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Using Micro-Surveys to Measure and Explain Corruption

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Summary. — This paper discusses survey techniques aimed at a better measurement of corruption at the micro-level and argues that with appropriate survey methods and interview techniques, it is possible to collect quantitative micro-level data on corruption. Public expenditure tracking surveys, service provider surveys, and enterprise surveys are highlighted with several applications. These surveys permit measurement of corruption at the level of individual agents, such as schools, health clinics, or firms. They also permit the study of mechanisms responsible for corruption, including capture of public funds and bribery.
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1. INTRODUCTION

The past decade has witnessed a boom in the empirical economic literature on corruption. With few exemptions, the existing literature has three common features.[1] First, it is based on cross-country analyses.[2] Second, the literature exploits data on corruption derived from perception indices, typically constructed from foreign experts' assessments of overall corruption in the country. Finally, it explains corruption as a function of countries' policy and institutional environment. The research on corruption and the media exemplifies this approach. Although the literature has provided important insights on the aggregate determinants of corruption, it has drawbacks. In particular, perception indices raise concerns about perception biases and causation.[3] Also, the aggregate nature of the data tells us little about the relationship between corruption and individual agents, such as service providers or firms. Conceptually macro-level determinants cannot satisfactorily explain the within-country variation of corruption; service providers and firms facing similar institutions and policies may still end up paying or demanding different amounts in bribes.

The quantitative measurement of corruption at the micro-level is difficult, but not impossible. We show this using three different data collection approaches: public expenditure tracking surveys, service provider surveys, and firm surveys. Although each approach has a more general focus, corruption—broadly defined—is often identified as a key issue.

The rest of the paper is organized as follows. Section 2 discusses the key features and findings of the expenditure tracking surveys (PETS) where the focus is on capture of public funds. Section 3 looks at the recent experience with

service provider surveys to explore broader incentive and performance issues, such as teacher and health worker absenteeism. Section 4 presents the firm-level approach and discusses key findings on the incidence, level, and effects of corruption on enterprise performance. Section 5 concludes with a discussion on policy implications.

2. PUBLIC EXPENDITURE TRACKING SURVEYS

Government resources allocated for particular uses flow within a legally defined institutional framework. Funds often pass through several layers of government bureaucracy on the way to service facilities, which are charged with the responsibility of exercising the spending. Policymakers in developing countries seldom have information on actual public spending at the provider or facility level or by activity. A public expenditure tracking survey (PETS) tracks the flow of resources through these strata, on a sample survey basis, in order to determine how much of the originally allocated resources reach each level. It is therefore useful as a method for locating and quantifying political and bureaucratic capture, leakage of funds, and problems in the deployment of human and in-kind resources, such as staff, textbooks, and drugs. A typical PETS consists of a survey of frontline providers (schools and clinics and their staff) and local governments (politicians and public officials), complemented by central government financial and other data. [4]

The PETS explicitly recognizes that an agent may have an incentive to misreport. These incentives derive from the fact that information provided, for example, by a school or a health facility to local governments (at least partly) determines its entitlement to public support. In cases where resources (staff time) are used for corruption (shirking), the agent involved in the activity will most likely not report it truthfully. Likewise, official charges may only partly capture what the survey intends to measure, for example, the user's cost of service. The PETS deals with these data issues by (i) using a multiangular data collection strategy (a combination of information from different sources including users); and (ii) carefully considering which sources and respondents have incentives to misreport, and identifying data sources that are the least contaminated by such incentives.

This data collection strategy serves to cross-validate the information obtained separately from each source.

The PETS allows us to observe the outputs and performance of service providers (the agent), and thereby provide new information to policymakers and beneficiaries (the principals) on the complex transformation of budgets to public services. When tailored to the specific circumstances, these tools can help identify incentives and shed light on the interactions which these incentives give rise to, such as collusion and bribery. The novelty of the PETS approach lies not so much in the development of new methods per se, but the application proven methods (micro-surveys) to service providers and governments, where administrative data and official records are typically used.

