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No. 5712

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PUBLIC POLICY



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Discussion Paper No. 5712
June 2006

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ABSTRACT

Bargaining for Bribes: The Role of Institutions*

We develop a simple bargaining framework of corruption where firms pay bribes to avoid regulation. Consistent with this setup, we find that time spent bargaining with bureaucrats and amount of bribe payments are positively correlated, but that this association is weaker (and, thus, corruption more 'efficient') when the terms of unofficial contracts are known to the firms. We also show that institutional arrangements that result in lower uncertainty in bargaining for bribes attenuate the impact of corruption on firm growth.

JEL Classification:

Keywords:

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* We thank Susan Rose-Ackerman, Phil Keefer, and participants to the annual conference of the Italian Society of Public Economics for useful comments. The views expressed here are those of the authors and do not necessarily reflect those of the World Bank and its member countries. We thank the World Bank Research Committee for financial support.

Submitted 22 May 2006

Much time and effort has been devoted to assessing the extent of corruption across firms, industries, and countries, and the effects that bribery has on various social and economic outcomes. The correlation between the level corruption and growth has been firmly established at the cross-country, as well as at the firm level, indicating that a high level of corruption has a negative impact on economic development. For example, early work from Mauro (1995) shows that corruption is strongly associated with lower growth at the country level, while more recent work by Svensson (2003) studies similar issues using data from firms in Uganda.

However, among the set of countries where corruption is perceived to be rampant, there is tremendous heterogeneity in the level of economic performance over the past several decades. For example, parts of Southeast Asia have thrived, while sub-Saharan Africa has stagnated. Many nations in both regions are perceived to be very corrupt. This evidence leads to the question – largely unexamined in the economics literature thus far – of whether there exist institutional and social factors that mitigate the growth-retarding effects of corrupt government. In this paper, we develop a simple bargaining framework to examine the factors that influence the efficiency with which corrupt transactions between entrepreneurs and public officials take place (and hence, ultimately, society's overall level of productivity).

Modeling the interaction between public officials and private agents as a negotiation is not new to the economics literature (see for example, Rose-Ackerman, 1999, for a summary). However, the main approach has traditionally been to identify how bribes amounts were determined (in this context, how the ‘pie’ was shared). For example, Svensson (2003) investigates how outside options (as proxied by a firm’s fixed assets) affect entrepreneurs bargaining power and, eventually, the bribes they have to pay. Here, we focus instead on the role of frictions associated with the bargaining process, and as a result, on the social costs of corruption – in the deadweight loss sense – rather than simple transfers of wealth from firms to bureaucrats.

The relatively sparse existing work in this area has studied corruption as efficient grease of the bureaucratic system. For example, Huntington (1968) characterizes bribes as a form of personalized de-regulation; Liu (1985) presents a queuing model where bribes reflect the opportunity cost of time. Conversely, Myrdal (1968) discusses the

possibility that corrupt officials might deliberately cause administrative delays to attract more corruption. In this vein, Kaufman and Wei (2000) develop a model where effective harassment is endogenous and, as a result, bribe-payers are forced to cope with greater harassment. Neither of these approaches, however, identifies the institutional setups in which corruption is more or less efficient, and, as such, the literature provides limited guidance to economists or policymakers on the institutional features that are effective in reducing the distortionary costs associated with corruption.

Our contribution to the existing literature is twofold. First, we lay out a simple framework to describe the nature of negotiations between a corrupt bureaucrat and a bribe-paying firm, and consider how these negotiations will be affected by a bargaining friction parameter. Thus, we provide a link between the literatures on the nature of corruption and the quality of institutions, an area of research that has flourished in recent years.¹ At the core of our investigation is the question of whether there are conditions that minimize the deadweight loss from bribery; that is, the extent to which corruption is more or less “efficient” in different environments. More importantly, we examine the predictions of the model using firm-level, cross-country data (World Environment Business Survey) providing information on firms’ relations with government agents, as well as data on the quality and features of institutions across countries. Our results suggest that bargaining frictions are lower when firms report a lower level of uncertainty surrounding the bribery process. Further, we find that these frictions matter for firms’ growth. Additionally, we investigate whether there are country-level characteristics that are associated with more certainty surrounding the bribery process.

