Extortion or cost-reduction: why do firms pay bribes?

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ABSTRACT
Do firms bribe government officials to reduce their costs or do bribe payments arise because of extortion from government officials? Using three of the Business Environment and Enterprise Performance surveys of firms across several countries and employing various estimation methodologies, this paper considers how bribery is associated with the potential for the firm to find honest government officials. If firms that report greater opportunities to find honest officials pay lower bribes, then this is a sign that bribes come from extortion because the presence of such officials should not matter for firms wanting to pay bribes to reduce costs. I generally find evidence that bribes arise due to extortion although results somewhat weaken in the latest survey.

1. Introduction

Corruption often referred to as the misuse of public office for private gain is treated by newspapers, NGOs, civil society leaders, etc. as one of the “the greatest obstacles to economic and social development” in many developing countries.¹ This is certainly a negative view of corruption and one that evokes images of extortion where unsavory government officials require that firms bribe them before they allow these firms to receive what they are legally entitled to. Reinforcing this view, Mauro (1995) and other empirical studies find that corruption lowers economic growth or investment.² However, this negative view is not uniform. Others argue corruption can sometimes act as “speed up” money that can facilitate productive activities and “grease the wheels” (Leff, 1964; Huntington, 1968; Aidt 2003). Firms are no longer victims but could even proffer the bribe as to avoid excessive regulation. Government officials are more passive in this scenario as the real impediments to growth become the regulatory obstacles firms must circumvent.

Determining which case is more prevalent is an important examination. If corruption stems from extortion then limiting it is, presumably, beneficial. Greatly reducing this cost of doing business could allow for more firms in the marketplace and provide existing firms with incentives to produce more, especially if extortion causes reallocations of resources to less efficient endeavors. If this is true then greater monitoring of public

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¹See the World Bank (2001).
²See Svensson (2005) and Asieudu and Freeman (2009) for surveys.
officials or more severe punishments for offenders could provide substantial growth benefits. On the other hand, reducing corruption when it helps firms avoid excessive regulation could have opposite effects. By denying firms this avenue to reduce costs, limiting corruption by more highly scrutinizing and punishing officials could retard economic growth. Policy prescriptions, instead, should focus on regulatory reform.

This paper attempts to distinguish between the two and ascertain why firms pay bribes. More specifically, does it appear that firms are being extorted or is it more likely that they are using bribes as a tool to avoid regulation? The empirical strategy is to rely on a survey question asked in several rounds of the BEEP surveys from the European Bank of Reconstruction and Development. These are firm level surveys of generally post-communist countries. This question pertains to how often a firm can turn to an official to receive the correct course of action if another official is acting improperly. When such “honest” officials are available, then the potential to extort the firm is low. However, if firms are trying to avoid regulation then the presence of honest officials is less important for a firm wanting to find a dishonest official, one that is willing to take a bribe to look the other way. Therefore, if firms that report being able to find honest officials pay lower bribes then this is a sign that bribes arise from extortion.

My methodological approach generally takes the bribe variable to be an ordinal one, denoting how prevalent bribery is; but I will also replace this ordinal variable with one that reports bribes as a percentage of revenues. The former can better capture the frequency of bribery whereas the latter is a better indication of its magnitude. I will also consider specific purposes – dealing with customs officials, dealing with tax administrators, obtaining licenses, etc. – for which a bribe could arise. Extortion could be more prevalent for some reasons why firms pay bribes and less prevalent in others.

The remainder of the paper is organized as follows. Section II briefly summarizes theoretical models where bribes are either a form of extortion or a way to avoid regulation. Section III describes the data and empirical models. Section IV presents results. A conclusion follows in section V.

2. Theoretical background

To more formally describe the bribe environment, I first define terms. I take extortion to arise when an official threatens to somehow punish a firm (such as delay goods through customs or deny a necessary permit) unless the firm pays the official under the table. The bribe is initiated by the official and the firm would rather not pay it but sees extortion as the less costly alternative than the punishment. On the other hand, a “cost-reducing” bribe occurs when the firm initiates a bribe payment because it wants the official to look the other way when it undertakes some illegal action so as to avoid an even costlier regulation. In both cases, the firm pays the bribe because it finds payment of the bribe to be beneficial (i.e., less costly) than the alternative. Nevertheless, I use the term “cost reduction” to apply only to those cases where a firm is initiating a bribe so as to avoid costly compliance with regulations.

Of course, it is also true that the two could be related. Government officials might not explicitly extort firms but they impose such onerous regulations that firms initiate bribes so as to reduce their costs. Banerjee (1997) provides an example. In such a setting, the regulatory environment is endogenous and becomes an indirect way to
extort firms. Nevertheless, I consider my approach informative for two reasons. For one, it can still tell us who is initiating bribes, firms or officials, and so provide information about how regulatory edifices should be improved. Second, I will show below that many firms report the potential to find honest officials even when they report onerous regulatory obstacles. If officials were creating such obstacles as an indirect way to extort firms then the potential to find honest officials should be small.

The question of whether bribery is driven by extortion or cost reduction holds implications both for how one models corruption and for its implications regarding the net cost of corruption upon social welfare. One example concerns whether market competition reduces or intensifies corruption. Rose-Ackerman (1978) models corruption as extortion. Market competition then reduces rents and so lowers the amount that can be extorted by corrupt officials. Bliss and Di Tella (1997) and Ades and Di Tella (1999) develop more nuanced models in that corrupt officials could try to maximize what they can extort by driving less efficient firms out of business. On the other hand, Straub (2009) and Alexeev and Song (2013) develop models where firms can bribe officials to reduce costs and so gain a competitive advantage over rivals. Sequeira and Djankov (2010) formally examine how the nature of corruption and, specifically, whether it is driven by extortion or cost reduction matters for how market competition influences bribery. Shleifer (2004) also considers both types of corruption. Therefore, if corruption largely stems from firms’ desires to reduce costs and gain advantage over their rivals then it should be more prevalent where market competition is strong. On the other hand, if corruption stems from extortion then corruption might be less prevalent where market competition is driving profits to zero.

