Is Bribery Really Regressive? Bribery's Costs, Benefits and Mechanisms *

Jennifer Hunt †
McGill University and NBER

Sonia Laszlo
McGill University

jennifer.hunt@mcgill.ca

sonia.laszlo@mcgill.ca

May 4, 2009

*We are grateful to Vincent Chandler for excellent research assistance, to the Instituto Nacional de Estadística e Información for the Peruvian data, and to Niels Ulrich, Paul Mpuga, Barbara Kasura Magezi Ndamira and K2 Consulting for the Ugandan data. We thank Leah Brooks, Miriam Golden, Yossi Greenberg, Franque Grimard, Javier Herrera, Miguel Jaramillo Baanante, Daniel Parent, Jan Svejnar, Kathy Terrell, Duncan Thomas and participants in numerous seminars for comments. Hunt is also affiliated with the CEPR, IZA and DIW-Berlin, and acknowledges the Social Science and Humanities Research Council of Canada for financial support. Laszlo is also affiliated with CIRANO in Montreal and Grupo de Análisis para el Desarrollo (GRADE) in Lima.

†Corresponding author: Department of Economics, McGill University, 855 Sherbrooke Street West, Montreal, QC, H3A 2T7, Canada; tel. (514) 398-6866; fax (514) 398-4938.

Abstract

We use data on households' bribery of public officials in Peru and Uganda to analyze the distribution across income classes of the burden of bribery, the mechanisms leading to this distribution, and the payoffs to bribery. We show that the burden of bribery is not borne disproportionately by the poor. Poor bribers pay a greater share of their income than rich bribers, but this is offset by the fact that rich users are more likely to bribe than poor users. Furthermore, the rich use officials more often than do the poor. The main benefit of bribery to a client is avoidance of the poor service delivered to clients who refuse to bribe.

1 Introduction

It is now widely accepted that corruption has negative economic consequences. Rose–Ackerman's influential early work warned that the assumptions required for corruption to enhance efficiency were unlikely to be satisfied in practice, and more recent theoretical contributions on the causes and consequences of corruption have also emphasized efficiency losses.[1] Empirical work has substantiated these fears: Mauro (1995) finds cross–country evidence that corruption reduces economic growth and Wei (2000) shows that corruption reduces foreign direct investment. Many development economists fear that corruption not only reduces efficiency, but also equity, constituting a regressive tax, causing the poor to be excluded from public services, and skewing growth in favor of the rich.[2] Yet there is little empirical evidence on the burden of corruption by income or on the links between income and corrupt behavior by individuals more generally.[3]

We fill this gap using data on households' bribery of public officials in complementary Peruvian and Ugandan data sets. We analyze the distribution across permanent income classes of the burden of bribery, the mechanisms leading to this distribution, and the payoffs to bribery. The mechanisms we study are the determinants of use of public officials, the determinants of bribery for users, and the determinants of bribe amounts for bribers. The client payoffs we consider include speed of service, quality of service, and the probability of paying an official fee for service.

Our study of contrasting countries allows us to draw more general lessons than would be possible with one country alone. Peru is a middle–ranking country in Transparency International's Corruption Perceptions Index, with a GDP per capita of US$4265 in 2002,

[1] Rose–Ackerman (1975,1978), Shleifer and Vishny (1993), Choi and Thum (2004), Kingston (2004), Sah (1988). Lui (1985) highlights the beneficial side of bribery. Aidt (2003) surveys the literature.

[2] E.g. Gupta, Davoodi and Alonso–Terme (1998), www.worldbank.org/anticorruption.

[3] Studies of other aspects of corruption include Fisman and Gatti (2002) and Treisman (2000) using international corruption perceptions data, Hunt (2006), Mocan (2005) and Swamy et al. (2001) using individual data, Di Tella and Schargrodsky (2003) and Yang (2008) inferring corruption, Olken (2007b) measuring bribery in the field, and Olken (2007a) and Castillo et al. (2008) measuring corruption in a field experiment. Olson et al. (2000) criticize the use of corruption perceptions.

while Uganda is classified as one of the most corrupt countries by TI and had a GDP per capita of only US$1134 in 2002. Peru's income is more equally distributed than Uganda's with a Gini of 0.45 in 2002, compared to 0.52 for Uganda.[4]

We first build a theoretical framework allowing us to understand the bribery–related interactions between public officials and clients. Officials angle for a bribe by shirking, punish clients who refuse to bribe with further shirking, and reward clients who bribe with a reduction in red tape that at least partially offsets the earlier shirking. Officials are more likely to angle for bribes from rich clients, who are more willing to pay due to a higher valuation of time, and officials with monopoly power can extract higher bribes from richer bribers.

We then turn to the data. We show that in Peru, the poor do not pay higher shares of their permanent income in bribes. We find the same result for Uganda once we account for measurement error in household permanent income. These results are contrary to a conventional wisdom based on limited empirical support. Kaufmann et al. (1998), Kaufmann et al. (2005) and Herrera et al. (2005) state that the poor pay a greater share of their income in bribes, but these analyses do not account for measurement error and in some cases only consider bribers.

Having shown that the burden of bribery is not borne disproportionately by the poor, we study the mechanisms underlying the distribution of the burden of bribery. The distribution of the burden among users of public officials is the result of offsetting effects: rich users are more likely to bribe, but although rich bribers pay larger bribes, the bribes are a smaller share of their income than is the case for poor bribers. Such price discrimination is consistent with the theoretical model. The Ugandan data further reveal that poorer users are more likely to bribe unwittingly, and that income differences in the bribery rate are smaller once this is taken into account. The most closely related previous work is by Hunt (2007), who shows using the same Peruvian data how people bribe when they fall

[4]Perceptions from Transparency International (2004a). Purchasing power parity gross domestic product from Heston, Summers and Aten (2006). Inequality data from the World Bank's PovCalNet, accessed November 10th, 2008.

victim to misfortune, and by Deininger and Mpuga (2004), who use the same Ugandan data to show that individuals knowing how to report bribery are less likely to bribe. Their results, and those of Hunt (2004), also show that the rich bribe more frequently.[5]

We find that permanent income's role in households' use of officials also influences the distribution of the burden of bribery. The rich use officials much more than the poor, and it is this, rather than differences in bribery among users of officials, that drives the fact that the rich bribe more frequently than the poor, and ultimately pay the same or higher share of their income in bribes. This difference in usage might be the natural result of the rich demanding more of normal goods, although some services, such as the provision of welfare or even public health care, might be considered inferior goods. Development economists' concern is that the need to bribe deters the poor from using officials. We present evidence that bribery does not deter the poor from using officials more than it does the rich.[6]

Finally, we study the payoffs to bribery. The Peruvian data indicate that the main client benefit of bribing is to avoid the poor service delivered to clients who refuse to bribe. Voluntary bribers receive service similar to that of clients engaged in scrupulous transactions, involuntary bribers receive worse service, and clients who refuse to bribe receive the worst service. This suggests that service improvements in response to a bribe merely offset service reductions associated with angling for a bribe, and that clients refusing to bribe are punished. The Ugandan results are consistent with this, although they suggest that bribes may be used to avoid official fees for service. We conclude that bribery involves a transfer from client to official with little or no net change in service quality relative to a scrupulous transaction. Our results are consistent with Thompson and Xavier (2002), who find that Kazakh patients who bribe stay longer in hospital and rate their service worse.[7]

[5]Most other related work has focused on firms. For example, Svensson (2003) finds that more profitable firms pay larger bribes, while Chavis (2006) finds that well–connected managers pay less in bribes.

[6]Kaufmann et al. (2005) use a small Peruvian survey to show that people feel discouraged from using the most corrupt official types, but do not link this to differential use by income.

[7]Kaufmann and Wei (1999), Svensson (2001) and Fisman and Svensson (2007) find bribing firms have

Our results suggest that the main costs of bribery lie in efficiency losses, as any large distributional effects must come indirectly through the performance of the economy. Nevertheless, the Ugandan data indicate that a good starting point for reducing bribery for the poor would be to reduce unwitting bribery by increasing literacy and clearly publicizing official costs for services. More generally, the results highlight the power of public officials in their relationship with clients and the importance of weakening this power, for example by providing clients with a choice of official or rotating officials through jobs.

2 Corruption in Peru and Uganda

2.1 Peru

The enormous scale of grand corruption in Peru was revealed in 2000 by discoveries leading to the resignation and self–exile of President Alberto Fujimori. Video–taped evidence showed Fujimori's spy chief Vladimir Montesinos repeatedly bribing congressmen to defect to Fujimori's party to ensure its majority in congress. Worse, large bribes enabled Montesinos to control most of the media and influence the judiciary.[8]

Despite these high–profile bribes, Fujimori is credited with having reduced petty corruption. His 1990–2000 administration pursued policies reducing the role of government, which he justified not only on efficiency grounds, but on the grounds that reducing the role of government would reduce opportunities for corruption. He attempted to reduce corruption in the police and municipal governments, in the latter case by establishing a supervisory agency to field citizen complaints. In contrast, his reforms of the judiciary are thought to have made it more corrupt.

Despite some progress, several institutions with which ordinary people have much contact were judged to be corrupt by Transparency International in a November 2001 report.[9] An increase in the number of temporary judges, appointed in part to help clear

worse outcomes.

[8]See McMillan and Zoido (2004).

[9]Most of this section is based on this report: Transparency International (2001a). See also Transparency International (2001b) and World Bank (2001a, 2001b).

backlogs, had contributed to corruption. Such judges, representing 74 per cent of all judges, were vulnerable to political pressure and susceptible to corruption because of their lack of job security.

The morale of the police in 2001 was thought to be low owing to poor pay and equipment, which, combined with weak internal controls and sanctions, rendered the police susceptible to small and large–scale corruption, as well as to cooperation with criminals. At this time it was customary to bribe the transit police.[10]

Public administration generally was corrupted by poor pay, complex procedures for sanctioning bribe–taking, and the judiciary's frequent overturning of administrative sanctions. Public servants whose contracts had been converted to private sector terms were well–paid, but they lacked the job security that would protect them from political interference (and, presumably, allow them to report corruption by superiors).

The interim and Alejandro Toledo administrations that followed Fujimori made corruption a priority, but focused particularly on prosecuting actors in the Montesinos affair. Nevertheless, a set of anti–corruption proposals was drawn up in 2001 by a group including representatives of civil society and the World Bank. Some initiatives put into place include the naming of an "Anti–Corruption Tsar", the establishment of a special anti–corruption police division, and the introduction of an anti–nepotism law for the public service.

2.2 Uganda

As part of the collection of the Ugandan data, the consulting company commissioned by the government ran focus groups on bribery and availability of public services in 180 villages. The picture that emerges from the discussion summaries is of inadequate public services plagued with rampant corruption, a picture consistent with academic and World Bank studies.[11] Almost every focus group notes that medical attention at public hospitals and health units can only be obtained in exchange for payment, despite the official abo-

[10] Anecdotal evidence suggests that making the Lima transit police all–female reduced bribery.

[11] E.g. Svensson (2001).

lition of patient payments, and that the only drug available is Panadol (Tylenol). Other drugs must be purchased at pharmacies, drug shops or private practices with connections to the doctor recommending the drug. Some groups note that the corruption and poor service in the public health sector lead people to use private clinics, despite their cost, or mission or NGO hospitals, if available.[12] Most focus groups also report that the police will not respond to any call from a complainant unless given an up–front payment, purportedly for transport costs. One group notes that the poor cannot afford to use the police. Many groups note that innocent and guilty alike pay bribes to free themselves from arrest.

