Why Are Some Public Agencies
less Corrupt than Others?
Lessons for Institutional Reform from Survey Data

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WHY ARE SOME PUBLIC AGENCIES LESS CORRUPT THAN OTHERS?

LESSONS FOR INSTITUTIONAL REFORM FROM SURVEY DATA[*]

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Abstract

This paper studies microeconomic data on corruption at the public agency level in eight developing countries, trying to understand which features of the agency influence corruption, and how to curb corruption inside each agency. The sources of the data are surveys of the employees working inside each public agency, as well as customers of the agency (households or firms). We find that corruption is influenced by two kinds of variables. On the demand side, corruption is more prevalent among agencies that provide services to firms (rather than households), and that provide an exclusive service for which there is no alternative. On the supply side, the internal organization of the agency is a major determinant of corruption. Three features of the organization are systematically associated with less corruption: having decisions regularly audited by external or internal auditors; maintaining open and transparent procedures; and basing personnel decisions on criteria of merit and professional competence. Moreover, the procedure for appointing the head of the agency also matters. Agencies whose head is popularly elected are systematically more corrupt and adopt worse internal organizations, while independent agencies whose head is appointed by a political body tend to have better organizational design.

I. INTRODUCTION

Cross-country measures of corruption have become increasingly available in recent years and have helped single out countries that face governance challenges. Empirical studies have shown that key determinants of corruption are colonial heritage, legal traditions, religion, geography, and electoral rules.[1] These results are of little help in identifying corruption mechanisms or the tools necessary to address them, however.[2] As a consequence, researchers have begun to conduct country-specific investigations to find practical policy solutions to the problem of corruption. This paper presents new evidence that specific agency-level institutions such as the procedure for appointing its director, or more detailed internal organization features such as auditing mechanisms, publicly announced budget and personnel decisions, and merit-based personnel management are associated with lower corruption in public agencies.

The evidence we discuss is based on largely unexplored World Bank Institute (WBI) surveys of public officials in eight Latin American and African countries. These surveys offer three distinct advantages for the study of corruption. First, public officials are not only asked to indicate their perceived level of corruption — as it is common practice in cross-country corruption surveys[3] — but also whether specific *corruption activities* are present in the public agency where they work. For example, public officials are asked about the frequency with which bribes are being paid to influence the public procurement process or to alter legal decisions. A second unique advantage of these surveys is that they shed light on *different types of corruption*, such as corruption in public procurement, or personnel management. The third advantage of the WBI surveys is that some of the questions assess objectively the presence of *specific features of the internal organization* that can explain the level of corruption in each public agency.

We find that corruption is influenced by two kinds of variables. On the supply side, the internal organization of the agency is a major determinant of corruption. Three features of the organization are systematically associated with less corruption: having decisions regularly audited by external or internal auditors; maintaining open and transparent procedures; and basing personnel decisions on criteria of merit and professional competence. Moreover, the procedure

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[1] Jain (2001) and Sveensson (2005) provide a detail review of recent works in this area. Treisman (2000) finds that more developed countries with Protestant tradition and British rule display lower corruption. Greater decentralization in government spending and foreign competition are also associated with lower corruption (Fisman and Gatti, 2000; Ades and Di Tella, 1999), while poor institutions translate into greater corruption in Transition Economies (Broadman and Recanatini; 2002). Moreover, greater presence of women in parliament and civil service is associated with lower corruption (Swamy et al., 2001). Van Rijckeghem and Weder (2001) suggest that higher relative salaries for public officials are associated with lowere corruption. Persson et al. (2003) find that electoral rules affect the level of corruption, with larger voting districts associated with less corruption. Olken (2004) uses randomized field experiment to evaluate different approaches to reduce corruption and finds that top-down monitoring plays a greater role than grass-root monitoring in reducing corruption. Finally a few papers have begun exploring determinants of corruption using micro-level data. Svensson (2003) uses firm-level data to show that variations in regulations across industries can explain incidence of corruption. Mocan (2004) provides micro-evidence that legal origin of the country, democracy and rule of law determine the risk of exposure to bribery. J. Hunt (2005) focuses on the determinants of bribery using household data from Peru and shows that user's frustration with slow service leads to higher and more frequent bribes.

[2] Kaufmann (2003).

[3] For information on corruption surveys, visit http://www.worldbank.org/wbi/governance/govdatasets/external.html and http://www.worldbank.org/wbi/governance/capacitybuild/d-surveys.html .

for appointing the head of the agency also matters. Agencies whose head is popularly elected are systematically more corrupt and adopt worse internal organizations. While independent agencies whose head is appointed by a political body tend to adopt better organizational design. On the demand side, corruption is more prevalent among agencies that provide services to firms (rather than households), and that provide an exclusive service for which there is no alternative.

The outline of the paper is as follows. Section II describes the database and its construction. This section also shows that public officials' assessments are a reliable measure of corruption in the agencies where they work. Section III discusses the empirical strategy. Section IV presents the empirical results. Section V concludes by discussing the main policy recommendations and the steps for future work.

II.   DATA

The WBI surveys of public officials in eight Latin American and African countries are our main source of data.[4] Appendix 1 provides detail information on the process and the instruments used to gather this data. Public officials are employees of each agency. They are polled about specific types of corruption activities in the agency where they work, and about specific features of the internal organization of the agency.

We seek to explain within country (or within region) variation in corruption, on the basis of specific agency features capturing either the demand or the supply of corruption. The novelty of our work is the unit of observation (agency i located in region j) and the multi-country breadth. For example, an agency present in five different regions of a country will contribute five distinct observations to the dataset (of course, some agencies may be present only in one region of a country). Examples of agencies that are present in several regions of a country are the ministries of health and education, some branches of the judiciary, and public enterprises providing water, sanitation, and sewage. Examples of agencies that tend to have only a central presence are the Supreme Court and regulatory agencies.

The number of agencies per country ranges from 15 to 222, while the number of regions ranges from 4 to 34, depending on the country. The resulting total number of available observations is 924. While this is a considerable number, some individual countries have relatively few observations (about 50 for one country and about 90 for two countries in our sample).

The number of survey respondents underlying each agency-level observation also varies considerably from observation to observation. It ranges from 1 to 122, with an average number of respondents per observation equal to 10 in the entire sample. This average number of respondents also varies from country to country, being as low as 4 and as high as 26 depending on the country. To prevent observations based on few respondents from driving our results, we weigh each observation with the associated number of respondents, but we also discuss what

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[4] Over the past 6 years, WBI has assisted countries to implement surveys in several countries to be able to develop a "map" of their institutional weaknesses and strengths for policy purposes. This data has been used by each country to produce governance assessment reports and Action Plans that can be found at:
 http://www.worldbank.org/wbi/governance/capacitybuild/d-surveys.html

happens without weighting the observations. We also control for some observable features of the respondents.

We use principal component analysis to aggregate responses to individual questions into summary indices, as done by Kaufmann, Mehrez, and Gurgur's (2002) in their work on Bolivia based on similar survey data. This approach minimizes respondent bias and measurement error due to individual differences in perceptions.

A.   Dependent variables

Our dependent variable is either an indicator of *overall corruption*, or the following specific types of corruption: (i) *corruption in public procurement* (based on a question on the payment of bribes during the public procurement process); (ii) *corruption in budget management* (based on specific questions about the use of unofficial payments in budget management decisions and the diversion of funds and other types of budget abuse); (iii) *corruption in personnel management* (based on a question on the use of unofficial payments— i.e., buying positions and promotions— in personnel management decisions); (iv) *legal and regulatory corruption* (based on a question on the frequency with which bribes to public officials are used to alter regulatory and legal decisions); and (v) *administrative corruption* (based on questions about the frequency with which bribes are used to obtain or hasten the provision of public services). These variables vary on a scale from 0 to 100, with 0 indicating the lowest level of corruption. The index of *overall corruption* is a simple average of the five specific types of corruptions activities. The individual indices are, instead, constructed as follows. First, we re-scale the individual responses and use factor analysis technique on the complete sample for each country. We then use the first factor obtained this way to calculate weighted average indicators by agency. Appendix 1 lists the questions we have selected from each survey and the summary indicators in which they are combined; it also discusses in detail the methodology used to aggregate them.

Figure 1 shows that *overall corruption* varies significantly across public agencies within each country, suggesting that corruption has an important within-country variation that needs to be explained and that cross-country studies neglect.

Insert Figure 1 about here

Table 1 orders the different types of corruption by severity in each country. The eight countries in our sample face different governance challenges. Corruption in public procurement is the most severe type of corruption in four countries while corruption in budget management tops the list for other three countries. Interestingly, countries that have similar country-wide rankings in terms of the KKZ Control of Corruption Indicator,[5] appear to have quite distinct corruption problems. Different types of corruption also hamper neighboring countries with otherwise similarly weak institutions.

