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Electoral Systems, District Magnitude and Corruption

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The relationship between electoral systems and corruption in a large sample of contemporary democratic nations is analysed in this article. Whereas previous studies have shown that closed-list proportional representation is associated with greater (perceived) corruption than open-list PR, it is demonstrated here that this relationship fails to hold once district magnitude is considered. The theory underlying this 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, it is shown 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 – the estimates here are that this is as low as fifteen – corruption is greater under open lists than closed lists. Only at small district magnitudes (below fifteen) is closed-list PR associated with more corruption, as conventionally held. These results hold for alternative measures of corruption, for different sets of countries analysed, for different measures of district magnitude and regardless of whether the political system is presidential or parliamentary, and of the number of parties.

Using an objective measure of corruption in public works contracting, corroborating evidence is also presented from Italian electoral districts. In Italy's open-list environment in the period prior to 1994, larger districts were more susceptible to corruption than smaller ones.

Why some nations experience more political corruption than others is a question of both empirical and normative interest. Corruption constitutes a drag on economic performance,[1] and also reduces the legitimacy of government in the eyes of the governed.[2] It is thus consequential for both economics and politics. When the proceeds of corrupt transactions are directed into electoral contests, as appears to be the case in various advanced democratic nations where political competition is expensive and winning public office highly desirable, corruption is also directly corrosive of democratic accountability. If elections are the primary mechanism that ensures accountability,[3] then accountability is patently

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[1] Stephen Knack and Philip Keefer, 'Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures', *Economics and Politics*, 12 (1995), 207–27; Paolo Mauro, 'Corruption and Growth', *Quarterly Journal of Economics*, 110 (1995), 681–712; Johann Lambsdorff, 'Corruption in Empirical Research – A Review' (unpublished manuscript, University of Goettingen, 1999).

[2] Mitchell Seligson, 'The Impact of Corruption on Regime Legitimacy: A Comparative Study of Four Latin American Countries', *Journal of Politics*, 64 (2002), 408–33; Christopher J. Anderson and Yuliya V. Tverdova, 'Corruption, Political Allegiances, and Attitudes toward Government in Contemporary Democracies', *American Journal of Political Science*, 47 (2003), 91–109.

[3] Joseph A. Schumpeter, *Capitalism, Socialism, and Democracy* (New York: Harper & Brothers, 1942); Bernard Manin, Adam Przeworski and Susan C. Stokes, 'Elections and Representation', in Adam Przeworski,

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sabotaged when electoral campaigns are funded in part by monies raised through illegal activities.

Nor are illegal activities on the part of public officials confined to the developing or transition economies, or merely incidental aspects of political life in economically developed countries. While the poor, often authoritarian countries of the world suffer most from the corrupt behaviour of public officials, we nonetheless observe a substantial frequency of perceived corruption even among some of the very richest democratic nations. The 1996 index of perceived corruption prepared by Transparency International (the Corruption Perceptions Index, or CPI)[4] finds that countries with gross domestic product per capita greater than $10,000 (in 1990 US dollars) 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 development, and, as the CPI reveals, a substantial amount occurs even in some developed nations.

Variation in the extent of corruption in democratic nations merits investigation. The determining factors of corruption are likely to be different in democratic institutional environments from those in non-democratic environments, because access to public office is regulated so differently in these two settings. In democratic contexts, apparently slight variations in the otherwise similar institutions regulating access to public office – such as electoral laws, political parties, campaign finance regulations and executive–legislative relations – may well significantly affect the propensity of public officials to engage in the illegal (mis)use of public office for private or party gain, as corruption is typically defined.[5]

In this study, we focus on whether different electoral systems have systematically different effects on the degree of corruption observed. We investigate whether open-list proportional representation (PR) or closed-list PR is more conducive to corrupt activities, and we show that the effect of the type of list hinges on district magnitude. We also control for the effective number of political parties, for whether the party is presidential or parliamentary, and whether it is federal or unitary. Finally, we include a battery of what are by now standard additional controls used in cross-national studies of corruption.

Our focus on the type of electoral system has both empirical and theoretical justification. Most of the world's democratic countries use proportional electoral systems. Variations in how this electoral system is implemented may prove substantively important for political accountability. One theoretical justification for focusing on how the type of electoral system affects accountability derives from the literature on the personal vote. This has

(F'note continued)

Susan C. Stokes and Bernard Manin, eds, *Democracy, Accountability, and Representation* (New York: Cambridge University Press, 1999).

[4] 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 Thomas D. Lancaster and Gabriella R. Montinola, 'Toward a Methodology for the Comparative Study of Political Corruption', *Crime, Law and Social Change*, 27 (1997), 185–206. But see also the important observations in Janine Aron, 'Growth and Institutions: A Review of the Evidence', *World Bank Research Observer*, 15 (2000), 99–135.

[5] Available cross-national measures of corruption do not allow us to distinguish political corruption (that is, illegal activities on the part of elected public officials) from other types of corruption, such as corruption by appointed officials (or bureaucrats) and the increasingly public phenomenon of corporate corruption. Nor can we distinguish empirically between corruption directed at personal gain and that directed at political and partisan (that is, electoral) ends. Our theoretical interest in this article is specifically in political corruption directed at electoral ends. Although our cross-national measure of corruption cannot isolate this from other aspects of corruption, the Italian data analysed in the second part of this article are more precisely targeted. Our cross-national results suggest that much of what is measured as corruption cross-nationally is likely to be directed at electoral ends.

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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 decrease in closed-list contexts.[6] 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 world's forty-odd democratic countries using proportional representation in the latter part of the 1990s, and subnationally, across Italy's thirty-two electoral districts in the 1990s.

Our findings are consistent at both the cross-national and sub-national levels, despite the fact that the measures of corruption we use at the two levels are necessarily quite different. Evidence from the cross-national data analysis corroborates our theory: 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 prior to 1994, 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 argument runs against a growing body of literature, including empirical cross-national studies by Kunicova and Rose-Ackerman, Persson and Tabellini, and Persson, Tabellini and Trebbi, claiming that closed-list PR is *more* susceptible to corruption than alternative types of electoral systems.[7] The theory underlying these studies is that closed-list PR diminishes individual accountability on the part of elected officials, thereby increasing corruption. We hypothesize and find the opposite for larger electoral districts. Our understanding of how list type affects political incentives mirrors that of Lederman, Loayza and Soares, who suggest that closed-list PR reduces corruption because it encourages politicians to develop concerns with the reputation of the party as a whole.[8]

The reason that previous studies have generated what we contend are empirically inaccurate findings is because they have failed to control for district magnitude (as in Lederman, Loayza and Soares, who as a result identify no systematic relationship between list type and corruption) or, where district magnitude and corruption are considered together as in Persson and Tabellini, because the analysis fails to differentiate open-list from closed-list PR.[9] 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.

[6] John Carey and Matthew Shugart, 'Incentives to Cultivate a Personal Vote: A Rank Ordering of Electoral Formulas', *Electoral Studies,* 14 (1995), 417–39; Matthew Soberg Shugart, Melody Ellis Valdini and Kati Suominen, 'Looking for Locals: Voter Information Demands and Personal Vote-Earning Attributes of Legislators under Proportional Representation', *American Journal of Political Science*, 49 (2005), 437–49.

