Bribery: Who Pays, Who Refuses, What Are The Payoffs? *

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January 31, 2005

*We are grateful to Yossi Greenberg, Duncan Thomas and participants at the McGill summer seminar series for comments, and to the Instituto Nacional de Estadística e Información for the data. Hunt is also affiliated with the William Davidson Institute, CEPR, IZA and DIW-Berlin. Laszlo is also affiliated with Grupo de Análisis para el Desarrollo.

Abstract

We provide a theoretical framework for understanding when an official angles for a bribe, when a client pays, and the consequences of the client's decision. We test this framework using a unique data set on bribery of Peruvian public officials by individuals. The theory predicts that bribery is more attractive to both parties when the client is richer, and we find empirically that both bribery incidence and value are increasing in household income. However, seventy percent of the income–incidence relation is explained by greater use of officials by high–income people, and by their greater use of more corrupt types of official. A client who refuses to bribe has a twenty percent lower probability of concluding her business with the official compared to other clients: clients dealing with honest officials have similar outcomes to clients who pay a bribe. This indicates that service improvements in response to a bribe merely offset service reductions associated with angling for a 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.[1] More recent theoretical contributions on the causes and consequences of corruption have also emphasized efficiency losses.[2] Shleifer and Vishny (1993) suggest that bribery of public officials has economic effects that can prove more distortionary than taxation. Such distortions can reduce economic performance and growth, and may have a particularly harmful effect on the poor.[3] Empirical work has substantiated these fears: Mauro (1995) finds cross–country evidence of a negative relationship between perceived corruption and economic growth.[4] However, in order to develop anti–corruption policy, it is necessary to test empirically the theoretical models of the principal–agent relationship between public officials and clients. Until now, however, there has been almost no such empirical evidence.

The empirical literature on the causes and consequences of corruption is not only conducted almost entirely at the macro (country) level, it is almost exclusively based on perceptions of corruption, rather than actual, measured corruption.[5] The perceptions, moreover, are those of business–oriented experts.[6] Only Svensson (2003), who finds that more profitable firms pay larger bribes, tests micro predictions of theoretical models of bribery. In this paper we exploit a survey that measures actual bribery, and is representative of the entire population of a country, thus principally capturing bribes paid in the course of daily life. We use it to provide an overall characterization of bribery–related interactions between public officials and clients in Peru.

[1] Rose–Ackerman (1975,1978).

[2] E.g. Choi and Thum (2004), Kingston (2004), Lui (1985), Sah (1988). See also Aidt's (2003) survey.

[3] Gupta, Davoodi and Alonso–Terme (1998).

[4] See also Neeman et al. (2003).

[5] E.g. Fisman and Gatti (2002), Treisman (2000). Exceptions are Hunt (2004), Mocan (2004), Svensson (2003) and Swamy et al. (2001), who use data on individual and firm bribery. Di Tella and Schargrodsky (2003) can convincingly infer corruption at the hospital level.

[6] Olson et al. (2000).

Bribes paid in the course of daily life, or "petty" bribes, represent the most common form of corruption. Furthermore, petty bribery of low–level public officials can cause corruption to spread upwards through the hierarchy of officials.[7] Contagion may also occur if people who pay bribes routinely as individuals are more willing to bribe or accept bribes in their capacity as firm representative or political actor. A further cause for concern is that the necessity of paying lower–level bribes acts as a tax on individuals. In most countries, respondents to Transparency International's Global Corruption Barometer judged "petty or administrative" corruption to be almost as serious a problem as "grand or political corruption."[8]

Concerns about petty corruption in Peru, a middle–ranking (and therefore corrupt) country in Transparency International's Corruption Perceptions Index[9], led the Peruvian statistical agency to include a module on bribery in the 2002 national household survey. We take advantage of the information about respondents' use of public officials, whether they bribed or refused to bribe, how much they paid if they bribed, as well as the quality of the services that they received from the official. Because corruption is common in Peru and because the survey is of individuals rather than of firms, respondents are likely to be little affected by either stigma or fear of prosecution.

We first build a theoretical framework allowing us to understand the bribery–related interactions between public officials and clients. Under what circumstances do officials angle for a bribe? Which clients pay and how much? What does bribery buy in terms of service? In our model, officials angle for a bribe by shirking, and punish with further shirking clients who refuse to bribe. Since richer clients have a higher valuation of time, they are more willing to bribe and, conditional on bribing, pay a higher bribe. Thus, officials are more likely to angle for a bribe from a rich client. If the clients choose to pay a bribe, the officials reward them with a reduction in red tape that will at least partially offset the earlier shirking.

[7] Cadot (1987).

[8] Transparency International (2004b).

[9] Transparency International (2004a).

We then evaluate the model with the data. The results suggest that it is indeed the official who moves first in the process leading to bribery, and that he does take client income into account in his decisions. We find that bribery incidence is strongly increasing in client income. Our results suggest, however, that at least seventy percent of this relationship is driven by the fact that the rich use more officials than the poor, and use a more corrupt mix of officials. Therefore, at most thirty percent of the higher bribery of the non–poor is owing to a higher probability of bribery conditional on using a particular official type. Doubling a client's income increases this probability by less than 0.2 percentage points. We find an income–elasticity of the bribe amount in the range of 0.2–0.3. Our results suggest that officials practice first–degree price discrimination rather than third–degree price discrimination, but are not conclusive on this point.

We find that the strongest determinant of quality of service is a refusal to bribe. A client who refuses to bribe has a 21% lower probability of concluding her business with the official compared to other clients. Furthermore, paying the bribe (reluctantly or voluntarily) yields a similar outcome to dealing with an official acting honestly. This points to an offsetting effect between service improvements facilitated by the payment of the bribe and the service reduction associated with the angling for a bribe.

2 Corruption in Peru

The enormous scale of grand corruption in Peru was revealed in 2000 by discoveries leading to the resignation and self–exile of the president, Alberto Fujimori. Video–taped evidence showed that Vladimir Montesinos, Fujimori's spy chief, had repeatedly bribed congressmen to defect to Fujimori's party to ensure its majority in congress. In addition, large bribes had enabled Montesinos to control most of the media and influence the judiciary.[10]

However, Fujimori is credited with having reduced petty corruption. His administration pursued policies reducing the role of government, which he justified not only on

[10]See McMillan and Zoido (2004).

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. However, his reforms of the judiciary are thought to have made it more corrupt.

Despite some progress, however, several institutions with which ordinary people have much contact were judged to be corrupt by Transparency International in a November 2001 report.[11] The judiciary was corrupted by the large share (74%) of temporary judges, appointed in part to help clear backlogs, who did not enjoy the job security of permanent judges. These judges were considered vulnerable to political pressure and susceptible to corruption.

The morale of the police was thought to be lowered by poor pay and equipment, which combined with weak internal controls and sanctions rendered them 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.[12]

Public administration generally was corrupted by poor pay, complex procedures for sanctioning bribe–taking, and the frequent overturning of administrative sanctions by the judiciary. Only 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 pub-

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

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

lic service. Ominously, however, the Tsar was fired in December 2004 after seeking to investigate accusations of corruption in the Toledo administration.[13]

3 Theoretical Model

In our theoretical model, 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 'honestly' 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. There is no distinction between these two possibilities in the model, but 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]

For bribery to be attractive to both official and client, it must yield something beneficial to both. For the official the benefit is obviously the bribe. 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 waving certain paperwork (red tape). This is a service on top of the service provided by an official behaving 'honestly' who requires compliance with all red tape.[15]

The amount or value of the time or effort saved by bribing can be viewed as dependent on the organizational structure of the official's particular bureaucracy, or can be viewed as a function of client income: the richer the client, the more valuable her time, and the more valuable a given reduction in bureaucracy. Rose–Ackerman (1978,

[13] www.signonsandiego.com/news/world/20041217-0702-peru-corruption.html

[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.

chapter 6) discusses whether it is more plausible that officials practice first–degree price–discrimination, by charging each client a different price, or whether they practice third–degree price–discrimination, by offering different levels of red–tape reduction for different bribe amounts. We do not model the latter, but consider it in the empirical section.

