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CORRUPTION IN INDONESIA

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ABSTRACT

Bribes by firms in Indonesia arise principally from regulations --licenses and levies --imposed by local government officials. Regulations generate direct revenues (fees) plus indirect revenues in the form of bribes. The expected value of the latter is capitalized into lower salaries needed by localities to compensate public officials. Localities in Indonesia are hampered by insufficient revenues from formal tax and transfer sources to pay competitive salaries plus fund "demanded" levels of public services, because local tax rates are capped by the center and inter-governmental transfers are limited. Thus the direct and indirect revenues from local regulations are critical to local finances. The paper models and estimates the key aspects of corruption -- the relationship between bribes, time spent with local officials, and different forms of regulation. It models how inter-jurisdictional competition for firms limits the extent of local regulation and how greater sources of tax or inter-governmental revenues reduce the need for regulation and corruption. The paper estimates a large reduction in regulation in better funded localities. The findings are directly relevant to Indonesia where corruption is high and the country is in the throes of major decentralization and local democratization efforts.

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Key words: corruption, inter-jurisdiction competition, fiscal decentralization.
JEL codes: D2, D7, H2, H7, O1

Corruption in Indonesia is widespread and costly. Based on the detailed survey this paper utilizes, firms report spending on average over 10% of costs on bribes and over 10% of management time in "smoothing business operations" with local officials. But the extent of corruption varies enormously across local jurisdictions, with, for example, the average of bribes to costs ranging from .56% to 31% across localities in the survey. This paper focuses on two issues. First we examine the nature and costs of corruption, asking how money and time costs vary as the local regulatory environment a firm faces varies. Second, we argue and present evidence that local regulatory environments depend on local fiscal arrangements and local fiscal situations, as determined in part by central government policy. Localities with more restricted formal fiscal situations use regulations and the resulting corruption and bribes as a form of indirect taxation to help fund adequate compensation for local officials. This relationship is of particular interest given two key political issues in Indonesia today—ameliorating corruption and achieving full devolution of many governmental functions to localities.

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In analyzing, first, the nature and costs of corruption, we ask what types of public regulations invite bribes (Kaufmand and Wei, 1998) and how important is each type. For regulations such as required licenses and levies, how does the bribing process work? What are the magnitude of bribes needed either to avoid requirements or to supplement official fees, and what determines the amounts of time spent wooing local officials? How heterogeneous are responses across firms and how predictable is this heterogeneity of response? Answering these questions will help us understand the extent to which creation of regulations enhances the ability of officials to extract bribes. We also examine forms of corruption, involving defraud of the state of, say, tax revenue that individual firms might favor (Shleifer and Vishny, 1993).

To examine corruption, we will utilize a data set collected in 2001-2002 by LPEM at the University of Indonesia covering 1808 firms in 64 (out of about 300) local government areas, which is unusual in two aspects. First is the detailed micro information on forms of regulations and interactions with local officials. Second is the high response rate – in terms of willingness to report bribes, willingness to report other corruption information, and candor about the magnitude of bribes paid. For example, 75% of all firms sampled report positive bribes, and we infer that about another 5% correctly report zero bribes. Given missing values on other responses, in all in our data, we work with a sample of valid bribe responses of over 70% of the original surveyed firms. As we will see, non-respondents on bribe payments are not a random group, with typically different behaviors in other corruption dimensions than respondents. In contrast, in Uganda which is a country viewed at least as equally corrupt (Bardhan, 1997), Svensson (2003) ends up analyzing bribes reported by just 48% of original surveyed firms from a general economic survey of firms. In Svensson's survey mean bribes are only about 3% of profits (and presumably a much smaller fraction of costs), in comparison to mean bribes to costs of 10.5% in our survey. The magnitudes reported for Uganda are similar to what Indonesian firms report as corruption costs ("gifts given") in the formal Industrial Economic Census. But the carefully crafted interviewing for our survey specifically focused on corruption, with various indirect checks on accuracy, brings out very different responses and response rates.

In examining the second issue of how fiscal arrangements affect regulatory and corruption environments, the corruption most firms face involves interaction with local officials, who administer regulations and taxation. Thus we focus on government at the kabupaten level, which is the main local government institution, and is similar in geographic scope to US counties. This focus is of particular interest, since several months before our survey started, Indonesia implemented full decentralization of expenditure functions, with some degree of local democracy, moving away from a formerly more unitary, authoritarian

system.[2] The regime shift is expected to help curtail corruption, by increasing the role of the local government and accentuating the forces of inter-jurisdictional and political competition. Corruption in Indonesia is a major on-going political issue with wide press coverage and public discussion and has been a focus of both World Bank (2003) and local academic (Kuncoro, 2003) study. It is recognized that democracy may have a limited impact on corruption (Rasmusen and Ramseyer, 1994) and that regime switches are difficult given the role of history, culture, and expectations (Tirole 1996, Sah 1988, Andvig and Moene 1990, and Bardhan 1997). However, as we will explain, the concern in this paper is that decentralization may worsen corruption overall and seems certain to worsen it in some kabupaten because, while expenditure functions are decentralized in the reforms, revenue functions are not.

To understand the potential link between corruption and fiscal arrangements, for the moment think of the government of a kabupaten, elected or not, as being embodied in the regent (the Indonesian term for the head of the local government), who hires local officials to administer regulations, as well as provide services. While the regent has a local property tax base, de facto tax rates are capped at low levels; and fiscal transfers are modest. It is widely acknowledged that revenues from tax and transfer sources both before and after decentralization are insufficient to pay for even minimal mandated public service levels, so the regent needs to seek other forms of revenue. Local regulations such as licenses and "levies" provide indirect revenues in the form of bribes, as well as direct revenues. Bribes received by local officials to ameliorate the impact of regulations mean the regent can pay lower salaries to officials, freeing up money for other purposes– i.e., expected bribes received are capitalized into lower official salaries.

The use of regulations and corruption to provide local revenues is not without consequence. A regent is aware that non-competitive levels of regulation and excessive bribe demands make his locality unattractive to firms, driving firms to other kabupaten. Loss of firms impinges on a kabupaten's tax base, lowering tax and bribe revenues. It also may affect local economic growth, local wages, property values, and wealth of the regent and other residents. In a context where the last 15 years in Indonesia has seen rapid and massive movement of manufacturing firms out of central cities into ex-urban areas (Henderson, Nasution and Kuncoro, 1996), rural kabupaten that are less corrupt may compete and develop more effectively.

The need for kabupaten to rely on regulation and corruption depends on inter-governmental fiscal arrangements. If the regent has access to higher effective tax rates on the kabupaten tax base or enjoys greater

[2] Local legislators are now elected. However the local government head, or regent, is still de facto appointed by the center. After 2001, she became subject to censor and impeachment by the local elected parliament; and in November 2003, new legislation was enacted to have her be directly elected as well in the future. Note regents themselves as well as central government officials are corrupt, perhaps inhibiting their ability to fight lower level corruption (Andvig and Moene, 1990).

inter-governmental transfers, her need to rely on corruption is reduced. The effect of decentralization on local government finances is still unclear; kabupaten have much greater expenditure responsibilities but also greater inter-governmental transfers. However it seems clear to observers that both before and after decentralization kabupaten governments are under-funded and that there are definite fiscal losers from decentralization. As we will see, in Indonesia because of oddities in the national tax-transfer system, in our data on local fiscal budgets, there is wide variation in the extent of fiscal transfers from the center as a fraction of local GDP, as well as wide variation in regulated tax revenues. We will link quantitatively the extent of regulation and local fiscal situations.

The paper starts with a conceptual framework, modeling aspects of corruption, inter-jurisdictional competition, and the effect of fiscal arrangements on corruption, reviewing the relevant literature as we go along. Next, it turns to an empirical assessment of regulation, corruption, and the interaction between firms and local officials. Finally, we review center-local fiscal arrangements in Indonesia and examine the effects of fiscal arrangements on corruption.

1. Modeling Corruption and Its Effects

In this section we outline a simple model of "demand and supply" of bribes in a locality. Firms supply bribes in interaction with local governmental employees, under the "efficient grease" hypothesis to reduce the impact of regulations (e.g., Liu, 1985, and Becker and Maher, 1986, as reviewed by Bardhan, 1997). Given the response of firms and local government employees, local governments "demand" bribes through the imposition of regulations (e.g., Banerjee, 1994, Kaufman and Wei, 1998). The new ingredients we bring to this traditional modeling of corruption are twofold. The choice of the extent of regulation and related corruption by local governments is constrained by strategic competition across localities for firms. Second the choice to use regulation and corruption as a form of indirect taxation and compensation of local government employees is influenced by local fiscal situations and the access of local governments to other forms of public revenues. The model we outline will form the basis for the empirical study of corruption.

2.1 Modeling Firm Response to Regulation

How do firms respond to regulations (e.g., licenses, "levies"), or what is often called "red tape" or just "harassment" (Kaufman and Wei, 1999), in interacting with local officials? Bribes are supplied to ameliorate the impact of regulations, such as waiting times for specific licenses needed to carry out different aspects of business. In thinking about the bribing process, evidence in Kaufman and Wei (1999), Svennson (2003) and our data suggests that bribes and firm time engaged with public officials are positively correlated. To reduce

the costs of regulation takes both time and money. In our data we will have six categories of the fraction of time spent by management with local officials smoothing operations. The mid-point values of time are 2.5%, 10%, 20%, 37.5%, 62.5% and 87.5%. The mean percent of bribes in production costs changes across firms in each category, taking average values respectively of 7.8%, 9.3%, 12.5% 16.8%, 14.4% and 19.4%, so the average rises by 2.5 fold moving from the lowest to highest category.