[7] Jana Kunicová and Susan Rose-Ackerman, 'Electoral Rules and Constitutional Structures as Constraints on Corruption', *British Journal of Political Science*, 35 (2005), 573–606; Torsten Persson and Guido Tabellini, *The Economic Effects of Constitutions: What Do the Data Say?* (Cambridge, Mass.: MIT Press, 2003); Torsten Persson, Guido Tabellini and Francesco Trebbi, 'Electoral Rules and Corruption', *Journal of the European Economic Association*, 1 (2003), 958–89.

[8] Daniel Lederman, Norman Loayza and Rodrigo Soares, 'Accountability and Corruption: Political Institutions Matter', *Economics & Politics*, 17 (2005), 1–35.

[9] Persson and Tabellini, *The Economic Effects of Constitutions*, chap. 7.

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

THEORIES OF THE IMPACT OF ELECTORAL SYSTEMS ON CORRUPTION

We start with empirical implications drawn from the literature on the 'personal vote'.[10] 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.[11]

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 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 which control candidate nomination, rather than for votes. Because voters have no means to select specific individuals off the party list whom 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 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'.[12]

[10] Bruce Cain, John Ferejohn and Morris Fiorina, *The Personal Vote: Constituency Service and Electoral Independence* (Cambridge, Mass.: Harvard University Press, 1987).

[11] Richard S. Katz, 'Intraparty Preference Voting', in Bernard Grofman and Arend Lijphart, eds, *Electoral Laws and Their Political Consequences* (New York: Agathon Press, 1986), pp. 85–103. 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 a discussion of the case of Brazil in David J. Samuels, 'Incentives to Cultivate a Party Vote in Candidate-Centric Electoral Systems: Evidence From Brazil', *Comparative Political Studies*, 32 (1999), 487–518. For obvious reasons, we are not able to incorporate party-level variables into our cross-national analysis, but the argument appears borne out by what is known of Italian corruption, which was apparently much more extensive in the parties with lower levels of central control. For instance, see the evidence on the Christian Democrats compared with the Italian Communist Party in Luca Ricolfi, *L'ultimo Parlamento. Sulla fine della prima Repubblica* (Rome: La Nuova Italia Scientifica, 1993). For a counterexample, see a discussion of the Spanish Socialist Party (PSOE), which apparently combined centralized control, including over the nomination process, and extensive involvement in corruption, in José María Maravall, 'Accountability and Manipulation', in Adam Przeworski, Susan C. Stokes and Bernard Manin, eds, *Democracy, Accountability, and Representation* (New York: Cambridge University Press, 1999), pp. 154–96.

[12] Carey and Shugart, 'Incentives to Cultivate a Personal Vote', p. 430.

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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 and Shugart *et al*. hypothesize that as district magnitude increases under open-list PR, so too do the associated activities of constituency service and pork-barrel politics;[13] 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 identify them uniquely 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 the extent to which elected officials engage in corruption. They lead us to expect that political corruption will rise as the need for acquiring the personal vote rises.[14] The need for acquiring the personal vote should in turn increase under open-list PR as district magnitude increases.

Political corruption is a complex set of activities that often involves multiple actors – the politicians who are the recipients of kickbacks, the businesses which 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 confidence what corrupt politicians do with the ill-gotten gains that they pocket. But our expectation that corruption rises in settings where incentives to amass personal votes increase hinges on the assumption that it does so precisely because elected officials use illegal proceeds to fund electoral 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 overall levels of corruption.

Our reasoning goes as follows. In settings where incentives for the personal vote rise, candidates for public office need larger baskets of individual campaign funds. They need money to advertise their individual candidacy. The relevant political activities vary across countries, but may entail the purchase of television advertising time, printing and distribution of campaign posters, gift-giving and the distribution of candidate-related

[13] Carey and Shugart, 'Incentives to Cultivate a Personal Vote'; Shugart, Ellis and Suominen, 'Looking for Locals'.

[14] However, Kunicová and Rose-Ackerman contend that corruption rises in open-list PR precisely because legislators have difficulty in multi-member settings claiming credit for the delivery of services to their districts.

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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 geographically targetable local public goods, such as public works and infrastructure investments, as well as patronage, in the form of government jobs. 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.[15] Our work builds on – and by implication potentially amends – 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 impact of open-list from closed-list PR. Like pork-barrel policies, corruption is geographically targetable; indeed, in many instances, corruption is more precisely targetable, because opportunities for corrupt exchanges are embedded in pork-barrel politics and can be directed even 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 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, we expect pork-barrel politics and corruption to vary in tandem, as two facets of the search for the personal vote.[16]

In sum, the hypotheses that we test in the following pages are two:

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

We use two empirical strategies to test these hypotheses. First, we analyse a widely-used crossnational measure of corruption perceptions based on surveys of business people 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 constitutes an acceptable proxy for political corruption.[17] As a check on our findings using that index, we also undertake a

[15] Gian Maria Milesi-Ferretti, Roberto Perotti and Massimo Rostagno, 'Electoral Systems and Public Spending', *Quarterly Journal of Economics*, 117 (2002), 609–57; Alessandro Lizzeri and Nicola Persico, 'The Provision of Public Goods under Alternative Electoral Incentives', *American Economic Review*, 9 (2001), 225–39; Persson and Tabellini, *The Economic Effects of Constitutions*; Thomas Stratmann and Martin Baur, 'Plurality Rule, Proportional Representation, and the German *Bundestag*: How Incentives to Pork-Barrel Differ Across Electoral Systems', *American Journal of Political Science*, 46 (2002), 506–14.

[16] Kunicová and Rose-Ackerman, 'Electoral Rules and Constitutional Structures as Constraints on Corruption'.

[17] Lambsdorff, 'Corruption in Empirical Research'.

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parallel analysis using an alternative but largely similar measure of corruption developed by the World Bank.[18] Kaufmann, Kraay and Zoido-Lobatón (KKZ) use a methodologically sophisticated unobserved components model to construct an alternate composite index (although the underlying data are the same).

Secondly, we analyse a sub-national measure of corruption drawn from Golden and Picci, which consists of the difference between the cumulative amounts of monies paid by government to construct public infrastructure and the actually existing amounts of infrastructure.[19] Where more money is used to build the same amount of infrastructure across localities in the same country, we assume these 'missing' funds are siphoned off in fraud, mismanagement, deliberate inefficiency, waste and corruption. The measure, which we have re-created for the present article at the level of Italy's thirty-two electoral districts, allows us to study whether, in the open-list context that existed in Italy until 1994, corruption in public works increases 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.

A CROSS-NATIONAL INVESTIGATION

Data

We begin our empirical analysis with a cross-national investigation of data on perceived corruption across forty-odd contemporary democratic nations. We build on the foundations established by Treisman, using Transparency International's Corruption Perceptions Index to study corruption cross-nationally.[20] Later, we also report results using an alternative 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 their closed-list counterparts. We also include a measure of district magnitude in our analysis, 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 other important political variables, such as the nature of the political system (presidential versus parliamentary) and the effective number of parties, as well as for the other variables (such

[18] Daniel Kaufmann, Aart Kraay and Pablo Zoido-Lobatón, 'Goverance Matters' (Washington, D.C.: International Bank for Reconstruction and Development, Policy Research Working Paper No. 2196, 1999); Daniel Kaufmann, Aart Kraay and Pablo Zoido-Lobatón, 'Governance Matters II – Updated Indicators for 2000/01' (Washington, D.C.: International Bank for Research and Development, Policy Research Working Paper No. 2772 2002); Daniel Kaufmann, Aart Kraay and Massimo Mastruzzi, 'Governance Matters III: Governance Indicators for 1996–2002' (Washington, D.C.: International Bank for Reconstruction and Development, 2003).

