corruption scores from up to 17 different polls for every country, including Wall Street Journal, Gallup International, Economist Intelligence Unit, World Bank, World Economic Forum, and others. These polls ask questions based on the concept of corruption as the misuse of public power for private benefit; specifically, the focus is on taking kickbacks in public procurement, embezzling public funds, and bribing public officials.

The CPI is computed as the simple average of a number of surveys assessing each country's performance, ranging between 0 (highly corrupt) and 10 (perfectly clean). Country coverage varies from year to year (from 38 countries in 1995 to 85 countries in 1999, with the most recent indices covering slightly fewer countries; see Table 2a). This occurs because the surveys that make up the index also vary from year to year. This poses a problem of inter-temporal comparability of the rankings: if a country moves from score 6.4 in one year to 7.2 in another, it does not necessarily mean that it became "cleaner"; TI may have simply used different surveys conducted by different institutions in these years. Thus the CPI cannot be used to measure changes over time. Despite its methodological deficiencies, the CPI is the best compilation available and is extremely popular among researches conducting cross-country analysis of corruption (Wei 1997a, 1997b; Fisman and Gatti 1999; Treisman 2000; Sandholz and Koetzle 2000; Persson, Tabellini, and Trebbi 2001, Kunicova 2001).

For the purposes of this study, we create a variable CRTIA, which is an average of CPI over 1995 through 2001. We record the number of years that enter this average for every country and later use it as one of the components in weighting the observations (the more years included in the average, the more reliable the observation).

Our second measure of corruption, CORRWB, is similar to CPI in that it also uses polls of experts and cross-country surveys of residents, resulting in an index of perception of corruption. Most of its component parts are also part of the CPI. However, CORRWB is a "second-generation index" in terms of aggregation methodology. In contrast to TI's simple average of surveys, CORRWB uses an unobserved components model to aggregate up to 30 surveys in 1997-98. This model expresses the observed data as a linear function of unobserved corruption plus a disturbance term capturing perception errors and sampling variation in the indicator. The model allows one to compute the variance of this disturbance term, which is a measure of how informative the index is. The point estimate of control of corruption is the mean of the conditional distribution of CORRWB given the observed data

and ranges between –2.5 (most corrupt) and 2.5 (least corrupt). Similarly, the variance of this conditional distribution provides an estimate of the precision of the CORRWB indicator for each country.

Being newer than CPI, CORRWB has been used in fewer studies, mostly by the researchers at the World Bank and the Inter-American Development Bank (Kaufman and Wei 1999, Mehrez and Kaufmann 2000, Hellman, Kaufmann, and Shankerman 2000, Adsera, Boix, and Paine 2000). However, it has obvious advantages over the TI index in its more precise aggregation methodology and country coverage (124 countries). The latter allows us to use a larger battery of controls and gives us more confidence in our regression results. Therefore, we use CORRWB as our main dependent variable and check the robustness of our results by re-running the models on CRTIA. Table 1 reports summary statistics and correlations between CORRWB and CRTIA and its component parts (CPI indices for 1995-2001). Clearly, all our dependent variables are highly correlated. This is hardly surprising since the World Bank index relies on the same underlying surveys used by Transparency International, and the annual TI indices include data from previous years.

Table 1 about here

These indices measure the overall level of public sector corruption in a country, but our interest here is only in political corruption. Ideally, we would prefer a more precise measure of political, as opposed to bureaucratic, corruption, given that the relevant actors in our model are politicians, not bureaucrats. Unfortunately, only one of the component surveys, the Gallup International, distinguishes between political and administrative corruption.[3] However, as reported in the TI CPI Framework Document (Lambsdorff 1998), the correlation between the assessment of politicians and public officials is 0.88. TI considers this a justification for "blending political and bureaucratic corruption, since there is no strong evidence that countries differ in prevalence of one type of corruption over another" (Lambsdorff 1998:7). Therefore, the TI Framework Document claims that "the extent of political corruption is well represented by this data" (ibid: 8). The same argument can be made for CORRWB, since it shares the same substantive characteristics as the CPI. Thus, we use these indices as proxies because political and bureaucratic corruption appear to be correlated and because both indices omit purely private sector fraud that is outside the scope of our analysis.

6.2 Electoral Rules

Our theoretical model concentrates on the distinction between three broad and stylized electoral rules: PLURALITY, CLPR and OLPR. We take our benchmark indicator variables from World Bank's Database on Political Institutions (DPI 2a) as described in Beck, Clarke, Groff, Keefer, and Walsh (1999). We also check the robustness of our results by using more specific measures of party-centrism compiled by Seddon, Gaviria, Panizza, and Stein (2001).

The dummy variables PLURALITY and PR, taken from DPI 2a for a cross-section of countries in 1997, have a non-empty intersection. In most cases, this reflects the fact that some bi-cameral systems use PR for one house and plurality for another. To see if this group is different from "pure" PR or plurality systems, we create a new dummy variable, MIX, that takes on a value of 1 whenever both PR and plurality rules are used. (Note that this way we obtain three overlapping, not mutually exclusive, categorical variables.) Further, to disentangle the effects of open and closed party lists, we create two dummy variables, CLPR and OLPR, by interacting the PR dummy with CL and OL dummies, also taken from DPI 2a.

As an alternative to our main explanatory variable, PR, we employ the index of particularism (PART). Its creators claim that it provides an "indicator of a degree to which individual politicians can further their careers by appealing to narrow geographic constituencies, on the one hand, or party constituencies, on the other" (Seddon, Gaviria, Panizza, Stein, 2001: 2). Although we believe that CLPR, OLPR, and PLURALITY dummies capture the most important distinction between candidate- and party-centered systems, we wish to see whether the results change with a more elaborate measure of the same concept. The index is based on the seminal work by Carey and Shugart (1995) and includes three components: *ballot*, *pool*, and *vote*.[4] The summary index of particularism, PART, is simply an average of these three components, taking the value between 0 (most party-centered) to 2 (most candidate-centered). On balance, PART aggregates several subtle features of electoral systems that criss-cross the boundaries between PR and plurality. However, there is no particular logic behind giving each variable equal weight.

To test our causal mechanism, we construct two variables: CLPLIST and DISTSIZE. CLPLIST measures the proportion of legislators elected on closed party lists and is continuous on the [0,1] interval. It is obtained by interacting PLIST from Persson,

Tabellini, and Trebbi (2001) with the CLPR dummy. We calculate DISTSIZE according to the following formula:

DISTSIZE = ln (LAND*MDM/NUMLEG)

where LAND is the country's area in millions of square kilometers (taken from WDI 2000); MDM is average district magnitude for the House (from DPI 2a); and NUMLEG is number of seats in the House (also from DPI 2a).

In our tests, we compare the effect of CLPLIST and DISTSIZE with the two variables used by Persson, Tabellini, and Trebbi (2001): PLIST (the proportion of representatives elected on a party list) and DISMAG (average district magnitude).

6.3 Control Variables

We also control for the effects of presidentialism and federalism. The presidential dummy (PRES) is transformed from the DPI 2a categorical variable. It takes the value 1 if the system has a directly elected president independent of the legislature and 0 otherwise. The federalism dummy (FEDERAL) is also taken from DPI 2a; 1 indicates that there are autonomous regions with extensive taxing, spending, and regulatory authority.

To control for economic development, we use log of averaged GDP per capita, 1995-97 (WDI 2001). Further, we need to control for other aspects of the political system, above and beyond constitutional structure, that may influence the level of corruption – such as political rights and liberties, freedom of press, degree of political competition. Freedom House Annual Surveys provide a satisfactory measure of these factors. The Freedom House index is a composite of several aspects of personal and economic freedom including freedom of the press, an aspect of public life that is particularly relevant to the control of corruption.[5] We average years 1992/93 through 2000/01; the index takes values from 1 (free) to 7 (least free).

Although we consider these two broad variables to be the most important background controls, we also include a larger set of economic, cultural, and social variables that were shown to influence corruption by other studies. These variables are: ethno-linguistic fractionalization (ELF; La Porta 1999); percent protestant (PROT; Treisman 2000), British colonial heritage (BRITCOL; Treisman 2000); democracy for the last 50 years (STABDEMO; Treisman 2000). Because we are not interested in the independent effect of these variables and because they drastically reduce the number of observations, we only report whether or not they were included in the model (indicator CONTROLS), without the

relevant coefficients. However, we prefer the Freedom House index to this large set of controls because it is a reduced form that reports the overall result of underlying social and demographic variables in producing a level of personal and economic freedom. This, for us, is the set of background conditions that we want to hold constant in order to examine the independent effect of alternative democratic structures.

Tables 2,3 about here

Table 2 presents the summary statistics and correlations of our independent variables. As a reference, Table 3 provides a list of all variables with their brief description and sources.