Why this positive, rather than negative correlation? Two sets of reasons come to mind. First, based on common perceptions of the social forces involved, officials enjoy spending time with firms, whether it is because of power issues ("I can force firm i to devote time to me") or because the official does not want to be seen as a simple thief but rather wants to cultivate a "gift relationship" among "friends". The latter seems to be a common perception of the bribe relationship in Indonesia. Second, as a pure economic explanation, time is spent trying to assess what level of bribe is needed to get cooperation of the official. In modeling, to simplify, we utilize a "black-box" formulation of the first notion, but note that the second can be modeled also. [3]

To model bribes, we adapt Kaufman and Wei, so that later in analyzing the demand for regulations and bribes, we can capture the notion of inter-jurisdictional competition for firms. In doing so, we separate the specification of firm production technology from that of corruption technology. We start with corruption technology and the supply of bribes. In the model, "harassment" is for example the number of licenses, h, which the local government imposes. For a firm, there is a "black-box" bribing "technology" to reduce the effects of harassment, $f(b,t)$, where effective harassment $\tilde{h} = h - f(b,t),$ and $f_b, f_t > 0, f_{bb}, f_{tt} < 0.$ Bribes are b and time by firm management is $t.$ So time and bribes may be spent to reduce waiting time to get a license, which is required to proceed with certain firm functions. Reducing harassment involves both time and money

[3]Economic micro-foundations for the *f(b,t)* function below about time and bribes could involve a learning story. For any license and license grantor, there is a minimum payment, say $\theta,$ an official will accept, depending on the official's "tastes". That minimum is private information and the firm only knows the distribution. The firm gets, say, two tries (visits by the official to the factory), to bribe him. If he fails on both accounts, he gets no license that year and that imposes specific costs. Suppose $\theta,$ is uniformly distributed between 0 and 1. The firm can offer θ_1 on the first visit which has a probability θ_1 of being accepted. If θ_1 is too low, no license is granted on the first visit and the official incurs a cost $c_1,$ with probability $(1-\theta_1).$ On the second visit the factory can offer θ_2 which has a probability $(\theta_2 - \theta_1)$ of being accepted. If it is rejected, the firm then bears a cost c_2 with probability $(1-\theta_2),$ where $c_2 > c_1.$ Optimizing with respect to θ_1 and θ_2 certain regions of parameter space yield an interior solution where $\theta_1 = 2/3\, c_1 + c_2/3$ and $\theta_2 = 2/3\, c_2 + c_1/3.$ Given $\theta_2 > \theta_1$ in such a solution, time spent (number of visits) with the local official rises with observed bribes; and the solution also has the feature that with greedy officials bribes may never be paid although heavy costs $(c_1,\ c_2$ and 2 visits) are incurred.

based on the later specification of the preferences of local government employees, who administer regulations and collect bribes.

For the firm, effective harassment imposes costs, $c(\tilde{h})$ where $c^{'},\ c^{"} > 0.$ The firm seeks to minimize harassment costs plus bribes paid plus the cost of time, or

$$c(h - f(b,t)) + b \ + \ w(t) \tag{1}$$

where $w^{'} > 0,\ w" \geq 0.$ The firm chooses b and t such that

$$c^{'}(h - f(\cdot))\, f_b(\cdot) = 1, \tag{2a}$$

$$c^{'}(h - f(\cdot))\, f_t(\cdot) = w^{'} \tag{2b}$$

If we differentiate (2a) (with a symmetric condition for (2b)), if $w^{"} = 0$, which we will generally assume, we get

$$db = \frac{c^{'} f_{bt} - c" f_t f_b}{c^{"} f_b^{\,2} - c^{'} f_{bb}}\ dt + \frac{c^{"} f_b}{c^{"} f_b^{\,2} - c^{'} f_{bb}}\ dh \tag{3}$$

In (3), while the coefficient of dh is unambiguously positive $(c^{"} > 0, f_{bb} < 0),$ the coefficient of dt can only be positive if $f_{bt} > 0$ and f_{bt} is "large", or if b and t are "strong complements".

For well behaved functions, eqs. (2) can be solved so

$$b = \ b(h) \tag{4a}$$

$$t = \ t(h) \tag{4b}$$

Utilizing eq. (3) and the corresponding term from differentiating (2b), we can show that

$$\frac{dt}{dh} = \ c^{"}c^{'}\ (f_b f_{bt} - f_t f_{bb}) / D \geq 0 \tag{5a}$$

$$\frac{db}{dh} = \ c^{"}c^{'}\ (f_t f_{bt} - f_b f_{tt}) / D \geq 0 \tag{5b}$$

where $D = \ (c^{"} f_t^{\,2} - \ c^{'} f_{tt})\ (c^{"} f_b^{\,2} - \ c^{'} f_{bb}) - \ (c^{"} f_b f_t - \ c^{'} f_{bt})^2 > 0$ from second order conditions. db/dh and dt/dh are assumed to be positive so that b and t are "normal" goods in response to increases harassment; a sufficient condition for this is that $f_{bt} > 0.$ For later reference, to ensure well-behaved interior outcomes it is convenient but not essential to assume $d^2b/dh^2,\ dt^2/dh^2 \leq 0$, so that increases in harassment increase time and bribes at a decreasing rate. In the empirical section we estimate a form of eq. (4), yielding the coefficients in (5). We also examine the complementarity effects in (3) directly.

If harassment increases both time and bribes enjoyed by local government employees, what limits harassment, apart from local social norms? One limit is firm exit, where in Bliss and Tella (1997), given

heterogeneous firms, corruption forces less efficient firms out of business. Another limit which we take here is to emphasize inter-jurisdictional competition, and exit to other jurisdictions.

2.2 Local Government Demand for Regulation and Corruption

There are two stages to modeling local government demand for regulation. First is to analyze firm location decisions and inter-jurisdictional competition for firms, so as to see how harassment affects the number of firms in a locality. The effect of harassment on the number of firms in a locality and hence on the local tax base is something local governments anticipate in policy decisions. The second stage formulates the nature of the local governments, their optimization problem and their fiscal situation. In the work to follow we assume there are two regions, *i* and *j*, with the model directly generalizing to n regions. At some points we will impose symmetry across regions, to simply and illustrate key points.

2.2.1 Harassment and Inter-Jurisdictional Competition for Firms

For our firms, there is a fixed amount of labor, L_i and L_j, available in each region, split among the (identical) firms in the region. Each firm is run by an entrepreneur where nationally there are a fixed number, $\bar{N}$, of entrepreneurs and firms, which are perfectly mobile so $N_i + N_j = \bar{N}.$ We first examine firm production technology, and then combine that with the corruption technology to look at location decisions.

Firm Production Technology.

If all entrepreneurs are identical, then per firm output in a region *i* is $x(L_i / N_i),$ where $x' > 0, x'' < 0$.

Assuming competitive labor markets, so wage, $w = x'$, we define firm revenue from production activity as $R(N_i / L_i) = x(L_i / N_i) - wL_i / N_i$, where we can show that[4]

$$\begin{aligned} dw_i / dN_i &= -x''(L_i / N_i) \cdot (L_i / N_i^2) > 0 \\ dR_i / dN_i &\equiv R_i^{'} = x''(L_i / N_i) \cdot (L_i^2 / N_i^3) < 0 \end{aligned} \tag{6}$$

Location Decisions.

Combining production and corruption, in region *i*, per firm total profits are

$$\pi_i = R_i(N_i / L_i) - c(h_i - f(b_i, t_i)) - b_i - w(t_i) - T_i. \tag{7}$$

Firms get net production revenue $R_i(\cdot),$ have harassment and bribe costs of $c(h_i - f(b_i, t_i)) + b_i + w(t_i)$ from (1), and pay a tax T_i set by the center and partially remitted to the local government. The regent anticipates that firms move between regions so $\psi = \pi_i - \pi_j = 0.$ Given this, we can determine how a regent perceives harassment levels will affect the number of firms in her region, in a Nash context, where the regent is

[4] $dR = (-x' + w)\, L_i / N_i^2 dN_i - \partial w_i / \partial N_i \; (L_i / N_i)\, dN_i$. But given $x' = w,$ we have the second equation in (6).

choosing harassment levels. Totally differentiating (7), we get

$R_i^{'}\ dN_i / L_i - c_i^{'}\ dh_i + \ (c_i^{'} f_{b_i} - 1)\ db_i + \ c_i^{'}\ (f_{t_i} - w_{t_i}) dt_i = \ R_j^{'}\ dN_j / L_j - c_j^{'}\ dh_j + c_j^{'}\ (f_{b_j} - 1)\ db_j$

$+ \ c_j^{'}\ (f_{t_j} - w_{t_j}) dt_j$, where the regent sees T_i as fixed. Utilizing eq. (2), imposing Nash perceptions at equilibrium by the regent in *i* that $dh_j, db_j, dt_j = 0$, and having the regent recognize the national constraint on numbers of firms so that $-dN_j = dN_j$, we get

$$\frac{dN_i}{dh_i}\Big|_{\bar{h}_j} = -\frac{c_i^{'}}{(-R_i^{'}/L_i - R_j^{'}/L_j)} < 0 \qquad (8)$$

where $R^{'}$ <0. In (8), as h_i rises in the numerator that increase costs and reduces profits to the representative firm which induces exit to region *j*. However, from the denominator, exit is limited by diminishing net firm revenues in *j* that occur with entry and rising net revenues in *i* that occur with exit. Again for later reference, to have well-behaved interior solutions, it is convenient but not essential to assume $d^2 N_i / dh_i^2 \leq 0$, so that as harassment increases firms exit at an increasing rate. A sufficient condition in a symmetrical situation for this to hold is that $f_{bb} f_{tt} - f_{bt}^2 \geq 0$.

2.2.2 The Local Government's Demand for Harassment Levels

For regions, we look first at the regent's revenue sources and expenditure requirements. Based on taxes collected from firms in the region, the T_i in eq. (6), the center remits to the locality a portion of that tax per firm, βT_i, so that the regent's tax revenue is $\beta T_i N_i$. This $\beta T_i N_i$ could also be adjusted to include general fiscal transfers dependent on local GDP or other measures of local economic activity that are influenced by the number of firms in the locality. Out of $\beta T_i N_i$, the regent must pay a salary, *S*, to the local government employee, or official, who works for her. The post salary residual is "profits" or net revenue kept by her or spent on improving public good quality. But it is thought that these capped tax revenues are insufficient to pay even the salaries of the base number of local officials needed to provide mandated public services.

