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. This effect is due to the use of closed party lists and geographically large districts. 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. To the best of our knowledge, only one other study so far has explored the relationship between electoral rules and corruption empirically (Persson, Tabellini, and Trebbi 2001). While we confirm their finding that proportional elections are associated with higher levels of corruption, we single out closed-list PR systems as the most conducive to corruption. In addition, we show that our causal mechanism performs better than the causal mechanism tested by Persson, Tabellini, and Trebbi, especially after adding more institutional structure.

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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 (PLURALITY), closed-list proportional representation systems (CLPR), and open-list proportional representation systems (OLPR). We argue that PLURALITY systems provide the most stringent constraints for politicians' rent-seeking due to their direct accountability to the voters. Voters in districts that have a single representative and that are geographically relatively small are more capable of observing their representative's performance in office, as well as his or her lifestyle that may indicate self-dealing. Elections then serve as a means for constituents to oust corrupt representatives. In contrast, CLPR 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. OLPR systems fall in between PLURALITY and CLPR systems. Despite the absence of grass-root monitoring due to large districts, each representative's accountability to voters is greater because the voters can cast their vote for a particular representative on the list. Thus, the link between re-election and doing well in office is stronger in OLPR than in CLPR.

Although our primary focus is on the methods by which the legislature is chosen, we also recognize that a complete model would 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.

While the link between electoral rules and corruption is far from being an established fact in comparative political economy, there exists a new and growing literature that addresses the relationship between political institutions and corruption. However, our paper makes several contributions. First, it explicitly distinguishes between criminal corruption (embezzlement of funds, bribery) and pork-barrel spending (perfectly legal activity), which tends to be conflated elsewhere (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 the existing models (Myerson 1993, Holmstrom 1982, Persson and Tabellini 2000, ch. 9). These models focus on district magnitude or party lists as the driving forces behind the effect of electoral rules on corruption;[1] we emphasize the effect of the geographic district size (as opposed to the number of representatives elected per district) and the distinction between closed and open party lists. Third, to the best of our knowledge, 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. In fact, we show that our variables are better at explaining corruption on an identical sample. Most importantly, we attempt to be more attentive to other institutional details that were assumed away by Persson, Tabellini, and Trebbi (2001). We differentiate between CLPR and OLPR and control for the effect of federalism and presidentialism that 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. Last but not least, 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, followed by regression diagnostics and a methodological discussion. 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; Sandholz and Koetzle 2000; Lambsdorf 1998). Yet some authors broaden this definition to "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 "common-denominator institutions" for both autocracies and democracies, such as size of selectorate and winning coalitions.

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 perilous when analyzing the impact of electoral rules on corruption. Some electoral systems, while 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.

PLURALITY systems have a purely geographic basis for electoral competition. 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. Incumbents make a nonpartisan appeal for reelection arguing that they have been able to obtain targeted benefits. In contrast, in CLPR systems 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 success. Thus, there will be more targeting in OLPR than CLPR, but less than in PLURALITY.

When pork-barrel spending is conflated with corruption, one would conclude that PLURALITY systems are more susceptible to corruption since they give incentives for pork-barrel spending. However, having made an explicit distinction between the two, we arrive at different predictions. 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, individual 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 the elections are not as good at constraining individuals. Nevertheless, 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.

The key idea here is that PLURALITY systems by design are more transparent to the grass-root monitoring by voters than are the CLPR systems. This is consistent with the "carreer-concern model" of Holmstrom (1982) and its extension to rents and corruption by Persson and Tabellini (2000, ch. 9). The argument there is that voting over individual candidates creates a direct link between individual performance and reappointment, which gives incentives to the incumbent to avoid corruption. Yet, our argument is that this "incentive to avoid corruption" is simply a flip-side of the constraint created by the voters who are able, by the design of PLURALITY system, to hold their representatives accountable. In PLURALITY, 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.

In contrast, there is no such link between voters and elected politicians in CLPR systems. Voters choose among party lists, and politicians' chance of re-election depend mainly on his ranking on the list. The lists are commonly drawn up by the party leaders, so the ranking will most probably reflect criteria such as party loyalty or effort within the party (not so much in office). 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 voters vote for parties and do not have much say in who will be the party representative, the politics in CLPR systems is less personality-centered than the politics in PLURALITY systems. Hence, electoral campaigns are not so much focused on 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 record) 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, we wish to argue that the system is designed in a way that does not allow the voters to directly observe how corrupt politicians are. Coupled with the fact that the electoral campaigns are centered less around individual characteristics and more around party platforms and track record, the voters are less likely to find out about the corrupt dealings of their leaders.