(a) Using PETS to measure corruption

Uganda was the first country to do a PETS in 1996. The study was motivated by the observation that despite a substantial increase in public spending on education, the official reports showed no increase in primary enrollment. The hypothesis was that actual service delivery, proxied by primary enrollment, was worse than budgetary allocations implied because public funds were subject to capture (by local politicians and public officials) and did not reach the intended facilities (schools). To test this hypothesis, a PETS was conducted to compare budget allocations to actual spending through various tiers of government, including frontline service delivery points, that is, primary schools (Ablo & Reinikka, 1998; Reinikka, 2001).

The survey collected five years of data on spending (including in-kind transfers), service outputs, and provider characteristics in 250 government primary schools, 18 local governments (districts), and three central government ministries. The initial objective of the PETS was purely diagnostic, that is, to measure leakage in school funding. As Sections 2(b) and 2(c) show, a PETS can also provide quantitative data to explain variation in the leakage, as well as serve as a tool to obtain data for impact evaluation.

The first Ugandan school survey provides a stark picture of public funding on the frontlines. On average, only 13% of the annual capitation grant (per student) from the central government reached the school in 1991–95 (Table 1). Eighty-seven percent was captured by local officials for purposes unrelated to

Table 1. *Leakage of nonwage funds in primary education in Uganda, 1991–95 and 2001 (%)*

	Mean	Median
1991	97	100
1992	96	100
1993	85	100
1994	84	100
1995	78	100
2001	18	18

Source: Reinikka (2001) and Reinikka and Svensson (2004b).

education, yet there was no evidence of increased spending in other sectors (Jeppson, 2001). Most schools received nothing. Based on yearly data, 73% of the schools received less than 5%, while only 10% received more than 50% of the intended funds. The picture looks slightly better when constraining the sample to the last year of the survey period. Still, only 22% of the total capitation grant from the central government reached the schools in 1995 (Reinikka & Svensson, 2004a). As discussed in Section 2(c). there was a major improvement subsequently, following a public information campaign. As a result, in 2001, the average leakage was only 18%. Even more importantly, the median leakage was reduced from 100% in 1995 to 18% in 2001 (Table 1).

Although there is indirect evidence that part of the observed leakage was theft, as indicated by numerous newspaper articles about indictments of district education officers after the survey findings went public, anecdotal evidence suggests that funds were largely used for patronage politics and the funding of political activities. For example, information collected during the survey suggests that funds were used to increase allowances for councilors and local officers and that on the day funds actually arrived in the district, well-connected citizens and local politicians got together with the district officials to decide how these should be used. While the PETS data can usefully quantify capture of funds in a public program and shed light on where in the hierarchy such capture takes place, the data do not, however, allow us to determine what actually happened to the funds after they had been captured.

The anecdotes collected during the survey are consistent with case study evidence of (local) political financing and corruption in Uganda, as reported in Thomas (1998, 1999). Thomas argues that the power in local governments is concentrated to a small pool of elites interconnected by common schooling. marriage, friendships, shared ethnicities, or religion. Sustaining this power balance is costly and public funds are fueling a system of patronage politics, where patrons give clients material rewards for their political loyalty and services. The patronage system takes different forms, including government actors diverting public resources for their own campaigns and those of friends and family, and financing of local and private causes, including distribution of private goods such as salt, sugar, and beer to neutralize voter dissatisfaction. Political parties, in the case of Uganda "the Movement," must also supply patronage goods to their workers and members. In a rural setting, an important way of maintaining an effective political organization is through personal presence, which means a well-staffed institutional hierarchy all the way down to the village level. This model assumes substantial resources, and diversion of public resources is often the only source of funding available.

Subsequently, several other countries have implemented public expenditure tracking surveys in education and health care. In primary education, these studies include Ghana, Peru, Tanzania, and Zambia. Leakage of nonwage funds—defined as the share of resources intended for but not received by the frontline service facility—is found to be a major issue in all cases (Table 2).