Corruption enters this process through its effect on the formal salary required for the local official. The local official hired by the regent must be paid utility $\bar{W}$. The local official has a utility function, $y + U(t(h)N)$, where *y* is income. The second term is utility enjoyed by the official from time spent with local firms, where we assume $U' > 0, U'' \leq 0$. Treating $\bar{W}$ is as fixed, the regent sees the official's required salary as $S = \bar{W} - b_i(h_i) N_i - U(t(h_i) N_i)$; or as the market utility less bribes collected by the official less the utility received by the local official from time devoted to him by local firms. Note we have not added in extra

direct revenue that the regent gets from the sale of licenses and imposition of levies; we simply normalize that revenue to zero.[5]

Given these assumptions, we need an objective function for the regent in region i. The regent's total net budget after paying the salary of the local official B_i is

$$B_i = \beta T_i N_i - (\bar{W} - b_i(h_i)N_i - U(t_i(h_i)N_i)), \qquad (9)$$

In the period for our data where harassment is still based on the pre-decentralization, pre-local democracy situation, we model the regent as a Leviathan government that seeks to maximize this budget. After the introduction of limited democracy in Indonesia, following Panizza (1999) and Arzaghi and Henderson (2004), we could model the political process as having an objective function that weights the utility of voters against that of the government, with weights representing the relative bargaining power of each group. For example the objective function could be $\Omega_i = V(w_i, B_i)^{\theta} B_i^{1-\theta}$, where $V(w_i, B_i)$ is the quasi-indirect utility function of the representative worker. His income equals the local wage rate w_i; and, normalizing the cost of local public goods to 1, B_i equals the level the level of local public services, g_i. θ is the relative bargaining power of the representative voter in the political process, or the degree of democratization. But for the pre-decentralization period, without loss of generality as to concepts involved, we assume Ω_i is simply B_i in a Leviathan situation where θ=0. Optimizing with respect to h_i, we have

$$\begin{aligned} &dB_i / dh_i = \partial B_i / \partial h_i + \partial B_i / \partial N_i \cdot \partial N_i / \partial h_i = 0 \\ &d^2 B_i / dh_i^2 < 0. \end{aligned} \qquad (10)$$

In the first order condition , the $\partial B_i / \partial h_i$ term represents the *benefits* of increasing harassment—increased corruption and bribes for the local official which reduces his formal salary and increases the public budget (from (9), $\partial B_i / \partial h_i = N[db/dh + U' \cdot dt/dh]$ which from (5) is positive). The term $\partial B_i / \partial N_i \cdot \partial N_i / \partial h_i$ represents the *costs* of increased harassment: the lost revenues because firms exit the kabupaten in response to increased harassment (from (9) $\partial B_i / \partial N_i \cdot \partial N_i / \partial h_i = [\beta T + t \cdot U' + b]\, dN/dh$, where dN/dh<0).[6] The first

[5] If p_h is some exogenously regulated harassment fee so total harassment revenues are $p_i N_i h_i$, that adds to the harassment determination terms reflecting lost harassment fees when a firm exits plus gained monies when *h* is increased.

[6] Under partial democracy the benefits and costs of increasing *h* are respectively $[\theta V^{\theta-1} V_g B^{1-\theta} + (1-\theta) V^{\theta} B^{-\theta}] N[db/dh + U' \cdot dt/dh]$ and $\{\theta V^{\theta-1} B^{1-\theta} V_w dw/dN + [\theta V^{\theta-1} B^{1-\theta} V_g + (1-\theta) V^{\theta} B^{-\theta}][\beta T + t \cdot U' + b]\}\ \{dN/dh\}$. In the cost expression, the first term in the first curly brackets is the effect of changes in firms on wages. While the expressions are more complicated they have the same economic interpretation.

order condition balances out these two forces. For the second order condition, sufficient conditions are $\frac{dN_i}{dh_i} < 0,\ \frac{d^2N_i}{dh_i^2} \le 0,\ \frac{db_i}{dh_i}, \frac{dt_i}{dh_i} > 0,\ \frac{d^2b_i}{dh_i^2}, \frac{d^2t_i}{dh_i^2} \le 0,$ U" ≤ 0 . Note we are assuming that each kabupaten perceives taxes are capped at too low a rate, so $dB_i / dT_i > 0$ at the current T_i .

Here we have modeled the choice of harassment and related corruption by the regent as helping ensure local officials receive market compensation, with the degree of harassment limited by inter-jurisdictional competition for firms. There are other limits on corruption, although so far in Indonesia these do not appear to be direct penalties for being caught (Mookerjee and Png, 1995 and Cadot, 1987). But in the empirical work, we do consider observed and unobserved heterogeneity of the characteristics of local officials, in particular their degree of education, which might affect either their sensibilities to media scrutiny and social pressure to limit corruption or their perceptions about the long-term effects of corruption on local economic growth and ultimately the resources available to them.

With this framework we can examine the effect on corruption of changes in fiscal situations. In particular we want to show that if inter-governmental transfers or money rebated from tax collections in the locality go up, harassment, bribes and corruption are likely to decline. That is, we want to show that an increase in βT_i (because either or both β and T_i are increased) reduces h_i . We can do this by simple differentiation for the symmetrical case where βT_i is increased everywhere by the same amount, so eq.(10) continues to apply everywhere with the same arguments;[7] imposing symmetry avoids having to detail the full impact on reaction functions required for the asymmetric case. Differentiating eq. (10) with respect to βT_i and h_i yields

$$\frac{dh_i}{d(\beta T_i)} = -\frac{d^2B_i / dh_i^2}{d(dB_i / dh_i) / d(\beta T_i)} < 0. \qquad (11)$$

We know from the second order condition in (10) that $d^2B_i / dh_i^2 < 0$. Given (9), $d(dB_i / dh_i) / d(\beta T_i) = dN_i / dh_i < 0$. Based on this result for the symmetric case with a Leviathan government, we argue that the forces are there for increased inter-governmental transfers to reduce harassment and corruption more generally. This paper will examine empirically the suggestions of this analysis: do kabupaten receiving more transfers have lower harassment levels?

[7] Note the T_i, T_j terms cancel out in the derivation leading to eq. (8).

2. Empirical Work: The Effects of Regulation (Harassment) on Firms

This section examines the effects of local regulations on firm bribe payments and time spent with local officials. The section is divided into several parts. First we discuss the specifics of bribing in Indonesia in order to motivate a formulation to equations (4) on the extent of bribes paid and then later the extent of time spent with local officials. Second we describe the data and econometric issues in estimation. Third we present results on bribe activity, for several formulations; and finally we turn to an analysis of time spent with local officials.

2.1 Corruption in Indonesia

A number of forms of corruption as faced by firms emerge from the survey results and investigations by local researchers. We start with forms of harassment. The dominant form is licensing, the most important source of local discretionary revenues and reputedly one of the two main sources of bribe activity. Depending on what a firm produces and where it locates, it must procure a variety of licenses, both to start and then to operate a business. For operational licenses which we focus on the median, mean and standard deviation of licenses for those reporting are respectively 5, 5.8, and 4.9. For start-up licenses similar numbers are reported. Corruption involved in licensing involves waiting time for licenses, where licenses must be renewed annually. Without the proper license for a particular activity (e.g., operate a business, make noise, create congestion, pollute in different dimensions, export, etc.), a firm variously may be harassed by neighbors and inspectors, unable to perform certain functions, or have all operations suspended. Bribes are paid for each license simply so officials do not hold up the granting of the license. Firms sometimes hire middlemen ("calo") to help procure licenses and pay the requisite bribes.

In terms of other forms of harassment, firms face "local levies and retributions" for having an escalator, operating a water pump, operating a generator, etc. Bribes are paid to spread payments over a period of time, perhaps a rather minor item. But for local levies and retributions, there may also be an element of defraud of the state, where the application of specific levies is subject to some negotiation. The survey has some information on levies and retributions, which we can control for. Finally, starting in the last 2-3 years, firms face official octroi taxation (taxes on movements of good across kabupaten boundaries). For timely movement of goods, bribes must also be paid in addition to the octroi tax. We want to control for this form of harassment.

Apart from harassment, there is another source of bribes not analyzed yet, which is defraud of the state of tax revenues, a form of corruption we need to control for. For fraud involving tax collections the main form is bribes paid to reduce property taxes. While the official national property tax rate is .5% on market

value of tangible assets, Economic Census data suggest the de facto rate averages about .25%. This differential presents an opportunity for bribe activity. Why is that? Property taxes are assessed and collected by the center, before remittances back to the locality. The property tax collector in a kabupaten is assigned a target for collections, which is typically based on historical collections and generally is met (with no reward for collection in excess of the target). The target is universally considerably less than what is hypothetically legally owed for the kabupten. Thus assessors and tax collectors are presented with a great opportunity for graft, in the form of collecting some portion of the gap between the legal tax liability of a firm and the on-average much lower target. Given potential legal liabilities, firms can lower their assessed payments by bribing assessors not inspect a building and to accept their statement of what the capital contents are. Collectors can be bribed on an annual basis, to lower the tax bill below legal assessed taxes for businesses claiming "special" circumstances such as cash-flow problems, poor sales, etc. Collectors and assessors work out of the same building and how they split the "surplus" that potentially is at hand we don't know.

Empirical implementation of this aspect of corruption requires an adaptation of the model in section 2, so firms have property. Suppose a firm's full tax liabilities are tK, where t is the official tax rate and K the full value of property. Given tK, a firm pays $tK\ (1-\alpha)$, where α is the forgiveness rate. For the typical firm in a kabupaten, α represents the gap between full tax liabilities and target tax collections, both of which are set by the center. While α is the overall forgiveness rate for the kabupaten, officials will negotiate with each firm as a bribe, a portion γ of αtK, since the firm's official tax liabilities remain tK. This bribe $\gamma\alpha tK$ is determined by bargaining, where bargaining power depends on the firm's influence with other government officials, the security of the official's position, the local attitude towards corruption, and the like. In a Nash bargaining context threat points could be to shut down, or seize the business unless γ=1, versus to offer the official close to nothing. We can't observe any of this process, but we estimate for the typical firm α and γ. If actual taxes paid are $tK\ (1-\alpha)$ and bribes $\alpha\gamma tK$, then for later reference

$$\text{bribes in } i \ = \ \frac{\alpha\gamma}{1-\alpha} \cdot [\text{actual taxes paid in } i] \qquad (12)$$

We note that we could incorporate defraud of the state into the analysis in Section 1 of strategic interactions across kabupaten; however it is more complicated. While firms might seem to want lower γ, if γ is lowered, collectively that would increase official salaries needed to pay local officials, forcing them to look for other sources of revenue (e.g., harassment).

