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Assessing the Effects of Corruption and Crime on Firm Performance: Evidence from Latin America

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Abstract

This paper uses a survey of private firms to assess the effects of corruption on the economic prospects of firms. The paper studies whether corruption and crime affect sales, investment and employment growth at the firm level, and whether bribes and illegal payments by firms reduce bureaucratic interference. The paper finds that corruption and crime substantially reduce sales growth, and that the reported levels of corruption and bureaucratic interferences are positively correlated at the firm level. Overall, the results of the paper suggest that corruption and crime substantially reduce firm competitiveness and that corruption is unlikely to have any positive effects.

I. Introduction

While many empirical studies have examined the connection between economic growth and corruption at the country level, only few have looked at the effects of corruption on the economic prospects of firms. This paper aims at filling this void. First, it studies whether corruption and crime affects sales, investment and employment growth at the firm level. Second, it examines whether bribes and illegal payments by firms reduce bureaucratic interference by government officials. In addition, the paper studies what type of firms are more likely to complain about crime and corruption, and whether corruption indicators that rely on private sector surveys are consistent across surveys and methodologies.

The paper finds that corruption and crime substantially reduce sales growth. These effects are apparent even after firm characteristics and country fixed effects are taken into account. Corruption (and in particular crime) also lowers investment and employment growth, though these effects are smaller and not always statistically significant. This paper also finds that the reported levels of corruption and bureaucratic interference are positively correlated at the firm level, which casts serious doubts on various theories that postulate that corruption may increase efficiency by allowing firms to circumvent government regulations. Overall, the results of the paper suggest that corruption and crime substantially reduce firm competitiveness and that corruption is unlikely to have positive effects.

The results show, on the other hand, that corruption and crime are ubiquitous in Latin America. In this region, 60 percent of the managers interviewed report that corruption is an obstacle to doing business, 28 percent report that bribe payments are common in their line of business, and 30 percent that at least one government official requested bribes during 1999. Further, corruption appears to affect all types of firms, regardless of tenure, size, location, sector or type of business. In contrast, bureaucratic red tape is not more common in Latin American countries than in O.E.C.D countries. In both cases, managers reported that about five percent of senior management's time is spent dealing with bureaucrats.

The rest of this paper is organized as follows. Section II presents an overview of the literature on the causes and consequences of corruption. Section III describes the data and presents the results on the incidence of crime and corruption. Section IV presents the results on the effects of corruption upon economic outcomes. Section V presents the results on the interplay between corruption and bureaucratic interference. Section VI concludes.

II. Literature Overview

The growing interest in governance issues has spurred a growing scholarly literature about the causes and consequences of corruption. Although a comprehensive survey of this literature is beyond the scope of this paper, our intention is to summarize some of the main arguments brought up by the scholars doing applied research on the topic. The ultimate goals are to facilitate the interpretation of the results presented below and to offer the uninitiated a quick peek into a burgeoning literature.

Figure 1 shows the main factors associated with the presence of corruption. The determinants of corruption are shown on the left-hand side and its main effects on the right-hand side. We will begin with the determinants. On a general level, the conjunction of rents and unaccountable public servants is the main cause of corruption. It goes almost without saying that the higher the rents, and the fewer the checks on public servants, the higher will be the opportunities for corruption.

<< Insert Figure 1 here>>

The more regulated an economy and the larger the amount of resources administered by the state, the higher will be the rents in the hands of public officials. Government regulations give public officials the right to disperse valuable rents, increasing the scope for corruption. Bloated budgets give public officials greater ability to transfer public resources to their pockets and their cronies, equally increasing the scope for corruption. Public rents tend to be higher in countries with large endowments of natural resources, which is why many champions of corruption are oil-producing countries. Likewise, public rents controlled by

bureaucrats are more valuable in economies with fewer opportunities and less competition, which is why countries less open to foreign trade tend to be more corrupt.

What makes public officials accountable? One can distinguish between two different sets of factors: the first has to do with the extent of democratic freedoms and the second with the effectiveness of legal institutions and the pervasiveness of anticorruption norms. Civil liberties and political rights lower corruption by giving people not only the freedom to denounce corrupt officials, but also the ability to vote out dishonest politicians. Obviously, an informed and participative electorate will lower the ability of public servants to get away with corruption. A freer and more influential press will also reduce the scope of corruption, as will the existence of well-functioning institutional checks and balances. Greater political instability will increase corruption, because instability generates the perception among politicians and bureaucrats that the probability of winning elections does not depend on their actions, thus increasing the incentives to extract rents.

Institutional factors also reduce corruption, and by institutional we mean both formal laws and informal norms. Common law systems, originally designed to protect people against arbitrary expropriations by the sovereign, reduce corruption by giving private parties the edge in their disputes with the state. The opposite is true for civil law systems, originally used by the sovereign as instruments for state building and the regulation of economic life. Social norms that encourage the challenge of authority by common citizens also reduce corruption, mainly by increasing public willingness to denounce malfeasant politicians and bureaucrats. These norms are usually more widespread in Protestant societies than in societies dominated by hierarchical religions (e.g., Catholicism, Eastern Orthodoxy, Islam). It is not surprising, then, that corruption will tend to be lower in Protestant societies. For the same reasons, corruption will tend to be lower in more educated societies, which implies, among other things, that corruption will fall as income per capita increases.

Corruption will also be higher if government agencies have complete control of important government services. If different agencies compete to offer the same service, competition will drive rents toward zero. If only one agency can offer the service, however, rents will be substantial, given public servants ample scope to collect bribes. This argument implies that federal states, in which sub-national units compete to attract business and sell government services, will be less corrupt. In addition, decentralization (and hence federalism) can lower corruption by facilitating the public control of government officials.

Unfortunately, the empirical literature on the causes of corruption does not permit to rank the factors mentioned above. Different authors emphasize different factors, and students of this sprawling literature are often at a loss when trying to draw some general conclusions. Perhaps the main (and disheartening) conclusion is that cultural and historical factors, many of which are not amenable to policy manipulation, are as important as current policies in the determination of corruption. Thus, Protestantism is as important as democratization and spontaneous political participation as important as institutional check and balances. Further, definitive conclusions are unlikely, if only because the various determinants of corruption interact in various and complex ways.

The right-hand side of the Figure 1 lists the main consequences of corruption brought up in the empirical literature. First and foremost, corruption is negatively correlated with economic growth. Whether this correlation actually means that corruption is bad for growth is still a contentious issue, though most empirical studies appear to confirm it. The pathways whereby corruption affects growth are rarely spelled out in the literature. Increasing uncertainty, the misallocation of talent and smaller rates of foreign direct investment are among the most frequently mentioned pathways.

Corruption affects not only the levels of foreign direct investment, but also its composition. If corruption is widespread, then foreign investors will avoid the host country altogether. If corruption is not prohibitive but still present, foreign investors will prefer to associate with local partners because of the importance of their knowledge about how to deal with wicked

bureaucrats. If corruption is absent, then foreign investors, especially when keen about protecting intangible assets, will prefer wholly-owned subsidiaries.

Corruption also increases the level of unofficial activity. Many entrepreneurs will prefer to go underground in order to avoid arbitrary expropriations by malfeasant officials. If corruption is very high, the unofficial economy will expand, often reaching a substantial fraction of total economic activity. As a result, tax revenues will fall and with them the size of the government. Not surprisingly, then, corrupt governments tend also to be small governments. Corruption also affects the composition of government expenditures. Specifically, corrupt officials will steer investments toward infrastructure (where bribe collection is more expeditious) and away from health and education (where bribe collection is more intricate).