Insert Table 1 about here

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[5] Kaufmann, Kraay, and Mastruzzi (KKM) (2005).

We also rely on alternative measures of corruption, obtained from household or firm surveys inside these same countries. These alternative measures refer to a subset of the agencies included in the WBI survey of public officials. They are described more in detail in subsection II.D below.

B. Agency features that explain corruption

Our goal is to explain such diverse patterns of corruption across and within countries on the basis of specific features of the internal organization of each agency, and other agency level variables. We rely on two kinds of variables.

First, we extract from the WBI surveys information on how the public officials themselves describe the internal organization of the agency. Here we use questions without any normative content that seek to describe objectively specific procedures routinely used inside the agency. From these questions, we construct three continuous variables, each measuring a specific feature of the agency: (i) The variable *audit* is based on several questions investigating whether decisions on personnel and budget management, as well as procurement, are subject to regular internal or external audits; (ii) The variable *openness* is based on questions enquiring whether the same set of decisions is publicly announced inside and outside the public agency and whether the agencies' financial status is regularly disclosed to the public; (iii) The variable *merit* is based on a set of questions referring to whether decisions on personnel management are based on professional experience, merit, performance, and the level of education. These indicators vary from 0 to 100. Their median values are 67 for both *audit* and merit and 58 for *openness* with standard deviations ranging between 14 and 16. The questions used to construct these variables are also reported in Appendix 1.

Table 2 summarizes the correlation coefficients between these three variables, in the full sample of over 900 observations. Clearly, they are strongly positively correlated: agencies that rely more on external audits are also more likely to base personnel decision on merit, and to have transparent procedures. Nevertheless, the correlation is far from perfect, suggesting that each variable indeed measures a different feature of the institution.

Insert Table 2 about here

These subjective indicators of organizational features come from agency insiders. Hence, they reflect detailed and reliable knowledge of how the institution actually operates. On the other hand, these subjective indicators reflect the practice of the institution, rather than its statute or other formal and legal rules. This makes it more difficult to interpret the correlations presented below as causal effects that can be manipulated through external intervention.

For this reason, we have also collected information on specific features of the institution, from formal rules or other external observable characteristics of each agency. The dummy variable *judiciary* takes value 1 to agencies that are part of the judicial system. To separate local agencies from those that operate nationally or regionally, we have defined the dummy variable *municipal* equal to one if the agency operates exclusively at the municipal level. To separate political agencies from those that enjoy some independence from the political process, we have created two variables that account for the appointment and control procedure of the head of the agency. The dummy variable *elected* equals one if the head of the agency is popularly elected. The

dummy variable *political* equals one if the head of the agency is appointed and directly controlled by a political body (the executive, Parliament, a major), while it equals zero in all other cases. Thus, the variable *political* equals zero if the appointment results from internal procedures or promotion (eg. in the judiciary), if the head of the agency is popularly elected, but also if the head of the agency results from a political appointment but it cannot be removed at will by the political body in charge (eg. a central banker appointed by the executive for a fixed term of office that cannot be removed at will by the politician is classified as zero).

Finally, as suggested by Svensson (2003), corruption inside an agency is also likely to reflect the "demand" of corruption by the individuals with which the agency interacts. An agency that provides a very valuable service for which there is no alternative provider is more likely to be offered bribes. For instance, if a license is needed for a firm to enter a lucrative market, the agency in charge is likely to be tempted to take bribes. Conversely, an agency who oversees the regulation of a national park (an entertainment activity with many alternative substitutes) is unlikely to find many customers willing to pay a hefty bribe. To account for these differences between agencies, we have created three dummy variables that capture the typical customer of the agency (*families*, *firms* and *foreigners* respectively), to be interpreted as the group of individuals or entities with which the agency interacts most frequently and directly. For example, universities and welfare agencies interact mostly with families while regulatory agencies and some ministries (e.g., the ministry of industry and commerce) mostly with firms. These categories are not necessarily mutually exclusive: municipalities have both families and firms as typical customers while ports have both firms and foreigners. Some agencies-e.g., the Presidency and the Supreme Court--are coded as not having any *direct* contact with customers. We have also defined the dummy variable *monopoly* to equal one if the agency is the exclusive provider of its service. The central bank, customs, and the judiciary are examples of such agencies.

C. Other control variables

Besides these subjective and objective organizational and institutional variables, in some specifications we also control for other variables that could explain differences in perceptions of corruption across agencies or regions. Corruption is likely to be affected by the economic and social environment where the agency operates, and not just by agency features. The simplest way to cope with this problem is to control for country and/or regional fixed effects. This is what we do in our basic specifications.

We are also interested to know how specific aspects of the environment impact on corruption, however. Hence, we have collected data on average levels of education and income, as well as large firms' concentration. These variables vary only across regions, not across agencies and are derived from the households' and firms' surveys discussed below. The regional level of education is a numerical average of the years of education of the respondents to the households' survey. Regional income levels are the average incomes of the households responding to the survey (with domestic currency converted into dollars at the average annual exchange rate for the

year in which the survey was implemented). Large firms' concentration is measured as the fraction of firms classified as large[6] in each region.

Finally, subjective perceptions of corruption or of organizational features may be influenced by the individual attributes of the respondents. Thus, in most specifications we also control for some known features of the public officials themselves (i.e. the individuals who are polled in the WBI surveys). Specifically, the variables *difference in income* and *difference in education* measure the average level of income of the officials in the agency in deviation from the regional average. The variable *years* is the average number of years for which the respondents of each agency have been employed in the public sector. We also control for the officials' relative position in the organization (*position_middle* and *position_low*), corresponding to the percentage of respondent in each agency with positions of middle management and administrative staff respectively. Note that the public officials polled in each agency are not necessarily a representative sample of the agency's staff. Hence, say, an agency with more educated public officials in our sample needs not really have a more educated staff on average. The main role of these variables describing the attributes of public officials is to limit the risk of respondents' bias.

D. How reliable are public officials' surveys?

The corruption indicators used in this paper are based on surveys of public officials working in these agencies. These public officials certainly have more detailed information compared to outsiders. But how reliable are their responses? This is a legitimate question, because respondents may answer strategically. Corrupt public officials might view the survey as a self-assessment and purposely underestimate corruption. Other officials may, instead, overestimate corruption to discredit supervisors and engineer their removal.

Unfortunately, there is no acid test of the reliability of public officials' surveys. Almost by definition, corruption is not observable. And the perceptions of outsiders do not necessarily measure corruption more accurately, since they are based on hearsay or may reflect dated prejudices. However, a positive and significant—albeit not perfect—correlation between the corruption indicators derived from these surveys and those derived from independent surveys of firms and households would be reassuring. This is what we find.

For six of the eight countries in our sample, we have WBI households' and firms' surveys that include questions about the respondent's perceived level of dishonesty of each public agency in a list. We use these assessments to construct a variable *dishonesty* by agency and region that we match with the public officials' corruption indicators in the same agency and region (i.e., the agency operates in the same region in which the respondent resides).

In this match we loose about one third of the observations, because: (i) there are no data for two countries in the sample; (ii) the list of public agencies in the households' and firms' surveys does not include all the public agencies whose public officials are surveyed; and (iii) some

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[6] The classification of firms by size varies across countries and is based on the national statistical agency's classification.

respondents decline to assess certain agencies. Moreover, the number of respondents corresponding to each agency-region observation differs substantially across databases. For example, the corruption measure for a specific agency-region from the public officials' database may be based on many more respondents than the corruption measure for the same agency-region from the households' or firms' database, and vice versa. If the respondents are few in at least one of the two databases, the information of that match is less reliable. We take this into account by weighing each observation with the *minimum* number of respondents of the two databases.[7]

Table 3 shows that the evaluations of public officials are consistent with those of firms and households. The correlation coefficients are not large, but they are highly significant. The assessments of public officials are more strongly correlated with those of firms than of households. This may reflect the fact that firms, thanks to their dealings with public agencies, have access to better information about corruption than households. Different education levels between managers and households may also play a role (the education of respondents is significantly higher among managers).

Insert Table 3 about here

For seven countries in our sample, the households' and firms' surveys also have data on the frequency with which citizens have been asked to pay a bribe while trying to obtain a public service. This allows us to construct a second corruption measure based on the households' and firms' surveys, called *Bribe,* which we can match with the assessments of public officials. While *Bribe* is more objective than *dishonesty*, it is available for fewer observations: in the match we loose about one half of the observations. Table 4 shows that the correlation between *Bribe* and the corruption indicators from the public officials' survey is positive and significant. In this case, the correlations for the households are stronger than for the firms.

Insert Table 4 about here

In view of these results, we conclude that the public officials' measures of corruption are sufficiently reliable and proceed to use them in the econometric analysis of the rest of the paper. We complement this approach by also displaying results where corruption is measured by firms or households (the variables *dishonesty* or *bribe*).