The rest of this paper proceeds as follows: In Section 1, we develop a simple illustrative bargaining model of bribery; Section 2 describes the data utilized in this paper; Section 3 presents the empirical results, and Section 4 concludes and discusses issues for future research.

1. Theoretical framework

In this section we develop a simple descriptive bargaining model of bribery. We

¹ See, for example, Acemoglu et al. (2002) for a recent take on the institutionalist perspective

consider, as an illustrative example, a bargaining situation where firms must deal with a number of bureaucratic regulations at a cost of r per regulation.² Obvious examples include compliance with labor safety standards and environmental impact regulations. Firms differ in the number of regulations, n_f , they must comply with, based on individual circumstances. To further simplify, we consider a decentralized model, where the firm is engaged in a series of bilateral negotiations with government officials, each of whom may force the firm to comply with the regulatory requirements, or pay a bribe to circumvent these requirements.

In each bilateral negotiation, we assume that the regulation may be costlessly circumvented by the bureaucrat, so that a surplus of r is created by joint agreement to avoid the regulation. The standard Stackelberg bargaining solution has the two parties splitting this benefit, so that the bribe will be $r/2$. However, in order to reach this agreement, a nontrivial amount of time may be spent negotiating this payment. We further assert that some bureaucratic systems will have an easier time in pricing these payments, and hence the time cost will be lower. Finally, we allow for the intuition that firms paying numerous bribes will have economies of scale. We thus describe the time spent with bureaucrats as $\alpha g(n_f)$, where $\alpha \in (0,1]$ is a parameter that reflects frictions in the bargaining process, with 0 indicating minimum frictions, and $g(\cdot)$ captures economies of scale in bargaining and is such that $g' > 0$, $g'' < 0$.

In this highly stylized framework, it is immediate that the time firms spend in bureaucratic hassle is an increasing function of the level of bribes paid, B_f , since each is a positive function of the number of regulations that the firm wishes to circumvent:

$$B_f = n_f(r/2)$$

$$T_f = \alpha g(n_f)$$

The reduced form relation between bribery and time with bureaucrats is then

² In this simplified version, we do not consider regulations that involve time (as distinct from money) in dealing with regulations, in order to most clearly illustrate our basic intuitions. The model is easily extended to allow for such time costs of regulation.

simply:

$$(1) \quad T_f = \alpha g\left(\frac{2B_f}{r}\right)$$

This straightforward example illustrates that by simply adding negotiating frictions, and a firm-specific vulnerability to regulatory hassle, bribes paid are positively correlated with time spent with bureaucrats. More interestingly, the presence of the bargaining friction parameter, α , indicates that this correlation should be weaker under institutions that allow for a relatively efficient negotiation process. Hence, our main intuition for the empirical analysis below is that institutional structures that allow for a relatively clear pricing of bribes should be characterized by a weaker association between bribery and time spent with bureaucrats.

More concretely, in a regression framework, our bargaining model suggests the following specification, which we will elaborate upon in Section 3 below:

$$(2) \quad Time_f = \beta_1 * B_f + \beta_2 * Uncertainty_f + \beta_3 * B_f * Uncertainty_f + \varepsilon_f$$

Beyond our basic interest in understanding the nature of the relations between bureaucrats and firms, we wish to examine whether a relatively inefficient negotiation between the two parties results in slower economic performance. We therefore consider a specification closely paralleling (2), where we replace *Time* with the firm's future growth:

$$(3) \quad Growth_f = \beta_1 * B_f + \beta_2 * Uncertainty_f + \beta_3 * B_f * Uncertainty_f + \varepsilon_f$$

