

# Electoral Systems, District Magnitude and Corruption

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## Abstract

We analyze the relationship between electoral systems and corruption in a large sample of contemporary democratic nations. Whereas previous studies have shown that closed-list proportional representation is associated with greater (perceived) corruption than open-list PR or majoritarian systems, we demonstrate that this relationship fails to hold once district magnitude is considered. The theory underlying our study draws on work on “the personal vote” that suggests that the incentives to amass resources — and perhaps even to do so illegally — increase with district magnitude in open-list settings but decrease in closed-list contexts. Extending this insight, we show that political corruption gets more (less) severe as district magnitude increases under open-list PR (closed-list PR) systems. In addition, once district magnitude exceeds a certain threshold — our estimates are that this is as low as 15 — corruption is greater in open list than in closed list settings. Only at unusually small district magnitudes (those below 15) is closed-list PR associated with more corruption, as conventionally held. Our results hold for alternate measures of corruption, for different specifications of the country cases to be included, and regardless of whether the political system is presidential or parliamentary.

Using an alternative, objective measure of corruption, we also present corroborating evidence across Italian electoral districts. Within the open-list environment characterizing Italy for the eleven parliamentary elections that spanned the second half of the twentieth century, larger districts are more susceptible to suspected political corruption than smaller ones. This finding is consistent with the underlying model that predicts that larger electoral districts are associated with higher levels of corruption in open-list settings.

Why some political systems are more conducive to political corruption than others is a question of both empirical and normative importance. Corruption constitutes a drag on economic performance (Knack and Keefer 1995; Mauro 1995; Lambsdorff 1999), and also reduces the legitimacy of government in the eyes of the governed (Seligson 2002; Anderson and Tverdova 2003). It thus has major consequences for both economics and politics. When the proceeds of corrupt transactions are used to fund electoral competition, as appears to be the case in various advanced democratic nations, in which political competition is expensive and winning public office highly desirable, corruption is also corrosive of democratic accountability. If elections are the mechanism that ensures accountability, then accountability is patently sabotaged when electoral campaigns are funded in part by monies raised through illegal activities.

Nor are illegal activities by public officials confined to the developing or transition economies, or merely incidental aspects of political life in developed countries. While the poor, often authoritarian countries of the world may suffer most from very frequent corrupt behaviors by public officials, we nonetheless observe a substantial range to perceived corruption even among the very richest democratic nations. For instance, the 1996 index of perceived corruption due to Transparency International (the Corruption Perceptions Index, or CPI)<sup>1</sup> finds that countries with per capita GDP of greater than \$10,000 US take values larger than 9 in countries like Denmark and New Zealand, indicating very little perceived corruption, but fall below 5 in countries like Spain and Italy, suggesting very widespread perceived corruption. Corruption does not necessarily evaporate with economic

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<sup>1</sup> The index, really an aggregation of various indices, is now a standard barometer of perceived corruption across a large number of countries. A good description is in Lancaster and Montinola 1997.

development, and, as the CPI index reveals, a substantial amount of corruption takes place even in some developed nations.

The substantial variation in the extent of corruption in democratic nations suggests that attention to the precise details of the electoral institutions themselves that are found in these countries may well be warranted, if we are to understand why public officials in some of them regularly engage in illegal behaviors whereas those in others apparently do not. In this paper, we study the effects of different electoral systems on the degree of corruption, where, following what is by now standard usage, we define corruption as the illegal (mis)use of public office for private or party gain. We investigate whether open-list proportional representation (PR) or closed-list PR is more conducive to corrupt activities. Most of today's democratic countries (45 of 79, according to data from the World Bank) use proportional electoral systems. Investigating the impact for political malfeasance of variations in how this system is implemented may prove substantively important for a large number of countries.

The literature on the personal vote has argued that politicians' incentives to amass (possibly illegal) resources to out-campaign their opponents during elections increase with district magnitude in open-list settings but that these incentives decrease in closed-list contexts (Carey and Shugart 1995; Shugart, Ellis and Suominen 2003). Building on this insight, we suggest that political corruption becomes more (less) severe as district magnitude increases under open-list PR (closed-list PR) systems. Our analysis is conducted at two levels: cross-nationally, among the 40-odd democratic countries using proportional representation in the latter part of the 1990s, and subnationally, across Italy's 32 electoral

districts over the eleven legislative periods that spanned the greater part of the second half of the twentieth century (1948–1994).

Our findings are remarkably consistent at both the cross-national and subnational levels, despite the fact that the measures of corruption we use at the two levels are necessarily quite different. The empirical evidence from the cross-national data analysis strongly corroborates our theory: political corruption becomes more (less) severe as district magnitude increases under open-list (closed-list) PR. At small district magnitudes, closed-list PR is associated with more corruption, but corruption is more widespread in open-list PR than in closed-list systems once district magnitudes exceed a threshold that we estimate to be as low as 15. Within Italy, which used open-list PR for the period we examine, suspected political corruption rises with district magnitude. In brief, our findings show that political corruption gets more (less) severe as district magnitude increases under open-list PR (closed-list PR) systems.

Our hypotheses run against a growing body of literature, including empirical cross-national studies by Kunicova and Rose-Ackerman (2003), Persson and Tabellini (2003), and Persson, Tabellini and Trebbi (2003), claiming that closed-list PR is *more* susceptible to corruption than alternative types of electoral systems. The underlying argument of this literature is that closed-list PR diminishes individual accountability on the part of elected officials, thereby increasing corruption. We hypothesize and find precisely the opposite in the work presented in the following pages.

The reason that previously studies have generated what we contend are inaccurate findings is because they have failed to control for district magnitude (the number of political representatives elected from each district) or, where district magnitude and corruption are

considered together (as in Persson and Tabellini 2003, ch. 7), because the analysis fails to differentiate open from closed list PR. Once we study corruption under *both* different district magnitudes and different rules governing candidate selection within proportional representation electoral systems, we find that open-list PR is associated with greater corruption than closed-list systems at large district magnitudes.

Our paper proceeds in four sections. We first briefly summarize the theories of the impact of electoral arrangements on corruption that we will examine empirically. We next present a cross-national empirical test and then a subnational (Italian) empirical test. A final section concludes.

## **I. Theories of the Impact of Electoral Systems on Corruption**

We start with empirical implications drawn from the literature on the “personal vote” (Cain, Ferejohn and Fiorina 1987). The theory underlying the idea of the personal vote posits that in electoral systems where electoral competition takes the form of intraparty competition, the desire for public office gives candidates incentives to cultivate personal reputations, or reputations that distinguish them from the party labels with which they affiliate. Open-list PR, which allows voters some mechanism to select individual candidates off party lists, means these candidates need ways to differentiate themselves politically from their partisan compatriots. Hence, they seek to acquire personal reputations (Katz 1986).<sup>2</sup>

In closed-list PR, by contrast, where candidate selection is controlled by the (national) party leadership, candidates of the same party are effectively prevented from competing electorally with each other. Voters are denied the opportunity to cast votes for individuals in

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<sup>2</sup> Note that within open-list PR systems, a candidate’s optimal electoral choice between personalistic and party-centered campaigning depends on the extent to which his party controls the candidate nomination process. See Samuels (1999) for a discussion for the case of Brazil.

these settings. Hence candidates compete for the attention and endorsement of their superiors in the party hierarchy, or for the approbation of those groups in the party who control candidate nomination, rather than for votes. Because voters have no means to identify which individuals off the party list they wish to see elected, individual candidate identity is not relevant to electoral competition.