7. Empirical Results

The empirical results are mostly consistent with our empirical claims. Regression diagnostics are included in the Appendix A3 and demonstrate that the results are not unduly influenced by influential observations or outlying cases. Similarly, as we show in the appendix, the bounded nature of the corruption measure does not appear to have introduced distortions.

7.1. H1: The Relationship between Electoral Rules and Corruption

We begin in Model 1 with a simple regression of the corruption index on the PR dummy controlling for economic development and political rights and liberties (tables 4a, 4b).[6] The regression indicates that proportional representation systems, taken as a whole, tend to be significantly more corrupt than plurality rule systems.[7] Both controls are highly significant and have the expected sign–more developed countries are better at controlling corruption, as are the politically more free countries.[8] This simple model explains 74-76% of the variation in the data. The impact of voting rules on corruption is comparable to that of income and the level of freedom.

Given the cross-section of countries in our data set, the disturbances are not likely to have the same variance. This means that the OLS estimator will not be minimum variance or efficient. To avoid problems associated with heteroscedasticity and obtain an efficient estimator, we employ two corrections. Table 4a reports OLS results with White-corrected standard errors. Table 4b uses weighted least squares (WLS) where the weights reflect measures of the apparent accuracy of the country estimates.[9] The results change very little

across these alternative methodologies, which gives us confidence in the validity of our estimates.

Tables 4a,b about here

The next step is to break out alternative types of PR systems, including mixed systems (MIX dummy) (Model 2) and to add more controls (Models 3 and 4). The coefficients on the closed-list PR dummy (CLPR) are negative in all these specifications (i.e., CLPR negatively affects a country's ability to control corruption) and highly significant in all specifications. The coefficient on OLPR has the right sign but is not statistically significant under any specifications, which means that statistically we cannot tell the difference between OLPR and our reference category, PLURALITY systems. This suggests that it is indeed closed party lists, not PR per se, that encourages corruption.

The effect of bicameral systems that use different electoral rules for each chamber is captured in the MIX dummy. This dummy "cleans" the coefficients on CLPR and OLPR of the effect of these "mixed" electoral systems. Given that these systems have some degree of "PR-ness", they should be more corrupt than the non-PR systems, yet less corrupt than "pure" PR systems.[10] The coefficients on MIX have correct signs and magnitudes but are not statistically significant when CORRWB is used as a dependent variable. They are significant using CRTIA as a dependent variable (appendix A2, tables 4c and 4d).

Controls for presidentialism and federalism are added in Model 3. As expected, PRES and FEDERAL also have negative signs and are statistically significant in most specifications. This suggests that all three institutional forms induce more corruption (or, to make the signs more intuitive, make corruption control more difficult). Model 3 is our preferred test of hypothesis 1 as it includes the inclusive yet parsimonious set of controls and still explains over 80% of the variation in the data.

On balance, these results strongly suggest that closed-list PR, federalism, and presidentialism increase corruption holding other factors constant. What can be said about the magnitude of these effects? Model 3 (CORRWB; OLS) allows the following numeric experiments.[11] If a country decided to change its electoral system from plurality to CLPR, it would decrease its corruption control index by .28, which is about .29 of CORRWB's standard deviation. For the sake of comparison, this is about the same effect as a drop in GDP per capita to 57.75% of its current level.[12] Similarly, a change from a unitary to a

federal state would increase corruption by about .34 of CORRWB's standard deviation, which is the same amount as a drop in GDP per capita to about one half of its current level. A change from parliamentarism to presidentialism would have the gravest effect, .42 of CORRWB's standard deviation, or the same as going to 44.76% of the current GDP per capita. Although these hypothetical experiments need to be taken with a grain of salt, they do suggest that the relative magnitude of institutional effects on corruption is rather large as compared to the effect of economic development. Yet the effect of electoral rules seems to be smaller than that of other institutional factors such as federalism and presidentialism.

Models 4 and 5 test the robustness of the results obtained in Model 3. Model 4 adds a large battery of social, economic, and political background controls (CONTROL). The coefficients on our institutional variables of interest retain their signs and, aside from presidentialism, do not drop substantially in statistical significance. OLPR is now negative significant under one specification (and increases in significance substantially in all others), which is still consistent with H1. As expected, the Freedom House Index (FH) drops in significance because many of the controls capture the same effect as FH.

Although Model 4 explains a great deal of the data variation (85-91%), we consider the use of this large set of controls controversial given our goals. Our concerns are due to potential simultaneity problems and sample truncation effects. First, variables like colonial origin and Protestantism have a direct impact on the kind of constitutional structure a country chooses (most British colonies adopted Westminster systems). Similarly, most ethnolinguistically fractionalized countries choose PR over plurality in order to allow for coalition-building. This creates simultaneity bias that makes OLS or WLS unsuitable for estimation (see Persson, Tabellini, and Trebbi 2001 for non-parametric estimates). In addition, these variables are only available for a limited number of countries, and hence truncate our sample in a potentially systematic way, reducing the number of observations by almost a half. Given these problems, we believe that the most meaningful and informative specification is Model 3 with two basic background controls.

Finally, Model 5 assesses whether the effect of closed-list PR is the same as the effect of individual-versus-party-centrism of the electoral system as measured by the index of particularism (PART) developed by Seddon, Gavira, Panizza, and Stein (2001). We find PART to be positive significant only when CORRWB is used as a dependent variable, plus we explain a little less variation in the data (73-79%) than in our preferred Model 3.[13] In

comparison to our simple CLPR, OLPR and MIX dummies, the PART variable includes many more features of electoral systems that make them more party-centered; however, note that the correlation between PR and PART is -0.62. In comparison to all other models, our FEDERAL variable drastically drops in significance in Model 5. This result is not easy to explain since the two variables are not highly correlated and seem to measure different aspects of the political system. Because the theory behind the aggregation method of the PART index is unclear, we prefer our simple, more transparent measure of electoral structure.

7.2. H2: Testing the causal story

We are now ready to test the causal story. The first two columns in Table 5 report the results for OLS using the same two techniques described above.[14] The results strongly support Hypothesis 2: district size and the proportion of candidates elected on closed party lists significantly influence control of corruption, adjusting for institutional and other explanations. For the sake of comparison, the second two columns of Table 5 report the results of the causal mechanisms suggested by Persson, Tabellini, and Trebbi (2001; henceforth, PTT) on the identical sample and with identical controls, but adding institutional structure.[15]

Table 5 about here

DISTSIZE is negative significant using both OLS and WLS, while CLPLIST loses some significance under the WLS specification. Still, our variables are far better at explaining corruption than PTT's variables, DISMAG and PLIST. Our results indicate that once the effects of presidentialism and federalism have been taken into account, PLIST loses significance.[16] This gives us further confidence in our hypothesis that it is *closed* party lists that influence the ability of the system to control corruption. In addition, we show that the geographic size of the district matters for the control of corruption, unlike the district magnitude as hypothesized by PTT and others.

What is the magnitude of the effect of our explanatory variables?[17] If average district size grows by 1%, the corruption control index falls by about 0.001 of its standard deviation. To see how large an increase in corruption this is, compare it with the effect of a fall in GDP per capita: the same effect on corruption would be achieved if GDP per capita fell by 0.12%. Perhaps more tellingly, corruption would increase equally if either of the following happened: GDP per capita fell by 1% or average district size increased by 8.43%.

Similarly, if the system changes from having 0% of its legislators elected on closed party lists to 100%, the corruption control coefficient goes down by .21 of its standard deviation. This is the same increase in corruption as effected by a 35.6% fall in GDP per capita. So, each added 1% of legislators elected on closed party lists has the same effect on increasing corruption as a 0.36% fall in GDP per capita.

These results have implications not just for the design of voting rules but for the construction of electoral districts as well. They suggest that corruption can be limited by reducing district size not just by reducing district magnitude but also by increasing the number of districts. Thus, a tradeoff is implied by these results. Large legislatures may be unwieldy and hard to manage. They may require considerable delegation to party leaders and committee chairmen to accomplish legislative business. Such organizational requirements may encourage corruption but that cost needs to be traded off against the gain from the better voter monitoring that smaller districts produce.[18]

7.3. H3: Interaction Effects

Our final empirical exercise concerns the interaction effects between constitutional structure and electoral rules. Tables 6a-b report the results obtained by interacting presidentialism and federalism with electoral rules. Again, the same methodological approach as in previous sections applies.[19]

Tables 6a—b about here

We first interact presidentialism with electoral rules and control for federalism (table 6a). Model 1 breaks down the constitutional systems into six categories: closed-list PR presidential (CLPRES), open-list PR presidential (OLPRES), plurality-presidential (PLPRES), closed-list PR parliamentary (CLPARL), open-list PR parliamentary (OLPARL), and plurality parliamentary (PLPARL). Using plurality-parliamentary government as a reference category, we find that CLPRES systems are always (and OLPRES sometimes) significantly more corrupt than our reference category. However, we cannot distinguish plurality presidential or any parliamentary regimes from the benchmark case of plurality parliamentary, as the coefficients on these variables are not statistically significant. Therefore, we cannot say anything about the difference presidentialism makes in plurality systems. What we can say, however, is that presidentialism makes CLPR (and probably OLPR) systems more corrupt.