The empirical work will also consider whether the prevalence of honest officials matters more or less for bribery in the presence of major obstacles as reported by the firm. Dusha (2015) creates a model where bureaucrats and private citizens/firms use intermediaries in their interactions such as the sale of permits to shield themselves from detection. Bribery is a form of cost reduction (when applied to how I am using terms) in that paying a bribe to obtain a permit can be less costly for the firm than obtaining it legally. He shows that more corruption will arise in equilibrium as obstacles to obtaining permits become more onerous. In such a case, the prevalence of honest officials should matter less for the level of bribe.

3. Data and empirical model

I use three editions of the Business Environment and Enterprise Performance (BEEP) surveys from the European Bank for Reconstruction and Development in conjunction with the World Bank. The three editions are the 1999, 2002, and 2005 surveys.³ I consider these three surveys since their survey questions and sample are sufficiently similar so as to employ common specifications and because, most importantly, other surveys (such as the 2009 and 2012 BEEP surveys) lack questions needed to ascertain whether firms have opportunities to go to other officials for correct treatment if a first

³Reinikka and Svensson (2006) provide a more general discussion regarding the use of micro-studies to examine corruption.
official acts improperly. The lack of such questions is also why I do not use surveys from the World Bank that consider a wider range of developing countries.

The first BEEP survey was launched in 1999 to understand the constraints that private companies face when doing business in Eastern European countries. The surveys investigate firms’ experiences interacting with government, financing investment, labor, infrastructure, informal payments and corruption. Later surveys were conducted in subsequent years but not annually. Unfortunately, panel techniques cannot be employed. Not only do firms differ across surveys but so can questions. The sample of countries primarily involves the post-communist countries of Eastern Europe and the former Soviet Union although with some exceptions.

I find this sample of post-communist countries extremely applicable as problems of corruption could be of particular relevance for them. Hillman and Schnytzer (1986) describe prevalent corruption in the former Soviet Union. Firms paid bribes to acquire inputs and individuals frequently paid bribes to obtain employment within government. Boettke (2001) sees the Soviet economy as a mercantile one where the government could extract rents in exchange for granting monopoly rights to firms. Although Boettke (2001) and Hillman and Schnytzer (1986) focus upon the Soviet system and other communist countries, such systems are unlikely to have completely changed following the fall of communism. Bayar (2011) finds corruption to be persistent over time. Vachudova (2009) also argues that such environments survived the fall of communism. Therefore, corruption has been a longstanding and ongoing issue for these countries.

3.1. Bribery

I consider two types of bribe variables. The first, denoted as BRIBE, is an ordinal variable indicating how prevalent bribes are. The second, BRIBE_LEV, measures the level of bribe payments as a share of firm revenue. I focus more on the ordinal measure. For one, it is more available than is BRIBE_LEV. Second, BRIBE better corresponds to later analysis in the paper examining in what specific area (obtaining licenses, customs, taxes, etc.) firms pay bribes in that these latter indicators are also ordinal. Nevertheless, use of the second measure is informative because it captures the magnitude of bribe payments rather than their frequency.

The ordinal variable comes from the question: “It is common for firms in my line of business to have to pay some irregular ‘additional payments/gifts’ to get things done with regard to customs, taxes, licenses, regulations, services, etc.” Responses take on integer values from 1 (never) to 6 (always). The second bribe variable, BRIBE_LEV, comes from the following question: “On average, what percent of total annual sales do firms like yours typically pay in unofficial payments/gifts to public officials”.

4EBRD does provide a panel data set but no question is included regarding the potential to seek recourse from “honest” government officials to receive proper treatment, which is the key variable of this paper.
5Duvanova (2014), Miller (2006), and Saffian, Graham, and Gonzalez-Vega (2001) also examine corruption in post-communist countries.
6The control of corruption score from the World Bank’s World Governance Indicators is centered at zero (so that zero is the population mean). The average WGI score for the countries in our sample is −0.31, suggesting that corruption is more widespread in these countries relative to the global average.
7However, data for BRIBE_LEV is not available in the 1999 survey.
Two questions become relevant regarding the applicability of both variables. First, can these measures potentially account for both extortion and cost reduction? Second, do firms’ responses accurately reflect the level of corruption?

For this first issue, Alexeev and Song (2013) focus on the phrase “to get things done” in questions regarding bribery and infer that this phrase more closely pertains to cost reducing corruption. To them, “to get things done” implies cutting through red tape. However, I believe this interpretation could be too narrow. Consider an example where a firm imports some of its inputs but these inputs must first pass through customs. Getting things done in this case would mean that its inputs quickly pass customs inspections and continue their journey to the firm. In one case, a firm concerned with costly delays could bribe an official to move these inputs to the first of the queue, thereby reducing its costs. But in a second case, suppose a customs official threatens to “misplace” these goods unless he receives a bribe, a clear case of extortion. In both cases, the firm is paying to get things done. It is paying to more quickly receive its shipment. The relevant distinction between these two cases in this example is whether the firm or the government official initiates the bribe.

Unfortunately, the firm is never asked about this distinction between extortion and cost reduction. More generally, the firm is not even directly asked if it pays bribes since most respondents would not admit to an illegal act. Instead, the responder is asked about bribes paid by “firms like yours”. The presumption is that the firm’s response is highly correlated with its own experiences. The bribe variables in Clarke and Xu (2004) and Berg et al. (2012) also originate from similar survey questions that do not ask a firm about its own bribe payments but about its perceptions of the industry in general. Nevertheless, not only must one be concerned that respondents answer truthfully but that responses are accurate. Of course, not just the presence of inaccuracies but how they arise are relevant for results. If any inaccuracies in responses are pure noise, then this noise would weaken the association between bribery and the right hand side variables, driving coefficient estimates to zero and suggesting that the associations are stronger than reported below. The same could hold if inaccuracies are intentional. As long as any such dishonest reporting is random, it would only weaken measured associations. More troublesome would be if inaccuracies are systematic. For example, respondents in countries where corruption is more severely punished would be more likely to underreport bribery. But to the extent that such misreporting occurs country-wide then this type of inaccuracy can be captured by country dummies. The inclusion of industry controls can also capture differences in reporting among industries.