The type of electoral system is not the only factor affecting the extent to which candidates seek to acquire personal reputations distinguishing them from others running for office under the same party label. Carey and Shugart (1995) contend that where candidates of the same party compete electorally against each other — that is, in open-list environments — the extent of competitiveness tends to increase with the number of candidates, or with what is called district magnitude. The reasoning underlying this view is that “as the number of other copartisans from which a given candidate must distinguish herself grows, the importance of establishing a unique personal reputation, distinct from that of the party, also grows” (Carey and Shugart 1995: 430).

We might think of this as a simple information problem for electors. In an open-list setting, candidates from the same party will have little difficulty gaining name recognition where there are few of them. However, as candidate numbers increase, so too does the need for the financial resources adequate to disseminate information to voters in order to achieve name recognition. By extension, Carey and Shugart (1995) and Shugart, Ellis and Suominen (2003) hypothesize that as district magnitude increases under open-list PR, so too do the associated activities of constituency service and pork barrel politics; in other words, all those activities in which individual officeholders can successfully claim credit for services and outputs delivered to specific clienteles of voters.

Under closed-list PR, by contrast, precisely the reverse relationship should be expected to obtain, according to Shugart and Carey. In closed-list PR, electors do not enjoy opportunities to allocate votes across contenders from the same party. In these circumstances, when district magnitude is large, party reputation overshadows the reputations of individual candidates, since there are too many candidates for voters to uniquely identify them and no incentives for voters to acquire the information to do so. Where district magnitude is small, however, the party has an incentive to select candidates who already have distinct individual political profiles, because doing so will advantage these candidates against those associated with other parties. Hence, Shugart and Carey hypothesize that individual reputation becomes more important as district magnitude falls in closed-list settings.

These hypotheses about the importance of individual reputation and personal vote seeking have clear and testable implications for political and bureaucratic corruption.<sup>3</sup> They lead us to expect that political corruption will rise as the need for acquiring the personal vote rises. Previous studies have found that policy outputs that are geographically targetable — rivers, bridges, and other “pork barrel” policy goods — are relatively more common in majoritarian electoral systems than under PR, where more broadly redistributive transfers obtain instead (Milesi-Ferretti, Perotti and Rostagno 2002; see also Lizzeri and Persico 2001). Our work builds on (and by implication potentially modifies) these studies, by extending research on “pork barrel” politics to corruption, which is also geographically targetable but which is characterized specifically by illegality, and by distinguishing the

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<sup>3</sup> The distinction is drawn from Rose-Ackerman 1978. Political corruption, which is typically aimed at increasing campaign contributions, is undertaken by elected public officials, whereas bureaucratic corruption occurs when appointed public officials (civil servants) interact with the public. The analysis we undertake is not able empirically to distinguish the two very clearly, although the Italian data mainly involves political corruption.

impact of open list from closed list PR. Political corruption is a complex set of activities that often involves multiple actors — the politicians who are the recipients of kickbacks, the businesses who are the payers, and the bureaucrats who facilitate the illegal transactions between public officials and businesses — and multiple goals, including both personal enrichment and campaign financing. Our conceptual focus is on the transactions that are used to raise monies illegally for political campaigns. Empirically, of course, we cannot know with any confidence what corrupt politicians do with the ill-gotten gains they pocket. But our expectation that corruption rises in settings where incentives to amass personal votes increase hinges critically on the assumption that it does so precisely because elected officials use illegal proceeds to fund political competition; this is the necessary link between “the personal vote” and corruption. If candidates for public office were not using some of the proceeds of corrupt transactions to fund their political careers, there would be no reason to expect that the search for the personal vote would also entail greater aggregate levels of corruption.

Our precise reasoning goes as follows. Where the incentives for the personal vote rise, candidates need larger baskets of individual campaign funds. They need money to advertise their individual candidacy. The relevant political activities vary across countries, but may include such things as the purchase of television advertising time, printing and distribution of campaign posters, gift-giving and the distribution of candidate-related trinkets, and other such matters during the campaign itself, as well as myriad costly candidate-centric activities while holding public office. All of these activities, which require money that the party itself is unlikely to provide, may tempt candidates to seek illegal campaign contributions, especially in contexts in which the abilities of individual candidates to raise

campaign funds may be legally circumscribed in various ways. Parties will typically fund electoral competition directed against other parties, not the candidacies of various co-partisans against each other. Individuals must raise their own funds to compete with contenders from the same party. These funds are necessary for building a personal reputation in the eyes of voters.

Our argument is thus that corruption is an illegal variant of the search for the personal vote, which in its licit form typically involves the distribution of pork barrel, geographically targetable collective goods such as public works and infrastructure investments. Like pork barrel policies, corruption is geographically targetable; indeed, in many instances, corruption is even more targetable, because opportunities for corrupt exchanges are embedded in pork barrel politics and can be even directed at single firms (by permitting only pre-selected firms to win public tenders, for instance). Note, however, that the content of the exchange differs between the two: pork barrel politics are aimed at winning votes for individual candidates from constituents in the localities so targeted, whereas corrupt exchanges are aimed at extracting financial resources. For present purposes, this final distinction is not pertinent. Rather, we emphasize that we see corruption as one likely by-product of the need to establish personal political reputations. Unlike Kunicova and Rose-Ackerman (2003), we expect that pork barrel politics and corruption to vary in tandem, as two facets of the search for the personal vote.

The hypotheses that we test in the following pages are thus two:

- 1) *Corruption increases with district magnitude under open-list PR;*
- 2) *Corruption decreases with district magnitude under closed-list PR.*

We use two empirical strategies to test these hypotheses. First, we analyze a widely-used cross-national measure of corruption perceptions based on surveys of businesspeople and others to study the relationship between open/closed list PR and the extent of corruption in countries that use proportional representation. Although activities identified in this dataset include both political and bureaucratic corruption, it is now commonly accepted that the two tend to go together, and that the CPI index constitutes an acceptable proxy for political corruption (Lambsdorff 1999). As a check on our findings using the TI index, we also undertake a parallel analysis using an alternate and arguably superior measure of corruption developed by the World Bank (Kaufmann, Kraay and Zoido-Lobaton 1999; Kaufmann, Kraay and Zoido-Lobaton 2002; and Kaufmann, Kraay and Mastruzzi 2003). Kaufmann, Kraay and Zoido-Lobaton (KKZ) use a methodologically sophisticated unobserved components model to construct a new composite index. As Gerring and Thacker (forthcoming) note, the strength of Kaufmann, Kraay and Zoido-Lobaton's index lies in "its enormous breadth of coverage and the variety of sources employed in compiling the index, rendering it less susceptible to poll- or question specific idiosyncrasies."

Second, we analyze a unique subnational dataset drawn from Golden (2004) on charges of suspected (mainly political) corruption lodged against Italian members of parliament in the first four postwar decades to study whether, in the open-list environment that existed there, allegations of corruption against legislators increase with district magnitude. Our hypotheses lead us to expect that corruption under open-list PR (closed-list PR) will be greater (less) as district magnitude increases, and that suspected political corruption in Italy will therefore also rise with district magnitude. We now turn to the first of our empirical analyses, the cross-national investigation.

## II. A Cross-National Investigation

### II.1 Data

We begin our empirical analysis with a cross-national investigation of data on perceived corruption across 40-odd contemporary democratic nations. We build on the foundations established by Treisman (2000), using the Transparency International Corruption Perceptions Index (CPI) to study corruption cross-nationally. Later, we also report results using an alternate measure developed by the World Bank.

