

Corruption and Country Size

Evidence Using Firm-Level Survey Data

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Abstract

What sorts of conditions make some countries more prone to corruption than the others? This is an important question for understanding how corruption arises and how to combat it. The present paper attempts to answer this question by exploring the link between the size of the country and corruption. Economic theory suggests advantages and disadvantages of being a large country. Fixed costs in monitoring and punishing corrupt politicians and bureaucrats implies lower corruption in larger countries. However, congestion or administrative costs may escalate with country size. Further, greater diversity in the larger countries implies that such countries may find it harder to reach a consensus on growth-enhancing anti-corruption reforms. Thus, the corruption and country size relationship is an empirical

issue. Using firm-level survey data for 135 countries, this paper finds that the level corruption experienced by the firms is positively correlated with country size. This holds for a measure of overall corruption and petty corruption that arises in availing specific government services. According to a conservative estimate, moving from a country the size of Namibia (25th percentile level in size) to a country the size of Morocco (75th percentile level) is associated with an increase in the level of overall corruption by 0.28 percentage point or about 23 percent of its mean value. The results are robust to several controls, alternative corruption measures, sample alternations, and different country size measures.

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Corruption and Country Size: Evidence Using Firm-Level Survey Data

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1. Introduction

Corruption is one of the most vexing problems confronting us today, as it inflicts many different layers of economies by distorting incentives and weakening institutions. The most harmful consequence of these distortions is that they cause misallocation of resources and retard fundamentals of an economy such as investment, innovation, entrepreneurship, growth and productivity (i.e. Shleifer and Vishny 1993, Mauro 1995, Fisman and Svensson 2007). Yet, lack of reliable data has hampered the understanding of the sorts of conditions that make some countries more prone to corruption than the others. The present paper attempts to fill the gap in the literature by using firm-level survey data for 135 countries on the experience of the firms with corruption to analyze how the level of corruption is related to the size of the country. Economic theory suggests contrasting effects of country size on corruption, implying the issue is essentially empirical. Our empirical results indicate that corruption is significantly higher in the relatively larger countries. The finding is robust to several controls, alternative use of corruption indicators, exclusion of some of the smallest and largest countries in the sample, and different measures of country size. Thus, institutional checks aimed at combating corruption may require additional strengthening in the relatively large countries.

Economic explanations of corruption are typically couched in terms of the crime and punishment model (Becker 1968, Becker and Stigler 1974) or the principal-agent model (Rose-Ackerman 1978, Klitgaard 1988). According to the crime and punishment model, corrupt public officials choose an optimal level of corruption by equating marginal benefit (bribes received) and the marginal cost (probability of getting caught and losing legal wages and pension plus any penalty). Thus, corruption is lower when benefits from legal activity (government wages) are higher, the probability of a corrupt official being caught and punished is greater, and/or when the returns to corruption are lower due to for example, limited government intervention. According to

the principal-agent model, corruption arises because principals (citizens) who elect agents (politicians) to act on their behalf lack the information to control the corrupt behavior of politicians. Imperfect monitoring encourages public officials to misuse their discretionary power in implementing rules and regulations to maximize bribe-taking. Thus, these models of corruption emphasize better monitoring of public institutions and officials and increasing horizontal competition within government to reduce corruption.

Another strand of the literature links the country's size with the quality of governance and institutions. Alesina and Spolaore (2003) list several benefits of being a large country, such as lower per capita costs of public goods (monetary and financial institutions, judicial system, communication infrastructure, police and crime prevention, public health, et cetera) and more efficient tax systems; cheaper per capita defense and military costs; greater productivity due to specialization (though access to international markets may reduce this effect); greater ability to provide regional insurance; and greater ability to redistribute income within the country. Against these potential benefits, there are some disadvantages of being a large country. For example, it is argued that larger countries have more diverse preferences, cultures, and languages and this greater heterogeneity of preferences may make it more difficult to reach consensus on growth enhancing reforms. Another potential problem with large countries is congestion or administrative costs that may escalate with country size.¹

The theoretical arguments presented above can be extended to the case of corruption. Economies of scale in governance suggests that larger countries have more efficient bureaucracy, better implementation of laws, more effective rule of law, better quality of institutions that constrain corrupt politicians and bureaucrats, et cetera. All these factors translate into lower

¹ An overview of the related literature is provided in Alesina et al. (2005a) and Rose (2006).

corruption (discussed in detail below). However, if congestion and administrative costs escalate with country size, leading to diseconomies of scale or greater diversity of preferences in the larger countries and prevents growth-enhancing reforms, the quality of governance will be poorer and therefore, corruption will be higher in the larger countries. Further, small countries need to be better managed to be financially and economically viable; hence there may be less corruption in smaller countries (Wei 2000). However, as Knack and Azfar (2003) note, the reasons outlined above for the positive link between corruption and country size can be easily reversed. For example, regarding the diseconomies of scale related arguments in combating corruption, Knack and Azfar (2003) argue that it is equally plausible that small nations may have fewer fiscal resources to afford capable and honest civil servants and may therefore suffer from more corruption. Thus, the relationship between country size and corruption is essentially an empirical issue.

The empirical evidence on the relationship between corruption and country size is limited to a handful of studies and points towards mixed results. Treisman (1999) reports significantly higher corruption in relatively larger countries. He suggests that the result may be attributable to diminishing returns to scale in combating corruption. Elaborating on this point, Knack and Azfar (2003) speculate that if anti-corruption agencies must remain small to avoid infection by corrupt officers, Treisman's conjecture regarding diseconomies of scale in combating corruption might be justified. Fisman and Gatti (2002) also find that corruption increases with country size. They suggest that if large countries exploit economies of scale in the provision of public services (as shown by for example, Ades and Wacziarg 1997) and therefore have a low ratio of service outlets per capita, individuals might revert to bribes to get ahead of the queue. Mocan (2008) finds that especially for developing countries, larger population increases the risk of bribery. Goel and Budak

(2006) find that larger countries may find it tougher to control corruption. In contrast, using Transparency International's Corruption Perceptions Index for 1998, Root (1999) finds that in a cross-section of 60 countries, higher population is significantly associated with less corruption. Root attributes the findings to economies of scale in governance. Similarly, Anoruo and Braha (2005) find that in Africa, population growth and corruption are negatively correlated. Knack and Azfar (2003) demonstrate that the corruption measures typically used in the literature suffer from sample selection bias and correcting for this bias causes the relationship between country size and corruption to become much weaker or disappear. Similarly, when using total land area as a measure of country size, Goel and Nelson (2010) also find that country size has no significant impact on corruption.

The broader literature on the determinants of corruption highlights several factors (discussed in detail in section 2). Treisman (2000) finds that states of government, colonial history, trade openness, religious affiliation, and exposure to democracy have a significant impact on corruption. At the same time, greater ethnic fractionalization or diversity in the country has also been found to contribute positively to corruption (Dincer 2008, Glaeser and Saks 2004, La Porta et al. 1999). If members of one ethnicity are elected to a public position, they are more likely to maintain the position even if they display corrupt behavior. Goel and Nelson (1998) and subsequently, Kotera et al. (2012) report that larger government is associated with higher corruption. They find that in larger government, there appears to be lesser individual accountability and greater layers of bureaucracy which eventually leads to more corruption. Fisman and Gatti (2002) also find that fiscal decentralization in government expenditure is strongly and significantly associated with lower corruption. This was supported by a later study that found a negative

relationship between decentralization and shadow economies and corruption (Dell'Anno and Teobaldelli 2015).

The present paper contributes to the literature discussed above in several ways. First, as Fan et al. (2009) note, most previous studies have used perceived corruption indices that rely on the aggregated perceptions of businesspersons or country experts, many of whom may have formed impressions—perhaps subconsciously—based on common press depictions of countries or conventional notions about what institutions or cultures are conducive to corruption. Therefore, the use of the available macro-level indices raises concerns about perception biases. A similar point is made by Svensson (2003). We depart from the literature by using firms' experience with corruption instead. We do so for the overall corruption as well as petty corruption. Overall corruption is bribes paid by firms to “get things done” in general while petty corruption arises in conducting specific transactions such as obtaining electricity connection, obtaining import license, paying taxes, etc.² Second, most of the existing studies use macro-level data which cannot capture within-country variations in the level of corruption and the regulatory burden. As Svensson (2003) notes, firms facing similar institutions and policies may still end up paying different amounts in bribes for the same amount of services received. This is particularly important for the present paper since corruption depends in part on the effective implementation of rules which can vary significantly across firms within the country.

Our analysis reveals that corruption is indeed higher in the relatively large countries. Figure 1 illustrates the point graphically for overall corruption; Figure 2 does the same for petty corruption.³ Our empirical results confirm that the positive relationship in Figures 1 and 2 survives

² Overall and petty corruption are defined formally in the next section.

³ The figures control for GDP per capita (logs), although doing so does not make much difference to the relationship shown.

even after controlling for several firm-level and country-level variables. The relationship is quantitatively large. For instance, for the baseline specification, our most conservative estimate suggests that moving from a country of the size of Namibia (25th percentile value of population) to a country of the size of Morocco (75th percentile value of population) is associated with an increase in the level of overall corruption by 0.28 percentage point or about 23 percent of its mean value. This is an economically large increase.

The plan of the remaining sections is as follows. In section 2, we describe the data and the variables used in the regressions. Our empirical results for overall corruption and petty corruption are provided in section 3. We summarize the main findings in the concluding section and suggest scope for future work.

2. Data and main variables

In this section, we discuss the data. The main data source we utilize is firm-level survey data collected by the World Bank's Enterprise Surveys (ES). The ES are nationally representative surveys of the non-agricultural and non-financial private economy. A common sampling methodology – stratified random sampling – is followed in all the surveys along with a common questionnaire.⁴ The sample for each country is stratified by industry, firm-size, and location within the country. Weights are provided in the survey and used in all our regressions so that the sample is representative of the target population.

Our main regression results are based on a sample of 47,952 firms in 135 countries.⁵ Of these, 26,526 are manufacturing firms while the remaining 21,426 firms belong to the services

⁴ Details of the sampling methodology and other survey related information are available at www.enterprisesurveys.org.

⁵ The list of countries is provided in Table A1 in the Appendix. All the countries covered by ES are included in this study.

sectors. The firms were surveyed between 2006 and 2018. The sample is a pure cross-section in that each country (and firm) is included only once. The most recent round of ES available for the country is used. This constitutes our baseline sample.

We complement the ES with several other data sources to control for country characteristics such as income level, gross primary school enrollment ratio, ethnic fractionalization, et cetera. Data sources for these variables include World Development Indicators (WDI, World Bank), Freedom House's Economic Freedom of the World, Polity IV, Worldwide Governance Indicators (World Bank), Alesina et al. (2003), and La Porta et al. (1999). A formal definition of all the variables used in the regressions is provided in Table 1.

2.1 *Dependent variable*

Our dependent variable is a measure of corruption experienced by the private firms. The ES asked firms about their experience with overall corruption. Specifically, firms were asked the amount of bribe (as percentage of annual sales) firms like itself typically pay to public officials to "get things done". The motivation for this question is that firms are most likely to report their own experience with paying bribes. Our main measure of corruption is this bribe amount reported by the firms and expressed as a percentage of the firms' annual sales (*Overall Corruption*). The variable ranges between 0 and 100 with a mean value of 1.19 and the standard deviation equals 5.50. Averaged at the country level, overall corruption is lowest in Eritrea (0 percent) and highest in Niger (10.3 percent).