For each of the three data sets, Table 1 shows summary statistics for BRIBE and BRIBE_LEV across three different categories of HONEST. HONEST is an ordinal variable denoting the potential to go to another official for “correct treatment” if a first official goes against the rules. The six categories are always (HONEST = 6), usually, frequently, sometimes, seldom, or never (HONEST = 1). For each data set, firms that can always or usually find proper treatment pay fewer bribes although far less difference arises between the never/seldom and the sometimes/frequently categories. If bribes were always initiated by the firm to reduce costs then one should see no association between the prevalence of honest officials and bribe payments. On the other hand, bribe payments are still positive for the usually/always group. If bribery completely stemmed from extortion, then one would think that the prevalence and magnitude of bribes...
Table 1. Bribery broken down by prevalence of “honest” officials.

| Find Honest Official? | Number of firms | Mean | Std. Deviation | Maximum Bribe |
|-----------------------|-----------------|------|----------------|---------------|
| **BRIBE**             |                 |      |                |               |
| 2005 BEEP Survey      |                 |      |                |               |
| Never/Seldom          | 3641            | 2.41 | 1.58           | 6             |
| Sometimes/Frequently  | 3106            | 2.44 | 1.33           | 6             |
| Usually/Always        | 2128            | 1.92 | 1.36           | 6             |
| 2002 BEEP Survey      |                 |      |                |               |
| Never/Seldom          | 2583            | 2.89 | 1.63           | 6             |
| Sometimes/Frequently  | 2218            | 2.63 | 1.33           | 6             |
| Usually/Always        | 1123            | 2.15 | 1.41           | 6             |
| 1999 BEEP Survey      |                 |      |                |               |
| Never/Seldom          | 1280            | 3.16 | 1.65           | 6             |
| Sometimes/Frequently  | 995             | 2.98 | 1.52           | 6             |
| Usually/Always        | 812             | 2.09 | 1.44           | 6             |
| **BRIBE_LEV**         |                 |      |                |               |
| 2005 BEEP Survey      |                 |      |                |               |
| Never/Seldom          | 3553            | 1.14 | 2.59           | 50            |
| Sometimes/Frequently  | 3104            | 1.14 | 2.64           | 40            |
| Usually/Always        | 1975            | 0.54 | 1.62           | 20            |
| 2002 BEEP Survey      |                 |      |                |               |
| Never/Seldom          | 2514            | 1.86 | 3.60           | 50            |
| Sometimes/Frequently  | 2162            | 1.51 | 3.06           | 30            |
| Usually/Always        | 1121            | 0.86 | 2.53           | 33            |

Formally, a firm finds an honest official when it reports being able to obtain the proper treatment from another government official or a supervisor when a first official acts improperly. BRIBE is an ordinal variable taking on values 1 (Never pay bribe) – 6. BRIBE_LEV is measured as percentage of sales. The 1999 BEEP Survey does not provide data for BRIBE_LEV.

Table 2. Summary statistics.

|                  | 2005 Survey |      |      | 2002 Survey |      |      | 1999 Survey |      |      |
|------------------|-------------|------|------|-------------|------|------|-------------|------|------|
|                  | Mean        | Std. Dev. | Mean | Std. Dev. | Mean | Std. Dev. |
| BRIBE            | 2.45        | 1.48   | 2.70 | 1.51       | 2.87 | 1.62   |
| BRIBE_LEV        | 1.22        | 2.65   | 1.80 | 3.45       |       |         |
| HONEST           | 2.95        | 1.50   | 2.90 | 1.47       | 3.10 | 1.63   |
| GOV              | 8.35        | 26.66  | 13.57| 32.59      | 20.78| 40.58  |
| FOREIGN          | 8.51        | 25.61  | 11.93| 29.36      | 12.44| 33.01  |
| EXPORT           | 0.74        | 1.44   | 0.83 | 1.49       | 0.84 | 1.49   |
| TAX              | 4.45        | 0.32   | 4.35 | 0.48       | 3.61 | 2.53   |
| SIZE             | 3.05        | 1.65   | 2.37 | 1.58       | 3.84 | 1.62   |
| SALESGOV         | 1.09        | 1.61   | 0.94 | 1.57       | 1.63 | 1.69   |
| AGE              | 2.40        | 0.74   | 2.24 | 0.83       | 2.13 | 0.80   |
| CAPITAL          | 0.32        | 0.47   | 0.32 | 0.47       | 0.33 | 0.47   |
| # of firms       | 6983        |        | 4686 |           | 2646 |        |

TAX (except for 1999), SIZE (except for 2002 and 1999), EXPORT, SALESGOV, and AGE are expressed as natural logarithms. BRIBE_LEV data not available in 1999 BEEP Survey. TAX in 1999 survey and SIZE in 1999 and 2002 surveys are ordinal variables.

Another possibility is that the respondent really is describing other firms as the question states. That is, the respondent’s firm might not pay bribes because her firm can obtain the correct treatment from another official but that other firms in the industry do, in fact, pay bribes.