Finally, this literature suggests that corruption and economic development (or the lack thereof) feed on each other. Economic development in general and the spread of education in particular lowers corruption. But dwindling corruption can spur economic development. This virtuous circle is an example of the positive reinforcement between government quality and economic developments; arguably the main mechanism underlying the differences in wealth among the nations. And still the biggest mystery of economics.

III. Corruption and Crime in the Private Sector Survey

Corruption is often defined as the misuse of public power for private gain. This definition encompasses a wide range of phenomena, from a police officer who accepts money from drug traffickers, to a custom agent who extorts businesses, to a politician who appropriates royalties. As different as these phenomena are, they may be driven by the same causes and have similar effects upon economic and social outcomes.

One should distinguish between at least two different forms of corruption. The first form refers to an illegal transaction involving public and private parts. This includes bribe collection by public officials and illegal payments by private businesses. The second form

does not involve private parts and refers mainly to the illegal misappropriation of public property by public officials, including bureaucrats, elected politicians and judges.

These forms of corruption affect the economic prospects of firms through different pathways. Bribes raise operational costs and create uncertainty. Exporting firms, for example, will be less competitive in a country where port official charge hefty bribes to complete pre-shipment inspections. Lawful businesses will suffer as well if corrupted officials allow illegal practices to go unchecked. Software firms, for example, may be driven out of business if "captured" officials decide not to enforce copyright regulations.

On the other hand, the stealing and pilfering of government resources by public officials do not have direct effects on the economic prospects of firms, but can have huge indirect effects. Public finances will deteriorate, creating uncertainty and raising the cost of credit. Infrastructure will crumble, public services will worsen and the general climate of business will suffer accordingly.

Not surprisingly, these two forms of corruption tend to go hand in hand. If bureaucrats can collect bribes without fear of punishment, chances are that they will also have enough leeway to unduly appropriate public money. Similarly, if politicians have the power to award contracts to his cronies, probably they will also be able to capture some government rents. These examples notwithstanding, it pays to distinguish between these two forms of corruption, if only to fully understand exactly what we measure when we use private sector surveys to study corruption.

The data used in this paper is based on a private sector survey conducted by the World Bank and the Inter-American Development Bank in 1999. About 100 middle and top managers in 29 countries, 20 of them from Latin American, were queried about their perceptions on several areas of government performance, including predictability of policies, reliability of the judiciary, problems with corruption, crime and public services. This survey is a sequel of a survey conducted by the World Bank in 1996 as part of World

Development Report of 1997.[1] The private sector survey includes several questions on firm characteristics, including size, location, tenure, and sector. Sector quotas were used in all countries: roughly 40 percent of the firms surveyed in each country come from manufacture. None of the country samples was intended to be representative of the universe of firms of the country, which should be kept in mind when comparing country means.

The survey includes at least six questions about corruption. The first question asks respondents to judge the extent to which corruption and crime are obstacles to the operation and growth of their business. The second question asks respondents whether firms in their line of business often pay bribes to get things done. The next three questions focus on various aspects of the bribe collection process: whether firms know in advance the value of the bribes they have to pay, whether firms can count on services being delivered after paying bribes, and whether firms have to pay bribes not to one but to several officials. In addition, the survey includes several questions as to whether officials from specific government offices (e.g., tax and procurement agencies, customs and courts) and state-owned companies (e.g., power and telephone companies) requested bribes during 1999.

Table 1 presents the sample means of the questions described above. Questions containing more than two options were dichotomized, so that the averages could be interpreted as percentages. While 46 percent of the respondents stated that corruption is an obstacle to the operation and growth of their firms (corr1), 23 percent stated that firms in their line of business often pay bribes (corr2). Similarly, 12 percent of the respondents report that they often have to pay bribes to more than one official for the same service (corr5), 13 percent report that custom officials requested bribes during 1999 and 30 percent that officials from at least one of the agencies listed did the same (corr6). Finally, 53 percent reported that crime is an obstacle to doing business (crime).

<< Insert Table 1 here>>

Table 1 also shows the stark differences between Latin American and O.E.C.D countries in terms of corruption and crime. As measured by any of the variables at hand, corruption is

[1] See World Bank (1997) for a thorough description of this survey. The O.E.C.D. countries included in the survey are Canada, France, Germany, Italy, Portugal, Spain, Sweden, United Kingdom, and the United States. The Latin American countries are listed in Figure 2.

much greater in Latin America than in O.E.C.D. countries. Whereas almost 60 percent of the respondents from Latin America state that corruption is an obstacle to doing business, only 17 percent of the respondents from O.E.C.D countries report a similar opinion. As for whether bribes are common in their line of business, 28 percent of the respondents from Latin America and 12 percent of the respondents from O.E.C.D countries said to agree with that statement. Concerning crime, the differences are even more striking: while 22 of the respondents in O.E.C.D countries state that crime is an obstacle to their business, 67 percent of the respondents in Latin American countries state the same.

Figure 2 shows the percentage of respondents in each Latin American country who reported that corruption is an obstacle to doing business. This percentage is the largest in Bolivia, Ecuador and Mexico, and the lowest in Uruguay, Chile and Trinidad and Tobago. Although corruption is ubiquitous in Latin America, it has different faces in different countries. Table 2 shows that custom officials are the most corrupt officials in Colombia, Costa Rica, Uruguay and Venezuela, tax inspectors in Argentina, Bolivia, Brazil and Panama, and telephone workers in Ecuador, Haiti and Honduras.

<<Insert Figure 2 here>>

Almost all of the questions included in Table 1 refer to the existence of illegal transactions involving private and public officials (the first form of corruption mentioned above). Only the first question, which asks whether corruption is an obstacle to doing business, can capture some general perceptions about the misuse of public resources by unscrupulous public officials (the second form of corruption mentioned above). In consequence, cross-country comparisons based on this survey refer mainly to the first form of corruption and should be interpreted as such.

<< Insert Table 2 here>>

In what follows, we focus on three measurement issues. First, we investigate the degree of association at the country level between the variables listed in Table 1. Second, we investigate whether or not the country means of the same variables are consistent across surveys. And last, we investigate what attributes make firms more likely to suffer from corruption and crime.

Correlation between Measures of Corruption and Crime

Table 3 displays the correlation coefficients between the country means of the different variables listed in Table 1. Most variables are highly correlated. In countries where most respondents state that corruption is a major obstacle to doing business (*corr1*), they also state that bribes are common in their line of business (*corr2*). Similarly, in countries where most respondents state that corruption is an obstacle (*corr1*), they were also much more likely to report that public officials requested bribes during 1999 (*corr6*). Moreover, perceptions of whether corruption is an obstacle to doing business are aligned with perceptions of whether crime constitutes a similar hurdle.

<< Insert Table 3 here>>

Table 4 looks in greater detail at the connection between corruption and crime. Countries were divided into two groups according to whether or not more than half of the managers interviewed report that corruption is an obstacle to doing business. Similarly, countries were divided in another two groups according to whether or not the same people report that crime is an obstacle to the operating of their business. Table 4 shows that in only one country the two partitions do not coincide, which points to the fact that perceptions about the prevalence of crime and corruption go hand in hand. So, firms in many countries are subject to a double curse: they lack protection from theft and violence, and they are at mercy of corrupt public officials.[2] It goes almost without saying that doing business under these circumstances could be a heroic activity.