Model 1 suggests that the effect of presidentialism is stronger than the effect of CLPR in increasing corruption: CLPR parliamentary systems are indistinguishable from PLURALITY parliamentary systems under both specifications. Therefore, Model 2 uses all parliamentary systems (whether CLPR, OLPR, and PLURALITY) as a reference category and examines how presidential systems compare across electoral rules. We find that plurality presidential systems are again statistically indistinguishable from our reference category; however, closed-list PR presidential systems are always most corrupt. The impact of open-list PR presidential systems is once again quite sensitive to the model specification.

Models 3 and 4 (table 6b) mimic 1 and 2 while adding federalism/bi-cameralism and electoral rules interaction effects. FEDMIX denotes those federal systems that have bicameral legislatures using different electoral rules for their two chambers. As expected, the correlation between FEDERAL and FEDMIX is extremely high (0.83). Therefore, we need to test for the joint significance of the coefficients on these two variables. CLPRES remains negative and highly significant under all specifications, but FEDERAL and FEDMIX are also always negative and, at least, jointly significant (denoted by ^). Mixing PR and PLURALITY voting in federal systems leads to more corruption.

On balance, these results confirm the part of H3 that stipulates that CLPR presidential systems are likely to be especially corrupt. We find some support for the claim that OLPR presidential systems are also conducive to corruption. Finally, we have not found any impact of presidentialism on plurality systems in increasing or decreasing corruption.

8. Conclusions

We have investigated how different electoral rules can influence political corruption. Under our proposed theoretical framework, CLPR systems are most susceptible to corruption relative to OLPR and PLURALITY systems because of their use of closed party lists and geographically large districts. We have also hypothesized the existence of interaction effects between electoral rules and other institutional forms, namely presidentialism, federalism, and bi-cameralism. We tested empirically our main prediction, the proposed causal mechanism, and interaction effects. We conducted a multivariate regression analysis to disentangle the effects of electoral rules from the most important determinants of corruption found in the literature. The empirical findings strongly support our theoretical hypothesis that CLPR systems, especially in conjunction with presidentialism, are associated with higher levels of corruption. This remains true after examining alternative

model specifications and eliminating influential observations. In addition to confirming the finding that proportional elections are associated with higher levels of corruption, we have been more specific about the precise causal mechanism and added more institutional structure. We have shown that it is closed lists and national districts that are especially harmful and that these features are especially salient in presidential systems.

The next step should be an examination of public spending to see if it is influenced by the nature of the electoral system. We have tested one half of the basic framework introduced in Sections 2 and 3 of this paper. The other half involves the tradeoff between anti-corruption incentives and "pork barrel" politics. Citizens who can monitor their politicians effectively may not only demand integrity but also insist on benefits for their local communities. States with electoral rules that encourage monitoring may also emphasize narrowly targeted public spending. We plan to explore this connection in subsequent work in spite of significant data problems concerning public goods. Defense spending may look like a benefit for the entire population but may well be targeted to favor producers located in particular regions. Education spending may benefit the nation over time but can easily be directed to local communities on the basis of political clout. Nevertheless, a full picture of the connection between the incentives and the constraints that voters impose on politicians can only be gained by combining the results on corruption that we present here with a more complete analysis of the work that legislatures do in designing programs and allocating spending.

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Tables and Figures

TABLE 1: DEPENDENT VARIABLES: Summary statistics and correlations

Variable	Obs	Mean	Std. Dev.	Min	Max
corrwb	124	0.07	0.98	-1.57	2.13
crtia	85	4.51	2.30	1.35	9.70
corr5	38	5.96	2.63	1.94	9.55
corr6	48	5.53	2.60	1.00	9.43
corr7	47	5.79	2.56	2.05	9.94
corr8	73	5.05	2.47	1.50	10.00
corr9	85	4.76	2.42	1.70	10.00
corr10	75	4.98	2.48	1.30	10.00
corr11	78	4.91	2.45	0.40	9.90

	corrwb	crtia	corr5	corr6	corr7	corr8	corr9	corr10	corr11
corrwb	1								
crtia	0.9759	1							
corr5	0.9074	0.9681	1						
corr6	0.9431	0.9842	0.9783	1					
corr7	0.982	0.9883	0.9324	0.9717	1				
corr8	0.9824	0.9937	0.9445	0.9692	0.9903	1			
corr9	0.9838	0.9927	0.9378	0.9607	0.9871	0.9966	1		
corr10	0.9753	0.9926	0.9476	0.9614	0.9763	0.9864	0.9918	1	
corr11	0.9661	0.9857	0.9417	0.9526	0.9664	0.9746	0.9815	0.9914	1

TABLE 2: INDEPENDENT VARIABLES: Summary statistics and correlations

Variable	Obs	Mean	Std. Dev.	Min	Max
PR	118	0.62	0.49	0.00	1.00
CLPR	118	0.47	0.50	0.00	1.00
OLPR	118	0.15	0.36	0.00	1.00
MIX	118	0.30	0.46	0.00	1.00
PART	130	0.93	0.66	0.00	2.00
CPART	129	0.89	0.19	0.42	1.00
PRES	132	0.65	0.48	0.00	1.00
FEDERAL	116	0.13	0.39	0.00	2.00
DISTSIZE	128	6.08	2.14	1.26	10.82
CLPLIST	73	0.40	0.46	0.00	1.00
DISMAG	130	14.45	25.58	1.00	120.00
PLIST	84	0.53	0.46	0.00	1.00
GPDLN	121	8.35	1.08	6.25	10.26
FH9301	132	3.52	1.91	1.00	7.00
BRITCOL	94	0.32	0.47	0.00	1.00
PROT	94	14.91	23.78	0.00	97.80
ETHNO	78	38.51	29.70	0.00	93.00
STABDEMO	94	0.23	0.43	0.00	1.00
LOGPOP	173	0.86	0.74	-0.86	3.09

	PR	CLPR	OLPR	MIX	PART	CPART	PRES	FEDERAL	DISTSIZE	CLPLIST
PR	1.00									
CLPR	0.69	1.00								
OLPR	0.26	-0.52	1.00							
MIX	0.42	0.21	0.21	1.00						
PART	-0.57	-0.61	0.14	0.07	1.00					
CPART	0.35	0.27	0.05	0.13	-0.32	1.00				
PRES	-0.08	0.11	-0.25	-0.08	-0.10	0.28	1.00			
FEDERAL	0.16	0.23	-0.12	0.26	-0.13	0.14	0.05	1.00		
DISTSIZE	0.18	0.11	0.06	-0.33	-0.40	0.33	0.16	0.02	1.00	
CLPLIST	0.55	0.80	-0.42	-0.20	-0.75	0.25	0.09	0.24	0.41	1.00
DISMAG	0.29	0.34	-0.11	0.09	-0.24	0.24	0.23	-0.09	0.07	0.20
PLIST	0.69	0.53	0.11	-0.11	-0.69	0.41	0.01	0.17	0.48	0.77
GPDLN	0.31	0.19	0.10	0.13	-0.19	-0.04	-0.62	0.02	0.07	0.13
FH9301	-0.24	-0.09	-0.16	-0.02	0.14	-0.06	0.57	0.02	-0.11	-0.14
BRITCOL	-0.57	-0.58	0.11	-0.25	0.48	-0.25	0.00	-0.19	-0.04	-0.45
PROT	0.05	-0.09	0.18	-0.20	0.04	0.14	-0.34	-0.16	0.30	0.01
ETHNO	-0.47	-0.35	-0.08	-0.14	0.36	-0.19	0.16	-0.16	-0.20	-0.31
STABDEMO	0.21	0.00	0.25	0.00	0.00	-0.20	-0.57	-0.10	0.00	0.01
LOGPOP	0.00	-0.05	0.05	0.36	0.20	-0.28	0.08	0.06	-0.63	-0.21

	DISMAG	PLIST	GPDLN	FH9301	BRITCO	PROT	ETHNO	STABDEM	LOGPOP
DISMAG	1.00								
PLIST	0.16	1.00							
GPDLN	0.06	0.21	1.00						
FH9301	-0.04	-0.21	-0.77	1.00					
BRITCOL	0.02	-0.53	-0.24	0.06	1.00				
PROT	-0.06	0.19	0.33	-0.46	0.00	1.00			
ETHNO	0.06	-0.41	-0.50	0.40	0.50	-0.14	1.00		
STABDEMO	0.01	0.07	0.63	-0.68	0.08	0.52	-0.23	1.00	
LOGPOP	0.05	-0.24	-0.08	0.26	-0.01	-0.31	0.30	-0.07	1.00