The most commonly cited institutions and types of corruption after health services and the police are schools, courts, tenders for public projects and nepotism. Many groups complain of the need to pay school fees at schools supposedly free under the Universal Primary Education program, and of embezzlement of schools funds by headmasters.[13] Court officials are accused of taking bribes from both sides to funnel to the prosecutor. Tenders for building projects are frequently mentioned as being decided on the basis of bribes and nepotism, and group members consider this corruption to lead to substandard work, particularly on school buildings. Nepotism in hiring into government jobs is frequently cited. An issue of concern to many participants is uncertainty about whether ostensibly official payments are actually bribes, given that receipts are frequently not received.

Most participants in the focus groups appear to view corruption and bribery negatively and portray bribes as being paid against the will of the client. However, in some cases participants mention that while most corruption is bad, bribery is mutually beneficial for client and official, and most focus groups appear to sympathize with corrupt officials to some degree because of their low and often delayed salaries and lack of housing. Focus group leaders report in the great majority of cases that participants spoke freely, and where they did not, this was usually when a member of the local council was present.

[12]See also Reinikka and Svensson (2005).

[13]Reinikka and Svensson (2004) show that only 13% of the education budget actually reaches schools.

3 Theoretical Framework

In our theoretical model of the mechanisms of bribery, two agents, the public official and the client, interact in a two–stage game. The official has a monopoly on the service he provides. The official plays first, and decides whether to angle for a bribe or not. If the official does not angle for a bribe, he carries out his job scrupulously in both stages (which means not shirking, and following required procedures, including possibly unnecessary red tape). If he angles for a bribe, he shirks in the first stage, which either conveys to the client that she should bribe, or sets the stage for the official actually asking for a bribe. We assume that either way the official can set the amount of the bribe. The client then bribes, or does not bribe. If she does not bribe, the official punishes her by shirking in the second stage as well.[14]

We assume that in return for the bribe, the official can offer a service to the client that is effortless to the official: putting the client's case at the front of the queue, or waiving certain paperwork (red tape). This is a service on top of the service provided by an official behaving scrupulously who requires compliance with all red tape.[15]

The formal model is presented in the Theoretical Appendix. It predicts that the clients receiving the worst service are those who refuse to bribe when a bribe is angled for: they receive zero service. Clients receiving scrupulous service receive two periods of service from the official, while those paying a bribe receive one period of service plus a reduction in red tape. Only empirical work can determine which of these bundles is more valuable to the client. In the extended model, where clients may have to bribe in return for only one period of service (and no reduction in red tape), such clients receive unambiguously worse service than clients receiving scrupulous service.

Rich clients may value the red tape reduction more than poor clients if the reduction

[14]The client in Cadot (1987) is also punished if she refuses to bribe, but may attempt to denounce the official and have him fired. She then attempts to conduct her business with his replacement.

[15]The official's control over red tape at low cost is reminiscent of Banerjee (1997). In his model, the official manipulates red tape to induce the client to reveal her valuation of the service, whereas in our model red tape reduction is merely an inducement for the client to bribe. In Kaufmann and Wei (1999) the official increases the amount of red tape to induce the client to bribe to reduce it.

saves time and the rich have a higher value of time. This implies rich clients are more willing to bribe and to pay a higher bribe conditional on bribing, for given scruples. The official is therefore more likely to angle for a bribe from a rich than a poor client.

4 Data

4.1 Peru

To measure the determinants of bribery in Peru, we use the 2002 and 2003 waves of the Peruvian household surveys, the Encuesta Nacional de Hogares (ENAHO), conducted yearly by Peru's national statistical agency, the Instituto Nacional de Estadística e Información. The surveys, which oversample rural regions, have more than 18,000 respondent households per year. Beginning in 2002, they include a governance module with questions on the use and bribery of public officials. One randomly chosen adult per household is asked numerous questions pertaining to the household's use of 21 different types of officials. If a particular type of official was used in the previous twelve months, then respondents are asked a series of questions in connection with use of this official type in this time–frame, whether the official asked for a bribe, gift, tip or "coima" (slang for bribe), whether the respondent felt obliged to bribe, bribed voluntarily, or refused to bribe, and the amount of the bribe if she bribed.

The module also asks respondents about the quality of the services received from each relevant official type: whether they saw an official immediately, the number of visits to the official, whether they concluded their business with the official, whether they consider the services received to be "good", "regular" or "bad" and whether they wasted significant time or money in connection with using the official (for example, on transportation). It is not possible to know for how many different purposes the client used the official. The question about the amount paid specifies that respondents should include the value of in–kind payments, but is ambiguous about whether this amount is the sum or average of all bribes paid to each official type. The statistical agency computes household consumption from 31 pages of questions.

4.2 Uganda

We use information on the 12,000 household respondents to the Ugandan Second National Integrity Survey, which over–samples urban areas. The Ugandan government commissioned a consulting company to conduct this survey in 2002. The core of the survey has a similar structure to the Peruvian bribery section, with a series of questions on usage, bribery, and service quality posed for each of 21 types of official or institution. The questions are asked of the household head or spouse, and the time horizon is the previous six months. A particularly valuable question asks whether the respondent received a receipt for any "official payment" they may have reported making: the suspicion in many countries is that ignorant clients are charged for services that are free, and receipts naturally tend not to be provided for such payments. In the questions, bribes are termed "payment other than official charges".

The question about the circumstances of the bribe implies that refusals to bribe could be included in the "asked for a bribe" category (and that bribes refused by the official could be included in the "offered a bribe" category), but refusals are not a separate category. Bribe amounts appear to be the sum of all bribes to an official. The question about bribe amounts appears to exclude the value of in–kind payments, which could be significant for the numerous subsistence farmers. Household expenditure is elicited through six questions pertaining to the previous week, and three questions pertaining to the previous month. The Data Appendix provides further information on both data sets.

4.3 Descriptive statistics

Columns 1 and 4 of Table 1 show that 86% of Peruvian and 87% of Ugandan households used at least one official (based on unweighted calculations). The bribery episode (bribing or refusing to bribe) rates differ sharply in the two countries, however. Four point nine percent of Peruvian households and 5.7% of Peruvian households who had used an official (columns 1 and 2) had experienced a bribery episode in the previous twelve months, compared to 27.8% and 32.0% in Uganda in the previous six months (columns 4 and

5). If Ugandans who had made a payment for which they did not receive a receipt are included with bribers, the share affected rises to 41.0% for the whole population and 47.2% for users of officials. As we discuss in the Data Appendix, although the surveys are likely to underestimate the true bribery episode rate, we do not believe the underestimation to be severe.

Peruvian household monthly consumption is much higher than Ugandan household monthly expenditure: $323 for the full Peruvian sample, compared to $88 for the full Ugandan sample (columns 1 and 4). In both countries, the consumption or expenditure is higher amongst those who have experienced a bribery episode (columns 3 and 6). This gap is less marked when Ugandans making a payment without receipt are included with bribers (column 7). Households in Peru and Uganda have similar outlays in bribes or receiptless payments, in the range of $18-$23 for households that bribe (columns 3, 6, 7), which translates to a much higher share of consumption or expenditure for bribers in Uganda than in Peru. While in Peru bribers pay only 0.5% of consumption, in Uganda bribers pay 6.6%–7.2%.

Table 2 provides the characteristics of bribery episodes using household–official pairs as the unit of observation.[16] For most of these pairs, no transaction took place: in only 12.1% of Peruvian and 9.7% of Ugandan pairs was the official used (columns 1 and 4). In the pairs where the official was used, the bribery episode rate was 2.3% in Peru (column 2) and 19.8% in Uganda, rising to 29.2% in Uganda when receiptless payments are included (column 5). Where a Peruvian bribery episode occurred, the respondent refused to bribe in 22% of cases (column 3).

Although 93% of Peruvian users concluded their business, only 74% of those with a bribery episode concluded their business. Given the phrasing and position of the question on concluding business, a positive response does not appear to imply necessarily that the business was concluded successfully. We view this variable as a proxy for the speed of service, whatever the outcome. For more subjective measures of service, whether the

[16]The data are stacked and contain 21 observations per household corresponding to the 21 types of official.

client judged it good or bad (available also for Uganda) and whether the client saw the official immediately, clients experiencing a bribery episode also report worse service than those who do not. On the other hand, the Ugandan data show that while 27.9% clients made an official payment (for which they received a receipt), this share is only 12.9% for the bribery episode sample (columns 5 and 6), suggesting a client payoff to bribery.

Table 3 shows that in Peru, the police account for 35% of bribery episodes (column 2) and the city (municipal) government for 21%, with the judiciary in third rank with 12%. These three institutions account for 68% of bribery episodes, and 80% of money paid in bribes (column 3). The judiciary and the police have the highest bribery episode rates – 37% and 16% respectively – but few users (columns 4 and 5). In Uganda, it is health units which dominate in terms of the share of bribes, with 37%, followed by the police with 19%, and the lowest level of local government with 11%. These three account for 67% of bribes, but only 49% of the value of bribes. As in Peru, courts take very large bribes, and account for 16% of the value of bribes yet only 3% of bribes. The police have the highest bribery episode rate at 49%.

5 Is the burden of bribery borne disproportionately by the poor?

We begin by considering whether the burden of bribery is borne disproportionately by the poor, analyzing the data at the household level. Our first measure of the burden is the share of equivalent permanent income spent on bribes to all types of official.[17] We compute equivalent permanent income by dividing consumption or expenditure by the square root of household size, to take into account the large variation in household size and number of earners per household. We use the weights in our calculations (in the regressions below we instead condition on the strata used for sampling). Column 1 of Table 4 shows that

[17] A small number of bribes have missing values (33 for Peru and 71 for Uganda). We set them to zero. Five affected Peruvian households and 22 affected Ugandan households nevertheless have non–zero bribe totals across all officials.

the expected monthly bribe outlay is higher for richer households, rising from 15c for the bottom equivalent income quintile to $2.55 for the top quintile in Peru and from $2.30 to $12.00 in Uganda (all in U.S. currency). When receiptless payments are counted as bribes for Uganda in column 2, the range is from $3.00 to $15.80.

Column 3 presents expected bribe outlays as a share of consumption or expenditure (in percent). For Peru the share is small (0.017% on average), and rises with consumption; the difference between the top quintile and the bottom two is statistically significant. For Uganda, the shares are large, and the 4.6% share for the bottom quintile is significantly larger than the shares for other quintiles. The greater burden for the poor is even more marked in column 4, where receiptless payments as counted as bribes.

However, if consumption is measured with error, looking at its effect on bribes divided by consumption will lead to a relation biased in the negative, and hence regressive, direction (and similarly for expenditure). For Peru, this problem can be remedied simply by considering the ratio of bribes to net total income by consumption quintile, as in column 5: the positive relation between the share and quintile is only slightly weakened.

We expect much more measurement error in Ugandan expenditure than in Peruvian consumption, owing to the more limited number of questions the Ugandan variable is based on. The huge standard deviation of the share of the bottom quintile in Uganda suggests measurement error in expenditure might be leading some high expenditure respondents to be classified in the bottom quintile. We cannot perform the exercise of column 5 for Uganda because the survey does not measure household income. However, we can use other variables in the data as instruments for expenditure: information about whether the household has a telephone, the household's type of latrine, whether the household owns its house, and the quality of the structure of the dwelling.[18] The means of these variables are presented in Appendix Table 1.

[18]We also have information on whether the household has electricity and the type of water supply used, but we do not use these as they are likely to affect the amount of bribes paid by affecting the probability of using the water and electricity authorities. The phone company, by contrast, is not listed as a possible bribery recipient.

We use these instruments in Table 5. Column 1 of panel A shows that in a simple least squares regression of bribery's share in expenditure on log expenditure (and conditioning on household size dummies, district dummies and an urban dummy) shows a significantly negative relationship. When expenditure is instrumented in column 2, the sign of the coefficient flips to positive, although the increase in the size of the standard errors means that it is not statistically significant. The excluded instruments have a very high joint F–statistic of 65. In columns 3 and 4 a dummy for a household's being in the bottom expenditure quintile is used instead of the continuous expenditure measure. Here again, instrumenting flips the sign of the coefficient (in this case from positive to negative). The results are similar in panel B, where the value of receiptless payments are added to the value of bribes, although the coefficient in column 4 is merely reduced to one tenth of its column 3 value, rather than flipping sign. The point estimates are therefore generally consistent with a positive relation between expenditure and the burden of bribery, as was found for Peru.