III.   ESTIMATION STRATEGY

We want to know whether corruption (total or of a specific type) is systematically correlated with the subjective indicators of the internal organization described above, plus other agency features. Thus, we estimate a regression of the type:

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[7] For example, if we match *Dishonesty* in the Ministry of Finance as reported by households with *Total Corruption* in the same agency as reported by public officials, the weight of that observation will be the minimum number of respondents that evaluated the Ministry in the two databases.

$$corruption_{jr} = b_1\ audit_{jr} + b_2\ merit_{jr} + b_3\ openness_{jr} + \boldsymbol{b_4\ I_{jr}} + \boldsymbol{b_5\ R_{jr}} + \boldsymbol{b_6\ x_{jr}} + a_r + e_{jr} \qquad (1)$$

where $corruption_{jr}$ represents the indicator of corruption (total or of a specific type) for agency j in region r; the variables *audit, merit, and openness* are the organizational variables of interest for agency j in region r; the vector $\boldsymbol{I_{jr}}$ denotes other agency-specific features of interest, such as the appointment procedure for the head of the agency, or whether the agency is a monopoly provider; the vector $\boldsymbol{R_{jr}}$ collects several characterisitcs of the respondents (public officials) surveyed in agency j in region r; the vector $\boldsymbol{x_{jr}}$ denotes other controls to be described below; a_r indicates the region-specific (or country-specific) intercept; and e_{jr} is the unobserved error term.

Given that the corruption and governance indicators represent average values for each agency in each region, we estimate equation (1) using a set of weights equal to the number of respondents on which the corruption indicator for agency j in region r is based. But the results are very similar when observations are not weighted (more on this below).

In estimating equation (1), our identifying assumption is that the subjective descriptions of the organization, the variables *audit, merit*, and *openness,* are exogenous and uncorrelated with the error term. There are several possible reasons why this assumption might be violated. The most straightforward potential problem is an omitted variable bias. For instance, regions may differ in terms of income, or education, or structure of production, and this could influence both overall corruption as well as the agency's organization. Or agencies could differ in terms of their function, or size, or scope, and this might affect both corruption and our organizational indicators. We cope with this problem in two ways. First, we report results that also include regional fixed effects. This means that our estimates only exploit within-regional variation of agencies. Thus, the bias could only arise from potentially omitted variables that vary at the level of the agency, not just of the regions. Second, in the vectors $\boldsymbol{I_{jr}}$, $\boldsymbol{R_{jr}}$ and $\boldsymbol{x_{jr}}$ we control for some observable features of the agency, or of the public officials that were polled in that particular agency/region.

The second potential problem has to do with the way in which the subjective organizational indicators are constructed. The variables *audit, merit* and *openness* are based on factual (as opposed to normative) questions, but they still summarize perceptions of organizational outcomes, rather than formal rules imposed externally upon the agency. An honest and effective head of the agency could both curb corruption and adopt open procedures, rely on external auditors, and base promotion on merit rather than political patronage. Auditors, transparent procedures and merit-based personnel decisions could be instrumental to reducing corruption. But nevertheless, they would be endogenous to the identity of the agency's leader. As such, our regressions would not estimate a true causal effect. This potential problem is almost intractable given our data, and should be born in mind when interpreting the results. We return to it below.

In light of this problem, we also report some reduced form estimates, where we omit the variables *audit, merit* and *openness* from the specification and just estimate the effect on corruption of the other agency features captured by the variables $\boldsymbol{I_{jr}}$, $\boldsymbol{R_{jr}}$ and $\boldsymbol{x_{jr}}$. These variables are more clearly exogenous in this context, so their estimated coefficients should not suffer from any bias. Of course, their interpretation is now different, since the reduced form effect of the variables $\boldsymbol{I_{jr}}$, $\boldsymbol{R_{jr}}$ and $\boldsymbol{x_{jr}}$ on corruption now reflects both the direct effect as well as

the indirect effect induced through the organizational design as measured by the variables *audit, merit* and *openness.*

IV.   RESULTS

a. Parsimonious specifications

In this subsection we start by excluding the vectors I_{jr} and x_{jr} from the regression, and estimate a specification that only contains country or regional fixed effects and the vector R_{jr} of respondents' characteristics (described at the end of Section II.C and not shown in the tables).[8] Richer specifications, which also control for other observable agency attributes, are discussed in the next subsections.

Table 5 shows weighted OLS estimates for the indicator of Total Corruption. Panel a) of Table 5 includes only country fixed effects.[9] Panel b) includes only regional fixed effects. Given the positive correlation between the three indicators of the internal organization, we include them one at a time and all three together. Indeed, *audit*, *openness*, and *merit* tend to be associated with lower levels of the overall corruption index, both individually and jointly. Not surprisingly, though, when they are all included the individual effect of each variable in isolation is smaller, though still significant. Controlling for regional (rather than country) fixed effects reduces slightly the absolute values of the estimated coefficients but preserves their statistical significance, except for the variable *merit* that becomes insignificant when all three organizational variables are included. Estimating by unweighted least squares (with standard errors clustered by country or region) produces very similar results.

Insert Table 5 about here

The size of the estimated coefficients implies that improvements in *audit, merit,* and *openness* might have a considerable impact on corruption. An improvement of one standard deviation in *audit* would reduce *Total Corruption* by 0.58 standard deviations in the estimates with country fixed effects (and 0.41 in the estimates with regional fixed effects). Similar improvements in *merit,* and *openness* would yield improvements of 0.44 and 0.52 standard deviations respectively (and 0.30 and 0.40 in the estimates with regional fixed effects). The correlation among these variables implies, however, that a simultaneous improvement of all three levers by one standard deviation would reduce *Total Corruption* by only 0.66 standard deviations (and 0.46 in the estimates with regional fixed effects).

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[8] Perceptions of corruption are correlated with several features of public officials. Perceived corruption is higher when public officials have more years of service in the public administration. Moreover, richer public officials are associated with less corruption, while their education has no significant correlation with corruption. A higher percentage of staff and middle management respondents is associated with higher perceptions of corruption. Note that all our key results would be confirmed if we did not include the vector of controls $R_{jr.}$

[9] The coefficients of the country dummy variables are also significant in each regression of panel a) and we reject the hypothesis of equality of these coefficients across countries.

Another way of assessing the size of the estimated coefficients is to consider the difference in *audit, merit,* and *openness* between the least corrupt and the most corrupt public agency of a specific type and compute how much of the gap in corruption levels could be closed if the latter adopted the levels of *audit, merit,* and *openness* of the former. In the case of municipalities, for example, the estimated coefficients (with country fixed effects) imply that 93.6 percent of the gap would be closed. This percentage declines to 67.5 percent when we use the coefficients estimated with regional fixed effects.

Figure 2 displays visually the correlation in the data between total corruption and each organizational feature in isolation. Observations are in deviations from regional means. The slope of the line in each plot corresponds to the estimated coefficients of unweighted OLS regressions corresponding to those in columns 1-3 of Table 5 (Panel b), respectively. Clearly, the negative correlations between corruption and organizational features reflect a robust feature of the data.

Table 6 repeats the same exercise when the dependent variable is one of the five specific types of corruption defined in the previous section. To allow for the likely correlation between the unobserved determinants of each type of corruption, we now estimate by Seemingly Unrelated Regression (SUR), still weighting observations by the number of respondents in each agency/region. To save space, we only display a specification that includes all three organizational indicators together. Panels a) and b) control for country and regional fixed effects respectively. The impact of each organizational feature—*audit, merit, and openness*—varies across the five types of corruption in a predictable way: auditing mechanisms are particularly important in curbing corruption in budget management; merit-based personnel management has its greatest impact on corruption in personnel decisions; and announcing publicly budget and personnel decisions has a particularly strong effect on corruption in budget management. This match between the type of corruption and the specific design of the organization suggests that the correlations are not spurious, and might reflect a true causal effect of the organization on corruption. Again, the results are similar when controlling for regional (rather than country) fixed effects, except for the variable *merit* that, in the specification with regional fixed effects, preserves its significance only in reducing *corruption in personnel.* Unweighted regressions (with country or regional fixed effects) yield broadly similar coefficients in terms of size and significance; the only noteworthy change is that in the unweighted regressions *openness* has its greatest impact on administrative corruption rather than corruption in budget management.

Insert Table 6 about here

A Breusch and Pagan test rejects the hypothesis of a diagonal covariance matrix of disturbances for both panels of Table 6. Moreover, the unobserved determinants of legal and regulatory corruption, administrative corruption, and corruption in procurement are highly positively correlated. Thus, there are other unobserved determinants of different levels of corruption, inside each agency, which are not captured by our three subjective indicators of institutions.