<<Insert Table 4 here>>

Cross-survey Correlations

As mentioned earlier, the private sector survey is a sequel of a survey conducted by the World Bank in 1997. Several questions about corruption and crime, and many others about policy predictability, bureaucratic red tape and government quality in general, were included in both surveys, allowing comparisons between the two. The original survey comprised 69 countries, including 58 from developing regions and 9 from Latin America. The new survey comprised 29 countries, including 20 from Latin America. Only 15

[2] This fact is referred to as the lawlessness syndrome in the World Bank (1997).

countries were included in both surveys, meaning that cross-survey comparisons must be limited to this small sample.[3]

This problem notwithstanding, these comparisons shed light on the reliability of the country means as indices of corruption. This is important because samples are not necessarily representative of the countries under consideration. If country averages are similar from one survey to the next, this will give credence to cross-country comparisons presented above. Otherwise, one must be especially cautious about such comparisons.

Table 5 presents a comparison between the two surveys. For three of the six variables under analysis, there seems to be a high degree of correlation between the two surveys. The results show, in particular, that country means based on questions as to whether corruption and crime are obstacles to doing business (*corr1* and *crime*) and bribes are common (*corr2*) vary very little from one survey to the next. By contrast, means based on questions as to whether firms know the values of the bribes and can count on services being delivered (*corr3*, *corr4* and *corr5*) yield much more volatile results. In sum, direct questions about the existence of corruption appear to yield reliable corruption measures. More elaborate questions appear to be more problematic.

<< Insert Table 5 here>>

Figure 3 shows that there exists a high correlation between the corruption indices derived from the 1999 version of private sector survey and a composite index of corruption computed by Kaufmann and his collaborators at the World Bank.[4] In sum, the previous results suggest that survey means are enough to gauge differences in corruption among countries.

[3] These countries are Bolivia, Brazil, Canada, Colombia, Costa Rica, Ecuador, France, Germany, Italy, Mexico, Portugal, Spain, United Kingdom, United States and Venezuela.

[4] Kaufmann, Krary and Zoido-Lobaton (1999) built an index of corruption by combining information from several existing indices using an unobserved component method. Most corruption indices are based on either survey of experts or surveys are firms. The former involved only a few experts per country whereas the latter usually involved hundred or more forms per country. It is worth noting that this index is based partially on country means derived from the private sector survey carried out by the World Bank in 1997; values that are in turn highly correlated to the country means derived from the survey used in this paper.

<<Insert Figure 3 here>>

Corruption, Crime and Firm Characteristics

Data from the private sector survey can be used to study what type of firms are more likely to report that corruption and crime affect them one way or another. This exercise does not intend to make any causal claims: the results may either indicate what type of firm characteristics induces corruption or how corruption alters the size and the business orientation of the firms. This problem notwithstanding, this analysis can provide some insights about the mechanisms of corruption and its consequences for competitiveness: learning about the victims can often teach us something about the nature of the crime.

We use the following empirical model to study the connection between the incidence of corruption and firm characteristics:

$$\mathrm{Y}_{ij} = c + \mathrm{X}_{ij}\beta + \lambda_j + \varepsilon_{ij}, \qquad (1)$$

where Y_{ij} is dummy variable showing whether the manager of firm i that is located in country j report the incidence of corruption, X_{ij} is a vector of firm characteristics (including sector, size, tenure, location, whether the firm has foreign or state ownership, and whether the firm sell goods or services to the government), λ_j is a country effect and ε_{ij} is an error term. Country effects are included to control for unobserved country attributes. One may argue, for example, that individuals living in more corrupt countries have looser standards for judging corrupt practices. Country-fixed effects control for these differences, among others.

In order to minimize spurious correlations between perceived corruption and firm characteristics, we control for the propensity of managers to complain. If managers of small firms are more likely to complain about all aspects of the business environment, we may wrongly conclude that small firms are more liable to suffer from corruption and crime. We use the average rating of the quality and efficiency of five public services: roads, postal service, power, telephone and water to approximate a respondent's tendency to complain. Because objective ratings of these services should not differ much across firms, actual

differences in the ratings can be interpreted as differences among managers in their tendency to complain indistinctively about all aspects of the business environment.[5]

Table 6 shows the average values of the main independent variables used in the analysis. The average values hide important variations among countries. In the United Kingdom only five percent of the firms included in the survey have more than 500 employees, in Colombia more than half exceed this value. In Italy over 60 percent of the firms do business with the State; in Portugal only 20 percent do so. Importantly, these differences reflect not so much differences in the structure of production of the countries under analysis, as differences in the sampling procedures.

<< Insert Table 6 here>>

We use four different dependent variables: whether corruption is an obstacle to doing business (corr1), whether bribery is common in one's line of business (corr2), whether at least one of government agencies listed in Table 1 requested bribes in 1999 (corr6), and whether crime is an obstacle to doing business (crime). The same specification was used in all four cases, so that one can evaluate the extent to which the results are robust to the changes in the definitions of the dependent variable.

Table 7 presents the estimation results. Results are based on a Probit model, but they do not differ much if other estimation methods are used. No systematic relationship between firm characteristics and corruption is apparent, apart from its higher incidence among small firms. Neither firms that sell goods and services to the government nor firms in manufacturing appear more likely to suffer from government arbitrariness in the form of corruption. There is slight evidence that firms with some government ownership are less likely to suffer from corruption, but this result is not always significant and may be driven not so much by actual differences in corruption, as by differences in the willingness to report corrupt practices.

As in the case of corruption, small firms are more likely to perceive crime as an obstacle to business operations than larger firms. Firms located in the capital and in large cities as well

[5] This correction was first proposed by Kaufmann and Wei (1999).

as firms that have some government ownership are less likely to complain about crime. The negative connection between city size and crime is at odds with evidence from victimization surveys, suggesting that the causal factors underlying crime affecting businesses differ from those underlying crime affecting people. [6]

There are some worthwhile differences between Latin America and the developed world in the patterns of corruption across firms. In O.E.C.D. countries firms that have sales to the state sector tend to complain more about corruption, while in Latin America they do not. However, the negative connection between firm size and the incidence of corruption is stronger in Latin America than in the O.E.C.D. One can speculate that while in developed countries corruption affects mainly firms that have deals with the government (corruption is often no more than a calculated nuisance for these firms), in Latin America corruption affects mainly smaller firms.

<<Insert Table 7 here>>

IV. Corruption, Crime and Economic Outcomes

Recent empirical research shows that growth rates tend to be lower in countries with higher levels of corruption. Various mechanisms have been mentioned to explain this fact: corruption depresses foreign and domestic investment, reduces innovation and increases the operating costs of firms. In this section, we use the private sector survey described earlier to examine the effects of corruption on the economic outcomes of firms.

The private sector survey includes several questions about firm performance. Managers were asked to approximate the growth of their companies' sales, investment, exports, employment and debt during the three years previous to the survey. We assume that these answers capture the recent performance of the firms under analysis. Indirect evidence gives credence to this assumption. For one thing, country means are highly correlated with average GDP growth (see Figure 4).[7] For another, the best performing firms in the sample are, as expected, younger firms with foreign ownership that export part of their production.

[6] See, for example, Gaviria and Pages (2000).
[7] The correlation coefficient between GDP growth and average sales growth is 0.64. The coefficients between GDP growth, on the one hand, and investment and employment growth, on the other, are 0.73 and 0.61.

Interestingly enough, firms that have some type of government ownership are the worst performing of all.