3.1 Model

If the official is honest in both stages, he experiences disutility of effort E per stage, and utility U_O per stage 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 honest official is therefore

$$2(U_O - E). \tag{1}$$

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:

$$B - E. \tag{2}$$

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:

$$B > E. \tag{3}$$

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

$$B < E + R - U_C. \tag{4}$$

From (3) and (4), 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.

3.2 The official can observe the client's scruples

Initially we assume that the official can observe the client's U_C: below we relax this. The official cannot affect the utility he or the client gets from punishment, but he can maximize the utility he gets from bribery (2) by picking the largest bribe B subject to the constraint that the client will choose to bribe (4). This means the official will choose[16]

$$B^* = E + R - U_C. \tag{5}$$

The official can get a higher bribe if he has something more valuable to offer in time savings (R), if the client is unscrupulous (low U_C) or if normal effort E is high (the client has a lot to lose from punishment). The official's utility in the second stage if the client bribes is therefore given by substituting (5) into (2):

$$R - U_C. \tag{6}$$

The expression does not depend upon normal effort E, because the bribe will compensate for this. The official therefore decides whether or not to angle for a bribe by comparing the total utility of honest behavior (1) with the sum of second stage utility

[16]We assume that when the client is indifferent she chooses to bribe.

from bribery (6) and zero utility from shirking in the first stage. He chooses honesty if $2(U_O - E) > R - U_C$, which implies

$$U_O > E + \frac{R - U_C}{2}. \tag{7}$$

The official chooses honesty if he has high scruples (high U_O), and chooses to angle for a bribe if he can offer the client something valuable compared to the client's scruples (high $R - U_C$), and if the normal effort E of being honest is high (punishment is costly). It is irrelevant whether the client prefers honesty or angling for a bribe, since the official's monopoly position allows him to choose.

If $R < U_C$ either the official or the client will not accept bribery, and the official will choose between honest behavior (1) and shirking in both stages (zero utility). He will choose honesty if the utility from honesty is greater than the effort of work:

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

The model does not explicitly incorporate a danger that the official will be caught either shirking or bribing. However, the structure of the model is the same as that of the following model. 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.[17] By choosing to angle for a bribe, he therefore has an expected loss of $2\delta F$ from being caught. The solution to this model is given by equations (7) and (8) with U_O replaced by δF, and the interpretation is that the official is less likely to angle for a bribe if the probability of detection δ is high, or the punishment F is high.[18]

[17] Andvig and Moene (1989), Cadot (1987) and Rose–Ackerman (1978, chapter 9) model interactions with corrupt superiors.

[18] Mookherjee and Png (1995) present a model that overturns this simple intuition.

3.3 The official cannot observe the client's scruples

It is plausible that the official knows R. If R is principally a parameter describing the official's bureaucracy he will know it, and if R represents the client's ability to pay, the official can judge this at least to some extent from the client's appearance and address. It is less plausible that an official can evaluate the client's aversion to dishonesty (U_C). We assume, however, that the official knows the distribution of U_C, and chooses B^* with this knowledge. Some clients will now choose not to bribe if the official angles for a bribe.[19]

Under these circumstances, a risk–neutral official who angles for a bribe picks the bribe to maximize the expected payoffs.[20] 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 $B - E$ (2).

Assume that U_C is uniformly distributed along the interval $[\underline{U}_C, \overline{U}_C]$. If the official asks for a bribe, (4) implies the client will pay it if

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

The probability γ that the client pays is therefore

$$\gamma = P(U_C < E + R - B) = \frac{E + R - B - \underline{U}_C}{\overline{U}_C - \underline{U}_C}. \tag{10}$$

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

$$\max_B \frac{E + R - B - \underline{U}_C}{\overline{U}_C - \underline{U}_C}(B - E). \tag{11}$$

From the first order condition,

$$B^* = E + \frac{R - \underline{U}_C}{2}. \tag{12}$$

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

[19] In a different model the client could signal her willingness to bribe. Our modelling of the official moving first is inspired by the empirical results.

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

job honestly (punishment is costly to the client), and increasing in the surplus available for the least scrupulous client ($R - \underline{U}_C$).

From (12) and (10), the probability of the client bribing is

$$\gamma = \frac{1}{2}\frac{(R - \underline{U}_C)}{(\overline{U}_C - \underline{U}_C)}, \tag{13}$$

while from (12) the payoff $B - E$ is

$$\frac{1}{2}(R - \underline{U}_C). \tag{14}$$

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

$$\frac{1}{4}\frac{(R - \underline{U}_C)^2}{(\overline{U}_C - \underline{U}_C)}, \tag{15}$$

and the official chooses honest behavior over angling for a bribe if (1) is greater than (15), and therefore:

$$U_O > E + \frac{1}{8}\frac{(R - \underline{U}_C)^2}{\overline{U}_C - \underline{U}_C}. \tag{16}$$

The official is likely to choose honest behavior over angling for a bribe if he has high scruples (U_O), and is likely to angle for a bribe if normal effort E is high (he can punish the client effectively), 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. In this case the official's choice is between honest behavior and punishment. The official will prefer honest 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 ($\gamma = 1$) when R is at the threshold value $2\overline{U}_C - \underline{U}_C$:

$$B^* = E + R - \overline{U}_C. \tag{17}$$

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

3.4 Empirical implications

Although we cannot observe a client's utility, we have measures in the data of the quality of the service she receives. 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 honest service receive $2E$ in services from the official, while those paying a bribe receive $E + R$. If we view R as an organizational parameter, the difference in service between these two groups is $E - \overline{R}$, where the average R is 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 honestly are better off in equilibrium, since the effort he provides in the first stage more than offsets the bureaucracy reduction his acting dishonestly provides in the second stage.

The model predicts the relation between income and bribery, if we instead interpret the utility R as stemming from a valuation of reduced bureaucracy. The rich have higher R, so 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. It is ambiguous whether the probability of refusing a bribe compared to the probability of the official acting honestly is larger for the rich or the poor: the rich are less likely to face an official acting honestly, but are less likely to refuse to pay a bribe if one is angled for.

In the empirical work we are able to distinguish between quarterly income and consumption. Consumption may be considered a measure of permanent income, and it is arguably a client's permanent income that an official will best be able to assess, based on information such as address, dress, and vehicle ownership. Consumption will therefore be

our preferred measure of what is called 'income' in the model. Under some assumptions, however, income might be a better predictor of certain outcomes. If an official demanding a bribe offers the client a menu of differently priced services, but the client's decision is based on her current income, the amount of the bribe and the quality of service conditional on bribing will be more influenced by income than consumption. We therefore check for different effects of the two variables.

4 Data

4.1 The survey

We use data from a large, nationally and regionally representative, household survey from Peru. The *Encuesta Nacional de Hogares* (ENAHO), conducted yearly by Peru's national statistical agency *Instituto Nacional de Estadística e Información* (INEI), contains detailed information about individual and household characteristics. Rural regions are over–sampled. Over 18,000 households responded to the 2002 survey. Of particular importance to our study, beginning in 2002 the ENAHO includes a detailed module on governance, democracy and transparency that gathers information about the use of public officials. Respondents, one per household (usually the household head), are asked numerous questions pertaining to the household's use of 21 different types of officials.[21] If a particular type of official was used in the last 12 months, then respondents are asked a series of questions in connection with bribery of this official type in this time–frame: whether the official asked for a bribe, whether the respondent felt obliged to bribe or bribed voluntarily, whether they refused to bribe, and the amount of the bribe if they bribed.[22] The module also asks respondents about the quality of the services received from the official type: whether they saw an official immediately, the number of visits to the official, whether they successfully concluded business with the official, and whether

[21] The categories include police, judiciary, schools, various utilities and 'other'.