As a final step, we will also consider the determinants of country-level uncertainty by looking at the country characteristics that predict average uncertainty by country, i.e.,

$$(4) \quad \text{Avg}(Uncertainty_f) = f(Country Characteristics) + \varepsilon_c$$

2. Data

To conduct the empirical exercise, we use data from the World Business Environment Survey (WBES), a firm-level survey carried out in 1999 and 2000 across 61 countries. About 100 firms were interviewed in each country. The survey includes basic background information on firms' characteristics, including number of employees, last years' sales, and sector. More importantly, it includes a variety of questions relating to 'extralegal payment' to government officials. Among these are the percentage of senior management's time spent in dealing with government officials (TIME), coded from 1 to 6 corresponding to the categories 0, up to 5%, between 6 and 10%, between 11 and 15%, between 16 and 20%, above 20%; the amount of 'irregular payments' paid to government officials (BRIBE), as a fraction of sales, coded similarly from 1 to 6; and the extent to which firms know in advance how much these 'irregular payments' will be (ADPY), coded from 1 to 6, with 6 indicating maximum uncertainty. Since we are also interested in the effect of the bribe transaction on economic outcomes, we also define a pair of variables relating to the firm's level of growth. Firms were asked to assess their expected growth rate in sales for the subsequent 3 years (INCSALES). Since the distribution of future growth projections has very long tails, we consider two transformations of the raw data that place less weight on outlying observations. First, we consider an indicator variable denoting whether sales are projected to increase (INCSALESD). Second, to preserve the information on how much sales are projected to change, we consider a log transformation of the following form:

$$\text{LINCSALES} = \text{sgn}(\text{INCSALES}) * \log(|\text{INCSALES}|)$$

This variable has the property of being monotonic in INCSALES, but a much more compressed distribution.

A number of recent contributions have systematized measures of institutional quality across countries. In particular, Djankov et al. (2003) compile a measure of legal formalism across countries reflecting the extent to which the court process is governed by rules rather than discretion in evicting a tenant (FORMAL1), and collecting the payment

for a bounced check (FORMAL2). We use a comprehensive measure obtained by simply adding these two measures together (FORMAL).

We also investigate in this context the role of the legal origin of a country. These variables were introduced in the literature by La Porta et al. (1998) and are five indicators that classify the legal origin of the Company Law or Commercial Code of each country.

Summary statistics for both our firm- and country-level variables are reported in Table 1.

3. Results

Our most basic specification in section (1) above relates time spent with bureaucrats to the level of bribes paid:

$$(5) \text{ TIME} = \alpha_c + \beta_1 * \text{BRIBE}_{fc} + \varepsilon_{fc}$$

In a model where bribes reflect the opportunity cost of time we expect a negative correlation between bribes and time spent with bureaucrats (Liu, 1985). Similarly, to the extent that bribing corresponds to a form of personalized de-regulation, bribes will buy less hassle from bureaucrats (Huntington, 1968). In our framework, the correlation between bribes and time would reflect the time spent bargaining with officials. However, we are aware that TIME and BRIBE may both reflect the result of an underlying latent susceptibility to bureaucratic hassle (which would predict a positive correlation). Similarly, as pointed out by Kaufman and Wei (2000), a positive relation might be the outcome of a game where bureaucratic hassle is determined endogenously.