According to a recent PETS in Zambia—unlike in Uganda in the mid-1990s—rule-based allocations seemed to reach the intended beneficiaries: more than 90% of all schools received their rule-based (fixed) nonwage allocations. In the case of salaries, 95% of teachers had no outstanding amounts (Das, Dercon, Habyarimana, & Krishnan, 2004). Since smaller

Table 2. *Leakage of nonwage funds in primary education: evidence from public expenditure tracking surveys (%)*

Country	Mean
Ghana 1998	49
Peru 2001[a]	30
Tanzania 1998	57
Zambia 2001	76

Source: Ye and Canagarajah (2002) for Ghana; Instituto Apoyo and the World Bank (2002) for Peru; Price Waterhouse Coopers (1999) for Tanzania; and Das et al. (2004) for Zambia.
[a] Utilities only.

schools tend to have students from poorer families, the rule-based allocation (e.g., a fixed amount per school) translates to more funding for poorer students. But rule-based funding accounts only for 30% of all funding. In discretionary allocations (70% of the total spending), the positive results no longer hold: less than 25% of schools receive *any* funding from discretionary sources. The rest is spent at the provincial and district level. Similarly, in the case of overtime allowances (which must be claimed every term) or other discretionary allowances, over a half was overdue by six months or more.

A few studies also quantify the share of ghosts on the payroll, that is, teachers or health workers who continue to receive a salary but who no longer are in the government service, or who have been included in the payroll without ever being in the service. In a PETS survey in Honduras, for example, 5% of teachers on the payroll were found to be ghosts, while in health care, the percentage was 8.3 for general practitioners in 2000 (World Bank, 2001). In Papua New Guinea, a recent survey showed that 15% of teachers on the payroll were ghosts (World Bank, 2004). In Africa, the comparable figures are even higher: 20% in Uganda in 1993 (Table 3).

Taken together, the PETS carried out in Africa found capture of nonwage funds on a large scale. Salaries and allowances also suffer from leakage but to a lesser extent. In Latin America, capture of funds occurs too, but at a considerably lower level. Given that availability of books and other instructional materials are key to improving the quality of schooling, the fact that between 87% (Uganda) and 49% (Ghana) of the funding for these inputs never reach the schools makes capture of funds a major policy concern in the education sector. Instead of instituting general public sector reforms, the PETS in Uganda shows that it may

Table 3. *Ghost workers on payroll (%)*

Country	Ghosts workers	
	Education	Health
Honduras 2000	5.0	8.3
Papua New Guinea 2002	15.0	–
Uganda 1993	20.0	–

Source: World Bank (2001) for Honduras; World Bank (2004) for Papua New Guinea; and Reinikka (2001) for Uganda.
– Not available.

be more efficient to target reforms and interventions at specific problem spots. For example, the PETS in 1996 pointed to the fact that nonwage expenditures are much more prone to leakage than salary expenditures (although the absolute amounts involved may be higher in salaries). They also demonstrate that leakage occurs at specific tiers within the government hierarchy (typically at the level of local government in Tanzania, Uganda, and Zambia). This knowledge can be exploited to implement more focused and hence more efficient interventions.

(b) *Explaining capture of public funds*

A striking feature of the Uganda PETS data is that, although a majority of schools did not receive funding (in a given year), there was a large variation in leakage across schools. Reinikka and Svensson (2004a) show that a large part of this variation can be explained by studying the interaction between local officials and schools as a bargaining game. The district was supposed to pass the grant on to schools. But, in the absence of central government oversight, district officials had a considerable degree of discretion over these funds, as only they knew the amount of monthly transfers (which varied from month to month, given cash-based budget management). In principle, a school could obtain information on disbursements of the capitation grant, but in practice contacting the central government is costly.

Even if the school decides to obtain the necessary information, exercising their voice (see Hirschman, 1970) is also costly. It would require organizing the parents and teachers and lodging a complaint with higher authorities. An important consequence is that resources are not allocated according to the rules underlying the central government's budget decisions, with obvious equity and efficiency implications.

The PETS data showed that resource flows are endogenous to a school's socioeconomic endowment. Rather than being passive recipients of flows from the government, schools use their bargaining power *vis-à-vis* other parts of the government to secure larger shares of funding. Combining the PETS data with household survey data, Reinikka and Svensson (2004a) demonstrate that poor students suffer disproportionately due to local capture because schools catering for them received even less than others. A 1% increase in income increases

the amount of public funding reaching the average school by 0.3% points. This result is in contrast to benefit incidence studies that use budget data: these had found that public spending in primary education was distributionally neutral (World Bank, 1996). Using the PETS data, it is evident that at least nonwage public spending was highly regressive due to capture.