[19] Miriam A. Golden and Lucio Picci, 'Proposal for a New Measure of Corruption, Illustrated with Italian Data', *Economics & Politics*, 17 (2005), 37–75.

[20] Daniel Treisman, 'The Causes of Corruption: A Cross-National Study', *Journal of Public Economics*, 76 (2000), 399–457.

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as level of economic development, religion, certain historical factors) that previous studies have identified as significantly contributing to corruption across nations.[21]

We compile our data by first using Treisman's dataset from his canonical cross-national study of the determinants of corruption. We then incorporate data on electoral systems and district magnitude from the Database on Political Institutions (DPI2000), documented in Beck *et al*.[22] 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 rely on the Freedom House index, which classes countries as 'free', 'partly free', or 'not free'.[23] We include in our dataset all those countries that Freedom House ranks as 'free' or 'partly free' and that the DPI2000 accurately codes as using PR for 1996, 1997 and 1998, for an initial total of forty-seven countries.[24] 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.[25] For these countries, we turn to the Polity IV dataset to verify that Polity too classes these four marginal nations as non-democratic. These countries were therefore excluded from our dataset. One country changed its electoral system from majoritarian to proportional during the three years we consider, and we also drop it from the analysis.[26] After dropping countries for the reasons just identified, we are left with a dataset of forty-two nations, all of which are democratic and all of which use proportional representation.[27]

We also incorporate into our dataset Gerring and Thacker's coding for parliamentarism and presidentialism, which is available for all forty-two cases, and Golder's coding of the effective number of parties.[28] Golder codes forty-one of our forty-two countries, so we

[21] Ideally, we would include information on campaign finance regulations as well, since these are important regulators of political competitiveness. We reserve studying the impact of campaign finance regulations on corruption for the future, however, given the difficulties in working out underlying theoretical issues.

[22] Thorsten Beck, George Clarke, Alberto Groff, Philip Keefer and Patrick Walsh, 'New Tools in Comparative Political Economy: The Database of Political Institutions', *World Bank Economic Review*, 15 (2001), 165–76. This dataset, maintained by the World Bank, codes 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.

[23] 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'.

[24] 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. For a discussion of the differences between mixed-member majoritarian and mixed-member proportional systems, see Matthew Shugart and Martin Wattenberg, 'Mixed-member Electoral Systems: A Definition and Typology', in Matthew Shugart and Martin Wattenberg, eds, *Mixed-member Electoral Systems: The Best of Both Worlds?* (New York: Oxford University Press, 2001). For details on our coding of mixed systems, see Appendix A2.

[25] This is true for Senegal, Singapore, Uganda and Kuwait.

[26] The country is El Salvador.

[27] Note that the usable number of observations is thirty-nine when the CPI index is used as the dependent variable, since the index does not provide scores for Malta, the Dominican Republic or Sri Lanka. When the KKZ index is used as the dependent variable instead, the usable number of observations increases to forty-one (but not forty-two, because KKZ does not have information on Namibia).

[28] John Gerring and Strom C. Thacker, 'Political Institutions and Corruption: The Role of Unitarism and Parliamentarism', *British Journal of Political Science*, 34 (2004), 295–330; Matt Golder, 'Democratic Electoral Systems Around the World, 1946–2000', *Electoral Studies*, 23 (2004), 103–21.

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preserve almost all our countries when we add his measure of competitiveness of the electoral environment.[29]

We choose to use information from the years 1996, 1997 and 1998 as the basis on which to construct our dataset in the first instance because Treisman's dataset is coded for these years.[30] Other studies (most notably for our purposes Gerring and Thacker), also use data from the latter part of the 1990s.[31] 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, we particularly want to use data from the same years they do, even if doing so dates our dataset. 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 of the relevant data. Appendix Table A1 provides a description of the cross-national data used in this study, and Appendix Table A2 enumerates the vital information for the forty-two democratic nations examined in our analysis.

Empirical Results

We begin our analysis using the largest, most inclusive dataset we could create for democratic countries using proportional representation, the one just described. Our statistical work proceeds in a series of steps, first dropping 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 analysis of how district magnitude affects corruption under closed-list and open-list systems begins with an examination of the unconditional impacts of the district magnitude variable (*DM*) and the electoral system variable (*OPEN*) on the CPI (averaged over 1996 through 1998 and rescaled so that higher values represent more corruption rather than the reverse). We use ordinary linear regression with robust standard errors to deal with the potential threat of heteroscedasticity among countries. As the results presented in Model 1 of Table 1 reveal, none of the variables is statistically significant. However, since this initial specification fails to capture our main prediction that district magnitude increases (reduces) corruption under open-list (closed-list) PR systems, it would be a mistake to infer from it that electoral systems and district magnitude were not associated with corruption. Once we include the interaction terms for *OPEN* and *DM* (*OPEN* × *DM*), we find unambiguous support for our expectation. The results reported in Model 2 of Table 1 show that the relationship between political corruption and district magnitude under open-list PR systems is characterized by the following equation:

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

[29] Golder does not code Paraguay. We also experiment with two measures of district magnitude available in Golder's dataset: average district magnitude in the lowest electoral tier and median district magnitude in the lowest electoral tier. These are each highly correlated with the DPI2000 measure of district magnitude (correlation = 0.91 for each) and do not change our substantive findings.

[30] Treisman, 'The Causes of Corruption'.

[31] Gerring and Thacker, 'Political Institutions and Corruption'.

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TABLE 1 *Estimation Results of the Cross-National Determinants of Corruption*

	Models					
Dependent variable	1	2	3	4	5	6†
District magnitude	− 0.0067	− 0.0199**	− 0.0143***	− 0.0146***	− 0.0087**	− 0.0110***
	[0.0108]	[0.0088]	[0.0049]	[0.0046]	[0.0032]	[0.0024]
Open-list indicator	− 1.1011	− 2.1994**	− 1.6445*	− 1.9261**	− 1.5331***	− 1.4750***
	[0.8896]	[0.9591]	[0.9045]	[0.8615]	[0.4476]	[0.4135]
Interaction (DM × open-list)		0.0441***	0.0469***	0.0476***	0.0207***	0.0212***
		[0.0105]	[0.0080]	[0.0077]	[0.0061]	[0.0050]
Parliamentarism			− 1.6043***	− 1.5604***	− 0.2702	
			[0.3344]	[0.3204]	[0.2273]	
Effective number of parties				0.2785*	0.1935**	0.1888**
				[0.1599]	[0.0711]	[0.0847]
Protestant tradition					− 0.0105*	− 0.0162***
					[0.0060]	[0.0032]
Long-term democracy					− 2.1485***	− 1.8562**
					[0.6650]	[0.5425]
Federal system					0.8599	
					[0.5418]	
Logged GDP per capita					− 2.7552*	− 2.8518***
					[1.4921]	[0.8828]
British colony					− 0.0261	
					[0.4388]	
Trade openness					0.0080	
					[0.0089]	
Constant	4.8103***	5.1602***	8.2796***	6.8513***	15.4923***	15.8935***
	[0.5902]	[0.5914]	[0.6274]	[1.0018]	[4.8828]	[2.8362]
N	39	39	39	38	32	30
R^2	0.051	0.15	0.46	0.47	0.92	0.90

Notes: Model 1–5 are based on the full sample. Model 6 drops mixed-member systems, including MMP and Taiwan. Robust standard errors in brackets. *Significant at 10 per cent; **Significant at 5 per cent; ***Significant at 1 per cent.