The estimated relationship between time and bribing is positive in the WBES sample. The sign and coefficient of bribing are robust to using country fixed effect estimation and adding standard firm-level controls (table 2, columns 1 and 2). A further prediction, embodied in equation (2) above, may help to distinguish between our bargaining frictions explanation and the endogenous regulation model of Kaufmann and Wei (2000). In particular, we include in the regression the variable ADPY, which measures the extent to which firms know in advance how much these ‘irregular

payments' will be, and interact it with bribes³

$$(6) \text{TIME}_{fc} = \alpha_c + \beta_1 * \text{BRIBE}_{fc} + \beta_2 * \text{BRIBE}_{fc} * \text{ADPY}_{fc} + \beta_3 * \text{ADPY}_{fc} + \varepsilon_{fc}$$

We find that higher uncertainty strengthens the positive relation between BRIBE and TIME, i.e., $\beta_2 > 0$. The size and the significance of the interaction effect are robust to including controls for firm size and sector of activity dummies (table 2, columns 3 and 4). We interpret these results as preliminary evidence of the efficiency-enhancing effect of reduced uncertainty in firm-bureaucrat negotiations. Note that a model of endogenous regulation does not make any strong predictions regarding these interaction terms.

The overall correlation between uncertainty and time spent with official is negative. This might reflect unobservable firm-specific effects, such as the frequency of interactions with bureaucrats – firms that seldom have contact with bureaucrats are less likely to know in advance the customary size of unofficial payments.

While the relation in (6) is interesting in its own sake, we are additionally concerned with the ultimate impact on economic outcomes. We therefore repeat our specifications in (6), replacing TIME with our measures of firm growth as the outcome variables:

$$(7) \text{Growth}_{fc} = \alpha_c + \beta_1 * \text{BRIBE}_{fc} + \beta_2 * \text{BRIBE}_{fc} * \text{ADPY}_{fc} + \beta_3 * \text{ADPY}_{fc} + \varepsilon_{fc}$$

In Table 3, we show the results, using INCSALESD and LINCSALES as measures of growth. First, we show the results without the interaction term, and confirm that there exists a negative relationship between reported bribes paid and projected growth. The interaction term is added in columns (5) to (8), where we find that the negative relationship between bribes and growth is generated primarily by firms that report uncertainty in the bribery process. In columns (9) and (10), we add TIME as an

³ Note that APDY is coded 1(always know the amount to be paid) to 6 (never know), so that higher values of the variable indicates more uncertainty.

additional control. We already determined in Table 2 that there is a high correlation between BRIBE*ADPY and TIME, and we find that the addition of TIME as a covariate in equation (7) reduces the magnitude and significance of β_2 . This indicates that the common component of these two terms might be driving the effect on growth.

The preceding analysis leads naturally to the question of whether there are specific institutional features that reduce the uncertainty associated with bargaining frictions. We suggest that any element to the legal or regulatory structure which creates *predictability* may have this effect. We focus on the variable FORMAL, compiled from Djankov et al. (2003), that reflects the discretion in legal systems around the world. In this case, a high value of formal is reflective of a rule-based system. We suggest that such systems will more easily ‘price’ bribes, since procedures are more formalized, rather than subject to discretion. We also consider the effect of legal origin, based on analogous reasoning. As described in La Porta et al. (1998), Civil Law systems are more procedural (rather than discretionary), which may create greater predictability in the context we investigate. We emphasize, however, that *any* set of institutional structures that lead to greater predictability in the firm-bureaucrat negotiation may lead to this effect.

To examine these country-level relations, we consider the country-level determinants of average uncertainty (ADPY). These results, presented in Table 4, do indeed suggest that both increased formality of the legal system, as well as proceduralism imposed by French legal origin, generate greater predictability. We view this suggestive evidence that some legal and institutional arrangements may attenuate the growth-retarding effects of corruption by reducing the bargaining frictions associated with bribe payments.

4. Conclusions and role for future research

This paper investigates the role of institutions in shaping the nature of illegal transactions between bureaucrats and entrepreneurs. In particular, we ask whether there are institutional and social factors that mitigate the growth-retarding effects of corrupt practices. We first developed a simple bargaining model of corrupt transactions, where each firm is subject to a firm-specific set of regulations. Then, using firm-level data

across countries, we characterize some salient aspects of the bargaining process underlying illicit transactions between public officials and firms. The data suggest that there is a positive correlation between bribery and time management spends with public official – which we interpret as the time spent bargaining to circumvent regulation. This correlation is attenuated if the firm reports to know in advance the amount of illegal payments required. We find that there is substantial variation across countries in the extent to which firms know the amount of illicit payments necessary to do business and that this is correlated with the legal origin of countries. In particular, the association between bargaining time and bribe paid gets stronger when we move from French-origin legal systems to British-origin legal systems.