<<Insert Figure 4 here>>

We focus on three indices of performance: reported growth rates of sales, investment and employment. The three indices are highly correlated at the firm level: the correlation coefficient between sales growth and employment growth is 0.58, and all coefficients are greater than 0.45. The mean growth rate of sales in the whole sample is 9.2%, the mean growth of investment 12.4%, and the mean growth of employment 3.4%. Mean growth rates of employment and sales are much higher in O.E.C.D. countries than in Latin American countries. For employment, the mean rates for O.E.C.D and Latin American countries are 7.6% and 1.5%, respectively. For sales, the corresponding values are 14.2% and 7.0%.

Country means of firm performance and corruption indicators are highly correlated. The correlation coefficient between mean sales growth and the percentage of managers that state that corruption is an obstacle to doing business is 0.42. Somewhat smaller values, though still large, are obtained if other indicators of economic performance and corruption are used. But cross-country correlations based on average indices can have serious drawbacks, if only because they can be driven by differences in country characteristics that are correlated with both economic activity and corruption. In what follows, we abstract from cross-country differences and focus on the relationship between economic performance and the incidence of corruption at the firm level.

Our empirical analysis is based on the following model

$$\mathrm{S}_{ij} = c + \delta \mathrm{Corrup} + \mathrm{X}_{ij}\beta + \lambda_j + \nu_{ij}, \qquad (2)$$

where S_{ij} is the rate of growth of sales of firm *i* in country *j*, *Corrup* is an indicator of corruption, X_{ij} is a vector of firm characteristics (including sector, size, tenure, location, whether the firm has foreign or state ownership, and whether the firm sell goods or services to the government), λ_j is a country effect and ε_{ij} is an error term. A negative value of δ would indicate that corruption negatively affects economic performance at the firm level. Several mechanisms can explain and adverse effect of corruption and crime on firm

performance. First, corruption and crime raise operational costs, lowering competitiveness and ultimately lowering sales. Second, crime and corruption prevent companies from entering profitable business, limiting the opportunities for growth and lowering sales, investment and employment. Finally, crime and corruption may cause firms to lose valuable human and financial resources, likewise lowering competitiveness. Unfortunately, the data at hand does not allow distinguishing among these mechanisms, which are likely to operate simultaneously.

Controlling for the propensity of managers to complain is crucial in this context. If managers complain indistinctively about everything, a positive but spurious correlation between bad economic outcomes and reported corruption would ensue. As we did in Section III, we use managers' rating of public services to approximate the propensity of respondents to complain. Because objective ratings of these services should not differ much across firms, differences can be interpreted as differences among managers in their tendency to complain indistinctively about all aspects of the business environment.

We estimate Equation (2) using OLS. We control for all firm characteristics included in Table 6, as well as for country specific fixed effects. Controlling for country fixed effects is important given the high correlation between countrywide averages of firm performance and countrywide indicators of corruption. We use four distinct corruption indicators: *corr1* (is corruption a significant obstacle to doing business?), *corr2* (are bribes common in their line of business?), *corr6* (did public officials request bribes during 1999?), and *crime* (is crime an obstacle to doing business). The implicit assumption is that firms that answer affirmatively to these questions are more likely to experience harassment by public officials and criminals.

Table 8 shows the effect of corruption and crime upon the rate of growth of sales. These rates are almost three percentage points (or 30 percent) lower in firms where managers report that corruption is an obstacle to doing business than in firms where managers report otherwise. Similarly, sales growth is 35 percent lower in firms where managers complain

about crime than in firms where managers do not. The same differences are smaller and no longer statistically significant if alternative corruption indicators are used.

Table 9 shows the effects of crime and corruption on investment growth. Unlike the previous results, no noticeable differences in investment growth between firms that complain about corruption and firms that do not. Investment growth is two percentage points (or 16 percent) lower in firms that report that crime is an obstacle to doing business than in firms that report the opposite, but this difference is not statistically significant. Table 10 repeats the exercise for employment growth. The results show that perceptions of corruption are not linked to employment growth at the firm level: employment growth is 1.5 percentage points (or 47 percent) lower in firms that report that crime is an obstacle than in firms that do not, but this difference is not statistically significant.

<< Insert Tables 8, 9 and 10 here>>

Two main conclusions can be drawn from the previous analysis. First, the effects of crime and corruption upon the economic prospects of firms appear to be limited to growth in sales. Second, crime appears to have a more pronounced effect on economic outcomes than corruption. These conclusions hold up after splitting the sample into developed and developing countries and after changing the sets of controls used in the analysis. Interestingly, the relationship between economic performance and corruption is the same irrespective of the level of development of the countries under study.

V. Corruption and Bureaucratic Interference in the Private Sector Survey

Figure 5 shows that there is a high correlation between indicators of corruption and regulatory burden at the country level. Both indicators were taken from Kaufmann et al. (1999).[8] While this correlation can be accounted for in many ways, most stories will tend to fall into two main groups. In the first, which goes back at least to Krueger (1974), excessive government restrictions on economic activity give rise to illegal attempts by private parties to circumvent them. In the second, which has been eloquently expounded by Shleifer and

[8] Both indicators were taken from Kaufmann et al. (1999). The corruption indicator was already described. The indicator of regulatory burden summarizes perceptions about the burdens imposed by excessive regulation in areas such as foreign trade and business development.

Vishny (1998), restrictions on economic activity and bureaucratic procedures are seen as a consequence, not simply as the initiators, of rent-seeking activities. In the latter story, bureaucrats usually adjust government restrictions in order to maximize bribe collection and not simply take them as given.

<<Figure 5>>

According to the first story, bureaucrats do not have enough leeway to change government regulations, which can be considered the result of well-intended efforts to prevent market failures and increase productivity, but can usually decide whether or not to enforce them. It is assumed that bureaucrats use all the power at their discretion for personal gain: they charge interested private parts for the privilege of skipping bureaucratic procedures. For example, a business license authority is bribed by an entrepreneur who wants to avoid a lengthy registration process. Or a customs official is bribed by a businessman who seeks exemption from shipment inspections.

In this story, corruption may allow private agents to buy lower effective red tape, thus reducing the detrimental effects of exaggerated government regulation. In short, corruption can be efficiency enhancing. Lui (1985) has formalized this idea by means of a queuing model in which the presence of corruption not only allows more willing private agents to move ahead in the queue, but it also induces bureaucrats to increase the speed with which they process the queue.

According to the second story, red tape and corruption are two sides of the same coin and the efficiency-enhancing role of corruption no longer applies. The point is that government regulations are no longer an exogenous hurdle that can be partially mitigated through illegal payments, but an instrument used by bureaucrats to enlarge their bounty. In this story, unmitigated corruption not only will be harmful in terms of economic efficiency, but will also cause obtrusive regulation to increase. While in the first model regulation begets corruption, in the second the causality is the opposite; it is corruption now that begets regulation.

Distinguishing between these two models is important because they imply a fundamental difference of emphasis when it comes to design anti-corruption policy interventions. According to the first model, a policy aimed at lowering corruption should focus on curtailing unnecessary government regulation. According to second story, a similarly motivated policy should focus directly on curtailing corruption, perhaps through increasing expected punishment to corrupt officials and increasing transparency in public matters. If successful, such policy should lower government regulation as well.

Unfortunately, the available cross-country evidence offers few clues as to which of these alternatives models bear closer resemblance to reality. As argued earlier, both models predict a positive connection between the extent of corruption and the extent of nominal bureaucratic red tape (see Figure 5). Empirical evidence showing that corruption is bad for growth could be interpreted as indirect evidence in favor of the second model. But this evidence is hardly enough to put up a definitive verdict. Below, we follow Kaufmann and Wei (1999) and present firm-level evidence that can be used to distinguish between the two competing models under consideration.