[22] For each official type, the survey question pertaining to bribery is "Were you solicited for, did you feel obliged to give or give voluntarily, a payment such as: gifts, tips and bribes, etc.?"

they consider the services received to be 'good', 'regular' or 'bad'.

One of the salient features of the data set is that it allows for an analysis of bribery by individuals while controlling for many household and individual observables. Notably, we are able to control for the respondent's age, education, occupation, household demographics, consumption and income.

4.2 Descriptive Statistics

Table 1 provides some descriptive statistics for the characteristics of bribery at the household level. The incidence of bribery experience (either paying a bribe, or refusing to pay a bribe) is 4.9% of the full sample and 6.2% conditional on using an official. This is comparable to another national estimate by Proética that cites an incidence of 6.5% in 2002.[23] While a recent Transparency International report finds an estimated incidence of 15%, their sample is restricted to Lima–Callao and the size for their sample is much smaller (only 416 observations).[24]

The number of official types used and the total number of visits to officials, not surprisingly, is higher for those experiencing bribery. Household quarterly consumption is also greater in the sample of respondents who reported a bribery experience. These descriptive statistics suggest a positive relationship between income (proxied by consumption) and bribery experience – this correlation may be driven by the fact that richer respondents have a higher rate of usage of public officials. Finally, it should be noted that the magnitudes of the bribes relative to net quarterly income is relatively low, at less than 2%.

Table 2 provides the characteristics of bribery experiences using household–official pairs as the unit of observation. Among the household–official interactions with a bribery experience (column 3), in 51% of cases the official solicited the bribe, in 21% of cases the respondent felt obliged to bribe, and in only 7% of cases did the respondent voluntarily bribe. The respondent refused to bribe in 21% of cases. Most interactions ended suc-

[23] Proética (2004).

[24] Transparency International (2004b).

cessfully since the client her concluded business with the official 92% of the time (column 1). This is far less often the case (only 71% of the time) for those who have experienced bribery (column 3). Paying the bribe only partly reverses the lower probability of successfully concluding business: clients who pay the bribe conclude their business 75% of the time (column 4). Respondents were also asked to rate whether the services received from the official were 'good', 'regular' or 'bad'. Respondents who faced a bribery experience were far more likely to rate the services as being 'bad' and far less likely to see the official immediately.

Certain officials have a disproportionate rate of bribery experience relative to the share of households using the official. Table 3 decomposes bribery experiences by type of official. Not counting the 'other' category, those officials that are less used by households (5% used a police official and 4% used an official from the judicial system) have the highest rate of bribery experience (30.4% for the police and 16.6% for the judicial service). These patterns are consistent with the notion that individuals who use the police or the judicial system have lower scruples than individuals who do not use them, so that officials know that there is a higher likelihood of successfully extracting a bribe from them. In addition, since the penalty for not bribing the police or the judicial system may be more severe (legal problems, criminal records...) than not bribing other officials (school officials, national registry...), police and judicial officials might recognize that angling for a bribe will be fruitful. Tables 1 and 2 in the Appendix provide individual and household characteristics of respondents.

5 Empirical specification

Our empirical tests fall into two categories: tests of who pays bribes, and tests of the payoffs for the parties involved. For the first category we run regressions on different samples with the following specification:

$$Y_{ij} = \mu_j + \beta_1 W_i + \mathbf{X_i}\beta_2' + \beta_3 Z_{ij} + \epsilon_{ij} \tag{18}$$

where j indexes official types and i the household, and Y is the outcome variable of interest: probability of a bribery experience (either for the full sample, or for the sample of observations where the official is used), probability of using an official (full sample), or number of visits to the official (sample where the official is used). μ_j are official–type fixed effects, W is a measure of household income or consumption, or a poverty indicator, and X contains the characteristics of the respondent and household whose means are in Appendix Tables 1 and 2. The only covariate Z varying by i and j is the number of visits by a household to a particular official type. Depending on the dependent variable, (18) is estimated using probits or ordinary least squares.

When we are interested in the payoff to bribery, for the official or the client, we estimate equations of the following form:

$$P_{ij} = \mu_j + \beta_1 W_i + \mathbf{X_i}\beta_2' + \beta_3 Z_{ij} + \mathbf{BX_{ij}}\beta_4' + \epsilon_{ij}. \tag{19}$$

The notation and specification here are the same as in (18), except that BX_{ij} are dummies for whether the respondent had any of several bribery experiences: bribed voluntarily, felt obliged to bribe, was asked by the official to bribe, and was asked but refused to bribe, and the outcomes P are the amount of bribe paid (for the sample who paid bribes), whether the client successfully concluded her business with the official, the client's subjective rating of the service quality, and whether the client saw the official immediately (all for the sample where the official is used). Depending on the dependent variable, (19) is estimated using simple or ordered probits or ordinary least squares. The theoretical model makes clear that BX_{ij} is endogenous: in the absence of convincing instruments, we use the theoretical model to interpret the results.

We also present the results of some regressions testing bribery determinants at the household level without official–type dummies. In this case bribe amounts are summed over official types and the bribery experience is positive if the household had at least one experience across official types.

We are concerned that consumption W_i may suffer from measurement error, possibly biasing its coefficients towards zero. Therefore, in addition to running the specification

reported below, we have run all regressions instrumenting consumption with income.[25] However, this did not in general raise the point estimates, suggesting that either measurement error is non–classical or correlated between consumption and income, or that income and consumption do play distinct roles, as proposed in the theoretical section. We choose to report the uninstrumented consumption and poverty coefficients, but note when uninstrumented coefficients on income differ. In all regressions we cluster standard errors at the level of the district.

6 Results – Who Pays and Who Refuses?

6.1 Household Level Regressions

By using the sample of households, we can give an overview of the relationship between household consumption and some key features of bribery. Table 4 presents the results. As in subsequent tables, the two panels of coefficients are from two regressions where the financial means of the household are represented by consumption, and dummies for extreme and moderate poverty, respectively. The odd columns of Table 4 include travel time to the district administrative center and dummies for household size, town size, and regional dummies (these are hereafter referred to as 'basic' controls). Even columns include all control variables.

The first two columns report the marginal effects from probits for the probability of the household's having been involved in a situation of bribery. We include all households, not only those who used at least one official. The coefficients on consumption (top panel) are similar in the two columns, and indicates that a doubling of household consumption (an increase of about one standard deviation) increases the bribery probability by (0.024)(log2)=0.017, or 1.7 percentage points (column 2). The marginal effects for the poverty dummies indicate that the extremely poor bribe about three percentage points less than the non–poor. These effects should be compared to the household–level bribery

[25] We used the procedure for Stata developed by Joseph Harkness, available at http://ideas.repec.org/c/boc/bocode/s415801.html.

prevalence of 4.9%. Clearly, there are large differences in bribery behavior based on consumption, and it will be important to decompose these into differences in use of officials and differences in bribery conditional on the use of an official. This is best done with the sample distinguishing types of official, in the next section.

Columns 3 and 4 report coefficients from an OLS regression for the determinants of the amount paid in bribes (for those who paid a bribe). With either basic covariates (column 3) or full covariates (column 4), the consumption elasticity of the bribe amount is about 0.3. The second panel of coefficients shows that the extremely poor households pay about 42 log points, or 35%, less in bribes. Amongst bribe–payers, the rich therefore pay more, but since the consumption elasticity is less than one, the poor pay a larger share of their consumption.

The results in columns 5 and 6 are coefficients from OLS regressions for the number of official types used by households that used at least one official. The coefficients fall from column 5 to column 6 as more covariates are added. Column 6 in the top panel indicates that a doubling of consumption increases the number of official types used by about .45 of an official, compared to an average of 2.1 official types per household. The second panel of column 6 indicates that the extremely poor use 0.7 fewer official types than the non–poor. The strong relation between consumption and number of official types may generally reflect greater demand of public services by the rich or greater supply to the rich, or could indicate that the rich have more complicated needs that require more than one official to complete.