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, as district magnitude increases under open-list PR, corruption rises. Under closed-list PR arrangements, political corruption becomes less prevalent as district magnitude increases.

To ascertain whether the effects of district magnitude on corruption under alternative electoral regimes are indeed significant, we use CLARIFY to enrich our understanding graphically of how the effect of district magnitude is conditioned by the difference between

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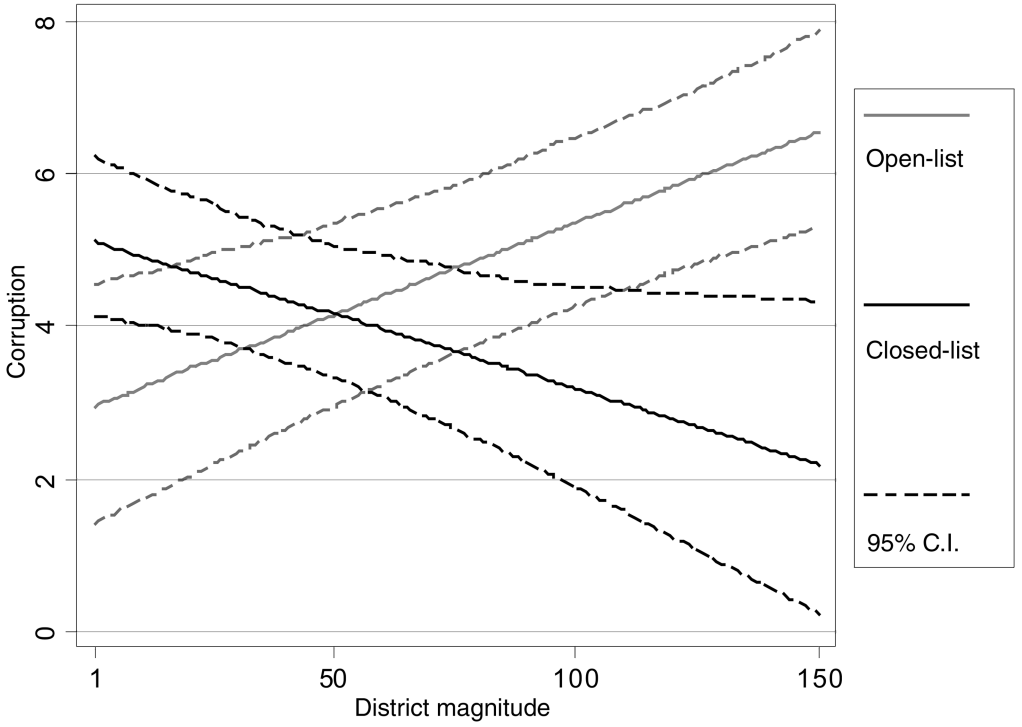


Fig. 1. Estimated effects of district magnitude on corruption under alternative electoral regimes

open-list and closed-list PR.[32] Figure 1 graphs the estimated relationship between the CPI and district magnitude under the two electoral systems, and also depicts the 95 per cent 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 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.[33]

The simple model just presented is obviously underspecified. Drawing on existing studies of the specifically political determinants of corruption, we incorporate other

[32] CLARIFY is a program that simulates quantities of substantive interest from statistical models. See Gary King, Michael Tomz and Jason Wittenberg, 'Making the Most of Statistical Analyses: Improving Interpretation and Presentation', *American Journal of Political Science*, 44 (2000), 341–55; Michael Tomz, Jason Wittenberg and Gary King, 'CLARIFY: Software for Interpreting and Presenting Statistical Results. Version 2.1' (Stanford University, University of Wisconsin, and Harvard University), http://gking.harvard.edu/.

[33] We also ran identical regressions using each of Golder's measures of district magnitude in place of the measure from the DPI2000, and results were unaffected. For reasons of space, we do not report these results here, which are available from the authors on request.

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important institutional variables into our initial specification.[34] We first take into account the effect of constitutional form, distinguishing parliamentary from presidential systems. Gerring and Thacker and Kunicova report that presidential systems exhibit greater levels of corruption than do their parliamentary counterparts.[35] Using Gerring and Thacker's coding of regimes, the results reported in Model 3 of Table 1 initially substantiate their findings. We find a negative and statistically significant relationship between regime type and the CPI, meaning that presidential democracies are associated with greater perceived corruption. More importantly for our purposes, however, 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.

We next incorporate a measure of the effective number of parties, as a proxy for transparency.[36] Our intuition is that in the multiparty environments characteristic of proportional representation, as the number of parties increases, it becomes that much more difficult for the press and the public to monitor the behaviour and activities of politicians and public officials. This increases the scope for corruption. Model 4 in Table 1 adds Golder's measures of the effective number of parties.[37] Our initial results remain robust to the inclusion of this variable. As expected, it emerges as significantly associated with greater values of perceived corruption.

Finally, using Treisman's dataset, we incorporate an additional 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 the length of exposure to democracy.[38] The results, presented as Model 5 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 ($-0.0087 + 0.02 \approx 0.011$) under open-list PR, whereas it is negative (-0.0087) in a closed-list context. Our results confirm Treisman's findings for the variables that he reports as important. In his study, which uses a larger sample of countries

[34] Lederman, Loayza and Soares, 'Accountability and Corruption'; Gabriella R. Montinola and Robert W. Jackman, 'Sources of Corruption: A Cross-National Study', *British Journal of Political Science*, 32 (2002), 147–70; Gerring and Thacker, 'Political Institutions and Corruption'. We attempted to include a measure of judicial independence, which we hypothesize should be negatively related to levels of corruption for intuitively obvious reasons. However, because coding provided by La Porta *et al*. (Rafael La Porta, Florencio López-de-Silanes, Cristian Pop-Eleches and Andrei Shleifer, 'Judicial Checks and Balances', *Journal of Political Economy*, 112 (2004), 445–70) is available for only twenty-six of our countries, including this variable leads to low degrees of freedom for the open-list PR countries. In any event, given the fact that democratic nations do not vary much in judicial independence, we suspect that including judicial independence would be unlikely to yield very meaningful results for our sample of countries even if more data were available.

[35] Gerring and Thacker, 'Political Institutions and Corruption: The Role of Unitarism and Parliamentarism'; Jana Kunicová, 'Political Corruption: Another Peril of Presidentialism?' (California Institute of Technology, unpublished paper, 2005).

[36] A more standard measure of transparency is independence of the press. However, there is inadequate variation on freedom of the press among the democratic nations in our dataset. (Documentation on freedom of the press is available from Freedom House.) Alternative measures, such as newspaper readership or number of newspapers in circulation, seem to us largely spurious. The first is a development measure, and does not capture the extent to which citizens have access to or obtain information about the political regime and political officials. The second is a measure of industry concentration that likewise speaks only peripherally to freedom of the press, especially in an age in which most citizens get a great deal of their political information from television rather than print media.