The ES also contains information on petty corruption. That is, instances of corruption that firms experience in soliciting the following public services, licenses and permits: obtaining electricity connection, obtaining water connection, obtaining construction permit, obtaining import

license, obtaining operating license, and inspections or meetings with tax officials. Based on this information, the ES compiles two separate measures of petty corruption. The first measure is the incidence of petty corruption defined as a dummy variable equal to 1 if a firm experienced a bribe payment or request for one or more of the six transactions listed above (*Petty Corruption Incidence*). The second measure is the depth of petty corruption defined as the percentage of the 6 transactions for which the firm experienced a bribe payment or a request for one (*Petty Corruption Depth*).⁶ We use both these measures of petty corruption as our dependent variables. The mean value of *Petty Corruption Incidence* equals 0.18 and the standard deviation is 0.39; the corresponding figures for *Petty Corruption Depth* are 14.1 and 32.1, respectively.

2.2 Main explanatory variable

Our main explanatory variable is a measure of country size. Following the broader literature, we use the (log of) total population of the country as our main measure of the size of the country (*Population*). We use five-year lagged values (from the date of the ES) of the variable to minimize concerns about the reverse causality problem. The mean value of *Population* in our baseline sample equals 15.7 log points (or 42 million people) and the standard deviation equals 1.96. The smallest country in our sample has a population of 47,971 (St. Kitts and Nevis) while the largest country has a population of about 1.3 billion (China). The data source for the variable is WDI.

Another measure of country size frequently used is the total surface area of the country. For a robustness check, we use (log of) country's total surface area as a measure of country size (*Area*). The variable is taken from WDI.

⁶ The two measures of petty corruption are available for only those firms that solicited the public services listed above or were inspected by tax officials. For the bribery depth measure and following the ES methodology, a refusal to answer a question on whether bribes were requested or expected is considered as an affirmative answer.

2.3 Other explanatory variables

Reverse causality from corruption that varies at the firm-level to the size of the country which varies at the country-level is highly unlikely. A more serious problem with our results for the relationship between corruption and country size (henceforth, main results) is the omitted variable bias problem. To guard against this problem, we control for several potential determinants of corruption that may also vary systematically between small and large countries. These controls are motivated by the existing studies on the determinants of corruption. They can be grouped into micro or firm-level and macro or country-level determinants.

Firm-level studies suggest that the level of corruption experienced by a firm depends on its ability to pay bribes, outside options available, bargaining power vis-à-vis public officials, visibility/exposure to public officials, and the degree of interaction with the various government agencies. These determinants of corruption are proxied by various firm characteristics in the literature which motivates our choice of the firm-level controls. The data source for all firm-level controls used below is ES.

First, industry choice affects firms' ability pay bribes, outside options available to the firm, its bargaining power against public officials, and the degree of its interaction with the government officials. Industry choice affects firms' position in the value-added chain and level of competition. This may in turn affect the perceived ability to pay bribes (see for example, Rand and Tarp 2012). Industry-specific requirements also affect the sunk cost component of physical capital and therefore a firm's outside options and bargaining power with the public officials. Industries with greater reliance on publicly provided physical infrastructure (electricity, water, et cetera) and institutions (courts, police, et cetera) are likely to have lower bargaining power and more

interactions with public officials. This will increase their susceptibility to corrupt public officials. If the industry composition varies systematically with the size of the country, our main results could suffer from omitted variable bias. To guard against this possibility, we control for industry fixed effects using dummy variables for the industry to which the firm belongs. In our sample, there are 10 industries defined at the 2-digit ISIC Rev 3.1 level.

Next, we control for two basic firm characteristics that include (log of) number of workers employed (Firm Size) and (log of) age of the firm. The literature suggests contrasting effects of these variables on corruption experienced by the firms. Larger and older firms are more visible and therefore, more exposed to the demands of corruption. They may also have higher ability to pay bribes due to their higher profitability and better access to finance. Further, large and more established firms may have higher sunk costs in terms of the physical capital, industry know-how and reputation. This will weaken their bargaining position with public officials, resulting in greater demand for bribes. Countering these effects, large and old firms may be less reliant on publicly provided utilities and services, have stronger political connections and have managers who are more skillful in negotiating with the public officials. The net effect of these forces will determine how corruption faced by a firm depends on its size and age. If the size and age of firms vary systematically between small and large countries, our main results could be spuriously affected. Controlling for firm-size and age of the firm guards against this possibility.

A firm's profitability and therefore, its ability to pay bribes depends on several additional factors such as management quality, financial condition, infrastructure availability and the quality of institutions. It is also possible that factors such as financial condition of the firm and the experience of its top management could affect its ability to deal with corrupt public officials as well its outside options. If firm characteristics happen to vary systematically with country size, our

main results could suffer from omitted variable bias problem. To guard against this possibility, we control for several firm-level variables for manager's experience, access to finance, the quality of physical infrastructure, and the institutional environment. We do so using the following variables: (log of) number of years of experience the top manager of the firm has working in the industry (Manager Experience); dummy variable equal to 1 if the firm has overdraft facility and 0 otherwise (Overdraft); dummy variable equal to 1 if the firm has a loan or line of credit and 0 otherwise (Line of Credit); total hours of power outages experienced by the firm over the last year (Power Outages); and how much of an obstacle is the (lack of proper) functioning of the courts for firms' operations as reported by the firms (How Much of An Obstacle: Courts).

Several studies analyze the possible effects of business regulations on corruption. Generally, the underlying motivation for these studies is that regulation provides opportunities for politicians and public officials to extort bribes from the private firms (*tollbooth* view of regulation). Djankov et al. (2002) look at the relationship between entry regulations across countries and the level of corruption and find evidence consistent with the tollbooth view. That is, more entry regulations are associated with higher corruption. Ades and Di Tella (1997) find that corruption is higher when governments promote industrial policy. Svensson (2003) reports that in a cross-section of Ugandan firms, the incidence of corruption is highly correlated with the extent to which rules and regulations give public officials the bargaining rights to extort bribe payments from firms. Duvanova (2014) finds no impact of regulations on the books (*de jure* regulation) on corruption but the actual regulatory burden experienced by the firms (*de facto* regulation) is significantly positively correlated with corruption. Other studies that report higher corruption associated with more regulation include for example, Kaufmann and Wei (2000), Lash and Batavia (2013), Manzetti and Blake (1996), and Holcombe and Boudreaux (2015). These findings suggest that if regulation varies systematically with the country size, our main results could be spuriously

affected. Thus, as in Duvanova (2014), we control for a *de facto* measure of regulatory burden on the firms which is the percentage of senior management's time that is spent in dealing with business regulations (Time Tax). Later, we introduce another control for business regulations based on macro-level data.

Next, we control for firm's exposure to international markets. Several studies have shown that exporting firms tend to be more productive and profitable either due to self-selection or learning effects. Higher profitability suggests greater ability to pay bribes. Another possibility is that firms engaged in international markets have greater visibility and greater interaction with government officials due to additional rules related to customs clearance. Similar arguments apply to firms with foreign ownership. Our main results could suffer from the omitted variable bias problem if the level of exposure to the international markets also happens to vary systematically with the size of the country. We guard against such possibility by controlling for the percentage of firm's annual sales made abroad (Exports) and a dummy variable equal to 1 if foreign individuals, companies or entities own 10 percent or more of the firm and 0 otherwise (Foreign Ownership).

Last, we control for fixed capital investment. Information is available in the ES on whether the firm purchased any fixed assets during the last year or not. We use this dummy variable as a proxy for capital stock.

Regarding macro-level drivers of corruption, the existing literature suggests several aspects of a country's economic structure, institutions and culture to be significantly related to the indicators of corruption (see for example, Svensson 2005, Fan et al. 2009, and Dimant and Tosato 2018 for an overview). Unless stated otherwise, all the country-level controls discussed below are lagged by two years from the date of the ES. This is done to allow any possible lags in their effect on corruption, although lagging does not affect our main results much.

There is now robust evidence that higher levels of GDP per capita is associated with lower corruption (La Porta et al., 1999; Ades and Di Tella, 1999; Svensson, 2005; Fan et al., 2009). If the level of income also varies systematically with country size, our main results could suffer from the omitted variable bias problem. Thus, we control for (log of) GDP per capita (PPP adjusted and at constant 2011 international dollars) taken from WDI. We complement the GDP per capita control with the annual growth rate of GDP per capita to capture any possible impact of recent changes in economic activity on the level of corruption. The data source for the variable is WDI.

There is some work on the impact of education attainment on civil participation and punishing the corrupt officials. Most studies in the area suggest that education lowers corruption. That is, education leads to a more vigilant political participation and “elite-challenging” behavior that identifies and punishes corrupt behavior (see for example OECD, 2007; Eicher et al., 2009). Empirical studies that confirm this prediction include for example, Galston (2001), Carpini and Keeter (1996), Popkin and Dimock (1999), Glaeser and Saks (2006), Goel and Nelson (2011), Nie et al. (1996).⁷ Thus, our main results could be biased if the level of education attainment also varies systematically with the country size. To guard against this possibility, we control for education attainment using the gross enrollment rate in primary education (Primary Education). Due to missing data, we use average values of the variable over the last two years (prior to the date of ES) for which data are available. The data source for the variable is WDI.

The degree of urbanization might also play a role in the level of corruption in a country. Meier and Holbrook (1992) argue that urbanization fosters the necessary conditions for corruption by loosening the social controls of family and religion, and by concentrating government programs and resources. Their empirical evidence shows a strong positive correlation between urbanization

⁷ A few studies provide a counter view that higher education attainment increases output and therefore corruption rents; this implies a positive impact of education on corruption (see for example Eicher et al., 2009).

and corruption. However, Goel and Nelson (2010) find the opposite. They argue that corrupt practices are easier to detect and stigmatized in urban areas. Notwithstanding these contrasting effects of urbanization, the possibility of a systematic relationship between urbanization and corruption cannot be ruled out. If the degree of urbanization also varies systematically with country size, our main results could suffer from omitted variable bias. Thus, we control for the percentage of people living in urban areas (Urbanization). The data source for the variable is WDI.

Government size can also impact corruption. One view is that since a larger government promotes a system of checks and balances, strengthens accountability and enforcement measures, an increase in the government size should reduce corruption. This viewpoint is inferred from the fact that developed countries generally have bigger governments and are less corrupt than developing countries. Empirical studies confirming this view include for example, La Porta et al. (1999), Adsera et al. (2003), Billger and Goel (2009), and Goel and Budak (2006). The alternative view is that an increase in government size provides more opportunity for political rent-seeking, causing the politicians and bureaucrats to become more corrupt (e.g., Rose-Ackerman 1978, 1999; Alesina and Angeletos 2005, Goel and Nelson 1998, Arvate et al. 2010, and Bergh et al. 2017). The direction of the relationship between corruption and government size depends on the net of the contrasting effects discussed above. If the size of the government also varies systematically with our measure of country size, our main results could suffer from omitted variable bias. Thus, we control for the government size using Freedom from Government Size indicator from Fraser Institute's Economic Freedom of the World database. Note that higher values of the variable imply smaller government size.