There are interesting policy implications to this analysis. In particular, our model and results suggest that potential policy interventions must consider the effect on both the level *and* efficiency of bribe transactions. For example, anecdotal evidence suggests that a continued relationship between public officials and private agents provides fertile ground for the flourishing of corruption (see for example the discussion in Tanzi, 1996). On this basis, anti-corruption strategies in many countries have included, amongst others, regular rotation in public officials posts.⁴ However, if new officials disrupt the status quo, leading to greater bargaining frictions and price uncertainty, the resulting distortionary costs could outweigh the benefit of reduced corruption. The extent of this trade-off has not been investigated so far.

This work can be extended along several other dimensions. In particular, it seems worth investigating what is the “value” of bribery (i.e. what services informal payments can actually buy for firms). For example, it will be useful to estimate the impact of one unit of unofficial payments on the effectiveness of delivery of public service, as measured, e.g., by the number of days needed to hook up a telephone line. In this context, we expect the value of corruption to be a function of the local institutional setup (measured, for example by the extent of autonomy of local authorities) and of the prevailing bribery practices (as captured, for example, by the average level of unofficial payments in the region).

⁴ See, for example, Ali (2000) for the role of public official rotation in Singapore’s anti-corruption effort, and Krushelnnycky (2003) for a more recent example from Ukraine.

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Table 1. Sample statistics

Middle east and north Africa	Obs	Mean	Std.	Dev.	Min	Max	
	BRIBE	70	2.60	1.60	1	6	
	ADPY	70	2.79	1.58	1	6	
	TIME	65	1.88	1.22	1	6	
Eastern Europe and central asia	Obs	Mean	Std.	Dev.	Min	Max	
	BRIBE	1592	3.17	1.22	1	6	
	ADPY	1592	3.43	1.54	1	6	
	TIME	1518	2.71	1.40	1	6	
East Asia	Obs	Mean	Std.	Dev.	Min	Max	
	BRIBE	686	2.91	1.50	1	6	
	ADPY	686	3.26	1.60	1	6	
	TIME	636	2.50	1.56	1	6	
South Asia	Obs	Mean	Std.	Dev.	Min	Max	
	BRIBE	82	3.37	1.48	1	6	
	ADPY	82	2.84	1.34	1	6	
	TIME	74	3.03	1.32	1	6	
Latin America	Obs	Mean	Std.	Dev.	Min	Max	
	BRIBE	878	2.41	1.41	1	6	
	ADPY	878	2.86	1.56	1	6	
	TIME	847	1.64	1.12	1	6	
Europe and North America	Obs	Mean	Std.	Dev.	Min	Max	
	BRIBE	245	1.82	1.17	1	6	
	ADPY	245	4.29	1.37	1	6	
	TIME	225	2.09	1.26	1	6	

Table 2. Time spent with bureaucrats and bribing

	(1)	(2)	(3)	(4)
Dependent variable	TIME	TIME	TIME	TIME
BRIBE	0.149 (10.22)**	0.172 (10.93)**	0.066 (1.86)	0.072 (1.93)
BRIBE*ADPY			0.028 (2.82)**	0.031 (2.97)**
ADPY			-0.123 (3.95)**	-0.130 (3.94)**
Constant	1.825 (47.07)**	1.581 (27.90)**	2.324 (19.81)**	2.160 (16.01)**
Dummies for firm size	No	Yes	No	Yes
Dummies for sectors of activity	No	Yes	No	Yes
Observations	4863	4431	3425	3163
Number of ccode	61	61	61	61
R-squared	0.02	0.04	0.03	0.05