Our empirical analysis focuses on the relationship between bribe payments and the amount of time wasted by senior managers dealing with bureaucrats. If the first model above applies, firm managers will be able to reduce the nominal levels of red tape by means of illegal payments. This implies that, all else equal, firms that do pay bribes will be less affected by bureaucratic interference and that hence their senior management will waste less time dealing with bureaucrats. From this, we can derive a simple hypothesis.

H1: All else equal, time wasted in bureaucratic red tape will be lower in firms that pay bribes.

However, if bureaucrats are able to modify government regulations on a firm-by-firm basis, they will impose more stringent regulations on those firms more willing to tolerate red tape and bureaucratic delay. Kaufmann and Wei (1999) formalize the second story sketched above, and show that if bureaucrats can vary nominal regulations from one firm to another,

effective bureaucratic interference will be higher in firms that do pay bribes. In this model, bureaucrats customize nominal regulation, imposing the most intricate and complex restrictions on the most tolerant firms. These firms will pay higher bribes, seeking to reduce the suffocating levels of red tape forced upon them, but despite the higher bribes, they will still bear a higher *effective* level of red tape. From this, we can derive an alternative hypothesis.

H2: All else equal, time wasted in bureaucratic red tape will be higher in firms that pay higher bribes.

We test the previous hypotheses using data from the private sector survey. Managers in this survey were queried about what fraction of their time was spent dealing with bureaucrats. The specific question was: "what percentage of senior management's time per year is spent in dealing with government officials about the application and interpretation of laws and regulations?" We interpret this percentage as the extent of effective bureaucratic red tape borne by each firm. Our test hinges on whether or not this percentage is higher in firms in which managers report that corruption is either an obstacle to doing business or a common practice in their line of business.

<<Table 11>>

Table 11 shows the distribution across firms of the percentage of management's time spent dealing with bureaucrats. Most managers (64%) report no time at all spent in this matter. The mean value of this variable is 4.6%. Surprisingly, the mean for developed countries is higher than the mean for Latin American countries (5.8% and 4.1%, respectively). Insofar as mean values are a good proxy for the extent of effective regulatory burden in a country or region, the data at hand suggests that, unlike the case of corruption, the burden of red tape is not much higher in developing countries than in developed ones.[9]

We use the following empirical model to study the interplay between effective bureaucratic red tape and corruption at the firm level:

[9] The correlation coefficient between the country means of this variable and the Kaufmann index of regulatory burden is almost zero, suggesting that the effective and nominal levels of bureaucratic interference can be quite at odds.

$$B_{ij} = c + \alpha \text{Corrup} + X_{ij}\beta + \lambda_j + \varepsilon_{ij}, \qquad (3)$$

where B_{ij} is the percentage of time spent dealing with bureaucrats by the senior management of firm *i* in country *j*, *Corrup* is an indicator of corruption, X_{ij} is a vector of firm characteristics (including sector, size, tenure, location, whether the firm has foreign or state ownership, and whether the firm sell goods or services to the government), λ_j is a country effect and ε_{ij} is an error term.[10] A negative value of α would indicate that corruption reduces the extent of effective bureaucratic red tape (i.e., H1 is true). A positive value would indicate that corruption and bureaucratic red tape go hand in hand (i.e., H2 is true).

We control for all firm characteristics listed in Table 6, as well as for the propensity of the respondents to complain indiscriminately and for country fixed effects. We use the same corruption and crime indicators used in the previous section: *corr1* (corruption is an obstacle to doing business), *corr2* (corruption is common in one's line of business), corr6 (public officials requested bribes during 1999), and *crime* (crime is a obstacle to doing business).[11] We assume that firms that answer these questions affirmatively are more likely to pay bribes.

We estimate Equation (3) using a Tobit model. This type of empirical model is appropriate in this case because of the peculiar distribution of the dependent variable, which includes a large mass of observations at the value of zero. One can argue that respondents only reported that they did spend some time dealing with bureaucrats if such time exceeds some unknown positive value. If this assumption is true, the dependent variable will be censored and a Tobit model will be the right one.[12]

Table 12 presents the main results. The fraction of time wasted by senior managers dealing with red tape is larger in firms in which managers state that corruption is a significant

[10] See Kaufmann and Wei (1999) for a formal model that can be used to justify this specification.
[11] We also study the relationship between economic outcomes and the other corruption indicators defined in Section III. Neither of these indicators have a consistent relationship with economic outcomes (unreported results).
[12] See, for example, Kennedy (1998).

obstacle to doing business than in firms in which manager state otherwise. On average, this fraction is more than two percentage points higher in the former than in the latter. Similarly, this fraction of time is larger in firms whose mangers say that public officials requested bribes during 1999 than in firms whose managers report no bribe requests. The difference in this case is almost four percentage points (90% of the sample mean).

The previous results do not change much if other estimation methods and other covariates are used. The results are also very similar if the sample is restricted to either Latin America or O.E.C.D countries, which suggests that the relationship in question is not mediated by the level of development: it has the same sign and similar size in both developed and developing countries.

<<Insert Table 12 here>>

The results provide compelling evidence in favor of the second hypothesis presented above. There appears to be a positive connection between bribe payments and effective bureaucratic delay at the firm level. The same result was obtained by Kaufmann and Wei (1999) using a similar empirical strategy and data from three distinct private surveys: the 1996 and 1997 surveys for the Global Competitiveness Report and the 1996 survey for the World Development Report. Taken together, these results suggest that public officials are able to manipulate nominal bureaucratic restrictions so as to increase bribe collection. Thus, nominal regulations should not be considered exogenously given but endogenously determined by corrupt officials seeking to extract higher bribes from private business.

Our empirical results are broadly consistent with the idea that regulation is mainly a mechanism to create rents for bureaucrats. Economic regulations should not then be perceived simply as well-intended attempts to prevent market failures and increase productivity that can inadvertently create corruption. Rather, they should be perceived as devices to transfer rents from firms and individuals to bureaucrats.[13]

[13] See Shleifer and Vishny (1998) for an eloquent exposition of this view, referred by them as the *Grabbing Hand* hypothesis.

VI. Conclusions

This paper examines both the effects of corruption and crime on the economic outcomes of firms and the link between corruption and effective bureaucratic interference at the firm level.

The results show that corruption has a noticeable effect on the economic outcomes of firms in the sense that these outcomes tend to be lower in firms where managers report that corruption is an obstacle to doing business than in firms where managers report otherwise. In the same vein, the results show that crime has a similar (if not higher) effect on the economic outcomes of firms. Both effects are noticeable even after taking into account firm and country characteristics. On the whole, the evidence indicates that corruption and crime substantially reduce competitiveness.

The results also indicate that corruption and *effective* bureaucratic interference (measured as the fraction of senior management's time spent dealing with bureaucrats) go hand in hand. That is, bureaucratic interference is higher in firms that are more likely to pay bribes. This result flies in the face of several theories that predict that bribes can increase efficiency by allowing firms to avoid exaggerated government regulations. The results suggest, in contrast, that government regulations are strategically used by bureaucrats to maximize bribe collection.

Finally, the results show that that the prevalence of corruption and crime differs substantially from one country to the next, and that both phenomena are closely associated. Government arbitrariness in the form of corruption and government's inability to enforce contracts and protect property rights are flip sides of the same problem—a problem that affects all types of firms, irrespective of their area of business, location or type of ownership, and that constitutes, without a doubt, one of the most serious hurdles to private entrepreneurship in developing countries.