Corruption has also been linked to trade openness. Theory suggests that greater trade openness lowers corruption due to fewer and less stringent trade restrictions (Krueger, 1974; Gatti,

1999); increased foreign competition that reduces rents at the margin (Ades and Di Tella, 1999); and more international investors who are particularly sensitive to the costs imposed by corruption (Wei, 2000). However, the opposite case has also been proposed. Ades and Di Tella (1999) argue that the cost of corruption is higher in less open societies, implying that such societies devote more resources to combating corruption. Similarly, Tanzi (1998) reports that trade liberalization has created new opportunities for corruption and paying bribes gives greater advantages in obtaining privileged access to markets. Empirical evidence on the issue largely favors a negative relationship between corruption and trade openness (see for example, Krueger 1974, Ades and Di Tella 1999, Wei 2000, Gatti 2004, Gokcekus and Knorich 2006), although a few studies find a positive or no significant relationship between the two (see for example, Tanzi 1998, Torrez 2001, Majeed 2014). Thus, if the degree of trade openness also varies systematically with size of the country, the possibility of our main results suffering from the omitted variable bias problem cannot be ruled out. We guard against this possibility by controlling for trade openness defined as the ratio of merchandise exports plus imports to GDP (Merchandise Trade). The data source is WDI.

Our next set of controls includes two historical factors, ethnic fractionalization and the legal origin of the country. The existing literature suggests that countries with higher ethnic fractionalization might be more corrupt (Shleifer and Vishny 1993, Mauro 1995). One reason for this is lack of obedience with respect to the state as civil servants and politicians aim to exploit their positions to favor members of their own ethnic group. Another reason suggested in the literature is that divided societies tend to under-provide public goods, and this in turn creates opportunities for corruption rents (Pellegrini and Gerlagh 2008). There is a large literature that argues that the kind of legal codes that are in place in a country affect the quality of governance including corruption. Specifically, theories trace the effort of property owners to limit the

discretionary power of the crown as the origin of the common law legal system (Glaeser and Shleifer 2002). Furthermore, they suggest that the actions of the independent judiciary system in countries that adopted the British Common Law system are more conducive to lower levels of corruption (see for example, La Porta et al. 1999, Pellegrini and Gerlagh 2008). Empirically, Treisman (2000) found that countries with common law had lower levels of corruption than the rest. Similar findings are reported by Goel and Nelson (2010). These findings suggest that if the degree of ethnic fractionalization and type of legal system also vary with the size of the country our main results could be spuriously affected. Thus, we control for the degree of ethnic fractionalization and the legal origin of the country. For ethnic fractionalization, we use the estimates provided by Alesina et al. (2003). For legal origin, we use dummy variables indicating if the country's legal system is based on Common Law or Civil Law. The omitted category here is the Socialist legal system. The data source for the variable is La Porta et al. (1999).

It is often argued that civil participation in the form of democracy can combat corruption. Democracy offers a mechanism to monitor the behavior of government officials more closely and to remove corrupt politicians via the electoral process. However, the opposite is also possible. That is, greater democracy could increase corruption as it provides more people with access to public funds and positions in the public sector.⁸ Both these effects could play out simultaneously and their net impact will determine how corruption and democracy are related. Existing empirical evidence on the corruption and democracy link is mixed. That is, while some studies find corruption is significantly lower under democracy than autocracy (Treisman 2000, Bhattacharyya and Hodler 2015, and Iwasaki and Suzuki 2012), others find no significant relationship between the two (Fisman and Gatti 2002, Ades and Di Tella 1999) or that the direction of the relationship

⁸ Theoretical models that show greater rent seeking by public officials and politicians and therefore greater corruption under democracy than in autocracy include for example, Corchon (2008) and Mohtadi and Roe (2003).

depends on GDP per capita (Jetter et al. 2015) and how mature the democracy is (Rock 2009). Notwithstanding the mixed nature of these findings, the possibility of a systematic correlation between corruption and democracy cannot be ruled out. If the level and quality of democracy also varies systematically with country size, our main results could be spuriously affected. We guard against this possibility by controlling for the quality of democracy in the country using the “Polity” measure from the Polity IV database.

Next, for civil society to play an important role in the fight against corruption,⁹ an enabling institutional environment is needed in terms of freedom of press, ability of citizens to voice their dissatisfaction against the government without any fear of political oppression and unjust imprisonment (see for example, Themudo 2013). Similarly, the quality of bureaucracy and its independence from political pressures, the quality of policy formulation and implementation, the credibility of the government's commitment to such policies can have significant effects on the level of corruption. If the level of regulation also varies systematically with the quality of bureaucracy or protection against political pressure and unjust imprisonment, our main results could suffer from the omitted variable bias problem. Thus, we control for the quality of bureaucracy using the Government Effectiveness measure from Worldwide Governance Indicators. For protection against political pressure and unjust imprisonment, we control for a sub-component of the Rule of Law measure from Freedom House’s Freedom in the World data set. The sub-component aims to capture if there is protection from political terror, unjustified imprisonment, exile, or torture, whether by groups that support or oppose the system, and if there is freedom from war and insurgencies (Rule of Law (Protection)).¹⁰

⁹ For the role of civil society in combatting corruption, see for example OECD (2003), World Bank (1997), Themudo (2013), Lambsdorff (2005) and McCoy and Heckel (2001).

¹⁰ Data for the Rule of Law (Protection) variable are not available for all the years covered by our sample. We use year 2013 values for all the countries. Thus, the variable is not included in our panel estimation results.

Above, we argued that failure to account for differences in the regulatory burden on the private sector across countries could bias our main results. We sought to address the problem using a firm-level de facto measure of regulatory burden on the firms, Time Tax. We complement this control for business regulations with another one which is the freedom from business regulations taken from Fraser Institute's Economic Freedom of the World database. Note that higher values of the variable imply less regulation of businesses.

Last, several studies have explored the relationship between corruption and inflation. Akça et al. (2012) provide a useful summary of the theoretical and empirical literature in the area. For instance, it is commonly believed by the public that inflation causes moral erosion (Paldam, 2002) and creates more opportunities for illegal and unethical behavior such as jugglery or cheating (Braun and Di Tella, 2004). Thus, higher inflation encourages greater corruption. Another argument is that inflation distorts income distribution in favor of capital owners and against those with fixed incomes including civil servants. The perceived imbalance in incomes stimulates corrupt behavior (You and Khagram, 2005). Empirical studies that find a positive impact of inflation on corruption include Braun and Di Tella (2004) Paldam (2002), Getz and Volkema (2001), Ata (2009), Tosun (2002), and Akça et al. (2012). If the level of inflation also varies systematically with the country size, our main results could be spuriously affected. We guard against this possibility by controlling for the annual rate of inflation (GDP deflator) using data from WDI.

Summary statistics of all the variables used in the regressions are provided in Table 2 while the correlations between the various controls and the measures of country size are provided in Table 3.

3. Empirical results

Our empirical results are obtained by estimating the following equation:

$$\begin{aligned} \text{Corruption}_{ij} = & \alpha + \beta_1 \text{Country size}_j + \alpha_1 \text{Firm Controls}_{ij} + \alpha_2 \text{Country Controls}_j \\ & + \text{Industry fixed effects} + \text{Year fixed effects} + \varepsilon_{ij} \end{aligned} \quad (1)$$

where i and j subscripts indicate firm and country, respectively. In separate regressions and for our main regressions, Corruption_{ij} is *Overall Corruption*, *Petty Corruption Incidence*, and *Petty Corruption Depth*. For our main or baseline regressions, country size is proxied by *Population* and by *Area* in our robustness checks. The firm-level and country-level controls are as discussed above. The model is estimated using the ordinary least squares method (OLS) when corruption is a continuous variable (*Overall Corruption* and *Petty Corruption Depth*) and the logit method when corruption is a dummy variable (*Petty Corruption Incidence*). All the regressions discussed below control for industry and year fixed effects. Robust standard errors are used throughout. Unless stated otherwise, all references to “significant” or “insignificant” estimated co-efficient values refer to the conventional 10 percent level.

3.1 Overall Corruption

Table 4 contains the results for *Overall Corruption* as the dependent variable and *Population* as the measure of country size. These results show a large positive and statistically significant relationship at the 1 percent level between overall corruption and population. This holds with or without the various controls. That is, without any other controls (except for industry and year fixed effects), the estimated coefficient value of *Population* equals 0.206 (column 1). The coefficient value implies that an increase in country size from the level of Namibia (25th percentile value of population) to the level of Morocco (75th percentile value of population) is associated with an

increase in overall corruption by a large 0.52 percentage point, or about 44 percent of its mean value. Controlling for GDP per capita causes the estimated coefficient value of *Population* to decline somewhat to 0.172 (column 2) and to 0.110 when we control for the various firm-level controls (column 3). Despite the decline, the relationship between corruption and population is still large, positive and significant at the 1 percent level. Adding the various macro-level controls to the specification causes the estimated coefficient value of *Population* to rise noticeably from 0.110 above (column 3) to 0.319 (column 4). We confirm that this increase is entirely due to the controls and not the decline in sample.¹¹ Based on the most conservative estimate so far (column 3), moving from a country at the 25th to the 75th percentile value of *Population* is associated with an economically large increase in the level of overall corruption by 0.28 percentage point or about 23 percent of its mean value.

Several control variables show a significant correlation with the level of corruption. Higher values of time tax and purchase of fixed assets are associated with higher corruption, significant at the 1 percent level; better functioning courts and greater manager experience are associated with lower corruption, significant at the 10 percent level. These results are consistent with the theoretical predictions above. The remaining firm-level controls show no robust and significant relationship with overall corruption.¹²

Several macro-level controls are significantly correlated with overall corruption. Consistent with the theoretical predictions above, overall corruption is significantly lower in countries that have higher GDP per capita (at the 1 percent level), more educated population (at the 5 percent level), better quality of democracy (at the 1 percent level), lower ethnic

¹¹ The sample size declines when we include the macro-level controls due to missing data.

¹² Better access to finance as reflected in having a line of credit is associated with significantly higher corruption, but this relationship is conditional on some of the other macro-level controls.

fractionalization (at the 1 percent level), and better rule of law in terms of protection against state oppression (at the 1 percent level). Although, theory offers little insight on how corruption depends on the growth rate of GDP per capita, we find that the two are inversely significantly correlated (at the 5 percent level). Two results that are different from the general findings in the literature are that countries that trade more have higher level of overall corruption (significant at the 1 percent level) and civil law countries have significantly lower level of overall corruption than both the common law and the socialist legal origin countries (differences are significant at the 1 percent level). We confirm that our main results continue to hold even if we do not include controls for legal origin of countries and the trade-to-GDP ratio.

3.2 *Petty corruption*

We repeat the regression exercise above for petty corruption as the dependent variable. For the incidence of petty corruption, estimated marginal effects from logit estimation are provided in Table 5 while Table 6 contains the OLS results with the depth of petty corruption as the dependent variable. As for overall corruption, the incidence and depth of petty corruption are both positively correlated with the country size and this correlation is significant at the 1 percent level in all the specifications. The only exception occurs when we regress the incidence of petty corruption on country size without any controls (other than industry and year fixed effects). Here, the relationship between the two is statistically weak (insignificant at the 10 percent level), although it is still quantitatively large (column 1, Table 5). The relationship becomes significant (at the 1 percent level) when we control for GDP per capita (column 2, Table 5). This happens entirely due to the greater precision with which the stated relationship is estimated (that is, due to lower standard errors) rather than any increase in the estimated coefficient value of *Population*. In fact, controlling

for GDP per capita causes a marginal drop in the estimated marginal effect of *Population* from 0.020 (column 1, Table 5) to 0.017 (column 2, Table 5). The results suggest that an increase in the size of the country from the 25th to 75th percentile value is associated with an increase in the incidence of petty corruption by 2.8 to 7 percentage points depending on the specification used. This is a large increase given that the mean incidence of petty corruption equals 18 percent. The corresponding increase in the depth of petty corruption ranges between 3.2 and 6.2 percentage points against the mean of 13.8 percent.