Table 2 reports summary statistics. Bribery is most prevalent in the 1999 survey and least prevalent for the non-post-communist countries. The opportunity to find honest officials is also greatest in this latter group with less difference across the other three samples.
3.2. Empirical model

Consider the following equation:

\[ \text{BRIBE}_{jki}^* = \delta_i + \alpha \times \text{SALES}_{jki} + \beta \times \text{HONEST}_{jki} + \sigma \times X_{jki} + \epsilon_{jki}, \]  

where \( j \) denotes the firm, \( k \) denotes the industry, and \( i \) denotes the country. \( \text{BRIBE}^* \) is the exact but unobserved degree of bribery. Instead of \( \text{BRIBE}^* \), firms report a level of bribery given by the ordinal variable, \( \text{BRIBE} \), which takes on integer values from 1 to 6 with higher values denoting a greater prevalence of bribery. Country-specific intercepts denoted by \( \delta_i \) capture countrywide determinants of corruption. These factors might include countries’ rule of law and legal systems, regulations of economic activities and other socio-economic characteristics. Treisman (2000) considers these and other variables in his cross-country study of the determinants of corruption. Such dummies could also capture countrywide factors that cause firms to misreport bribe payments. The variable \( \text{SALES} \) denotes firm \( j \)’s sales in industry \( k \) and so controls for industry level effects. Industry factors could also be important as even within the same country regulatory agencies could differ across industries but still be common for all firms within that industry. \( \text{HONEST} \) is described above and \( X \) contains firm level control variables discussed below. Since \( \text{BRIBE} \) takes one of six ordinal variables, I will employ an ordered probit estimation methodology.

I will later replace \( \text{BRIBE}^* \) with \( \text{BRIBE}_{\text{LEV}} \) denoting the percentage of sales going to bribe payments and discuss below alternative methodologies for estimating (1) when using \( \text{BRIBE}_{\text{LEV}} \).

A zero coefficient for \( \beta \) would suggest that the presence of honest officials is not associated with bribery. Such a finding would more strongly indicate that corruption is initiated by the firm to reduce costs as the presence of honest officials would not matter for firms wanting to pay bribes to avoid costly regulations.\(^9\)

A potential weakness, however, arises if all officials are honest. In such cases, firms would not pay bribes. They would not be extorted nor could they pay bribes to reduce costs since honest officials would not accept them. Therefore, firms reporting no bribes would also report a high value for \( \text{HONEST} \) thereby creating a negative association between the two. However, I do not believe this potential weakness would be driving results. First, a response of “Always” as to whether a firm can get the correct treatment when a first official acts improperly does not imply that no dishonest officials exist, only that at least one other official provides the correct treatment. More generally, this is an important distinction as the survey provides information regarding the potential to seek proper treatment, not the percentage of officials that would provide proper treatment. Second, the premise of the question is that some first official is acting improperly implying that not all officials are “honest”. Therefore, according to the premise of the question the firm has the opportunity to encounter a “dishonest” one.

A second weakness involves the possible endogeneity of honest officials. Perhaps honest individuals are less likely to self-select into environments where corruption is rampant whereas dishonest individuals prefer such activity. If true then a negative

\(^9\)A positive \( \beta \) would suggest the presence of cost-reducing bribery in that firms would have to offer more bribes to turn “honest” officials into “dishonest” ones.
coefficient on HONEST could reflect this possibility and not necessarily suggest that the presence of honest officials lowers bribes due to smaller opportunities for extortion. A related possibility is that the potential for corruption and the ethical characteristics of government officials are driven by the same latent factors. Employing country dummies and industry controls helps to alleviate these concerns to the extent that such latent factors are found at the country or industry level. Nevertheless, other factors affecting certain subgroups of firms cannot be ruled out. Ideally, one could find instruments that are correlated with the probity of government officials but not otherwise associated with bribery. Finding such instruments, unfortunately, is difficult. Most of the questions from the BEEP surveys focus on firm characteristics, not the characteristics of government officials. And even so, the survey only provides information regarding the firm’s perception of government officials. Second, bribery and the degree to which officials are honest are certainly related at a conceptual level, making it difficult to find instruments that are correlated with the latter but not otherwise correlated with the former. Given these difficulties I refrain from using instruments in the methodology although I acknowledge that the strength of the paper’s findings is tempered by their omission.

A third concern stems from Banerjee (1997) who considers to what extent government officials create more regulatory obstacles to induce more firms to pay bribes. This possibility would conflate the two types of bribes I am considering. Given the onerous regulations, firms are initiating bribes but officials have rigged the game so as to force firms to do so and so are indirectly extorting them. I do not deny the potential for such behavior but I do not believe that such instances will undercut my examination as to why firms pay bribes. Rigging the game to create incentives for firms to pay bribes is less beneficial for corrupt officials when firms can receive “correct treatment” by not paying bribes. That is, the mere presence of honest officials suggests that the institutional environment cannot be completely rigged so as to force firms to pay bribes. In such cases of complete rigging, then there should be no potential to go to honest officials.

$X_{ijk}$ denotes a set control variables comprising firm characteristics. Many of these same variables are in Campos and Giovannoni (2007). I include the firm’s age (AGE) as longer surviving firms could have established networks with government officials. GOV and FOR consider the share of government and foreign ownership of the firm. Firms with large government shares or large foreign shares could face different bribe environments. Another control variable is EXPORT, the percentage of a firm’s output that is either directly or indirectly exported. Firms that export products on global markets could also differ in important ways from ones that mainly sell their output domestically. Ideally, one would also like to include a measure of the firm’s ability to pay. Unfortunately, the surveys do not have data that closely matches this characteristic as it does not provide firm profits. Instead, I use a cruder measure, namely the size of the firm (SIZE) as measured by the number of employees. I presume that larger companies are able to pay larger amounts of bribes. On the other hand, larger firms might have also developed political connections that allow them to avoid paying bribes in which case SIZE would become a measure of a firm’s refusal power.

Other characteristics measure the firm’s bargaining power when facing corrupt officials or its ties to the government. I use the percentage of firm’s total sales to government or government agencies (SALESGOV) as a proxy for a firm’s reliance on government contracts. TAX provides another characteristic of the association between
firm and government as it denotes the percentage of total sales that the firm reports for tax purposes. A small value would denote that the firm inherently hides much of its operation from the government and so could show a more antagonistic dynamic between the two. Moreover, its inclusion can also help control for firms’ potential to misreport bribe payments. To the extent that misreporting of bribes is associated with misreporting of taxable revenue, then the inclusion of TAX can help control for the degree of misreporting. CAPITAL takes the value one if the firm is located in the capital and zero otherwise. Firms located in the capital could find ways to influence government officials other than through bribery. Conversely, firms might move to the capital to better bribe officials and so the sign on CAPITAL is unclear.