A final form of corruption involving defraud of the state (by the state) we probably don't see for our sample of firms. Some local budgets go to "shadow salaries" although these are increasingly subject to media scrutiny. On development projects such as road construction, kick-backs to local officials are built into the

public budget and corresponding project bids. We generally don't cover construction firms and data on shadow salaries are non-existent.

Based on this discussion, bribes paid by firms consist of four elements – bribes to encourage the timely granting of licenses, bribes to receive various considerations concerning levies and retribution, bribes for the transport of goods, and bribes to reduce assessed property taxes. The information we have is total bribes/costs, numbers of licenses, location information that would affect the extent of potential octroi taxation, attitudinal questions on levies and retributions before and after decentralization, and total taxes/costs, We don't know total costs or sales, so we formulate the following for firm k in kabupaten j

$$\left(\frac{\text{bribes}}{\text{costs}}\right)_{kj} = C_1(Z_{kj}) + \beta_1 \ \ln\ (\text{no. of licenses}_{kj}) + D\ (\text{location}_{kj}) + L\ (\text{attitudes on levies}_{kj}) + \left(\frac{\alpha\gamma}{1-\alpha}\right)\left(\frac{\text{taxes}}{\text{costs}}\right)_{kj} + \varepsilon_{kj}. \tag{13}$$

Eq. (13) is an implementation of eq. (4a), with a corresponding form for (4b). The first term $C\ (Z_{kj})$ represents a set of qualitative controls for firm costs (see below). In the second term the β_1 coefficient on number of licenses captures how bribes rise with harassment, in the form of the number of licenses. The $D(\bullet)$ function controls for possible bribes connected with location and transport. The main control is distance to the nearest of six major urban centers, given transport routes run out from mayor cities. We also experimented with whether the kabupaten is on the coast and can avoid octroi taxation by shipping by boat. While that reduced bribes, the coefficient is always insignificant and we drop the variable. The $L(\cdot)$ function on harassment from levies and retributions consists of two variables. One asks about the obstacles for firm k created by levies and redistributions with a response grade 1-6, from "very small" to "very big". The second asks with the same response range whether the recent regional autonomy law (see below) resulted in the creation of new levies. It is a little difficult to interpret these attitudinal variables, since responses may be conditioned on expectations as to what is normal in the specific kabupaten. The last term before the error term is based on eq. (13) where bribes paid for taxes are $\alpha\gamma/(1-\alpha)$ where α is the forgiveness rate on assessments and γ is the bribe rate on forgiven taxes. Below we will present evidence from the Industrial Census on α. Finally we note that in eq. (13), we will control for the fact that some firms paying bribes report paying no taxes or having no licenses, or both. These will turn out to be rather interesting firms.

We now turn to data sources and econometric issues.

2.2 Data and Econometric Issues

LPEM, an institute at the University of Indonesia, carried out the corruption survey of 1,808 firms in Indonesia, randomly selected across all economic activity in 64 kabupaten between September 2001 and June 2002. The survey covered many attitudinal questions and quantitative questions about regulations and taxes. Just before this time period, in January 2001, as described in Section 3, decentralization was enacted and some questions deal with firms' fears about the effects of decentralization (e.g., their anticipation as to how the number of levies and retribution would be affected, a control in (13)). In a survey on corruption as noted earlier, the big issue is how to elicit responses that seem to be fairly accurate. Pre-survey testing suggested that, in Indonesia, asking for absolute monetary figures on bribes, taxes and the like would not bring forth many accurate responses. So, respondents were asked about the ratio of bribes and of taxes to total costs.

The information on bribing was elicited carefully, with many examples of what constituted bribes (shopping trips to Singapore, gifts, under-the-table payments, etc.) and with return visits to initial non-respondents. Giving of gifts per se is not illegal in Indonesia, although bribing is, so the issue of what might be illegal was carefully avoided. Besides the interviewers, a representative from the local Chamber of Commerce (non-governmental) was present at interviews, with the tested idea that this would facilitate "a conversation among friends". Out of 1,808 firms, 75% gave positive responses on bribes. The distribution of responses is given in Figure 1, for those giving positive answers. There is some tendency to bunch responses at numbers like 5%, 10%, 15% but many responses are much more nuanced. Of the 25% non-respondents, the interviewers felt perhaps a quarter of those actually paid no bribes, while the rest simply wouldn't reveal a magnitude. Those not responding had no particular pattern across typical firm characteristics such as size or industry. However, as we will see, a high proportion of non-respondents also reported paying no taxes, but reporting spending a lot of time smoothing business operations. For reasons discussed below, we think non-respondents typically paid high bribes.

Given these ratio questions, such as bribes as a fraction of costs, the intent had been to gauge firm size by asking about sales, as well as a three-sector industry breakdown, employment in three size categories and information on whether the firm exported, had FDI investment, or had the government as a partial shareholder. The interviewees turned out to perhaps be cagey; and it became clear that absolute continuous numbers on sales were unlikely to be forthcoming from a large enough set of respondents. So the questionnaire was adjusted and firms slotted themselves into four size categories by sales. However, for researchers, that leaves rather imprecise controls in the Z_{kj} variables in (13) for firm size and profitability.

The first econometric issue involves the 25% of respondents reporting no bribes. This is not simple truncation or Heckman-type selection, because the non-respondents contain both those who pay no bribes and

those who do not report. Moreover, a high percentage of non-respondents (about 75%) also do not report taxes. For reasons which will become apparent, we believe many of these responded correctly on the tax question and lied on the bribe question, paying significant non-reported bribes. Nevertheless we did experiment with selection modeling for non-respondents where we related non-response to attitudinal questions on whether a firm says it faced recent labor problems, thinks the recent general election was good for them, or believes the police currently protect them and their property. Those who answer ("breezily") that everything is fine are significantly less likely to report bribes. In the experimentation with a selection formulation, both Mills' ratios in the 2-step formulation and correlation coefficients in the ML formulation are insignificant; and selection has no discernible pattern of effects. Therefore we do not report selection results below. However we do test robustness of our results to adding back into the sample those reporting no bribes, with various ascribed bribe rates.

The second set of econometric issues concerns omitted variables. There may be unobserved kabupaten characteristics (greed of current local officials, current fiscal circumstances) affecting both RHS and LHS variables. We experiment with kabupaten fixed effects to deal with this problem. Kabupaten fixed effects are rejected (resoundingly) by Hausman tests, in favor of either OLS or random effects. The rejection implies that unobserved kabupaten characteristics affecting bribe ratio magnitudes do not affect RHS variables facing firms, a very strong result. So the de facto number of licenses a firm faces is not affected by, say, the greed of local license grantors. However, random effects are preferred to OLS ones (Breusch-Pagan multiplier test). The random effects finding suggests that local "greed" exists so, ceteris paribus, typical bribe rates vary across localities; but the rejection of fixed effects suggests licenses, retributions and so on are set exogenous to the greed of on-line officials by, say, the regents and local legislatures.

Finally, there are also unobserved characteristics of firms related to the "slickness" of the entrepreneur in handling bribes, which would affect not just the bribe payment but also directly taxes as a fraction of costs, a right-hand side variable. While a strategy would be to instrument, one problem is that we have no firm characteristics that are obviously exogenous and don't also affect the dependent variable. We construct historical kabupaten characteristics that are arguably valid instruments, predicting, local effective tax rates, where historical fiscal circumstances, sophistication of public officials, manufacturing, and wealth and educational measures are not related to current measures of greed or firm "slickness" but may predict effective current effective local tax rates, which are historically based. The problem will turn out to be that instruments are weaker than one would like, but we will report key results on IV work below.

2.3 Results on Bribing

Basic Results

Results on bribes paid are reported in Table 1, based on the OLS formulation. As noted random effects are significant; but we prefer an OLS formulation, allowing for more general clustering of errors. In Table 1, we focus on the column (i) results which are a specification of the relationship in eq. (4a), as given in eq. (13), looking at the continuous harassment and fraud variables. The mean and standard deviation of the bribe/cost ratio are 10.5 and 10.8 respectively. The harassment variables have hypothesized effects, and indicate the extent to which more harassment leads to more bribes.

Foremost in the results is that a doubling of the number of licenses (ln 2) raises the bribe ratio by .85. An increase in the absolute number of licenses from 1 to 16, or to 2 standard deviations above the mean, raises the bribe ratio by 3.3. Similarly for "levies are obstacles", a one-standard deviation increase in this rating (1.55) raises the bribe ratio by 1.2. For "new levies since autonomy law" a one-standard deviation increase raises the bribe ratio by .87. Finally for distance, a one-standard deviation increase raises the bribe ratio by .54.

Turning to the tax-fraud variable, the coefficient identifies $\gamma\ (1-\alpha)/\alpha,$ where α is the forgiveness rate on taxes and γ is the bribe rate on forgiven taxes. The coefficient is .408. From the Annual Survey of Medium and Large Enterprises for manufacturing firms, for a sample size of 9784, we regress indirect taxes paid $((1-\alpha)\ tK)$ on the market value of all land, buildings and capital machinery $(K).$ From Table 2, the coefficient gives an overall estimate of $(1-\alpha)t$, which is .00263. (The coefficient is .00248 if zeros are included in LHS observations and a sample is 14,289.) The estimate is "tight" but the R^2 is low; there is enormous cross-kabupaten and cross firm variation in taxes paid. While in theory, indirect taxes are property taxes, in practice they also include special assessments, such as for firms with government links. Given an official tax rate t of .005, the Table 2 coefficient implies an α of .47. From Table 1 that, in turn, implies a γ of .37. So, local officials collect under the table about 37% of forgiven taxes, on average across Indonesia.

The qualitative variables on bribes, dealing with firms that report paying but paying no taxes or having no licenses, suggest the bribing situation is more complicated than suggested so far. Those paying no taxes report a bribe ratio that is increased by a large 7.3 (given a mean bribe ratio of 10.8) and those reporting no licenses report a bribe ratio that is higher by 3.1. (For firms reporting both no bribes and no taxes, a formulation separating out this event suggests the two components are simply additive, as in our formulation.) The implication of these dummy variables is that some firms bribe their way out of one or the other (or both) obligations. For taxes that is plausible; and the presumption is that firms bribing their way out of all tax obligations pay a very high bribe cost. For licenses, the consensus among observers is that a firm must have a

license if it engages in any specific licensed activity. But the data suggest there may firms with certain types of activities, where a firm can bribe its way out of all licensing. This remains a puzzle that only further surveying can resolve, especially given every firm is required to have an operating license at a minimum. The issue of paying bribes to eliminate obligations will appear below in the analysis of time allocation, as well.