Now, consider the OLPR systems. They share the second feature with PLURALITY systems: voters can also 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.

The simple theoretical framework we have provided above concentrates on the effect of electoral systems on corruption, but abstracts from other institutional features of political systems that may influence corruption and interact with electoral rules. We consider the effect of the most important of these features in the following section.

4. Richer Institutional Setting

4.1 Presidential and Parliamentary Systems

A cross-country study by Jana Kunicova (2001) shows that presidential systems are more corrupt than parliamentary systems holding other factors constant. The argument there has three parts. First, in most presidential systems, presidents have many legislative, agenda-setting, and veto powers that give them the status of almost an "elected autocrat." Second, presidents only needs to get re-elected to enjoy control rights over public resources, while the members of parliamentary governments, besides being re-elected, also needs 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.

The above arguments give us strong grounds to believe that we should control for the effect of presidentialism in our empirical investigation. However, we also ask the following question: how does the effect of presidentialism interact with electoral rules? To understand that, we need to introduce an intermediate step: 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. Thus, the supposed anti-corruption benefits of PLURALITY may be reduced in parliamentary PLURALITY (Westminster systems) in comparison with presidential PLURALITY systems with weaker parties.

The joint effect of CLPR and presidentialism is more straightforward. CLPR would still produce strong parties in a presidential system that bargains with the president about policy. However, the party leadership may have more room for rent-seeking in presidential

CLPR system 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. Here, the extreme weakness of the parties need not be so propitious as their relative weakness in presidential PLURALITY in comparison to parliamentary PLURALITY. Given the extreme weakness of the parties, the President can easily "divide and conquer," and therefore he can obtain more benefits than with a set of relatively stronger parties whose leaders bargain with the president. Therefore, 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 is important above and beyond the effect of electoral rulesand therefore should be controlled for in our empirical cross-country investigation. The interaction between presidentialism and electoral rules is rather complicated.Due to relative weakening of the parties, presidentialism may strengthen the corruption-controlling mechanism of PLURALITY systems relative to parliamentary systems that use plurality rule However, presidential CLPR and OLPR systems are predicted to be even more corrupt than their parliamentary counterparts. The precise interaction between presidentialism and electoral rules is an empirical question that we investigate in the later sections of this paper.

4.2 Federalism and Bi-Cameralism

Treisman (2000) shows empirically that federal systems are more corrupt than unitary ones; Kunicova (2001) confirms this result. Theoretical arguments as to why this should be so abound. Shleifer and Vishny (1993) suggest that the relatively balanced power of central and subnational officials over 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]

However, 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 simply control for federalism and for those cases of bi-cameralism that use different electoral rules for their chambers.

5. Hypotheses

Our discussion of institutional structure and corruption in sections 3 and 4 leads to 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 like level of economic and political development.

H2 *Causal mechanism.* Ceteris paribus, district size (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.* Ceteris paribus, presidentialism increases the anti-corruption benefits of PLURALITY systems. Alternatively, presidential PR systems are expected to be more corrupt than their parliamentary counterparts. . This prediction should hold controlling for the effects of federalism and other background factors.

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ortional 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.

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).

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 in line with conceptualizing corruption as the misuse of public power for private benefits; specifically, the focus is on taking kickbacks in public procurement, embezzling public funds, and bribing public officials.

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 most recent indices covering slightly fewer countries; see Table 2a), as does the number of component surveys used to construct the index. The latter 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. Despite its methodological deficiencies, CPI 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. However, it 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 IADB (Kaufman and Wei 1999, Mehrez and Kaufmann 2000, Hellman, Kaufmann, and Shankerman 2000, Adsera, Boix, and Paine 2000). However, it has obvious advantages over TI in 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

An important question is to what extent these subjective indices measure political corruption that is the focus of this paper. The first argument in favor of using these indices as proxies for political corruption is that both focus solely on corruption in the public sector, without any attempt to assess private sector fraud. Of course, ideally, we would need 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,[3] distinguishes between political and administrative corruption. 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.