Results are obtained with country fixed effects estimates. Absolute value of t statistics in parentheses. * significant at 5%; ** significant at 1%

Table 3. Bribes, firm growth, uncertainty, and time spent with bureaucrats

Dependent variable	(1) INCSALES (0/1)	(2) INCSALES (0/1)	(3) LINCSALES	(4) LINCSALES	(5) INCSALES (0/1)	(6) INCSALES (0/1)	(7) LINCSALES	(8) LINCSALES	(9) INCSALES (0/1)	(10) LINCSALES
BRIBE	-0.007 (2.34)*	-0.008 (2.50)*	-0.056 (1.90)	-0.078 (2.43)*	0.010 (1.19)	0.009 (1.03)	0.094 (1.25)	0.089 (1.08)	0.006 (0.75)	0.059 (0.76)
log value of sales in USD	0.001 (0.76)	0.001 (0.82)	0.001 (0.05)	0.009 (0.55)	0.002 (1.11)	0.003 (1.33)	0.019 (1.02)	0.034 (1.58)	0.003 (1.27)	0.021 (1.11)
BRIBE*ADPY					-0.004 (1.96)*	-0.004 (1.70)	-0.046 (2.10)*	-0.046 (1.98)*	-0.003 (1.17)	-0.026 (1.17)
ADPY					0.010 (1.42)	0.010 (1.29)	0.095 (1.45)	0.096 (1.36)	0.005 (0.69)	0.042 (0.63)
TIME									-0.003 (0.80)	-0.051 (1.44)
Constant	0.925 (48.35)**	0.935 (44.00)**	2.624 (14.85)**	2.731 (13.86)**	0.862 (25.73)**	0.871 (23.64)**	2.098 (6.80)**	2.192 (6.47)**	0.879 (24.99)**	2.333 (7.22)**
Dummies for firm size	No	Yes	No	Yes	No	Yes	No	Yes	No	No
Dummies for sector of activity	No	Yes	No	Yes	No	Yes	No	Yes	No	No
Observations	5071	4621	3574	3249	3553	3283	2537	2340	3365	2440
Number of countries	60	60	60	60	60	60	60	60	60	60
R-squared	0.01	0.02	0.01	0.02	0.03	0.02	0.01	0.01	0.02	0.03

Absolute value of t statistics in parentheses.* significant at 5%; ** significant at 1%. LINCSALES=sgn(INCSALES)*log(|INCSALES|).

Table 4. What institutional arrangements help make payments more predictable?

Dependent variable	(1) (mean) ADPY	(2) (mean) ADPY	(3) (mean) ADPY	(4) (mean) ADPY	(5) FORMAL
legor==FR	-0.425 (1.97)	-0.425 (2.00)*		-0.575 (2.29)*	3.296 (7.99)**
legor==UK	0.250 (1.23)	0.250 (1.25)		0.183 (0.77)	2.024 (5.37)**
legor==GER	-0.221 (0.89)				
legor==SC	1.031 (4.25)**				
Log GDP per capita	0.258 (3.22)**	0.258 (3.27)**	0.290 (3.84)**	0.347 (4.53)**	-0.137 (1.33)
FORMAL			-0.067 (1.53)	0.025 (0.50)	
Constant	1.471 (2.20)*	1.471 (2.24)*	1.556 (1.98)	0.593 (0.79)	6.914 (9.39)**
Observations	61	59	47	47	63
R-squared	0.41	0.34	0.31	0.50	0.54

Robust t statistics in parentheses * significant at 5%; ** significant at 1%. *note that the specification in column 1 is not estimated with precision as there is only 1 country of German and Scandinavian legal origin respectively. Germany and Sweden are excluded from the sample in column 2. Log GDP per capita is from WDI (2004).