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Figure 1. Causes and Effects of Corruption

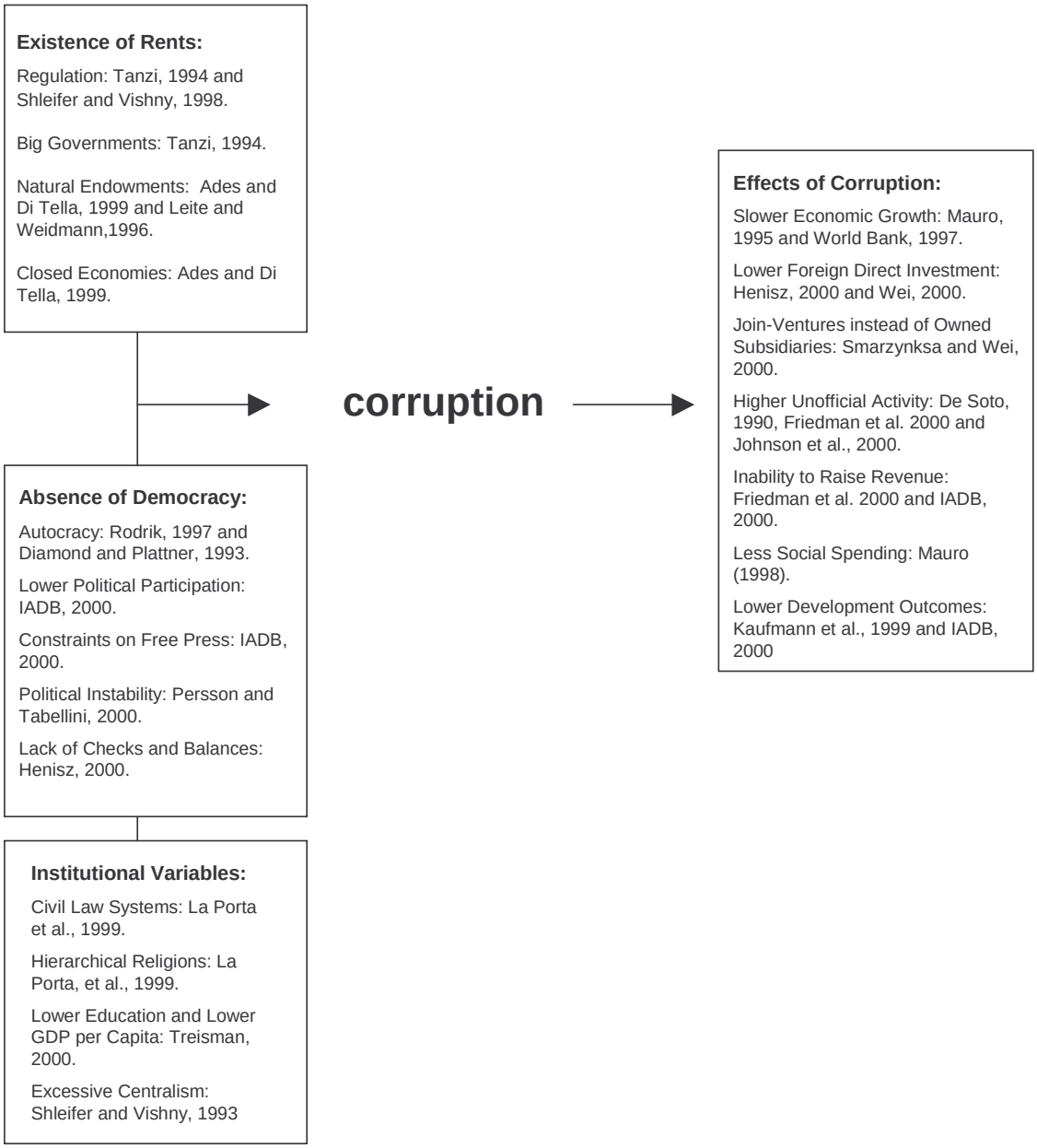


Figure 2. Corruption as an obstacle to doing business

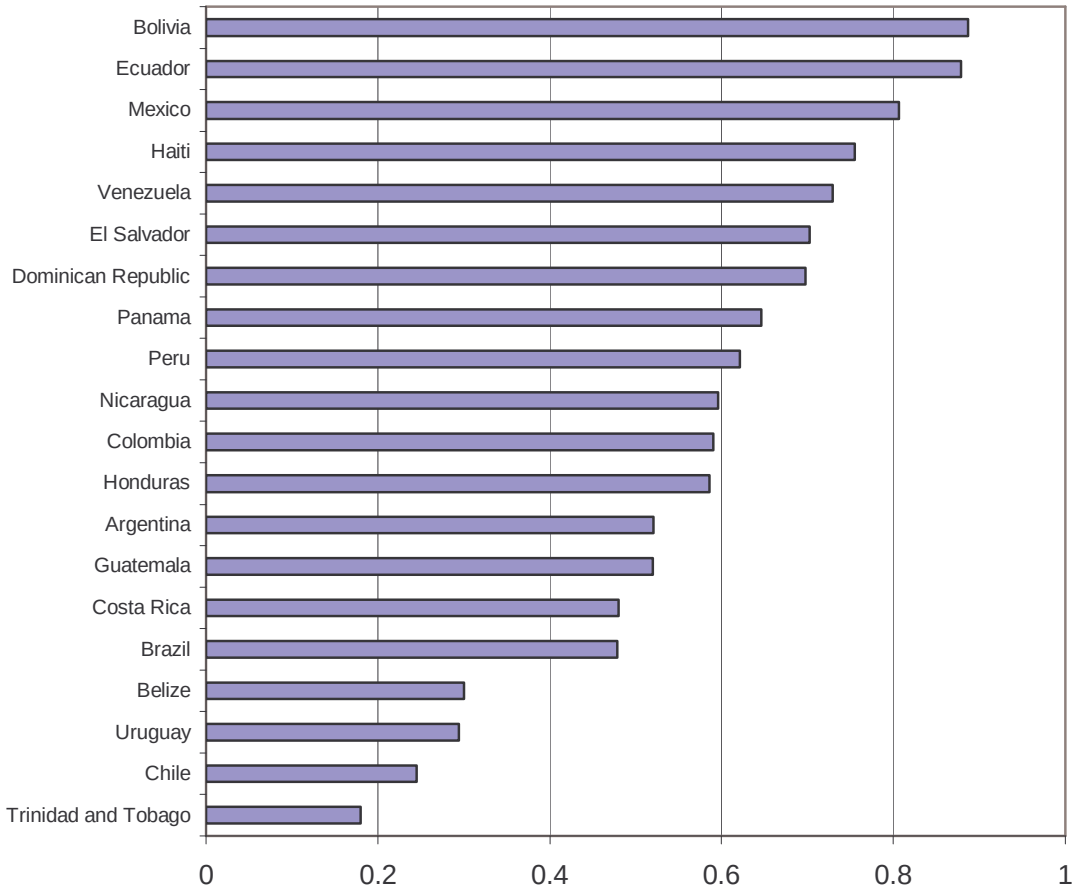
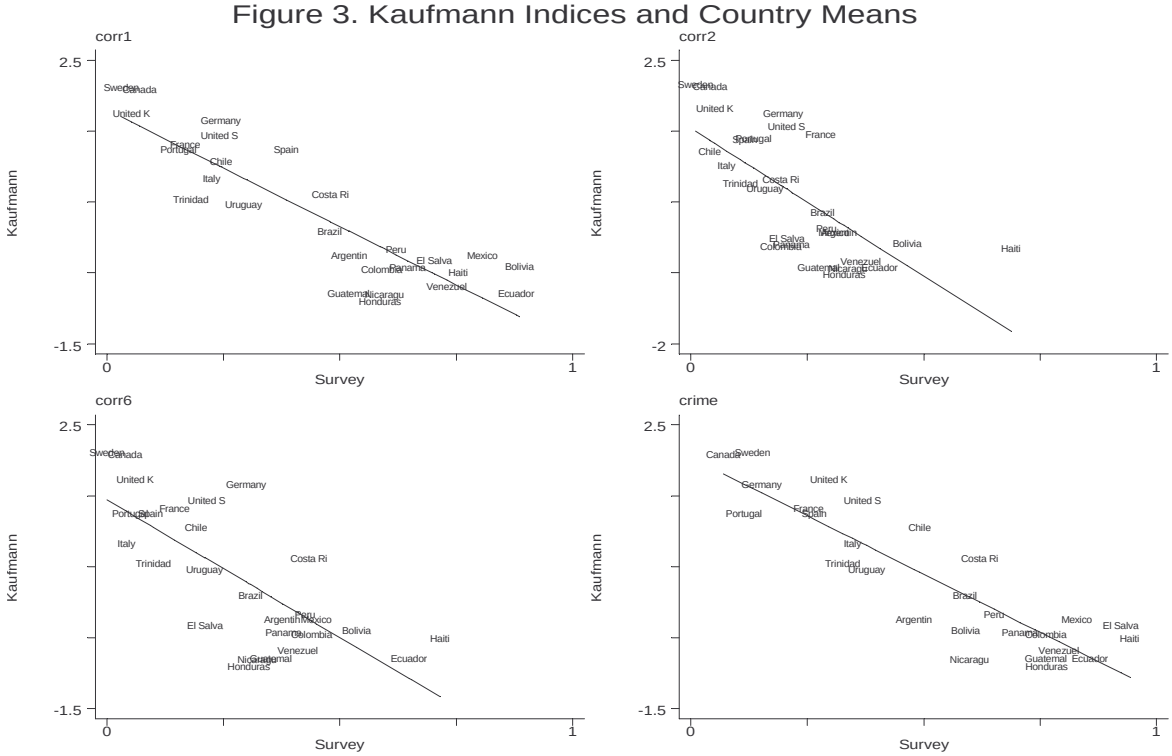