Overall, these results are intuitively appealing and provide rare statistical evidence about policies and organizational designs that can curb corruption in public agencies. They also suggest that

different types of corruption require different policy tools. Nonetheless, there are limits to the policy implications that can be drawn from this evidence, and further work is needed to hone policy prescriptions for the reform of public agencies. Specifically, the WBI surveys do not reveal whether some agencies have better organizational design because these are mandated by law or because their managers implement them in earnest. This distinction is of critical importance for policymakers because in the first case they would only need to introduce appropriate legislation and regulations, while in the second case they should focus on selecting capable managers and making them accountable.

Before turning to richer specifications that include additional controls, we ask whether there are regional determinants of corruption, besides the organizational features already discussed. To answer this question, we drop the regional fixed effects (maintaining the country fixed effects), and add to the specification three variables that vary across regions but not across agencies: *Income, Education* and *Firm concentration*, all measured at the regional level as regional averages (except for Bolivia, where these three variables are only available as national averages). The results are reported in Table 7. Higher regional education is associated with a reduction in specific types of corruption (though not of overall corruption); firm concentration has a significant positive impact only on corruption in budget management; regional income, on the other hand, is not associated with any significant effect. The estimated coefficients on the subjective indicators of institutions remain as in the previous tables.[10]

Insert Table 7 about here

In the remaining subsections, we examine how robust are these correlations to controlling for other observable determinants of corruption that vary both across agencies and regions (the vectors *I* and *x* in equation 1), and to redefining corruption as perceived by firms and households.

b. Controlling for features of the agency

Next, we turn to other observable features of the agency. The variables *families*, *firms* and *foreigners* identify the main user of the agency's services, while the variable *monopoly* captures whether the agency is a monopolistic provider of the service. The variable *municipal* refers to municipal agencies. All these variables are defined more precisely in subsection II.C. The specification and the estimation method is otherwise as in Tables 5b and 6b (i.e., weighted OLS or weighted SUR with regional fixed effects and respondents' controls).[11]

The results are displayed in Table 8. The variables of interest, *audit, merit* and *openness*, retain their relevance and significance and their pattern is very similar to that in the previous tables. In particular, the variable *openness* emerges as the most important determinant of corruption, while

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[10] Gleaser et al. (2004) and Svensson (2005) suggest that education and human capital are needed for institutions to operate in an effective way and, therefore, to reduce corruption.

[11] For the time being, these variables are available only for the five Latin American countries in our sample.

the variable *merit* has a significant effect only on corruption in personnel and administrative corruption**.**

Insert Table 8 about here

But new features of the agency now appear as relevant determinants of corruption. In Table 8, we see that agencies that primarily deal with *firms* tend to be more corrupt, while being a monopolistic provider is relevant only for corruption in personnel. *Judicial* agencies are not particularly more or less corrupt than the rest. *Municipal* agencies appear much more corrupt, instead. A priori this could go either way: as discussed for instance by Seabright (1996) and Persson and Tabellini (2000), decentralization can have opposite effects on corruption. But often experts in international organizations claim that corruption is can be higher at the local level in countries where state institutions are weak to begin with, because in such institutional environment it is more difficult to monitor actions and performance at the local level and abuses are more likely to occur. Our empirical findings seem to confirm this practical knowledge.

Table 9 adds two variables that refer to the appointment and control procedure over the head of the agency. The variables *elected* and *political* capture agencies whose head is elected through a popular vote or appointed by a political body, respectively. Agencies where the leader is *elected* through a popular vote appear as much more corrupt. For the rest, the estimates remain stable, with one main exception: now the evidence of higher corruption at the municipal level appears less robust. This is not too surprising because the dummy variable *elected* captures Ministries, Municipalities, as well as national and local Assemblies. Its estimated coefficient is very large and robust, implying that *Total Corruption* would be almost one-fourth of a standard deviation higher when the head of the agency is elected. To put this result in perspective, consider that a full standard deviation improvement in *openness* is estimated to have a similar effect. Given the nature of the agencies captured by the *elected* dummy, it is also not surprising that its estimated impact on legal and regulatory corruption is larger than that on all other forms of corruption but administrative corruption. The large estimated impact of *elected* on the latter suggests that elected officials may accept bribes to interfere in the provision of public services (see definition of Administrative Corruption in Table 2 of Appendix 1).

Insert Table 9 about here

c. A different measure of corruption

A possible problem with the results discussed so far is that both the indicators of corruption and the subjective measures of institutions (*audit, merit* and *openness*) reflect the perceptions of the same set of individuals. The correlations documented in Tables 5-9, therefore, could just reflect the subjective evaluations of the respondents, rather than the intrinsic features of the agencies. To cope with this problem, we have replaced the dependent variable with perceptions of corruption available from other surveys: from firms (*dishonesty_firms*) and from households (*dishonesty_households*). As noted in subsection II.D, the sample is now smaller, both because some agencies are not available in this other sample, and because these surveys are not available in two of the eight countries in our data set.

With theses caveats in mind, Table 10 reproduces the basic estimates, with the same specification as in Table 9 including alternatively country and regional fixed effects but excluding public officials' controls. The variable *openness* has a significant effect in curbing corruption as perceived by firms. The remaining variables, *audit* and *merit,* only have a significant impact on corruption when entered in isolation (not shown), but not when all three subjective organizational indicators are included. None of these variables has a significant effect on corruption as perceived by households when they are all simultaneously included but the variable *openness* has a significant effect on *dishonesty_households* when entered alone (ie. without also including the variables *audit* and *merit*).[12] Altogether, these results confirm that the subjective organizational features captured by the variables *openness, merit* and *audit* are associated with less corruption as perceived by the customers of the agency, and not just by the agency insiders. Given the high correlation amongst these three variables, it is not easy to disentangle their precise role, although having transparent and open procedures seems to be associated with more honest behavior by the agency.

Insert Table 10 about here

Table 10 also confirms several of the previous findings and points to other agency features that influence corruption. As already apparent from Table 9, agencies that provide services to *firms* are more corrupt. But now, agencies that cater to *households* emerge as less corrupt. Moreover, the variable *monopoly* now enters significantly and with a positive sign in the regressions that explain corruption as perceived by households. This pattern is plausible, since often firms are willing to pay larger bribes than households, particularly if there is no alternative provider of the service. Altogether, these three variables suggest that corruption is systematically influenced by demand, not just by supply. On the supply side, we confirm the result of Table 9 that agencies whose head is popularly *elected* are more corrupt. Being a *municipal* agency is significantly correlated with more corruption only in the perceived *dishonesty* measure reported by households**.**

We have also run some estimates (not shown) using the frequency of *bribe* requests as reported by firms and households as dependent variable together with the standard full set of regressors. These estimates are less reliable because they are based on a much smaller sample (about 200 observations) that allows us to include only country fixed effects. Nonetheless, the results for the frequency of *bribe* as reported by firms were encouraging with significant negative coefficients on *audit* and *openness* when included individually and on *audit* when included jointly with the other organizational features. None of these features were, instead, significant in the regressions with the frequency of *bribe* as reported by households.

d. Reduced forms

As discussed in section III, an important issue in interpreting the results presented so far concerns the possible endogeneity of the organizational variables *audit*, *merit* and *openness*.

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[12] A standard F test indicates that the estimated coefficients of *audit, merit*, and *openness* are jointly significant when the dependent variable is *dishonesty_firms* but not when it is *dishonesty_households.*

These variables are tools with which to fight specific types of corruption inside each agency. But why do some agencies and not others rely on these tools? The regressions presented so far assume that the internal organization of each agency is random, after controlling for the observable features described above (plus the country or regional fixed effects). This is a strong assumption. Not much can be done about this problem in the absence of a valid instrument (i.e. a variable that explains the internal organization of each agency and has no direct effect on corruption).

But as shown above, corruption is explained by other features of the agency, such as the kind of service it offers, and the procedures for appointing or controlling the head of the agency. These other variables are much more likely to be exogenous. Is their effect on corruption apparent also in a "reduced form", where we omit the possibly endogenous variables *merit, audit*, and *openness*? The answer to this question is presented in Tables 11a and 11b, for all the possible measures of corruption. To see how the internal organization of each agency correlates with the other determinants of corruption, the last three columns of Table 11a regress the organizational features (*audit, merit*, and *openness*) on the same regressors.

Insert Table 11 about here

The results reported in Table 11 confirm some of the previous findings such as the higher corruption of agencies that deal primarily with firms and that have popularly elected heads. Similarly, in their assessments of the *dishonesty* of public agencies, households and firms agree that agencies that deal with *families* tend to be less corrupt while those that deal with *foreigners* are more corrupt.