For the control variables AGE, EXPORT, and SALES_GOV, I take natural logs to lessen the influence of outliers although I first add a “one” to these reported values before taking natural logs so as to not lose the observations reporting “zero” for one of these responses.\footnote{Since TAX is an ordinal variable in the 1999 survey, I do not take its natural log when using data from the 1999 survey.} I do the same for TAX in 2005 and 2002 and SIZE in 2005. Ordinal variables are used for SIZE and TAX for the other years.

When replacing the ordinal variable BRIBE with bribes as a percentage of annual sales, BRIBE\_LEV, alternative estimation methodologies can be used. I consider several estimation methodologies to better ensure that results are not dependent upon any particular methodology. The first is a tobit methodology which I consider given its prevalence in past studies. Alexeev and Song (2013) also consider such a methodology. However, three weaknesses arise with the tobit methodology. Since bribes cannot take negative values, one could argue that no actual censoring arises as assumed in a tobit model. The second weakness is the higher number of zeros for the dependent variable. Coefficient estimates can be inconsistent when the error terms are nonnormal or heteroskedastic which is likely to be the case with so many observations clustered at zero as discussed in Silva and Tenreyro (2006). Finally, one sometimes takes natural logarithms to lower the influence of outliers and so employs a log-linear model. To avoid removing the “zero” observations, one often adds a one before taking natural logs. Silva and Tenreyro (2006) report sizable biases to coefficient estimates from the use of such models. Because of these weaknesses, they conclude that the tobit specification inadequately address the zeroes in the data. Nevertheless, I will employ tobit specifications – with and without taking natural logarithms – given their prevalence in past research.

As an alternative, I consider the Poisson Pseudo-Maximum Likelihood (PPML) estimator from Silva and Tenreyro (2006) which they find decreases the degree of bias, especially when the sample contains a large number of zeroes. As its name implies, the PPML estimator assumes that the dependent variable follows a Poisson distribution where the densest mass point (in my application) is found at zero and then density declines as the amount of bribe payment increases.\footnote{One could be concerned that PPML is applied to a distribution with an upper bound of 100%, but the observations in the sample report maximums of 50% and so are far away from this theoretical upper bound. Moreover, the frequency of BRIBE\_LEV decreases as one moves away from zero percent which is also similar to a Poisson distribution.} The PPML estimation is applied to a model that contains the same right hand side variables as given in (1) but is expressed in multiplicative form.

I also consider a negative binomial estimation methodology which is an alternative to Poisson specifications when concerns arise that the data are overdispersed. A Poisson
specification assumes that the mean of the distribution equals the variance (although the PPML approach only assumes the two are proportional).

Finally, I employ a fractional regression methodology originally proposed by Papke and Wooldridge (1996) and further considered in Ramalho, Ramalho, and Murteira (2009).12 Bribes as percentage of sales are constrained to lie between 0 and 100% and so lie within the unit interval after converting percentages into decimals. In my application, only the lower bound is binding as the highest reported bribe across all three survey samples totals 50% of sales. I create \( FRACBRIBE \) by dividing the bribe percentage by 100 and so \( FRACBRIBE \) takes on values between 0 and \( \frac{1}{2} \) in my sample.

### 3.3. Purposes of bribes

Results could also differ depending upon the type of regulatory obstacles facing the firm. Perhaps some firms are extorted by customs officials but other firms initiate bribes to reduce costs of paying taxes. An advantage of the BEEP surveys is that they ask firms to state why they pay bribes. Reasons to pay bribes (which I denote as “purposes”) include: to get licenses and permits (\( LIC \)); to deal with taxes and tax collection (\( TAX \)); when dealing with customs/imports (\( CUSTOMS \)); when dealing with courts (\( COURTS \)); and when dealing with health and safety regulations (\( SAFETY \)). Responses are ordinal and are given in integer values from 1 to 6 with higher values denoting a greater prevalence for bribery for that specific purpose.

These surveys also ask firms to describe what obstacles they face in their business operations. Some of these obstacles relate to government regulations and whether the firm perceives a specific government obstacle as onerous. I consider five obstacles: obtaining permits/licenses, dealing with customs officials, dealing with tax officials, dealing with the judiciary, and dealing with labor regulations. For each of these, a firm rates the obstacle on a scale of one to four where higher values denote greater obstacles.

Given these purposes of paying bribes and these obstacles, I consider how results can differ for specific purpose-obstacle pairs. Does the presence of honest officials influence the extent to which firms pay bribes to circumvent this obstacle?

As an example, consider licenses and let \( LIC \) be the dependent variable:

\[
LIC_{jki} = \delta_i + \alpha * SALES_{jki} + \beta * HONEST_{jki} + \sigma * X_{jki} + \epsilon_{jki},
\]

where again the exact prevalence of bribery to obtain licenses, \( LIC^* \), is unobserved but \( LIC \) denotes the observed ordinal variable and so I again employ an ordered probit methodology. I first consider the entire sample. Is the presence of honest officials associated with bribes used to obtain licenses/permits? I then consider only those firms reporting that obtaining licenses and permits is a substantial obstacle as denoted by a value of ‘3’ or ‘4’ on the one to four integer scale. Presumably, these are the firms that would have the most incentive to pay bribes so as to reduce costs in obtaining licenses and permits. To the extent that firms are initiating bribes to reduce costs then the opportunity to go to another official for “correct treatment” should not matter and the coefficient on \( HONEST \) should be zero. I follow a similar procedure when examining \( TAX, CUSTOMS, SAFETY, \) and \( COURTS \). A weakness, however, of this approach is

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12To estimate the fractional regression model, I consider a generalized linear model using a binomial distribution for the dependent variable and assuming a logistic link function.
that the same variable, \textit{HONEST}, denoting a general potential of finding appropriate treatment from officials is being used across specific purposes.