Figure 3. Kaufmann Indices and Country Means



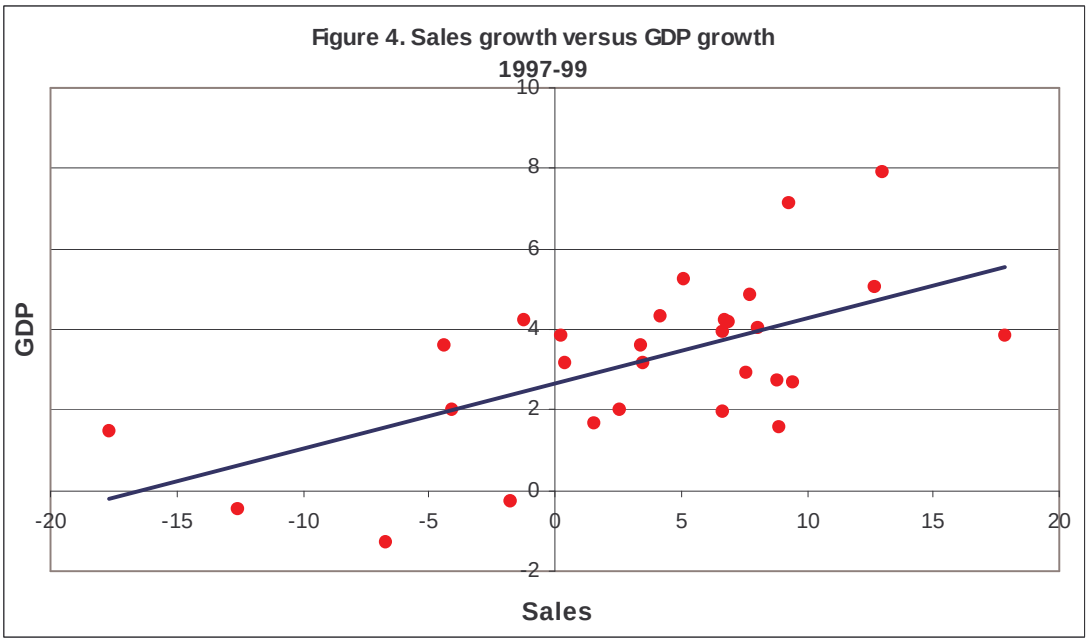


Figure 5. Kaufmann Indicators of Corruption and Regulatory Burden

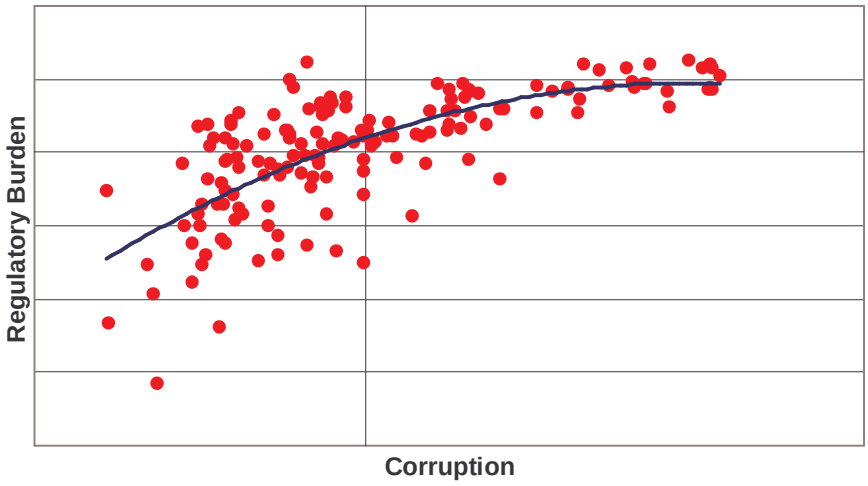


Table 1. Averages of corruption and crime variables

Variable	Symbol	All countries	Latin American Countries	Developed countries
Corruption is an obstacle to doing business	corr1	46%	59%	17%
Bribes are common in one's line of business	corr2	23%	28%	12%
Firms do not know in advance the value of the bribe	corr3	23%	27%	16%
Service is not delivered after paying	corr4	21%	25%	13%
Other officials require payments for the same service	corr5	12%	14%	7%
Officials from power company requested bribes		9%	12%	2%
Officials from phone company requested bribes		9%	12%	2%
Business licensing officials requested bribes		11%	14%	5%
Tax agency inspectors requested bribes		12%	16%	3%
Government procurement agents requested bribes		7%	9%	2%
Custom agents requested bribes		13%	18%	2%
Judges or court officials requested bribes		5%	7%	2%
Politicians requested bribes		6%	7%	5%
Any of the previous officials requested bribes	corr6	30%	39%	10%
Crime is an obstacle to doing business	crime	53%	67%	22%

Table 2. Government Agencies More Likely to Request bribes in 1999

Argentina: Tax Agency (28%) and Business License (16%).

Bolivia: Tax Agency (41%), Business License (28%) and Customs (28%).