We collect information on the world's democratic countries that use proportional representation electoral systems, and we study how the extent of political corruption differs between open-list PR systems and closed-list PR. We also include a measure of district magnitude, and its interaction with our variable for list type (open or closed) to examine how district magnitude may condition and moderate the effect of electoral systems on corruption. Finally, as we detail shortly, we include controls for the nature of the political system (presidential versus parliamentary) as well as for the other variables (such as level of economic development, religion, certain historical factors) that previous studies have identified as significantly contributing to corruption across nations.

We compile our data by first using Treisman's (2000) dataset from his canonical cross-national study of the determinants of corruption. We then incorporate the data on electoral systems and district magnitude from the Database on Political Institutions (DPI2000), documented in Beck et al. (2001).<sup>4</sup> Since our conceptual focus is on the effect of different types of PR on corruption in a democratic setting, we exclude non-democratic countries from our dataset. To determine whether a country qualifies as a democracy, we

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<sup>4</sup> This dataset, maintained by the World Bank, offers coding for 177 countries on various items, including whether they use plurality electoral rules or proportional representation, and whether they use open or closed lists. The DPI2000 dataset also contains a measure of district magnitude.

rely on the Freedom House index, which classes countries as “free,” “partly free,” or “not free.”<sup>5</sup> We include in our dataset all those countries that Freedom House ranks as “free” or “partly free” and that the DPI2000 accurately codes<sup>6</sup> as using PR<sup>7</sup> for 1996, 1997 and 1998, for a total of 43 countries. A few countries appear in the Freedom House index as “partly free” for only one or two of our three years, rendering their democratic status marginal.<sup>8</sup> For these countries, we turn to the Polity IV dataset to verify that Polity too classes four marginal nations as non-democratic. These countries were excluded from our dataset. One country<sup>9</sup> changed its electoral system from majoritarian to proportional during the three years we consider, and we also dropped it from the analysis. After dropping countries for the reasons just enumerated, we are left with an initial dataset of 42 nations.<sup>10</sup>

We choose to use information from the years 1996, 1997 and 1998 as the basis on which to construct our dataset largely because Treisman’s (2000) dataset is coded for these years. Other studies (most notably for our purposes Gerring and Thacker (forthcoming)), also use data from the latter part of the 1990s. By confining our analysis to the same time period, we render it most comparable to these other investigations; to the extent that our results differ, it cannot be because of a slight alteration in the years considered. Because our results only partially corroborate a main finding reported in Gerring and Thacker

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<sup>5</sup> Countries whose combined averages for political rights and for civil liberties fall between 1.0 and 2.5 are designated “free;” between 3.0 and 5.5. “partly free;” and between 5.5 and 7.0 “not free.”

<sup>6</sup> We identified and corrected some errors in the DPI2000 coding. We enumerate these in Appendix A.

<sup>7</sup> In other words, plurality systems and mixed-member majoritarian systems are excluded from the analysis. Note that the countries included in our dataset also cover mixed-member proportional countries (Bolivia, Germany, New Zealand, and Venezuela), as well as one (Taiwan) in which closed-list PR and SNTV coexist. As we elaborate below, our findings are insensitive to the inclusion or exclusion of these five cases. See Shugart and Watterberg (2001) for a discussion of the differences between mixed-member majoritarian and mixed-member proportional systems.

<sup>8</sup> This is true for Senegal, Singapore, Uganda and Kuwait.

<sup>9</sup> El Salvador.

<sup>10</sup> Note that the usable number of observations is 39 when the CPI index is used as the dependent variable, since the index does not provide scores for Malta, the Dominican Republic and Sri Lanka. When the KKZ index is used as the dependent variable instead, the usable number of observations increases to 41 (but not 42, because KKZ does not have information on Namibia).

(forthcoming), we particularly wanted to use data from the same years as they did, even if it meant our dataset would be slightly outdated. However, we doubt that our results would substantially alter were we to update the data (on either the dependent or independent variables) by two years to 2000, which is the most recent year for which it might be feasible to collect all the relevant data. Appendix A provides a description of the cross-national data used in this study, and descriptive statistics for the 42 democratic nations using PR that we include in our analysis.

## II. 2. Empirical Results

Our procedure in the cross-national analysis is as follows. We begin with the largest, most inclusive dataset we could create for democratic countries using proportional representation. We then proceed in a series of steps, first dropping some questionable cases of mixed-member proportional electoral systems, and then dropping outlier countries with unusually large district magnitudes. At each step, we report parallel regression results, verifying that our basic argument is substantiated regardless of how we cut the data. We include important control variables at each step, and an alternative measure of corruption. Finally, we also perform simulations aimed at generating intuitively meaningful and substantively interesting interpretations of our findings.

Our first step is to examine the statistical impact on the CPI index (averaged over 1996 through 1998 and rescaled so that higher values represent more corruption rather than the reverse) of the electoral system variable (*OPEN*), the district magnitude variable (*DM*) and the interaction term (*OPENxDM*), using OLS regression with robust standard errors to deal with the potential threat of heteroscedasticity among countries. As the results that are reported in Model 1 of Table 1 reveal, in this initial model, the relationship between political

corruption and district magnitude under open-list PR systems is characterized by the following equation:

$$TI_i^{OPEN} = (5.16 - 2.2) + (-0.0199 + 0.04)DM_i^{OPEN} = 3.04 + 0.02DM_i^{OPEN} \quad (1)$$

whereas under closed-list PR systems the relationship between corruption and district magnitude is described by:

$$TI_i^{CLOSED} = 5.16 - 0.0199DM_i^{CLOSED} \quad (2)$$

In other words, we can see that as district magnitude increases under open-list PR, corruption rises. Under closed-list PR arrangements, political corruption becomes less prevalent as district magnitude increases.

[Table 1 about here]

To ascertain whether the effects of district magnitude on corruption under alternative electoral regimes are indeed significant, we use *Clarify*<sup>11</sup> (King, Tomz and Wittenberg 2000; Tomz, Wittenberg and King 2003) to graphically enrich our understanding of how the effect of district magnitude is conditioned by the difference between open-list and closed-list PR. Figure 1 graphs the estimated relationship between the CPI index and district magnitude under the two electoral systems studied here (open-list and closed-list PR), and also depicts the 95 percent confidence intervals. As we can see from the results displayed in the figure, the empirical evidence indicates that the key to understanding which type of PR system is more prone to corruption lies in the extent of district magnitude. Closed-list PR is more corrupt than its open-list counterpart only when district magnitude is relatively small. More importantly, since the confidence intervals overlap at smaller district magnitudes, there is no district magnitude at which we can assert with enough statistical precision to be sufficiently

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<sup>11</sup> *Clarify* is a program that simulates quantities of substantive interest from statistical models. See King, Tomz, and Wittenberg (2000) for a discussion.

confident of our results that closed-list PR is associated with more corruption. Finally, we can see that once district magnitude gets sufficiently large, corruption becomes greater under open-list PR than in closed-list settings.

[Figure 1 about here]

The simple model just presented is obviously underspecified. Previous studies (including Treisman 2000; Lederman, Loayza and Soares 2001; Montinola and Jackman 2002; and Gerring and Thacker forthcoming) identify additional variables that are statistically associated with corruption cross-nationally. We now incorporate into our initial specification these other independent variables. Our first additional variable distinguishes parliamentary from presidential systems, since Gerring and Thacker (forthcoming) report that presidential systems exhibit greater levels of corruption than their parliamentary counterparts. Using their coding of regimes (where presidential systems are coded 1, semi-presidential systems are coded 2, and parliamentary regimes 3), the results reported in Model 2 of Table 2 substantiate Gerring and Thacker's findings. We find a negative and statistically significant relationship between regime type and the CPI corruption index, meaning that presidential democracies are associated with more corruption. More importantly, controlling for regime type leaves our primary variable of interest unaltered. Larger open-list systems are still significantly more likely to report higher levels of corruption than closed-list systems.