I acknowledge two other potential weaknesses of this approach. First, obstacles could be positively correlated with one another, similarly with the purposes for which they pay bribes. However, to best identify differences across obstacles or purposes in the empirical methodology, one would like zero correlation within each group. With no correlation, firms facing high obstacles obtaining licenses, for example, would not necessarily face greater obstacles regarding customs. The same would hold for the variables denoting for what purposes firms pay bribes. Weak associations within these two sets of variables would then make one more confident that one successfully disentangles these various purposes. Unfortunately, positive correlations across obstacles and across purposes do arise as Table 3 shows, making it less clear that estimates regarding \textit{HONEST} when one considers business licenses, for example, are actually being driven by this obstacle-purpose combination.

Second, the above discussion presumes that the obstacles firms face are regulatory ones and so a bribe could potentially allow a firm to avoid the obstacle and, thus, reduce its costs. Another possibility is that a firm perceives an obstacle whenever extortion arises. If so, then the obstacle, itself, is the extorted bribe and so the bribe and the obstacle are not distinct, at least as to how firms are answering in the survey. However, Panel B of Table 3 shows that there is little correlation between the prevalence of honest officials and how firms perceive the severity of various obstacles. All of the reported correlations are near zero, implying that the opportunity or lack thereof of finding honest officials is not associated with these types of obstacles.

4. Results

4.1. Baseline results

I first consider \textit{BRIBE} as the dependent variable and an ordered probit methodology. Results are given in Table 4. In all three surveys, the coefficient on \textit{HONEST} is negative and statistically significant. Firms that report the ability to go to other officials when a first official acts improperly also report fewer instances of bribery. This association suggests that extortion plays a role in determining bribes. If firms were initiating bribes to reduce costs, then presumably the presence of honest officials would be irrelevant. The bottom panel of Table 4 shows that these results are robust to including the non-post-communist countries available from the surveys within the sample.

The right half of Table 4 shows the predicted probabilities for the six possible values of \textit{BRIBE} given that \textit{HONEST} = 1 (top number of each cell) or = 6 (bottom number of each cell) and given all other variables are set at their mean values. Since \textit{BRIBE} = 1 (Never) for most firms, the outcome \textit{BRIBE} = 1 takes on the highest probability regardless of whether \textit{HONEST} equals one or six. Nevertheless, increasing \textit{HONEST} from one to six raises the probability of reporting a response of “never”. This probability increases from 0.33 to 0.42 with the 2005 sample and the differences for the other two years are even greater. Since few firms answer “always” regarding the prevalence of bribery, the predicted probabilities are low (and so their difference is low as well) for both of the considered values of \textit{HONEST}. Nevertheless, the magnitudes at the low end for \textit{BRIBE} do suggest that the presence of honest officials has a nontrivial bearing upon whether firms report a positive incidence of bribery or not.
Before proceeding, I briefly state results for the control variables. Firms that are at least somewhat owned by the government report fewer bribes. Older firms report less. As stated, older firms might have found other ways to avoid paying bribes such as networking with important government officials. Those that report a greater fraction of sales to the government for tax purposes also report fewer bribes. This could arise because reporting greater sales could signal a higher level of trust in government officials by the firm as well as a more harmonious relationship between business and government. Firms located in the capital pay more. One possibility is that firms choose to locate in the capital to take advantage of opportunities to bribe. A second possibility, however, is that government officials find it easiest to extort nearby firms.

Results for the other control variables are not uniform across surveys. Some evidence arises that foreign firms pay fewer bribes although this does not hold in the 2005 survey. No strong association is found with the size of the firm. In two of the surveys (with the 1999 survey as the exception), firms that export report more frequent bribe payments, possibly because sending goods through customs provides another layer of bureaucracy where firms could be paying bribes. Another possibility is that firms that export are more profitable than otherwise similar firms and so are more at risk for extortion.

### 5. Amount of bribe

Table 5 presents results when $BRIBE_{LEV}$ replaces $BRIBE$ although, as stated, $BRIBE_{LEV}$ is not available within the 1999 survey. $BRIBE_{LEV}$ denotes the level of bribe payments as a percentage of annual sales and so can better address the magnitude of bribe payments, albeit not their frequency. Given the aforementioned discussion concerning how to best estimate this specification, Table 5 considers several methodologies. However, regardless of the estimation methodology, the coefficient on $HONEST$ is negative and significant at the
Table 4. Coefficient estimates of ordered probit model with \textit{BRIBE} as dependent variable.