Even if bribery's financial burden is equal across the income distribution, it is possible that the financial burden needs to be progressive in order to constitute an equitable burden in terms of household welfare. We therefore define a second measure of the burden for a household, available for Peru only: the number of official types the household reports having caused a waste of time or money. Households who experience at least one bribery episode report more wasteful incidents than households who experience no bribery episode (the results are not reported in a table). However, the difference between bribery and non–bribery households is similar at the top and bottom of the distribution: 1.54 incidents for the bottom quintile compared to 1.58 incidents for the top quintile. These results suggest that the utility burden, like the financial burden, is not regressive across consumption classes. The question remains of whether the burden is regressive once non–users, who may be discouraged potential users, are considered. It is natural to consider this point in the section below on the determinants of using officials.

6 Empirical Specification: Mechanisms and Payoffs

Our empirical tests of the bribery mechanisms and payoffs fall into two categories: tests of who pays bribes, and tests of the payoffs for the parties involved. The unit of observation is the household–official pair. For the first category we run probits on different samples with the following specification:

$$Y_{ijt} = \alpha_1 + \mu_j + \gamma_t + \beta_1 W_{it} + \mathbf{X_{it}}\beta_2' + \beta_3 Z_{ijt} + \epsilon_{ijt} \quad (1)$$

where j indexes the official type, i the household and t the survey year, and Y_{ijt} is the outcome variable of interest: probability of using a particular official type (full sample), or probability of a bribery episode (for the sample of observations where the official is used). Variables μ_j are official–type fixed effects, γ_t is a dummy for the 2003 survey (Peru only), W_{it} is a measure of (log) household consumption or expenditure, and X_{it} contains the other characteristics of the respondent and household. All the variables in Appendix Tables 2 and 3 (Uganda) and 4 and 5 (Peru) are included in X_{it}: respondent information on demographics, education and occupation; and household information on place of residence, vehicle ownership and household composition. Monthly visits, likely to be for routine business such as paying bills, are represented by Z_{ijt}, a dummy for whether a household visited an official type twelve times (Peru).

We are most interested in β_1, which describes the relationship between income and the probability of using an official or the probability of a bribery episode. Given the minor matters for which most bribes in the sample are paid, simple reverse causality, whereby households are enriched by bribery, seems unlikely. We have verified that the Peruvian results are unchanged when employers, self–employed and unpaid family workers, for whom reverse causality is more likely, are dropped.[19] More subtly, if client unscrupulousness not only increases the probability of bribery, but also increases client income W_{it}, failure to control for this characteristic will lead to β_1 being biased up when (1) is used to estimate the probability of a bribery episode. For Peru, we can address this by

[19]For Uganda these groups cannot be identified precisely.

adding to X_{it} dummy variables representing a rich set of respondent opinions, to proxy for unscrupulousness: whether the respondent prefers democratic, military, technocratic or authoritarian government; whether the respondent is on the far left, left, center, right or far right politically; whether the respondent has considered a political career; whether the respondent identifies most with country, region (department), ethnicity or religion; whether the respondent donated to charity; whether the respondent thinks politicians are out to enrich themselves rather than trying to help people; and the degree to which the respondent has confidence in Congress (the institution in which the fewest people have confidence). We also experiment with adding a likely endogenous dummy for whether the respondent listed corruption as one of the top problems facing the country.

When we are interested in the determinants of the amount of the bribe, or the client payoff to bribery, we estimate equations of the following form:

$$H_{ijt} = \alpha_2 + \mu_j + \gamma_t + \beta_4 W_{it} + \mathbf{X_{it}}\beta_5' + \beta_6 Z_{ijt} + \mathbf{BE_{ijt}}\beta_7' + \epsilon_{ijt}. \quad (2)$$

The notation and specification here are the same as in (1), except that BE_{ijt} are dummies for whether the respondent had one of the possible types of bribery episodes (solicited, felt obliged, voluntary, refused), and, for the sample who paid bribes, the outcome H_{ijt} is the (log) amount of bribe paid. For the sample where the official is used, H_{ijt} is either whether the client successfully concluded her business with the official (for Peru), whether the client rated the service as bad, whether the client saw the official immediately (Peru), or whether the client made an official payment for which she was given a receipt (Uganda). According to the dependent variable, (2) is estimated using ordinary least squares or probits. The theoretical model makes clear that BE_{ijt} are endogenous: in the absence of convincing instruments, we use the theoretical model and other considerations to interpret the results.

We are concerned that measurement error may bias the consumption coefficients towards zero. In addition to running the specifications reported below, we have run all Peruvian regressions instrumenting consumption with net total income. However, this did not in general raise the point estimates, suggesting that any measurement error is

non–classical or correlated between consumption and income. We present results for Uganda from regressions where we instrument expenditure with the information on living standards used in the previous section.

The Peruvian results reported below are similar when expenditure or poverty dummies are used instead of consumption, but various income measures have smaller coefficients. In all regressions we cluster standard errors at the level of the Peruvian district or Ugandan sub–county.

7 Mechanisms

We now study the mechanisms behind the distribution of bribery shown in section 5, although we do not perform a formal decomposition.[20]

7.1 Use of officials

We begin with probits for the full set of stacked household–official pairs to study the effect of consumption and expenditure on the probability of using an official. Column 1 of Table 6 includes only basic covariates: for Peru, travel time to the district administrative center and dummies for twelve visits, household size, town size, region and the 2003 survey; for Uganda, dummies for district, household size and urban residence. Panel A indicates that if Peruvian household consumption is doubled (an increase of about one standard deviation), the probability of using an official rises by (0.045)(log2)=0.031, or 3.1 percentage points. Panel B indicates that the equivalent for Uganda is (0.021)(log2)=0.015. These effects compare to usage rates at the household–official level of 12.1% for Peru and 9.7% for Uganda.

In this table and those that follow, we prefer the column 2 specification, which includes official type dummies, over the column 1 specification. In this table, the marginal effects

[20]Reconciling the regressions and the distribution of bribery's burden is complicated by the fact that when one backs the distribution out of the regressions, one calculates average bribes divided by average expenditure, instead of the average of the ratio.

of expenditure and consumption are slightly lower for both countries in column 2 than in column 1. In Table 6, as in many subsequent tables, the addition of education and job type, in column 3, has little effect. We can therefore focus on column 4, which has the most covariates. Here, the marginal effect is 0.025 for Peru and 0.014 for Uganda, indicating that about half the effect of consumption and expenditure can be explained by other covariates. This is the preferred specification for Peru, while for Uganda the preferred specification is the instrumental variables specification of column 5. Instrumenting raises the coefficient considerably, indicating measurement error in household expenditure, and the coefficient of 0.029 is very similar to the preferred Peruvian coefficient of 0.025.

The effect of consumption or expenditure on use of officials could reflect greater demand by the rich (though supply and demand are not separately identified), or it could reflect disproportionate discouragement by the poor in the face of bribery. What is required to test the latter hypothesis is an exclusion restriction permitting us to estimate the impact of expected bribes on use of officials. In the absence of a convincing exclusion restriction for either country, we exploit the Ugandan variables in a different approach.

The Ugandan survey asks each respondent to rate to what degree each official type is free from bribery on a five point scale, and we examine the effect of this on use of officials. We begin by restricting the sample to household–official pairs in which the household has an opinion about the official, assuming that to be discouraged, one must have an opinion (70% of non–users have no opinion, compared to 13% of users). To minimize the reverse effect of usage on beliefs, we further restrict the sample to the half of respondents who said that their opinions about corruption in public service delivery were little or not influenced by their own experiences (or answered no opinion to this question). Unreported results from this sample show those who rate an official type in the most scrupulous category are more likely to use the official, but the controls for beliefs do not affect the coefficient on household expenditure (indicating a similar distribution of opinion by expenditure). Furthermore, the addition of an interaction term indicated that a favorable assessment increased the use of the rich more than the poor. This evidence, while imperfect, is

inconsistent with disproportionate discouragement of poor potential users.[21]

7.2 Bribery conditional on use of the official

We next examine the determinants of a bribery episode, conditional on the official in the household–official pair having been used by the household. The marginal effects from these probits, multiplied by 100, are reported in Table 7. The Peruvian marginal effect of 0.740 in column 1 of panel A indicates that a doubling of consumption increases the probability of a bribery episode by (0.0074)(log2)=0.0051, or 0.5 percentage points, relative to a base of 2.3%. The Ugandan marginal effect in panel B is higher at (0.0121)(log2)=0.0084 or 0.8 percentage points, but is much lower compared to the Ugandan bribery rate of 19.8%. The addition in column 2 of 20 dummies for the various official types greatly reduces the coefficients associated with consumption for Peru, but not for Uganda. For Peru, the marginal effect is reduced by two–thirds to 0.253. Thus, at least half of the greater propensity of the Peruvian rich to bribe is because they disproportionately use official types that are generally more involved in bribery.[22] If this reflects discouragement by poor users, it is not an effect that generalizes to Uganda. In the case of the police, high usage could be involuntary.

For Peru, the marginal effect is little affected by the addition of further controls in columns 3 and 4.[23] For Uganda, adding information on education and job type in column 3 increases the marginal effect on expenditure from 1.13 to 1.79, but further controls, including the many dummies for detailed official type and the reason for using the official in column 5, do not change the marginal effect.[24] For Uganda, it is not clear whether the preferred specification is one including or excluding education and job type. In column 6, we present instrumental variables counterparts to column 5 for Uganda.

[21] The results are similar if all respondents with an opinion are included.

[22] Hunt (2006) investigates this further.

[23] If we add household dummies to the one quarter of the Peruvian sample that is a panel, the coefficient on consumption is rendered insignificant by standard errors eight times larger than in Table 7.

[24] In order to include the hundreds of covariates for this specification, we have to use linear probability. With fewer covariates, probit and linear probability give extremely similar results for Uganda.

Oddly, in this case instrumental variables causes the coefficient to fall to zero.

In the Ugandan data, the broader category of bribery episodes and payments for which no receipt was given may be considered, and the specification with maximum covariates for the probability of making a payment in this category is presented in column 7. The marginal effect of expenditure on bribery is smaller at 0.97 than in the equivalent column 5. As is implicit in the comparison with column 5, unreported regressions show the poor are more likely to make a payment with no receipt, which cancels out the higher probability of the rich of making an explicit bribe. The focus group discussions suggest this means the poor are more likely to make unwitting bribes, rather than that the poor avoid admitting explicitly to a bribe by disguising it as a receiptless payment. Not taking this into account leads to an overstatement of the bribery gap by expenditure. These results suggest that the Peruvian data may overstate the influence of consumption by omitting unwitting bribes. However, given the higher adult literacy rate in Peru – 88% compared to 67% in Uganda – unwitting bribes may be less common.[25]

The covariates included in the regressions of the table do not include proxies for the scrupulousness of the client. However, the Peruvian results, and all other Peruvian results in the paper, are unchanged by the simultaneous addition of the many dummy variables, listed in the empirical specification section, capturing respondent character and opinions.

Thus far, the analysis has not distinguished between types of bribery episode. Unreported multinomial logit analysis of the types of Peruvian bribery episode (solicited, felt obliged, voluntary and refused) leads to large standard errors, but points to a positive effect of consumption on all types compared to no bribery episode. Similar analysis for Uganda shows positive effects of expenditure on both bribe types compared to no bribery episode, but the effect on offered bribes is statistically significantly larger than the effect on bribes that were asked for.