Overall, the findings from the PETS provide new insights into an area almost exclusively studied using cross-country data. They show that a large part of the variation in capture of public funds at the local level can be explained by studying the interaction between local officials and end users (schools in this case). From an analytical point of view, this approach differs from much of the existing literature on corruption, since it focuses on the principal's (schools and parents) rather than the agent's (the district officials) incentives and constraints.

(c) *Evaluating impact of a public information campaign*

Following publication of the findings from the first PETS in 1996, the Ugandan central government made a swift attempt to remedy the situation. It began publishing the monthly intergovernmental transfers of capitation grants in the main newspaper and requiring primary schools to post information on inflows of funds for all to see. This not only made information available to parent–teacher associations, but also signaled local governments that the center had resumed its oversight function. As discussed above, an evaluation of the information campaign—using a repeat PETS—reveals a great improvement. While schools on average are still not receiving the entire grant (and there are delays), capture has been reduced from on average 78% in 1995 to 18% in 2001 (Table 1).

A key component in the information campaign was making monthly transfers of public funds to the districts public in newspapers. Thus, schools with access to newspapers have been more extensively exposed to the information campaign. Interestingly, in 1995, schools with and without access to newspapers suffered just as much from local capture. From 1995 to 2001, both groups experienced a large drop in leakage. However, the reduction in capture is significantly higher for the schools with newspapers; these schools on average increased their funding by 14% points more than the schools that lacked newspapers (Reinikka & Svensson,

2004b). The results hold also when controlling for differences in income.

Using distance to the nearest newspaper outlet as an instrument, Reinikka and Svensson (2004b) show that a strong relationship exists between proximity to a newspaper outlet and reduction in capture of funds since the newspaper campaign started.

In sum, with a relatively inexpensive policy action—provision of mass information through the press—Uganda has dramatically reduced capture of a public program to increase primary education. Poor schools, being less able to claim their entitlement from the district officials before the information campaign, benefited most from it. This improvement coincided with a massive increase in primary enrollment (and hence a large increase in total capitation spending) thanks to a universal primary education initiative in 1997 (Stasavage, 2003).

3. FRONTLINE PROVIDER SURVEYS

Service provider surveys are increasingly used to examine the efficiency of public spending, incentives, corrupt behavior, and various other dimensions of service delivery in provider organizations, especially those on the front lines. The quantitative service delivery survey (QSDS) is a variant of these provider surveys, with an emphasis on systematic quantitative data on finances, inputs, outputs, pricing, quality, oversight, and other aspects of service provision. It can be applied to government, private for-profit, and not-for-profit providers. The facility or frontline service provider is typically the main unit of observation in a QSDS in much the same way as the firm is in enterprise surveys and the household is in household surveys. A QSDS requires considerable effort, cost, and time compared to some of its alternatives, especially surveying perceptions of users.

A QSDS-type survey conducted in Bangladesh made unannounced visits to health clinics with the intention of discovering what fraction of medical professionals were present at their assigned post (Chaudhury & Hammer, 2003). The survey quantified the extent of this problem on a nationally representative scale and collected other information as well. Absentee rates for medical providers in general were found to be quite high (35%), and higher for doctors (40% and 74% at lower-level health facilities). [5] The average absence rate is roughly

the same in Ugandan health facilities (37%), but even higher (40%) in India and Indonesia (Table 4). [6] Teacher absence rates are generally lower than those found in health care.

Honduras, for example, used a combination of PETS and QSDS to diagnose the moral hazard with respect to frontline health and education staff (World Bank, 2001). The study demonstrated that even when salaries and nonwage funds reach frontline providers, certain staff behaviors and incentives in public service have an adverse effect on service delivery, particularly absenteeism and job capture by employees. Migration of posts, due to capture by employees, was considered a major problem. The Honduran system of staffing in the education and health sectors assigns posts to the central ministry, not individual facilities. Because the central ministry has discretion over the geographic distribution of posts, frontline staff have an incentive to lobby for having their posts transferred to more attractive locations, most often to urban areas. The implication is that posts migrate over time from the rural and primary level to cities and higher levels of health care/schooling. This is neither efficient nor equitable.