In terms of control variables, the bribe ratio declines with firm size: harassment obligations involve relatively fixed sums. Firms with foreign exposure especially FDI appear to pay more, either because they are more profitable or more visible and constrained by appearances (must pay their taxes; will face more neighborhood protests if their licenses are not up-to-date). While having the government as a shareholder seems to reduce bribes, the effect is not significant.

IV Estimation.

The estimates in column (i) of Table 1 face problems of bias, because unobserved slickness of the firm manager affects both bribes paid and taxes paid. To deal with this, we constructed a variety of fiscal and historical instruments. To predict taxes paid, the best instruments were the 1997 median tax rate reported by manufacturing firms in the Annual Survey of Medium and Large [Manufacturing] Enterprises, and historical variables reflecting the overall kabupaten tax base which affect the current tax targets set by the center: 1990 average employment of manufacturing firms, % population finishing high school (1990), percent households owning their house (1990), percent villages with paved roads (1986), average altitude of the population, and the percent of manufacturing firms in 1985 in the kabupaten with no formal sector status. We used these to instrument for the tax to cost ratio and the dummy variable for no taxes reported paid. But we note that instruments are weak: for example, for the tax-cost ratio variable, the first stage *F*-statistic for the instruments is 6.7, with a partial R^2 of about .03.

In 2SLS results for column (i) in Table 1 the tax/cost coefficient rises from .41 to .56, with a standard error of .35. If that point estimate is used, it says that for a forgiveness rate (α) of .47, the bribe rate, γ, is .50. Then 50% of taxes not paid to the government go as bribes to the collectors or assessors. This is higher than the OLS estimate of 37%, but is consistent with a split the surplus model of bargaining between the firm and tax agent. In the 2SLS the dummy variable coefficient for no taxes paid has, not surprisingly, a large standard error (8.9) and a not stable coefficient. Other coefficients weaken as well, in the sense that standard errors generally rise. Our conclusion is that IV estimation is problematic, but reinforces the basic findings.

Other Results and Robustness

In column (iii), we give corresponding results for firms responding as to what percent of set-up costs new firms in their area pay in bribes. The question is asked of all firms and newer firms do not appear to have differential responses, but the overall response rate is lower than for column (i). The question isn't as clearly

defined in terms of what are "set-up bribes" distinct from operational ones, but the pattern of results is similar. Now licenses are set-up licenses and doubling these, as expected, has a noticeable impact (.86) on the bribe ratio (with its mean of about 9.). Perhaps the main difference relative to column (i) on operational bribes concerns the control variables. Now size effects are insignificant and FDI firms pay less, not more. For the latter, the implication is that kabupaten lure in FDI investors, asking lower set-up bribes; but once in place these firms pay more.

Next, we turn to results in column (ii) of Table 1, which is an estimation of the eq. (13) formulation based on the first order condition (2a). That is, to the bribe equation we add an (endogenous) right-hand side variable, time spent smoothing local officials. The point is to show certain correlations; it proved futile to try to find reasonable instruments for the time variable[8]. In terms of correlations in column (ii), as time devoted to public officials rises, so do bribes. This supports the notion that in eq. (3), $f_{bt} > 0,$ or in bribing technology, time and bribes are "complements". Bribing doesn't eliminate hassle; rather hassle and bribes go together.

To this equation, we also add other aspects of bribing (which additions don't affect the magnitude of the time coefficient). If firms can better predict bribes (on a scale of 1-6), or "know the prices", they actually pay less. We anticipated a positive correlation: firms would pay a premium to operate in an environment where prices are known. Instead the issue seems to be that, in any environment, some firms know the prices and others don't: those who don't spend more, and, as we will see below, also spend more time smoothing. This would be consistent with the micro-foundations outlined in footnote 3. Those who know prices don't need to experiment with time and money. Finally in terms of the bribe ratio, perceptions about whether promised "services" will be delivered don't affect the bribe ratio.

Finally there is an issue of robustness of the Table 1 column (i) results, to the inclusion of firms reporting no bribes, which are currently excluded from the estimating equation. As note earlier, traditional sample selection approaches aren't fruitful. But in the next section, we note that many of those who report no bribes report spending large amounts of time smoothing business operations with local officials, and report having no taxes or no licenses. The concern is that these people in fact may be paying large bribes to avoid taxes or licenses all together and refusing to answer the bribe question. To test robustness of our results to this possibility, we re-estimate column (i) in Table 1 adding back in those reporting no bribes and giving them all a very high value—35. For the sample size of 1754, not surprisingly the dummy variable coefficients for no taxes and no licenses rise dramatically (to 21.4 and 6.2 respectively), since many of these observations are

[8] The first stage F-statistic on plausible instruments for time (such as education of local officials and kabupaten wealth variables representing sophistication of local officials) is 2.3 and the partial R^2 is .011. While instrumenting for this variable alone raises the coefficient to .189, the standard error is .380.

now given bribe values of 35. But it is the slope coefficients on harassment variables that we are interested in. These tend to fall modestly because we have added in observations assigned high bribe rates, where people tend to report no harassment: the new [and old] coefficients on licenses, taxes, levies as obstacles, and new levies are a problem are 1.11 [1.20], .354 [.408], .634 [.766], and .438 [.639]. Nevertheless, given the experiment, our basic results seem stable. We also experimented with inserting a predicted value of bribes, rather then just assigning 35 for those without reported bribe ratios. Predicted bribes for non-respondents can be backed out based on the Table 3, column (ii) formulation of the time smoothing equation below, with the bribe ratio as a covariate (given most firms report time smoothing, even if they don't report bribes). The results again are very similar to those in Table, but the procedure suffers from the flaw that predicted bribe values are based on biased coefficients.[9]

2.4 Results on Time Allocation

In Table 3 we present results on time spent by management to smooth business operations with local officials, an estimation of the time equation in (4). The time spent variable has a higher response rate and, as we will see, contributes to our understanding of the non-response problem. The dependent variable is six categories of the percent of management time spent smoothing: 0-5%, 5-15%, 15-25%, 25-50%, 50-75%, over 75%. We estimate the model by OLS using mid-point values for the categories and by ordered Probit, getting qualitatively similar results with similar quantitative interpretations. We present the OLS results in Table 3, along with ordered probit estimates in the last column. The first column gives base OLS results; and the second adds bribe payments as a covariate and thus represents an estimation of eq. (2b), as opposed to (4b).

Basic Results.

In column (i) we start with the continuous corruption variables. A doubling of licenses increases management time by 1.2 percent points, while a one standard deviation increase in the tax ratio and "levies are obstacles" respectively raise time by 1.1 and 1.7 points. For taxes the interpretation is that an increased tax ratio affects both time dealing with assessors and collectors. For the distance variable and issues of goods transport, a one-standard deviation increase in distance raises smoothing time by .88. While the "new levies are a problem

[9] In Table 3, column (ii) the equation based on (2b) is estimated for the sample of firms all reporting time, bribes, taxes and licenses. We can then back-out a predicted bribe from this time smoothing equation for those excluded people reporting no bribe (but reporting time smoothing): the predicted bribe is actual time smoothing minus predicted time smoothing (excluding the bribe covariate), all divided by the bribe coefficient. Note however as discussed above estimates of coefficients based on eqs. (2a) and (2b) are biased. Inserting this predicted value as a LHS variable in the Table 1 column (i) formulation of bribes paid for those reporting no bribes, we re-estimate. The new [and old] coefficients on licenses, taxes, levies as obstacles, and new levies are a problem are 1.17 [1.20], .370 [.408], .851 [.766], and -.291 [.639]. Only for the variable speculating about new levies is there a drastic change.

since autonomy" is positive, it is insignificant. Overall, the idea that a cost of increased harassment is more time devoted to officials comes through clearly.

Next the dummy variable results are of considerable interest. Those reporting no bribes but paying both taxes and licenses spend considerably less time smoothing (4.1% points). While those reporting no bribes and either paying no taxes or having no licenses spend considerably more time smoothing operations (6.9 and 5.0 points respectively). These results suggest two possibilities. First, those reporting taxes and licenses but no bribes may be telling the truth: they could be the 5% of firms surveyed who actually don't pay bribes. They pay their official taxes, wait for their licenses and spend little time with local officials. Second, those reporting no bribes and either no taxes or no licenses, a group we call non-respondents, spend much more time with public officials. Table 1 results for firms not paying taxes or not having licenses but still willing to report bribes suggest non-respondents probably pay large bribes. We looked also at whether non-respondents differ from other firms. For a Probit on who is a non-respondent --"who lies or not"-- non-response rises if the firm is large, in or near a major metro area, has no government ownership, and doesn't export.[10] Finally we note that in Table 3 column (i), the small number of firms who report bribes but have either no taxes or no licenses have insignificant, although positive coefficients. It could be that some of these firms may actually be exempt from taxes or somehow possibly licenses.

In Table 3 for the relationship between firm characteristics and time, in column (i), firm size and all other characteristics except industry (service) have insignificant coefficients. For industry, the perception is that certain visible urban services, such as hotels and restaurants, are subject to considerable harassment.

Other Results.

Column (ii) estimates the first order condition eq. (2b), ignoring the endogeneity problem. As in Table 1, the correlation patterns suggest bribes and time are complements, where a (unbiased) positive coefficient on the bribe ratio would require $f_{bt} > 0$. In addition, the variable on predictability of bribes lowers time spent with public officials, consistent with the bribe result in column (ii) Table 1. Finally, getting the promised services, while not costing more (Table 1), is associated with spending more time with public officials.