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 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 than "pure" PR or plurality systems, we create a new dummy variable, MIX, that takes on value 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 how 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* 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. 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 [0,1] interval. It is obtained by interacting PLIST from Persson, Tabellini, and Trebbi (2001) with 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). These

authors tested two different causal mechanisms. First, the "barriers to entry effect" (Myerson 1993; Ferejohn 1986; Persson, Rolland, and Tabellini 2000) implies that the more representatives elected per district (the larger DISMAG) and hence the lower the barriers to entry, the less corruption. Second, the "party list effect" (Holmstrom 1982, Persson and Tabellini 2000, ch.9) implies the larger the proportion of representatives elected to party lists, the more corruption due to weakened individual accountability. Based on these two effects, it is difficult to predict whether PR or PLURALITY elections are more conducive to corruption because these effects work in opposite directions: PR systems have districts of larger magnitudes and at the same time large proportion of the legislators elected on party lists. Empirically, the authors find that the party list effect is stronger than the barriers-to-entry effect and hence PLURALITY systems are better at containing corruption.

6.3 Control Variables

Extensions to our theoretical model imply the need to control for the effect of presidentialism and federalism. Presidential dummy (PRES) is transformed from the DPI 2a categorical variable. It takes 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 or 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. 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 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 frationalization (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. Our basic argument for preferring the Freedom House index to this large set of controls is that it is a reduced form that simply 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.

Table 2 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

7.1 Methodology and Regression Estimates

7.1.1 H1: Establishing the existence of a relationship between electoral rules and corruption

Tables 4a—d report the results of our basic specifications for two dependent variables: the World Bank measure of corruption control (CORRWB; Tables 4a and 4b) and the TI corruption index averaged over 1995—2001 (CRTIA; Tables 4c and 4d). Given the cross-section of countries we are examining, the disturbances are likely not 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 OLS with White-corrected standard errors (Tables 4a and 4c) and weighted least squares (Tables 4b and 4d). The weights in WLS 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.[4] The results change very little across these methodological alternatives, which gives us confidence in their validity. The results strongly support H1.[5] The coefficients on CLPR dummy are negative in all specifications (i.e., CLPR negatively affects country's ability to control corruption) and highly significant in all specifications.

Tables 4a—d about here

[4] 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.

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

Model 1 is a simple regression of the corruption index on the PR dummy controlling for economic development and political rights and liberties. Both controls are highly significant and have expected sign – more developed countries are better at controlling corruption, as are the politically more free countries.[6] This simple model explains 74-76% of the variation in the data.

Model 2 breaks down the PR systems into CLPR and OLPR and controls for bi-cameral systems that use both PR and plurality (MIX dummy). The coefficient on CLPR is negative significant under all specifications, which strongly supports H1. On the other hand, 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 that induce corruption, as hypothesized. The effect of bicameral systems that use different electoral rules for each chamber also shows an interesting result. The MIX dummy "cleans" the coefficients on CLPR and OLPR of the effect of these "mixed" electoral systems. So, given that these systems have some degree of "PR-ness", they should be more corrupt than the non-PR systems, yet less corrupt than the "pure" PR systems.[7] The coefficients on MIX have the right magnitudes and signs and are statistically significant when CRTIA is used as a dependent variable. This model explains slightly more variation in the data (75-78%) than Model 1.

Model 3 adds controls for presidentialism and federalism. CLPR is still negative significant, although its magnitude drops slightly. 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 H1 as it includes the inclusive yet parsimonious set of controls and still explains 78-82% variation in the data.

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 under two specifications, do not drop substantially in statistical significance. An interesting finding is that now OLPR is negative significant under one specification (and

increases in significance substantially in all others), which is still consistent with H1. As expected, FH drops in significance because all included controls capture to some degree the same effect as FH. Although Model 4 explains a great deal of 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 what kind of constitutional structure a country chooses (most British colonies adopted Westminster systems). Similarly, most ethnolinguistically fractionalized countries are bound to 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. Below, we use this model for all predictive and diagnostic purposes.

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). We find PART to be positive[8] significant only when CORRWB is used as a dependent variable, plus we explain a little less variation in the data (73—79%) than by our preferred Model 3. In comparison to our simple CLPR, OLPR and MIX dummies, the PART variable includes many more features of the electoral systems that make them more party-centered; however, note that the correlation between PR and PART is –0.62. Still, this variable seems to capture the same effect as federalism, since FEDERAL drastically drops in significance. 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. Since the theory behind the aggregation method of the PART index is unclear, we prefer our simple, more transparent measure of electoral structure.

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

[8] Recall that 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.

On balance, these results strongly suggest that closed-list PR, federalism and presidentialism increase corruption holding other factors constant. Yet what can be said about the magnitude of these effects? Model 3 (CORRWB; OLS) allows the following numeric experiments.[9] If a country decided to change its electoral system from plurality to CLPR, it would decrease its corruption control index by .28. 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.[10] Similarly, a change from unitary to federal state would increase corruption by 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 – 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 in comparison to other institutional factors like federalism and presidentialism, the effect of electoral rules seems to be the smallest.

