Working Paper No. 139

EXPLOITING THE POOR: BUREAUCRATIC CORRUPTION AND POVERTY IN AFRICA

by **Mogens K. Justesen** and **Christian Bjørnskov**

A comparative series of national public attitude surveys on democracy, markets and civil society in Africa

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ABSTRACT

Corruption is a major source of slow development in Africa – the poorest region of the world. While extant research has focused on the causes and consequences of corruption at the macro-level, less effort has been devoted to understanding the micro-foundation of corruption, as well as the mechanisms through which poverty may be related to corruption and bribery. In this paper, we develop a simple model of the relationship between poverty and corruption. The model suggests that poor people are more likely to be victims of corrupt behavior by street-level government bureaucrats. Poor people often rely heavily on services provided by governments and are therefore more likely to be met by demands for bribes in return for obtaining those services. We test this proposition using micro-level survey data from the *Afrobarometer*. Since individuals are surveyed in different countries, we use multilevel regressions to estimate the effect of poverty on people's experience with paying bribes. The results show that poor people are indeed much more prone to pay bribes to government officials. This suggests that the people who are worst off materially are also more likely to be victims of corruption.

Keywords: Bribery, corruption, poverty, Africa, political economy

INTRODUCTION[1]

Corruption constitutes a major problem in most of the developing world. It tends to hamper investment and economic growth (Shleifer and Vishny, 1993; Mauro, 1995; Sekkat and Méon, 2005), aggravates problems of underground economies (Friedman et al., 2000; Dreher et al., 2009; Bjørnskov, 2011), exacerbates the difference between rich and poor (Gupta et al., 2002; Uslaner, 2008), creates obstacles to economic and political reform (Shleifer, 1998; Hellman et al., 2003), and can in the long run cause very considerable losses of human welfare (Kaufmann, Kraay, and Mastruzzi, 2005). While popular debate often treats corruption as a problem created by greedy bureaucrats and politicians that mainly affects elites—those who presumably can afford to pay bribes—little is known about how a culture of corruption affects ordinary citizens and which groups are most likely to bear the costs of corruption.[2] Hunt (2007), one of the few papers to study this issue, finds that in Peru, victims of adverse events like crime and job losses are more likely to pay bribes than other people. Describing this phenomenon as 'hitting people when they are down', she hints at a more general set of social problems related to street-level corruption that has received only little attention in the literature.

In this paper, we begin to open the black box of street-level bureaucratic corruption by asking who is actually most likely to pay bribes, and in particular how micro-level economic conditions and poverty affect people's exposure to corruption. In doing so, we make two contributions to the literature. First, we develop a simple theoretical framework showing that corrupt bureaucrats would ideally want to extract bribes from the rich, but may have incentives to mainly target the poor when asking for money in return for access to public services they control. The mechanism creating this perverse effect is the existence of costly exit options not available to the poor, a mechanism strengthened if households face credit constraints and coordinating bureaucracies. Secondly, we test the theoretical implications using micro-level data from the third round of the *Afrobarometer*, which includes detailed survey information from individuals in 18 sub-Saharan African countries. We create an index capturing how often respondents have had to bribe bureaucrats controlling access to five different areas of public services. Estimates from multilevel regressions provide robust evidence that poorer individuals more often have to bribe bureaucrats to obtain access to vital public services. In Africa, consequently, bureaucratic corruption is not an elite problem, but one that is most harmful to the poorest. This result sheds new light on the relationship between micro-level poverty and corruption in Africa.

The rest of the paper proceeds as follows. We first outline the theoretical considerations in section two. Section three describes the data and estimation strategy used in section four. Section five explores two possible complications, while section six concludes.