Useful insights on the channels through which specific agency characteristics influence corruption can be derived from examining the difference between the structural and reduced form coefficients for *Total Corruption* (column (1) of Tables 9 and 11a respectively) in light of the determinants of *audit, merit,* and *openness* (columns (2)-(4) in Table 11a). For example, *elected* is estimated to have a substantially larger impact on corruption in the reduced form than in the structural form. This happens because the reduced form captures the overall effect of popularly elected heads of the agencies on corruption including the indirect effect through their smaller propensity to introduce organizational features such as *audit, merit*, and *openness*.[13]

A good design of the internal organization is more likely if the head of the organization is appointed by a political body and enjoys some independence: the variable *political* has a positive and significant effect on *audit* and *openness*. Good organizational features as measured by *audit, merit,* and *openness* are also less frequent in agencies that deal primarily with *families* and more frequent in agencies that deal primarily with *foreigners*, which is plausible.

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[13] The relationship between the estimated coefficients of *elected* in the structural and reduced form equations of *dishonesty* is, instead, the opposite because *elected* is not statistically significant and has even a positive effect on some organizational features when the determinants of *audit, merit,* and *openness* are estimated on the smaller sample for which *dishonesty* is available (not shown).

V.   CONCLUDING REMARKS

Corruption varies greatly also within countries, not just between them. In this paper we have shown that two types of variables help to explain the pattern of corruption across public agencies in eight developing countries.

First and most important, the internal design of the organization is systematically associated with perceptions of corruption, both by agency insiders and by its customers. Corruption is lower when internal decisions on budget, procurement and personnel are regularly audited, and when these same decisions are taken with open and transparent procedures. Corruption in personnel is also lower when such decisions are based on merit and clearly stated professional criteria. These findings suggest that corruption is not a given: it can be fought, with appropriate organizational tools.

Both corruption and the design of the organization can be influenced by the individuals at the very top of the agency. This is suggested by the finding that the procedure for appointing the head of the agency is one of the major determinants of corruption, as well as of the design of its internal organization. Agencies whose head is popularly elected are systematically more corrupt and adopt worse internal organizations. While independent agencies whose head is appointed by a political body tend to adopt better organizational design.

Finally, the data show that corruption is also influenced by demand-side factors, and not just by its internal organization. Agencies that provide services to firms (rather than households) are more prone to corruption; and corruption is more likely if the service provided by the agency has no easily available substitute in the market place or elsewhere.

Perhaps the single most important direction for future research is to gain a better understanding of why the internal design of the organization varies so much across agencies. Why do some agencies adopt more open and transparent procedures, or rely on external auditors, while others do not? Being able to answer this question would be important for two reasons. First, it would lend more credibility to the estimated impact of the internal organization on corruption. Here we assumed that organization features are exogenous, after controlling for observable agency features. But this is a strong assumption. If whatever pushes an agency to adopt a better organization also reduces corruption through other channels, our estimates of the effect of the internal organization on corruption could be biased upwards. Second, once we know why some agencies adopt better organization than others, we would also be one step closer to making policy recommendations that are feasible and likely to be implemented in practice.

References

Acemoglu, D. J. Robinson and S. Johnson (2004), "Institutions as the Fundamental Causes of Long-Run Growth", mimeo, MIT.

Ades, A. and R. Di Tella (1999), "Rents, Competition and Corruption", *American Economic Review*, Vol. 89, No.4, pp.982-993.

Broadman, H. and Recanatini, F. (2002) "Seeds of Corruption" *MOCT-MOST, Economics of Planning,* March 2002.

Fisman, R. and R. Gatti (2002), "Decentralization and Corruption: Evidence across Countries", *Journal of Public Economics*, Vol.83.

Gatti, R. (1999), "Corruption and Trade Tariffs, or a Case for Uniform Tariffs", *Policy Research Working Paper,* No. 2216, The World Bank.

Gleaser, E., R. La Porta, F. Lopez-de-Silanes and A. Shleifer (2004), "Do Institutions Cause Growth?", *Journal of Economic Growth,* Vol. 9, #3, pp.271-303.

Hunt, J. (2005), "Why are Some Public Officials more Corrupt than Others?", *NBER Working Paper Series,* #11595, August 2005.

Jain, Arvind (2001), "Corruption: A Review", *Journal of Economic Surveys*, Vol. 15, No. 1 , pp. 71-121.

Kaufmann, D. (2003), "Rethinking Governance: Empirical Lessons Challenge Orthodoxy", mimeo, http://www.worldbank.org/wbi/governance/pdf/rethink_gov_stanford.pdf , The World Bank, March 2003.

Kaufmann, Kraay and Mastruzzi (2005), "Governance Matters IV: Governance Indicators for 1996-2004", mimeo, http://www.worldbank.org/wbi/governance/pubs/govmatters4.html , The World Bank, May 2005.

Kaufmann, D., G. Mehrez, and T. Gurgur (2002), "Voice or Public Sector Management?", mimeo, The World Bank, May 2002.

Mauro, Paolo (1995), "Corruption and Growth", *Quarterly Journal of Economics*, August, 1995.

Mocan, N. (2004), "What Determines Corruption? International Evidence from Micro Data", *NBER Working Paper Series,* #10460, April 2004.

Olken, B. (2004), "Monitoring Corruption: Evidence from a Field Experiment in Indonesia", mimeo, Harvard University, November 2004.

Persson, T. and G. Tabellini (2000), *Political Economics,* MIT Press

Persson, T., Tabellini, G. and F. Trebbi 2003. "Electoral Rules and Corruption", *Journal of the European Economic Association*

van Rijckeghem, C. and B. Weder (2001), "Bureaucratic Corruption and the Rate of Temptation: do Wages in the Civil Service affect Corruption and by How Much?", *Journal of Development Economics,* Vol. 65, pp.307-331

Seabright, P. (1996). "Accountability and decentralization in government: An incomplete contracts model." *European Economic Review* 40: 61-89

Shleifer, A. and R. Vishny (1993), "Corruption", *Quarterly Journal of Economics*, Vol. 108.

Svensson, J. (2005), "Eight Questions about Corruption", *Journal of Economic Perspectives*, Vol. 19, #3, Summer 2005, pp.19-42.

_____ (2003), "Who Must Pay Bribes and How Much?", *Quarterly Journal of Economics,* Vol. 118, #1, pp. 207-230.

Swamy, A. S. Knack, Y. Lee and Omar Azfar (2001), "Gender and Corruption", *Journal of Economic Development*, Vol.64, pp.25-55.

Tanzi, V. and H. Davoodi (1997), "Corruption, Public Investment and Growth", *IMF Working Papers*, WP/97/139.

Treisman, Daniel (2000), "The Causes of Corruption: A Cross-National Study", *Journal of Public Economics,* Vol.76 (June).

Appendix 1: World Bank Institute Governance and Anti-corruption (GAC) Diagnostic Surveys[14]

The Process

In-depth country data provide a key input to policy design and can empower citizens, enterprises, legislators, and reformists in government. The GAC Diagnostic Surveys are an example of tools that can help countries collect such detail information. They consist of in-depth, country-specific surveys of thousands of households, business people, and public officials that gather information about institutional vulnerabilities to be used for policy purpose. While WBI provides the overall methodology and the template survey, the data collection, the analysis and the design of specific policies are carried out locally in each country by a joint partnership of government and civil society. Such partnership use the information gathered to design specific governance action plans, which are subsequently implemented by the government.

Key features of the GAC diagnostic surveys comprise the following:
- i) multi-pronged, separate surveys of users of public services/households, business people and public officials, which permits triangulation of the responses; and
- ii) use of experience-based (vs. 'opinions') type of questions.

This approach encourages local stakeholders to make use of the results of these diagnostic assessments to promote a constructive debate on institutional reforms, while fostering learning through the close collaboration between external experts and local counterparts.

For more information and description of outcomes, please visit

The Data

The three surveys of public officials, households and businesspeople offer in-depth, country-specific information on the quality of governance and public sector performance in a few countries from the point of view of both providers and users of public services.

In particular, the household and business people surveys provide information about the effectiveness of public institutions, the quality of governance and the business environment from the point of view of users of those institutions. These surveys allow us to evaluate the quality of public services based on the experience that citizens have with public procedures and providers' behavior. They also provide information on citizens' knowledge of and access to mechanisms to report a complaint or a case of corruption.

The public official survey collects data on the specific dimensions of corruption and quality of public institutions, such as:

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[14] Over the past 6 years, WBI has assisted countries to implement surveys in several countries to be able to develop a "map" of their institutional weaknesses and strengths for policy purposes. This data has been used by each country to produce governance assessment reports and Action Plans that can be found at:
http://www.worldbank.org/wbi/governance/capacitybuild/d-surveys.html

1. administration of personnel (including quality and stability of rules, transparency and accountability, extent of corruption and nepotism, wage and work satisfaction, internal promotion mechanisms, and motivation to work in public agencies)
2. administration of the budget (including quality and stability of rules about budget procedures, mismanagement and corruption, transparency and accountability in budget administration);
3. ability of the agency to meet its mandate (including employee motivation, understanding of the agency's mission, complaint mechanisms, external hiring procedures, quality and accessibility of services provided by the agency).