7.1.2 H2: Testing the causal story

Table 5 reports the results for OLS with robust standard errors and WLS with weights being the inverse of standard errors for CORRWB.[11] The same methodological approach as in previous subsection applies. The results strongly support H2: 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 mechanism suggested by Persson, Tabellini, and Trebbi (2001; henceforth, PTT) on the identical sample and with identical controls.[12]

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 DISMAG and PLIST. Our results indicate that once the

[10] .51(logY1 – log Y0) = .51log (Y1/Y0)= -.28. Then, Y1/Y0= exp (-.55) = 0.5775; so Y1 =.5775*Y0.
[11] With new institutional variables we lose too many degrees of freedom when using CRTIA, so we only report the results on CORRWB here.
[12] Although we prefer a more parsimonious set of controls, we use the extended list here for the sake of comparison with PTT.

effect of presidentialism and federalism has been taken into account, PLIST loses significance.[13] 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. Finally, we explain slightly more variation in the same sample than PTT's variables (86—89% versus 84—88%).

What is the magnitude of the effect of our explanatory variables?[14] If average district size grows by 1%, the corruption control index falls from, say, 2.000 to 1.9993. 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 from, say, 2.00 to 1.79. This is the same increase in corruption as effected by 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 0.356% fall in GDP per capita.

7.1.3 H3: Examining interaction effects

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.[15]

Tables 6a—b about here

Table 6a presents the results of the models that interact presidentialism with electoral rules and control for federalism. We find mixed support for H3. Model 1 breaks down the constitutional systems into 6 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 as a reference category, we find that CLPRES systems are

[14] These numerical experiments are based on H2 OLS model.
[15] 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.

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 definitely makes CLPR (and probably OLPR) systems more corrupt.

However, 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 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 its two chambers. As expected, the correlation between FEDERAL and FEDMIX is extremely high (0.83), which suggests high collinearity. Therefore, we need to test for the joint significance of the coefficients on these two variables. So, while CLPRES remains negative and highly significant under all specifications, FEDERAL and FEDMIX are also always negative and at least jointly significant (denoted by ^). So, aside from presidential CLPR systems being especially corrupt, mixing of any kind of PR and PLURALITY in federal systems also leads to more corruption.

On balance, these results only confirm that part of H3 that stipulates that CLPR presidential systems are especially bad at controlling corruption. We find some support that OLPR presidential systems are also conducive to corruption. Finally, we cannot say anything about the effect of presidentialism on plurality systems.

7.2 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.

7.2.1 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):

$|DFFITS| \geq 2[(k+1)/(n-k-1)]^{1/2}$. 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.

7.2.2 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.

7.2.2 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.

7.3 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.

8. Conclusions

In this paper, we have investigated how different electoral rules can influence political corruption. We have proposed a theoretical framework in which CLPR systems are most susceptible to corruption relative to OLPR and PLURALITY systems due to their use of closed party lists and geographically large districts. We have also hypothesized different interaction effects between electoral rules and other institutional forms, namely

presidentialism, federalism, and bi-cameralism. Then, we have 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 eliminating influential observations and changing model specifications. While we have confirmed 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 the in introduction to this paper. The other half involves the tradeoff between anti-corruption incentives and "pork barrel" politics. Citizens who can monitor their politicians well may demand not only integrity but also 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 although it raises significant data problems. 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 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	

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)
(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)
(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)
(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)

