BARGAINING FOR BRIBES: THE ROLE OF INSTITUTIONS

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Preliminary version. Comments welcome

pubblicazione internet realizzata con contributo della COMPAGNIA di San Paolo

Abstract

We develop a bargaining model 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") in more rule-based environments, where the terms of illegal transactions are more transparent.

Much time and effort has been devoted to assessing the extent of bribery across firms, industries, and countries, and the effects that bribery, or corruption, 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 and the literature indicates 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 exists 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.[1] 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 examine the role of institutional characteristics such as the amount of regulatory burden or the extent of discretionality in bureaucracies in determining the efficiency with which corrupt transactions between entrepreneurs and public officials take place (and hence, ultimately, society's overall level of productivity).

The relatively sparse existing work in this area has focused on the role of corruption as efficient grease of the bureaucratic system. For example Liu (1985)

[1] Corrupt practices differ widely across countries. It has been noted, for example, that corruption tends to be more centralized in East Asia, while it is more uncoordinated in Africa and South Asia. Many factors can account for these differences, including the level of ethnic fractionalization (see amongst others Olson, 1992 and Shleifer and Vishny, 1993). However, an in depth discussion of these aspects of corruption is beyond the scope of this work.

presents a queuing model where bribes reflect the opportunity cost of time. Huntington (1968) characterizes bribes as a form of personalized de-regulation. Conversely, Kaufman and Wei (1999) develop a model where nominal 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. This paper develops a simple framework for thinking about the characteristics that are associated with high social costs of corruption – in the deadweight loss sense – rather than simple transfers of wealth from firms to bureaucrats.

Our contribution to the existing literature is twofold. First, we lay out a simple model 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.[2] At the core of our investigation is the question of whether there are institutional arrangements 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 will examine the prediction of the model using data from a number of recently collected datasets. These include several firm-level data sets that provide information on firms' relations with government agents, as well as country-level data on the nature of institutions across countries. In particular, we report results that suggest that bargaining frictions are lower in rule-based governmental systems, which we propose may be the result of the greater clarity in the bribe bargaining process afforded by rule-based systems.

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 are empirical results, and Section 4 concludes and discusses issues for future research.

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

1. Theoretical framework

In this section we develop a simple descriptive bargaining model of bribery. We 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.[3] 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 so that we describe total bribes paid as $\alpha g(n_f)$ where α is a parameter that reflects frictions in the bargaining process and g () captures economies of scale in bargaining and is such that g'>0,g''<0.

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

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

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

[3] 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.

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

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

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, our bargaining friction parameter, α, suggests 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 ascertainment of bribe schedules should be characterized by a weaker association between bribery and time with bureaucrats.

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

$$Time_f = \beta_1 * \mathrm{B}_f + \beta_2 * \mathrm{Uncertainty}_f + \beta_3 * \mathrm{B}_f * \mathrm{Uncertainty}_f + \varepsilon_f$$

There are a number of additional elements that we are currently working to incorporate into this framework. These include the level of harassment, which incorporates both n and r (i.e., both the number of regulations, as well as the cost per regulation); uncertainty over a firm's ability to pay, where the firm's vulnerability to bureaucratic hassle cannot be readily observed by the bureaucrat; and the potential to seek recourse in the legal system.

2. Data

To conduct the empirical exercise, we use data from two different sources. The World Business Environment Survey (WBES), carried out in 1999 and 2000, provides

firm-level data across 81 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); the amount of 'irregular payments' paid to government officials, as a fraction of sales (BRIBE1); and the extent to which firms know in advance how much these 'irregular payments' will be (ADPY).

The work by Djankov et al. (2002, 2003) and Botero et al. (2003) provides us with data on quality of institutions across countries. In particular, Botero et al. (2002) develop an index that measures the extent to which a government regulates the labor market, with implications for the extent of harassment by bureaucrats. The paper also presents measures of labor regulation for specific elements of the labor contract, such as leave allowances, wages, and hiring/firing decisions. Djankov et al. (2003) generate a measure of legal formalism across countries, which reflects the extent to which the court process is governed by rules rather than discretion (FORMAL).