Using Treisman's (2000) dataset, we next incorporate another six control variables that he found important in accounting for the cross-national variance of perceptions of corruption: Protestantism, a history of British rule, per capita wealth, a higher volume of trade imports, federalism, and length of exposure to democracy. The results, presented as

Model 3 in Table 1, also substantiate those initially reported for Model 1. As we can see from the data displayed in the table, the effect of district magnitude on corruption is positive ( $-0.0079+0.019 \approx 0.011$ ) under open-list PR, whereas it is negative ( $-0.0079$ ) in a closed-list context. Our results confirm Treisman's findings for the variables that he reported as important. In his study, which used a larger sample of countries than we do, and not only those democracies whose electoral systems utilized proportional representation, he found, as we confirm, that countries with Protestant traditions, higher levels of economic development, unitary political systems, and a long exposure to democracy suffer from less corruption. In our results, the coefficient for the variable measuring British rule has the expected sign but is indistinguishable from 0 by conventional standards. We drop the insignificant variables and then reestimate the model. The results of this more parsimonious estimation are reported in Model 4, where we can see that the substantive results remain unchanged.

Our initial dataset comprises all democracies that use PR and a few countries that use mixed member proportional systems (see footnote 7). We now drop these mixed cases and reestimate the model we just reported. Nonetheless, as the information reported in Model 5 in Table 1 shows, our results are substantially unaffected. The signs on all the variables remain unaltered, and the variables that were statistically significant in Model 4 retain their significance.

### II. 3. Robustness Checks

How robust are our findings? We undertook two different types of sensitivity analyses: reestimating the model using a different measure of corruption, on the one hand, and dropping outliers, on the other. We report the findings of these additional regressions in Table 2.

[Table 2 about here]

Models 6 and 7 report regression results when we use a World Bank indicator of perceptions of corruption (initially reported in Kaufmann, Kraay and Zoido-Lobaton 1999). As was the case in the regression results reported in Table 1, we find here also that the effect of district magnitude on corruption is positive under open-list PR, whereas it is negative in a closed-list context, and this is true both for our initial set of countries, as we see from the results under Model 6, and after we drop the mixed-member proportional systems, as reported in Model 7.

The size of district magnitude varies very considerably among our countries, from a low of 2 to a high of 150 among the 42 countries in our initial dataset, with an average of 25 representatives per district. As we can see in Figure 2, the distribution of district magnitude is highly right skewed, and there are several very notable outliers, such as the Netherlands, Slovakia, Israel and Peru.<sup>12</sup> This leads us to ask whether our results are driven by these outliers. We test whether our basic results continue to hold even if we drop the countries with unusually large electoral districts, and report the results as Models 8 and 9 in Table 2.

The results again corroborate our earlier findings. In Model 8, we report results without the six outliers, using the CPI index as the measure of corruption. Once again, we find that the effect of district magnitude on corruption is positive under open-list PR, whereas it is negative in a closed-list context. Moreover, once we drop these outliers, we can get a much more realistic idea of the threshold at which the effect shifts. Figure 3 shows results using Clarify to graph the difference in the impact of the size of electoral districts on perceived corruption in closed-list compared with open-list environments. In the results

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<sup>12</sup> Some of these, such as Israel and the Netherlands, are countries whose “district” is the entire nation; others have simply established unusually large district boundaries.

depicted in Figure 1, where we included the six outliers, we found that closed-list PR was more corrupt than its open-list counterpart when district magnitudes were smaller than 50. Once we drop the six countries with exceptionally large district magnitudes, however, this becomes true for countries with district magnitudes as low as 15. At small district magnitudes, where fewer than 15 representatives are elected from each district, closed-list proportional representation is associated with more corruption than its open-list counterpart.

### **III. A Subnational (Italian) Investigation**

The cross-national empirical evidence presented so far provides strong corroborative evidence for our argument. Our theory also carries with it observable implications for specific types of electoral institutions: open-list and closed-list. We should observe that corruption falls with district magnitude in closed-list settings and rises with district magnitude in open-list environments. We therefore turn to the only publicly-available subnational dataset of which we are aware (Golden 2004) allowing us to test the hypothesis in an open-list environment.<sup>13</sup> We explore the relationship between district magnitude and political corruption in Italy for the years from 1948 to 1994. Over these eleven legislative periods, Italy used an open-list PR system in which voters could decide to use as many as three (and in very large districts, four) preference votes for individual candidates on the party list of their choice. Individual candidates won office on the basis of the number of preference votes they received, giving each candidate a powerful incentive to attempt to amass preference votes. This system encouraged intraparty competition (Katz 1985).

By estimating corruption across Italian electoral districts for the postwar era, we hold relatively constant a wide variety of factors that vary cross-nationally, including culture,

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<sup>13</sup> Parallel to our study, other studies also use the publicly available judicial records to examine the causes of corruption (Meier and Holbrook 1992; Goel and Nelson 1998). However, these studies focus on corruption in the United States, where district magnitude does not vary.

language, legal tradition and institutions, and other aspects of the national political and party systems. This is especially useful if we have any suspicion that the choice of electoral system and/or district magnitude may itself be endogenous to government performance and policy outputs. Finally, the Italian case is especially useful because our measure of corruption exhibits a lot of variation — variation that on first blush appears mainly temporally determined (because so many more deputies were charged with malfeasance in the XI Legislature than in any previous period).<sup>14</sup> As far as we know, we are the first to note the significant relationship between district magnitude and allegations of corruption in postwar Italy.

### III.1. Data

Using Italy's 32 electoral districts as the unit of analysis,<sup>15</sup> we measure political corruption in a given district as the number of charges lodged by the judiciary against members of the lower house of Parliament (the Chamber of Deputies) in each legislative period for all types of malfeasance except crimes of opinion. The latter includes libel, slander, and other similar charges easily provoked by behaviors that naturally occur during the course of electoral campaigns, but that is not likely therefore to be valid indicators of genuine corruption.<sup>16</sup> The charge we study take the form of official requests transmitted by the Ministry of Justice to the lower house to remove parliamentary immunity from the legislator(-s) named in the request in order to pursue judicial investigations and possible proceedings. These requests are called *richieste di autorizzazione a procedure* (commonly

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<sup>14</sup> District magnitude in Italy averages 20. In the XI Legislature, an average of more than seven deputies per district were charged with malfeasance, whereas the overall average for the entire period is only three and a half.

<sup>15</sup> One of Italy's electoral districts (Valle d'Aosta) is effectively majoritarian rather than using PR. Because of this, and also because of data problems pertaining specifically to that district, we drop it from our analysis.

<sup>16</sup> The remaining charges include corruption but also a wide variety of charges that suggest abuse of office.

abbreviated in Italian as RAP). A study of part of the dataset we use is reported in Golden and Chang (2001), but there, analysis is limited to deputies elected from the Christian Democratic party. That paper's main finding is parallel to the argument advanced here, however: starting in the mid-1970s, suspected corruption within the Christian Democratic party appears driven largely by intraparty competition within the open-list environment then in force. Other studies of RAP include Cazzola (1988), whose data ends in 1987 rather than spanning the full period available through the end of 1993; Chang (2004), whose level of analysis comprises individual legislators; D'Aniello and Sclafani (1991), who studied the RAP lodged against members of Italy's upper house, the Senate; and Ricolfi (1993), who analyzes all requests to remove parliamentary immunity from legislators from all parties during the XI Legislature (1992-94). In the present study, we use data on (non-opinion) charges of criminal malfeasance against all members of all political parties in the first eleven postwar parliaments.<sup>17</sup> The nature of the charges is highly variable, running the gamut from speeding offenses to murder. Systematic data on the nature of charges for all the legislative periods we consider are not currently available, but in the XI Legislature, which has been analyzed in detail by Ricolfi (1991), the most frequent of the 120 charges listed in the 540 RAP transmitted to both the Chamber and the Senate involved violations of the law on campaign financing, abuse of office, and corruption for "un atto contrario ai doveri di ufficio" (an act against one's official obligations) (p. 24). So while the RAP are not a perfect measure of suspected political corruption, they seem a reasonable (and analytically valuable) proxy

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<sup>17</sup> Italy's electoral system changed with the 1994 elections, so that data are not comparable as of the twelfth legislature. In addition, the constitution was changed towards the end of 1993, making it easier to remove parliamentary immunity of legislators, so that the measure of corruption we use is no longer comparable after that date.