Finally, in columns 7 and 8 the determinants of the total number of visits to officials are examined for the sample of households with at least one visit. The coefficient of 3.4 in the top panel of column 8 implies that a doubling of consumption leads to 2.3 more visits, while the second panel indicates that the extremely poor have 4 fewer visits than the non–poor, compared to 11.6 visits on average for those household making at least one visit. Columns 5–8 confirm that there are large differences by income in the usage of officials, which should be taken into account when considering the consumption differences in bribery experience.

6.2 Bribery Conditional on Use of the Official

Regressions equalent to the determinants of bribery experience in Table 4 columns 1 and 2, where usage of officials is not conditioned on, may be repeated using the official–household sample. These results shed little extra light, however, and are relegated to Appendix Table 3. It is more interesting to discard from the stacked sample the observations for household–official pairs where the household did not use the official, and examine the determinants of bribery of an official conditional on his having been used by the household. The marginal effects from these probits, multiplied by 100, are reported in Table 5.

Column 1 contains only the basic controls, while in column 2 we also control for the number of visits to the official type, which changes the consumption–related coefficients little. The marginal effect of 0.617 in column 2 line 1 indicates that a doubling of consumption increases bribery by 0.4 percentage points. The second panel indicates that the extremely poor have a 1.1 percentage point lower probability of bribing than the non–poor. These effects are sizeable compared to the mean probability of 2.7% in this stacked sample. However, they are smaller than the effects in Table 4 columns 1 and 2, indicating that greater usage of officials by the rich is a partial explanation for their greater bribery experience.

The addition in column 3 of 20 dummies for the various official types greatly reduces the coefficients associated with consumption. In the first panel, the marginal effect is reduced by 70% to 0.187, while in the second panel, the reduction is less dramatic: the effect falls by 51% to 0.56 percentage points. Thus, at least half of the greater propensity of the rich to bribe is because they disproportionately use official types that are generally more involved in bribery.

To investigate this further, we have run unreported regressions where we add the official type dummies singly. Two types of official stand out as having a large effect on the consumption coefficients: police, and school officials. The former is a very high–bribery type that the rich use slightly more, while the latter is a low–bribery type that the rich use much less, probably because they send their children to private schools. Controlling

only for police and school officials reduces the marginal effect of 0.617 in column 2 first row to 0.271.

The addition of further groups of covariates in columns 4–7 of Table 5 changes the consumption coefficients slightly. The coefficient on years of education (added in column 4) is insignificant or negative, and neither its inclusion nor adding characteristics of the respondent's job in column 5 affects the consumption–related coefficients much. The effect of consumption on bribery experience therefore does not principally reflect the types of jobs richer people have.[26] Adding the 'remaining' covariates in column 6 increases the consumption–related coefficients (to a marginal effect of 0.31 for consumption). Finally, in column 7, the number of types of official used by the household is controlled for: each additional type of official used increases the probability of bribing a given official by 0.1 percentage point. Controlling for the number of official types reduces the coefficient on consumption from 0.315 (which would translate a doubling of consumption into a 0.2 percentage point increase) to 0.230. These results are consistent with the idea that the rich bribe more because they have more complicated needs requiring more than one official type at once.

We do not report the results of controlling for net total income, rather than consumption, but for the regressions of this table the income coefficients are considerably smaller. The coefficient corresponding to column 1 in the first panel is 0.318, and once official type dummies are added (corresponding to column 3) the coefficient becomes insignificant, and remains so as further covariates are added. The coefficient corresponding to column 7 is 0.02 with a t–statistic of 0.2. This is consistent with the hypothesis that the official has more control than the client over who pays bribes, and that he bases his actions on consumption rather than income. To check the robustness of the difference between income and consumption, we confirm that all combinations of net/gross and monetary/total income give similar results, that expenditure gives the same result as the value of con-

[26]The full covariates contain some information about household members other than the respondent, but characteristics of the respondent are much more significant, suggesting the respondent underreports bribery experiences of other household members.

sumption, and that subtracting any consumption category that might include bribes does not affect the consumption coefficient (these robustness checks are not reported).

For both consumption and income at least half the effect is explained by the fact that the rich use more corrupt types of official. Our model of bribery does not predict that officials with a rich clientele would ask for more bribes from poor clients, but one could develop a model where officials are corrupted by having rich clients.

Thus far, the analysis has not distinguished between types of bribery experience. We run unreported multinomial logits allowing the bribery experience to be split into the categories of bribed voluntarily, felt obliged to bribe, bribed because the official solicited a bribe, and refused to bribe. With only basic covariates, the point estimates suggest that while there is some effect of consumption on all bribe categories relative to no bribery experience, the effect is largest for the 'felt obliged' category. Once official type dummies are added, the coefficients for categories other than 'felt obliged' become small and insignificant, while the effect for the 'felt obliged' category remains strongly positive and significant.

The theoretical model grouped those solicited for a bribe and those feeling obliged to bribe in the same category, and predicted richer clients would be more likely to fall into these categories. The empirical results suggest there is some unmodelled difference between them. The model had an ambiguous prediction for the relation between consumption and bribe refusal. Voluntary bribes were not modelled.

6.3 Use of Officials

In Table 6 we present the results of examining the relation between consumption and use of officials directly using the full household–official sample. Results using income instead of consumption were almost identical. We present the marginal effects of a probit for whether the household used the official type. Column 1 includes only basic covariates, and the first panel indicates that if household consumption is doubled, the probability of using an official rises by about (0.04)(log2)=0.028, or 2.8 percentage points. The second

panel indicates that the extremely poor have a 4.8 percentage point lower probability of using an official. These effects are very large compared to the mean usage rate of 10.2% in this sample. Adding further covariates successively across the columns reduces the effect of doubling consumption to 1.6 percentage points in column 5 (marginal effect of 0.023), and reduces the effect of being extremely poor to 2.2 percentage points in column 5. About half the effect of consumption can therefore be explained by other covariates, but the effects remain substantial.

In Table 7 we investigate whether the rich also make more visits to a given official type, conditional on using the official type at least once. We suspect that these visits are not completely exogenous to the question of bribery, since more red tape, which the official manipulates in our theoretical model, may mean more visits. Columns 1 and 2 show that the rich do make more visits to any given official type, but that this is strongly influenced by the fact that the rich tend to use officials who generally receive a lot of visits, since controlling for official type dummies reduces the consumption–related coefficients by about half in column 2. While education and job type do not influence the consumption–related coefficients greatly (columns 3,4), the addition of the remaining covariates renders these consumption coefficients small and insignificant. The effect of being extremely poor, for example, goes from implying 0.9 fewer visits per official in column 1, to an insignificant 0.06 fewer visits in column 6 (compared to 4.3 visits on average).

Controlling for the number of visits to an official type does not have a large effect on the consumption–related coefficients in Table 5 (determinants of bribery conditional on use) in any case, so we focus hereafter on the probability of using an official type at all as the most important dimension of usage for bribery. It is tempting to interpret the greater use of officials by richer households as reflecting their generally greater demand for goods and services, but in fact we are unable to identify supply and demand separately: although we include geographic controls and travel time to the district administrative center, we cannot exclude the possibility that richer households have more public services available to them.

6.4 Decomposition into Use and Bribery Conditional on Use

The results of Tables 5 and 6 may be used to decompose the greater experience of bribery of the rich (in Appendix Table 3) into components due to higher usage and to higher bribery conditional on usage. Conceptually this is easiest when discrete groups are used, so we focus on the difference between the extremely poor and the non–poor.