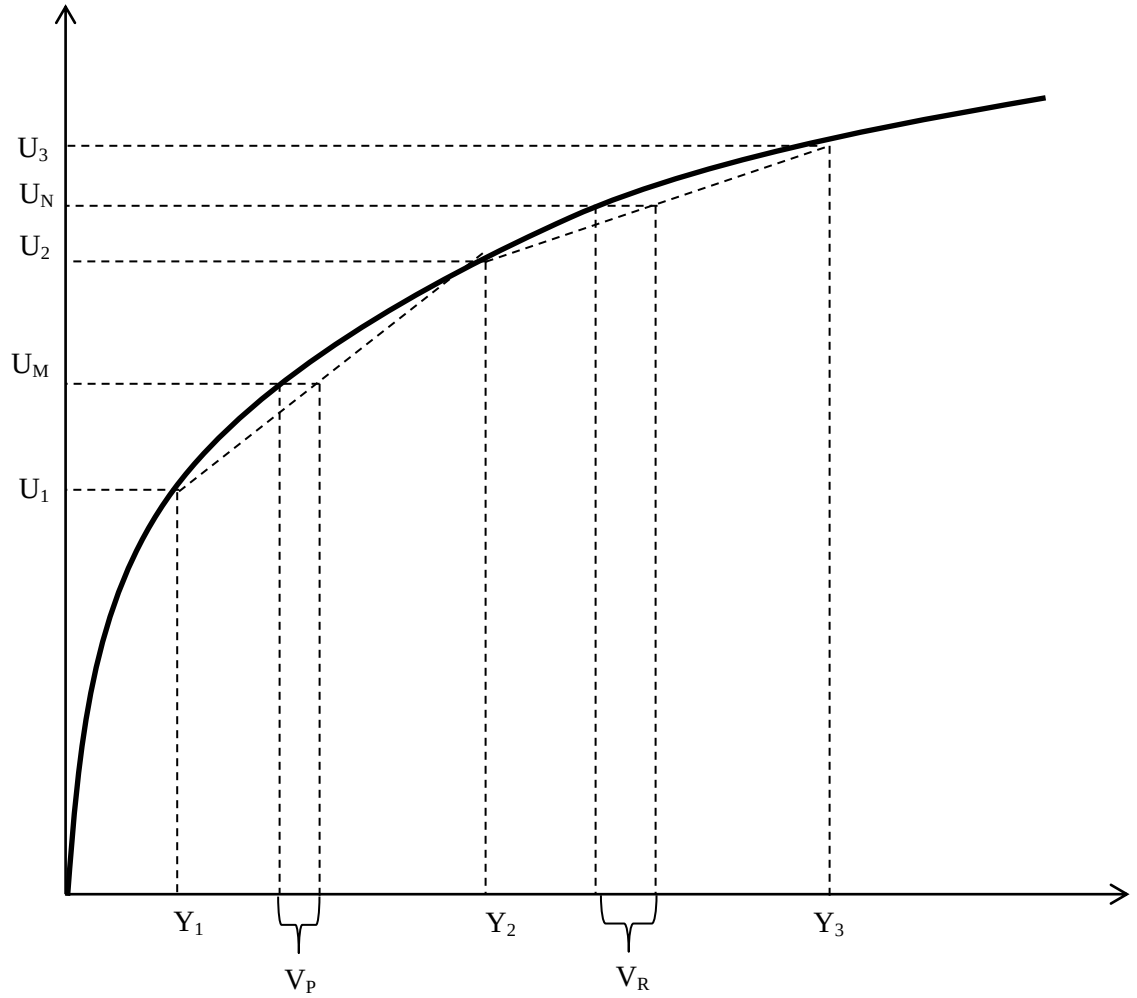
THEORETICAL CONSIDERATIONS: A SIMPLE MODEL OF BUREAUCRATIC CORRUPTION

We start by assuming that a key motivation for paying bribes in Africa is to get access to basic public services, such as education, water, permits and licenses, or legal enforcement. If, for example, a public water supply is not available, getting water may be difficult and highly costly. Our theory takes as a starting point that people—the actual or potential clients of public services—have strong incentives to protect themselves from such situations. As such, street-level corruption differs from standard settings of grand corruption where agents attempt to gain illegal access to special treatment (Banerjee et al., 2012). In our setting, bribes associated with regular access to public services instead are functionally similar to insurance against adverse shocks to service access.

[1] Earlier versions of this paper were presented at the 2012 meetings of the Midwest Political Science Association, Chicago, and the International Society for New Institutional Economics, Los Angeles. We are grateful for constructive comments from Stine Ludvig Bech, Mike Bratton, Ted Jelen, Phil Keefer and Steve Knack. Any remaining errors are ours alone.

[2] For general surveys of the corruption literature, see Aidt (2003) and Treisman (2007). For evidence on the costs of corruption for firms and private entrepreneurs, see Svensson (2003, 2005).

Figure 1: Willingness to pay (bribes) for service access



Note: U denotes utility, Y denotes income, and V_P and V_R denote willingness to pay bribes for the poor and the rich, respectively.