TABLE 3. LIST OF VARIABLES AND SOURCES

VARIABLE	Source	Description
britcol	Treisman	british colonial heritage
clplist	KRA	percentage of representatives elected on closed party lists
clpr	KRA	open list PR systems
corr10	TI	CPI 00
corr11	TI	CPI 01
corr5	TI	CPI 95
corr6	TI	CPI 96
corr7	TI	CPI 97
corr8	TI	CPI 98
corr9	TI	CPI 99
corrwb	WB	control of corruption (-2.5 to 2.5)
cpart	GPSS	control variable for PART (proportion of legislators considered in index)
CRTIA	KRA	average of CPI 95–01
dismag	GPSS	district magnitude
distsize	KRA	log of average geographic district size
ethno	Treisman	ethnolinguistic fractionalization
federal	DPI	federalism
fh9301	FH	average of FH scores for 1993 through 2001
gdpln	WB/WDI	log of GDP p/c, PPP adjusted (average 93-97)
logpop	WB/WDI	log of population in millions, 1997
mix	KRA	systems that use both PR and plurality
olpr	KRA	closed list PR systems
part	GPSS	particularism index (combining ballot/pool/vote)
plist	PTT	percentage of representatives elected on party lists
pluralty	DPI	plurality rule
pr	DPI	proportional representation
pres	DPI	presidentialism
prot	Treisman	% protestant
stabdemo	Treisman	stable democracy for the last 50 years?

TABLE 4a.Testing H1: the existence of the relationship
between electoral rules and corruption (OLS; dependent var.: CORRWB)
All coefficients estimated with robust standard errors in square brackets (Huber/White estimate of variance)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coeff	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*
PR	***-0.36	0.00								
	[0.12]									
CLPR			**-0.32	0.03	**-0.28	0.04	**-0.33	0.03		
			[0.15]		[0.13]		[0.15]			
OLPR			-0.09	0.62	-0.18	0.31	*-0.26	0.07		
			[0.19]		[0.18]		[0.14]			
MIX			-0.14	0.30	-0.07	0.59	0.11	0.41		
			[0.13]		[0.12]		[0.12]			
PRES					***-0.41	0.00	-0.22	0.17	**-0.34	0.02
					[0.11]		[0.16]		[0.14]	
FEDERAL					***-0.33	0.00	**-0.36	0.04	-0.11	0.54
					[0.11]		[0.17]		[0.19]	
PART									**0.19	0.02
									[0.08]	
CPART									-0.43	0.13
									[0.28]	
GDPLN	***0.53	0.00	***0.53	0.00	***0.51	0.00	***0.54	0.00	***0.51	0.00
	[0.07]		[0.07]		[0.06]		[0.09]		[0.06]	
FH9301	***-0.24	0.00	***-0.23	0.00	***-0.20	0.00	-0.06	0.32	***-0.20	0.00
	[0.03]		[0.03]		[0.04]		[0.06]		[0.04]	
CONTROL	NO		NO		NO		YES		NO	
Intercept	***-3.4	0.00	***-3.42	0.00	***-3.04	0.00	***-3.89	0.00	***-3.04	0.00
	[0.61]		[0.60]		[0.61]		[0.89]		[0.61]	
R-sq.	0.74		0.75		0.82		0.88		0.79	
Obs.	105		105		93		63		96	

TABLE 4b.Testing H1: the existence of the relationship
between electoral rules and corruption (WLS; dependent var.: CORRWB)
Weights: inverse of standard errors of CORRWB

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coeff	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*
PR	***-0.40	0.00								
	[0.12]									
CLPR			***-0.39	0.00	**-0.29	0.03	**-0.33	0.05		
			[0.13]		[0.13]		[0.17]			
OLPR			-0.11	0.54	-0.13	0.45	-0.28	0.14		
			[0.19]		[0.18]		[0.19]			
MIX			-0.1	0.41	-0.07	0.56	0.16	0.26		
			[0.13]		[0.12]		[0.14]			
PRES					***-0.35	0.01	*-0.20	0.10	**-0.31	0.03
					[0.12]		[0.14]		[0.14]	
FEDERAL					**-0.32	0.03	**-0.38	0.02	-0.08	0.52
					[0.15]		[0.16]		[0.12]	
PART									**0.21	0.02
									[0.09]	
CPART									-0.26	0.37
									[0.28]	
GDPLN	***0.59	0.00	***0.59	0.00	***0.55	0.00	***0.56	0.00	***0.50	0.00
	[0.06]		[0.07]		[0.06]		[0.08]		[0.06]	
FH9301	***-0.24	0.00	***-0.22	0.00	***-0.19	0.00	-0.05	0.32	***-0.18	0.00
	[0.04]		[0.03]		[0.04]		[0.05]		[0.04]	
CONTROL	NO		NO		NO		YES		NO	
Intercept	***-3.87	0.00	***-3.93	0.00	***-3.44	0.00	***-4.10	0.00	***-3.29	0.00
	[0.61]		[0.60]		[0.65]		[0.89		[0.73]	
Adj. R-sq.	0.76		0.77		0.81		0.85		0.78	
Obs.	105		105		93		63		96	

TABLE 5.Testing H2: the causal mechanism (dep. var.: CORRWB)

	H2 OLS		H2 WLS		PTT OLS		PTT WLS	
	Coeff	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*
DISTSIZE	**-0.07	0.04	**-0.07	0.04				
	[0.03]		[0.03]					
CLPLIST	*-0.21	0.10	-0.2	0.17				
	[0.13]		[0.14]					
DISMAG					0.001	0.51	0.001	0.73
					[0.001]		[0.001]	
PLIST					-0.23	0.15	-0.24	0.12
					[0.15]		[0.15]	
PRES	-0.07	0.69	-0.05	0.69	-0.19	0.26	-0.17	0.25
	[0.16]		[0.14]	0.71	[0.16]		[0.15]	
FEDERAL	-0.22	0.26	-0.24	0.14	-0.27	0.15	*-0.28	0.09
	[0.20]		[0.16]		[0.19]		[0.16]	
GDPLN	***0.59	0.00	***0.60	0.00	***0.49	0.00	***0.50	0.00
	[0.08]		[0.08]		[0.09]		[0.10]	
FH9301	-0.07	0.30	-0.07	0.28	-0.11	0.12	-0.11	0.12
	[0.06]		[0.06]		[0.07]		[0.07]	
CONTROL	YES		YES		YES		YES	
Intercept	***-4.03	0.00	***-4.08	0.00	***-3.47	0.00	***-3.51	0.00
	[0.83]		[0.91]		[0.97]		[1.07]	
(Adj.) R-sq.	0.89		0.86		0.88		0.84	
Obs.	56		56		56		56	

TABLE 6a.H3: presidentialism-electoral-rules interaction effects (dep. var.: CORRWB)
OLS with robust st. errors; WLS weighted by inverse of standard errors.

	Model 1/OLS		Model 1/WLS		Model 2/OLS		Model 2/WLS	
	Coeff	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*
CLPRES	***-0.48	0.00	***-0.47	0.00	***-0.44	0.00	***-0.42	0.00
	[0.13]		[0.13]		[0.10]		[0.10]	
OLPRES	*-0.38	0.07	-0.38	0.19	*-0.33	0.09	-0.34	0.23
	[0.21]		[0.29]		[0.19]		[0.28]	
PLPRES	-0.15	0.25	-0.1	0.43	-0.12	0.31	-0.06	0.57
	[0.13]		[0.13]		[0.11]		[0.11]	
CLPARL	-0.16	0.45	-0.19	0.3				
	[0.21]		[0.18]					
OLPARL	-0.08	0.64	-0.03	0.87				
	[0.18]		[0.18]					
FEDERAL	***-0.32	0.00	**-0.32	0.03	***-0.34	0.00	**-0.35	0.02
	[0.10]		[0.15]		[0.09]		[0.14]	
GDPLN	***0.52	0.00	***0.56	0.00	***0.51	0.00	***0.55	0.00
	[0.07]		[0.06]		[0.07]		[0.06]	
FH9301	***-0.21	0.00	***-0.2	0.00	***-0.2	0.00	***-0.19	0.00
	[0.04]		[0.04]		[0.04]		[0.04]	
CONTROLS	NO		NO		NO		NO	
Intercept	***-3.29	0.00	***-3.72	0.00	***-3.29	0.00	***-3.70	0.00
	[0.65]		[0.65]		[0.62]		[0.63]	
(Adj.) R-sq.	0.81		0.79		0.81		0.8	
Obs.	93		93		93		93	

TABLE 6b.H3: adding federalism-electoral-rules interaction effects (dep. var.: CORRWB)
OLS with robust st. errors; WLS weighted by inverse of standard errors.