There are some differences from above in the results for the various controls which are as follows. For firm-level controls, time tax shows no significant correlation with petty corruption (incidence and depth). This is not surprising as the time tax variable relates to the overall regulatory burden while petty corruption relates to specific transactions. Purchase of fixed assets during the last year shows a somewhat weak relationship with the depth of petty corruption in that it is significant only when we control for some of the macro-level controls but not otherwise. For the country-level controls, there are several changes. Education attainment, quality of democracy, growth rate of GDP per capita and ethnic fractionalization do not show any significant correlation with petty corruption (incidence and depth). Further, the significant negative relationship between GDP per capita and the incidence of petty corruption becomes insignificant when we control for some of the country-level variables (column 4, Table 5). The same holds for the relationship between the depth of petty corruption and having a legal system based on the Civil Law system (column 4, Table 6). Both the incidence and depth of petty corruption are significantly lower in countries with lower inflation, larger size of the government, and more effective governments (Government Effectiveness). We also find that greater freedom from business regulations is associated with lower petty corruption, but this result is somewhat weak in that it holds for the

depth of petty corruption (significant at the 10 percent level) but not for the incidence of petty corruption.

3.3 Surface area as the measure of country size

We repeat the regression exercise for overall and petty corruption above (Tables 4, 5 and 6) using surface area as the measure of country size. Regression results are provided in Table 7. For brevity, only some of the specifications are shown. Columns 1-3 contain results for overall corruption, columns 4-6 contain results for the incidence of petty corruption (marginal effects) while columns 7-9 contain results for the depth of petty corruption. As is evident from Table 7, there is no qualitative change from above in the results for the corruption and country size relationship.

3.4 Disregarding small bribes

One concern with our results for overall corruption above could be the presence of very small bribe levels that could have an unduly large impact on our regression results. To ensure that our results are not unduly affected by such values of overall corruption, we set to zero all values of overall corruption equal to or less than 0.1 percent. Regression results using this adjusted overall corruption as the dependent variable are provided in Table A2 in Appendix A. These results are qualitatively the same as the ones discussed above for overall corruption.

3.5 Excluding very small and very large countries from the sample

We confirm that our results are not driven by some very small or very large countries. To this end, we dropped extremely small and large countries from the sample. Using the population variable for country size, we exclude all small countries with a population of less than 2 million and the

largest 4 countries in our sample.¹³ Regression results for the reduced sample are provided in Table 8. For brevity, only some of the specifications are shown. Table 8 clearly shows that the qualitative nature of the relationship between corruption (overall corruption, incidence and depth of petty corruption) and *Population* remains intact.

3.6 Additional controls

Starting with our final baseline specification (column 4, Table 4), we experimented by adding some more controls for extra robustness. The controls include dummy variables for the region (region fixed effects)¹⁴; religious affiliation of countries captured by the proportion of population that is Catholic, Muslim and Protestant (omitted category is all other religions)¹⁵; a measure of the independence of the judiciary taken from Freedom House's Economic Freedom of the World database (Judicial independence); and a measure of the functioning of the government based on whether elected officials determine the policies of the government, steps taken by the government to combat corruption and whether the media and public can freely express their views regarding corruption, and if the government is answerable to the electorate between elections and if it works with transparency, taken from Freedom House's Economic Freedom of the World database (Functioning of the government).¹⁶ There is no qualitative change in our main results due to these controls (Table A3 in the Appendix provides the full results).

¹³ The largest 4 countries excluded have a population of more than 190 million and include Brazil, China, India, and Indonesia. We experimented with alternative samples such as excluding the largest 5 percent and the smallest 5 percent of the countries, but this did not change the qualitative nature of the results discussed in this section.

¹⁴ The regions are Sub-Saharan Africa, East Asia and the Pacific, Eastern Europe and Central Asia, Latin America and the Caribbean, South Asia, and Middle East & North Africa. The data source for the regions is WDI, World Bank.

¹⁵ Data on religions are taken from Maoz and Henderson (2013). The data are available for every 5 years. We use year 2010 values for all the countries in our sample. The data are available at: <http://www.thearda.com/Archive/Files/Descriptions/WRPNATL.asp>.

¹⁶ For the two measures from Freedom House's Economic Freedom of the World, we use year 2013 values for all the countries. Due to missing data for several years, we are unable to match these variables to the year the ES was conducted.

4. Conclusion

Combating corruption requires a proper understanding of what sorts of factors make some countries more prone to corruption than the others. Yet efforts in this direction are significantly constrained by lack of reliable data on corruption. The present paper takes one step in this direction by using firm-level survey data on firms' experience with corruption to analyze how the size of the country is associated with the level of corruption. Theory suggests both advantages and disadvantages of being large, implying the issue is essentially empirical. Our results show that overall corruption and petty corruption associated with specific public transactions are much higher in large than small countries. Thus, large countries need to strengthen monitoring and punishment of potentially corrupt politicians and bureaucrats more than the small countries.

Several issues remain to be explored. We highlight a couple of them to illustrate the point. First, data limitations do not allow us to empirically identify the mechanisms through which the size of the country affects the level of corruption. Theory suggests that large countries could suffer due to diseconomies of scale in implementing policies and monitoring public officials; another possibility is greater diversity of preferences in the relatively large countries that makes it more difficult to reach a consensus on growth enhancing reforms. Understanding which of these or other mechanisms are at play will help in designing appropriate policies to combat corruption. Second, several other factors are found in the literature to affect corruption. Examples include overall economic development or per capita income, legal origin of countries, business regulations, etc. One issue that is not discussed in theoretical or empirical studies is whether the drivers of corruption work independently of each other or substitute or complement one another. This remains an important task for future research.

References

- Ades, A., & Wacziarg, R. (1997). Openness, Country Size and Government. *Journal of Public Economics*, 69 (3): 305 – 321.
- Akça, H., Ata, A. Y., & Karaca, C. (2012). Inflation and Corruption Relationship: Evidence from Panel Data in Developed and Developing Countries. *International Journal of Economics and Financial Issues*, 2 (3): 281 – 295.
- Ades, A., & Di Tella, R. (1999). Rents, Competition and Corruption. *American Economic Review*, 89 (4): 982 – 993.
- Adserà, A., Boix, C., & Payne, M. (2003). Are You Being Served? Political Accountability and Quality of Government. *Journal of Law, Economics, and Organization*, 19: 445 – 490.
- Aidt, T., Dutta, J., & Sena, V. (2008). Governance Regimes, Corruption and Growth: Theory and Evidence. *Journal of Comparative Economics*, 36 (2): 195 – 220.
- Alesina, A. & Spolaore, E. (2003). *The Size of Nations*. MIT Press: Cambridge.
- Alesina, A., Devleeschauwer, A., Easterly, W., Kurlat, S., & Wacziarg, R. (2003). Fractionalization. *Journal of Economic Growth*, 8: 155 – 194.
- Alesina, A., Spolaore, E., & Wacziarg, R. (2005a). Trade, Growth and the Size of Countries. In Philippe, A., & Durlauf, S. N. (Eds.) *Handbook of Economic Growth*, pp. 1499 – 1542. Elsevier: North-Holland.
- Alesina, A., & Angeletos, G. (2005b). Corruption, Inequality, and Fairness. *Journal of Monetary Economics*, 52 (7): 1227 – 1244.
- Anoruo, E., & Habtu, B. (2005). Corruption and Economic Growth: the African Experience. *Journal of Sustainable Development in Africa*, 7 (1): 43 – 55.
- Arvate, P. R., Curi, A. Z., Rocha, F., & Sanches, F. A. (2010). Corruption and the Size of Government: Causality Tests for OECD and Latin American Countries. *Applied Economics Letters*, 17 (10): 1013 – 1017.
- Ata, A. Y. (2009). *Opportunity and Motivation of Corruption in the Framework of Institutional Economics: An Analysis on EU Countries*. Economic Research Foundation Publications: Istanbul.
- Bai, J., Jayachandran, S., Malesky, E. J., & Olken, B. A. (2013). Does Economic Growth Reduce Corruption? Theory and Evidence from Vietnam. National Bureau of Economic Research, No. W19483.
- Becker, G. S. (1968). Crime and Punishment: An Economic Approach. *Journal of Political Economy* 76 (2): 169 – 217.
- Becker, G. S., & Stigler, G. J. (1974). Law Enforcement, Malfeasance and Compensation of Enforcers. *Journal of Legal Studies*, 3 (1): 1 – 18.
- Bergh, A., Fink, G., & Öhrvall, R. (2017). More Politicians, More Corruption: Evidence from Swedish Municipalities. *Public Choice*, 172 (3): 483 – 500.
- Billger, S. M., & Goel, R. K. (2009). Do Existing Corruption Levels Matter in Controlling Corruption? Cross-country Quantile Regression Estimates. *Journal of Development Economics*, 90: 299 – 305.
- Braun, M., & Di Tella, R. (2004). Inflation, Inflation Variability, and Corruption. *Economics & Politics*, 16 (1): 77 – 100.
- Carpini, M. X. D., & Keeter, S. (1996). *What Americans Know About Politics and Why It Matters*. Yale University Press: New Haven, CT.
- Dell'Anno, R., & Teobaldelli, D. (2015). Keeping Both Corruption and the Shadow Economy in Check the Role of Decentralization. *International Tax and Public Finance* 22 (1): 1 – 40.