The PETS/QSDS in Honduras set out to quantify the incongruity between budgetary and real staff assignments and determine the degree of attendance at work. It used central government information sources and a nationally representative sample of frontline facilities in health and education. Central government pay-

roll data indicated each employee's place of work. The unit of observation was both the facility and the staff member, both operational and administrative, and the study included all levels of the two sectors from the ministry down to the service facility level.

In health, the study found absenteeism to be common in Honduras, with an average attendance rate of 73% across all staff categories (Table 4). Thirty-nine percent of absences were without justifiable reason (such as sick leave, vacations, and compensation for extra hours worked). This amounts to 10% of total staff work time. Multiple jobs were prevalent, especially for general practitioners and specialists. Fifty-four percent of specialist physicians had two or more jobs, and 60% of these were in a related field. Five percent of sampled staff members had migrated to posts other than the one assigned to them in the central database, while 40% had moved since their first assignment. The highest proportions of migrators were found among general practitioners. Migration was always from lower- to higher-level institutions, although there was also some lateral migration. Job migration was found to reflect a combination of employee capture and budget inflexibility.

In education, staff migration was highest among nonteaching staff and secondary teachers. Multiple jobs in education were twice as prevalent as in health, with 23% of all teachers doing two or more jobs. Furthermore, 40% of the educational staff worked in administrative jobs suggesting a preference for nonfrontline service employment.

The QSDS is still a relatively new tool but the results of the first surveys indicate that it can generate very useful information on performance in service delivery as well as corrupt practices in service delivery. It also provides information on incentives more broadly. There are ongoing attempts—for which published results are not yet available—to use the QSDS to measure other aspects of corruption and inefficiencies across service providers, including drug leakage and informal user fees.

Table 4. *Absence rates among teachers and health-care workers in the public sector (%)*

Country	Primary schools	Primary health facilities
Bangladesh	16	35
Ecuador	14	–
Honduras	14	27
India[a]	25	40
Indonesia	19	40
Papua New Guinea	15	19
Peru	11	23
Uganda 2002	27	37
Zambia 2002	17	–

Source: Chaudhury and Hammer (2003) for Bangladesh, Chaudhury *et al.* (2004) for Ecuador, India, Indonesia, Peru, and Uganda; World Bank (2001) for Honduras; World Bank (2004) for Papua New Guinea; and Habyarimana *et al.* (2003) for Zambia.
– Not available.
[a] Average for 19 states.

4. MEASURING AND UNDERSTANDING CORRUPTION AT THE FIRM LEVEL

Given the secretive nature of corrupt activities, the common view has been that it is virtually impossible to collect reliable quantitative information on corruption from firm managers.

Kaufmann (1997) argues that this presumption is incorrect. With appropriate survey methods and interview techniques, managers are willing to discuss corruption with remarkable candor. At the same time, in order to collect reliable information on graft at the firm level, it is crucial to design an empirical strategy that gives the manager an incentive to cooperate and truthfully report their experiences with corruption.

One such attempt was carried out in the late 1990s in Uganda (Reinikka & Svensson, 2001). The idea was to expand a standard firm-level survey with a module on corruption and revise the survey implementation design to increase the firm managers' incentive to cooperate. In the end, a unique data set, with detailed financial and structural information from firms combined with quantitative graft data, was collected.

The empirical strategy to collect information on bribe payments across firms in Uganda had the following four key components. First, a local industry association, Uganda Manufactures' Association Consultancy and Information Service, implemented the survey. In Uganda, as in many other countries, there is a deep-rooted distrust of the government. To avoid suspicion of the overall objective of the data collection effort, it was therefore decided that a body in which most firms had confidence should implement the survey. Second, the questions on corruption were phrased in an indirect manner to avoid implicating the respondent of wrongdoing. Third, the corruption-related questions were asked at the end of the interview, when the enumerators had had enough time to establish the necessary credibility and trust. Finally, to enhance the reliability of the corruption data, multiple questions were asked on corruption in different sections of the questionnaire. Consistent findings across measures significantly increase the reliability of the data. [7] The data collection effort was also aided by the fact that corruption had, to a large extent, been desensitized in Uganda. Prior to the survey, several awareness-raising campaigns had been implemented on the consequences of corruption. [8]

A striking finding of the survey was the large variation in reported graft across firms (Svensson, 2003a). Since the Uganda firm-level survey was designed to be representative of the population of firms that had five or more employees, this suggests that the second moment (i.e., variation) may be very important. In other words,

the country-specific average (i.e., the first moment) may not be that informative, given the large variation. This finding points to a critical shortcoming with the cross-country literature on corruption. By construction, the variation in graft within countries cannot be studied using cross-country data.