[37] Golder, 'Democratic Electoral Systems Around the World, 1946–2000'.

[38] Treisman, 'The Causes of Corruption'.

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than we do, not only those democracies whose electoral systems utilize proportional representation, he finds, as we confirm, that countries with Protestant traditions, higher levels of economic development, unitary political systems and a long exposure to democracy suffer less from corruption. In our results, the coefficients for the variables measuring British rule and federalism have the expected signs but are indistinguishable from 0 by conventional standards.

Our initial dataset comprises all democracies that use PR and a few countries that use mixed-member proportional systems (see footnote 24). We now drop these mixed cases and re-estimate the model based on the variables that were found to be significant in Model 5. Nonetheless, as the information reported in Model 6 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 5 retain their significance.

Robustness Checks

How robust are our findings? We undertook two different types of sensitivity analyses. First, we re-estimated the model using a different measure of corruption, and,

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

Dependent variable	Model 7, World Bank corruption index (full sample)	Model 8, World Bank corruption index (dropping MMP)	Model 9, CPI index (dropping outliers)	Model 10, CPI index (dropping outliers and MMP)
District magnitude	− 0.0043*** [0.0009]	− 0.0046*** [0.0009]	− 0.1068*** [0.0289]	− 0.1078* [0.0527]
Open-list indicator	− 0.5177*** [0.1694]	− 0.5861*** [0.1531]	− 2.9974*** [0.8761]	− 3.1501*** [0.8649]
Interaction (DM × open-list)	0.0070*** [0.0018]	0.0082*** [0.0019]	0.1705** [0.0646]	0.1763** [0.0730]
Effective number of parties	0.0788* [0.0423]	0.0753* [0.0391]	0.1679* [0.0906]	0.1792* [0.0894]
Protestant tradition	− 0.0046*** [0.0015]	− 0.0042** [0.0017]	− 0.0206*** [0.0039]	− 0.0196*** [0.0041]
Long-term democracy	− 0.5434** [0.2626]	− 0.2734 [0.3096]	− 1.9611*** [0.5573]	− 1.5725** [0.6414]
Logged GDP per capita	− 1.6750*** [0.4168]	− 2.0536*** [0.4782]	− 1.9968** [0.8208]	− 2.6609** [0.9514]
Constant	5.9454*** [1.3752]	7.3184*** [1.5850]	13.7532*** [2.5537]	16.0709*** [3.0658]
N	36	31	29	24
R^2	0.87	0.89	0.92	0.91

Notes: Robust standard errors in brackets. *Significant at 10 per cent; **Significant at 5 per cent; ***Significant at 1 per cent.

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secondly, we dropped outliers. We report the findings of these additional regressions in Table 2.

Models 7 and 8 report regression results when we use a World Bank indicator of perceptions of corruption.[39] As was the case in the regression results reported in Table 1, we find that using this measure also confirms that the effect of district magnitude on corruption is positive under open-list PR, whereas it is negative in a closed-list context. This is true both for our initial set of countries, as we see from the results under Model 7, and after we drop the mixed-member proportional systems, as reported in Model 8.

The average size of electoral districts varies considerably among our countries, from a low of two to a high of 150 among the forty-two countries in our initial dataset. The boxplot depicted in Figure 2 shows a majority of countries with less than fifteen representatives and half a dozen outliers, such as the Netherlands and Slovakia, which have up to 150 representatives.[40] This leads us to ask whether our results are driven by outliers, whose district magnitudes each average forty representatives or more. 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 9 and 10 in Table 2.

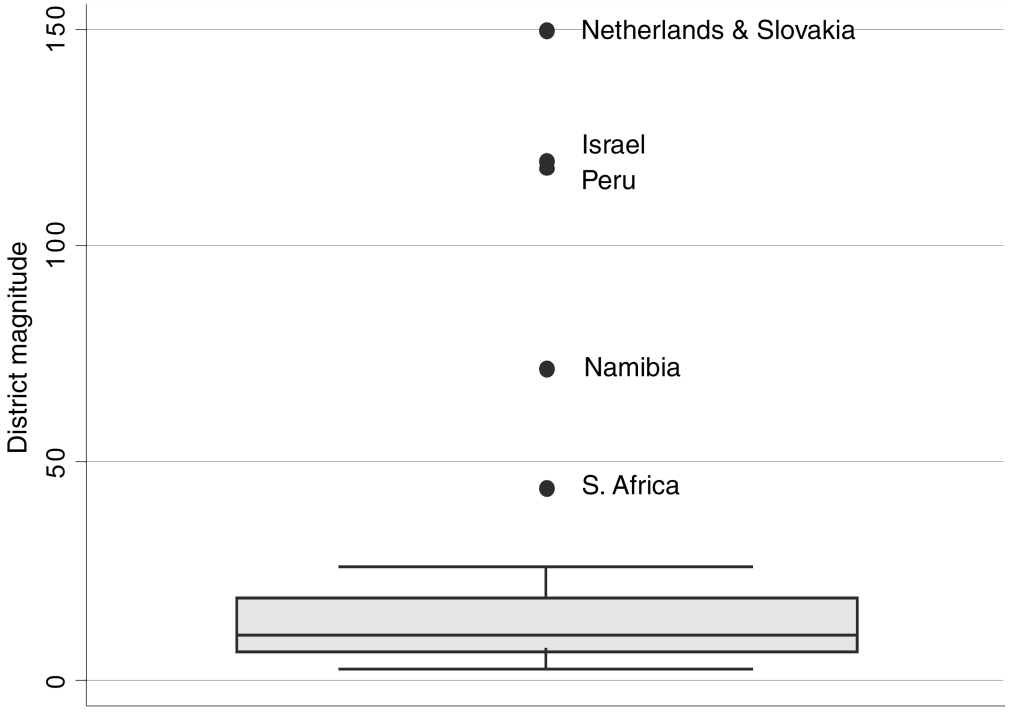


Fig. 2. Boxplot of district magnitudes in forty-two contemporary democracies

The results again corroborate our earlier findings. In Model 9, we report results without six outliers, using the CPI as the measure of corruption, and in Model 10, we report results

[39] Initially reported in Kaufmann, Kraay and Zoido-Lobatón, 'Governance Matters'.

[40] 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.