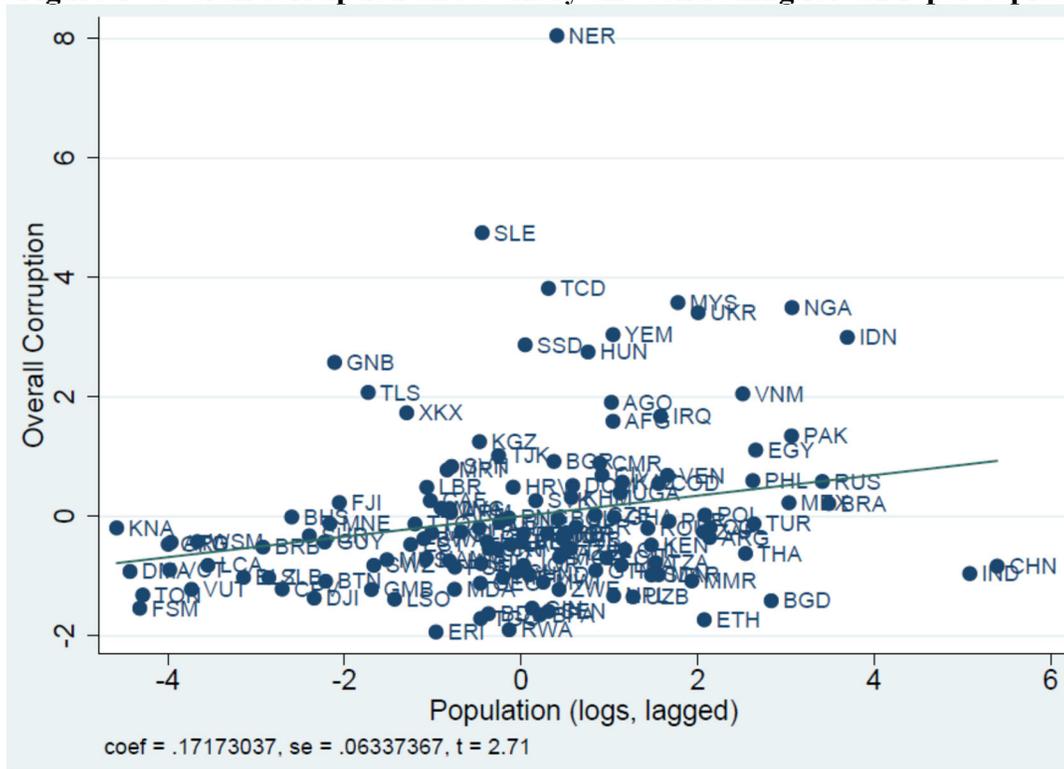
- Dincer, O. C. (2008). Ethnic and Religious Diversity and Corruption. *Economics Letters*, 99 (1): 98 – 102.
- Eicher, T., Garcia-Penalosa, C., & van Ypersele, T. (2009). Education, Corruption, and the Distribution of Income. *Journal of Economic Growth*, 14 (3): 205 – 231.
- Fan, C. S., Lin, C. & Treisman, D. (2009). Political Decentralization and Corruption: Evidence from Around the World. *Journal of Public Economics* 93: 14 – 34.
- Fisman, R. and Gatti, R. (2002). Decentralization and Corruption: Evidence Across Countries. *Journal of Public Economics*, 83 (3): 325 – 345.
- Fisman, R., & Svensson, J. (2007). Are Corruption and Taxation Really Harmful to Growth? Firm Level Evidence. *Journal of Development Economics* 83 (1): 63 – 75.
- Gatti, R. (1999). Corruption and Trade Tariffs, or a Case for Uniform Tariffs. Policy Research Working Paper 2216.
- Gatti, R. (2004). Explaining Corruption: Are Open Countries Less Corrupt? *Journal of International Development*, 16 (6): 851 – 861.
- Galston, W. A. (2001). Political Knowledge, Political Engagement, and Civic Education. *Annual Review of Political Science*, 4: 217 – 234.
- Getz, K. A., & Volkema, R. J. (2001). Culture, Perceived Corruption and Economics: Model of Predictors and Outcomes. *Business and Society*, 40 (1): 7 – 30.
- Glaeser, E. L. & Shleifer, A. (2002). Legal Origins. *Quarterly Journal of Economics*, 117 (4): 1193 – 1229.
- Glaeser, E. L., & Saks, R. (2006). Corruption in America. *Journal of Public Economics*, 90 (6): 1053 – 1072.
- Goel, R. K. & Budak, J. (2006). Corruption in Transition Economies: Effects of Government Size, Country Size, and Economic Reform. *Journal of Economics and Finance*, 30(2): 240-250.
- Goel, R. K., & Nelson, M. A. (1998). Corruption and Government Size: A Disaggregated Analysis. *Public Choice*, 97 (1-2): 107 – 120.
- Goel, R. K., & Nelson, M. A. (2010). Causes of Corruption: History, Geography, and Government. *Journal of Policy Modeling*, 32 (4): 433 – 447.
- Goel, R. K., & Nelson, M. A. (2011). Measures of Corruption and Determinants of US Corruption. *Economics of Governance*, 12 (2): 155 – 176.
- Gokcekus, O., & Knorich, J. (2006). Does Quality of Openness Affect Corruption? *Economics Letters*, 91 (2): 190 – 196.
- Klitgaard, R. E. (1988). *Controlling Corruption*. Berkeley: University of California Press.
- Knack, S., & Azfar, O. (2003). Trade Intensity, Country Size and Corruption. *Economics of Governance*, 4 (1): 1 – 18.
- Kotera, G., Okada, K., & Samreth, S. (2012). Government Size, Democracy, and Corruption: An Empirical Investigation. *Economic Modelling*, 29 (6): 2340 – 2348.
- Krueger, A. O. (1974). The Political Economy of Rent-seeking Society. *American Economic Review*, 64 (3): 291 – 303.
- Lambsdorff, J. G. (2005). *The New Institutional Economics of Corruption*. Routledge: London.
- La Porta, R., Lopez-de Silanes, F., Shleifer, A., & Vishny, R. (1999). The Quality of Government. *Journal of Law, Economics and Organization*, 15 (1): 222 – 279.
- McCoy, J., & Heckel, H. (2001). The Emergence of a Global Anti-Corruption Norm. *International Politics*, 38 (1): 65 – 90.
- Majeed, M. (2014). Corruption and Trade. *Journal of Economic Integration*, 29 (4): 759 – 782.

- Maoz, Z., & Henderson, E. A. (2013). The World Religion Dataset, 1945–2010: Logic, Estimates, and Trends. *International Interactions*, 39 (3), 265 – 291.
- Mauro, P. (1995). Corruption and Growth. *Quarterly Journal of Economics*, 110: 681 – 712.
- Meier, K. J., & Holbrook, T. M. (1992). I Seen My Opportunities and I Took’Em: Political Corruption in the American States. *The Journal of Politics*, 54 (1): 135 – 155.
- Mocan, N. (2008). What Determines Corruption? International Evidence from Microdata. *Economic Enquiry*, 46 (4): 493 – 510.
- Nie, N. H., Junn, J., & Stehlik-Barry, K. (1996). *Education and Democratic Citizenship in America*. Chicago: University of Chicago Press.
- OECD. (2003). “Fighting Corruption: What Role for Civil Society? The Experience of the OECD.” OECD Report.
- OECD. (2007). *Specialised Anti-Corruption Institutions: A review of models*. Paris: OECD.
- Paldam, M. (2002). The Cross-Country Pattern of Corruption: Economics, Culture and Seesaw Dynamic. *European Journal of Political Economy*, 18 (2): 215 – 240.
- Pellegrini, L., & Gerlagh, R. (2008). Causes of Corruption: A Survey of Cross-Country Analyses and Extended Results. *Economics of Governance* 9: 245 – 263.
- Popkin, S. L., & Dimock, M. A. (1999). Political Knowledge and Citizen Competence. In Elkin, S. K., & Soltan, K. E. (Eds.) *Citizen Competence and Democratic Institutions*, pp. 117 – 146. University Park: Pennsylvania State University Press.
- Rand, J., & Tarp, F. (2012). Firm-Level Corruption in Vietnam. *Economic Development and Cultural Change*, 60 (3): 571 – 595.
- Root, H. (1999). The Importance of Being Small. Unpublished manuscript.
- Rose, A. (2006). Size Really Doesn’t Matter: In Search for a National Scale Effect. *Journal of Japanese International Economies*, 20 (4): 482 – 507.
- Rose-Ackerman, S. (1978). The Political Economy of Corruption. In Elliott, K. A. (Ed.) (1997) *Corruption and the Global Economy*. Washington DC: Institute for International Economics.
- Shleifer, A., & Vishny, R. (1993). Corruption. *Quarterly Journal of Economics*, 108: 599 – 617.
- Svensson, J. (2003). Who Must Pay Bribes and How Much? *Quarterly Journal of Economics*, 118 (1): 207 – 230.
- Svensson, J. (2005). Eight Questions About Corruption. *Journal of Economic Perspectives*, 19 (3): 19 – 42.
- Tanzi, V. (1998). Corruption Around the World: Causes, Consequences, Scope, and Cures. *IMF Staff Papers*, 45 (4): 559 – 594.
- Themudo, N. S. (2013). Reassessing the Impact of Civil Society: Nonprofit Sector, Press Freedom, and Corruption. *Governance*, 26: 63 – 89.
- Torrez, J. (2001). The Effect of Openness on Corruption. *The Journal of International Trade & Economic Development*, 11 (4): 387 – 403.
- Tosun, U. (2002). A Public Failure Product: Corruption. In Cingi, S., Guran, C., & Tosun, U. (Eds.) *Corruption and Efficient State*. Ankara: Ankara Chamber of Commerce Publication.
- Treisman, D. (1999). Decentralization and Corruption: Why Are Federal States Perceived to be More Corrupt? UCLA Department of Political Science.
- Treisman, D. (2000). The Causes of Corruption: A Cross-National Study. *Journal of Public Economics*, 76 (3): 399 – 457.
- Wei, S. (2000). Natural Openness and Good Government. World Bank Policy Research Working Paper No. 2411 and NBER Working Paper No. 7765.

World Bank. (1997). *Helping Countries Combat Corruption: The Role of the World Bank*. Washington, DC: World Bank.

You, J., & Khagram, S. (2005). A Comparative Study of Inequality and Corruption. *American Sociological Review*, 70: 136 – 157.

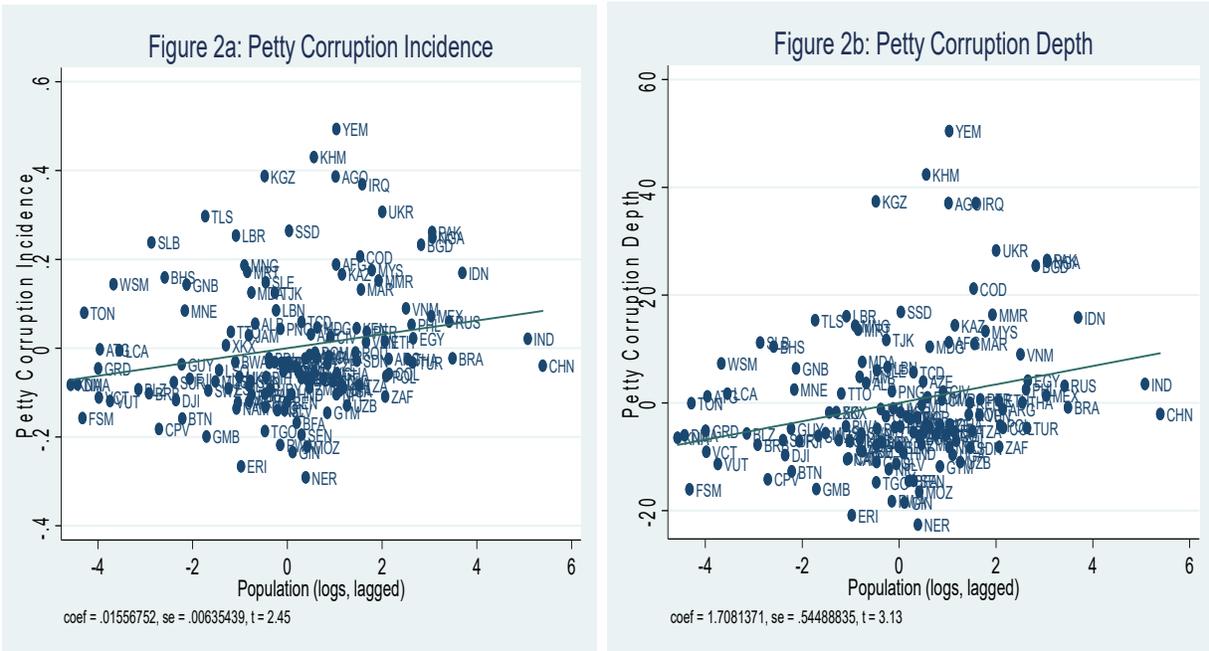
Figure 1: Overall corruption and country size controlling for GDP per capita



Source: Enterprise Surveys and World Development Indicators (World Bank)

Note: The figure is a partial scatter plot of Overall Corruption (formally defined above) and country-size measured by the log of total population of the country (formally defined above) obtained after controlling for (log of) GDP per capita (formally defined above). The positive and significant relationship shown remains intact even without controlling for GDP per capita.

Figure 2: Petty corruption and country size controlling for GDP per capita



Source: Enterprise Surveys and World Development Indicators (World Bank)

Note: The figure is a partial scatter plot of Petty Corruption (Incidence and Depth; formally defined above) and country-size measured by the log of total population of the country (formally defined above) obtained after controlling for (log of) GDP per capita (formally defined above). The positive and significant relationship shown remains intact even without controlling for GDP per capita.