The probability of bribing $P(B)$ is the product of the probability of using the official $P(O)$ and the probability of bribing the official conditional on use $P(B|O)$:

$$P_j(B) = P_j(O)\ P_j(B|O), \tag{20}$$

where j represents N, for non–poor, or XP, for extremely poor. The bribery gap between the non–poor and the extremely poor population is

$$P_N(B) - P_{XP}(B) = P_N(O)\ P_N(B|O) - P_{XP}(O)\ P_{XP}(B|O), \tag{21}$$

which can be rewritten as

$$P_N(O)\Delta P(B|O) + P_{XP}(B|O)\Delta P(O) \tag{22}$$

or

$$P_{XP}(O)\Delta P(B|O) + P_N(B|O)\Delta P(O). \tag{23}$$

In the raw household–official data, the overall bribery experience gap is 0.0023, the usage gap is 0.047, and the gap in bribery conditional on usage is 0.012: these numbers are very close to the coefficients on extreme poverty reported in the first column, second panel of Appendix Table 3, Table 6 and Table 5 (but not exactly the same, owing to the non–linear estimates and the presence of the basic controls in the tables). Depending on whether the weighting of the usage and conditional bribery gaps is that of (22) or (23), the usage gap $\Delta P(O)$ contributes either 62% or only 38% to the overall bribery gap.

At least 38% of the higher bribery experience by the non–poor is therefore because they have a higher probability of using officials. Furthermore, the second panel of Table 5 has shown that of the remaining at most 62%, half is caused by the fact that the non–poor

use more corrupt types of officials. Therefore, at most 31% of the higher bribery of the non–poor is owing to a higher probability of a bribery experience conditional on using a particular type of official.

7 Results – What Are the Payoffs?

7.1 Official's Payoff: 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. In column (1) with basic controls, the two panels indicate that as predicted by the theoretical model, the official receives larger bribe amounts from richer clients. The top panel indicates that the consumption elasticity of the bribe amount is 0.3. The second panel indicates that the extremely poor pay 46 log points less, or 38%. In column 2 we control for the number of visits to the official, which reduces the coefficient on consumption somewhat. We are unsure whether it is preferable to control for the number of visits or not: the instructions to the respondents mention that they should 'average', but it is not clear whether the intention is for respondents to average over multiple bribes to the same official or not. Results using income instead of consumption are similar.

The results in columns 1 and 2 are very similar to those in the household level Table 4 columns 3 and 4. The advantage of the stacked sample is that the types of official can be controlled for, which we do in column 3. In this case, however, these controls prove to be unimportant: they increase the R-squared little and do not affect the consumption–related coefficients. While official types appear to vary importantly in how frequently they take bribes, the bribe amounts do not appear to vary conditional on a bribe being taken.

The addition of further controls in columns 4–6 reduces the consumption–related coefficients, rendering them insignificant in columns 5 and 6 (the much smaller sample than in other tables makes for larger standard errors). In column 7 we control for the type of bribery experience. Compared to the omitted bribe solicited by the official, those feeling

obliged to bribe and especially those bribing voluntarily pay smaller bribes. This is also true when consumption is not controlled for in column 8 (and in an unreported regression where visits are not controlled for). Solicited bribes may be larger because they include a risk–premium for the official. Alternatively, the size of the bribe across categories may be related to the circumstances that lead to that category occurring.

We can go further with this sample of bribers and use it to test whether the richer clients are paying more bribes for the same level of service (first degree price–discrimination) or whether the official offers richer clients packages of better service for a higher bribe (third degree price–discrimination). We can do this by controlling for our measures of service: whether the business with the official was completed successfully, the subjective assessment of the service quality (as two dummy variables) and whether the client was seen immediately. The inclusion of these variables changes the consumption–related coefficients little (these results are not reported), which would appear to be support for price–discrimination. However, the bribe amount is larger when the service is worse, which calls into question the validity of the test . We discuss the sign of this relation in the next section.

7.2 Client's Payoff: Quality of Service

In this section we investigate the payoff to the client of bribing or refusing to bribe, compared to dealing with an official acting honestly, while also allowing for the possibility of consumption having an independent effect on the payoff. We measure the payoff in terms of the quality of service, for which we have several measures. Our preferred measure is whether the client successfully completed her business with the official, and marginal effects from probits for the probability of completion are presented in Table 9.

The marginal effect of -0.012 in the first panel of the first column, where only basic controls are included, indicates that a doubling of household consumption actually reduces the probability of the client's concluding her business by a significant but small 0.9 percentage points (92% of clients concludes their business successfully). This coefficient is

little affected by the inclusion of the number of visits to the official in the second column. The fact that the number of visits is negative and significant hints at an omitted third factor like official quality that is driving both the probability of concluding business and the number of visits necessary.

The inclusion of official type dummies in column 3 changes the consumption coefficient in the first panel from negative and significant to zero: richer clients appear to get worse service because they use officials who tend to give worse service (consistent with the Table 7 result that the rich use officials who tend to require more visits), either because the officials of that type are of lower quality, or because they deal with more complicated and/or bureaucratic services. As more covariates are included in columns 4–6, the coefficient on consumption stays at zero in the first panel.

In column 6 we include dummy variables for whether the client experienced bribery, distinguishing between the various bribery possibilities and refusal to bribe. As predicted by the model, the worst service is received by those who refuse to bribe: the probability of their concluding their business is 21 percentage points lower than that of those who had no situation of bribery (and hence dealt with an official acting honestly).

However, those who felt obliged to bribe, or whom the official solicited for a bribe, still did worse than those dealing with an honest official, by 6.4–6.7 percentage points. This is supportive of endogeneity of the type predicted by the theoretical model: it is likely that the official provided bad service as a prelude to a bribe. The results indicate that the service loss from angling for a bribe is slightly more than the service gain provided in return for the bribe. For those who felt obliged to bribe, the results could additionally reflect that they had mistaken a naturally incompetent official for an official angling for a bribe. These two groups do statistically significantly better than those who refuse to bribe.

Voluntary bribes were not considered in the theoretical model, but the fact that clients bribing voluntarily get the best outcomes suggests that they may have nipped the angling stage in the bud to end up no worse off than with an honest official.

We already know from the previous section that the amount of the bribe is negatively

related to the quality of service. This is similar in spirit to the fact of bribing being slightly negatively related to the quality of service, but was nevertheless not predicted by the model.

The poverty coefficients of the second panel mirror the consumption coefficients of the first: apparently better service for the extremely poor in columns 1 and 2 is fully explained by the official type dummies in column 3. However, the unreported results using net total income instead of consumption differ. The difference is only one of magnitude in the equivalent of columns 1 and 2, but once official types are controlled for in column 3, the income coefficient becomes positive and significant, and the coefficient increases slightly with the addition of further covariates. Results for the equivalent of column 6 indicate that a doubling of income increases the probability of completing business by 0.6 percentage points. This is a small magnitude, however.

As when a discrepancy was found between consumption and income in Table 5, we check the sensitivity of the results to using expenditure instead of consumption, the four combinations of net/gross and money/total income, and the subtraction from consumption of items that might include bribes. In this case we find that in addition to all the income permutations, expenditure also has a positive and significant coefficient with the other controls of column 6. Overall, then, it appears that richer clients can get better service through channels other than the bribe, but the magnitude is small. One channel for getting this better service could be personal connections with public officials. Those with the best connections would be public officials themselves. However, the unreported coefficient on the public administration dummy indicates that public officials use other public officials more, but do not bribe differently conditional on use, and are not more likely to conclude their business.

The general picture provided by the Table 9 analysis of the probability of concluding business is supported by the analysis in Table 10 of our two other measures of service quality: an ordered probit for the client's subjective assessment in columns 1–5 (with one indicating good service and three indicating bad service), and a probit for whether the client saw the official 'immediately' in columns 6–8. The signs of the marginal effects

associated with the different consumption measures suggest that there may be a beneficial effect of consumption on subjective service quality after the official type is controlled for (columns 3 and 4), but the coefficients are not significant, and the signs imply the opposite for the probability of seeing the official immediately (columns 7 and 8). Unreported coefficients for income are smaller in absolute value.