Brazil: Tax Agency (17%) and Business License (16%).

Chile: Customs (6%) and Tax agency (5%).

Colombia: Customs (20%), Telephone Company (11%) and Politicians (11%).

Costa Rica: Customs (30%) and Telephone Company (12%).

Dominican Republic: Tax Agency (43%) and Customs (27%)

Ecuador: Telephone (53%), Power (42%) and Tax Agency (35%).

El Salvador: Customs (9%) and Telephone Company (7%).

Guatemala: Customs (19%) and Business License (14%).

Haiti: Telephone (57%), Power (47%) and Business License (37%).

Honduras: Telephone Company (24%) and Power Company (23%).

Mexico: Business License (28%) and Tax Agency (24%).

Nicaragua: Customs (21%).

Panama: Tax agency (21%) and Customs (19%).

Peru: Business License (27%), Customs (18%) and Courts (17%).

Uruguay: Customs (17%).

Venezuela: Customs (23%) and Business License (16%).

Table 3. Pairwise Correlations of Country Means

	corr1	corr2	corr3	corr4	corr5	corr6	crime
corr1	1.0000						
corr2	0.7694*	1.0000					
corr3	0.6084*	0.2621	1.0000				
corr4	0.6500*	0.7360*	0.5051*	1.0000			
corr5	0.6877*	0.7076*	0.5328*	0.6426*	1.0000		
corr6	0.8574*	0.8054*	0.5107*	0.7615*	0.5806*	1.0000	
crime	0.8905*	0.6701*	0.5823*	0.6184*	0.6795*	0.7816*	1.0000

Values show Pearson Correlations. * Siginificant at 5 %.
See Table 1 for variable definitions.

Table 4. Corruption and Crime in the Private Sector Survey

	Corruption is an obstacle	Corruption is not an obstacle
Crime is an obstacle	15	1
Crime is not an obstacle	0	13

Table 5. Cross-Survey Correlations

Corruption is an obstacle to doing business	corr1	0.8498
Bribes are common in one's line of business	corr2	0.7914
Firms do not know in advance the value of the bribe	corr3	0.3585
Service is not delivered after paying	corr4	0.6708
Other officials require payments for the same service	corr5	0.3848
Crime is an obstacle to doing business	crime	0.8507

Table 6. Mean Characteristics of Surveyed Firms

Firm is in manufacturing	36.0%
Number of employees is 5 to 50	33.5%
Number of employees is 51 to 500	41.7%
Number of employees is 500+	24.7%
Commercial firm	22.3%
Firm is located in capital city of country	61.5%
Firm is located in large city	19.7%
Firm is located in small city or countryside	18.8%
Years of functioning	27.9
Government has financial stake in the firm	4.2%
Foreign companies have financial stake in the firm	23.1%
Firm exports	34.7%
Firm have sales to state sector	45.4%

Table 7. Firm characteristics and the Incidence of Corruption and Crime
Marginal Effects -- Probit Estimation

	Corr1	Corr2	Corr6	Crime
Firm is in manufacturing	0.025	-0.006	-0.003	0.029
	(0.95)	(0.31)	(0.12)	(1.14)
Number of employees is 51 to 500	-0.076	-0.013	<0.000	-0.085
	(2.88)**	(0.68)	(0.02)	(3.22)**
Number of employees is 500+	-0.118	-0.069	-0.064	-0.065
	(3.69)**	(2.98)**	(2.33)*	(1.96)
Commercial firm	0.006	-0.023	0.037	0.028
	(0.21)	(1.09)	(1.47)	(1.04)
Firm is located in capital city of country	-0.044	0.020	0.026	-0.076
	(1.38)	(0.77)	(0.91)	(2.49)*
Firm is located in large city	-0.016	-0.017	0.01	-0.038
	(0.42)	(0.54)	(0.27)	(1.04)
Years of functioning	<0.000	-0.001	-0.001	<0.000
	(1.10)	(1.66)	(2.09)*	(1.38)
Government has financial stake in the firm	-0.105	-0.041	-0.067	-0.095
	(1.76)	(0.85)	(1.29)	(1.67)
Foreign companies have financial stake in the firm	<0.000	-0.044	-0.001	-0.058
	(0.01)	(2.04)*	(0.05)	(2.20)*
Firm exports	-0.018	0.003	0.044	-0.052
	(0.66)	(0.11)	(1.77)	(2.02)*
Firm have sales to state sector	0.024	0.020	0.015	-0.003
	(1.06)	(1.03)	(0.75)	(0.14)
Subjective Perceptions of Quality of Public Services	0.030	0.038	0.038	0.043
	(2.15)*	(3.72)**	(3.11)**	(3.06)**
Observations	2612	2556	2518	2671
Number of countries	29	29	29	29

Absolute value of z statistics in parentheses
* significant at 5% level; ** significant at 1% level
Small firms and firms located in the country side are the baseline groups

Table 8. Sales Growth and Corruption at the Firm Level

Corruption Indicator	***Corr1***	***Corr2***	***Corr6***	***Crime***
Estimated δ	-2.698	-2.103	-1.775	-3.400
	(1.87)*	(1.34)	(1.20)	(2.36)*
N	2385	2342	2383	2426
R-Squared	0.04	0.04	0.04	0.04

Absolute Value of t-statistics in parentheses
* Significant at 5% level; ** significant at 1% level
Controls include firm characteristics and country fixed effects.

Table 9. Investment Growth and Corruption at the Firm Level

Corruption Indicator	***Corr1***	***Corr2***	***Corr6***	***Crime***
Estimaded δ	-1.508	-0.442	0.081	-2.012
	(1.01)	(0.27)	(0.05)	(1.35)
N	2337	2300	2347	2383
R-Squared	0.03	0.03	0.03	0.03

Absolute Value of t-statistics in parantheses
* Significant at 5% level; ** significant at 1% level
Controls include firm characteristics and country fixed effects.

Table 10. Employment Growth and Corruption at the Firm Level

Corruption Indicator	***Corr1***	***Corr2***	***Corr6***	***Crime***
Estimaded δ	-0.715	-0.848	-0.783	-1.588
	(0.58)	(0.63)	(0.62)	(1.30)
N	2434	2389	2433	2476
R-Squared	0.03	0.03	0.03	0.03

Absolute Value of t-statistics in parantheses
* Significant at 5% level; ** significant at 1% level
Controls include firm characteristics and country fixed effects.

Table 11. Distribution of Time Fraction Wasted by Senior Management in Bureaucratic Red Tape

Range	Frequency	Percent	Cumulative
x=0	1712	63.6%	63.6%
0<x≥5	460	17.1%	80.7%
5<x≥10	235	8.7%	89.5%
10<x≥15	54	2.0%	91.5%
15<x≥20	87	3.2%	94.7%
20<x≥25	23	0.9%	95.6%
25<x≥30	41	1.5%	97.1%
30<x≥50	50	1.9%	99.0%
x>50	28	1.0%	100.0%

Table 12. Bureacratic Delay and Corruption at the Firm Level Tobit Model

Corruption Indicator	***Corr1***	***Corr2***	***Corr6***	***Crime***
Estimaded α	2.261	-0.086	3.890	0.736
	(1.90)*	(0.06)	(3.21)**	(0.62)
N	2457	2410	2464	2509
Pseudo R-Squared	0.03	0.03	0.03	0.03

Absolute Value of t-statistics in parantheses
* Significant at 5% level; ** significant at 1% level
Controls include firm characteristics and country fixed effects.