We therefore base our theory on a simple insurance model, as depicted in Figure 1. With a well-behaved quasi-concave utility function, the willingness to pay for insurance against an adverse shock to public service access, *V*, is parallel to a standard maximum insurance premium. For the poor, who would normally earn Y_2 but suffer a cost $Y_2 - Y_1$ when either forced to find alternative access or suffer no access at all, the maximum bribe they are rationally willing to pay is given by V_P. Similarly, for a richer group with a full-access income set at Y_3, the maximum rational bribe is $V_R > V_P$. Assuming that access to the public service is either a constant or less than proportionally increasing in income, willingness to pay *V* is simply a well-behaved, increasing function of household income *Y*.

Bureaucrats controlling access to the public service are likely to extract bribes from people relying on the particular service—their clients. In line with the model developed by Hunt and Laszlo (2012), we start by assuming that bureaucrats have a monopoly on the provision of public services—an assumption that we will relax shortly. We also follow recent theoretical models in assuming that potentially corrupt bureaucrats trade off a safe honest wage for an expected benefit of demanding a bribe (Yavas, 2007; Dreher et al., 2009; Bjørnskov, 2011). Bureaucrats earn a wage *w*, can choose to charge a bribe *b*, and face an outside option worth w_{out} if caught taking a bribe, which may include a fine or prison sentence. Following Bjørnskov (2011), bureaucrats also face a moral cost *M* of behaving objectively immoral; this cost is similar to the psychic cost noted in Banfield (1975) that is negatively associated with their belief that other people might

also engage in dishonest transactions. We assume that M is independently and identically distributed (M_A, σ_M), and that all corrupt bureaucrats face a risk of being caught accepting the bribe given by the quality of the legal system, which we denote λ. Bureaucrats therefore trade off a safe wage w with an expected pay-off from being corrupt of $\lambda\ (w + b\ ) + (1- \lambda)\ w_{out} - M$. It follows that bureaucrats are likely to demand a minimum bribe from clients given by:

$$b_{min} = \lambda / (1 - \lambda)\ (w - w_{out}) + M / (1 - \lambda) \qquad (1)$$

Bureaucrats face clients with differing willingness to pay for certain service access, V, which bureaucrats can infer from a number of observable characteristics, although with some noise, υ. We assume that this noise is distributed around zero and includes individual degrees of risk-aversion as well as a moral cost similar to M. Isolated from any selection effects and other complications, this implies that corrupt transactions take place with the probability p, given that bureaucrats are risk-neutral:

$$p = f\{M < (1 - \lambda)\ (V + \upsilon) - (1 - \lambda)\ (w - w_{out})\} \qquad (2)$$

The size of bribes extracted from clients can therefore be maximized at V, assuming that bureaucrats are sufficiently able to distinguish individual clients' willingness to pay. If not, bribes may be smaller, depending on the negotiation strength of bureaucrats relative to clients, the particular distribution of M, and the risk bureaucrats face when trying to extract bribes from incorruptible clients.

This implies, all other things being equal, that all clients but the poorest would face the risk of paying a bribe to get certain access to public services. Consequently, people who are so poor that $b_{min} > V + \upsilon$ would most probably have to accept only intermittent access to a service unless service-controlling bureaucrats take pity on them and provide access at no cost. In this simple set-up, corruption risk is an increasing function of V and thus an increasing function of household income, given that income is above a minimum level.[3]

Including exit options

However, the implications change fundamentally if an exit option exists—that is, the possibility that clients can opt out of public services. We think of this option as, for example, the possibility of using NGO, community-based or private health facilities, moving to another neighborhood with better and/or certain public services—at the extreme a gated community—or in the case of education having the possibility of sending one's children to a private school. By incorporating an exit option, our model relaxes an important feature of the theoretical framework of Hunt and Laszlo (2012), who explicitly assume that government officials have a monopoly on service provision, and that their clients, by implication, cannot opt out of public service provision. We furthermore assume that the exit option has a fixed cost of E, such that households with an expected bribe cost exceeding E will want to use the exit option. To keep things simple, we also assume that service access at the exit option is either incorrupt or significantly less subject to corruption than the public service option.

This modification of our model changes the implications in the significant way that a participation constraint may become credibly binding for only some of the potential clients: clients with a sufficient willingness to pay may want to opt out of using public services. First, with an exit cost of E, all individuals with a valuation of certain service access of $V > E - \upsilon$ and the means to pay the exit cost would potentially want to opt out of the game involving corruption. The expected cost for an individual staying in the corrupt game is $p\ V$ (note that for the individual, υ is known with a value at the average of 0), which effectively becomes the cut-off at which richer households will want to opt for the exit. As such, the relatively rich use the exit option and do not pay bribes while the relatively poor are forced to do so because they cannot afford to pay E.