In columns 4 and 8 we again see that the worst service (or perceived service) is reserved for those who refused to bribe: these clients rate their service worse by 1.3 points out of 3, and are 18 percentage points less likely to see the official immediately (compared to a mean of 93%). The best service is for those dealing with honest officials, while those bribing voluntarily are significantly worse off by these measures. Those feeling obliged to bribe or who are solicited for a bribe do not receive significantly worse service than the voluntary bribers, but do receive significantly better service than those who refuse to bribe.

Column 5 indicates that controlling for whether the client was seen immediately and whether the client concluded her business with the official has very large effects on the subjective assessment of the service quality (close to one point), and reduces the coefficients on the bribery dummies: for example, the reduction in the coefficient on refused to bribe from 1.3 to 1.0 indicates that some (though not all) of the punishment (and reduced service from angling) they received came through not being seen immediately and having service ineffective enough to reduce conclusion rates.

8 Conclusions

We have used theory and detailed data on individuals' use and bribery of public officials in Peru to build a framework describing the determinants of bribery, and the payoffs to bribery. Together, theory and data lead us to several characterizations of official–client interactions. We observe that the official moves first in the game determining whether a bribe will be paid. On initial contact with the client, the official chooses to act honestly or to angle for a bribe by shirking. If the client refuses to bribe, the official punishes the

client with further shirking. We find that the probability that such a client completes her business successfully is 21% lower than for clients dealing with an official acting honestly. For a client agreeing to bribe, the probability of completing her business is 6–7% lower than for clients dealing an official acting honestly, suggesting that the extra service the official provides in return for a bribe does not quite offset the service loss from his original shirking. Occasionally a client bribes voluntarily, which results in service quality equal to that of clients dealing with honest officials: possibly such clients cut short the initial period of shirking.

The official takes the client's income into consideration when deciding whether to angle for a bribe, and how much to ask for. An official with monopoly power is more likely to angle for a bribe if the client is richer, and asks a richer client for a higher bribe. We find an income–elasticity of the bribe amount in the range of 0.2–0.3. Thus, rich bribers pay higher bribes, but spend a lower share of their income on bribes. Our results suggest that officials practice first–degree price discrimination rather than third–degree price discrimination, but are not conclusive on this point.

We find that at least 38% of the bribery gap between the extreme poor and the non–poor is explained by the greater use of officials by the non–poor. Furthermore, of the remaining 62%, at least half is explained by the fact that the non–poor use a more corrupt mix of official types. Therefore, at most 31% of the higher bribery of the non–poor is owing to a higher probability of bribery conditional on using a particular official type. Doubling a client's value of consumption increases this probability by less than 0.2 percentage points, compared to a bribery probability in the relevant sample of 2.7%.

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Table 1: Characteristics of bribery in previous 12 months – household level
(Standard deviations in parentheses)

	(1) Full sample	(2) Used an official	(3) Bribery experience	(4) Reported amount bribe
Bribery experience	0.049	0.062	1	1
Number of situations of bribery	--	--	1.19 (0.52)	1.20 (0.52)
Used an official	0.79	1	1	1
Used police	0.05	0.06	0.38	0.40
Used school official	0.48	0.60	0.54	0.55
Number of types of officials used	2.1 (1.9)	2.7 (1.8)	4.2 (2.5)	4.4 (2.6)
Total visits to officials	9.1 (13.6)	11.6 (14.4)	18.9 (20.2)	19.6 (20.7)
Value of bribes paid by household (Nuevo sol)	--	--	--	71 (284)
Household quarterly consumption (Nuevo sol)	3166 (3051)	3420 (3168)	4370 (3801)	4425 (3857)
Bribe value/quarterly consumption	--	--	--	0.019 (0.05)
Extreme poverty	0.22	0.22	0.11	0.11
Moderate poverty	0.28	0.27	0.25	0.25
Observations	18,272	14,454	896	707

Sample: households for whom information on at least one official type is used.

One Nuevo sol is worth about 30 US cents.

Table 2: Characteristics of bribery in previous 12 months – household-official level
(Standard deviations in parentheses)

	(1) Full sample	(2) Used an official	(3) Bribery experience	(4) Paid bribe
Bribery experience	0.0028	0.027	1	1
Bribery: official solicited bribe	--	--	0.51	0.65
Bribery: felt obliged to bribe	--	--	0.21	0.26
Bribery: bribed voluntarily	--	--	0.07	0.09
Bribery: refused to bribe	--	--	0.21	0
Used official	0.102	1	1	1
Visits to official	--	4.3	4.7	4.6
Concluded business with official	--	0.92	0.71	0.75
Official service good	--	0.34	0.10	0.10
Official service regular	--	0.56	0.40	0.42
Official service bad	--	0.10	0.50	0.48
Saw official immediately	--	0.93	0.70	0.71
Value of bribe	--	--	--	63
				(241)
Bribe value/quarterly consumption	--	--	--	0.017
				(0.05)
Observations	383,577	38,937	1059	806

Notes: There are 21 official types and 18,272 households for whom at least one official type's information is used.

Table 3: Distribution of bribes across official types

Official type	(1) Number of bribes	(2) Share of bribes	(3) Share of households using official	(4) Share of officials with bribery experience
Police	280	0.26	0.05	0.304
Municipal government	267	0.25	0.23	0.064
Judicial system	127	0.12	0.04	0.166
Schools	88	0.08	0.48	0.010
Utilities (sum of water, phone, electricity)	66	0.06	0.21	0.007
State hospitals	46	0.04	0.20	0.013
National ID Registry	44	0.04	0.12	0.020
Other	141	0.13	0.03	0.020
Total	1059	1	--	0.027

Note: the 21 official types have been collapsed to fewer categories for this table.

Table 4: Regressions at the household level
(T-statistics in parentheses)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Bribery experience		Amount paid in bribes (log)		Number of official types used (if>0)		Total visits to officials (if>0)	
Log household consumption	0.027	0.024	0.340	0.294	0.928	0.652	5.416	3.402
	(10.1)	(7.4)	(3.3)	(2.3)	(18.3)	(14.0)	(14.7)	(10.5)
Household extremely poor	-0.035	-0.028	-0.436	-0.414	-1.230	-0.734	-7.40	-4.06
	(-8.3)	(-5.9)	(-2.1)	(-1.9)	(-19.9)	(-13.8)	(-15.2)	(-9.9)
Household moderately poor	-0.019	-0.014	-0.352	-0.281	-0.759	-0.424	-4.96	-2.71
	(-5.1)	(-3.8)	(-2.4)	(-1.7)	(-13.9)	(-9.4)	(-12.5)	(-8.3)
Additional covariates?	--	Yes	--	Yes	--	Yes	--	Yes
R-squared	0.04	0.06	0.07	0.11	0.22	0.25	0.24	0.26
Observations	18,272		707		14,454		14,446	

Notes: Results in columns 1-2 are marginal effects from probits, while coefficients in columns 3-8 are from OLS regressions. T-statistics are clustered by district. The two panels of coefficients are from two different regressions. The R-squared is the same in each panel. All regressions include seven regional dummies, household size dummies, town size dummies and time to the district administrative center. "Additional covariates" consist of characteristics of the respondent (sex, married/cohabiting, married/cohabiting*sex, age and age squared, education, student status, whether main job is in military/police, or public administration, job type) and of the household (number of earners, number of members in school, ownership dummies for bicycle, car/van, tricycle, motorbike, and truck, whether land obtained by invasion, presence of children aged 0-5 and 6-15). "Job type" categories for the respondent's main job are employer (non-agricultural), employer (agricultural), employer*employs more than ten employees, self-employed (non-agricultural), self-employed (agricultural), white collar, blue collar, domestic worker, unpaid family member, other and not working.