To explore agency differences within the same country, the responses from the public officials can be grouped by public agency. This agency-level analysis adapts the approach introduced by Kaufmann, Mehrez and Gurgur's (2002) work for Bolivia, using similar survey data. Both methodologies allow us to minimize respondent bias and measurement error due to individual differences in perceptions using principal component analysis technique. In addition, it is possible to separate agencies located in different cities and introduce them in the sample as different units of observation, one per city.

To construct the indices of public sector performance for each country, we first re-scale the individual responses. In particular, all questions about individual perceptions, which can be scaled from 1 to 7 (or 1 to 5) in the original survey, are rescaled from 0 to 100, in order to facilitate percent interpretation (0 always meaning the lowest level of quality of governance, corruption, access or service performance). We constructed then several variables intended to capture different aspects related to the quality of governance and the presence of corruption within the institutions. We begin extracting the first principal component for each of the variables of interested (described below) using the information from the whole sample with all individual responses. The agency-regional average of this principal component is used to construct the agency-regional indices for our analysis.

Tables A1 and A2 provide the definitions of all governance and corruption indicators used in the empirical analysis.

Table A1: Survey Questions Used to Construct Governance Variables.

Governance Variable	Questions available in the survey
AUDIT	Decisions on personnel management are regularly audited by some internal unit.
	Decisions on personnel management are subject to external audits.
	Decisions on budget management are regularly audited by some internal unit.
	Decisions on budget management are subject to external audits.
	Decisions on service delivery/contracts are regularly audited by some internal unit.
	Decisions on service delivery/contracts are subject to external audits.
	Transactions are supported by hard copy receipts to help auditing.
MERITOCRACY	Percent of cases the decisions on personnel management issues are based on professional experience/merit/performance.
	Percent of cases the decisions on personnel management issues are based on level of education.
OPENNESS	Decisions on personnel management are announced and opened to the internal of the institution (and also to the outside if applicable).
	Decisions on budget management are announced and opened to the internal of the institution (and also to the outside if applicable).
	Decisions on service delivery/performance of daily tasks/public contracts are announced and opened to the internal of the institution (and also to the outside if applicable).

Table A2: Definition of Corruption indices.

Index	Definition
OVERALL CORRUPTION INDEX	Corruption index representing the average of five standardized corruption indicators: bribery over regulatory/legal decisions, bribery over public contracts, bribery to obtain public services, corruption in personnel management and corruption in budget management.
Sub-indices of corruption constructed:	
CORRUPTION IN PERSONNEL MANAGEMENT	Corruption index representing the percentage of cases where decisions on personnel management are based on unofficial payments (job purchase).
CORRUPTION IN BUDGET MANAGEMENT	Corruption index representing the frequency within the institution of irregularities/diversion of funds or any other type of budget abuse.
CORRUPTION IN CONTRACTS	Corruption index representing the frequency within the institution of bribes in the contracting process.
LEGAL AND REGULATORY CORRUPTION	Corruption index representing the extent of bribes to alter regulations and legal decisions within the institution.
ADMINISTRATIVE CORRUPTION	Corruption index representing within the frequency of bribes to obtain public services at the institution.

Figure 1

Total Corruption - Variation Across Countries and Agencies
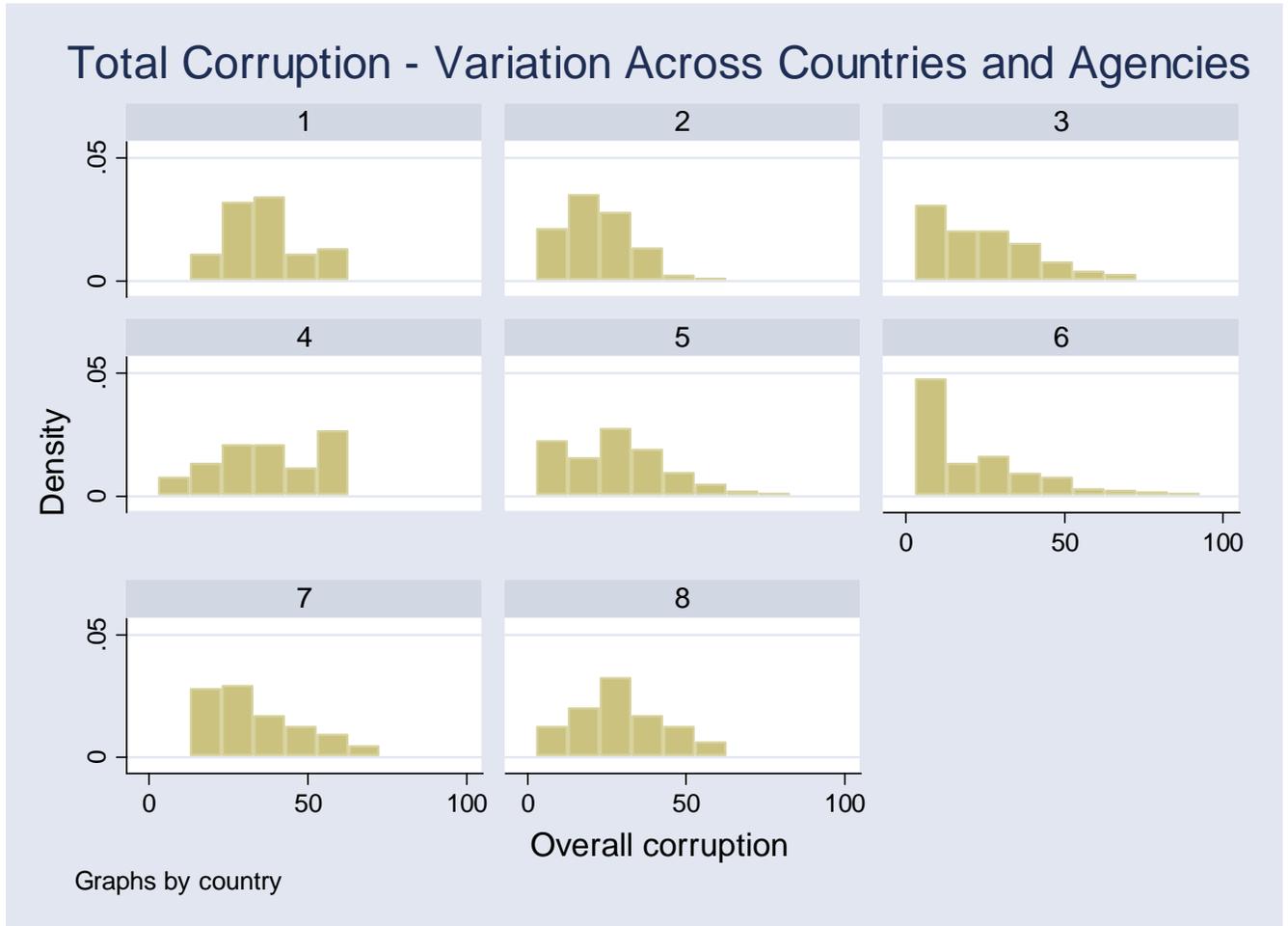
Figure 2. Total corruption and organizational features: deviations from regional means