[3] Note, however, that corruption will also be decreasing with the standard deviation of individual noise, υ. Although we ignore it in this subsection, the noise term has the effect of 'smoothing' p, which would otherwise have distinct cut-offs in Y after which only corner solutions exist.

This leads to our first directly testable hypothesis, which asserts an approximately monotonically decreasing relationship between household income and bribe-paying:

> *H1: The risk of paying bribes to get access to public service, controlled by street-level bureaucrats is decreasing in household income, given that clients have access to viable exit options. Poor clients are therefore more likely to pay bribes in return for public services than wealthier clients, provided exit options exist.*

One of the specific problems of developing countries that might make the participation constraint apply for more clients is credit constraints. In the context of developed countries, one can find similar situations where access to public services might depend on bribes, but where access to financial services alleviates the problem. As households have access to loans, fixed exit costs may be too low relative to the discounted value of V and the income of households to make engagement in corrupt transactions participation compatible. However, in developing countries, a credit constraint may be binding if credit is rationed, access to financial services is limited, or standard household assets are either unacceptable as collateral or not marketable (De Soto, 2000), thus changing the role of the participation constraint. In practice, then, households may be characterized by $V > E - \upsilon$ but be unable to exit anyhow. If a credit constraint binds at $A > E$, only households above $V > A - \upsilon$ will be in a position to exit and escape corruption.

The consequence of this more realistic complication is that an exit option lowers bureaucrats' corrupt earnings. From their point of view, they face an adverse selection problem: the most profitable clients are least likely to engage in any transactions with the bureaucrat, while the least profitable clients are most likely to select into the services of the bureaucrat. This problem gives all bureaucrats an incentive to lower their demands on richer clients to avoid the adverse selection problem by making the exit option less attractive. The existence of an exit option therefore works as a constraint on corrupt bureaucratic behavior towards specific clients. Overall, this means that the probability that a transaction is corrupt is given by (3), which is evidently smaller than (2).

$$p = f\{M < (1-\lambda)\min\{V + \upsilon, A - \upsilon\} - (1-\lambda)(w - w_{out})\} \qquad (3)$$

Plotting the corruption risk, p, of a transaction against household income Y gives a clear prediction that differs from that in the simpler model.

Figure 2: Corruption risk and household income

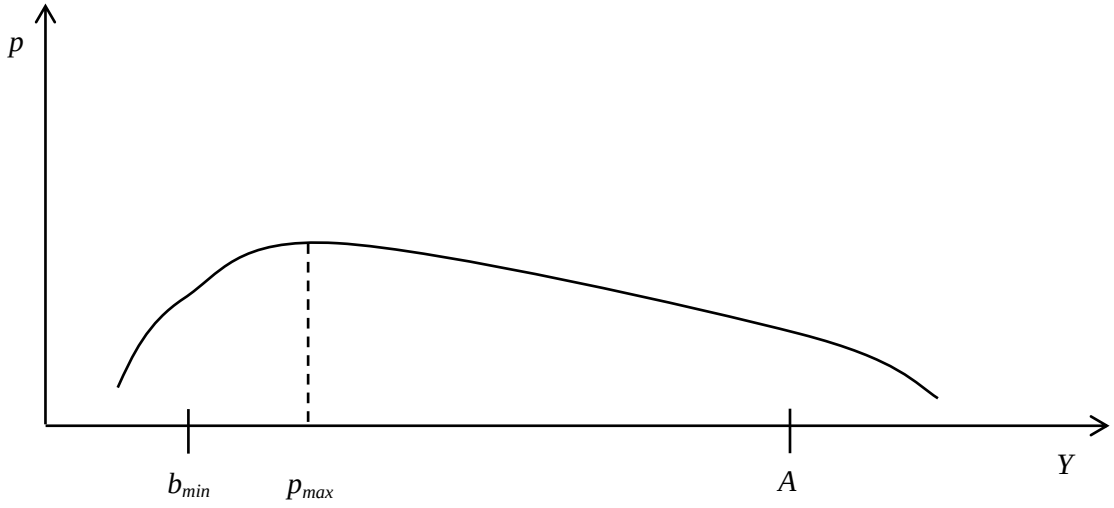


Figure 2 shows this relationship, where we note that the risk is likely to be maximized for households sufficiently above b_{min} but decreasing from that point. The reason is that moving from b_{min}, which is the point at which the participation binds for a household with an average stochastic term, i.e. $\upsilon = 0$, and to p_{max}, the distribution of υ ensures that an increase in household income gradually outweighs the importance of υ. We note that this initial increase only applies if the participation constraint actually binds for the very poorest.