Column (iii) gives ordered Probit results. While variables appear to have signs corresponding to those in other columns, with ordered Probit, interpretation is tedious. We give one illustration. For a large, non-

[10] Given these results, we also looked at the bribe-equation sample selection issue again. We look at all firms who answered the time question (about 1777). We then define as non-respondents, those who are "liars", or who report either no taxes or no licenses, and also no bribes. For the continuous equation, the sample is all those with positive bribes plus those with no bribes but both having licenses and paying taxes. Again, in a selection model, the Mills' ratio coefficient is insignificant, as is the correlation coefficient for the two errors in the full ML full version.

export, non-FDI, non-government, manufacturing firm at an average distance, with average attitudes on levies, with an average numbers of licenses and kabupaten characteristics, and paying bribes and taxes and having licenses, we examine the effect on the probability of being in the six smoothing time orders, of a change in the tax to cost ratio. For the tax ratio at the mean, the probabilities of being in the lowest to highest order are .30, .38, .23, .082, .0108, and .0024 respectively. If the tax ratio rises by one-standard deviation, the probabilities become .26, .38, .25, .097, .014, and .0033. Then, for example, the probability of being in the lowest group falls 12%, while the probability of being in the top group rises 39%. If we assign mid-point values for time in the 6 categories, the *expected* amount of time with average taxes is 13.0, while with the one standard deviation increase in the tax ratio, it is 14.1. To compare with column (i) results, this 1.1 increase in expected time is exactly equal to the OLS estimate of a 1.1 increase in time if the tax cost variable increases by one standard deviation. It appears OLS captures the relationships involved well enough.

3. The Effects of Fiscal Capacity on Corruption.

3.1. The Context

In January 2001, Indonesia implemented extensive decentralization, following legislation enacted in 1999. Our survey starts in September 2001 and runs through June 2002. Our survey is so close to the time of decentralization, to the extent harassment in our data is linked to the local fiscal situation, it will be to the pre-decentralization situation. We give a brief description of the pre-decentralization situation and then relate it to the post-decentralization situation. As we will see, revenue structures facing kabupaten governments are very similar before and after decentralization.

Before decentralization, local governments had autonomy over a limited range of services such as construction and maintenance of local side streets, parks, and other more minor infrastructure. Other public services were provided centrally. Also major types of construction projects were usually centrally approved or mandated and paid for out of capital construction transfer (INPRES) monies, to be spent on, say, constructing a specific school (or hospital) in a specific district of the kabupten.

On the revenue side prior to decentralization, the major categories of revenues for discretionary expenditures were the portion (64.8%) of national property taxes rebated back to the kabupaten, local license and levy fees, and residual inter-governmental transfers, some of which seem arbitrary and some connected, for example, with the kabupaten's generation of natural resource related revenues. While we know absolute magnitudes for each of these items in some years, detailing their exact shares in local budgets is hard. Prior to decentralization, the local kabupaten administration also acted as a "cashier" for the national government

formally paying for most operational expenditures of the national government (e.g. teachers' salaries) within the kabupaten. These cashier money transfers, or pass-through monies were called "SDO" funds, but not all of these can be separated out from locally raised revenues, especially in certain miscellaneous categories. Moreover, all monies are mingled on the expenditure side, making it impossible to separate out locally determined versus nationally mandated local expenditures. Such a separation would have allowed us to examine how local expenditures are funded.

With decentralization, most expenditure functions governing local public services including schooling, health care, public works, communications, environmental regulation and policing were decentralized to the kabupaten level. In essence the cashier for formerly nationally provided local public services became the new provider. However, while legislative functions are decentralized, most critically revenue functions are not and the effective revenue structure remains similar to the pre-decentralization one. Formally, now localities get extensive inter-governmental transfers from the center, under the DAU program, which accounts for about 50% of local revenues. However most DAU monies are based on a "hold harmless condition", relating these DAU monies to the former SDO cashier funds transferred to the kabupaten. The idea is that minimum DAU transfers should be enough so the kabupaten can afford to pay the same teachers who were on the payroll before decentralization whom they now formally employ, with a similar constraint covering historical capital expenditures, as well as pay the salaries of former central government administrative personnel whose employment has now shifted to the kabupaten.

In 2001, apart from DAU transfer funds, the three main sources of local government revenues are as before. Non-discretionary sources are first property taxes accounting for about 19% of local revenues, and second transfers from the national government of some revenues generated by the sale of oil, natural gas, mining, and forest and fishery products from the kabupten (replacing the former residual category of transfers). The latter vary enormously across kabupaten, depending on the resource bases of the kabupaten, although on average they only account for 6% of local revenues. As before, the only source of local discretionary revenues are from harassment- the sale of licenses and "special levies and retributions" on aspects of business operations, with bribes being the unofficial component that alleviates salary obligations. Collections from sales of licenses and impositions of levies average about 23% of the local budget. We don't have a breakdown between licenses and levies; but, in a survey of local government heads carried out at the same time as our firm survey, 75% report licenses as being the more dominant form of revenues.

The common perception as noted in the introduction is that local governments in Indonesia are "under-funded". Prior to decentralization, monies from property taxes and from general transfer revenues were insufficient to fund competitive salaries of local officials and provide basic services over which the

kabupaten had autonomy. Post-decentralization, property tax transfer revenues, natural resource based transfer revenues, and the new program (DAU) of inter-governmental transfers (where the last are pegged to historical levels of central government provision of local services) are similarly insufficient to meet budgetary needs. As yet we can't tell whether the situation is better or worse overall, in terms of the extent of under-funding but one anticipates that with time the situation will be worse, unless central government transfers grow at a higher rate than expected. Regardless, local governments impose regulations before and after decentralization so as, in part, to allow local officials to collect bribes to supplement their salaries. At the end of the theory section we argued that, in this context, an increase in transfer revenue sources will reduce harassment, since the local government would then need to rely less on harassment, which tends to drive firms from the kabupaten. Here we test this notion.

The test we perform is to see if harassment varies with fiscal circumstances. Specifically we examine the determinants of the main form of harassment, which has also a quantitative measure: the number of licenses. There are a number of other tests one might like to perform which we discuss in a sub-section below. The number of licenses facing a firm is partly determined by firm characteristics like size and activities such as whether the firm exports and hence needs a license to do so. Controlling for firm characteristics, we examine whether harassment levels are affected by kabapaten fiscal needs, and also sophistication of local public officials. For the latter, we know the education level of the village head (in interval form), a basic level of administrator within the kabupaten. As a cultural-taste control, we test whether kabupaten with a greater fraction of heads who have completed high school utilize harassment less, perhaps because they simply "enjoy" administering harassment and soliciting bribes less.

Turning to how we measure fiscal needs, while we have argued that kabupaten are under-funded, the need to utilize harassment will depend on the degree of under-funding. Thus the use of harassments is a function of a "fiscal gap". The fiscal gap is the "demand" for local public services less outside revenues received. In section 1, we focused on a Leviathan government, where demand would come from central mandates for localities to fulfill certain functions. But we also outlined and footnoted a more general process where citizen demand for public services is represented. Here, we assume the demand in the political process for local services is an increasing function of size, or population, and income, or GDP per capita. For outside revenues, we use 1999 fiscal variables. Records for 2000 are messed up because of a change in the dates of the fiscal year. Post-decentralization 2001 fiscal variables are unlikely to influence the numbers of licenses in place, as reported in 2001. For fiscal variables, we have two -- transfers back to the kabupaten from property tax collections by the center and residual, general transfers (as noted above based to some extent on natural resources rents collected by the center). In principle, property tax and residual transfers could have the same

effect; but, in fact, property tax revenues are long standing and "certain", so those with greater access to such revenues have less long term need for harassment. We enter these two fiscal magnitudes as a fraction of local GDP.[11] While we have many firms, we have only 64 kabupaten and covariates are rather collinear, so we approximate functional forms and use a short variable list.

3.2 The Empirical Formulation and Results for Harassment.

Harassment is measured as the count of licenses, where the median is 5 for those reporting licenses. We estimate a Poisson count model for the absolute number of licenses per firm, and also look at equivalent regressions of the determinants of the log of the number of licenses. We treat zero licenses as missing values given every firm should have an least a license to operate per se; but we will also report results where zeros are treated as true zeros in the Poisson.

In estimation an econometric issue is endogeneity. Presumably whatever unobserved variables drive kabupaten levels of harassment (e.g., unexplained needs for public services) affect also the intensity with which the kabupaten bargains for higher property tax targets and central government's willingness to adjust these targets, or to increase monies in the residual transfers category. Thus we should treat the two fiscal variables as endogenous. As such we want to define a set of instruments that influence these covariates but are exogenous to current kabupaten error drawings. In that case we estimate a moment condition based on a count model. If $V_j \equiv L_j - \lambda_j = L_j - \exp(\beta X_j)$, where X_j are covariates , L_j is the actual number of licenses and λ_j the expected number, the moment condition is $E\left[V_j \mid Z_j\right] = 0$ (Windmeijer and Silva, 1997 and Mullahy, 1997), where Z_j are instruments. As in section 2, we face a potential problem of weak instruments. After much experimentation we settled on land area as a scale control, the median property tax rate paid by manufacturing firms in 1997 as being correlated with tax transfers, and the ratio of first sector GDP (which includes natural resources) to all GDP in 1994 as influencing residual transfers. While the use of a 1997 tax rate might be "suspicious", the idea is that rate itself in 1997 is historically based and not driven by unobserved public good demand determinants in, say 2000. The variable does survive specification tests (see below) and it is a strong instrument for tax transfers with a first stage F – statistic on the instruments of 63. However for residual transfers in 1999, while specification tests suggest they are endogenous, first stage F's are just under 5 and the partial R^2 is under .05.

[11] If all transfers are known for sure, transfer formulae facing kabupaten are the same, and no monies are siphoned off, then a simple minded equation for the use of harassment as a function of fiscal gap is $b * \ln(\alpha GDP - transfers)$, where the income elasticity of demand is one. Then we could approximate the relevant parts as $b\ln(GDP) - bratio$, where *ratio* = transfers/GDP.

Basic results are in Table 4. For the number of licenses, the OLS and Poisson coefficients in columns (iv) and (i) respectively are fairly close. We focus on the IV results in column (ii), based on the moment condition in the non-linear model, where the Poisson distribution assumption no longer need apply and where estimates account for heteroskedasticity[12]. In column (ii), in terms of firm covariates, we see that the number of licenses rises with firm size as would be expected—larger firms have more operations, or tasks, requiring licensing. Government firms are less harassed, presumably facing less enforcement of regulations. But what are of interest are the fiscal variables.