| Survey | \textit{HONEST} | \textit{GOV} | \textit{FOREIGN} | \textit{EXPORT} | \textit{TAX} | \textit{SIZE} | \textit{SALESGOV} | \textit{AGE} | \textit{CAPITAL} | \# of firms |
|--------|----------------|-------------|----------------|----------------|-----------|----------|-------------|--------|-------------|-----------|
|        | (1)            | (2)         | (3)            | (4)            | (5)       | (6)      | (7)         | (8)    | (9)         | (10)      |
|        | 2005           | 2002        | 1999           | 2005           | 2002      | 1999     | 2005        | 2002   | 1999        | 3083      |
| \textit{HONEST} | $-0.051^{***}$ | $-0.096^{***}$ | $-0.170^{***}$ | $0.328$ | $0.223$ | $0.169$ | $-0.051^{***}$ | $0.424$ | $0.389$ | $0.457$ |
|       | ($0.010$)      | ($0.011$)   | ($0.014$)      | ($0.010$)      | ($0.009$) | ($0.009$) | ($0.010$)   | ($0.009$) | ($0.009$) | ($0.009$) |
| \textit{GOV} | $-0.004^{***}$ | $-0.005^{***}$ | $-0.004^{***}$ | $0.195$ | $0.189$ | $0.133$ | $-0.004^{***}$ | $0.198$ | $0.213$ | $0.172$ |
|       | ($0.001$)      | ($0.001$)   | ($0.001$)      | ($0.001$)      | ($0.001$) | ($0.001$) | ($0.001$)   | ($0.001$) | ($0.001$) | ($0.001$) |
| \textit{FOREIGN} | $-0.0002$ | $-0.001^{**}$ | $0.0001$ | $0.255$ | $0.267$ | $0.252$ | $-0.0002$ | $0.223$ | $0.226$ | $0.208$ |
|       | ($0.0005$)     | ($0.0005$)  | ($0.001$)      | ($0.001$)      | ($0.001$) | ($0.001$) | ($0.001$)   | ($0.001$) | ($0.001$) | ($0.001$) |
| \textit{EXPORT} | $0.033^{***}$ | $0.026^{*}$ | $0.026$ | $0.111$ | $0.149$ | $0.171$ | $0.033^{***}$ | $0.084$ | $0.095$ | $0.088$ |
|       | ($0.010$)      | ($0.014$)   | ($0.017$)      | ($0.011$)      | ($0.009$) | ($0.009$) | ($0.011$)   | ($0.009$) | ($0.009$) | ($0.009$) |
| \textit{TAX} | $-0.691^{***}$ | $-0.351^{***}$ | $-0.088^{***}$ | $0.075$ | $0.115$ | $0.189$ | $-0.691^{***}$ | $0.050$ | $0.057$ | $0.061$ |
|       | ($0.045$)      | ($0.059$)   | ($0.011$)      | ($0.011$)      | ($0.009$) | ($0.009$) | ($0.011$)   | ($0.009$) | ($0.009$) | ($0.009$) |
| \textit{SIZE} | $0.011$ | $-0.020$ | $-0.058^{***}$ | $0.037$ | $0.057$ | $0.087$ | $0.011$ | $0.020$ | $0.020$ | $0.014$ |
|       | ($0.010$)      | ($0.016$)   | ($0.017$)      | ($0.017$)      | ($0.016$) | ($0.016$) | ($0.017$)   | ($0.016$) | ($0.016$) | ($0.016$) |
| \textit{SALESGOV} | $0.018^{**}$ | $0.006$ | $0.022$ | $0.020$ | $0.020$ | $0.014$ | $0.018^{**}$ | $0.009$ | $0.007$ | $0.014$ |
|       | ($0.009$)      | ($0.007$)   | ($0.014$)      | ($0.014$)      | ($0.009$) | ($0.009$) | ($0.014$)   | ($0.009$) | ($0.009$) | ($0.009$) |
| \textit{AGE} | $-0.079^{**}$ | $-0.035$ | $-0.063^{*}$ | $0.523$ | $0.422$ | $0.302$ | $-0.079^{**}$ | $0.622$ | $0.602$ | $0.629$ |
|       | ($0.022$)      | ($0.024$)   | ($0.034$)      | ($0.034$)      | ($0.022$) | ($0.022$) | ($0.034$)   | ($0.022$) | ($0.022$) | ($0.022$) |
| \textit{CAPITAL} | $0.114^{***}$ | $0.108^{***}$ | $0.140^{***}$ | $0.223$ | $0.321$ | $0.277$ | $0.114^{***}$ | $0.154$ | $0.172$ | $0.163$ |
|       | ($0.030$)      | ($0.030$)   | ($0.049$)      | ($0.049$)      | ($0.030$) | ($0.030$) | ($0.049$)   | ($0.030$) | ($0.030$) | ($0.030$) |
| \# of firms | 6983 | 4686 | 2646 | \textit{HONEST} | \textit{GOV} | \textit{FOREIGN} | \textit{EXPORT} | \textit{TAX} | \textit{SIZE} | \textit{SALESGOV} | \textit{AGE} | \textit{CAPITAL} | \# of firms |
|        | 6983           | 4686        | 2646           | $-0.051^{***}$ | $-0.092^{***}$ | $-0.174^{***}$ | $-0.051^{***}$ | $-0.092^{***}$ | $-0.174^{***}$ | $-0.051^{***}$ | $-0.092^{***}$ | $-0.174^{***}$ | 6983 |

Notes: All regressions contain country dummies and industry shares ($\text{SALES}_{ji}$). *, **, *** denote significance at the 10%, 5%, and 1% level, respectively. Standard errors in parentheses. Specifications in panel B are identical to those in panel A. To compute the predicted probabilities of \textit{BRIBE} taking on each response, all variables are set at their means except for \textit{HONEST} which equals one (top number of each cell) or six (bottom number).
1% level for all three surveys. Firms that report being able to go to an honest official for correct treatment also report lower bribe amounts. Columns three and four present magnitudes when again setting the control variables at their means. The coefficient estimate on HONEST from the tobit estimations provides the marginal effect of HONEST upon BRIBE_LEV. The reported magnitudes in columns 3–4 for the remaining specifications are the predicted means when all variables are set at their means except for HONEST. The top row provides the predicted mean of the dependent variable when HONEST = 1 (no opportunity to go to an honest official) and the bottom row does the same but for HONEST = 6 (a firm can always seek correct treatment from another official). In many cases, the predicted mean when HONEST = 1 is twice that when HONEST = 6, suggesting that the amount of bribery approximately doubles when honest officials cannot be found.

6. Bribe purposes

Finally, I consider to what extent results could differ across bribe purposes. Although not presented in Table 6 to conserve space, control variables include the same right hand side variables as those explicitly listed in Table 4 along with country dummies and industry shares. An additional control variable for each regression in panel A of Table 6 is the associated obstacle to the bribe. For example, when considering how prevalent it is for a firm to pay a bribe to expedite goods through customs, an additional control is the aforementioned ordinal variable denoting how severe obstacles of doing business arise when dealing with customs officials. For the 1999, 2002, and 2005 BEEP surveys, the sample only includes the post-communist countries although results are robust to the inclusion of the other countries in the survey.