In what follows, we examine the relationship between district magnitude and the degree of alleged political corruption. If our theory is correct, then we should find more charges of malfeasance lodged against legislators from larger districts, all else equal. We introduce control variables for district wealth and education, which research on subnational determinants of corruption in other countries finds to be important. In addition, one common and potentially valid objection to the use of judicial records as a proxy for corruption is that they are likely to be influenced by the judicial efficiency (Seligson 2002). Recognizing this potential threat, we use reasonable proxies to control for judicial activism and efficiency.

### III.2 Empirical Analysis.

We first examine the judicial records of all members of Italy's Chamber of Deputies in the first eleven postwar legislatures (those elected between 1948 and 1992), and we aggregate these records to the level of electoral districts. In so doing, we compile a cross-sectional (district) time-series (legislature) dataset, with the dependent variable the number deputies charged with corruption in a given district (*CORRUPT*), and the key independent variable district magnitude (*MAG*).

Figure 4 provides a visual summary of the relationship between these two variables. As we can see from this figure, the upward trend of the *lowess* curve that summarizes the dependence of *CORRUPT* on *MAG* suggests that political corruption becomes more severe as district magnitude becomes larger.

[Figure 4 about here]

To further our analysis, we now examine the relationship between corruption and district magnitude using a more systematic statistical technique. In a recent article, Zorn (2001) recommends the use of generalized estimating equations (GEE) to model non-

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continuous yet temporally dependent data.<sup>19</sup> Since *CORRUPT* is an event-count variable that is also likely to be temporally correlated (i.e. corruption might be sticky in some particular districts across time), we follow Zorn's suggestion and implement GEE to test our theory empirically. We choose a negative binomial distribution to entertain the possibility of over-dispersion. Again, the key explanatory variable is *MAG*, and its coefficient is predicted to be positive.

As a first cut, we model *CORRUPT* as a function of *MAG* and whether the district is in the southern part of Italy (*SOUTH*), since it is commonly believed that corruption is greater in the southern half of Italy (cf. Putnam 1993).<sup>20</sup> The results, reported in Model 10 of Table 3, provide strong corroborative evidence for our theory. The coefficient on *MAG* is positive and highly significant, suggesting that suspected corruption is greater as district magnitude gets larger. The empirical evidence also confirms the conventional wisdom that political corruption tends to be higher in the southern part of Italy.

[Table 3 about here]

To further account for variance across districts, we next follow the lead provided by Alt and Lassen (2003), and include measures of district levels of wealth (*WEALTH*) and education (*EDU*). Alt and Lassen find these variables important in accounting for corruption in a cross-sectional study of US states. More generally, many have suggested that economic development and education reduce corruption (although cross-nationally, the relationship may be parabolic rather than linear, according to Montinola and Jackman 2002; cf.

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<sup>19</sup> Zorn posits that the GEE approach enables scholars to model correlated data in a variety of forms, such as binary, ordinal and event-count outcome variables. See Zorn (2001). For a technical discussion of the GEE procedure, see Zeger and Liang (1986).

<sup>20</sup> South is defined in conventional fashion, encompassing all electoral districts from Rome down.

Huntington 1968).<sup>21</sup> Results of this expanded model are reported in Model 11 of Table 3.<sup>22</sup> As we can see, the coefficient of *MAG* remains positive and significant. For every 10 additional deputies elected, the number of charges almost doubles. Education, too, is strongly associated with the presence of legislators suspected of criminal wrongdoing; where the population is less well educated, and thus perhaps less capable of monitoring its elected officials, these officials are more likely to engage in alleged malfeasance. GDP per capita, finally, exhibits the expected sign (wealthier areas are associated with less suspected corruption) and is marginally significant. In this new specification, the variable *SOUTH* becomes statistically insignificant. A closer examination reveals that, in accordance with the conventional view, that southern electoral districts are significantly poorer than the northern areas. These combined results indicate that there is not something unexplained about the “south” that is associated with more corruption, but instead that suspected corruption is greater in southern Italy because its population has lower levels of education and economic development is less there.

In Model 12 of Table 3, we next rerun the last model but remove the variable *SOUTH*. The results for district magnitude hardly change. Larger districts elect more political representatives who are subsequently charged with criminal activities. In Model 12, wealth as well as education now emerge as strongly associated with suspected legislative malfeasance. Poorer districts, and districts with populations who are less well educated, elect more legislators who engage in alleged wrongdoing.

### III.3 Robustness Checks

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<sup>21</sup> It may also be the case that corruption inhibits economic development, thereby reducing wealth, but for the moment we ignore endogeneity issues.

<sup>22</sup> Note that the data source that yields these two variables does not cover the first two and the last legislature. Consequently, the number of observations drops substantially from 339 to 250.

As discussed above, one might object to the use of **judicial records as a proxy for corruption**, since these are a measure of the energy and activism of judicial enforcement as well as a reflection of the underlying level of corruption. To ensure that our results do not simply reflect a spurious relationship between corruption and judicial efficiency, we include **two reasonable measures of judicial efficiency directly into the model specification**. The first measure is the annual average length of civil trials in the lower courts, and the second is the annual ratio of completed judicial proceedings in civil cases to the total pending, again in the lower courts. These two measures are quickly becoming standard proxies for judicial efficiency in Italian regions (Bianco, Jappelli and Pagano forthcoming; Fabbi 2001; Guiso, Sapienza and Zingales 2002). If our measure of corruption were actually tapping judicial efficiency, we would find that as efficiency improves (indicated by shorter civil proceedings and increasing ratios of completed to pending proceedings every year), allegations lodged against deputies also increased.

We test our expectations in Model 13 and Model 14 respectively.<sup>23</sup> The results detailed in Table 4 reconfirm that larger electoral districts elect more allegedly corrupt politicians, as our main theory predicts. In addition, the coefficients for education, wealth, and judicial efficiency are all signed consistently with our expectations, but only the final variable is significant by conventional statistical standards. In areas where civil trials take longer and where the completion rate is low, more elected national politicians engage in suspected malfeasance. The impact is relatively small, but statistically, we can be quite confident that the relationship we observe is not due to chance.

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<sup>23</sup> Our data on judicial efficiency are not available for the period before 1970. Therefore, we are only able to include these two variables from the fifth legislature on. Consequently, the number of observations drops from 250 to 188.