[25]Literacy rates are from UNESCO at www.uis.unesco.org/ev.php?ID=6705_201&ID2=DO_TOPIC .

7.3 Decomposition into use and bribery conditional on use

We have shown that the rich have a higher incidence of bribery episodes in both countries, and that both higher usage rates and higher bribery rates conditional on use contribute to this. It is useful to quantify the relative sizes of the two components. The probability of bribing $P(B)$ is the product of the probability of using the official $P(U)$ and the probability of bribing the official conditional on use $P(B|U)$. The bribery gap between the top quintile of equivalent consumption or expenditure (5) and the bottom quintile (1) is

$$P_5(B) - P_1(B) = P_5(U)\ P_5(B|U) - P_1(U)\ P_1(B|U), \tag{3}$$

which can be rewritten as

$$P_5(U)\Delta P(B|U) + P_1(B|U)\Delta P(U) \tag{4}$$

or

$$P_1(U)\Delta P(B|U) + P_5(B|U)\Delta P(U), \tag{5}$$

where $\Delta P(B|U) = P_5(B|U) - P_1(B|U)$ and similarly for $\Delta P(U)$.

For Uganda, the usage gap $\Delta P(U)$ is 0.062 in the household–official data, and the gap in bribery conditional on usage $\Delta P(B|U)$ is 0.035 (all based on weighted data). The decomposition shows that the usage gap represents 72–85% of the overall bribery gap $\Delta P(B)$ of 0.016. For bribery episodes and receiptless payments, the usage gap represents more than 100% of the overall bribery gap, as the bottom quintile pay more frequently than the top quintile conditional on use.

For Peru, the results are more sensitive to whether they are based on (4) or (5). The usage gap is 0.113, and the gap in bribery conditional on usage is 0.008 (in weighted data). The usage gap contributes 61–87% of the overall bribery gap of 0.003. Usage behavior generally explains an even larger share, since, as indicated in Table 7 columns 1–2, a good fraction of the $\Delta P(B|U)$ gap is explained by the more corrupt mix of officials used by the rich.

7.4 Bribe amount

In Table 8, for the sample of household–official pairs where a bribe was actually paid, we examine the determinants of the amount of the (log) bribe. For both Peru and Uganda, all specifications indicate that, as predicted by the theoretical model, the official receives larger bribe amounts from richer clients. Column 1 indicates that the Peruvian consumption elasticity of the bribe amount is 0.36 with only basic covariates included, and the equivalent number for Uganda is very similar at 0.33. The marginal effects of consumption and expenditure decline to 0.27 for Peru and 0.24 for Uganda as additional covariates are added in columns 2–4.[26]

In column 5 we control for the type of bribery episode. For Peru, compared to the omitted bribe solicited by the official, those feeling obliged to bribe and especially those bribing voluntarily pay smaller bribes. Similarly, Ugandans offering to pay a bribe pay smaller bribes than those asked for a bribe. Solicited bribes may be larger because they include a risk–premium for the official or because there is an advantage to being the first mover in a bargaining game. Alternatively, the size of the bribe across categories may be related to the circumstances that lead to that category occurring.

In column 6 for Uganda, we control for the detailed official type dummies and the dummies for the purpose of the visit. These scarcely affect the coefficient on expenditure. With such complete covariates, we feel confident that the positive elasticity represents first–degree price discrimination on the part of the official. The elasticity is robust to broadening the definition of a bribe to include receiptless payments, as in column 7. When we instrument expenditure in column 8, the point estimate of the elasticity grows substantially to 0.66, indicating substantially greater price discrimination than in Peru (the unreported instrumental coefficient for the broader definition of bribes is similar).[27]

[26] If a tobit is performed on a sample including the zeroes of non–bribing users, the coefficient on consumption is very similar to least squares for Peru, and larger for Uganda. The explanatory variable is of necessity the level of consumption or expenditure, rather than the log.

[27] Price–discrimination is not inconsistent with the claim often made that for particular transactions "everyone knows how much you have to bribe". People in rich circles may know the price for rich people, and be unaware that people in poor circles "know" a lower price.

8 Client Payoffs to Bribery

In this section, we investigate the payoff to the client of bribing or refusing to bribe, compared to dealing with an official acting scrupulously, while allowing consumption to have an independent effect on the payoff. Our preferred measures of payoffs are the Peruvian dummy for whether the client concluded her business with the official, which we believe represents speed of service, and the Ugandan dummy for whether an official fee was paid (and a receipt issued), an indicator of whether the client might have bribed to avoid official fees. The effect of bribing on these payoffs is shown in columns 1 and 2 of Table 9. For brevity, we present only the results with full covariates and without instrumenting expenditure for Uganda (the coefficients on bribe types change little with instrumenting).

Column 1 shows that, as predicted by the model, the slowest service in Peru is received by clients who refuse to bribe: the probability of a client who refuses to bribe concluding her business is 16.0 percentage points lower than that of a client who had no bribery episode (and hence dealt with an official acting scrupulously). This marginal effect is significantly different from those for the other bribe categories of solicited, felt obliged, and voluntary. Those who felt obliged to bribe, or whom the official solicited for a bribe, also did significantly worse than those dealing with a scrupulous official, by 2.8–4.8 percentage points. This can be interpreted in two ways consistent with the model and its extension: either extra service in exchange for a bribe fails to make up for shirking on average; or, while some clients who bribe for extra service get a net benefit compared to clients with scrupulous dealings, bribers do worse overall because other clients are subjected to shirking and obliged to bribe merely to get normal service.

The service received by voluntary bribers is statistically indistinguishable from the service received by clients with scrupulous dealings. The theoretical model did not allow for voluntary bribes. Clients who value fast service more than the official can observe or who anticipate particularly slow service are likely to bribe voluntarily. For example, a client in a hurry who discovers a particularly long queue upon arriving in an office may

seek out an official to bribe to jump the queue. The bribe may succeed in improving service, yet, given the bad initial situation, only bring service up to the normal level.

A negative correlation between service quality and bribery could arise through channels other than that of the model. For instance, for those who felt obliged to bribe, the negative coefficient could reflect that they had mistaken a naturally incompetent official for an official angling for a bribe. If corrupt officials also tend to be incompetent, this would make the coefficients on all the bribery categories more negative (we return to this point below). However, unlike our model, these channels do not predict our empirical result that refusal to bribe is associated with the worst service of all.[28]

Column 2 shows that Ugandan clients experiencing either type of bribery episode were less likely to make an official payment for which a receipt was received: by 12.7–14.7 percentage points (compared to a mean of 27.9%).[29] Even here the benefit of bribing is complex, however, as unreported analysis shows that bribing does not reduce the sum of all payments made to the official.

The data also contain more subjective assessments of service quality that could represent payoffs to bribery. In column 3 we examine the probability of seeing a Peruvian official immediately, since the purpose of many bribes is to jump a queue to see an official. The marginal effects on the types of bribery episode mirror the case of concluded business in column 1: those involved in bribery are statistically significantly less likely to see an official immediately, compared to clients engaged in non–corrupt dealings, and especially so for those who refuse to bribe. Clients who refuse to bribe are 17.1 percentage points less likely to see an official immediately, a statistically significantly worse outcome than for the three types of clients who do bribe.

We perform a similar exercise for the probability of the service being assessed as bad. For Peru, the marginal effects for the bribery categories have a familiar pattern

[28]The effects of different bribe types are similar when the sample is split into poor and non–poor households. If we add household dummies to the one quarter of the sample that is a panel, the results for the bribery types also change little.

[29]By definition a client can pay either an 'official' payment with a receipt, or without, so we do not control for receiptless payment.

in column 4: those involved in bribery are worse off, while among this group, clients refusing to bribe are worst off and voluntary bribe payers are best off. The results for Uganda in columns 4 and 5 show that here too respondents who had a bribery episode were more likely to rate their service as bad. As for Peru, the magnitude is smaller for those who offered to bribe: 15.1 percentage points versus 22.6 percentage points for those who were asked to bribe (column 5). Respondents who made a receiptless payment are 5.0 percentage points more likely to rate their service as bad. This could come about either because some of these payments are misclassified bribes, or because unscrupulous officials are also less competent even when obtaining a bribe by deception rather than by angling for it. If the whole effect is the latter one, it suggests that some of the poor service for those explicitly bribing is due to natural incompetence on the part of unscrupulous officials. However, it also suggests that most of the poor service is caused by other factors, unless clients who care less whether they obtain a receipt also care less than others about service quality generally.

9 Conclusions

The mechanisms through which permanent income affects bribery are remarkably similar in the disparate settings of Peru and Uganda. The rich bribe more frequently than the poor, principally because they use more officials than the poor. Amongst users of officials, the rich are slightly more likely to bribe than the poor, although the gap is smaller when unwitting bribes are taken into account. However, although rich bribers pay larger bribes, consistent with price–discrimination, the bribes are a smaller share of their income than is the case for poor bribers. The offsetting effects lead to an equitable or progressive distribution by permanent income quintile of the share of income paid in bribes. We do not find evidence that this result arises due to disproportionate discouragement of poor potential users in the face of bribery.

The main benefit of bribery to a client is avoidance of the poor service delivered to clients who refuse to bribe. The results suggest that service improvements in response

to a bribe merely offset service reductions associated with angling for a bribe, and that clients refusing to bribe are punished.

Our results suggest that the main costs of bribery lie in efficiency losses, as any large distributional effects must come indirectly through the performance of the economy. Nevertheless, the Ugandan data indicate that a good starting point for reducing bribery for the poor would be to reduce unwitting bribery by improving literacy and clearly publicizing official costs for services. More generally, the results highlight the power of public officials in their relationship with clients and the importance of weakening this power, for example, by providing clients with a choice of official, and rotating officials through jobs.

References

[1] Aidt, Toke. "Economic Analysis of Corruption: a Survey". *Economic Journal*, Vol.113 (November 2003): F632-F652.

[2] Andvig, Jens Christian and Karl Ove Moene. "How Corruption May Corrupt". *Journal of Economic Behavior and Organization*, Vol.13 (1990): 63–76.

[3] Banerjee, Abhijit. "A Theory of Misgovernance". *Quarterly Journal of Economics*, Vol.112 (4) (1997): 289–1332.

[4] Bertrand, Marianne, Simeon Djankov, Rema Henna and Sendhil Mullainathan. "Does Corruption Produce Unsafe Drivers?" National Bureau of Economics Research, NBER Working Paper 12274, 2006.

[5] Cadot, Olivier. "Corruption as a Gamble". *Journal of Public Economics*, Vol.33 (1987): 223–44.

[6] Castillo, Marco, Ragan Petrie, Maximo Torero and Angelino Visceiza. "Lost in the Mail: A Field Experiment on Corruption". Georgia State University Working Paper, 2008.

[7] Chavis, Larry. 2006. "Firms, Bureaucrats, and Organized Crime: An Empirical Examination of Illicit Interactions". Stanford Graduate School of Business Working Paper, 2006.

[8] Choi, Jay Pil and Marcel Tham. "The Economics of Repeated Extortion". *RAND Journal of Economics*, Vol.35 (2) (Summer 2004): 203–223.

[9] Deininger, Klaus and Paul Mpuga. "Does Greater Accountability Improve the Quality of Public Service Delivery? Evidence from Uganda". *World Development* Vol.33 (1) (2004): 171–191.

[10] Di Tella, Rafael and Ernesto Schargrodsky. "The Role of Wages and Auditing During a Crackdown on Corruption in the City of Buenos Aires". *Journal of Law and Economics*, Vol.1 (April 2003): 269–292.

[11] Fisman, Raymond and Jakob Svensson. "Are Corruption and Taxation Really Harmful to Growth? Firm Level Evidence". *Journal of Development Economics*, Vol.83 (1) (May 2007): 63–75.