	Model 3/OLS		Model 3/WLS		Model 4/OLS		Model 4/WLS	
	Coeff	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*
CLPRES	***-0.51	0.00	***-0.47	0.00	***-0.43	0.00	***-0.42	0.00
	[0.16]		[0.15]		[0.11]		[0.11]	
OLPRES	*-0.4	0.10	-0.37	0.23	-0.32	0.11	-0.32	0.27
	[0.24]		[0.31]		[0.20]		[0.29]	
PLPRES	-0.17	0.29	-0.09	0.55	-0.11	0.37	-0.05	0.68
	[0.16]		[0.15]		[0.12]		[0.12]	
CLPARL	-0.19	0.45	-0.18	0.4				
	[0.25]		[0.21]					
OLPARL	-0.13	0.64	-0.02	0.92				
	0.27		[0.23]					
MIX	0.05	0.76	-0.01	0.97	-0.02	0.88	-0.04	0.74
	[0.16]		[0.14]		[0.11]		[0.11]	
FEDERAL	***-0.23	0.01	^^^-0.21	0.57	***-0.24	0.01	^-0.22	0.54
	[0.09]		[0.36]		[0.09]		[0.36]	
FEDMIX	^^^-0.12	0.44	^^^-0.13	0.74	^^^-0.12	0.44	^-0.14	0.72
	[0.16]		[0.40]				[0.39]	
GDPLN	***0.52	0.00	***0.57	0.00	***0.51	0.00	***0.55	0.00
	[0.07]		[0.07]		[0.07]		[0.06]	
FH9301	***-0.21	0.00	***-0.20	0.00	***-0.20	0.00	***-0.20	0.00
	0.04		[0.04]		[0.04]		[0.04]	
CONTROLS	NO		NO		NO		NO	
Intercept	***-3.30		***-3.75	0.00	***-3.31	0.00	***-3.72	0.00
	[0.65]		[0.66]		[0.67]		[0.64]	
(Adj.) R-sq.	0.81		0.79		0.81		0.8	
Obs.	93		93		93		93	

TABLE 7a. REGRESSION DIAGNOSTICS: DROPPING INFLUENTIAL OBSERVATIONS in Model 3 (H1)
(dep.var.: CORRWB)
OLS w/robust standard errors

	Dropping large STUDENT		Dropping large DFclpr		Dropping large DFFITS	
	Coeff	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*
CLPR	***-0.37	0.00	***-0.30	0.01	**-0.27	0.03
	[0.12]		[0.11]		[0.12]	
OLPR	*-0.27	0.10	*-0.29	0.07	-0.07	0.64
	[0.16]		[0.16]		[0.12]	
MIX	-0.11	0.36	-0.14	0.24	-0.14	0.19
	[0.12]		[0.12]		[0.12]	
PRES	***-0.45	0.00	***-0.46	0.00	***-0.39	0.00
	[0.11]		[0.12]		[0.12]	
FEDERAL	***-0.29	0.01	***-0.35	0.00	***-0.29	0.01
	[0.10]		[0.10]		[0.10]	
GDPLN	***0.48	0.00	***0.55	0.00	***0.48	0.00
	[0.05]		[0.05]		[0.052]	
FH9301	***-0.21	0.00	***-0.19	0.00	***-0.21	0.00
	[0.03]		[0.03]		[0.03]	
Intercept	***-2.66	0.00	***-3.29	0.00	***-2.79	0.00
	[0.50]		[0.5]		0.5	
R-sq.	0.86		0.87		0.85	
Obs.	88		85		89	

TABLE 7b. REGRESSION DIAGNOSTICS: DROPPING INFLUENTIAL OBSERVATIONS in Model 1(H2) dep.var.: CORRWB
(OLS w/robust standard errors)

	Dropping large STUDENT		Dropping large Dfdsize		Dropping large Dfclist		Dropping large DFFITS	
	Coeff	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*
DISTSIZE	***-0.09	0.01	**-0.08	0.04	**-0.07	0.03	*-0.05	0.08
	[0.03]		[0.04]		[0.03]		[0.03]	
CLPLIST	**-0.27	0.04	-0.16	0.30	**-0.25	0.04	**-0.29	0.02
	[0.12]		[0.15]		[0.12]		[0.12]	
PRES	-0.01	0.95	-0.16	0.26	-0.03	0.98	0.01	0.97
	[0.15]		[0.14]		[0.16]		[0.14]	
FEDERAL	***-0.37	0.00	-0.19	0.30	***-0.36	0.00	-0.34	0.13
	[0.09]		[0.18]		[0.09]		[0.22]	
GDPLN	***0.58	0.00	***0.54	0.00	***0.58	0.00	***0.55	0.00
	[0.07]		[0.08]		[0.07]		[0.08]	
FH9301	-0.07		-0.10	0.17	-0.02	0.69	-0.09	0.20
	[0.06]	0.23	[0.07]		[0.06]		[0.07]	
CONTROLS	YES		YES		YES		YES	
Intercept	***-3.75	0.00	***-3.35	0.00	***-4.00	0.00	***-3.83	0.00
	[0.75]				[0.81]		[0.86]	
R-sq.	0.92		0.92		0.92		0.92	
Obs.	54		51		53		50	

TABLE 7c. REGRESSION DIAGNOSTICS: DROPPING INFLUENTIAL OBSERVATIONS in Model 2(H3)
Dep. Var.: CORRWB
(OLS w/robust standard errors)

	Dropping large STUDENT		Dropping large Dfclpres		Dropping large DFFITS	
	Coeff	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*
CLPRES	***-0.49	0.00	***-0.42	0.00	***-0.50	0.00
	[0.10]		[0.09]		[0.10]	
OLPRES	*-0.35	0.08	*-0.31	0.06	***-0.32	0.00
	[0.20]		[0.16]		[0.07]	
PLPRES	-0.10	0.28	**-0.25	0.02	-0.07	0.46
	[0.10]		[0.10]		[0.10]	
FEDERAL	***-0.32	0.00	***-0.33	0.00	***-0.28	0.01
	[0.09]		[0.08]		[0.10]	
GDPLN	***0.47	0.00	***0.48	0.00	***0.47	0.00
	[0.05]		[0.06]		[0.05]	
FH9301	***-0.21	0.00	***-0.20	0.00	***-0.22	0.00
	[0.03]		[0.04]		[0.03]	
Intercept	***-2.92	0.00	***-2.99	0.00	***-2.95	0.00
	[0.50]		[0.63]		[0.51]	
R-sq.	0.84		0.84		0.84	
Obs.	90		88		88	

Figure 1a. Actual CORRWB versus predicted corruption according to Model 3 (H1)

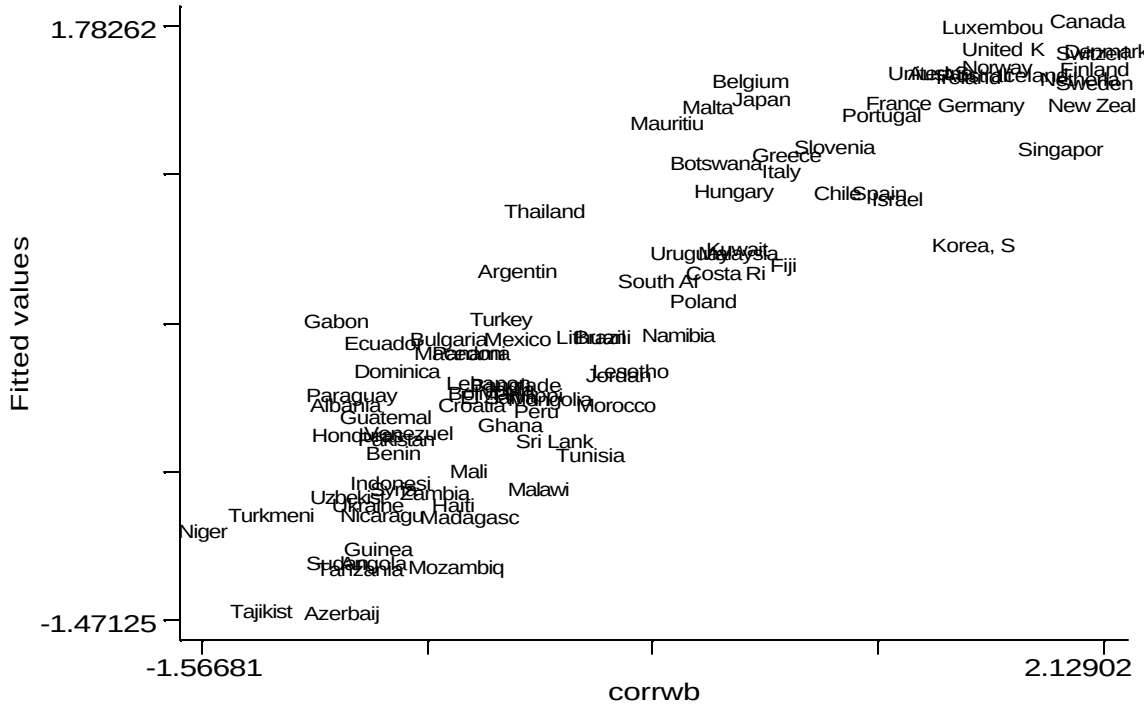


Figure 1b. Actual CORRWB versus predicted corruption according to Model 1 (H2)