Table 5: Determinants of bribery experience conditional on use of official
(Marginal effects; t-statistics in parentheses; coefficients multiplied by 100)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log household consumption	0.644	0.617	0.187	0.205	0.233	0.315	0.230
	(4.3)	(4.2)	(1.9)	(1.9)	(2.1)	(2.6)	(1.9)
Number of visits to this official	--	0.052	0.060	0.060	0.060	0.060	0.058
		(1.9)	(5.8)	(5.8)	(5.8)	(6.0)	(5.9)
Respondent education years	--	--	--	-0.006	0.003	-0.029	-0.036
				(-0.4)	(0.2)	(-1.5)	(-2.0)
Number of types of officials used	--	--	--	--	--	--	0.104
							(3.1)
Household extremely poor	-1.194	-1.155	-0.563	-0.588	-0.586	-0.645	-0.575
	(-4.3)	(-4.1)	(-3.1)	(-3.2)	(-3.2)	(-3.4)	(-3.0)
Household moderately poor	-0.460	-0.428	-0.199	-0.217	-0.243	-0.305	-0.246
	(-2.0)	(-1.9)	(-1.3)	(-1.3)	(-1.5)	(-1.9)	(-1.5)
20 official type dummies	--	--	Yes	Yes	Yes	Yes	Yes
Respondent job type	--	--	--	--	Yes	Yes	Yes
Remaining covariates	--	--	--	--	--	Yes	Yes
R-squared	0.02	0.02	0.21	0.21	0.21	0.22	0.22

Notes: Probit regressions with t-statistics clustered by district. 38,937 observations. The two panels of coefficients are from two different regressions. The R-squared is the same in each panel. All regressions include seven regional dummies, household size dummies, town size dummies and time to the district administrative center. "Job type" dummies for the respondent's main job are employer (non-agricultural), employer (agricultural), employer*employs more than ten employees, self-employed (non-agricultural), self-employed (agricultural), white collar, blue collar, domestic worker, unpaid family member and other (the omitted type is respondent not working). "Remaining covariates" consist of 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, number of members in school, ownership dummies for bicycle, car/van, tricycle, motorbike, and truck, whether land obtained by invasion, presence of children aged 0-5 and 6-15).

Table 6: Probability of using an official
(Marginal effects; t-statistics in parentheses)

	(1)	(2)	(3)	(4)	(5)
Log household consumption	0.041	0.031	0.025	0.024	0.023
	(22.2)	(22.9)	(18.9)	(17.9)	(16.1)
Respondent education years	--	--	0.0019	0.0017	0.0016
			(15.9)	(12.7)	(10.5)
Household extremely poor	-0.048	-0.035	-0.027	-0.026	-0.022
	(-21.4)	(-22.2)	(-17.6)	(-16.9)	(-13.9)
Household moderately poor	-0.032	-0.024	-0.018	-0.017	-0.014
	(-17.9)	(-18.6)	(-15.1)	(-13.9)	(-11.5)
20 official type dummies	--	Yes	Yes	Yes	Yes
Respondent job type	--	--	--	Yes	Yes
Remaining covariates	--	--	--	--	Yes
R-squared	0.04	0.26	0.26	0.26	0.26

Notes: Probit regressions with t-statistics clustered by district. 383,577 observations. The two panels of coefficients are from two different regressions. The R-squared is the same in each panel. See notes to Table 5 for a description of the covariates.

Table 7: Determinants of numbers of visits to official conditional on at least one visit
(T-statistics in parentheses)

	(1)	(2)	(3)	(4)	(5)	(6)
Log household consumption	0.480 (7.0)	0.252 (4.0)	0.187 (2.9)	0.158 (2.4)	0.069 (1.0)	-0.045 (-0.6)
Respondent education years	--	--	0.022 (3.1)	0.021 (2.7)	0.034 (3.6)	0.026 (2.8)
Number of types of officials used	--	--	--	--	--	0.138 (5.9)
Household extremely poor	-0.915 (-8.8)	-0.439 (-4.7)	-0.348 (-3.6)	-0.308 (-3.2)	-0.182 (-1.8)	-0.063 (-0.6)
Household moderately poor	-0.582 (-7.4)	-0.345 (-4.9)	-0.288 (-4.1)	-0.258 (-3.7)	-0.187 (-2.5)	-0.109 (-1.5)
20 official type dummies	--	Yes	Yes	Yes	Yes	Yes
Respondent job type	--	--	--	Yes	Yes	Yes
Remaining covariates	--	--	--	--	Yes	Yes
R-squared	0.10	0.23	0.23	0.23	0.23	0.23

Notes: OLS regressions with t-statistics clustered by district. 38,937 observations. The two panels of coefficients are from two different regressions. The R-squared is the same in each panel. See notes to Table 5 for a description of the covariates.

Table 8: Determinants of log bribe value
(Marginal effects; t-statistics in parentheses)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log household consumption	0.324 (3.2)	0.267 (2.9)	0.267 (2.9)	0.276 (2.5)	0.178 (1.6)	0.166 (1.4)	0.170 (1.5)	--
Number of visits to this official	--	0.047 (5.2)	0.047 (5.2)	0.046 (5.0)	0.047 (5.0)	0.046 (4.9)	0.048 (5.1)	0.049 (5.3)
Respondent education years	--	--	--	-0.006 (-0.4)	0.004 (0.2)	0.002 (0.1)	0.006 (0.3)	--
Number of types of officials used	--	--	--	--	--	0.018 (0.7)	0.017 (0.7)	--
Felt obliged to bribe	--	--	--	--	--	--	-0.287 (-2.3)	-0.220 (-1.9)
Bribed voluntarily	--	--	--	--	--	--	-0.497 (-3.4)	-0.403 (-2.6)
Household extremely poor	-0.462 (-2.2)	-0.397 (-1.9)	-0.403 (-1.9)	-0.421 (-1.9)	-0.365 (-1.7)	-0.356 (-1.7)	-0.349 (-1.7)	--
Household moderately poor	-0.299 (-2.1)	-0.226 (-1.7)	-0.226 (-1.8)	-0.213 (-1.5)	-0.123 (-0.9)	-0.108 (-0.7)	-0.117 (-0.8)	--
20 official type dummies	--	--	Yes	Yes	Yes	Yes	Yes	Yes
Respondent job type	--	--	--	Yes	Yes	Yes	Yes	--
Remaining covariates	--	--	--	--	Yes	Yes	Yes	--
R-squared	0.06	0.21	0.21	0.22	0.25	0.25	0.26	0.21

Notes: OLS regressions with t-statistics clustered by district. 806 observations. The two panels of coefficients are from two different regressions. The R-squared is the same in each panel (except in column 2, where the R-squared with the poverty dummies is only 0.13). See notes to Table 5 for a description of the covariates. The omitted bribe type in column 7 is one solicited by the official.

Table 9: Determinants of probability of successfully concluding business with official
(Marginal effects; t-statistics in parentheses)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log household consumption	-0.012 (-4.0)	-0.011 (-3.7)	0.000 (0.0)	0.001 (0.1)	0.002 (0.8)	0.002 (0.9)	--
Number of visits to this official	--	-0.002 (-4.0)	-0.002 (-4.1)	-0.001 (-4.1)	-0.001 (-4.0)	-0.001 (-3.8)	-0.001 (-3.9)
Respondent education years	--	--	--	-0.000 (-0.5)	-0.000 (-0.2)	-0.000 (-0.3)	--
Number of types of officials used	--	--	--	--	-0.002 (-2.2)	-0.002 (-2.1)	--
Bribe solicited by official	--	--	--	--	--	-0.067 (-6.1)	-0.067 (-6.1)
Felt obliged to bribe	--	--	--	--	--	-0.064 (-3.5)	-0.064 (-3.5)
Bribed voluntarily	--	--	--	--	--	0.002 (0.1)	0.001 (0.0)
Refused to bribe	--	--	--	--	--	-0.213 (-9.1)	-0.211 (-8.9)
Household extremely poor	0.022 (4.1)	0.020 (3.7)	0.004 (0.7)	0.003 (0.5)	0.001 (0.2)	0.000 (0.1)	--
Household moderately poor	0.010 (2.4)	0.009 (2.1)	0.002 (0.4)	0.001 (0.4)	0.000 (0.1)	-0.000 (-0.1)	--
20 official type dummies	--	--	Yes	Yes	Yes	Yes	Yes
Respondent job type	--	--	--	Yes	Yes	Yes	--
Remaining covariates	--	--	--	Yes	Yes	Yes	--
R-squared	0.01	0.02	0.11	0.11	0.11	0.12	0.12

Notes: Probit regressions with t-statistics clustered by district. 38,937 observations. The two panels of coefficients are from two different regressions. The R-squared is the same in each panel. In the second panel consumption is instrumented with income (and t-statistics are not clustered). See notes to Table 5 for a description of the covariates.