[12] Fisman, Raymond and Roberta Gatti. "Decentralization and Corruption: Evidence Across Countries". *Journal of Public Economics*, Vol.83 (2002): 325–345.

[13] Granovetter, Mark. "The Social Construction of Corruption". Stanford University Working Paper, 2005.

[14] Gupta Sanjeev, Hamid Davoodi and Rosa Alonso–Terme. "Does Corruption Affect Income Inequality and Poverty?". *Economics of Governance*, Vol.3 (2002): 23–45.

[15] Herrera, Javier, Razafindrakoto, Mireille and François Roubaud. "Gouvernance, démocratie et lutte contre la pauvreté: enseignements tirés des enquêtes auprès des ménages en Afrique et en Amérique latine". DIAL Working Paper, 2005.

[16] Heston, Alan, Robert Summers and Bettina Aten. *Penn World Table Version 6.2*, Center for International Comparisons of Production, Income and Prices at the University of Pennsylvania, 2006.

[17] Hunt, Jennifer. "Trust and Bribery: The Role of the Quid Pro Quo and the Link with Crime". National Bureau of Economic Research, NBER Working Paper 10510, 2004.

[18] Hunt, Jennifer. "Why Are Some Public Officials More Corrupt Than Others?". In Susan Rose–Ackerman ed. *International Handbook on the Economics of Corruption*, Cheltenham: Edward Elgar, 2006.

[19] Hunt, Jennifer. "How Corruption Hits People When They Are Down". *Journal of Development Economics* Vol.84 (2)(2007): 574–589.

[20] Kaufmann, Daniel, Sanjay Pradhan and Randi Ryterman. "New Frontiers in Diagnosing and Combating Corruption". *World Bank PREM Notes: Public Sector*, October (1998).

[21] Kaufmann, Daniel, Judit Montorial–Garriga and Francesca Recanatini. "How Does Bribery Affect Public Service Delivery? Micro–evidence from Service Users and Public Officials in Peru". World Bank working paper, 2005.

[22] Kaufmann, Daniel and Shang–Jin Wei. "Does 'Grease Money' Speed Up the Wheels of Commerce?". National Bureau of Economic Research, NBER working paper 7093, 1999.

[23] Kingston, Christopher. "Corruption and Social Structure: Theory, and Evidence from India". BREAD Working Paper No. 075, June 2004.

[24] Lui, Francis. "An Equilibrium Queuing Model of Bribery". *Journal of Political Economy*, Vol.93(4) (1985): 760–81.

[25] Mauro, Paolo. "Corruption and Growth". *Quarterly Journal of Economics*, Vol.110(3) (1995): 681–712.

[26] McMillan, John and Pablo Zoido. "How to Subvert Democracy: Montesinos in Peru". *Journal of Economic Perspectives*, Vol.18(4) (Fall 2004): 69–92.

[27] Mocan, Naci. "What Determines Corruption? International Evidence From Micro Data". University of Colorado Working Paper, 2005.

[28] Olken, Benjamin. "Monitoring Corruption: Evidence from a Field Experiment in Indonesia". *Journal of Political Economy* Vol.115 (2) (2007): 200-249.

[29] Olken, Benjamin. "Monitoring Corruption: Evidence from a Field Experiment in Indonesia". NBER working paper 13145, 2007.

[30] Olson, Mancur Jr., Naveen Sarna and Anand Swamy. "Governance and Growth: A Simple Hypothesis Explaining Cross–Country Differences in Productivity Growth". *Public Choice*, Vol.102 (2000): 341–64.

[31] Prendergast, Canice. "Selection and Oversight in the Public Sector, with the Los Angeles Police Department as an Example". National Bureau of Economic Research, NBER working paper 8664, 2001.

[32] Proética. "Segunda Encuesta Nacional Sobre Corrupción". APOYO Opinión Y Mercado. Lima: APOYO, 2003.

[33] Proética. "Tercera Encuesta Nacional Sobre Corrupción". APOYO Opinión Y Mercado. Lima: APOYO, 2004.

[34] Reinikka, Ritva and Jakob Svensson. "Fighting Corruption to Improve Schooling: Evidence from a Newspaper Campaign in Uganda". *Journal of the European Economic Association*, Vol. 3 (2005): 259–267.

[35] Reinikka, Ritva and Jakob Svensson. "Local Capture: Evidence from a Central Government Transfer Program in Uganda". *Quarterly Journal of Economics*, Vol. 119 (2004): 679–705.

[36] Rose–Ackerman, Susan. "The Economics of Corruption". *Journal of Public Economics*, Vol.4 (1975): 187–203.

[37] Rose–Ackerman, Susan. *Corruption: A Study in Political Economy.* New York: Academic Press, 1978.

[38] Sah, Raaj Kumar. "Persistence and Pervasiveness of Corruption: New Perspectives". Yale Economic Growth Center Discussion Paper No. 560, August 1988.

[39] Shleifer, Andrei and Robert W. Vishny. "Corruption". *Quarterly Journal of Economics*, Vol.109 (August 1993): 599–617.

[40] Svensson, Jakob. "Who Must Pay Bribes and How Much? Evidence From A Cross Section of Firms". *Quarterly Journal of Economics*, Vol.118 (February 2003): 207–30.

[41] Svensson, Jakob. "The Cost of Doing Business: Firms' Experience with Corruption in Uganda". In Ritva Reinikka and Paul Collier eds. *Uganda's Recovery: The Role of Farms, Firms and Government.* Oxford: Oxford University Press.

[42] Swamy, Anand, Stephen Knack, Young Lee and Omar Azfar. "Gender and Corruption". *Journal of Development Economics*, Vol.64 (2001): 25–55.

[43] Thompson, Robin and Ana Xavier. "Unofficial payments for acute state hospital care in Kazakhstan. A model of physician behaviour with price discrimination and vertical service differentiation". LICOS Centre for Transition Economics Discussion Paper 124, 2002.

[44] Transparency International. "Country Report on the National Integrity System in Peru". (In Spanish) Report prepared by Instituto APOYO for Transparency International. Lima: APOYO/Transparency International, 2001a.

[45] Transparency International. "Country Report on the National Integrity System in Peru". (In Spanish) Questionnaire for report prepared by Instituto APOYO for Transparency International. Lima: APOYO/Transparency International, 2001b.

[46] Transparency International. "Corruption continues to deprive societies around the world". Press Release (20 October 2004), http://www.icgg.org/downloads/ (Retrieved 16 December 2004) Berlin: Transparency International, 2004a.

[47] Transparency International. "Report on the Transparency International Global Barometer 2004". Policy and Research Department. Berlin: Transparency International, 2004b.

[48] Treisman, Daniel. "The Causes of Corruption: A Cross–National Study". *Journal of Public Economics*, Vol.76 (3) (2000): 399–457.

[49] Wei, Shang–Jin. "How Taxing is Corruption on International Investors?" *Review of Economics and Statistics* Vol. 82 (1) (2000): 1-11.

[50] World Bank. "Peru Institutional Governance Review". World Bank Peru Governance Diagnostics. Washington: World Bank, 2001a.

[51] World Bank. *Memorandum of the President of the International Bank for Reconstruction and Development to the Executive Directors on a Country Assistance Strategy: Progress Report of the World Bank Group for Peru.* Bolivia, Ecuador and Peru Country Management Unit. Washington: World Bank, 2001b.

[52] Yang, Dean. "Can Enforcement Backfire? Crime Displacement in the Context of Customs Reform in the Philippines," *Review of Economics and Statistics* Vol. 90 (1) (2008) pp.1–14.

Theoretical Appendix

T.1 Model

If the official is scrupulous in both stages, he experiences disutility of effort E per stage, and utility U_O per stage from having resisted the temptation of bribery i.e. from having discharged his duty with appropriate effort, according to the rules and without taking bribes. His wage is normalized to zero. The total utility of the scrupulous official over two periods is therefore:

$$2(U_O - E). \tag{6}$$

When considering whether to angle for a bribe or not, the official must consider whether he can induce the client to bribe in the second stage, so we first examine the bribery versus punishment alternatives that follow from the official angling for a bribe. If the client does bribe, the official exerts effort E in the second stage and receives bribe B. The official's second stage utility is therefore:

$$B - E. \tag{7}$$

If the client refuses to bribe, the official shirks in the second stage, exerting no effort, and has a utility of zero. Therefore, the official prefers receiving a bribe to punishing the client by shirking if the bribe gives more utility than the disutility of effort:

$$B > E. \tag{8}$$

To induce the client to bribe, however, the official must make an offer that is attractive to the client. If she bribes, the client receives utility E from the effort the official is exerting, and receives utility R from having reduced bureaucracy. If she refuses to bribe, she will simply get utility U_C from having refused to bribe, and no utility from services from the official who is exerting no effort. R, U_C and U_O are independent. The client therefore chooses to bribe if $E + R - B > U_C$, which implies

$$B < E + R - U_C. \tag{9}$$

From (8) and (9), if both official and client prefer bribery, it must be that $R > U_C$: the benefit to the client from reduced bureaucracy must be greater than the utility she gets from refusing to bribe. This may be because the service provided by that official is particularly bureaucratic, because the client is rich and thus values time highly, or because the client has few scruples.

We assume that the official knows both the organizational structure and client income, the latter based on his records or the client's appearance and address, and hence the value of R. We assume that the official knows the distribution of U_C, though not a particular client's value, and chooses B^* with this knowledge and his knowledge of R. Some clients will choose not to bribe if the official angles for a bribe.[30] Under these circumstances,

[30]In a different model the client could signal her willingness to bribe. Granovetter (2005) posits that the socially superior person initiates the bribe. Our modelling of the official moving first is inspired by the empirical results.

a risk–neutral official who angles for a bribe picks the bribe to maximize the expected payoffs.[31] The payoff from punishing the client is zero for the official, so the official's problem reduces to maximizing the probability of the client agreeing to bribe (γ) times its payoff, with the latter given by (7).

Assume that U_C is uniformly distributed along the interval $[\underline{U}_C, \overline{U}_C]$. If the official asks for a bribe, (9) implies the client will pay it if

$$U_C < E + R - B. \tag{10}$$

The probability γ that the client pays is therefore

$$\gamma = P(U_C < E + R - B) = \frac{E + R - B - \underline{U}_C}{\overline{U}_C - \underline{U}_C}. \tag{11}$$

The official therefore picks B to maximize $\gamma(B - E)$:

$$\max_B \frac{E + R - B - \underline{U}_C}{\overline{U}_C - \underline{U}_C}(B - E). \tag{12}$$

From the first order condition,

$$B^* = E + \frac{R - \underline{U}_C}{2}. \tag{13}$$

The bribe maximizing the expected utility from angling for a bribe with heterogeneous clients with unobservable scruples is increasing in the effort E required to do the official's job scrupulously (punishment is costly to the client), and increasing in the surplus available for the least scrupulous client $(R - \underline{U}_C)$.

From (13) and (11), the probability of the client bribing is

$$\gamma = \frac{1}{2}\frac{(R - \underline{U}_C)}{(\overline{U}_C - \underline{U}_C)}, \tag{14}$$

while from (13) the payoff $B - E$ is

$$\frac{1}{2}(R - \underline{U}_C). \tag{15}$$

The expected payoff $\gamma(B - E)$ from angling for a bribe is the product of the two:

$$\frac{1}{4}\frac{(R - \underline{U}_C)^2}{(\overline{U}_C - \underline{U}_C)}. \tag{16}$$

The official chooses scrupulous behavior over angling for a bribe if the utility expressed in (6) is greater than the payoff from bribing in (16), or where:

$$U_O > E + \frac{1}{8}\frac{(R - \underline{U}_C)^2}{\overline{U}_C - \underline{U}_C}. \tag{17}$$

[31] Cadot (1987) examines closely the implications of the official's being risk averse.