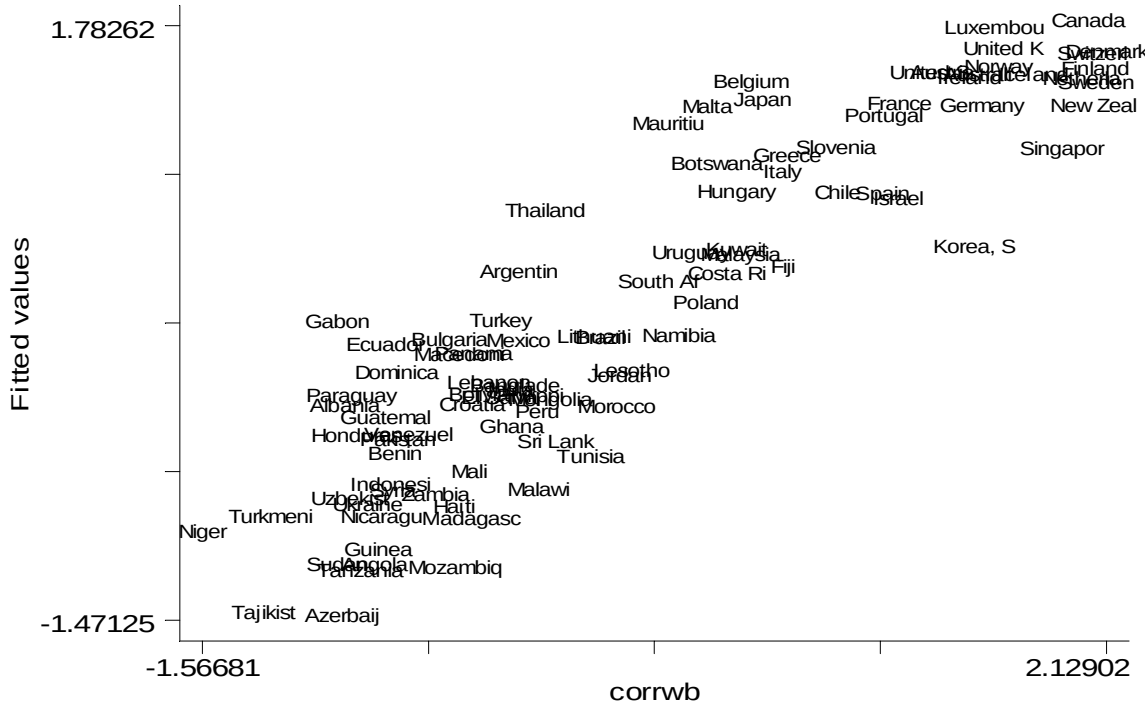

Figure 1b. Actual CORRWB versus predicted corruption according to Model 1 (H2)

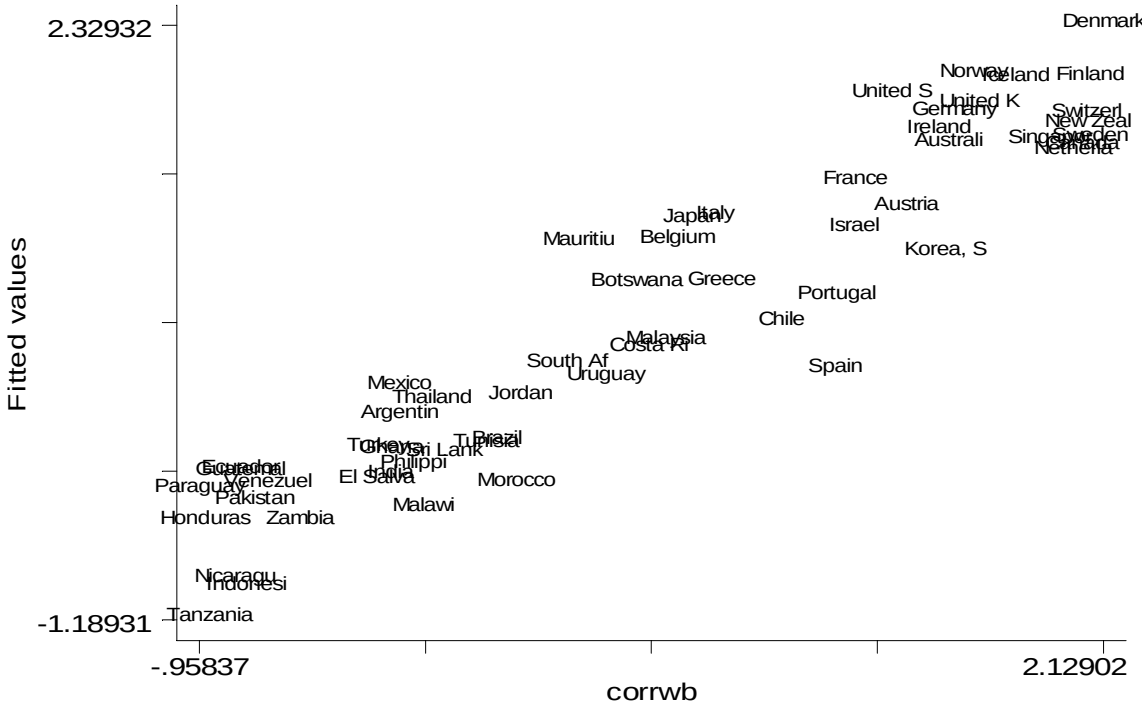

Figure 1c. Actual CORRWB versus predicted corruption according to Model 2 (H3)