Table 10: Determinants of further service measures
(T-statistics in parentheses.)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Service quality (1=good, 2=medium, 3=bad)					Saw official immediately		
Log household consumption	0.042	0.015	-0.021	-0.023	-0.028	-0.018	-0.012	-0.005
	(2.5)	(0.9)	(-1.0)	(-1.1)	(-1.3)	(-6.1)	(-4.3)	(-1.7)
Number of visits to this official	--	--	0.007	0.006	0.003	--	--	--
			(2.7)	(2.2)	(1.1)			
Respondent education years	--	--	0.006	0.006	0.006	--	--	-0.000
			(2.3)	(2.5)	(2.3)			(-0.9)
Number of types of officials used	--	--	0.003	0.001	-0.004	--	--	-0.002
			(0.5)	(0.2)	(-0.6)			(-2.9)
Bribe solicited by official	--	--	--	0.99	0.82	--	--	-0.126
				(15.3)	(12.7)			(-11.1)
Felt obliged to bribe	--	--	--	0.86	0.68	--	--	-0.124
				(8.4)	(6.4)			(-7.7)
Bribed voluntarily	--	--	--	0.57	0.51	--	--	-0.074
				(3.6)	(3.1)			(-3.4)
Refused to bribe	--	--	--	1.32	1.01	--	--	-0.180
				(12.4)	(9.2)			(-9.5)
Saw official immediately	--	--	--	--	-0.98	--	--	--
					(-35.7)			
Concluded business	--	--	--	--	-0.70	--	--	--
					(-21.3)			
Household extremely poor	-0.047	0.000	0.035	0.044	0.050	0.024	0.016	0.005
	(-1.7)	(0.0)	(1.2)	(1.5)	(1.7)	(5.1)	(3.6)	(1.0)
Household moderately poor	-0.029	-0.006	0.021	0.025	0.024	0.010	0.005	-0.002
	(-1.4)	(-0.3)	(0.9)	(1.1)	(1.0)	(2.7)	(1.5)	(-0.5)
20 official type dummies	--	Yes	Yes	Yes	Yes	--	Yes	Yes
Respondent job type	--	--	Yes	Yes	Yes	--	--	Yes
Remaining covariates	--	--	Yes	Yes	Yes	--	--	Yes
R-squared	0.01	0.03	0.04	0.05	0.09	0.02	0.09	0.11

Notes: 38,937 observations. Columns 1-5 are ordered probits, columns 6-8 report marginal effects from probits. T-statistics are clustered by district. The two panels of coefficients are from two different regressions. The R-squared is the same in each panel. See notes to Table 5 for a description of the covariates.

Appendix Table 1: Means of household characteristics
(Standard deviations in parentheses)

	(1) Full sample	(2) Used an official	(3) Bribery experience	(4) Reported bribe amount
Time to district administrative	64	59	49	51
center (minutes)	(150)	(148)	(142)	(157)
Town >500,000	0.16	0.17	0.23	0.21
Town 100,000-500,000	0.22	0.23	0.27	0.28
Town 50,000-100,000	0.06	0.07	0.09	0.10
Town 20,000-50,000	0.08	0.08	0.06	0.06
Town 2000-20,000	0.08	0.08	0.07	0.07
Town 500-2000	0.05	0.05	0.03	0.03
Town about 200	0.26	0.24	0.18	0.17
Town about 100	0.09	0.08	0.07	0.07
Own bike	0.26	0.28	0.36	0.35
Own car/van	0.07	0.07	0.12	0.13
Own tricycle	0.04	0.05	0.08	0.08
Own motorbike	0.03	0.03	0.04	0.03
Own truck	0.01	0.01	0.01	0.01
Own taxi	0.01	0.01	0.02	0.02
Own residence through invasion	0.05	0.06	0.08	0.08
Child aged 0-5 present	0.40	0.42	0.45	0.47
Child aged 6-15 present	0.57	0.63	0.58	0.58
Household size	4.4	4.7	4.7	4.8
	(2.2)	(2.2)	(2.2)	(2.2)
Number of earners	2.0	2.1	2.2	2.2
	(1.1)	(1.1)	(1.2)	(1.2)
Number of members in school	1.5	1.7	1.7	1.7
	(1.4)	(1.4)	(1.5)	(1.5)
Observations	18,272	14,454	896	707

Sample: households for whom information on at least one official type is used.

Appendix Table 2: Means of respondent characteristics
(Standard deviations in parentheses)

	(1) Full sample	(2) Used an official	(3) Bribery experience	(4) Reported bribe amount
Male	0.49	0.48	0.56	0.58
Age	40.7	39.5	37.9	37.8
	(16.3)	(15.1)	(13.5)	(13.3)
Years education	7.8	8.2	9.5	9.7
	(4.8)	(4.8)	(4.6)	(4.5)
Married or cohabiting	0.64	0.66	0.64	0.67
Married/cohabiting*male	0.33	0.34	0.39	0.41
Not employed	0.23	0.22	0.19	0.20
Non-agricultural employer	0.03	0.03	0.03	0.03
Agricultural employer	0.02	0.02	0.04	0.04
Non-agricultural self-employed	0.16	0.14	0.11	0.11
Agricultural self-employed	0.18	0.19	0.22	0.22
White collar	0.12	0.14	0.18	0.20
Blue collar	0.12	0.11	0.12	0.12
Unpaid family worker	0.12	0.12	0.08	0.07
Domestic worker	0.01	0.01	0.02	0.01
Other worker	0.003	0.002	0.001	0
Employer with >10 workers	0.003	0.003	0.004	0.004
In school	0.07	0.08	0.11	0.11
In military/police	0.005	0.005	0.003	0.003
In public administration	0.06	0.07	0.08	0.09
Observations	18,272	14,454	896	707

Sample: households for whom information on at least one official type is used.

Appendix Table 3: Determinants of bribery experience (not conditional on usage)
(Marginal effects; t-statistics in parentheses; coefficients multiplied by 100)

	(1)	(2)	(3)	(4)	(5)
Log household consumption	0.158	0.069	0.057	0.056	0.057
	(11.0)	(10.9)	(8.1)	(8.1)	(7.7)
Respondent education years	--	--	0.004	0.004	0.002
			(3.7)	(3.4)	(1.4)
Household extremely poor	-0.204	-0.087	-0.072	-0.069	-0.065
	(-8.5)	(-8.4)	(-6.7)	(-6.6)	(-6.0)
Household moderately poor	-0.114	-0.050	-0.038	-0.037	-0.036
	(-5.3)	(-5.3)	(-3.9)	(-3.8)	(-3.7)
20 official type dummies	--	Yes	Yes	Yes	Yes
Respondent job type	--	--	--	Yes	Yes
Remaining covariates	--	--	--	--	Yes
R-squared	0.02	0.15	0.15	0.15	0.16

Notes: Probit regressions with t-statistics clustered by district. 383,577 observations. The two panels of coefficients are from two different regressions. The R-squared is the same in each panel. See Table 5 for a description of the covariates.