Table 1: Description of variables	
Variable	Description
<i>Overall Corruption</i>	Average percentage of firm's total annual sales, or estimated total annual value, do establishments like this one pay in informal payments or gifts to public officials to "get things done". <i>Source: Enterprise Surveys.</i>
<i>Petty Corruption Incidence (dummy)</i>	Dummy variable that takes the value of 1 if firm experienced at least one bribe payment request across 6 public transactions dealing with utilities access, permits, licenses, and taxes. <i>Source: Enterprise Surveys.</i>
<i>Petty Corruption Depth</i>	Average percentage of instances in which firm was either expected or requested to provide a gift or informal payment during solicitations for public services, licenses or permits. <i>Source: Enterprise Surveys.</i>
<i>Population (logs)</i>	(Log of) Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship. <i>Source: World Development Indicators, World Bank.</i>
<i>Area (logs)</i>	(Log of) Country's total land area (sq. km) excluding area under inland water bodies, national claims to continental shelf, and exclusive economic zones. <i>Source: World Development Indicators, World Bank.</i>
<i>GDP per capita (logs)</i>	(Log of) GDP per capita based on purchasing power parity. <i>Source: World Development Indicators, World Bank.</i>
<i>Firm size (logs)</i>	(Log of) Number of permanent, full-time workers working in the firm three fiscal years ago. <i>Source: Enterprise Surveys.</i>
<i>Age of Firm (logs)</i>	(Log of) Age of the firm based on the year in which the firm began operation. <i>Source: Enterprise Surveys.</i>
<i>Manager Experience (logs)</i>	(Log of) Years of firm's top manager's experience working in the sector. <i>Source: Enterprise Surveys.</i>
<i>Exports</i>	Proportion of firm's total sales that are exported directly. <i>Source: Enterprise Surveys.</i>
<i>Foreign Ownership (dummy)</i>	Dummy variable that takes the value of 1 if firm has at least 10% owned by private foreign individuals, companies or organizations. <i>Source: Enterprise Surveys.</i>
<i>Firm Bought Fixed Assets (dummy)</i>	Dummy variable that takes the value of 1 if firm purchased any new or used fixed assets, such as machinery, vehicles, equipment, land or buildings in the last fiscal year. <i>Source: Enterprise Surveys.</i>
<i>How Much of An Obstacle: Courts</i>	The severity of (lack of proper) functioning of courts as major constraint to the firm. It is rated based on a five-point scale: 0 – no obstacle; 1 – minor obstacle; 2 – moderate obstacle; 3 – major obstacle; 5 – very severe obstacle.

	<i>Source: Enterprise Surveys.</i>
Overdraft (dummy)	Dummy variable that takes the value of 1 if the firm currently has overdraft facilities and 0 otherwise. <i>Source: Enterprise Surveys.</i>
Line of Credit (dummy)	Dummy variable that takes the value of 1 if the firm has a line of credit or loan from a financial institution and 0 otherwise. <i>Source: Enterprise Surveys.</i>
Time Tax	Average percentage of the firm's senior management's time that is spent in a typical week dealing with requirements imposed by government regulations (e.g. taxes, customs, labor regulations, licensing and registration), including dealings with officials, completing forms, et cetera. <i>Source: Enterprise Surveys.</i>
Merchandise Trade	Sum of merchandise exports and imports divided by the value of GDP. <i>Source: World Development Indicators, World Bank.</i>
Primary Education	Gross primary school enrollment ratio. This is the ratio of total primary school enrollment, regardless of age, to the population of the age group that officially corresponds to primary education. <i>Source: World Development Indicators, World Bank.</i>
GDP per capita Growth Rate	Annual percentage growth rate of GDP per capita based on constant local currency. <i>Source: World Development Indicators, World Bank.</i>
Inflation	Inflation as measured by the annual growth rate of the GDP implicit deflator. <i>Source: World Development Indicators, World Bank.</i>
Urbanization	Percentage of people living in urban areas as defined by national statistical offices. <i>Source: World Development Indicators, World Bank.</i>
Common Law (dummy)	Dummy variable that takes the value of 1 if country's has British legal origin. <i>Source: La Porta, Rafael, Florencio Lopez-de Silanes, Andrei Shleifer and Robert Vishny (1999), "The Quality of Government," Journal of Law, Economics and Organization, 15(1): 222-7.</i>
Civil Law (dummy)	Dummy variable that takes the value of 1 if country's has French legal origin. <i>Source: La Porta, Rafael, Florencio Lopez-de Silanes, Andrei Shleifer and Robert Vishny (1999), "The Quality of Government," Journal of Law, Economics and Organization, 15(1): 222-7.</i>
Ethnic Fractionalization	Measure of ethnic fractionalization. <i>Source: Alesina, Alberto, Arnaud Devleeschauwer, William Easterly, Sergio Krulat, and Romain Wacziarg (2003), "Fractionalization," Journal of Economic Growth 8(2): 155-194.</i>
Polity	Polity score of a country. Rated on a scale ranging from +10 (strongly democratic) to -10 (strongly autocratic). <i>Source: Polity IV.</i>

Business Regulations	<p>Measure of how business regulations restrict entry into markets and interfere with the freedom to engage in voluntary exchange reduce economic freedom. Rated on a scale ranging from 0 – no freedom to 10 – complete freedom.</p> <p><i>Source: Economic Freedom of the World, Fraser Institute.</i></p>
Government Size	<p>Size of government based on government consumption, transfers and subsidies, government enterprises and investment, and top marginal tax rate.</p> <p><i>Source: Economic Freedom of the World.</i></p>
Government Effectiveness	<p>The perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.</p> <p><i>Source: Worldwide Governance Indicator</i></p>
Rule of Law (Protection)	<p>Country's rule of law score. Rated on a scale ranging from 0 (Weak) to 16 (Strong).</p> <p><i>Source: Freedom House.</i></p>
Industry Dummies	<p>A series of dummy variables that represent the firms' industries.</p> <p><i>Source: Enterprise Surveys.</i></p>
Year Dummies	<p>A series of dummy variables that represent the year the survey was conducted.</p> <p><i>Source: Enterprise Surveys.</i></p>

Table 2: Summary statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
<i>Overall Corruption</i>	47,952	1.19	5.50	0	100
<i>Petty Corruption Incidence</i> (dummy)	32,739	0.18	0.39	0	1
<i>Petty Corruption Depth</i>	32,739	14.13	32.07	0	100
<i>Population</i> (logs)	47,952	15.72	1.96	10.78	20.99
<i>Area</i> (logs)	47,034	11.59	2.26	5.56	16.61
GDP per capita (logs)	47,952	8.73	0.98	6.53	10.37
Firm Size (logs)	47,952	2.76	1.09	0	12.03
Age of Firm (logs)	47,952	2.52	0.79	0	5.42
Manager Experience (logs)	47,952	2.61	0.74	0	4.09
Exports	47,952	0.06	0.19	0	1
Foreign Ownership (dummy)	47,952	11.05	31.35	0	100
Firm Bought Fixed Assets (dummy)	47,952	0.42	0.49	0	1
Power Outages	47,952	25.62	86.42	0	720
How Much of An Obstacle: Courts	47,952	0.92	1.22	0	4
Overdraft (dummy)	47,952	0.42	0.49	0	1
Line of Credit (dummy)	47,952	0.34	0.47	0	1
Time Tax	47,952	9.53	15.65	0	100
Merchandise Trade	47,078	65.26	28.98	15.62	154.22
Primary Education	45,937	99.23	18.08	33.96	145.86
GDP per capita Growth Rate	47,820	1.99	5.09	-27.03	13.83
Inflation	47,820	6.68	7.45	-19.52	39.18
Urbanization	47,832	48.91	20.53	11.19	95.09
Common Law (dummy)	47,952	0.36	0.48	0	1
Civil Law (dummy)	47,952	0.37	0.48	0	1
Ethnic Fractionalization	46,248	0.48	0.24	0.04	0.93
Business Regulations	43,925	5.87	1.13	2.86	8.74
Government Size	43,925	6.62	1.29	3.42	9.49
Government Effectiveness	47,952	-0.32	0.70	-1.73	1.39
Polity	45,229	0.58	1.60	-2.25	7.50
Rule of Law (Protection)	47,671	1.83	1.26	0	4

Table 3: Correlation

Variable	<i>Population</i>	<i>Area</i>
<i>Population</i> (logs)	1.00	0.71
<i>Area</i> (logs)	0.71	1.00
GDP per capita (logs)	-0.04	-0.06
Firm Size (logs)	0.05	0.06
Age of Firm (logs)	0.04	-0.01
Manager Experience (logs)	0.01	-0.02
Exports	-0.02	-0.05
Foreign Ownership (dummy)	-0.10	-0.01
Firm Bought Fixed Assets (dummy)	-0.12	-0.02
Power Outages	0.10	0.03
How Much of An Obstacle: Courts	0.07	0.08
Overdraft (dummy)	-0.09	-0.05
Line of Credit (dummy)	-0.08	-0.09
<i>Time Tax</i>	-0.04	0.07
Merchandise Trade	-0.40	-0.34
Primary Education	-0.04	-0.19
GDP per capita Growth Rate	0.17	0.10
Inflation	0.09	0.16
Urbanization	-0.02	0.06
Common Law (dummy)	-0.18	-0.19
Civil Law (dummy)	0.18	0.21
Ethnic Fractionalization	0.02	0.22
Business Regulations	-0.24	-0.35
Government Size	0.16	-0.01
Government Effectiveness	-0.12	-0.21
Polity	0.05	-0.07
Rule of Law (Protection)	-0.32	-0.25

Table 4: Base regression results (Overall corruption, OLS)

Dependent Variable: <i>Overall Corruption</i>	(1)	(2)	(3)	(4)
<i>Population</i> (logs)	0.206*** (0.020)	0.172*** (0.021)	0.110*** (0.026)	0.319*** (0.060)
GDP per capita (logs)		-0.500*** (0.064)	-0.461*** (0.076)	-0.424*** (0.153)
Firm Size (logs)			-0.031 (0.046)	-0.015 (0.056)
Age of Firm (logs)			0.032 (0.076)	0.141 (0.097)
Manager Experience (logs)			-0.157* (0.089)	-0.208* (0.112)
Exports			0.145 (0.228)	-0.019 (0.308)
Foreign Ownership (dummy)			-0.002 (0.002)	-0.001 (0.002)
Firm Bought Fixed Assets (dummy)			0.415*** (0.127)	0.433*** (0.156)
Power Outages			0.003** (0.001)	0.001 (0.001)
How Much of An Obstacle: Courts			0.147*** (0.046)	0.110* (0.060)
Overdraft (dummy)			-0.090 (0.114)	0.107 (0.144)
Line of Credit (dummy)			0.069 (0.129)	0.338** (0.167)
Time Tax			0.025*** (0.006)	0.024*** (0.006)
Merchandise Trade				0.015*** (0.004)
Primary Education				-0.010** (0.005)
GDP per capita Growth Rate				-0.099** (0.039)
Inflation				0.014 (0.012)
Urbanization				0.004 (0.006)

Common Law (dummy)				0.074 (0.183)
Civil Law (dummy)				-0.614*** (0.202)
Ethnic Fractionalization				1.319*** (0.391)
Business Regulations (higher values imply less regulation)				0.044 (0.094)
Government Size (higher values imply smaller govt. size)				-0.011 (0.060)
Government Effectiveness				-0.014 (0.210)
Polity				-0.250*** (0.036)
Rule of Law (Protection)				-0.221*** (0.084)
Industry fixed effects			Yes	Yes
Year fixed effects			Yes	Yes
Constant	-2.054*** (0.297)	2.854*** (0.709)	3.400*** (1.301)	-0.261 (2.217)
Number of observations	47,952	47,952	47,952	41,241
R-Squared	0.005	0.013	0.029	0.044

Note: Standard errors reported in brackets. Significance is denoted by *** (1 percent), ** (5 percent), and * (10 percent).