Why would some firms need to pay bribes while others do not? Clearly, there might be several reasons. For instance, firms deal with public officials who differ on the personal (moral) cost of demanding bribes. Public officials' perception of the likelihood of getting caught, if being corrupt, and the perceived punishment if found guilty, may also differ. However, the most likely explanation is that officials' opportunity to extract bribes, that is, their opportunity to influence the firms' business decisions and cash flows, differ across sectors and locations. With private firms, these control rights stem from the existing regulatory system and the discretion public officials have over implementing, executing, and enforcing rules and benefits that affect firms, such as business regulations, licensing requirements, permissions, taxes, exemptions, and public-goods provision.

How much must graft-paying firms then pay? As discussed in Svensson (2003a), if the firms face the same set of rules and regulations and there are no differences in the number (or the extent) of interactions with the public sector, the answer must be firm specific. Consider a firm forced to pay bribes to continue its operations and that is bargaining with a rent-maximizing public official. The official will try to extort as high a bribe as possible, subject to the constraints that he or she might get caught and punished and that the firm might exit. Two firm-specific features would influence the magnitude of the graft demand according to this bargaining hypothesis: the firm's ability to pay the bribe and the firm's refusal power, that is, the cost of not paying.

In line with the control right hypothesis, the survey data reveal that there are statistical differences between the group of firms that pay graft and the group of firms that do not. Firms that do not pay graft tend to have characteristics suggesting that they operate in sectors with little or no contact with the public sector, that is, in the informal sector. They receive significantly less public services, are less involved in foreign trade, and pay fewer types of taxes, particularly when controlling for tax exemptions. This interpretation is further supported by the finding that firms reporting positive bribe

payments spend significantly more time dealing with government regulations and more money on accountants and specialized service providers to deal with regulations and taxes. In other respects, the two groups of firms are similar.

Consistent with the bargaining hypothesis, Svensson (2003a) finds that firms' "ability to pay," proxied by firms' current and expected future profitability, and firms' "ability to refuse to pay," proxied by the expected cost of reallocation, can explain a large part of the variation in bribes across graft-reporting firms. The results are statistically robust and remained intact when instrumenting for profits. These results suggest that public officials act as price (bribe) discriminators, demanding higher bribes (for a given public service) from firms that can afford to pay, and demanding lower bribes from those that can credibly threaten to exit the market or use other means of acquiring the service.

These results have stark implications. As analyzed in Harstad and Svensson (2004), if public officials cannot commit to a given bribe level, this might create a hold-up problem that influences firms' investment and adjustment decisions. By investing in a more cost-effective production technology, the firm also subjects itself to higher bribe demands. The end result may be that firms choose not to enter the market or choose a technology based on minimizing bribe demands at the expense of profits or productivity.

Do bribe payments constitute a heavy burden on firms? The evidence suggests that they do. For the firms reporting positive bribes, the average amount of corrupt payments was equivalent to US$8,280, with a median payment of US$1,820. These are large amounts, on average corresponding to US$88 per worker, or roughly 8% of the total costs (1% in the median). Including firms reporting zero bribe payments, the average payment is US$6,730, with a median payment of US$450.

Approximately 50% of the firms reporting positive bribe payments paid more in grafts (annually) than for security (including guards and investment in security-related equipment). Almost 50% of the firms reported larger bribe payments than total investment. [9]

When assessing these data, it should be stressed that despite the data collection strategy, there are likely to be cases of misreporting in the sample. The average graft numbers may be sensitive to such misreporting. The strategy used to collect information on graft, however, has minimized any obvious systematic biases in the correlation between reported graft and the set of explanatory variables discussed above.