The official is likely to choose scrupulous behavior over angling for a bribe if he has many scruples (high U_O), and is likely to angle for a bribe if normal effort E is high (he need not exert any effort in the first period), if there is a narrow range of scruples among clients (the less desirable punishment outcome can more frequently be avoided), and if the surplus available for the least scrupulous client is high.

If $R < \underline{U}_C$, either the official or the client will not want bribery (which means the corner solution of $\gamma = 0$ will arise). In this case the official's choice is between scrupulous behavior and punishment. The official will prefer scrupulous behavior if $U_O > E$, as in the case when the client's scruples are observable.

If $R > 2\overline{U}_C - \underline{U}_C$, the official would like to set a bribe that induces $\gamma > 1$ of the clients to bribe. Since this is impossible, he chooses a corner solution, where he picks the bribe that just persuades all clients to bribe ($\gamma = 1$), using (11):

$$B^* = E + R - \overline{U}_C. \tag{18}$$

At this corner solution the official's (positive) utility is $R - \overline{U}_C$, and he chooses scrupulousness over angling for a bribe if $2(U_O - E) > R - \overline{U}_C$, and hence $U_O > E + \frac{1}{2}(R - \overline{U}_C)$.

The model has the same structure as one where the official has no scruples ($U_O = 0$), but with probability δ, the official risks being caught if he shirks or takes a bribe. If he is caught, his wages are docked by F, or he must pay a bribe of F to his superior to avoid being fired.[32]

The model can easily be extended to the case where the disutility to the official of providing normal effort (E_O) is not equal to the utility his normal effort provides to the client (E_C). This allows for the possibility that richer clients value normal service more than poorer clients. The only qualitative difference with this extension is that if E_C is high enough relative to E_O, the official can extract a bribe in return for only normal service in the second stage, providing no reduction in bureaucracy ($R = 0$).

T.2 Empirical Implications

The model predicts that the clients receiving the worst service are those who refuse to bribe when a bribe is angled for: they receive zero service. Clients receiving scrupulous service receive $2E$ in services from the official, while those paying a bribe receive $E + R$. If we view the reduction in red tape R as an organizational parameter, the difference in service between these two groups is $E - \overline{R}$, where $\overline{R}$ is the average R computed over officials who successfully angle for a bribe (and therefore higher than when computed across all officials). In the model R and E are independent, so the gap cannot be signed, but the empirical work can give the relevant magnitudes for the official–client pairs where a bribe is exchanged. If $E - \overline{R}$ is positive, clients dealing with an official acting scrupulously are better off in equilibrium, since the effort he provides in the first stage more than offsets the bureaucracy reduction his acting unscrupulously provides in the second stage. In the

[32] Andvig and Moene (1989), Cadot (1987) and Rose–Ackerman (1978, chapter 9) model interactions with corrupt superiors. See also Prendergast (2001).

extended model, where clients may have to bribe in return for total service of only E, such clients receive unambiguously worse service than clients receiving scrupulous service.

Rich clients may value the red tape reduction R more than poor clients if the reduction saves time and the rich have a higher value of time. This implies rich clients are more willing to bribe and to pay a higher bribe conditional on bribing, for given scruples. The official is therefore more likely to angle for a bribe from a rich than a poor client.

Data Appendix

D.1 Peru – Encuesta Nacional de Hogares

The data are available at www.inei.gob.pe/srienaho/English/Consulta_por_Encuesta.asp. The 2002 survey was taken in October, November and December of 2002. The "2003" survey was taken from May 2003 to April 2004. One quarter of the 2003 households were also interviewed in 2002. We simply combine monetary values from surveys taken at different times with no adjustment for inflation or seasonality, which tests indicated was appropriate for household consumption. A noteworthy discrepancy between 2002 and 2003 is a leap in the share of households reporting in the bribery module that they had used a state hospital, apparently due to more complete reporting. Whenever we control for official type dummies, we therefore also permit an interaction of the state hospital dummy with a dummy for the survey year 2003. Household consumption, household income and household poverty dummies are variables computed by the statistical agency. Consumption is based on the survey's 31 pages of questions on household expenditure and consumption. Household income is computed using responses to 11 pages of questions.

The twenty–one types of official listed in the survey are: municipal (city) government, social security (providing social insurance other than pensions), state banks, judiciary, drinking water, telephone, electricity, state schools, arbitration, Ministry of Agriculture, Ministry of Industry, tax/customs authority, state hospitals, national civil identification registry, Department of Migration, police, electoral office, electoral court, development agency, food agency, and "other."

D.2 Uganda – Second National Integrity Survey

The survey was conducted in 55 of 56 districts of Uganda. The subsequent non–random sampling of sub–counties led to the sub–county of the district headquarters always being chosen, which means that urban areas are over–sampled. The district's sub–counties were divided into three categories based on availability of government services and infrastructure, and 20% of sub–counties in each category were randomly chosen. Within each of these sub–counties, the level 1 local council areas were similarly divided into three categories, and one level 1 local council area per category was chosen randomly. The selection of which households to interview within these level 1 local council areas did not appear to be random, as it appeared to involve choosing households near the residence or office of the level 1 local council chairperson.

The sample weights were not provided with the data. Using the 2002 Ugandan census (www.ubos.org), which provides the urban and rural populations of each district, we devised weights to compensate for the oversampling of urban areas.

It is not possible to distinguish between zeroes and missing values in the components of expenditure, so we simply assign zeroes to all missing values and sum the nine components. For seven components, most of the values are missing. It seems that respondents who had ever used an official could answer most of the questions about each official: where relevant, we retain only the responses of those who reported having used the official in the previous six months. The question about whether a receipt was received could refer to the "unofficial payment" (what we call the bribe amount) or the "official payment". We define a receiptless (official) payment to have occurred when a value was reported for "official payment" and the respondent replied "no" to whether receipts were received for payments (rather than "yes, all" or "yes, some").

The twenty–two agencies listed in the survey are: local primary school, Department of Education, health unit, police, traffic police, local council level 1, local council level 3, Agriculture Department, Veterinary Department, Fisheries Department, Forestry Department, Department of Cooperatives, Public Service (pensions), Water Department, Land Board, Magistrates Court, Ugandan People's Defence Force, Local Defence Force, Uganda Revenue Authority (licencing), Uganda Revenue Authority (customs, anti–smuggling), Uganda Electricity Board and "other". However, the variable for whether or not the household used "other" officials is missing from the data we have received, so we use none of the information on "other", leading to an underestimate of the overall bribery rate. Health units can include private clinics, where the bribery rate is lower and the quality higher than in the public health sector (as shown by the health module).

D.3 Are the bribery rates plausible?

There are a number of factors that make it likely that any survey will underestimate the incidence of bribery. People may be reluctant to admit to illegal behavior, people may use intermediaries or agents to pay bribes for them, and ignorant clients may pay bribes unwittingly. The existence of unwitting bribes is very important, but we can measure such bribes for Uganda, examine their influence on the results, and assume their influence would be qualitatively similar for Peru. We do not believe our underestimation to be severe.

In high–bribery countries, bribery is viewed as inevitable and the fault of the system. The stigma attached to admitting paying a bribe is therefore low. Also, anti–corruption drives typically target officials, so the fear of prosecution from such an admission should be low. The high reported bribery rates in Uganda are consistent with this. The much lower bribery rate in Peru may appear less consistent with this, yet the bribery episode rates for some official types are very high (37% for the police), indicating that, at least for some official types, respondents were not ashamed or afraid to acknowledge a bribery episode. Proética, a Peruvian anti–corruption group, found that when asked to define the Peruvian slang for bribe ("coima"), less than half their survey respondents gave answers

with a negative connotation.[33] More importantly, the Peruvian household survey does not attempt to force respondents to admit to having voluntarily paid a bribe, but allows them merely to acknowledge having paid a tip under duress, or to having refused to bribe. The Ugandan survey gives respondents the option of giving their name along with the responses. We have checked the correlation between bribing and providing a name. Neither providing a first name only nor both a first and last name is associated with a lower probability of bribing conditional on using an official than giving no name (conditional on other covariates), although oddly providing one name and one initial is associated with a higher bribery probability than giving no name. We are therefore not concerned that reluctance to report is a major issue.

The share of households bribing will be understated if clients commonly use agents to act as intermediaries between themselves and officials, and bribes paid by the agent are reported in the survey by the agent (or no–one), rather than the client. A 2003 survey by Proética gathered information on bribes and agents ("tramitadores").[34] 52% of respondents who had bribed to obtain a driver's licence reported having paid the bribe to an agent, while the share was 15% or less for the other nine activities reported in the summary statistics.[35]

The only advantage of alternative data from NGOs is that the government played no role in the data collection, thus potentially reducing fear of admitting bribes. One such survey, a 2004 Transparency International survey of 416 respondents in greater Lima, found 14% of respondents had bribed in the previous twelve months, compared to 6% among the 3758 Lima respondents in our 2002–2003 data.[36] However, the TI question did not restrict itself to bribes paid to public officials (bribes may also be paid to private companies). Proética reports much higher Peruvian bribery rates for the years 2002, 2003 and 2004 of 32%, 29% and 27%, respectively.[37] Proética's bribery rates, conditional on the use of particular officials, look very similar to those in our data, but their usage rates look implausibly high for a window of one year. This suggests that the Proética time frame, not reported in the documentation available to us, was in fact much longer than a year, even though yearly bribery rates are reported.

[33] Proética (2004).
[34] Proética (2003).
[35] Bertrand et al. (2006) analyze the use of agents for obtaining drivers' licences in India.
[36] Transparency (2004b).
[37] Proética (2004).

Table 1: Characteristics of bribery and use of officials in Peru and Uganda – household level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Peru: bribery/use last 12 months			Uganda: bribery/use last 6 months			
	Full sample	Used an official	Bribery episode	Full sample	Used an official	Bribery episode	Bribery episode or receiptless payment
Used an official	0.86	1	1	0.87	1	1	1
Number of types of officials used	2.5 (2.0)	3.0 (1.8)	4.5 (2.4)	2.4 (2.0)	2.8 (1.9)	3.6 (2.3)	3.3 (2.2)
Bribery episode	0.049	0.057	1	0.278	0.320	1	--
Bribery episode or receiptless payment	--	--	--	0.410	0.472	--	1
Number of bribery episodes	--	--	1.20 (0.52)	--	--	1.48 (1.0)	--
Monthly (US $) consumption	323 (295)	342 (300)	443 (360)	88 (143)	94 (150)	106 (157)	96 (147)
Observations	36,080	30,889	1,774	11,298	9,812	3,141	4,632
Value of bribes paid (US $)	--	--	23 (139)	--	--	21 (104)	18 (89)
Share consumption paid in bribes	--	--	0.005 (0.020)	--	--	0.072 (0.611)	0.066 (0.531)
Observations	--	--	1,415	--	--	3,087	4,597

Notes: The unit of observation is the household. Standard deviations are in parentheses. A household is included if information on at least one official type is complete. The share of bribes in consumption is calculated so as to be comparable in Peru and Uganda. For Peru it is value of total bribes (in past 12 months) divided by four times quarterly consumption. For Uganda it is twice the value of total bribes (in past 6 months) divided by 12 times monthly expenditure. Currencies are converted to US dollars at the rate of one Peruvian Nuevo Sol to $0.30, and one Ugandan Shilling to $0.0005417.