Dispersion of difference from the mean, corruption and audit, by region
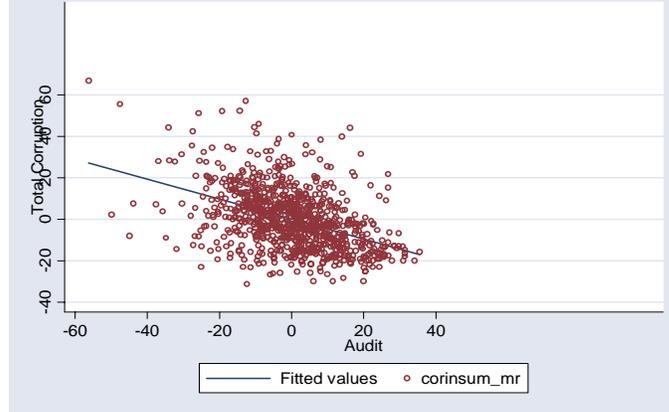
Dispersion of difference from the mean, corruption and merit, by region
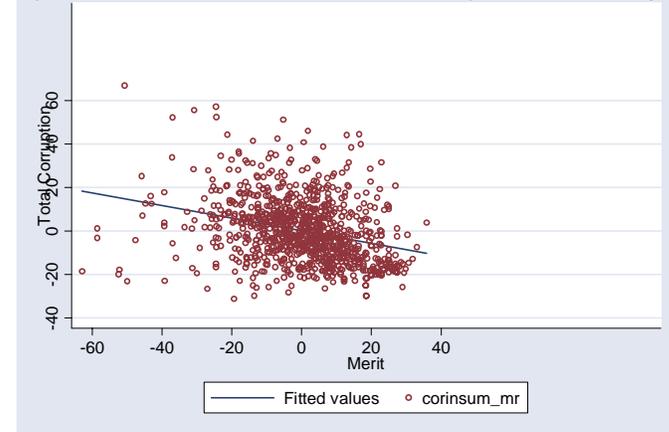
Dispersion of difference from the mean, corruption and openness, by region
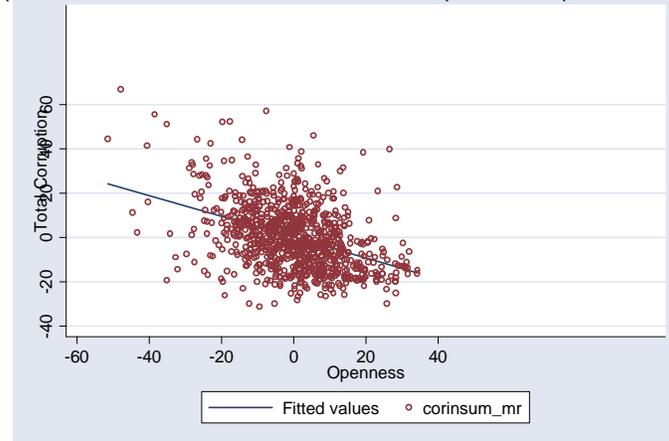
Table 1: Types of Corruption ranked by severity

	Country 1	Country 2	Country 3	Country 4	Country 5	Country 6	Country 7	Country 8
1.	Corruption in public procurement	Corruption in public procurement	Corruption in personnel management	Corruption in public procurement	Administrative corruption	Corruption in budget management	Corruption in budget management	Corruption in budget management
2.	Administrative corruption	Administrative corruption	Corruption in budget management	Legal and regulatory corruption	Corruption in personnel management	Administrative corruption	Administrative corruption	Corruption in public procurement
3.	Corruption in budget management	Corruption in budget management	Administrative corruption	Administrative corruption	Corruption in public procurement	Corruption in public procurement	Legal and regulatory corruption	Administrative corruption
4.	Legal and regulatory corruption	Corruption in personnel management	Corruption in public procurement	Corruption in personnel management	Corruption in budget management	Corruption in personnel management	Corruption in public procurement	Legal and regulatory corruption
5.	Corruption in personnel management	Legal and regulatory corruption	Legal and regulatory corruption	Corruption in budget management	Legal and regulatory corruption	Legal and regulatory corruption	Corruption in personnel management	Corruption in personnel management

Table 2: Correlations between Audit, Merit and Openness

	Audit	Merit
Merit	0.57	
Openness	0.72	0.58

Table 3: Weighted correlation between indicators of corruption (public officials' surveys) and measures of dishonesty (households' and firms' surveys)
(Simple pairwise correlation coefficients)

Public officials' measures =>	Total Corruption	Legal and Regulatory Corruption	Corruption in Budget Management	Corruption in Personnel Management	Administrative Corruption	Corruption in Public Procurement
Perception of dishonesty (Firms)	0.30	0.35	0.23	0.15	0.23	0.20
	0.0	0.0	0.0	0.0	0.0	0.0
	622	769	658	761	775	763
Perception of dishonesty (Households)	0.18	0.14	0.0714	0.12	0.16	0.13
	0.0	0.0	0.080	0.0	0.0	0.0
	572	621	595	618	623	621

Line 2 of each cell reports the p-value of the level of significance of the correlation coefficient. Line 3 reports the number of observations. Bolivia is excluded because households' and firms' surveys are not available.

Table 4: Weighted correlation between indicators of corruption (public officials' surveys) and payments of bribes (households' and firms' surveys)
(Simple pairwise correlation coefficients)

Public officials' measures =>	Total Corruption	Legal and Regulatory Corruption	Corruption in Budget Management	Corruption in Personnel Management	Administrative Corruption	Corruption in Public Procurement
Frequency of bribe (Firms)	0.16	0.28	0.04	0.22	0.11	0.12
	0.0	0.0	0.473	0.0	0.029	0.014
	312	406	331	402	412	403
Frequency of bribe (Households)	0.23	0.51	0.22	0.26	0.17	0.21
	0.0	0.0	0.0	0.0	0.0	0.0
	357	445	371	443	451	442

Line 2 of each cell reports the p-value of the level of significance of the correlation coefficient. Line 3 reports the number of observations. Bolivia is excluded because households' and firms' surveys are not available

Table 5: weighted OLS regression with country and regional FE – Dependent variable: Total Corruption

	a) Country Fixed Effects				b) Regional Fixed Effects			
Audit	-0.58			-0.36	-0.41			-0.21
	(0.03)***			(0.05)***	(0.03)***			(0.05)***
Merit		-0.45		-0.12		-0.31		-0.03
		(0.03)***		(0.04)***		(0.03)***		(0.05)
Openness			-0.59	-0.22			-0.46	-0.26
			(0.04)***	(0.06)***			(0.04)***	(0.07)***
Observations	895	906	899	892	895	906	899	892
R-squared	0.89	0.88	0.89	0.90	0.89	0.88	0.89	0.89

Controls for public officials' characteristics are included in each regression.
Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 6a: weighted SUR regression with country FE – Dependent variable: Different Types of Corruption

	(1) Legal and Regulatory Corruption	(2) Corruption in Personnel	(3) Corruption in Budget Management	(4) Administrative Corruption	(5) Corruption in Public Procurement
Audit	-0.18	-0.24	-0.43	-0.26	-0.24
	(0.05)***	(0.06)***	(0.06)***	(0.06)***	(0.06)***
Merit	-0.11	-0.35	-0.15	-0.16	-0.13
	(0.04)***	(0.05)***	(0.05)***	(0.05)***	(0.05)***
Openness	-0.14	-0.09	-0.39	-0.22	-0.21
	(0.06)**	(0.06)	(0.07)***	(0.06)***	(0.06)***
Observations	902	902	902	902	902

Controls for public officials' characteristics are included in each regression.
Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 6b: weighted SUR regression with regional FE – Dependent variable: Different Types of Corruption

	(1) Legal and Regulatory Corruption	(2) Corruption in Personnel	(3) Corruption in Budget Management	(4) Administrative Corruption	(5) Corruption in Public Procurement
Audit	-0.13	-0.11	-0.33	-0.10	-0.14
	(0.05)***	(0.06)*	(0.06)***	(0.06)	(0.06)**
Merit	-0.03	-0.29	-0.03	-0.07	-0.03
	(0.04)	(0.05)***	(0.05)	(0.05)	(0.05)
Openness	-0.17	-0.10	-0.40	-0.28	-0.23
	(0.06)***	(0.07)	(0.07)***	(0.07)***	(0.06)***
Observations	902	902	902	902	902

Controls for public officials' characteristics are included in each regression.
Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 7: Regional and organizational determinants of corruption

Dependent variable	(1) Total Corruption	(2) Legal and Regulatory Corruption	(3) Corruption in Personnel	(4) Corruption in Budget Management	(5) Administrative Corruption	(6) Corruption in Public Procurement
Audit	-0.39	-0.20	-0.27	-0.44	-0.26	-0.26
	(0.05)***	(0.05)***	(0.06)***	(0.07)***	(0.06)***	(0.06)***
Merit	-0.10	-0.10	-0.34	-0.10	-0.15	-0.11
	(0.04)**	(0.04)**	(0.05)***	(0.05)*	(0.05)***	(0.05)**
Openness	-0.20	-0.13	-0.07	-0.44	-0.22	-0.20
	(0.06)***	(0.06)**	(0.07)	(0.07)***	(0.07)***	(0.06)***
Income	0.00	0.02	-0.01	0.004	-0.01	-0.002
	(0.01)	(0.01)*	(0.01)	(0.01)	(0.01)	(0.01)
Education	-0.96	-1.43	-0.002	-3.29	0.58	-1.26
	(0.65)	(0.65)**	(0.70)	(0.79)***	(0.73)	(0.69)*
Firm concentration	2.07	-1.61	-4.26	19.08	-3.57	14.57
	(8.97)	(8.90)	(9.72)	(10.87)*	(10.07)	(9.57)
Estimation	Weighted OLS	Weighted SUR	Weighted SUR	Weighted SUR	Weighted SUR	Weighted SUR
R squared	0.88					
Observations	844	861	861	861	861	861