Our interpretation of this finding is twofold. First, where the courts are less efficient, as indicated by the slow-moving trials for which Italy is notorious, politicians feel less threatened by the judiciary, and hence are more likely to engage in criminal activities. This aspect of our interpretation is straightforward. More subtly, however, and also of greater theoretical importance, our finding helps dispel doubts we might have entertained about the validity of our measure of political corruption, namely, the RAP. Because the RAP are a measure of judicial enforcement of corruption, rather than a direct measure of corruption itself, perhaps in the form of government output (as proposed by Golden and Picci 2004), we cannot know how well it captures the underlying phenomenon of interest. Perhaps more RAP are lodged in electoral districts where public prosecutors are more activist. Our finding that suspected political corruption is greater where trials take longer and the courts are less efficient — and by extension are presumably less activist as well — implies that the RAP are not likely to be products merely of judicial efficiency and activism per se. Rather, the RAP appear to be empirically independent of overall judicial efficiency.

[Table 4 about here]

Finally, another possible objection to our analysis thus far is that larger electoral districts may elect more corrupt politicians simply because they elect more politicians. To handle this, we put the number of deputies charged in each district and each legislative period in relation to the number of legislators elected from the district, thereby effectively controlling for district size. This measure is equivalent to the percent of deputies charged with (non-opinion) malfeasance. At the same time, we also include a control for judicial efficiency.

Using this new measure as the dependent variable and repeating the model specified in Model 13 and Model 14, we reestimate the impact of district magnitude on corruption. Note that we correct the problem of temporal correlation by including the lagged dependent variable among our regressors, and we report panel-corrected standard errors to guard against potential problems of panel heteroskedasticity across districts and contemporaneous correlation of errors (Beck and Katz 1995). The results again provide unambiguous support for the positive effect of district magnitude on political corruption under Italy's open-list PR system.

#### **IV. Conclusions**

This study analyzes the relationship between institutional details of proportional representation electoral systems and corruption. Whereas previous studies have shown that closed-list proportional representation is associated with greater (perceived) corruption than open-list PR or majoritarian systems, we demonstrate that this relationship fails to hold once district magnitude is incorporated into the model. Extending insights from the personal vote literature, we show that political corruption gets more (less) severe as district magnitude increases under open-list PR (closed-list PR) systems. In addition, once district magnitude exceeds a certain threshold — our cross-national empirical estimates put this at 15 — and once we exclude a handful of countries whose extremely large electoral districts cause them to appear as statistical outliers, we demonstrate that corruption is greater in open list than in closed list settings. Using an alternative, objective measure of corruption across postwar Italian electoral districts, we find consistent evidence that suggests that larger electoral districts are associated with higher levels of corruption in an open-list environment.

Our results have empirical interest. One obvious policy implication of our main finding is that countries using open-list rules should keep district magnitudes small in order to discourage the intense intraparty political competition that we believe constitutes an important driving force behind political corruption.

Our results also have theoretical importance. We have shown that open-list proportional representation is conducive to political corruption, at least where electoral districts are somewhat large. This underscores that corruption and the search for the personal vote go hand in hand. Legislators who engage in illegal activities may not be less moral than the rest of us, just a lot more pressured in their search for job security.

Finally, our findings are not intuitively obvious. Take the case of open list PR, for instance, where we have documented that corruption rises with district magnitude. Where there are more candidates, one might imagine that monitoring on the part of co-partisans would discourage corruption. Given the sheer numbers involved, at least some candidates ought to have low moral thresholds for tolerating illegal behavior among their competitors, and ought therefore to be predisposed to denounce them. This should, in equilibrium, make actual corrupt transactions *less* likely to occur in large districts. Instead, we find the reverse, suggesting that the incentives for amassing illegal funds must be quite pronounced indeed if candidates regularly expose themselves to the potential dangers of doing so despite the large number of competitors (and potential denunciations) they face.

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## DATA APPENDICES

### A.1. Variables and Sources for the Cross-National Dataset

Variable	Definition	Source
TI	Aggregated perceived corruption index (1-10, 10 as most corruption)	Transparency International: <a href="http://www.transparency.org">http://www.transparency.org</a>
KKZ	Alternative corruption index (-2.5 – 2.5, 2.5 as most corruption)	Kaufmann, Daniel, Kraay, Aart and Pablo Zoido-Lobaton. 1999.
OPEN	Open-list PR systems (as defined by the DPI 2000)	Beck et al. 2001
DM	The average number of legislators elected to the lower house from each electoral district	Beck et al. 2001
OPENXDM	The interaction between OPEN and DM	
Parliamentalism	The degree to which the executive is accountable to the legislature.	Gerring and Thacker, forthcoming
PROTEST	The percentage of total population that is Protestant	Treisman 2000
DEMOCRAT	Whether or not the country has been democratic uninterruptedly since 1950	Treisman 2000
UKCOLONY	Whether or not the country is a former British colony	Treisman 2000
FEDERAL	Whether or not the country has a federal political system	Treisman 2000
GDPPC	Log of GDP per capita in 1990	Treisman 2000
TRADE	Value of the imports of goods and services as a percentage of GDP	Treisman 2000

## A.2. Coding for Democratic Countries using PR Included in the Cross-National Dataset

Country	CPI	KKZ	District Magnitude	Parliament- alism	Open-list PR	Mixed Member Proportional
Argentina	6.93	0.28	10.70	1	0	0
Austria	2.43	-1.46	20.30	3	0	0
Belgium	4.17	-0.67	7.50	3	0	0
Brazil	6.49	-0.06	19.00	1	1	0
Bulgaria	7.10	0.56	7.70	2	0	0
Chile	3.45	-1.03	2.00	1	1	0
Colombia	7.61	0.49	5.00	1	0	0
Costa Rica	3.97	-0.58	8.10	1	0	0
Czech R	4.88	-0.38	25.00	3	1	0
Denmark	0.24	-2.13	10.50	3	1	0
Dom Rep		0.77	5.00	1	0	0
Ecuador	7.26	0.82	7.40	1	0	0
Estonia	4.30	-0.59	9.20	3	1	0
Finland	0.62	-2.09	14.20	2	1	0
Iceland	0.70	-1.60	7.90	3	0	0
Ireland	1.69	-1.57	4.00	3	1	0
Israel	2.41	-1.28	120.00	3	0	0
Latvia	7.30	0.26	20.00	3	1	0
Luxemburg	1.35	-1.67	16.00	3	1	0
Malta		-0.50	5.00	3	1	0
Namibia	4.70		72.00	1	0	0
Netherlands	1.09	-2.03	150.00	3	0	0
Nicaragua	7.00	0.84	7.60	1	0	0
Norway	1.07	-1.69	10.00	3	0	0
Paraguay	8.50	0.96	4.40	1	0	0
Peru	5.50	0.20	118.00	1	0	0
Poland	4.92	-0.49	16.70	2	0	0
Portugal	3.33	-1.22	10.50	2	0	0
Romania	6.78	0.46	7.80	1	0	0
S Africa	4.72	-0.30	44.40	3	0	0
Slovakia	6.10	-0.03	150.00	3	1	0
Spain	4.56	-1.21	6.90	3	0	0
Sri Lank		0.12	11.50	2	1	0
Sweden	0.69	-2.09	13.90	3	0	0
Switzerland	1.24	-2.07	9.10	2	1	0
Turkey	6.62	0.35	7.00	3	0	0
Uruguay	5.78	-0.43	5.20	1	0	0
Bolivia	7.25	0.44	3.80	2	0	1
Germany	1.87	-1.62	11.20	3	0	1
New Zealand	0.65	-2.08	25.80	3	0	1
Taiwan	4.90	-0.63	11.50	2	1	0

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Venezuela	7.48	0.73	6.90	1	0	1
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**Notes: Parliamentary/presidential: coded 1 for presidential; 2 for semi-presidential; 3 for parliamentary.**