Table 2: Characteristics of bribery and use of officials in Peru and Uganda – household-official level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Peru: bribery/use last 12 months			Uganda: bribery/use last 6 months			
	Full sample	Used an official	Bribery episode	Full sample	Used an official	Bribery episode	Bribery episode or receiptless payment
Used official	0.121	1	1	0.097	1	1	1
Bribery episode	0.0028	0.023	1	0.019	0.198	1	--
Bribery episode or receiptless payment	--	--	--	0.028	0.292	--	1
Official solicited bribe	--	--	0.48	--	--	0.86	0.58
Felt obliged to bribe	--	--	0.22	--	--	0.12	0.08
Bribed voluntarily	--	--	0.08				
Refused to bribe	--	--	0.22	--	--	--	--
Unknown bribe type	--	--	--	--	--	0.02	0.02
Receiptless payment	--	--	--	--	--	--	0.38
Twelve visits to official	--	0.21	0.03	--	--	--	--
Concluded business	--	0.93	0.74	--	--	--	--
Official service good	--	0.33	0.09	--	0.13	0.07	0.09
Official service regular	--	0.57	0.39	--	0.57	0.43	0.49
Official service bad	--	0.09	0.52	--	0.26	0.47	0.40
Saw official immediately	--	0.95	0.73	--	--	--	--
Payment with receipt	--	--	--	--	0.279	0.129	--
Observations	757,461	91,668	2,123	231,545	22,441	4,444	6,554
Value of bribe (US $)	--	--	20	--	--	13	12
			(127)			(84)	(70)
Bribe as share of consumption	--	--	0.004	--	--	0.045	0.041
			(0.019)			(0.51)	(0.44)
Observations	--	--	1,628	--	--	4,333	6,468

Notes: The unit of observation is the household-official pair. Standard deviations are in parentheses. The bribe as share of consumption is calculated so as to be comparable in Peru and Uganda. For Peru it is the value of bribe(s) to the official divided by four times quarterly consumption. For Uganda it is twice the value of bribe(s) to the official (in past 6 months) divided by 12 times monthly expenditure. For Uganda: felt obliged to bribe and bribed voluntarily are in the single category "offered to bribe", as opposed to "asked for bribe", or a small unreported category of where the bribe type is not identified; good service corresponds to "very satisfied", regular service corresponds to "satisfied", while bad service corresponds to "not satisfied" or "very unsatisfied".

Table 3: Distribution of bribery episodes across official types

Official type	(1) Number of bribery episodes	(2) Share of bribery episodes	(3) Share of amount of bribe payments	(4) Share of transactions with bribery episode	(5) Share of households using official type
A. Peru					
Police	738	0.35	0.27	0.372	0.06
Municipal government	447	0.21	0.11	0.048	0.26
Judicial system	245	0.12	0.42	0.165	0.04
Schools	165	0.08	0.05	0.008	0.54
Utilities (sum of water, phone, electricity)	107	0.05	0.01	0.004	0.42
State hospitals	95	0.04	0.02	0.008	0.34
National ID Registry	78	0.04	0.02	0.013	0.16
Other	248	0.12	0.10	0.018	0.28
Total	2,123	1	1	--	--
Observations	2,123	2,123	1,628	91,668	See notes
B. Uganda					
Health units	1,626	0.37	0.15	0.246	0.64
Police (sum of regular and traffic police)	839	0.19	0.31	0.487	0.16
Local council, level 1	478	0.11	0.03	0.167	0.27
Primary schools	312	0.07	0.02	0.078	0.38
Veterinary department	312	0.07	0.02	0.344	0.08
Utilities (sum of water, electricity, not phone)	179	0.04	0.04	0.123	0.12
Courts	130	0.03	0.16	0.300	0.04
Other	568	0.13	0.27	0.128	0.32
Total	4,444	1	1	--	--
Observations	4,444	4,444	4,444	22,441	See notes

Notes: The 21 official types in each country have been collapsed to fewer categories for this table. In column 4 36,080 households contribute to the calculations for Peru and 11,298 for Uganda, but a few households are missing from each row, as not all households have valid information for all official types. The complete lists of official types are in the Data Appendix.

Table 4: Average bribe for user households, including zeroes, by financial status of household

	(1)	(2)	(3)	(4)	(5)
	Monthly amount (US $)		As share of monthly consumption (%)		As share of income (%)
	Bribes	Bribes and receiptless payments	Bribes	Bribes and receiptless payments	Bribes
A. Peru (36,080 obs)					
Bottom quintile	0.15	--	0.012	--	0.014
	(2.6)		(0.2)		(0.2)
2nd quintile	0.24	--	0.012	--	0.011
	(3.5)		(0.1)		(0.2)
3rd quintile	0.48	--	0.015	--	0.015
	(7.7)		(0.1)		(0.3)
4th quintile	1.07	--	0.020	--	0.032
	(19.4)		(0.2)		(0.6)
Top quintile	2.55	--	0.026	--	0.021
	(42)		(0.2)		(0.4)
All	0.89	--	0.017	--	0.019
	(21)		(0.2)		(0.4)
B. Uganda (11,298 obs)					
Bottom quintile	2.3	3.0	4.6	6.9	--
	(25)	(25)	(57)	(65)	
2nd quintile	2.4	3.6	1.7	2.5	--
	(11)	(19)	(9)	(15)	
3rd quintile	3.1	4.9	1.2	1.9	--
	(15)	(20)	(6)	(8)	
4th quintile	6.9	8.8	1.5	1.9	--
	(37)	(38)	(8)	(8)	
Top quintile	12.0	15.8	1.0	1.3	--
	(53)	(61)	(8)	(5)	
All	5.3	7.2	2.0	2.9	--
	(32)	(36)	(26)	(30)	

Note: The unit of observation is the household. The sample is all households. Standard deviations are in parentheses. Means are weighted. Quintiles for Peru are for equivalent consumption, for Uganda are for equivalent expenditure (obtained by dividing by the square root of household size). The share of bribes in consumption is calculated so as to be comparable in Peru and Uganda. For Peru it is value of total bribes (in past 12 months) divided by four times quarterly consumption (or quarterly income). For Uganda it is twice the value of total bribes (in past 6 months) divided by 12 times monthly expenditure.

Table 5: Measurement error and the financial burden of bribery for user households in Uganda

	(1)	(2)	(3)	(4)
A. Dependent variable: Values of bribes/expenditure				
Log household expenditure	-0.012	0.018	--	--
	(-2.9)	(0.9)		
Bottom quintile of household expenditure	--	--	0.040	-0.010
			(2.5)	(-0.3)
B. Dependent variable: Value of bribes+receiptless payments/expenditure				
Log household expenditure	-0.018	0.017	--	--
	(-3.8)	(0.8)		
Bottom quintile of household expenditure		--	0.043	0.005
			(3.1)	(0.1)
Household size, district and urban dummies	Yes	Yes	Yes	Yes
Instrumental variables	--	Yes	--	Yes
F-statistic excluded instruments first stage	--	65	--	26
Partial R^2 excluded instruments first stage	--	0.09	--	0.04

Note: The unit of observation is the household. The sample is all households (11,298 observations). Values include zeroes. Ordinary least squares regressions, with t-statistics adjusted for clustering by sub-county in parentheses. The excluded instruments for log household expenditure in columns 2 and 4 are 15 dummies for type of dwelling, type of telephone, type of sanitation facilities and types of household ownership. Quintiles are of household expenditure (not equivalent income).

Table 6: Probability of using an official

	(1)	(2)	(3)	(4)	(5)
A. Peru (757,461 obs)					
Log household	0.045	0.033	0.026	0.025	--
consumption	(29.7)	(29.9)	(24.2)	(23.2)	
Pseudo R-squared	0.04	0.30	0.31	0.31	--
B. Uganda (231,545 obs)					
Log household	0.021	0.017	0.015	0.014	0.029
expenditure	(20.7)	(21.7)	(18.7)	(17.6)	(8.0)
Pseudo R-squared	0.03	0.31	0.31	0.31	--
20 official type dummies	--	Yes	Yes	Yes	Yes
Job type and education	--	--	Yes	Yes	Yes
Other covariates	--	--	--	Yes	Yes
Instrumental variables	--	--	--	--	Yes
F-statistic instruments					22

Notes: The unit of observation is the household-official pair: the sample includes all such observations. Marginal effects from probit regressions with t-statistics clustered by district for Peru and sub-county for Uganda. All Peruvian regressions include seven regional dummies, nine household size dummies, town size dummies, time to the district administrative center, and a dummy for the 2003 survey. All Ugandan regressions include 54 district dummies, 13 household size dummies, and an urban dummy. The excluded instruments for log household expenditure in column 5 are 15 dummies for type of dwelling, type of telephone, type of sanitation facilities and types of household ownership.

For Peru, job type dummies are for the respondent's main job (e.g. employer-non-agricultural, white collar); for Uganda they are the household's main source of income (e.g. farming/cash, farming/food) and the respondent's occupation (e.g. farmer/crops, trader). For Peru, other covariates are characteristics of the respondent (sex, married/cohabiting, married/cohabiting*sex, age and age squared, student status, whether main job is in military/police, or public administration) and of the household (number of earners, ownership dummies for bicycle, car/van, tricycle, motorbike, and truck, whether land obtained by invasion, presence of children aged 0-3, 3-7, 8-11 and 12-15). When official types are controlled for, the interaction state hospital*2003 survey is also included (see Data Appendix for discussion). For Uganda, other covariates are characteristics of the respondent (sex, whether household head, age and age squared) and of the household (number of males 18 or older, number of females 18 or older, ownership dummies for bicycle, car/pickup, motorbike, and bus/truck). Purpose and official sub-type are the official-specific purpose in using the official (134 dummies), and 102 dummies for sub-categories within the official types.

Table 7: Determinants of bribery episode conditional on use of official

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Peru (91,668 obs)							
Log household	0.740	0.253	0.223	0.277	--	--	--
consumption	(8.5)	(4.5)	(3.4)	(4.0)			
Pseudo R-squared	0.04	0.27	0.27	0.27	--	--	--
B. Uganda (22,441 obs)							
Log household	1.207	1.138	1.783	1.746	1.755	0.014	0.976
expenditure	(2.9)	(3.1)	(4.7)	(4.5)	(4.5)	(0.6)	(2.4)
(Pseudo) R-squared	0.03	0.11	0.11	0.12	0.14	--	0.16
Receiptless payments counted as bribes?	--	--	--	--	--	--	Yes
20 official type dummies	--	Yes	Yes	Yes	Yes	Yes	Yes
Job type and education	--	--	Yes	Yes	Yes	Yes	Yes
Other covariates	--	--	--	Yes	Yes	Yes	Yes
Purpose, official sub-type	--	--	--	--	Yes	Yes	Yes
Instrumental variables	--	--	--	--	--	Yes	--
F-statistic instruments	--	--	--	--	--	14	--

Notes: The unit of observation is the household-official pair. The sample contains the observations where the official was used. Columns 1-5 report marginal effects from probit regressions, multiplied by 100; columns 5 and 7 report the coefficients from linear probability regressions, multiplied by 100. T-statistics clustered by district for Peru and sub-county for Uganda. The dependent variable in columns 6 and 7 is whether any bribe or official payment with no receipt was made. All Peruvian regressions include seven regional dummies, nine household size dummies, town size dummies, time to the district administrative center, a dummy for the 2003 survey and a dummy for twelve visits. All Ugandan regressions include 54 district dummies, 13 household size dummies, and an urban dummy. The excluded instruments for log household expenditure in column 6 are 15 dummies for type of dwelling, type of telephone, type of sanitation facilities and types of household ownership. See notes to Table 6 for a description of the other covariates.