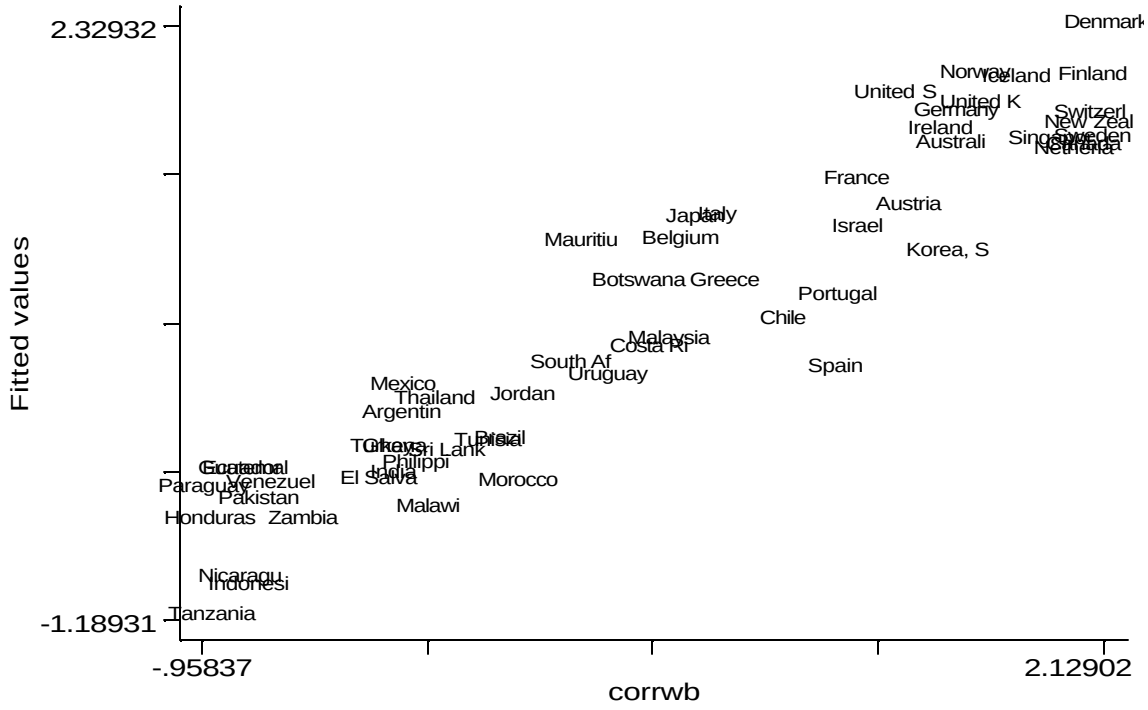
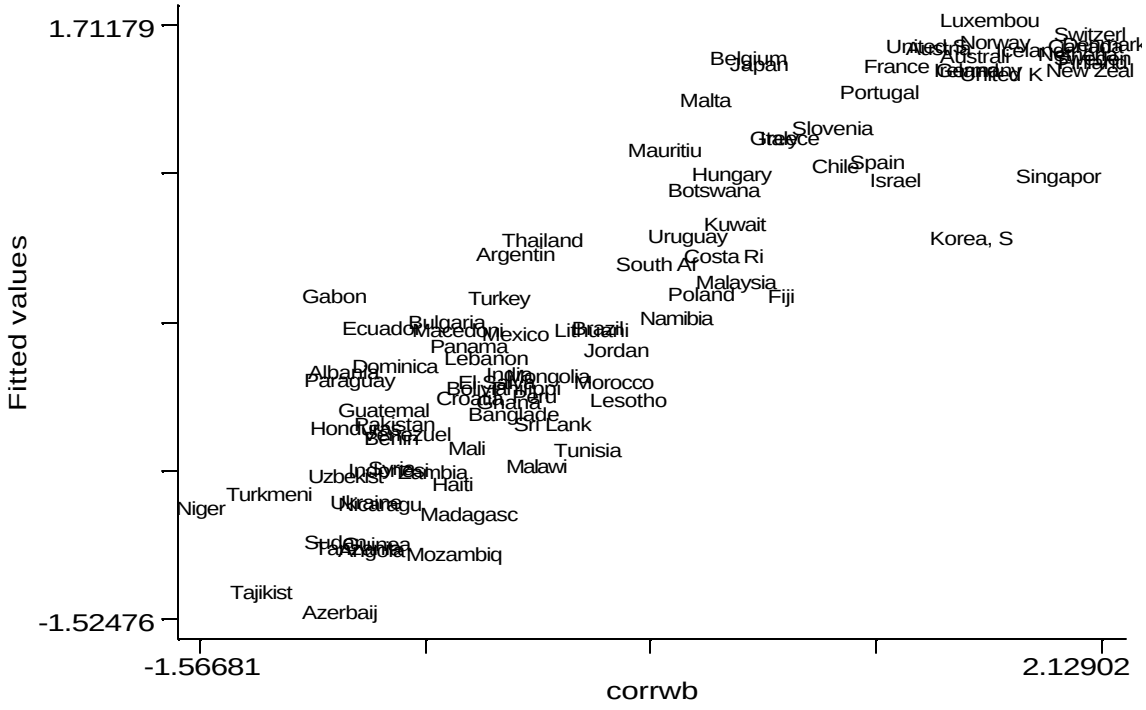


Figure 1c. Actual CORRWB versus predicted corruption according to Model 2 (H3)



APPENDIX

A1. **Ranking of countries from most corrupt to least corrupt by CORRWB**

rank	country	Corrwb	olpr	clpr	plurality	pres
1	Niger	-1.567	0	0	1	1
2	Tajikistan	-1.316	0	0	1	1
3	Turkmenistan	-1.289	0	0	1	1
4	Iraq	-1.265	0	0	1	1
5	Liberia	-1.051	.	.	.	1
6	Somalia	-1.051	.	.	.	.
7	Sudan	-1.015	0	0	1	1
8	Gabon	-1.015	0	0	1	1
9	Azerbaijan	-0.998	0	1	1	1
10	Yugoslavia	-0.995	0	1	0	1
11	Albania	-0.985	0	1	1	0
12	Uzbekistan	-0.963	0	0	1	1
13	Paraguay	-0.958	0	1	0	1
14	Honduras	-0.938	0	1	1	1
15	Tanzania	-0.924	0	0	1	1
16	Ukraine	-0.892	0	1	1	1
17	Algeria	-0.878	0	1	1	1
18	Kazakhstan	-0.869	0	0	1	1
19	Angola	-0.863	0	1	0	1
20	Yemen	-0.854	0	0	1	1
21	Papua New Guinea	-0.854	0	0	1	0
22	Iran	-0.848	.	.	1	1
23	Guinea	-0.848	0	1	1	1
24	Nicaragua	-0.836	0	1	0	1
25	Guatemala	-0.819	0	1	1	1
26	Ecuador	-0.819	0	1	0	1
27	Armenia	-0.803	0	1	1	1
28	Indonesia	-0.799	0	1	0	1
29	Syria	-0.789	0	0	1	1
30	Benin	-0.781	0	1	0	1
31	Dominican Rep.	-0.773	0	1	1	1
32	Pakistan	-0.769	1	0	1	0
33	Kyrgyz Rep.	-0.763	.	.	.	1
34	Venezuela	-0.725	0	1	1	1
35	Kenya	-0.651	0	0	1	1
36	Russian Federation	-0.616	0	1	1	1
37	Zambia	-0.614	0	0	1	1
38	Bulgaria	-0.557	0	1	0	1
39	Mozambique	-0.535	0	1	0	1
40	Korea, N.	-0.535	.	.	.	1