Fisman and Svensson (2000) use the same firm-level data set to study the effects of corruption on firm performance. Evaluating the effects of corruption (for instance on firm growth) using firm-level data is difficult. The problem is identification, since both growth and corruption are likely to be jointly determined. A simple example illustrates the point. Consider two firms in a given sector of similar size and age. One of the firms is producing a good/brand perceived to have a very favorable demand forecast, while the other firm is producing a good with much less favorable demand growth. Assume furthermore that the firms need to clear a certain number of business regulations and licensing requirements, or require some public infrastructure services. Moreover, assume that public servants have discretion in implementing and enforcing these regulations and services. A rational rent-extracting public official would try to extract as high a bribe as possible. In this setup, one would expect a public official to demand higher bribes from the firm producing the good with a favorable demand forecast, simply because this firm's expected profits are higher and, thus, its ability to pay is larger. If the forecasts also influence the firms' willingness to invest and expand, we would expect (comparing these two firms) a positive (observed) relationship between corruption and growth.

Fisman and Svensson (2000) try to overcome this simultaneity problem by using industry-location averages as instruments. They argue that if the simultaneity problem is specific for firms, but not industries or locations, then netting out this firm-specific component yields a bribe measure that only depends on the underlying characteristics inherent to particular industries and/or locations.

Fisman and Svensson (2000) find the rate of bribery to be negatively correlated with firm growth. For the full data set, a 1 percentage point increase in the bribery rate is associated with a reduction in firm growth of 3 percentage points, an effect that is about three times greater than that of taxation on firm growth. Moreover, after outliers have been excluded, they find a much greater negative impact of bribery on growth, while the effect of taxation is considerably reduced.

Despite these strong results, it should once more be stressed that in reality, some firms

may still benefit (and possibly a great deal) from corruption. What this type of econometric work identifies is what is true on average, or in general. The data suggest that there is a strong negative relationship between bribery payments and firm growth, on average.

In the firm survey work discussed above, the graft data measure the aggregate (for an individual firm) graft paid by firms. A complementary approach is to indirectly estimate subcomponents of this firm-specific aggregate, using cost information on provision of homogeneous public services. In the Ugandan enterprise survey, information on two variables related to the delivery of public services was collected (Reinikka & Svensson, 2001; Svensson, 2001). The respondents were asked about the total costs (including informal payments to speed up the process) of getting connected to the public grid and the total cost (including informal payments to speed up the process) of acquiring a telephone line. The fee for a telephone connection (around US$100) was supposed to be fixed. Thus, deviations from the set price typically reflect graft. Connection costs to the public electricity grid is more problematic. In fact, the cost of connection to the public grid is a complex function of load requirements, necessary upgrades, and distance to existing voltage connection. The complexity in determining the price of connection implies that the public electricity company in reality had large discretion over the cost. To the extent that the other determinants of connection costs to the public grid can be controlled for, deviations typically reflect graft.

Most firms acquiring a telephone line had to pay more than the official price (Svensson, 2003b). On average, the additional cost was around US$130, which, given that the official price was around US$100, implies that the average firm had to pay more than twice the stated cost to acquire a telephone line. The results are similar when analyzing the cost of connecting to the public grid. Interestingly, there is no clear relationship between the excess price and the time it takes for firms to get access to the services they paid for.

Preliminary evidence suggests that the price firms need to pay is correlated with the firm's "ability to pay," proxied by firms' current and expected future profits, a result consistent with the bargaining hypothesis in Svensson (2003a). Interestingly, there are patterns also in the delay data, that is, the time it takes for firms to get access to the services they paid

for (Svensson, 2003b). Firms in sectors with a higher variation in reported profits, that is, for which the return is less predictable, suffer from longer delays. This finding is consistent with the hypothesis that delays serve as a learning process which enables the official to infer a firm's willingness to pay. [10] Since a firm cannot credibly communicate its profit, it will be forced to signal lower willingness to pay by enduring delays. With higher uncertainty *ex ante*, the signaling becomes less informative and the probability of agreeing on a price of the public service without delay falls. An increase in the firm's expected profitability raises the expected relative return of agreeing, since the official can ask for a higher price, holding the probability of delay constant. This effect strengthens the incentives to agree, and results in a lower probability of delay. When firms are less dependent on the service being provided, their bargaining strength improves, leading to lower bribe demands and thereby lower probability of delay.