**Mixed-member proportional: coded 1 for mixed, 0 for pure PR.**

**Open/closed list: coded 1 for open-list, 0 for closed-list.**

### B.1. Variables in the Italian Dataset

Variable	Definition	Source
TOTCOR	Total number of deputies charged with non-opinion criminal charges in each electoral district in each legislative period	Golden 2004
MAG	District magnitude (number of representatives to the Chamber of Deputies) for each legislative period	Golden 2004
SOUTH	Whether or not the district is in the south (districts 19-30 are defined as south)	Our coding
EDU	Annual high school gross enrollment out of total population aged 15 to 19 (averaged over the years of each legislative period)	ISTAT
WEALTH	Annual GDP per capita in a given district (averaged over the years of each legislative period)	ISTAT
IPDUR	Annual average length of judicial proceedings, <i>Istruttoria</i> and <i>Primo grado</i>	CRENoS
IPEST	Annual ratio of completed judicial proceedings to number pending, <i>Istruttoria</i> and <i>Primo grado</i>	CRENoS

**Table 1. Estimation Results of the Cross-National Determinants of Corruption**

The Dependent Variable and the Sample Tested	Model 1 CPI index (Full Sample)	Model 2 CPI index (Full Sample)	Model 3 CPI index (Full Sample)	Model 4 CPI index (Full Sample)	Model 5 CPI index (without MMP)
District Magnitude	-0.0199** [0.0088]	-0.0143*** [0.0049]	-0.0079* [0.0038]	-0.0086** [0.0035]	-0.0095** [0.0034]
Open-list PR	-2.1994** [0.9591]	-1.6445* [0.9045]	-1.2478** [0.4663]	-1.0153** [0.4224]	-1.2445*** [0.4180]
Interaction (DM*open-list)	0.0441*** [0.0105]	0.0469*** [0.0080]	0.0190*** [0.0063]	0.0176*** [0.0048]	0.0205*** [0.0048]
Parliamentarism		-1.6043*** [0.3344]	-0.2681 [0.2696]		
Protestantism			-0.0149** [0.0070]	-0.0161*** [0.0041]	-0.0157*** [0.0043]
Long-term Democracy			-1.8336** [0.7979]	-1.8717*** [0.5986]	-1.4338* [0.7236]
Federal System			0.9733 [0.5805]	0.9709** [0.4241]	0.8989* [0.4814]
GDP per capita (logged)			-3.0067* [1.5742]	-3.4010*** [1.0628]	-3.7298*** [1.2916]
British Colony			-0.2528 [0.4566]		
Trade openness			0.0083 [0.0112]		
Constant	5.1602*** [0.5914]	8.2796*** [0.6274]	17.3047*** [5.3409]	18.6058*** [3.6764]	19.7632*** [4.5346]
N	39	39	33	36	31
Adjusted R <sup>2</sup>	.08	.40	.86	.87	.87

Notes:

Model 1 – Model 4 are based on the full sample. Model 5 drops mixed-member systems, including MMP and Taiwan.

Robust standard errors in brackets.

\*significant at 10 percent; \*\* significant at 5 percent; \*\*\* significant at 1 percent.

**Table 2. Robustness Checks for the Cross-National Determinants of Corruption**

The Dependent Variable and the Sample Tested	Model 6 World Bank corruption index (Full Sample)	Model 7 World Bank corruption index (dropping MMP)	Model 8 CPI index (dropping outliers)	Model 9 CPI index (dropping outliers and MMP)
District Magnitude	-0.0031** [0.0012]	-0.0037*** [0.0013]	-0.1518*** [0.0247]	-0.1491*** [0.0374]
Open-list PR	-0.4392** [0.1647]	-0.5229*** [0.1610]	-3.6137*** [0.7039]	-3.6890*** [0.6301]
Interaction (DM*open-list)	0.0064*** [0.0017]	0.0077*** [0.0019]	0.2411*** [0.0538]	0.2390*** [0.0546]
Protestantism	-0.0041* [0.0022]	-0.0041* [0.0023]	-0.0299*** [0.0059]	-0.0260*** [0.0056]
Long-term Democracy	-0.4405 [0.3058]	-0.1908 [0.3743]		
Federal System	0.2787 [0.2178]	0.1873 [0.2294]		
GDP per capita (logged)	-1.9139*** [0.4938]	-2.1581*** [0.5928]	--3.6445*** [0.7772]	-4.0773*** [0.8459]
Constant	7.0910*** [1.6830]	7.9758*** [2.0458]	20.7618*** [2.8167]	22.2828*** [3.1314]
N	37	32	30	25
Adjusted R <sup>2</sup>	.83	.85	.84	.84

Notes:

Robust standard errors in brackets.

\* significant at 10 percent; \*\* significant at 5 percent; \*\*\* significant at 1 percent.

**Table 3: Estimation Results of the Cross-District Determinants of Suspected Political Malfeasance, Italy, Legislatures I-XI**

	Model 10 Total Number of Deputies Charged	Model 11 Total Number of Deputies Charged	Model 12 Total Number of Deputies Charged
District Magnitude	0.0533*** [0.0068]	0.0543*** [0.0072]	0.0560*** [0.0070]
South	0.2751** [0.1288]	0.1248 [0.1675]	
Education		-0.1421*** [0.0243]	-0.1392*** [0.0213]
GDP per capita		-21.4263 [14.2877]	-27.0352** [12.2858]
Constant	-0.0762 [0.1519]	0.2515 [0.2791]	0.3524 [0.2405]
Prob> $\chi^2$	0.0000	0.0000	0.0000
Observations	339	250	250

Notes:

Standard errors in brackets.

\* significant at 10 percent; \*\* significant at 5 percent; \*\*\* significant at 1 percent.

**Table 4: Robustness Checks for Subnational Determinants of Corruption, Postwar Italy**

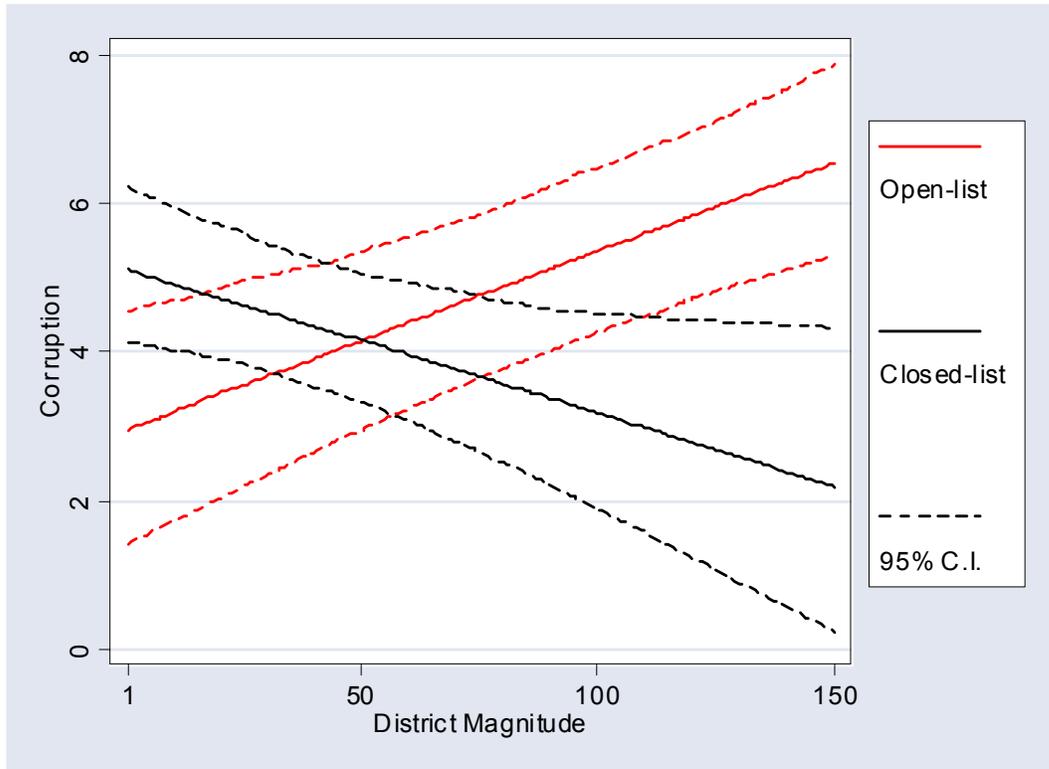
	Model 13 Total Number of Deputies Charged	Model 14 Total Number of Deputies Charged	Model 15 Percent of Deputies Charged	Model 16 Percent of Deputies Charged
The Lagged Dependent Variable			.1541 [.1774]	.1491 [.1799]
District Magnitude	0.0557*** [0.0079]	0.0556*** [0.0077]	0.0015*** [0.0006]	0.0014*** [.0005]
Education	-0.7522 [0.5896]	-0.7782 [0.5871]	-0.1152 [0.0838]	-.1181 [.0864]
GDP per capita	-9.9149 [12.3495]	-9.3126 [12.3699]	-1.2046 [2.3313]	-1.1944 [2.3621]
Ratio of completed judicial proceedings to total	-3.9710*** [0.8924]		-0.5231*** [0.1656]	
Average length of judicial process		0.0060*** [0.0014]		0.0008*** [0.0002]
Constant	3.3282*** [0.7862]	-0.3720 [0.4204]	0.5660*** [0.1427]	0.0805 [0.0690]
Observations	188	188	188	188