Table 5: Incidence of Petty Corruption (Marginal effects, logit estimation)

Dependent Variable: <i>Petty Corruption Incidence</i>	(1)	(2)	(3)	(4)
<i>Population</i> (logs)	0.020 (0.047)	0.017*** (0.002)	0.011*** (0.002)	0.027*** (0.004)
GDP per capita (logs)		-0.058*** (0.005)	-0.053*** (0.005)	-0.015 (0.011)
Firm Size (logs)			0.009** (0.004)	0.006 (0.005)
Age of Firm (logs)			-0.004 (0.006)	0.008 (0.007)
Manager Experience (logs)			-0.020*** (0.007)	-0.017** (0.008)
Exports			-0.006 (0.023)	-0.015 (0.027)
Foreign Ownership (dummy)			0.000 (0.000)	0.000 (0.000)
Firm Bought Fixed Assets (dummy)			0.025** (0.011)	0.028** (0.011)
Power Outages			0.000*** (0.000)	0.000 (0.000)
How Much of An Obstacle: Courts			0.024*** (0.004)	0.019*** (0.004)
Overdraft (dummy)			-0.013 (0.012)	0.002 (0.013)
Line of Credit (dummy)			-0.005 (0.010)	0.020* (0.012)
Time Tax			0.000 (0.000)	0.000 (0.000)
Merchandise Trade				0.002*** (0.000)
Primary Education				0.000 (0.000)
GDP per capita Growth Rate				-0.001 (0.002)
Inflation				0.002** (0.001)
Urbanization				0.000 (0.000)

Common Law (dummy)				-0.001 (0.017)
Civil Law (dummy)				-0.033** (0.015)
Ethnic Fractionalization				0.017 (0.029)
Business Regulations (higher values imply less regulation)				-0.001 (0.007)
Government Size (higher values imply smaller govt. size)				0.014*** (0.005)
Government Effectiveness				-0.127*** (0.019)
Polity				-0.003 (0.004)
Rule of Law (Protection)				-0.023*** (0.007)
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Number of observations	38,241	38,241	38,235	32,186

Note: Standard errors reported in brackets. Significance is denoted by *** (1 percent), ** (5 percent), and * (10 percent).

Table 6: Depth of Petty Corruption (OLS)

Dependent Variable: <i>Petty Corruption Depth</i>	(1)	(2)	(3)	(4)
<i>Population</i> (logs)	2.048*** (0.172)	1.708*** (0.167)	1.281*** (0.222)	2.450*** (0.353)
GDP per capita (logs)		-4.730*** (0.475)	-4.102*** (0.512)	-2.081** (1.029)
Firm Size (logs)			0.433 (0.388)	0.285 (0.442)
Age of Firm (logs)			-0.346 (0.533)	0.385 (0.637)
Manager Experience (logs)			-1.657** (0.677)	-1.317* (0.776)
Exports			-0.070 (2.110)	-1.169 (2.664)
Foreign Ownership (dummy)			0.008 (0.018)	0.024 (0.022)
Firm Bought Fixed Assets (dummy)			1.246 (0.962)	1.796* (1.047)
Power Outages			0.026*** (0.006)	0.012** (0.006)
How Much of An Obstacle: Courts			2.115*** (0.371)	1.470*** (0.470)
Overdraft (dummy)			-1.112 (1.051)	0.024 (1.276)
Line of Credit (dummy)			-0.716 (0.870)	1.322 (1.085)
Time Tax			0.008 (0.027)	0.017 (0.028)
Merchandise Trade				0.182*** (0.022)
Primary Education				0.030 (0.062)
GDP per capita Growth Rate				-0.047 (0.164)
Inflation				0.212** (0.106)
Urbanization				0.067 (0.049)

Common Law (dummy)				0.005 (1.687)
Civil Law (dummy)				-1.997 (1.658)
Ethnic Fractionalization				1.152 (3.331)
Business Regulations (higher values imply less regulation)				-1.076* (0.645)
Government Size (higher values imply smaller govt. size)				1.258** (0.531)
Government Effectiveness				-9.220*** (1.761)
Polity				0.008 (0.311)
Rule of Law (Protection)				-1.875*** (0.683)
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Constant	-18.463*** (2.661)	28.126*** (4.984)	11.934* (6.101)	-34.468** (14.685)
Number of observations	38,241	38,241	38,241	32,190
R-Squared	0.016	0.037	0.060	0.105

Note: Standard errors reported in brackets. Significance is denoted by *** (1 percent), ** (5 percent), and * (10 percent).

Table 7: Robustness for Area

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:	<i>Overall Corruption</i>			<i>Petty Corruption Incidence</i> (Marginal effects)			<i>Petty Corruption Depth</i>		
<i>Area</i> (logs)	0.213*** (0.018)	0.115*** (0.025)	0.202*** (0.045)	0.019 (0.046)	0.012*** (0.002)	0.018*** (0.004)	1.743*** (0.156)	1.137*** (0.175)	1.546*** (0.333)
GDP per capita (logs)		-0.437*** (0.077)	-0.467*** (0.154)		-0.051*** (0.005)	-0.027** (0.011)		-3.925*** (0.514)	-2.450** (1.036)
Firm Size (logs)		-0.033 (0.047)	-0.016 (0.056)		0.009** (0.004)	0.006 (0.005)		0.476 (0.389)	0.293 (0.444)
Age of Firm (logs)		0.077 (0.077)	0.152 (0.097)		-0.001 (0.006)	0.009 (0.007)		-0.162 (0.540)	0.511 (0.637)
Manager Experience (logs)		-0.135 (0.089)	-0.203* (0.113)		-0.018** (0.007)	-0.018** (0.008)		-1.392** (0.687)	-1.277 (0.778)
Exports		0.227 (0.230)	0.037 (0.309)		0.001 (0.023)	-0.011 (0.027)		0.233 (2.134)	-0.787 (2.629)
Foreign Ownership (dummy)		-0.003* (0.001)	-0.002 (0.002)		0.000 (0.000)	0.000 (0.000)		0.002 (0.018)	0.018 (0.022)
Firm Bought Fixed Assets (dummy)		0.385*** (0.128)	0.382** (0.157)		0.023** (0.011)	0.024** (0.011)		1.029 (0.973)	1.460 (1.044)
Power Outages		0.003** (0.001)	0.001 (0.001)		0.000*** (0.000)	0.000** (0.000)		0.027*** (0.006)	0.015** (0.006)
How Much of An Obstacle: Courts		0.137*** (0.046)	0.125** (0.059)		0.024*** (0.004)	0.020*** (0.004)		2.117*** (0.377)	1.597*** (0.472)
Overdraft (dummy)		-0.093 (0.115)	0.082 (0.144)		-0.013 (0.012)	-0.002 (0.013)		-1.224 (1.054)	-0.180 (1.292)
Line of Credit (dummy)		0.089 (0.130)	0.324* (0.169)		-0.002 (0.010)	0.020* (0.012)		-0.632 (0.873)	1.276 (1.059)
Time Tax		0.022*** (0.006)	0.022*** (0.006)		0.000 (0.000)	0.000 (0.000)		-0.010 (0.027)	0.005 (0.028)
Merchandise Trade			0.012*** (0.003)			0.001*** (0.000)			0.155*** (0.021)

Primary Education			-0.006 (0.004)			0.000 (0.000)			0.058 (0.064)
GDP per capita Growth Rate			-0.099*** (0.038)			-0.001 (0.002)			-0.036 (0.166)
Inflation			0.008 (0.012)			0.001 (0.001)			0.172 (0.107)
Urbanization			0.003 (0.007)			0.001 (0.000)			0.062 (0.050)
Common Law (dummy)			-0.036 (0.182)			-0.011 (0.016)			-0.857 (1.686)
Civil Law (dummy)			-0.637*** (0.204)			-0.039*** (0.015)			-2.332 (1.688)
Ethnic Fractionalization			1.080*** (0.399)			-0.014 (0.029)			-0.791 (3.277)
Business Regulations			-0.013 (0.091)			-0.008 (0.007)			-1.499** (0.613)
Government Size			0.032 (0.058)			0.017*** (0.005)			1.568*** (0.526)
Government Effectiveness			0.169 (0.225)			-0.104*** (0.020)			-7.753*** (1.847)
Polity			-0.205*** (0.032)			0.002 (0.004)			0.351 (0.309)
Rule of Law (Protection)			-0.308*** (0.082)			-0.031*** (0.007)			-2.542*** (0.687)
Constant	-1.299*** (0.188)	5.099*** (1.132)	2.906 (2.338)				-6.597*** (1.723)	26.455*** (5.732)	-8.538 (16.445)
Industry fixed effects	Yes	Yes	Yes				Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes				Yes	Yes	Yes
Number of observations	47,034	47,034	41,241	37,229	37,224	32,186	37,229	37,229	32,190
R-Squared	0.008	0.030	0.043				0.015	0.059	0.102

Note: Standard errors reported in brackets. Significance is denoted by *** (1 percent), ** (5 percent), and * (10 percent).

Table 8: Excluding extremely small and large countries

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Dependent variable:	<i>Overall Corruption</i>			<i>Petty Corruption Incidence</i> (Marginal effects)			<i>Petty Corruption Depth</i>		
<i>Population</i> (logs)	0.229*** (0.031)	0.106*** (0.038)	0.340*** (0.075)	0.023 (0.059)	0.009** (0.004)	0.023*** (0.005)	2.221*** (0.285)	1.281*** (0.350)	2.088*** (0.493)
GDP per capita (logs)		-0.548*** (0.085)	-0.687*** (0.160)		-0.052*** (0.006)	-0.012 (0.011)		-4.039*** (0.554)	-2.631** (1.091)
Firm Size (logs)		0.014 (0.050)	0.021 (0.058)		0.008* (0.005)	0.003 (0.005)		0.275 (0.420)	0.058 (0.462)
Age of Firm (logs)		-0.022 (0.085)	0.063 (0.098)		-0.008 (0.006)	0.006 (0.007)		-0.704 (0.560)	0.202 (0.640)
Manager Experience (logs)		-0.093 (0.092)	-0.147 (0.110)		-0.019** (0.008)	-0.018** (0.008)		-1.532** (0.745)	-1.373* (0.801)
Exports		0.282 (0.263)	0.049 (0.334)		-0.014 (0.026)	-0.013 (0.029)		-0.771 (2.306)	-1.951 (2.804)
Foreign Ownership (dummy)		-0.002 (0.002)	-0.001 (0.002)		0.000 (0.000)	0.000 (0.000)		0.015 (0.019)	0.030 (0.022)
Firm Bought Fixed Assets (dummy)		0.328** (0.143)	0.299* (0.162)		0.026** (0.012)	0.028*** (0.011)		1.493 (1.049)	1.926* (1.082)
Power Outages		0.003** (0.002)	0.000 (0.001)		0.000*** (0.000)	0.000 (0.000)		0.017*** (0.006)	0.001 (0.006)
How Much of An Obstacle: Courts		0.172*** (0.051)	0.146** (0.061)		0.025*** (0.004)	0.018*** (0.004)		2.107*** (0.396)	1.266*** (0.485)
Overdraft (dummy)		-0.054 (0.129)	0.153 (0.153)		-0.016 (0.013)	0.008 (0.013)		-1.184 (1.157)	0.548 (1.331)
Line of Credit (dummy)		0.077 (0.147)	0.338* (0.177)		-0.006 (0.011)	0.023* (0.012)		-0.678 (0.951)	1.569 (1.133)
Time Tax		0.026*** (0.006)	0.023*** (0.006)		0.000 (0.000)	0.000 (0.000)		0.018 (0.028)	0.023 (0.029)
Merchandise Trade			0.017*** (0.004)			0.002*** (0.000)			0.198*** (0.022)