rank	country	corrwb	olpr	clpr	plurality	pres
41	Haiti	-0.535	0	0	1	1
42	Macedonia	-0.517	0	0	1	1
43	Colombia	-0.490	0	1	0	1
44	Mali	-0.476	0	0	1	1
45	Madagascar	-0.469	0	1	1	1
46	Uganda	-0.466	.	.	1	1
47	Croatia	-0.464	0	1	1	1
48	Panama	-0.458	1	0	1	1
49	Bolivia	-0.438	0	1	1	1
50	Lebanon	-0.397	0	0	1	1
51	El Salvador	-0.354	0	1	0	1
52	Turkey	-0.349	0	1	0	0
53	Vietnam	-0.332	.	.	1	1
54	Zimbabwe	-0.319	0	0	1	0
55	India	-0.306	1	0	1	0
56	Ghana	-0.301	0	0	1	1
57	Bangladesh	-0.289	0	0	1	0
58	China	-0.289	.	.	.	1
59	Mexico	-0.277	0	1	1	1
60	Argentina	-0.275	0	1	0	1
61	Latvia	-0.264	1	0	0	0
62	Togo	-0.242	0	0	1	0
63	Philippines	-0.228	0	1	1	1
64	Peru	-0.200	0	1	0	1
65	Malawi	-0.195	0	0	1	1
66	Guinea-Bissau	-0.176	.	.	.	1
67	Thailand	-0.165	0	0	1	0
68	Mongolia	-0.145	0	0	1	1
69	Sri Lanka	-0.124	1	0	0	1
70	Jamaica	-0.116	0	0	1	0
71	Guyana	-0.019	0	1	0	1
72	Sierra Leone	-0.019	0	1	0	1
73	Suriname	-0.019	0	1	0	0
74	Gambia	-0.019	.	.	.	1
75	Swaziland	0.007	.	.	.	1
76	Tunisia	0.020	0	1	1	1
77	Lithuania	0.034	0	1	1	1
78	Brazil	0.058	1	0	1	1
79	Morocco	0.125	0	0	1	1
80	Jordan	0.139	0	0	1	1
81	Lesotho	0.188	0	0	1	0
82	Cuba	0.274	.	.	.	1
83	South Africa	0.299	0	1	0	1
84	Mauritius	0.336	0	0	1	0

rank	country	corrwb	olpr	clpr	plurality	pres
85	Namibia	0.382	0	1	0	1
86	Uruguay	0.430	0	1	0	1
87	Poland	0.492	0	1	1	1
88	Malta	0.497	1	0	0	0
89	Botswana	0.535	0	0	1	0
90	Costa Rica	0.577	0	1	0	1
91	Hungary	0.614	1	0	1	0
92	Kuwait	0.619	0	0	1	1
93	Malaysia	0.633	0	0	1	0
94	Belgium	0.672	0	1	0	0
95	Japan	0.724	0	1	1	0
96	Italy	0.802	0	1	1	0
97	Fiji	0.807	0	0	1	0
98	Greece	0.825	1	0	1	0
99	Slovenia	1.023	1	0	1	0
100	Chile	1.029	0	0	1	1
101	Spain	1.214	0	1	1	0
102	Portugal	1.218	0	1	0	0
103	Israel	1.277	0	1	0	1
104	France	1.282	0	1	1	0
105	United States	1.407	0	0	1	1
106	Austria	1.457	0	1	0	0
107	Ireland	1.567	1	0	0	0
108	Korea, S.	1.590	0	1	1	1
109	Australia	1.601	1	0	1	0
110	Germany	1.620	0	1	1	0
111	Luxembourg	1.671	1	0	0	0
112	Norway	1.687	0	1	0	0
113	United Kingdom	1.707	0	0	1	0
114	Cyprus	1.811	1	0	0	1
115	Iceland	1.831	0	1	0	0
116	Singapore	1.948	0	0	1	0
117	Netherlands	2.026	0	1	0	0
118	Canada	2.055	0	0	1	0
119	Switzerland	2.072	1	0	1	0
120	New Zealand	2.075	0	1	1	0
121	Finland	2.085	1	0	0	0
122	Sweden	2.085	0	1	0	0
123	Denmark	2.129	1	0	0	0

A2. **Regression Results with CRTIA as dependent variable**

TABLE 4c.Testing H1: the existence of the relationship
between electoral rules and corruption (OLS; dependent var.: CRTIA)
All coefficients estimated with robust standard errors in square brackets (Huber/White estimate of variance)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coeff	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*
PR	***-1.14	0.00								
	[0.31]									
CLPR			**-0.89	0.02	*-0.71	0.06	*-0.74	0.08		
			[0.37]		[0.38]		[0.42]			
OLPR			-0.13	0.80	-0.1	0.85	-0.6	0.15		
			[0.50]		[0.53]		[0.41]			
MIX			**-0.7	0.04	**-0.76	0.02	0.07	0.80		
			[0.33]		[0.32]		[0.29]			
PRES					-0.47	0.21	-0.31	0.37	-0.52	0.22
					[0.37]		[0.34]		[0.41]	
FEDERAL					**-0.70	0.03	*-0.73	0.08	-0.54	0.22
					[0.32]		[0.41]		[0.19]	
PART									0.27	0.27
									[0.25]	
CPART									-0.82	0.45
									[1.07]	
GDPLN	***1.58	0.00	***1.56	0.00	***1.46	0.00	***1.38	0.00	***1.32	0.00
	[0.21]		[0.21]		[0.22]		[0.22]		[0.24]	
FH9301	***-0.43	0.00	***-0.39	0.01	**-0.34	0.02	-0.05	0.72	***-0.33	0.01
	[0.13]		[0.14]		[0.14]		[0.14]		[0.12]	
CONTROL	NO		NO		NO		YES		NO	
Intercept	***-6.82	0.00	***-6.84	0.00	**-5.73	0.02	***-6.48	0.00	*-4.74	0.10
	[2.10]		[2.11]		[2.37]		[2.27]		[2.84]	
R-sq.	0.74		0.76		0.78		0.91		0.73	
Obs.	82		82		75		58		75	

TABLE 4d.Testing H1: the existence of the relationship
between electoral rules and corruption (WLS; dependent var.: CRTIA)
Weights: (yravail*nsur/crtiasd)

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Coeff	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*	*Coeff*	*p-value*
PR	***-1.08	0.00								
	[0.36]									
CLPR			**-0.91	0.02	*-0.58	0.10	*-0.66	0.09		
			[0.37]		[0.38]		[0.42]			
OLPR			-0.22	0.64	-0.1	0.84	-0.6	0.18		
			[0.50]		[0.46]		[0.44]			
MIX			***-0.90	0.01	**-0.75	0.03	0.13	0.67		
			[0.33]		[0.36]		[0.29]			
PRES					**-0.80	0.02	-0.44	0.15	**-0.99	0.02
					[0.34]		[0.30]		[0.41]	
FEDERAL					**-0.91	0.03	**-0.82	0.02	-0.4	0.32
					[0.42]		[0.35]		[0.39]	
PART									0.37	0.2
									[0.28]	
CPART									0.48	0.58
									[0.79]	
GDPLN	***1.81	0.00	***1.81	0.00	***1.69	0.00	***1.37	0.00	***1.60	0.00
	[0.24]		[0.23]		[0.24]		[0.19]		[0.29]	
FH9301	***-0.61	0.00	***-0.54	0.00	***-0.47	0.01	-0.03	0.85	**-0.35	0.04
	[0.15]		[0.14]		[0.14]		[0.13]		[0.17]	
CONTROL	NO		NO		NO		YES		NO	
Intercept	***-8.41	0.00	***-8.65	0.00	***-7.47	0.00	***-6.14	0.00	***-8.20	0.01
	[2.53]		[2.39]		[2.48]		[2.08]		[3.02]	
Adj. R-sq.	0.74		0.78		0.8		0.91		0.75	
Obs.	82		82		75		58		75	

A3**. Regression Diagnostics**

Although we used OLS with robust standard errors and WLS to correct for heteroscedasticity that was bound to plague our cross-sectional dataset, further regression diagnostics is warranted to identify influential observations and outlying cases. For each of our three hypotheses, we select a representative model and examine influential observations that influence the intercept, regression coefficient, or the model as a whole.

A3.1 H1: Model 3

A good starting point is Figure 1a that plots the predicted corruption control index against the actual corruption index.

Figure 1a about here

Clear outliers are Niger, Gabon, Argentina, Thailand, Mauritius, Malta, Belgium, Singapore, and South Korea. To further examine the effect of outliers, we use the following techniques: studentized residuals to identify observations that shift the intercept; DFBETAs to identify the observations that unduly influence the coefficient on our institutional variables; and DFFITS to identify observations that influences the model as a whole. The results are in Table 7a.