As GDP per capita rises, ceteris paribus, the number of licenses rises, with the interpretation that the relative demand for public services rises as GDP per capita rises, requiring more harassment to meet revenue needs. Demand also rises with population size, although that effect is weaker. As sophistication of local officials increases, that reduces the use of licenses, perhaps reflecting a greater aversion to encouraging corruption. A one standard deviation (21) increase in this education variable reduces the number of licenses by 20%, a substantial effect. This result is of interest in itself, with the idea that with human capital accumulation and perhaps the resulting improvement in local institutions, corruption declines.

Finally we come to the revenue transfer variables and the test of equation (11). In column (ii), the ratio of property tax transfers to GDP has a strong, significant negative effect, as does the residual transfer variable. A one standard deviation (.00238) increase in the tax transfer variable decreases the number of licenses by 73%; while a similar size increase in the residual transfer variable decreases the number of licenses by 56%. The IV estimates are completely different from the ordinary Poisson or OLS estimates. The effect of instrumenting is to remove the positive correlation from unobserved demand components increasing both tax transfers permitted and licenses imposed. Sargan-test statistics are well within the acceptable range, and represent an overall test of the model and orthogonality of instruments to the error term.

Robustness and Other Tests

How robust are the results? We re-estimated the model using the full sample with zero license observations included. There the IV coefficients (and standard errors) for the tax and general transfer variables are respectively -354 (87) and -182 (130); the Sargan-test statistic deteriorates modestly with a p-value of .164. Second as reported in column (iii), we estimated the model replacing our ratio tax and transfer to GDP variables by the logs of total property tax transfers and total residual transfers. The Sargan-test statistic increases substantially and now is just in the critical range. The new specification has a big effect on the income and population variables increasing their elasticities dramatically, with the change in functional form. The tax and other transfer variables are now in elasticity form and are negative and significant, with a

[12] We use Windmeijer's EXPEND Gauss program, which he has kindly made available on the IFS website at UCL.

stronger effect for tax transfers. Holding income and population fixed if tax transfers double, the number of licenses falls by 45%. Finally we experimented with adding other covariates and instruments to the basic formulations. Experimentation suggests as long as instruments for the tax variable remain strong, the tax-transfer coefficient is stable. The residual transfer variable can take smaller absolute values (down to $|-150|$) in different experiments, but again is stable for specifications passing the Sargan test.

There are other tests of the model one would like to carry out. For example, besides looking at harassment or regulation levels we could look through to bribes and see if bribe activity itself varies with the fiscal gap. For a bribe equation, as in section 2, IV estimation is more problematic yielding very large standard errors. So we have focused on the test where the statistical formulation is more compelling.[13] Second one should test whether firms respond, in fact, in making location decisions to harassment. We spent a lot of time on that issue. We structured a firm birth model for counts of births of manufacturing firms across kabupaten from 1997 to 2000 (the last year available), using the IV approach we used for counts of licenses. Unfortunately this time period (base of 1997) is well before our data on harassment in 2001-2002. Thus we can't look at whether harassment affects location decisions; that will require birth data for, say, 2001-2003 which is not yet available. But we can look at whether effective property tax rates in 1997 across kabupaten as reported in the Annual Survey of Medium and Large Size Establishments affects location decisions for 1997-2000. For firm births, apart from this tax variable (which is also measured with error), variables such as local wage rates and own industry external scale economies are endogenous. In IV estimation a one standard deviation increase in the tax rate leads to a 29% decline in the number of firms in a kabupaten, a really strong effect. However given the larger number of endogenous variables and a problem of less than very strong instruments, while the estimate of the coefficient is fairly robust, it is "noisy" with a t-statistic of only 1.20.

4. Summary

Bribes for firms in Indonesia in part arise from the imposition of harassment, principally licenses, administered by local government officials. Harassment generates direct revenues (fees) plus indirect revenues in the form of bribes, where we argue that the latter will be capitalized into lower salaries needed by localities to compensate public officials. Localities in Indonesia are hampered by insufficient revenues from

[13] We looked at a reduced form bribe ratio equation where we remove all forms of harassment and ask whether unconditioned bribes (except for firm covariates) rise with the fiscal gap. In OLS work, not surprisingly tax and general transfer numbers have positive coefficients. The problem with two stage work is that standard errors are simply enormous, not surprisingly given section 2 problems with IV estimation.

non-harassment sources to pay competitive salaries plus fund "demanded" levels of public services. Effective local tax rates are capped at different levels across localities by the center and inter-governmental transfers are limited. Thus the direct and indirect revenues from harassment are a central part of local finances.

In modeling and estimating the relationship between bribes, time spent with local officials, and different forms of harassment, or regulation, the paper finds that both bribes and time rise strongly with different forms of harassment and that bribes and time are positively correlated. Bribing is a time intensive activity. Patterns of non-reporting on different answers suggest some firms bribe their way entirely out of paying taxes or, even, securing licenses, but that activity takes a lot of time; and many of inferred big bribers seem to refuse to report bribe amounts.

The paper then models how inter-jurisdictional competition for firms may limit the degree of harassment and how greater sources of tax or inter-governmental revenues reduce the need for harassment, and help limit corruption. The paper estimates the effect of differential revenue sources on the variation in harassment across localities, finding a large reduction in the main form of measurable harassment –licenses-- in better funded localities. It also finds that, ceteris paribus, harassment declines with increased education of local officials. That would suggest that economic development per se will retard corruption. The findings are directly relevant to Indonesia where corruption is high and the country is in the throes of major decentralization and local democratization processes. A key to limiting local corruption, apart from appointing better educated officials, may be to either relax caps on local property tax rates or to increase inter-governmental transfers, so localities have sufficient revenue sources and don't need to rely on "red tape" and corruption to effectively compensate local officials and raise local revenues.

References

Andvig, J.C. and K.O. Moene (1990), "How Corruption May Corrupt," Journal of Economic and Behavioral Organization, 13, 63-76.

Arzaghi, M. and J. V. Henderson (2004), " Why are Countries Fiscally Decentralizing," Journal of Public Economics, in press

Banerjee, A. (1994), "A Theory of Misgovernance," MIT working paper.

Bardhan, P. (1997), "Corruption and Development: A Review of Issues," Journal of Economic Literature, 35, 1320-1346.

Beck, P.J. and M.W. Maher (1986), "A Comparison of Bribing and Bidding in Thin Markets," Economics Letters, 20, 1-5.

Besley, T. and A. Case (1995), "Incumbent Behavior: Vote Seeking, Tax-Setting, and Yardstick Competition," American Economic Review, 85, 25-45.

Brueckner, J.K. (1998), "Testing for Strategic Interaction Among Local Governments: The Case of Growth Controls," Journal of Urban Economics, 44, 438-469.

Brueckner, J.K. and L.A. Saavendra (2001), "Do Local Governments Engage in Strategic Competition," National Tax Journal, 54, 202-229.

Buettner, T. (2001), "Local Business Taxation and Competition for Capital," Regional Science and Urban Economics, 31, 215-245.

Cadet, O. (1987), "Corruption as a Gamble," Journal of Public Economics, 23, 223-244.

Case, A.C., H.S. Rosen and J.R. Hines (1993), *"Budget Spillovers and Fiscal Policy Interdependence,"* Journal of Public Economics, 52, 285-307.

Guimaraẽs, P., D. Woodward and O. Figueiredo (2003), "A Tractable Approach to the Firm Location Decision," Review of Economics and Statistics, forthcoming

Henderson, J.V., D.Nasution and A. Kuncoro (1996) "The Dynamics of Jabotabek Development," Bulletin of Indonesian Economic Studies.

Kaufman, D. and J. Wei (1999), "Does 'Grease Money' Speed Up the Wheels of Commerce," NBER Working Paper No. 7093

Kelejian, H.H. and I.R. Prucha (1998), "A generalized spatial two-stage least squares procedure for estimating a spatial autoregressive model with autoregressive disturbances," Journal of Real Estate Finance and Economics, 17, 99-121.

Kuncoro, A. (2003), "Bribery at the Local Government Level in Indonesia: A Preliminary Descriptive Analysis," University of Indonesia mimeo.

Lee, L-F., G.S. Maddala and R.P. Trost (1980), "Asymptotic Covariance Matrices of Two-Stage Probit and Two-Stage Tobit Methods for Simultaneous Equations Models with Selectivity," Econometrica, 48, 491-504.

Lui, F. (1985), "An Equilibrium Queuing Model of Bribery," Journal of Political Economy, 93, 760-781.

Mauro, P. (1995), "Corruption and Growth," Quarterly Journal of Economics, 110, 681-712.

Mookherjee, D. and J.P.L. Png (1995), "Corruptible Law Enforcers: How Should They be Compensated," Economic Journal, 105, 145-159.

Mullahy, J. (1997), "Instrumental-Variable Estimation of Count Data Models: Applications to Models of Cigarette Smoking Behavior," Review of Economics and Statistics, 586-593.

Panizza, U. (1999), "On the Determinants of Fiscal Centralization: Theory and Evidence," Journal of Public Economics, 74, 97-139.

Rasmusen E. and J.M. Ramseyer (1994), "Cheap Bribes and the Corruption Ban: A Co-ordination Game Among Rational Legislators," Public Choice, 78, 305-327.

Rose-Ackerman, S. (1978), Corruption: A study in political economy, New York Academic Press (1994).

_____ "Reducing Bribery in the Public Sector," in Corruption and democracy, D.V. Trang (ed.), Budapest Institute for Constitutional and Legislative Policy.

Sah, R. (1988), "Persistence and Pervasiveness of Corruption: New Perspectives," Yale Economic Growth Center Discusser Paper 560.

Shleifer, A. and R.W. Vishny (1993), "Corruption," Quarterly Journal of Economics, 108, 599-617.

Svensson, J. (2003), "Who Must Pay Bribes and How Much? Evidence From a Cross-Section of Firms," Quarterly Journal of Economics, 118, 207-230.

Tirole, J. (1996), "A Theory of Collective Reputations," Review of Economic Studies, 63, 1-22.