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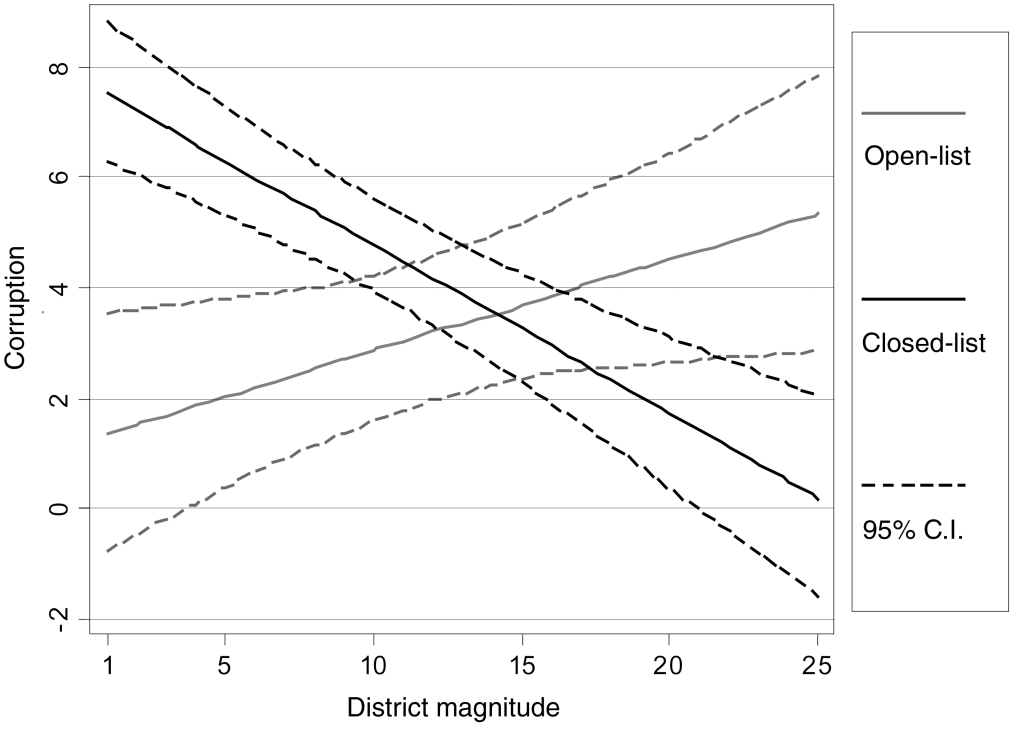


Fig. 3. Estimated effects of district magnitude on corruption under alternative electoral regimes, without outliers

without either outliers or mixed-member proportional systems. 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. In addition, once we drop outliers, we can get a 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 depicted in Figure 1, where we include the six outliers, we found that closed-list PR was more corrupt than its open-list counterpart when district magnitudes were smaller than fifty. Once we drop the six countries with exceptionally large district magnitudes, however, this becomes true for countries with district magnitudes as low as fifteen. At small district magnitudes, where fewer than fifteen representatives are elected from each district, closed-list proportional representation is associated with more corruption than its open-list counterpart.

A SUBNATIONAL (ITALIAN) INVESTIGATION

The cross-national 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 one of the few publicly available sub-national datasets of which we are aware allowing us to test the hypothesis in an open-list environment. We

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explore the relationship between district magnitude and political corruption in Italy in the period prior to 1994. Until that year, 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.[41] 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. In addition, political resources and positions within many parties were distributed on the basis of the number of preference votes won. This system encouraged intraparty competition.[42] With an average district magnitude of twenty, but ranging in the number of representatives elected from one to fifty-four, we expect that corruption rises in Italy's open-list setting as district magnitude increases.

By estimating corruption across Italian electoral districts, we hold relatively constant an array of factors that usually vary cross-nationally, including culture, language, legal tradition and institutions, and other aspects of the national political and party systems. This is useful if we suspect that the choice of electoral system and/or district magnitude may itself be endogenous to government performance and policy outputs. The Italian case is also useful because our measure of corruption exhibits a lot of variation across electoral districts. We use an index of corruption in public works contracting, which is normalized so that 100 represents the Italian average. The index varies from a low of 0.24 (meaning a district whose infrastructure goods are only 24 per cent of the national average for the same cumulative amounts of money) to a high of 1.9 (meaning a district whose infrastructure goods are nearly twice the national average for the same cumulative amounts of money).

Data

Using Italy's thirty-two electoral districts as the unit of analysis, we measure political corruption in a given district as the difference between the cumulative amounts of government monies historically allocated to public capital up to 1997 and the actually existing amounts of public infrastructure (kilometres of highways, numbers of hospital beds, number of telephone lines, etc.) as of approximately 1997.[43] The procedures involved in aggregating the various data into an index are detailed in Golden and Picci.[44] The intuition underlying the index is that where more government money is needed to produce the same quantity of public infrastructure, political authorities are siphoning off more monies in the form of bribes and kickbacks connected to the contracting process. In order to explore whether this type of corruption varies systematically with district magnitude, we rebuild the Golden–Picci index at the level of electoral districts by aggregating both parts (spending and physical goods) from provincial data.[45]

The Golden–Picci index is only available for 1997, because the measures of physical goods used to create it are available only for that year. Italy switched from a pure open-list

[41] Preference votes were restricted to one in the 1992 parliamentary elections.

[42] Richard S. Katz, 'Preference Voting in Italy: Votes of Opinion, Belonging, or Exchange', *Comparative Political Studies*, 18 (1985), 229–49.

[43] One of Italy's electoral districts (Valle d'Aosta) is effectively majoritarian rather than PR, because it only elects a single legislator. Because of this, and also because of data limitations pertaining specifically to that district, we drop it from our analysis.

[44] Golden and Picci, 'Proposal for a New Measure of Corruption, Illustrated with Italian Data'.

[45] We are grateful to Lucio Picci for assistance in reconstructing the index from provincial data.

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PR system to a mixed system with the 1994 legislative elections. We study the impact of district magnitude prior to 1994 – under open-list PR, in other words – on corruption in public works contracting, where the latter measure is taken from 1997. Our justification for this minor temporal misalignment is that the measure of corruption in public works contracting that we use moves very slowly year to year. It reflects the historically accumulated amounts of corruption, because the relationship between government monies allocated on public capital and the amounts of public infrastructure that exist do not change much from one year to the next. Bridges do not get built in a day, and physical infrastructure accumulates slowly. Cumulative spending on public capital is an obviously slow-moving measure, since every year's addition is only a small part of total spending over many decades. Both components of our measure of corruption are thus unlikely to have experienced much modification between 1994 – the year we measure district magnitude – and 1997 – the year we measure corruption. If our theory is correct, we should find more corruption in public works contracting in larger districts, all else equal.

Empirical Analysis

We compile a cross-sectional (district-level) dataset. The dependent variable is the index of public works corruption, constructed as a standardized and normalized index of physical goods divided by the cumulative amounts of monies spent on public infrastructure minus depreciation (*PUBWORKS*) as of about 1997, and the key independent variable is district magnitude (*DMAG*) in the pre-1994 electoral system.

To provide a visual summary of the relationship between these two variables, Figure 4 plots the value of *PUBWORKS* against the value of *DMAG* in Italy's thirty-one PR districts. As we can see from the figure, corruption in public works contracting is generally more severe as district magnitude becomes larger, although there are three notable outliers (districts 21 and 26 in the South, and district 32, Trieste, located in the far North-East). The correlation coefficient between the two variables is -0.24. (Because higher values on the Golden–Picci index indicate less public works corruption, the sign is as expected.) Even without any controls and including outliers, district magnitude is a marginally significant factor associated with the index of public works corruption.

We now examine the relationship between corruption and district magnitude in a more systematic manner. We first model *PUBWORKS* as a function of *DMAG* 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.[46] The results, reported in Model 11 of Table 3, do not reject our theory. The coefficient on *DMAG* is negative, as expected, but statistically insignificant. Location, by contrast, is a highly significant predictor of corruption in public works construction, which tends to be higher in the southern part of Italy.

Model 11 is obviously underspecified, serving only as an initial benchmark. To provide a fuller understanding of the causes of corruption, we add two control variables. We follow the lead provided by Alt and Lassen's state-level analysis, and include a measure of district

[46] Robert Putnam, *Making Democracy Work: Civic Traditions in Modern Italy* (Princeton, N.J.: Princeton University Press, 1993). South is defined in conventional fashion, encompassing all electoral districts from Rome southwards.