Table 7a about here

We studentize the residuals to identify the outliers among the residuals. Studentized residuals correspond to the *t* statistic we would obtain by including in the regression a dummy predictor coded 1 for that observation and 0 for all others; i.e., we test whether the particular observation significantly shifts the intercept. Only five countries have relatively large residuals, i.e. $|t| \geq 2$: Gabon, Thailand, Mauritius, Singapore, and South Korea. Under normal conditions, we should see about 5% of observations in that range; 5 countries constitute 5.38% of our sample, which is close to the norm. Dropping these 5 countries from Model 3 produces a highly significant intercept that is slightly smaller in magnitude.

We proceed to the analysis of the influence of outliers on the coefficient on CLPR. We compute DFclpr– a variable that indicates by how many standard errors the coefficient on CLPR would change if the *i*th observation were dropped from the regression. We consider an observation influential if its $|DFpr| \geq 2/n^{1/2}$ (Fox 1991), which then identifies eight countries: Turkey, Paraguay, Ecuador, Belgium, Thailand, Mozambique, Mauritius, and

Gabon. Dropping these observations slightly increases the magnitude and the significance of the coefficient on CLPR.

Finally, we identify the observations that have a potential to influence the set of predicted values in our model as a whole by computing DFFITS. We consider the observation influential after the cutoff point suggested by Chatterjee and Hadi (1988): $|\text{DFFITS}| \geq 2[(k+1)/(n-k-1)]^{1/2}$. This leads to removing the following observations: Gabon, Malta, South Korea, and Singapore. Running Model 3 without these observations does not change the results significantly. All three coefficients of interest are highly significant with the unchanged signs. We conclude that outliers did not influence the model as a whole.

A.3.2 H2

We only used one model for testing H2, so the choice for diagnostics is easy. Figure 1b plots predicted versus actual values of corruption.

Figure 1b about here

The candidates for outliers are Honduras, Paraguay, Mexico, Mauritius, United States, Norway, Denmark, South Korea, Spain, Morocco, and Malawi. To see which ones of these unduly influence our model, we use exactly the same methodology as in the previous subsection. The results of the regressions without identified influential observations appear in Table 7b.

Table 7b about here

Studentizing residuals produces only 2 outliers, Mauritius and Spain, which is far less than allowed 5% of observations. Hence, the intercept is unlikely to be influenced by outliers; as expected, dropping these two observations does not change the results, aside from increasing the significance of coefficients of interest.

Next, we compute Dfdists and Dfclplist. The observations unduly influencing coefficient on DISTSIZE are South Korea, Singapore, Canada, Brazil, and Mauritius. Dropping these only makes the coefficient on DISTSIZE more significant. To "clean" the coefficient on CLPLIST of influential observations, we must drop Chile, the Netherlands, and Spain. After that, its significance and magnitude increases.

Finally, according to DFFITS, the observations that influence the model as a whole are Venezuela, Mauritius, United States, South Korea, Singapore, and Spain. The results after removing these observations support H2 even stronger.

A3.2 H3: Model 2

We repeat the same exercise for the concise model testing our interaction effects hypothesis. Plotting predicted values of corruption against the actual index reveals a slew of possible outliers: South Korea, Singapore, Luxembourg, Belgium, Japan, Malta, Thailand, Argentina, Gabon, Niger, and others.

Figure 1c, Table 7c about here

After studentizing residuals, we delete only 3 observations that have been culprits in earlier models as well: Gabon, South Korea, and Singapore. The estimation of the intercept is definitely not influenced by outliers. Large Dfclpres lead us to remove Equador, Argentina, Paraguay, Tunisia, and South Korea. Again, the results are even stronger – now, CLPRES is even more significant and higher in absolute magnitude, but also OLPRES and PLPRES are negative significant. The latter suggests even strongly that the effect of presidentialism is stronger than the effect of electoral rules, given that PLURALITY presidential systems seem to be more corrupt than any parliamentary systems. Finally, according to DFFITS, the model as a whole seems to be influenced by the following observations: Panama, Gabon, South Korea, Sri Lanka, and Singapore. The coefficients on CLPRES and OLPRES are now significant at the highest levels which only strengthens our earlier results.

A3.2 Other Methodological Issues

Although OLS assumptions require that dependent variable varies freely, CORRWB is bounded between –2.5 and 2.5. However, the index does not display any particular clustering at very low or very high values (see Table 2a for descriptive statistics), which suggests that truncation is not a major problem and ML methods like Tobit are not necessary. We experimented with monotonic transformations of CORRWB that would allow it to vary from minus infinity to infinity (hyperbolic arctan) with no apparent change in results. TI corruption indices are bounded between 0 and 10, but similarly to CORRWB, they display no particular clustering. Ordinality of the TI index was easily overcome by averaging it over 1995—2001, so ordered probit was not necessary.

[1] These two factors act in opposite directions: larger district magnitude is supposed to decrease corruption due to lower barriers to entry (Myerson 1993), while the use of party lists should increase corruption due to weakened accountability (Holmstrom 1982, Persson and Tabellini 2000). In Myerson's "barriers to entry" argument, corrupt incumbents may still cling on to power if voters sharing the same ideological preferences cannot find a good substitute for the incumbent. In PR systems, the barriers to entry are lower because of larger district magnitude, so PR systems should be less corrupt according to this argument. In sum, there are conflicting theoretical predictions in the literature as to whether proportional elections should be associated with higher or lower corruption levels.

[2] There are theoretical arguments to the contrary, i.e., that federal systems should be less corrupt (see Bardhan and Mookherjee 1998 for competing arguments). Also, Fisman and Gatti (1999) empirically show that more fiscally decentralized systems tend to be less corrupt; however, they use a measure different from a simple federalism dummy. They concentrate on expenditures only, not the origin of funds. We would suggest that federal system with a high level of fiscal decentralization relative to taxing authority are likely to be especially subject to corruption. In other words, our hunch is that it is not expenditure decentralization per se that is driving Fisman and Gatti's results but rather government structures where both spending and taxes are decentralized.

[3] This dataset has very limited country coverage.

[4] *Ballot* describes party control over access to and control of the ballot, and takes on values 0 (full control of the party, i.e. closed list), 1 (limited control of the party), 2 (no control). *Pool* stands for sharing of votes across candidates in the same party, and similarly takes on values 0 (votes divided on the party level), 1 (votes divided on the sub-party level) and 2 (votes cast for a particular candidate determine only his electoral success). Finally, *Vote* codes candidate versus party-specific voting in the following fashion: 0 is a single vote for a party, 1 for multiple votes across candidates who may or may not be from the same party, and 2 for one vote for one candidate.

[5] Political liberties include free and fair elections of the head of state and the legislature, the power of minorities, the fairness of electoral laws, etc. Civil liberties comprise the freedom of expression and belief (including the freedom of press), associational and organizational rights, human rights, and economic rights. We average the scores of both civil and political liberties. The details on the methodology of constructing the FreedomHouse Index of political and civil liberties are available at http://www.freedomhouse.org/research/freeworld/2000/methodology.htm

[6] Here we only report regressions with CORRWB as dependent variable. See Data Appendix A2 for results on CRTIA.

[7] Recall that the "cleanest" countries have the highest scores on the corruption indices, so we expect a negative sign on our main explanatory variables.

[8] We have also run the same model dropping the countries that have FH scores higher than 5.5, which would place them in the "unfree" category. In our original sample of Model 1 (105 countries), there were only 8 such countries, and dropping them did not change the magnitude or significance of the coefficient on PR.

[9] The weights are the inverse of the standard error of CORRWB and number of years for which TI index is available divided by the average standard deviation. We have experimented with different weights as well: number of surveys used across years divided by average standard deviation and number of survey-years divided by average standard deviation. The results do not change.

[10] We have also experimented with the bicameralism variable, which turned out insignificant under all specifications.

[11] We base our numeric experiments on the models that use CORRWB as dependent variable.

[12] .51(logY1 – log Y0) = .51log (Y1/Y0)= -.28. Then, Y1/Y0= exp (-.55) = 0.5775; so Y1 =.5775*Y0.

[13] Recall that the index of particularism ranges between 0 (most party-centered) to 2 (most individual-centered). In this sense, it is inversely related to "PR-ness" and therefore we expect the opposite sign.

[14] With new institutional variables we lose too many degrees of freedom when using CRTIA, so we only report the results on CORRWB here.

[15] Although we prefer a more parsimonious set of controls, we use the extended list here for the sake of comparison with PTT.

[16] PTT have not shown DISMAG to be significant under their specifications either.

[17] These numerical experiments are based on H2 OLS model.

[18] To check for the effects of the size of the country, we tested H2 adding on the right-hand side the log of the land area (LANDLN) and its interaction with DISTSIZE. The results do not substantially differ from those

reported here. Also note that, quite surprisingly, there is a minimal correlation between DISTSIZE and LANDLN, only 0.08. So, large countries do not have geographically larger districts.

[19] For the sake of brevity, we only report the results for CORRWB; results for CRTIA do not substantively change our findings and can be obtained from the authors.