In the absence of any noise term, the corruption risk would be flat up until a point where $V > A$, i.e. where a household becomes sufficiently wealthy to opt for exiting. However, the noise term means that as households on average move closer to a point where $V = A$, a larger share of households are likely to have an idiosyncratic term υ that de facto makes the exit option more attractive. While V is increasing in Y, the probability that the participation constraint – $\min \{V + \upsilon, A - \upsilon\} = V + \upsilon$ – binds is decreasing in Y. The full derivative, dp/dY in (4), therefore becomes negative and decreasing over a substantial share of the distribution of Y.

$$dp / dY = f(\cdot) \{dV / dY \, dq / dY + dA / dY \, (1 - dq / dY) \} \qquad (4)$$

where q represents the probability that $\min \{V + \upsilon, A - \upsilon\} > V + \upsilon$, which is decreasing in Y. The inclusion of uncertainty on behalf of the bureaucrat therefore implies that for a substantial part of the distribution of our theoretical subjects, corruption risk is *decreasing* in household income. As the idiosyncratic noise term gradually takes effect at higher levels of household income, this effect is likely to be non-linear, and potentially flat for the poorest part of the income distribution that is unable to pay and therefore may suffer exclusion from the public service.[4] The second testable hypothesis follows as:

> *H2: The effect of household income on corruption risk is non-linear as corruption risk increases with income for the poorest groups due to an exclusion effect, but decreases with income above a certain threshold (as depicted in Figure 2); poorer clients are therefore more likely to be forced to pay bribes.*

Finally, we note from equation (3) that λ, the quality of legal enforcement in the country, enters as a moderating factor, as enforcement makes corrupt actions more expensive. From this follows the third directly testable implication:

> *H3: The effect of household income on corruption risk is decreasing with country-level legal quality.*

This is similar to saying that the effect of poverty decreases as legal quality increases.[5]

A simple but realistic combination of an exit option and some level of uncertainty of a household-specific valuation of access to public services therefore turns the implication of the simplest theoretical set-up on its head. The existence of an exit option simply causes adverse selection in the sense that demanding higher bribes from relatively richer groups causes some of those to exit, leaving poorer groups to select into corrupt service provision. By implication, poor people are more likely to pay bribes to street-level bureaucrats in return for access to public services.

[4] We further notice that if the main problem of exit is a credit constraint due, e.g., to the absence of household assets suitable as collateral, the relation between household assets and corruption risk is likely to be stronger than that between household income and risk.

[5] The same applies for 'moral costs'. We nevertheless refrain from exploring this issue further, as most available proxies for such costs are potentially endogenous to corruption.

Possible extensions

We prefer to keep the theoretical framework as simple as possible, yet briefly discuss a number of possible extensions. None of these extensions are likely to change the main theoretical implications, but in principle provide separate mechanisms reinforcing the effects of poverty. We briefly describe three such extensions.

A first extension concerns the behavior of bureaucrats demanding bribes. We have so far assumed that bureaucrats act unilaterally—on their own—and thereby obtained a decentralized solution. However, when corruption is sufficiently widespread in an organization, this is may be an invalid assumption. Instead, when a substantial share of bureaucrats is corrupt, it may be more reasonable to treat them as a cartelistic organization. Assuming that bureaucrats behave as if they are a cartel, they can internalize the adverse selection problem associated with costs of the richest clients opting out of public services.

Internalizing this problem can lead to at least two different responses. First, the size of bribes can be lowered to an acceptable level for the clients, making them abstain from exiting. While this need not affect the likelihood of paying bribes, the financial burden on clients may be reduced. Second, the bureaucratic corps might be able to shift its attention towards maximizing *total* bureaucratic rents from corruption. This is likely to imply an optimal mix of lowering the size of bribes on richer clients as well as shifting the probability of having to pay a bribe at all towards poorer and middle-income clients. As such, invoking the cartel assumption is likely to make poorer clients even more vulnerable to paying bribes. In other words, cartelization in contexts where corruption is widespread is likely to exacerbate the problem identified by the simpler model: that is, given cartelization, poor people become even more likely to pay bribes to bureaucrats in return for public service access.

Second, one might want to endogenize the number of bureaucrats. Given that bureaucrats have access to alternative employment, i.e. bureaucracy-specific exit options, a situation with decreasing corruption due to increasing average incomes or stronger legal protection against corruption may increase the burden of bribery on poorer clients. With increasing average income, more citizens are likely to choose the exit option, which will tend to lower bureaucrats' incomes. Giving bureaucrats an exit option in this type of situation creates an adverse selection problem: the first (marginal) bureaucrats to lose too much income from bribes to make the exit option attractive will be the types for whom the moral costs of accepting bribes are relatively high, while bureaucrats who do not suffer high moral costs will stay.