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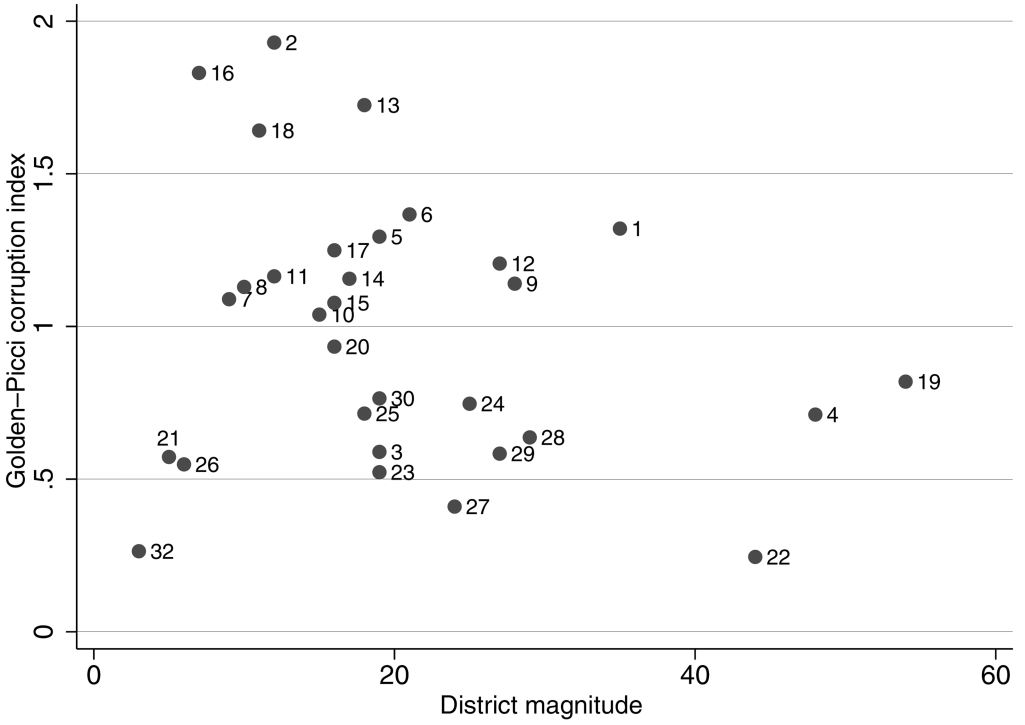


Fig. 4. Scatterplot of the relationship between public works corruption and district magnitude in Italy, circa 1990s

levels of economic wealth (*WEALTH*).[47] Alt and Lassen find economic development is important in accounting for corruption in a cross-sectional study of American states. Likewise, many have suggested that economic development reduces corruption, and gross domestic product is the single most important correlate of corruption at the cross-national level.[48] Secondly, we include a measure of judicial efficiency. It is intuitive to expect that politicians are less likely systematically to extort firms into paying kickbacks in exchange for public works contracts in environments where the judiciary is hard-working, efficient and itself incorruptible. The measure of judicial efficiency that we use is the average annual ratio of completed judicial proceedings in civil cases to the total pending in the lower courts (*IPEST*) in the period of the Eleventh Legislature (1992–94). This measure is one of the standard proxies for judicial efficiency in Italian regions.[49] We have reaggregated it to

[47] James Alt and David Lassen, 'The Political Economy of Institutions and Corruption in American States', *Journal of Theoretical Politics*, 15 (2003), 341–65.

[48] Treisman, 'The Causes of Corruption'. It may also be the case that corruption inhibits economic development, thereby reducing wealth, but for the moment we ignore endogeneity issues.

[49] Daniela Fabbi, 'Legal Institutions, Corporate Governance and Aggregate Activity: Theory and Evidence' (Center for Studies in Economics and Finance Working Paper No. 72, University of Salerno, 2001); Magda Bianco, Tullio Jappelli and Marco Pagano, 'Courts and Banks: Effects of Judicial Enforcement on Credit Markets', *Journal of Money, Credit, and Banking*, 37 (2005), 223–44; Luigi Guiso, Paola Sapienza and Luigi Zingales, 'Does Local Financial Development Matter?' (NBER Working Paper No. 8923, 2002).

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TABLE 3 *Estimation Results of the Cross-District Determinants of Corruption in Public Works Construction, Italy, 1990s*

	Model 11, benchmark model	Model 12, controls	Model 13, augmented controls
District magnitude	− 0.0033 [0.0061]	− 0.0099* [0.0051]	− 0.0071 [0.0055]
South	− 0.5628*** [0.0983]		− 0.294015 [0.267434]
GDP per capita		54.6193*** [9.1654]	30.5345 [23.7616]
Ratio of completed judicial proceedings		− 3.2774 [2.3138]	− 2.7192 [2.4413]
Constant	1.2654*** [0.1729]	2.2284 [1.5090]	2.453246 [1.566417]
N	31	31	31
R^2	0.43	0.45	0.47

Notes: Robust standard errors in brackets. *Significant at 10 per cent; **Significant at 5 per cent; ***Significant at 1 per cent.

correspond to then-existing electoral districts. We expect there will be less corruption in public works contracting in areas where the judicial branch is more efficient and where wealth is higher.

Results of this expanded model are reported in Model 12 of Table 3. As we can see, the coefficients of *DMAG* remain negative but are now statistically significant. Both of the additional control variables enter with the expected signs. Wealth is higher where public investments are more productive and as the ratio of completed judicial proceedings to the total increases (*IPEST*), so too do public investments produce more units of public capital.[50] This specification reconfirms that corruption is worse in larger open-list electoral districts.

Finally, Model 13 of Table 3 reports results with all possible control variables included. In this new specification, perhaps because of problems of collinearity, no regressor exhibits a coefficient that meets standard criteria for statistical significance. District magnitude continues to exhibit the expected sign, however, suggesting once again that larger districts are associated with more corruption.

[50] We also estimated an identical model but using an alternative measure of judicial efficiency, the annual average length of civil trials in the lower courts during the period of the Eleventh Legislature (1992–94). In this model, district magnitude again emerged as significantly and positively related to corruption; as district magnitude increased, so did corruption. Both per capita wealth and this alternative measure of judicial efficiency exhibited statistically significant coefficients. However, the sign on the latter variable was in the wrong direction. We have no explanation for why this is the case. However, we note as well that the overall fit of the model using our preferred measure of judicial efficiency (*IPEST*) was better.

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CONCLUSIONS

This study analyses 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 – we demonstrate that corruption is greater in open-list than in closed-list settings. Using an alternative, objective proxy for corruption across Italian electoral districts in the 1990s, we find consistent evidence that suggests that larger electoral districts are associated with more corruption in the construction of public infrastructure.

Our results have empirical relevance. 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. Erecting barriers to entry so as to discourage the formation of large numbers of political parties, which appears to hinder the ability of the public to monitor elected officials, thereby decreasing accountability, is another policy implication of our findings.

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 the fact 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 behaviour 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 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.