Primary Education			-0.010**			0.000			0.061
			(0.005)			(0.000)			(0.061)
GDP per capita Growth Rate			-0.107**			-0.001			-0.063
			(0.043)			(0.001)			(0.173)
Inflation			0.008			0.002***			0.219**
			(0.011)			(0.001)			(0.103)
Urbanization			0.007			0.000			0.085*
			(0.006)			(0.000)			(0.049)
Common Law (dummy)			0.012			0.013			0.748
			(0.182)			(0.017)			(1.676)
Civil Law (dummy)			-0.643***			-0.018			-0.351
			(0.201)			(0.016)			(1.717)
Ethnic Fractionalization			0.416			0.018			1.030
			(0.481)			(0.037)			(3.890)
Business Regulations			-0.033			-0.003			-1.329**
			(0.094)			(0.007)			(0.629)
Government Size			-0.057			0.006			0.380
			(0.065)			(0.005)			(0.527)
Government Effectiveness			0.152			-0.119***			-8.279***
			(0.211)			(0.018)			(1.737)
Polity			-0.201***			-0.004			-0.200
			(0.035)			(0.004)			(0.314)
Rule of Law (Protection)			-0.271***			-0.025***			-2.347***
			(0.089)			(0.007)			(0.726)
Constant	-2.392***	4.879***	2.623			-21.655***	18.588**		-22.453
	(0.476)	(1.333)	(2.055)			(4.441)	(8.718)		(16.578)
Industry fixed effects	Yes	Yes	Yes			Yes	Yes		Yes
Year fixed effects	Yes	Yes	Yes			Yes	Yes		Yes
Number of observations	32,060	30,857	25,113	25,879	25,876	20,668	26,741	25,879	20,669
R-Squared	0.003	0.031	0.048				0.010	0.053	0.101

Note: Standard errors reported in brackets. Significance is denoted by *** (1 percent), ** (5 percent), and * (10 percent).

Appendix

Table A1: List of countries

Country	Country	Country
1 Afghanistan	47 Georgia	93 Papua New Guinea
2 Albania	48 Ghana	94 Paraguay
3 Angola	49 Grenada	95 Peru
4 Antigua and Barbuda	50 Guatemala	96 Philippines
5 Argentina	51 Guinea	97 Poland
6 Armenia	52 Guinea-Bissau	98 Romania
7 Azerbaijan	53 Guyana	99 Russian Federation
8 Bahamas, The	54 Honduras	100 Rwanda
9 Bangladesh	55 Hungary	101 Samoa
10 Barbados	56 India	102 Senegal
11 Belarus	57 Indonesia	103 Serbia
12 Belize	58 Iraq	104 Sierra Leone
13 Benin	59 Israel	105 Slovak Republic
14 Bhutan	60 Jamaica	106 Slovenia
15 Bolivia	61 Jordan	107 Solomon Islands
16 Bosnia and Herzegovina	62 Kazakhstan	108 South Africa
17 Botswana	63 Kenya	109 South Sudan
18 Brazil	64 Kosovo	110 Sri Lanka
19 Bulgaria	65 Kyrgyz Republic	111 St. Kitts and Nevis
20 Burkina Faso	66 Lao PDR	112 St. Lucia
21 Burundi	67 Latvia	113 Vincent and the Grenadines
22 Cabo Verde	68 Lebanon	114 Sudan
23 Cambodia	69 Lesotho	115 Suriname
24 Cameroon	70 Liberia	116 Tajikistan
25 Central African Republic	71 Lithuania	117 Tanzania
26 Chad	72 Macedonia, FYR	118 Thailand
27 Chile	73 Malawi	119 Timor-Leste
28 China	74 Malaysia	120 Togo
29 Colombia	75 Mali	121 Tonga
30 Congo, Dem. Rep.	76 Mauritania	122 Trinidad and Tobago
31 Costa Rica	77 Mauritius	123 Tunisia
32 Côte d'Ivoire	78 Mexico	124 Turkey
33 Croatia	79 Micronesia, Fed. Sts.	125 Uganda
34 Czech Republic	80 Moldova	126 Ukraine
35 Djibouti	81 Mongolia	127 Uruguay
36 Dominica	82 Montenegro	128 Uzbekistan
37 Dominican Republic	83 Morocco	129 Vanuatu
38 Ecuador	84 Mozambique	130 Venezuela, RB

39	Egypt, Arab Rep.	85	Myanmar	131	Vietnam
40	El Salvador	86	Namibia	132	West Bank and Gaza
41	Eritrea	87	Nepal	133	Yemen, Rep.
42	Estonia	88	Nicaragua	134	Zambia
43	Eswatini	89	Niger	135	Zimbabwe
44	Ethiopia	90	Nigeria		
45	Fiji	91	Pakistan		
46	Gambia, The	92	Panama		

Table A2: Disregarding very small bribes (OLS)

Dependent variable: Adjusted Overall Corruption	(1)	(2)	(3)
<i>Population</i> (logs)	0.145*** (0.026)	0.110*** (0.026)	0.319*** (0.060)
GDP per capita (logs)		-0.461*** (0.076)	-0.424*** (0.153)
Firm Size (logs)		-0.031 (0.046)	-0.015 (0.056)
Age of Firm (logs)		0.032 (0.076)	0.141 (0.097)
Manager Experience (logs)		-0.157* (0.089)	-0.208* (0.112)
Exports		0.145 (0.228)	-0.019 (0.308)
Foreign Ownership (dummy)		-0.002 (0.002)	-0.001 (0.002)
Firm Bought Fixed Assets (dummy)		0.415*** (0.127)	0.433*** (0.156)
Power Outages		0.003** (0.001)	0.001 (0.001)
How Much of An Obstacle: Courts		0.147*** (0.046)	0.110* (0.060)
Overdraft (dummy)		-0.090 (0.114)	0.107 (0.144)
Line of Credit (dummy)		0.069 (0.129)	0.338** (0.167)
Time Tax		0.025*** (0.006)	0.024*** (0.006)
Primary Education			-0.010** (0.005)
Inflation			0.014 (0.012)
Urbanization			0.004 (0.006)
Ethnic Fractionalization			1.320*** (0.391)
Business Regulations (higher values imply less regulation)			0.044 (0.094)
Government Size (higher values imply smaller govt. size)			-0.011 (0.060)

Government Effectiveness				-0.014 (0.210)
Polity				-0.250*** (0.036)
Rule of Law (Protection)				-0.221*** (0.084)
Merchandise Trade				0.015*** (0.004)
GDP per capita Growth Rate				-0.099** (0.039)
Common Law (dummy)				0.075 (0.183)
Civil Law (dummy)				-0.614*** (0.202)
Industry fixed effects	Yes	Yes	Yes	
Year fixed effects	Yes	Yes	Yes	
Constant	-0.447 (0.977)	3.398*** (1.301)	-0.263 (2.217)	
Number of observations	47,952	47,952	41,241	
R-squared	0.013	0.029	0.044	

Standard errors in brackets. Significance is denoted by *** (1%), ** (5%), * (10%). The dependent variable is same as *Overall Corruption* except that bribes of less than or equal to 0.1 percent of annual sales are set to 0.

Table A3: Additional controls

Dependent Variable:	(1)	(2)	(3)
	<i>Overall Corruption</i>	<i>Petty Corruption Incidence</i>	<i>Petty Corruption Depth</i>
<i>Population</i> (logs)	0.160*** (0.055)	0.018*** (0.005)	1.433*** (0.432)
GDP per capita (logs)	-0.137 (0.157)	-0.013 (0.014)	-1.902* (1.104)
Firm Size (logs)	-0.010 (0.055)	0.005 (0.005)	0.255 (0.457)
Age of Firm (logs)	0.150 (0.098)	0.008 (0.007)	0.384 (0.640)
Manager Experience (logs)	-0.186 (0.114)	-0.016** (0.007)	-1.196 (0.751)
Exports	-0.072 (0.314)	-0.019 (0.027)	-1.707 (2.719)
Foreign Ownership (dummy)	-0.001 (0.002)	0.000 (0.000)	0.026 (0.022)
Firm Bought Fixed Assets (dummy)	0.414*** (0.157)	0.024** (0.010)	1.709* (1.027)
Power Outages	0.000 (0.001)	0.000 (0.000)	0.011* (0.006)
How Much of An Obstacle: Courts	0.156*** (0.060)	0.022*** (0.004)	1.823*** (0.466)
Overdraft (dummy)	0.148 (0.148)	0.006 (0.013)	-0.009 (1.294)
Line of Credit (dummy)	0.393** (0.171)	0.022* (0.011)	1.596 (1.056)
Time Tax	0.022*** (0.006)	0.000 (0.000)	0.002 (0.029)
Merchandise Trade	0.011*** (0.004)	0.001*** (0.000)	0.153*** (0.024)
Primary Education	0.005 (0.004)	0.001 (0.001)	0.040 (0.052)
GDP per capita Growth Rate	-0.053 (0.039)	0.002 (0.002)	0.225 (0.194)
Inflation	0.015 (0.012)	0.002** (0.001)	0.304*** (0.111)
Urbanization	0.001 (0.008)	-0.000 (0.000)	0.042 (0.051)

Common Law (dummy)	0.007 (0.214)	-0.006 (0.017)	-0.584 (1.679)
Civil Law (dummy)	-0.544** (0.236)	-0.018 (0.017)	-0.429 (1.862)
Ethnic Fractionalization	0.678 (0.436)	0.031 (0.034)	3.641 (3.117)
Business Regulations (higher values imply less regulation)	-0.354*** (0.105)	-0.021** (0.009)	-2.540*** (0.768)
Government Size (higher values imply smaller govt. size)	0.096 (0.065)	0.023*** (0.006)	1.992*** (0.565)
Government Effectiveness	-0.267 (0.278)	-0.130*** (0.025)	-9.009*** (1.964)
Polity	-0.202*** (0.039)	0.006 (0.004)	0.492 (0.316)
Rule of Law (Protection)	-0.715*** (0.128)	-0.029*** (0.011)	-1.947** (0.991)
Protestants	1.402 (0.957)	0.035 (0.089)	-0.692 (8.486)
Roman Catholics	0.408 (0.317)	0.040 (0.034)	4.420* (2.273)
Islam	1.307*** (0.351)	0.057*** (0.022)	5.299** (2.428)
Judicial independence	-0.189 (0.177)	-0.017 (0.013)	-0.096 (1.075)
Functioning of the government	0.339*** (0.088)	0.013** (0.006)	0.503 (0.657)
Industry fixed effects	Yes		Yes
Year fixed effects	Yes		Yes
Region fixed effects	Yes		Yes
Constant	-1.577 (2.189)		-19.522 (18.229)
Number of observations	41,241	32,186	32,190
R-Squared	0.052		0.116

Note: (1) The variable Protestants, Roman Catholics, and Islam refer to the proportion of adherents in the respective countries. Source: Maoz and Henderson (2013). (2) Standard errors reported in brackets. Significance is denoted by *** (1 percent), ** (5 percent), and * (10 percent).