Country fixed effects and and controls for public officials' characteristics are included in each regression.
Income, Education and Firm Concentration refer to regional averages for all countries except Bolivia for which only national averages are available.
Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 8: Controlling for some agency features

	Total Corruption	Legal and regulatory corruption	Corruption in personnel	Corruption in budget	Administrative corruption	Corruption in public procurement
Audit	-0.18	-0.09	-0.11	-0.33	-0.08	-0.13
	(0.06)***	(0.06)*	(0.07)	(0.07)***	(0.06)	(0.06)**
Merit	-0.08	-0.04	-0.34	-0.06	-0.10	-0.06
	(0.05)	(0.04)	(0.05)***	(0.06)	(0.05)**	(0.05)
Openness	-0.26	-0.22	-0.07	-0.39	-0.28	-0.23
	(0.07)***	(0.06)***	(0.08)	(0.08)***	(0.07)***	(0.07)***
Municipal	2.79	0.40	4.96	6.48	0.32	0.89
	(1.31)**	(1.19)	(1.43)***	(1.52)***	(1.39)	(1.30)
Judiciary	-0.33	-1.45	-2.97	-0.78	-1.26	0.13
	(1.53)	(1.39)	(1.67)*	(1.78)	(1.63)	(1.53)
Families	-0.47	0.84	-0.61	-2.23	0.36	-0.23
	(1.02)	(0.93)	(1.11)	(1.19)*	(1.09)	(1.02)
Firms	3.48	1.42	2.64	2.45	3.96	2.51
	(1.07)***	(0.97)	(1.17)**	(1.25)**	(1.14)***	(1.07)**
Foreigners	0.98	0.08	1.29	1.47	-0.01	0.84
	(1.25)	(1.14)	(1.36)	(1.45)	(1.33)	(1.25)
Monopoly	0.83	0.08	2.31	0.02	0.04	-0.14
	(1.02)	(0.93)	(1.12)**	(1.19)	(1.09)	(1.02)
Estimation method	Weighted OLS	Weighted SUR	Weighted SUR	Weighted SUR	Weighted SUR	Weighted SUR
Observations	703	706	706	706	706	706
R-squared	0.89					

Regional fixed effects and controls for public officials' characteristics are included in each regression.
Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 9: Controlling for additional agency features

	Total Corruption	Legal and regulatory corruption	Corruption in personnel	Corruption in budget	Administrative corruption	Corruption in public procurement
Audit	-0.18	-0.10	-0.11	-0.33	-0.08	-0.13
	(0.06)***	(0.06)*	(0.07)	(0.07)***	(0.06)	(0.06)**
Merit	-0.08	-0.04	-0.33	-0.06	-0.11	-0.06
	(0.05)*	(0.04)	(0.05)***	(0.06)	(0.05)**	(0.05)
Openness	-0.25	-0.21	-0.06	-0.39	-0.26	-0.22
	(0.07)***	(0.06)***	(0.08)	(0.08)***	(0.07)***	(0.07)***
Municipal	0.28	-1.38	3.20	4.89	-2.90	-1.32
	(1.61)	(1.46)	(1.76)*	(1.88)***	(1.70)*	(1.60)
Judiciary	0.39	-0.43	-2.33	-0.52	-0.58	0.78
	(1.71)	(1.56)	(1.88)	(2.01)	(1.81)	(1.71)
Families	-0.11	1.25	-0.24	-2.02	0.78	0.09
	(1.03)	(0.94)	(1.13)	(1.20)*	(1.09)	(1.02)
Firms	4.40	2.02	3.24	3.04	5.16	3.33
	(1.13)***	(1.03)*	(1.25)***	(1.33)**	(1.20)***	(1.13)***
Foreigners	1.01	0.13	1.31	1.48	0.02	0.87
	(1.24)	(1.13)	(1.36)	(1.45)	(1.32)	(1.24)
Monopoly	-0.03	-0.69	1.63	-0.49	-1.01	-0.91
	(1.05)	(0.96)	(1.15)	(1.23)	(1.11)	(1.05)
Political	-0.83	-0.07	-0.44	-0.73	-1.33	-0.73
	(1.21)	(1.10)	(1.33)	(1.42)	(1.28)	(1.21)
Elected	3.82	3.28	2.85	2.22	4.67	3.41
	(1.12)***	(1.02)***	(1.23)**	(1.31)*	(1.18)***	(1.11)***
Estimation method	Weighted OLS	Weighted SUR	Weighted SUR	Weighted SUR	Weighted SUR	Weighted SUR
Observations	702	705	705	705	705	705
R-squared	0.89					

Regional fixed effects and controls for public officials' characteristics are included in each regression.
Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

**Table 10: OLS regression Dependent Variable: dishonesty of public institutions
as reported by firms and by households**

	Regional Fixed Effects		Country Fixed Effects	
	Dishonesty (Firms)	Dishonesty (Households)	Dishonesty (Firms)	Dishonesty (Households)
Audit	0.01	0.08	-0.03	-0.01
	(0.08)	(0.06)	(0.08)	(0.05)
Merit	0.05	0.06	-0.04	0.002
	(0.06)	(0.04)	(0.06)	(0.04)
Openness	-0.26	-0.08	-0.23	-0.07
	(0.09)***	(0.06)	(0.08)***	(0.05)
Municipal	4.91	4.66	1.63	1.71
	(3.13)	(2.33)**	(2.81)	(2.07)
Judiciary	1.52	7.66	-0.52	4.96
	(2.84)	(2.16)***	(2.57)	(1.92)***
Families	-3.93	-1.97	-6.38	-4.34
	(1.88)**	(1.40)	(1.71)***	(1.26)***
Firms	4.31	4.92	4.30	3.28
	(2.01)**	(1.57)***	(1.83)**	(1.40)**
Foreigners	1.42	2.59	2.17	3.35
	(2.54)	(1.65)	(2.29)	(1.46)**
Monopoly	1.79	2.25	2.07	2.38
	(1.76)	(1.28)*	(1.60)	(1.14)**
Political	-3.46	0.89	-6.13	-1.54
	(1.99)*	(1.53)	(1.81)***	(1.36)
Elected	6.62	5.98	4.96	3.85
	(1.89)***	(1.43)***	(1.72)***	(1.28)***
Observations	470	464	470	464
R-squared	0.92	0.96	0.93	0.96

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 11a: Reduced forms of corruption and organizational features

	Total Corruption	Audit	Merit	Openness
Municipal	0.76	-0.04	-0.64	-1.30
	(1.79)	(1.77)	(1.89)	(1.64)
Judiciary	0.89	-0.73	1.14	-2.12
	(1.90)	(1.89)	(2.00)	(1.74)
Families	1.10	-3.02	-2.51	-1.59
	(1.13)	(1.13)***	(1.20)**	(1.04)
Firms	4.86	-1.70	0.86	-1.17
	(1.25)***	(1.25)	(1.33)	(1.15)
Foreigners	-1.43	5.74	5.16	4.33
	(1.36)	(1.35)***	(1.44)***	(1.25)***
Monopoly	-0.33	0.93	0.11	0.87
	(1.17)	(1.16)	(1.23)	(1.07)
Political	-2.34	4.40	1.45	2.41
	(1.33)*	(1.33)***	(1.41)	(1.22)**
Elected	5.13	-2.45	-2.57	-3.05
	(1.24)***	(1.23)**	(1.30)**	(1.13)***
Observations	706	711	723	719
R-squared	0.86	0.97	0.96	0.97

Regional fixed effects and controls for public officials' characteristics are included in each regression.
Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%

**Table 11b: Reduced forms of dishonesty of public institutions
as reported by firms and by households**

	Regional Fixed Effects included		Country Fixed Effects included	
	Dishonesty (Firms)	Dishonesty (Households)	Dishonesty (Firms)	Dishonesty (Households)
Municipal	5.62	0.94	6.44	0.89
	(3.55)	(2.65)	(3.36)*	(2.44)
Judiciary	3.45	2.32	3.59	1.46
	(3.00)	(2.24)	(2.84)	(2.06)
Families	-6.37	-4.59	-6.62	-4.36
	(2.08)***	(1.56)***	(1.99)***	(1.44)***
Firms	1.66	8.28	2.32	8.20
	(2.10)	(1.60)***	(1.98)	(1.46)***
Foreigners	7.13	3.46	4.38	0.66
	(2.63)***	(1.94)*	(2.49)*	(1.78)
Monopoly	5.62	2.30	4.71	0.88
	(1.82)***	(1.36)*	(1.72)***	(1.25)
Political	-1.72	3.91	-3.77	2.42
	(2.48)	(1.84)**	(2.35)	(1.70)
Elected	2.37	3.76	0.54	2.06
	(2.29)	(1.70)**	(2.16)	(1.56)
Observations	480	474	480	474
R-squared	0.91	0.95	0.92	0.95

Standard errors in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%