Notes:

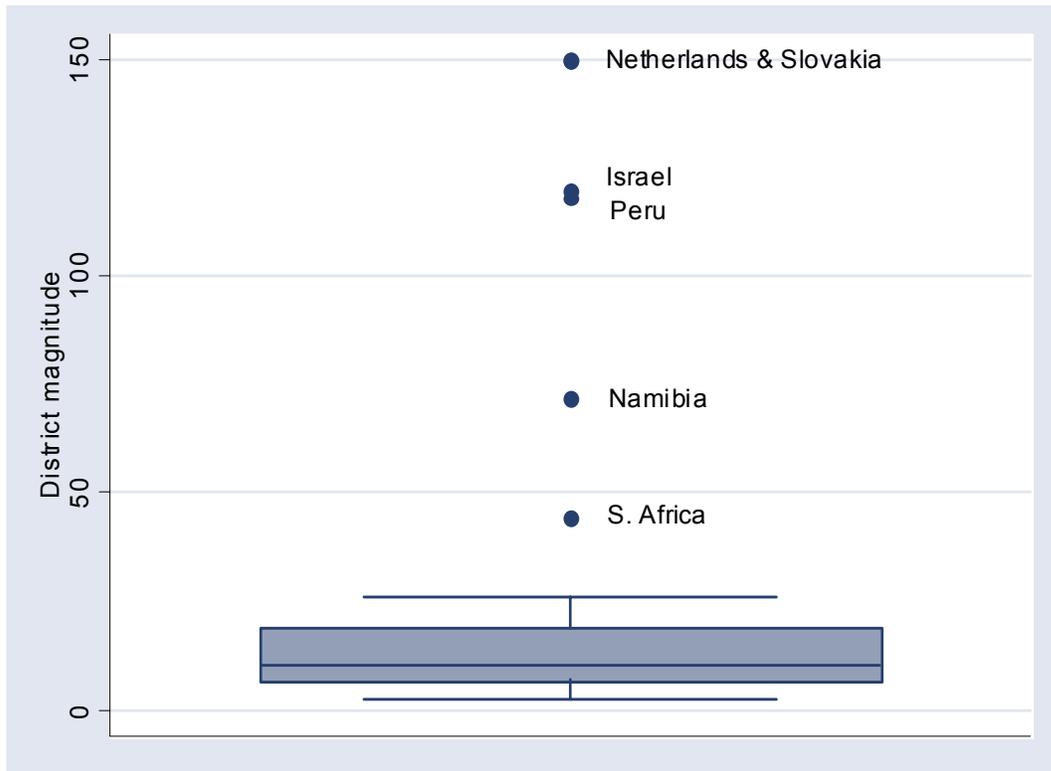
Standard errors in brackets in Model 13 and Model 14. Panel-corrected standard errors in bracket in Model 15 and Model 16.

\* significant at 10 percent; \*\* significant at 5 percent; \*\*\* significant at 1 percent

**Figure 1: Estimated Effects of District Magnitude on Corruption under Alternative Electoral Regimes**



**Figure 2: The Distribution of District Magnitudes in 42 Contemporary Democracies**



**Figure 3: Estimated Effects of District Magnitude on Corruption under Alternative Electoral Regimes, without Outliers**

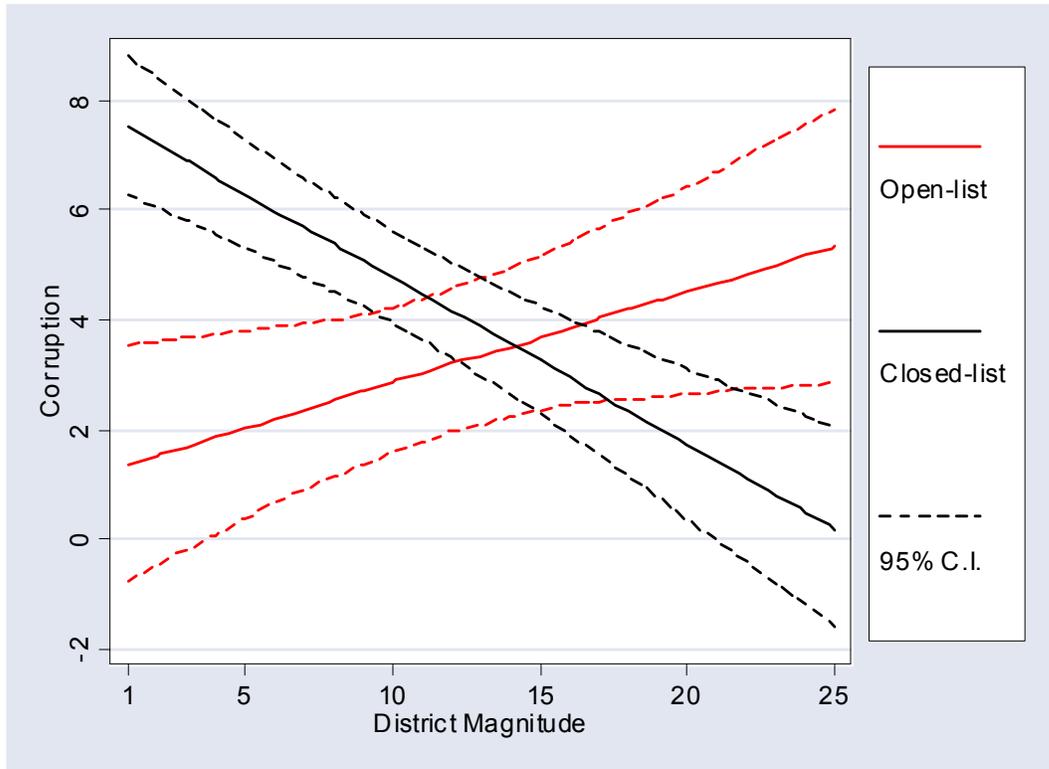


Figure 4: Scatterplot of the Relationship between Suspected Political Malfeasance and District Magnitude in Postwar Italy