Windmeijer, F.A. G. and J.M. C. Santos Silva (1997), "Endogeneity in Count Data Models: An Application to Demand for Health Care," Journal of Applied Econometrics, 12, 281-294.

World Bank (2003), "Combating Corruption in Indonesia: Enhancing Accountability For Development," East Asia Poverty Reduction and Economic Management.

Table 1. Bribes Paid

	(i)	(ii)	(iii)
		OLS with	OLS set-up
	OLS	Smoothing Time	costs
dummy: no taxes	7.33**	7.12**	6.64**
	(1.05)	(1.09)	(1.30)
dummy: no licenses	3.12**	2.85**	6.22**
	(1.12)	(1.13)	(1.34)
ln (no. of licenses)	1.20**	.908**	1.80*
	(.482)	(.462)	(.554)
taxes/costs	.408**	.384**	.249**
	(.0394)	(.0409)	(.0530)
distance to nearest	.492**	.371*	.183
major metro area	(.222)	(.221)	(.353)
"levies are obstacles"	.766**	.589**	1.00**
	(.198)	(.211)	(.229)
"new levies problem	.639**	.569**	-.290
since auto. law"	(.235)	(.219)	(.246)
dummy: small-	.768	.754	.661
medium firm	(.796)	(.798)	(.663)
dummy: medium-	-2.56**	-2.46**	-1.18
large firm	(.696)	(.686)	(.862)
dummy: large firm	-4.98**	-5.41**	-1.22
	(1.07)	(.936)	(1.48)
dummy: service	1.30**	.920**	1.21
sector	(.669)	(.685)	(.933)

Table 1. Bribes Paid – (Continued)

	OLS	OLS with time	set-up costs
dummy: FDI or not	2.21**	1.96*	-1.94*
	(1.09)	(1.11)	(1.08)
dummy: export or not	1.13	1.39	1.73*
	(.943)	(.916)	(.913)
dummy: govt.	-1.60	-1.26	-1.57
shareholding	(.867)	(.849)	(.959)
time spent smoothing	--	.121**	--
		(.0382)	
firms predict bribes	--	-.531**	--
		(.241)	
firms will receive	--	.0737	--
promised favors		(.249)	
constant	-3.34**	-1.63	-.991
	(1.29)	(1.69)	(1.64)
adj. R^2	.197	.225	.128
N	1302	1302	1104

Table 2. Taxes in Annual Survey of Medium and Large Enterprises

Value Capital Stock	.002631**
	(.000172)
controls for ownership	yes
N	9784
R^2	.0447

* Only government ownership is significant with a large positive coefficient. This is the "cash-cow" problem facing firms with government ownership – extra "taxes" assessed.

Table 3. Time Spent Smoothing

	(i)	(ii)	(iii)
		OLS with	
	OLS	bribes	Ordered Probit
dummy: no bribes	-4.12**	-2.29**	-.442**
	(1.08)	(1.12)	(.117)
dummy: no bribes,	6.92**	6.51**	.667**
no taxes	(2.12)	(2.04)	(.156)
dummy: no bribes,	4.98**	4.08*	.470**
no licenses	(2.23)	(2.17)	(.155)
dummy: bribes, no	1.91	1.22	.176
taxes	(1.32)	(1.34)	(.117)
dummy: bribes, no	1.84	1.67	.164
licenses	(1.58)	(1.63)	(.116)
ln (no. of licenses)	1.76**	1.70**	.175**
	(.781)	(.786)	(.0444)
distance to nearest	.748**	.626**	.0737**
major metro area	(.297)	(.289)	(.0232)
taxes/costs	.129**	.0804	.0121**
	(.0543)	(.0539)	(.00348)
“levies are obstacles”	1.09**	.999**	.143**
	(3.72)	(.376)	(.0220)
“new levies problem	.456	.336	.0215
since auto. law”	(.383)	(.382)	(.0247)
dummy: small	1.64	1.67	.200**
medium firm	(1.30)	(1.35)	(.0695)
dummy: medium-	-.661	-.358	-.00820
large firm	(1.14)	(1.12)	(.0718)
dummy: large firm	.227	1.03	.0570
	(1.10)	(1.10)	(.0909)
dummy: service	2.10**	1.77**	.214**
sector	(.912)	(.887)	(.0598)

Table 3. Time Spent Smoothing – (Continued)

	(i)	(ii)	(iii)
		OLS with	
	OLS	**bribes**	**Ordered Probit**
dummy: FDI or not	.977	.429	.0651
	(.988)	(1.04)	(.0879)
dummy: export or not	-.352	-.805	.00695
	(.748)	(.705)	(.0728)
dummy: govt. share-	-.806	-.469	-.152
holding	(1.38)	(1.37)	(.103)
bribes/costs	--	.139**	--
		(.0463)	
firms can predict	--	-.782**	--
bribes		(.258)	
firms receive	--	.460**	--
promises and favors		(.275)	
constant	1.57	3.11	n.a.
	(1.58)	(1.89)	
R^2	.0819	.101	(.0439)
N	1688	1685	1688

(a) Cut-off points (on 1-6 scale) with standard errors in parentheses are .698 (.122), 1.69 (.126), 2.54 (.132), 3.44 (.146), and 4.05 (.179).

Table 4. Harassment (Licenses) and Fiscal Transfers

	(i)	(ii)	(iii)	(iv)
	Number of licenses	**Number of licenses**	**Number of licenses**	**Ln(number of licenses**
	Poisson	**IV**	**IV**	**OLS**
dummy: small-medium firm	.153**	.128**	.124*	.143**
	(.0638)	(.0619)	(.0646)	(.0476)
dummy: medium-large firm	.251**	.216**	.162**	.248**
	(.0639)	(.0637)	(.0644)	(.0575)
dummy: large firm	.371**	.404**	.418**	.338**
	(.100)	(.0915)	(.0924)	(.0818)
dummy: service sector	-.0504	-.0354	.0408	-.0475
	(.0633)	(.0500)	(.0625)	(.0487)
dummy: FDI or not	.0889	.142	.0647	.0655
	(.112)	(.106)	(.103)	(.0904)
dummy: export or not	.111	.105**	.179**	-.0825
	(.0721)	(.0653)	(.0652)	(.0566)
dummy: govt. shareholding	-.157**	-.284**	-.182**	-.114*
	(.0610)	(.0763)	(.0697)	(.0684)
ln (GDP pc)	.136**	.125**	.771**	.165**
	(.0568)	(.0548)	(.143)	(.0470)
ln (population)	.172**	.0478	.783**	.122*
	(.0747)	(.0378)	(.215)	(.0658)
% village heads with high school	-.00864**	-.0096**	-.0091**	-.00741**
	(.00219)	(.0016)	(.0013)	(.00217)
	--			
residual trans./GDP	-.481	-237**	[-.452**]	3.35
[ln(res. trans.)]	(7.16)	(105)	[(.149)]	(4.94)
prop. tax trans/GDP	-23.4	-306**	[-.144**]	-21.4
[ln(prop. taxes)]	(16.6)	(81.1)	[(.0284)]	(13.3)
constant	-.324	2.51**	-4.85**	.0587
	(.988)	(.591)	(1.75)	(.843)
Sargan (p-value)	n.a.	1.23 (.267)	3.20 (.0737)	[.169]
[R^2]				
N	1422	1422	1422	1422

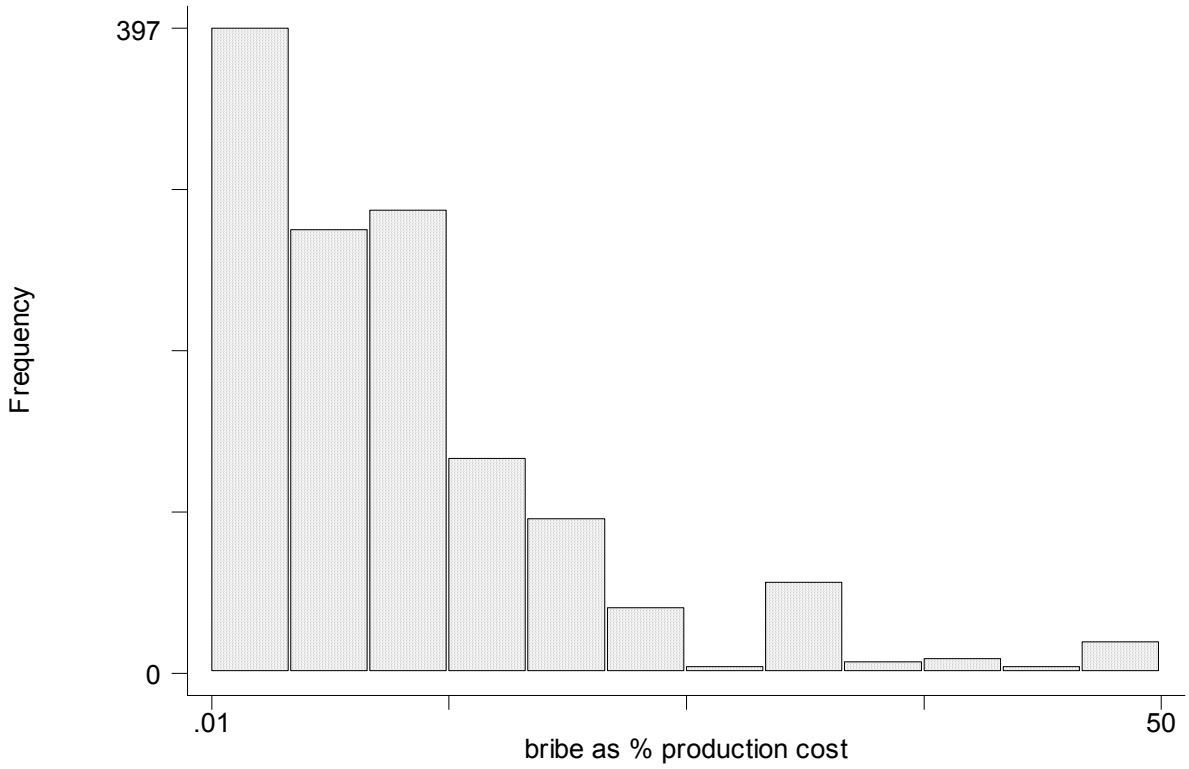

Figure 1. Distribution of Bribe to Cost Percents (12 equal length cells)