The consequence for most clients is an increase in the risk of having to pay a bribe, given that a bureaucrat is available. Two possibilities then exist: either no new bureaucrats are employed, in which case a rationing problem applies (Leff, 1964); or new bureaucrats will have to be employed—but without a wage increase, since only applicants with low moral costs can be attracted. In either case, the average M of the bureaucratic corps will be lowered by the increase in Y. The risk of paying bribes therefore increases for all potential clients without access to an attractive exit option. Given that the exit option is costly, the richest clients are unaffected, while the burden of corruptions again falls disproportionately on the poor. Finally, we could also endogenize the likelihood of getting caught accepting bribes, λ. We consider two ways to do so: either by assuming that the risk of getting caught depends on the income of the client being asked for a bribe, or by assuming that enforcement rests on limited resources. In the first case, a reasonable assumption would be that clients' willingness to report corrupt bureaucrats depends on their V as well as a cost of reporting. Most models in the corruption literature implicitly assume that when clients are asked to pay a bribe and refuse, they have no incentive to blow the whistle on corrupt bureaucrats.[6] Relaxing this assumption by allowing clients to report a corrupt bureaucrat to some higher-level authority, but at some cost, may change the equilibrium outcome. This cost may either be a monetary cost or an opportunity cost from the time it takes to deal with legal authorities. As richer clients tend to have higher V's, they will be more willing to bear the cost of reporting, all other things being equal. Realizing this, bureaucrats will tend to ask for larger and more

[6] For an exception to this assumption, see Bjørnskov and Freytag (2011) who add a whistle blower option with an explicit cost.

frequent bribes from relatively poor people, as the risk of getting caught is decreasing in income. This type of mechanism again exacerbates the main implication of our model.

The second assumption of limited enforcement resources implies that if corruption is increasing, the marginal risk of getting caught will decrease. Again, any change that causes more corruption will decrease the risk that corrupt bureaucrats are getting caught, λ, which in turn increases corruption. Given an assumption of limited resources and thereby of potentially changing marginal risks of getting caught, a multiplier effect will aggravate the consequences of any change.

Overall, it is possible to add a number of extensions and qualifications to our simple theoretical model. However, the three types of extensions we have briefly discussed all tend to intensify the association between poverty and the risk of having to pay bribes to get access to services controlled by a public bureaucracy. We therefore refrain from discussing these extensions in the following, in which we set up data to test the basic implications of the theory.

DATA AND METHODS[7]

We test the hypothesis linking poverty to bribery using data from the *Afrobarometer* survey, which has by now become a standard source of survey research in Africa (Bratton et al., 2004, 2011; Harding, 2010; Keefer, 2010; Justesen, 2011; Nunn and Wantchekon, 2012). We use data from the third round of the survey, which contains individual-level data for 18 African countries, and therefore has a multilevel structure with individuals nested in countries. Accordingly, we use multilevel regressions to test the impact of poverty on individuals' experience with paying bribes to government officials. Following the wording of the *Afrobarometer* questionnaire, we use the term 'government officials' to denote employees in the public sector in a broad sense. That is, it includes both bureaucrats working in administrative government agencies, and street-level bureaucrats such as teachers, medical personnel, and police officers.

We employ data from the third round of the *Afrobarometer* survey rather than the more recent fourth round for the simple reason that the third round contains more questions and therefore more detailed information about respondents' experience with paying bribes to government officials.[8] The surveys were conducted in 2005 and 2006, and consist of individual-level responses to a set of standardized questions. The data were collected based on a stratified sampling procedure, producing a broadly representative sample of adult individuals in each country (Bratton et al., 2004).[9] The sample size is 1200 in most countries, but 2400 in Nigeria, South Africa, and Uganda, all of which are highly fractionalized countries. Interviews were conducted face-to-face, with confidentiality, and by people who are not part of the local community. This means that the sample represents people irrespective of access to modern technologies such as cell phones and the internet, and that respondents can express their experience with paying bribes without worrying about repercussion from the local community. Finally, while the *Afrobarometer* countries do not differ significantly from the sub-Saharan average in terms of various socio-economic indicators (Justesen, 2011, 8), the surveys are conducted only in countries that are minimally democratic and not part of armed conflicts (Bratton et al., 2004). In these respects, the countries are not representative of sub-Saharan Africa and the results cannot necessarily be generalized to the region as a whole.