Our study opens the way for additional research. Although theoretically consistent, our study cries out for a formal analysis of the conditions under which elected officials engage in criminal wrongdoing in order to enhance their prospects for re-election. Specifically, it is important to sort out the relative effects of institutional incentives behind corruption from the monitoring difficulties allowing it to occur. Is it merely that the incentives for corruption rise with larger numbers of competitors, both within one's party and outside it, because it is more expensive to compete with twenty other candidates than with two? Or could it be that more contestants reduce the ability of the press and the judiciary to monitor campaigning by candidates, thereby permitting them greater opportunities to engage in illegal activities? Finally, and relatedly, is illegal behaviour among public officials merely anomic, isolated wrongdoing, or does collusion among co-partisans play

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a systematic role in inducing corruption? These questions merit theoretical investigation informed by the empirical regularities we have observed thus far.

Empirically, our study suggests the need for the collection of data on and the development of measures of judicial independence, campaign financing laws and government regulation of the economy, none of which we succeeded in incorporating into our analysis. Finally, an obvious empirical extension of our concern with the personal vote is to incorporate single-member electoral districts into the analysis. Our expectation is that single-member districts with open primaries should resemble large districts with open lists in the extent of corruption generated, whereas closed primaries and single-member districts should resemble large districts under closed lists. But this awaits future analysis.

APPENDIX

TABLE A1 *Variables and Sources for the Cross-National Dataset*

Variable	Definition	Source
DEMOCRAT	Whether or not the country has been democratic uninterruptedly since 1950	Treisman, 'The Causes of Corruption'.
DM	The average number of legislators elected to the lower house from each electoral district	Beck *et al*., 'New Tools'.
ENEP	The effective number of political parties	Golder, 'Democratic Electoral Systems Around the World'.
FEDERAL	Whether or not the country has a federal political system	Treisman, 'The Causes of Corruption'.
GDPPC	Log of GDP per capita in 1990	Treisman 'The Causes of Corruption'.
KKZ	Alternative corruption index (− 2.5 to +2.5, 2.5 as most corruption)	Kaufmann, Kraay and Zoido-Lobatón, 'Governance Matters'.
OPEN	Open-list PR systems (as defined by the DPI 2000)	Beck *et al*., 'New Tools'.
OPEN × *DM*	The interaction between OPEN and DM	
Parliamentalism	The degree to which the executive is accountable to the legislature	Gerring and Thacker, 'Political Institutions and Corruption'.
PROTEST	The percentage of total population that is protestant	Treisman, 'The Causes of Corruption'.
TRADE	Value of the imports of goods and services as a percentage of GDP	Treisman, 'The Causes of Corruption'.
TI	Aggregated perceived corruption index (1 to 10, 10 as most corruption)	Transparency International: http://www.transparency.org
UKCOLONY	Whether or not the country is a former British colony	Treisman 'The Causes of Corruption'.

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TABLE A2 *Coding for Democratic Countries using PR Included in the Cross-National Dataset*

Country	CPI	KKZ	District magnitude	Effective number of parties	Parlia-mentalism	Open-list	MMP
Argentina	6.92	0.27	10.7	3.46	1	0	0
Austria	2.43	− 1.45	20.3	3.70	3	0	0
Belgium	4.17	− 0.67	7.5	9.82	3	0	0
Bolivia	7.25	0.43	3.8	5.92	2	0	1
Brazil	6.49	− 0.05	19.0	8.14	1	1	0
Bulgaria	7.10	0.55	7.7	3.02	2	0	0
Chile	3.45	− 1.02	2.0	6.95	1	1*	0
Colombia	7.61	0.49	5.0	3.50	1	0	0
Costa Rica	3.97	− 0.57	8.1	3.35	1	0	0
Czech Rep.	4.87	− 0.38	25.0	5.02	3	1	0
Denmark	0.24	− 2.12	10.5	4.74	3	1	0
Dominican Rep.		0.77	5.0	2.73	1	0	0
Ecuador	7.25	0.81	7.4	6.30	1	0	0
Estonia	4.30	− 0.59	9.2	6.40	3	1	0
Finland	0.62	− 2.08	14.2	5.85	2	1	0
Germany	1.86	− 1.62	11.2	3.79	3	0	1
Iceland	0.70	− 1.60	7.9	3.92	3	0	0
Ireland	1.69	− 1.56	4.0	3.95	3	1	0
Israel	2.40	− 1.27	120.0	7.79	3	0	0
Latvia	7.30	0.26	20.0	8.27	3	1	0
Luxemburg	1.34	− 1.67	16.0	4.62	3	1	0
Malta		− 0.49	5.0	2.05	3	1	0
Namibia	4.70		72.0	1.67	1	0	0
Netherlands	1.08	− 2.02	150.0	5.13	3	0	0
New Zealand	0.64	− 2.07	25.8	4.12	3	0	1
Nicaragua	7.00	0.83	7.6	2.92	1	0	0
Norway	1.07	− 1.68	10.0	5.07	3	0	0
Paraguay	8.50	0.95	4.4		1	0	0
Peru	5.50	0.20	118.0	5.02	1	0	0
Poland	4.91	− 0.49	16.7	4.59	2	0	0
Portugal	3.33	− 1.21	10.5	3.14	2	0	0
Romania	6.78	0.45	7.8	6.06	1	0	0
S. Africa	4.72	− 0.29	44.4	2.16	3	0	0
Slovakia	6.10	− 0.03	150.0	5.26	3	1	0
Spain	4.56	− 1.21	6.9	3.27	3	0	0
Sri Lanka		0.12	11.5	2.31	2	1	0
Sweden	0.69	− 2.08	13.9	4.54	3	0	0
Switzerland	1.24	− 2.07	9.1	6.34	2	1	0
Taiwan	4.90	− 0.62	11.5	3.14	2	1*	0
Turkey	6.61	0.34	7.0	6.45	3	0	0
Uruguay	5.78	− 0.43	5.2	3.12	1	0	0
Venezuela	7.47	0.72	6.9	7.01	1	0	1

Notes: Parliamentary/presidential: coded 1 for presidential; 2 for semi-presidential; 3 for parliamentary.
MMP: coded 1 for mixed-member proportional systems; 0 for pure PR.
Source: Shugart and Wattenberg 'Mixed Member Electoral Systems'.
Open/closed list: coded 1 for open-list, 0 for closed-list.
*Corrected by the authors from Beck *et al.*, 'New Tools'.
Sources: See Appendix A1.

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TABLE A3 *Variables in the Italian Dataset*

Variable	Definition	Source
PUBWORKS	Index of corruption in public works construction as of approximately 1997 (physical capital/cumulative public investments)	Authors' recoding, based on Golden and Picci, 'Proposal'.*
DMAG	District magnitude (number of representatives to the Chamber of Deputies) in each electoral district in Legislature XI	Golden, 'Datasets'.†
SOUTH	Whether or not the district is in the south (districts 19–30 are defined as south)	Authors' coding
WEALTH	Average annual GDP per capita in a given district during Legislature XI in each electoral district	ISTAT‡
IPEST	Average annual ratio of completed judicial proceedings to number pending during Legislature XI, *Istruttoria* and *Primo grado*, in each electoral district	CRENoS‡

*Golden–Picci index reaggregated from provincial to district level.
†See Miriam A. Golden, 'Datasets on Charges of Malfeasance, Preference Votes, and Characteristics of Legislators, Chamber of Deputies, Republic of Italy, Legislatures I–XI (1948–92)', available at www.golden.polisci.ucla.edu/italy (posted 2004). In fact, legislature XI sat from 1992 to 1994.
‡ISTAT and CRENoS data reaggregated from regional to district level.

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