We will also investigate 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 indicator variables that classify the legal origin of the Company Law or Commercial Code of each country.

3. Results

To illustrate the types of analyses we intend to conduct, we describe some preliminary evidence on the relationships between different aspects of illegal transactions and on the impact of different institutional arrangements on these relationships.

Consider the following regression:

(1) $TIME = \alpha_c + \beta_1 * BRIBE_{fc} + \varepsilon_{fc}$

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). However, there are a number of reasons why the correlation between bribing and time spent with bureaucrats could be positive. As pointed out by Kaufman and Wei (1999), this might be the outcome of a game where bureaucratic hassle is determined endogenously. Alternatevely, this might reflect latent firm characteristics that are observable to the bureaucrat and that make firms more or less captive; this is similar to the model in Section 2, where the latent variable is the number of regulations that the firm is subject to.

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. To try to further distinguish between the endogenous regulation explanation, and unobserved bribe vulnerability, we consider some of the further predictions of our descriptive model in Section 2. First, 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 bribes[4]

$$(2) \qquad TIME = \alpha_c + \beta_1 * BRIBE_{fc} + \beta_2 * BRIBE_{fc} * ADPY_{fc} + \beta_3 * ADPY_{fc} + \varepsilon_{fc}$$

We find that higher certainty attenuates the positive relation between BRIBE and TIME, i.e., $\beta_2<0$ (table 2, column 2). The size and the significance of the interaction effect are robust to including an interaction with log (gdp) per capita and controls for firm size (table 2, columns 3 and 4) . Similar results are obtained when BRIBE is interacted with a variable ranking the "predictability of laws". The more predictable are laws and regulations, the more tenuous is the link between bribe paid and time spent with bureaucrat (table 2, columns 5-7). We interpret these results , though tentative, as evidence of the efficiency-enhancing effect of reduced uncertainty in firm-bureaucrat negotiations. Note that a model of endogenous regulation makes does not make any strong predictions regarding these interaction terms.

[4] 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.

The preceding analysis leads naturally to the question of whether there exist institutions which act to reduce the uncertainty that leads to bargaining frictions. We suggest that any element to the legal or regulatory structure which creates *predictability* may have this effect. We focus on a variable we define as FORMAL, derived 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 argue, furthermore, that such systems will more easily 'price' bribes, since procedures are more formalized, rather than subject to discretion. With some reservations, we also consider the effect of legal origin, based on analogous reasoning: As described in La Porta et al's (1998) original law and finance article, Civil Law systems are more procedural (rather than discretionary), which we again assert may create greater predictability. 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 ADPY. These results, presented in Table 3, do indeed suggest that both increased formality of the legal system, as well as proceduralism imposed by French legal origin, generate greater predictability.

In Table 4, as a final step, we consider a version of specification (2), where we substitute institutional characteristics for ADPY; consistent with the prior set of tables, we do indeed find that the interaction of FORMAL with BRIBE is negative, as is the interaction of French legal origin with BRIBE, though the latter effect is not statistically distinguishable from the English legal origin interaction.

4.Conclusions and 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 British-origin legal systems to French -origin legal systems.

This work can be extended along several dimensions. In particular, it seems worth investigating what is the "value" of bribery (i.e. what services informal payments can actually buy for firms) – an issue that, to our knowledge, no study has characterized thus far. 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).