Dependent variable

To measure the extent to which government officials demand bribes from individuals, we use a series of questions inquiring into peoples' experience with paying bribes in return for obtaining government services. The *Afrobarometer* contains five similarly phrased questions (Q57A-E), covering different areas of public services, which ask respondent the following: "*In the past year, how often (if ever) have you had to pay a*

[7] An appendix with supplementary material is available at https://sites.google.com/site/mkjustesen/publications-1

[8] The fourth round contains three questions concerning payment of bribes whereas round three contains five.

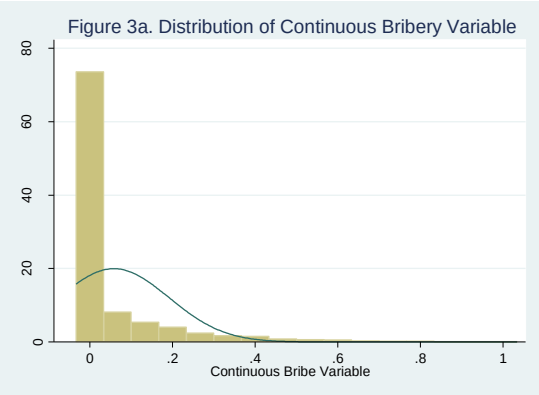
[9] Further details on the methodology behind the surveys are available in Bratton et al. (2004) and on the *Afrobarometer* website http://*Afrobarometer*.org/. Mattes (2007) provides a general discussion of the challenges of doing survey research in developing countries.

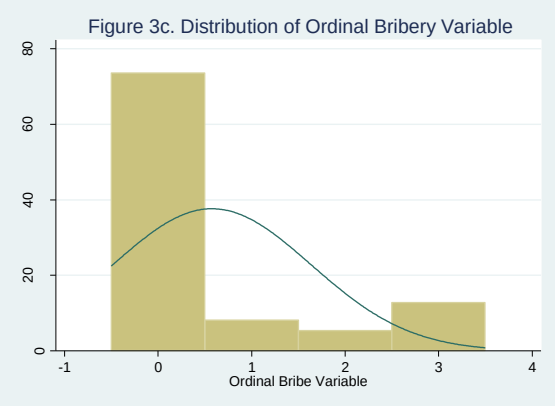
bribe, give a gift, or do a favor to government officials in order to: a) get a document or a permit, b) get a child into school, c) get a household service (like piped water, electricity, or phone), d) get medicine or medical attention, e) avoid a problem with the police (like passing a checkpoint or avoiding a fine or arrest)?" The wording of this question is similar to questions asked in related surveys of corruption and bribery (Hunt, 2006, 326; 2007, 576; Knack, 2007; Mocan, 2008). Importantly, these questions are measuring corruption in the relationship between ordinary citizens and government officials, and therefore deal with what Knack (2007, 256) calls 'administrative corruption'—corresponding to what we label 'bureaucratic corruption'. Consequently, we do not pretend that the questions capture all dimension of corruption in Africa. For instance, bribes paid to local chiefs or representatives of private companies are not included in our measure, and nor is corruption in exchanges between large corporations, high-ranking government bureaucrats, and politicians. Another caveat is that the survey data do not allow us to measure how much money people pay in bribes or how large a share of their incomes this amounts to, given that they engage in bribery. Consequently, we can only measure the raw magnitude of corruption episodes—that is, how frequently people pay bribes to government bureaucrats in return for public services.

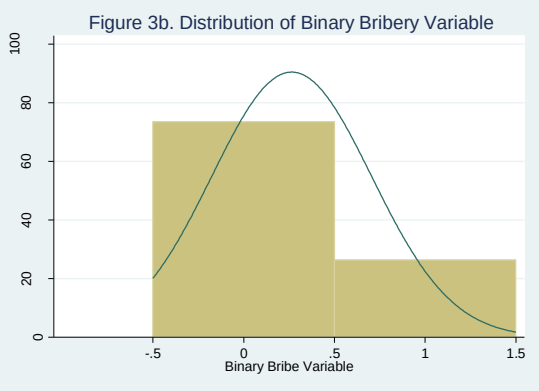
For each question, respondents can answer using the categories 'Never', 'No experience with this in the past year', 'Once or twice', 'A few times', or 'Often'. We combine the first two categories of each item and code them as 0, while the remaining categories are given the values 1, 2, and 3, respectively. On this background, we create three different dependent variables, which are used in the analyses below. First, we add the five items into one bribery variable producing a 16-point scale ranging from 0 to 15. Results from principal component analysis confirm that the bribe variables load onto one common factor, with Cronbach's alpha equal to 0.76.[10] This variable is normalized to vary from 0 to 1, where low values indicate that respondents have no experience with paying bribes in the past year, and high values indicate that people often have to pay bribes to obtain services from government officials in a number of areas, e.g. to get permits and household services. We treat this variable as continuous and use it as dependent variable in the linear models. However, as shown in Figure 3a, a problem is that the continuous variable is not normally distributed but strongly skewed.