Table 8: Determinants of log bribe value

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
A. Peru (1,628 obs)								
Log household	0.360	0.331	0.329	0.268	0.273	--	--	--
consumption	(5.0)	(5.1)	(4.6)	(3.2)	(3.3)			
Felt obliged to bribe	--	--	--	--	-0.294	--	--	--
					(-3.6)			
Bribed voluntarily	--	--	--	--	-0.516	--	--	--
					(-5.3)			
R-squared	0.04	0.15	0.16	0.18	0.19	--	--	--
B. Uganda								
Log household	0.330	0.247	0.242	0.236	0.240	0.225	0.269	0.657
expenditure	(12.7)	(10.5)	(9.1)	(9.0)	(9.1)	(8.8)	(13.3)	(4.9)
Offered to bribe	--	--	--	--	-0.229	-0.225	-0.192	-0.312
					(-3.5)	(-3.4)	(-3.1)	(-4.1)
Made receiptless	--	--	--	--	--	--	0.889	
payment							(10.5)	
Observations	4,333						6,468	
R-squared	0.12	0.31	0.32	0.32	0.32	0.37	0.35	
20 official type dummies	--	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Job type and education	--	--	Yes	Yes	Yes	Yes	Yes	Yes
Other covariates	--	--	--	Yes	Yes	Yes	Yes	Yes
Purpose,official sub-type	--	--	--	--	--	Yes	Yes	Yes
Instrumental variables	--	--	--	--	--	--	--	Yes
F-statistic instruments	--	--	--	--	--	--	--	7

Notes: The unit of observation is the household-official pair. Observations for which a bribe amount is reported (columns 1-6) or a bribe amount or an official payment without a receipt is reported (column 7) are included. Least squares regressions (except column 7) with t-statistics clustered by district for Peru and sub-county for Uganda. The excluded instruments for log household expenditure in column 8 are 15 dummies for type of dwelling, type of telephone, type of sanitation facilities and types of household ownership. All Peruvian regressions include seven regional dummies, nine household size dummies, town size dummies, time to the district administrative center, a dummy for the 2003 survey and a dummy for twelve visits. All Ugandan regressions include 54 district dummies, 13 household size dummies, and an urban dummy. See notes to Table 6 for a description of the other covariates. The omitted bribe type in columns 5-7 is one solicited by the official (Peru) and asked for (Uganda). Columns 5-7 for Uganda include a dummy for bribe of unspecified type, and column 7 also includes a dummy for no bribe.

Table 9: Determinants of payoffs to bribery

	(1) Concluded business	(2) Made official payment with receipt	(3) Saw official immediately	(4) Bad service	(5) Bad service
A. Peru (91,668 obs)					
Log household	-0.007	--	-0.011	0.007	--
consumption	(-3.0)		(-5.7)	(2.6)	
Bribe solicited by official	-0.048	--	-0.097	0.285	--
	(-7.1)		(-12.7)	(22.9)	
Felt obliged to bribe	-0.028	--	-0.088	0.226	--
	(-3.0)		(-9.7)	(13.2)	
Bribed voluntarily	-0.016	--	-0.048	0.097	--
	(-1.0)		(-3.7)	(4.9)	
Refused to bribe	-0.160	--	-0.171	0.370	--
	(-9.7)		(-13.8)	(17.2)	
Pseudo R-squared	0.11	--	0.12	0.11	--
B. Uganda (22,441 obs)					
Log household	--	0.022	--	-0.003	-0.003
expenditure		(6.2)		(-0.9)	(-0.8)
Asked to bribe	--	-0.147	--	0.249	0.226
		(-16.7)		(20.9)	(19.2)
Offered to bribe	--	-0.127	--	0.182	0.151
		(-6.1)		(7.7)	(6.5)
Made receiptless payment	--	--	--	0.060	0.050
				(5.3)	(4.6)
Pseudo R-squared	--	0.31	--	0.10	0.15
20 official type dummies	Yes	Yes	Yes	Yes	Yes
Job type and education	Yes	Yes	Yes	Yes	Yes
Other covariates	Yes	Yes	Yes	Yes	Yes
Purpose, official sub-type	--	Yes	--	--	Yes

Notes: The unit of observation is the household-official pair. The sample contains the observations where the official was used. Columns 1, 3 and 4 report marginal effects from probit regressions; columns 2 and 5 report coefficients from linear probability regressions. T-statistics are clustered by district for Peru and sub-county for Uganda. All Peruvian regressions include seven regional dummies, nine household size dummies, town size dummies, time to the district administrative center, a dummy for the 2003 survey and a dummy for twelve visits. All Ugandan regressions include 54 district dummies, 13 household size dummies, an urban dummy and a dummy for bribe of unspecified type. See notes to Table 6 for a description of the other covariates. For Uganda good service means very satisfied, bad service means not satisfied or very unsatisfied.

Appendix Table 1: Means of Ugandan respondent characteristics

	(1) Full sample	(2) Used an official	(3) Bribery episode	(4) Bribery episode or receiptless payment
Male	0.60	0.61	0.68	0.65
Household head	0.75	0.75	0.77	0.76
Age	35	35	35	35
	(12)	(12)	(12)	(12)
No education	0.11	0.10	0.10	0.10
1-4 years primary education	0.14	0.14	0.13	0.14
5-7 years primary education	0.31	0.31	0.33	0.33
1-4 years secondary education	0.27	0.28	0.27	0.26
5-6 years secondary education	0.04	0.04	0.04	0.04
Post-secondary education	0.10	0.10	0.10	0.09
Other education	0.03	0.03	0.03	0.03
Farmer – mainly crops	0.31	0.31	0.34	0.34
Farmer – mainly livestock	0.02	0.02	0.02	0.02
Trader	0.21	0.21	0.20	0.21
Civil servant	0.05	0.05	0.04	0.04
Teacher	0.05	0.05	0.04	0.04
Professional in private practice (doctor/lawyer)	0.03	0.03	0.03	0.03
Craftsperson (carpenter/mechanic etc)	0.06	0.07	0.07	0.07
Casual laborer	0.08	0.07	0.08	0.08
Housewife	0.10	0.10	0.08	0.09
Student	0.01	0.01	0.01	0.01
Tailor/builder	0.01	0.01	0.01	0.01
Bodaboda or taxi driver	0.01	0.02	0.02	0.02
Repair and service jobs	0.04	0.04	0.05	0.04
Armed forces	0.001	0.001	0.001	0.000
Unemployed	0.005	0.005	0.005	0.004
Retired	0.002	0.002	0.002	0.002
Observations	11,298	9,812	3,141	4,632

Notes: The unit of observation is the household. Standard deviations are in parentheses.

Appendix Table 2: Means of Ugandan household characteristics used as covariates

	(1) Full sample	(2) Used an official	(3) Bribery episode	(4) Bribery episode or receiptless payment
Urban	0.40	0.40	0.38	0.38
Farming – cash crops	0.14	0.14	0.15	0.15
Farming – foods crops	0.21	0.21	0.21	0.22
Farming – livestock	0.02	0.02	0.02	0.02
Manufacturing, crafts, repair	0.07	0.07	0.08	0.07
Trade - petty	0.09	0.09	0.08	0.08
Trade – retail/shop/stall	0.13	0.13	0.12	0.13
Trade – wholesale, crop buying	0.02	0.03	0.02	0.03
Government – salaried or wage	0.11	0.11	0.10	0.10
Private – salaried or wage	0.07	0.07	0.06	0.06
Stipends from relatives	0.02	0.01	0.01	0.01
Casual work	0.09	0.08	0.09	0.09
Other	0.05	0.05	0.05	0.05
Own bicycle	0.44	0.46	0.48	0.48
Own car/pickup	0.04	0.04	0.04	0.04
Own motorbike	0.07	0.07	0.08	0.08
Own truck/bus	0.01	0.01	0.01	0.01
Household size	5.7	5.9	6.3	6.1
	(3.6)	(3.6)	(3.9)	(3.7)
Number males 18 or older	1.3	1.3	1.3	1.3
	(1.0)	(1.0)	(1.0)	(1.0)
Number females 18 or older	1.3	1.3	1.4	1.4
	(1.0)	(1.0)	(1.1)	(1.0)
Observations	11,298	9,812	3,141	4,632

Notes: The unit of observation is the household. Standard deviations are in parentheses.

Appendix Table 3: Means of Ugandan household characteristics used as instruments for expenditure

	(1) Full sample	(2) Used an official	(3) Bribery episode	(4) Bribery episode or receiptless payment
Land line only	0.01	0.01	0.01	0.01
Mobile telephone only	0.12	0.12	0.12	0.11
Land line and mobile telephone	0.03	0.03	0.03	0.03
No telephone	0.84	0.83	0.83	0.84
Telephone info missing	0.01	0.01	0.01	0.01
Latrine in house	0.03	0.03	0.03	0.03
Latrine in yard	0.70	0.71	0.73	0.73
Communal latrine	0.22	0.21	0.18	0.19
No latrine	0.04	0.04	0.05	0.05
Latrine info missing	0.01	0.01	0.01	0.01
Own home	0.61	0.62	0.64	0.63
Rent home	0.35	0.34	0.32	0.33
Borrow home	0.02	0.02	0.02	0.02
Corporation/gov't home	0.02	0.02	0.01	0.02
Ownership info missing	0.005	0.005	0.005	0.005
Permanent dwelling	0.38	0.39	0.38	0.36
Semi-permanent dwelling	0.36	0.36	0.35	0.38
Temporary dwelling	0.26	0.25	0.27	0.26
Dwelling info missing	0.002	0.002	0.001	0.002
Observations	11,298	9,812	3,141	4,632

Notes: The unit of observation is the household. Standard deviations are in parentheses.

Appendix Table 4: Means of Peruvian household characteristics

	(1) Full sample	(2) Used an official	(3) Bribery episode
Time to district administrative	66	61	48
center (minutes)	(159)	(156)	(127)
Town >500,000	0.15	0.16	0.20
Town 100,000-500,000	0.22	0.23	0.26
Town 50,000-100,000	0.06	0.06	0.10
Town 20,000-50,000	0.08	0.08	0.09
Town 2000-20,000	0.08	0.08	0.08
Town 500-2000	0.05	0.05	0.03
Town about 200	0.27	0.25	0.17
Town about 100	0.10	0.09	0.06
Own bike	0.27	0.29	0.36
Own car/van	0.07	0.07	0.14
Own tricycle	0.04	0.05	0.07
Own motorbike	0.03	0.03	0.06
Own truck	0.01	0.01	0.01
Own taxi	0.01	0.01	0.03
Own residence through invasion	0.04	0.05	0.06
Child aged 0-3 present	0.29	0.30	0.30
Child aged 4-7	0.33	0.36	0.34
Child aged 8-11 present	0.35	0.38	0.36
Child aged 12-15 present	0.33	0.36	0.34
Household size	4.4	4.6	4.5
	(2.2)	(2.2)	(2.1)
Number of earners	2.0	2.1	2.1
	(1.1)	(1.1)	(1.1)
Observations	36,080	30,889	1,774

Notes: The unit of observation is the household. Standard deviations are in parentheses.

Appendix Table 5: Means of Peruvian respondent characteristics

	(1) Full sample	(2) Used an official	(3) Bribery episode
Male	0.48	0.47	0.55
Age	41.1	40.1	37.5
	(16.5)	(15.6)	(13.3)
Years education	7.7	8.1	9.8
	(4.8)	(4.8)	(4.5)
Married or cohabiting	0.64	0.66	0.65
Married/cohabiting*male	0.32	0.33	0.37
Not employed	0.22	0.22	0.19
Non-agricultural employer	0.02	0.02	0.04
Agricultural employer	0.03	0.03	0.03
Non-agricultural self-employed	0.19	0.19	0.25
Agricultural self-employed	0.16	0.15	0.09
White collar	0.12	0.13	0.18
Blue collar	0.12	0.11	0.11
Unpaid family worker	0.13	0.13	0.09
Domestic worker	0.01	0.01	0.01
Other worker	0.004	0.003	0.003
Employer with >10 workers	0.003	0.003	0.004
In school	0.06	0.06	0.08
In military/police	0.005	0.005	0.006
In public administration	0.06	0.07	0.09
Observations	36,080	30,889	1,774

Notes: The unit of observation is the household. Standard deviations are in parentheses.