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Table 2. Time spent with public officials, bribing and uncertainty of payments

	(1)	(2)	(3)	(4)	(5)	(6-)	(7)
Dep. Variable	t_smgt	t_smgt	t_smgt	T_smgt	t_smgt	t_smgt	t_smgt
Estimation	Country Fixed effects	Country Fixed effects	Country Fixed effects	Country Fixed effects	Country Fixed effects	Country Fixed effects	Country Fixed effects
bri_ptr	0.440	0.066	0.101	0.086	0.081	0.147	0.136
	(5.71)**	(1.86)	(0.88)	(2.45)*	(1.95)	(1.39)	(1.22)
bri_adpy		0.028	0.028	0.026			
		(2.82)**	(2.82)**	(2.58)**			
Adpy		-0.123	-0.123	-0.111			
		(3.95)**	(3.95)**	(3.58)**			
bri_lgdp			-0.005			-0.009	-0.004
			(0.32)			(0.68)	(0.30)
Bri_pred					0.017	0.017	0.016
					(1.75)	(1.70)	(1.55)
Law_pred					-0.057	-0.056	-0.049
					(1.97)*	(1.93)	(1.56)
Including controls for firm size				Yes			Yes
Constant	1.089	2.324	2.325	2.106	2.054	2.052	1.779
	(5.51)**	(19.81)**	(19.81)**	(17.41)**	(17.57)**	(17.56)**	(13.25)**
Observations	4929	3425	3425	3421	4764	4764	4340
Number of countries	61	61	61	61	61	61	61
R-squared	0.26	0.03	0.03	0.04	0.02	0.02	0.04

Absolute value of t statistics in parentheses.* significant at 5%; ** significant at 1%. Note that the variables ADPY , LAW_PRED are coded 1(always)-6 never. Column 8 includes also controls for sector of activity.

Table 3. The role of uncertainty and legal origin

	(1)	(2)	(3)	(4)	(5)
Dependent variable	(mean) adpy	(mean) adpy	(mean) adpy	formal3	(mean) adpy
Estimation	OLS	OLS	OLS	OLS	OLS
legor==2	-0.425	-0.425		3.296	-0.575
	(1.97)	(2.00)*		(7.99)**	(2.29)*
legor==3	0.250	0.250		2.024	0.183
	(1.23)	(1.25)		(5.37)**	(0.77)
legor==4	-0.221	0.000		0.000	0.000
	(0.89)	(.)		(.)	(.)
legor==5	1.031	0.000		0.000	0.000
	(4.25)**	(.)		(.)	(.)
formal3			-0.067		0.025
			(1.53)		(0.50)
lgdppc	0.258	0.258	0.290	-0.137	0.347
	(3.22)**	(3.27)**	(3.84)**	(1.33)	(4.53)**
Constant	1.471	1.471	1.556	6.914	0.593
	(2.20)*	(2.24)*	(1.98)	(9.39)**	(0.79)
Observations	61	59	47	63	47
R-squared	0.41	0.34	0.31	0.54	0.50

Robust t statistics in parentheses. * significant at 5%; ** significant at 1%. In columns 2-5, ‡Germany and Sweden were excluded from the samples in columns 2-5 as they were the only countries of German and Scandinavian Legal origin respectively. Note that higher average ADPY indicates *more* uncertainty in the pricing of illegal payments.

Table 4 – Effect of formalism on the relationship between frequency of bribe payment and time spent by firm management with bureaucrats

	(1)	(2)	(3)	(4)
Dependent variable	t_smgt	t_smgt	t_smgt	t_smgt
Estimation	Country fixed effects	Country fixed effects	Country fixed effects	Country fixed effects
bri_ptr	0.153	0.123	0.358	0.392
	(4.27)**	(0.95)	(4.70)**	(2.22)*
bri_legfr	-0.052	-0.044		
	(1.24)	(0.97)		
bri_legso	0.046	0.050		
	(1.08)	(1.05)		
bri_for3			-0.027	-0.028
			(3.02)**	(2.76)**
Including bribes/gdppc interaction	No	Yes	No	Yes
Including firm size and sector dummies	No	Yes	No	Yes
Constant	1.814	1.579	1.837	1.598
	(44.95)**	(26.65)**	(42.43)**	(24.80)**
Observations	4692	4271	3887	3513
Number of ccode	58	58	48	48
R-squared	0.02	0.04	0.02	0.03

Absolute value of t statistics in parentheses. * significant at 5%; ** significant at 1%