Several interesting findings arise. First, the results are not uniform across surveys. Consider first the 1999 and 2002 surveys. All coefficient estimates are negative and most are significant at the 5% level. The largest coefficient (in absolute value) is that for obtaining licenses and permits. Results are even stronger in panel B where only those
Table 6. Coefficient estimates for HONEST in an ordered probit model.

| Purpose/Obstacle | Licenses and Permits | Tax Administration | Customs | Courts | Labor/Safety Regulations |
|------------------|----------------------|--------------------|---------|--------|--------------------------|
| **Panel A: Full Sample** | | | | | |
| BEEP 2005 | $-0.026^{***}$ | $-0.025^{**}$ | $-0.017$ | $0.004$ | $-0.017^*$ |
| (0.010) | (0.010) | (0.012) | (0.011) | (0.010) | |
| BEEP 2002 | $-0.097^{***}$ | $-0.074^{***}$ | $-0.054^{***}$ | $-0.048^{***}$ | $-0.064^{***}$ |
| (0.011) | (0.011) | (0.004) | (0.016) | (0.012) | |
| BEEP 1999 | $-0.170^{***}$ | $-0.185^{***}$ | $-0.161^{***}$ | | Not Available |
| (0.019) | (0.017) | (0.021) | | | |
| **Panel B: Sample includes only firms reporting that the relevant obstacle is “Moderate” or “Major”** | | | | | |
| BEEP 2005 | $-0.015$ | $-0.016$ | $-0.029$ | $-0.006$ | $0.029$ |
| (0.017) | (0.014) | (0.019) | (0.018) | (0.019) | |
| BEEP 2002 | $-0.137^{***}$ | $-0.086^{***}$ | $-0.083^{***}$ | $-0.092^{***}$ | $-0.088^{***}$ |
| (0.017) | (0.018) | (0.022) | (0.025) | (0.043) | |
| BEEP 1999 | $-0.178^{***}$ | $-0.186^{***}$ | $-0.166^{***}$ | | Not Available |
| (0.029) | (0.031) | (0.041) | | | |

All specifications contain country dummies and industry shares. They also include the same control variables as listed in Panel A of Table 4. *, **, *** denote significance at the 10%, 5%, and 1% level, respectively. Standard errors in parentheses. For “Licenses and Permits” the dependent variable is an ordered variable denoting how frequently firms pay bribes to acquire licenses. The obstacle refers to the firm’s report of how onerous obtaining such licenses/permits are in conducting business. The other categories are analogous.

firms reporting that the relevant obstacle is “moderate” or “major” is included. The coefficient estimates on HONEST are now even greater in magnitude. In all of these cases, the presence of honest officials lowers the prevalence of bribes, even for firms that would presumably be more likely to pay bribes to reduce costs.

The results for firms from the 2005 survey are the most diverse. First, the baseline results in panel A are of lower magnitude than their counterparts in the other surveys. Second, coefficient estimates also decrease in magnitude in panel B. Now, evidence for cost reducing bribery – at least for those firms reporting onerous obstacles – is relatively strong given that none of the coefficients in panel B are significant.

7. Conclusion

This paper generally finds that the opportunity to go to another government official when a first official has acted inappropriately is negatively associated with the prevalence and magnitude of bribery. This finding might seem obvious since the presence of such officials lowers the bribe that any corrupt official can charge. However, the relevance of such honest officials need not be the case if firms are actively seeking out officials to bribe to avoid regulations. Since some have argued that bribery “greases the wheels” and have even formalized such practices by modeling bribery as a cost-reducing activity undertaken by firms, examining what type of bribery is more prevalent is an important examination. This paper’s main conclusion is that greater evidence suggests bribery stems from extortion. Nevertheless, several caveats arise.

The first is that we cannot infer from the survey why an honest official might not exist. Is it because all officials are corrupt or is it because the firm has no choice but to interact with one particular official who when providing the government service can act like a monopolist? Perhaps going around a corrupt official is possible but very time

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13Since I am restricting the sample to firms that report moderate or major obstacles, the obstacle variable on the right hand side is not included.
consuming in which case honest officials would not exist in a practical sense. Obviously, such distinctions matter and call for different regulatory reforms to reduce corruption.

The second caveat is that results are not uniform across years. The 1999 and 2002 surveys found strong negative coefficients on HONEST regardless of the purpose and regardless of whether obstacles were present. Results for 2005 were weaker and provided some support for bribery as a cost reducing tool. These differing results are somewhat surprising given that the 2002 and 2005 surveys consider almost an identical set of countries, namely those from post-communist Eurasia, although they largely differ at the firm level and so results could be largely dependent upon what firms are included in the sample. The prevalence of corruption certainly changes over time. If such changes are “real” then exploring them in greater detail becomes relevant for any study of corruption.

Another caveat that tempers conclusions is that endogeneity concerns were not formally addressed. If corrupt individuals are more likely to enter into environments that allow them to extract bribes, then HONEST could be endogenous and driven by the prevalence and magnitude of bribery. Causation would then run in the opposite direction. Finally, the paper attempted to determine whether the type of bribery – extortion versus cost reducing – differs across various purposes for which a bribe might be paid. Unfortunately, the high correlation within the set of obstacles and within the set of bribe prevalence for the remaining obstacles creates a large knot that is difficult to unravel. Working to solve these problems provides other avenues of future research on this topic.

Disclosure statement

No potential conflict of interest was reported by the author.

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**Appendix**

The sample of countries includes:

1999 BEEP Survey: Albania, Armenia, Azerbaijan, Belarus, Bosnia, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyz Republic, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Russia, Slovakia, Slovenia, Turkey, Ukraine, and Uzbekistan.

2002 BEEP Survey: Same as 1999 survey but add Tajikistan and Yugoslavia.

2005 BEEP Survey: Same as 1999 survey but add Ireland, Serbia, Spain and Tajikistan.