A similar approach to collect quantitative data on corruption is used in the di Tella and Schargrodsky (2003) study. [11] They collect procurement data (prices paid) on basic, homogeneous inputs for public hospitals in Buenos Aires, Argentina, during a crackdown on corruption in public hospitals. They find large effects. The price initially fell by 15% on average. In hospitals with relatively well-paid procurement officers, the price fell significantly more than in hospitals with relatively low-paid procurement officers. This result is consistent with the efficiency-wage hypothesis. Higher wages and monitoring can be an effective way to combat corruption.

5. CONCLUSION

The paper has argued that with appropriate survey methods and interview techniques, it is possible to collect quantitative data on corruption at the micro-level. In particular, the PETS and QSDSs are promising new micro-economic tools for diagnosing corruption and other problems in basic service provision in developing countries. Until recently, the analysis of service delivery has focused almost entirely on financing services, while provision, particularly issues related to institutions, incentives, and provider behavior, has received less attention. The PETS and QSDS can address this omission.

From a policy perspective it should be noted that the extent (or variation across firms and service providers) of corruption and capture seem to have less to do with conventional audit and supervision mechanisms, and more to do with the schools' or clinics' opportunity to voice their claims for the funds, and firms' bargaining positions. Traditionally, it has been left to the government and a country's legal institutions to devise and enforce public accountability. The findings reviewed in this paper question this one-sided approach. As the government's role and services have expanded considerably during the past decades, it has become apparent that conventional mechanisms, such as audit and legislative reviews, may not be enough. Collusion, organizational deficiencies, abuse, and lack of responsiveness to citizens' needs cannot easily be detected and rectified even with the best of supervision. When the institutions are weak, as is common in many developing countries, the government's potential role as auditor and supervisor is even more constrained.

The positive impact of the information campaign to reduce capture in Uganda further suggests that corruption can be effectively tackled only when the reform of the political process and the restructuring of the regulatory systems are complemented by a systematic effort to increase the citizens' ability to monitor and challenge abuses of the system, and inform the citizens about their rights and entitlements. [12] Breaking the culture of secrecy that pervades the functioning of the government and empowering people to demand public accountability are two important components in such an effort.

Recent reviews of growth performance in Sub-Saharan Africa have identified a number of recurring features of African politics likely to undermine the results of traditional institutional reforms. These features include restricted civil society involvement, the state perceived as a vehicle of wealth accumulation, the prevalence of patronage politics, and a small elite with close political connections. Although each feature may not be applicable to every country, a successful national anticorruption program must also tackle these fundamental determinants of corruption—corruption that can be measured at the level of an individual agent by using the new micro-level survey tools.

NOTES

1. See Svensson (2003a).

2. Recent contributions on the determinants of corruption include Ades and di Tella (1997, 1999), Persson, Tabellini, and Trebbi (2003), Svensson (2000a), and Treisman (2000). On the effects of corruption, see Johnson, Kaufmann, and Shleifer (1997), Mauro (1995), and Wei (1997).

3. Brunetti and Weder (2003) and Ahrend (2002), for example, use a corruption perception index compiled by the International Country Risk Guide (ICRG). Perception biases may occur if, say, improved protection of journalists reporting on corruption is perceived as lowering the cost of doing business due to corruption. In this case, there would be a direct link between freedom of media and the risk rating score published by ICRG. Establishing a correlation between freedom of the media and corruption does not provide strong evidence of a causal link since both measures are highly correlated with several other institutional characteristics that may explain the level of corruption in a country.

4. See also Dehn, Reinikka, and Svensson (2003).

5. These rates do not separate excused and unexcused absences, but compare the staff roster to those who were physically present at the time of the survey.

6. See also Jaffré and Olivier de Sardan (2003).

7. The firm survey had a more general focus. The survey data have been used to evaluate the effects of trade liberalization on firm productivity (Gauthier, 2001), assess the bad news principle (Svensson, 2000b), and study the effects of, and coping with, poor public service provision (Reinikka & Svensson, 2002a, 2002b). Reinikka and Collier (2001) summarize several of the findings from the firm survey.

8. See Ruzindana, Langseth, and Gakwandi (1998) and World Bank (1998).

9. Part of the explanation to this striking finding is that a considerable number of firms invested very little or nothing in any given year.

10. See also Banerjee (1997).

11. See also Fisman and Wei (2004).

12. Paul (1998) makes the same argument.

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