[10] Results are available upon request. We also note that the country averages of our variable correlate highly (>.8) with standard corruption indices from Transparency International and the World Governance Indicators.

Figure 3: Distribution of dependent variables







The skewness of the bribery index is caused by the fact that a surprisingly large proportion of Africans—more than 70 percent—report that they have no experience with paying bribes to government officials. This corresponds to the results reported by Bratton et al. (2004), and indicates that people's experience with paying bribes is, in fact, relatively modest. Part of the explanation of the distribution of the bribe index may be that what we define as corruption—the use of public power to obtain private pecuniary gains (Aidt, 2003; Kaufmann et al., 2005; Svensson, 2005; Rose-Ackerman, 2006) – is not always perceived as acts of corruption (Bratton et al., 2004, 234; Anderson and Heywood, 2009, 748-750). However, it is equally important to stress that the bribery index is a measure of people's actual experience with paying bribes—which is precisely what we are interested in—and not their *perceptions* of corruption. That is, we do not look at whether people perceive government officials to be corrupt; rather, we follow recent contributions to the literature that attempt to measure behavioral and experience-based rather than perceptional aspects of corruption and bribery (Hunt, 2006, 2007; Olken, 2006, 2009; Knack, 2007; Treisman, 2007). This is an important distinction, since perceptions of corruption may differ dramatically from personal experiences with paying bribes (Knack, 2007; Treisman, 2007, 217-220; Olken, 2009; Anderson and Heywood, 2009, 752). Indeed, in Africa the level of perceived corruption is much larger than corruption measured as people's experience with being part of an exchange involving bribes (Bratton et al., 2004, 234).

To alleviate problems caused by the skewness of the bribery index—which may result in a non-normal distribution of the errors obtained from linear regressions—we also create dependent variables which are coded as binary and ordinal responses. These are shown in Figures 3b and 3c, respectively. The binary dependent variable is coded as zero (0) if respondent have no experience with paying bribes, and one (1) if respondents report having experience with paying bribes to government officials. The ordinal dependent is divided into four categories from zero (0) to three (3), according to the following rules: Respondents who have no experience with paying bribes are coded as zero (0). People who report that they have paid a bribe

'once or twice' in just one of the areas covered by the questions (e.g. to get a permit or a household service) are given the value one (1). People who have paid bribes 'once or twice' in two areas or 'a few times' (>2) in one area are given the value two (2). Finally, people whose experience with paying bribes exceeds these levels are given the value three (3). This yields an ordinal variable with four categories ranging from 'no experience' to 'extensive' experience with paying bribes in return for government services. We treat the binary and ordinal variables as manifest realizations of a latent variable, measuring the propensity of people to be targets of corrupt actions by government officials.

Although our dependent variable is based on experienced rather than perceived corruption, we do not want to be too sanguine about the corruption measure. Indeed, a final worry may be that the corruption measures are biased by social desirability effects, which occurs when respondents' answers to survey questions reflect their beliefs about what is socially desirable rather than their true attitudes or experiences (Heerwig and McCabe 2009, 676). Social desirability bias often arises because highly educated people are more likely to overreport socially desirable attitudes and behavior and underreport socially undesirable attitudes and behavior. Indeed, one of the most robust findings in the literature on social desirability bias and voter participation is that highly educated people are more likely to overreport their voting behavior (Silver et al. 1986; Bernstein et al. 2001; Karp and Brockington 2005). This association arises because "…highly educated respondents are the most likely to misrepresent their true beliefs, attitudes, or practices in order to align themselves with existing social norms" (Karp and Brockington 2005, 826). This would also seem to be consistent with the results of Olken (2009, 958-059), who finds that corruption perceptions are increasing with education.

Against this background, one might worry that even experience-based measures of corruption suffer from a type of social desirability bias related to the educational background of respondents. However, it is not entirely clear whether higher education will lead to over- or underreporting of experienced corruption. On the one hand, better educated people may be more aware of attempts by bureaucrats to extract bribes, and therefore more likely than less educated people to report incidents of corruption to interviewers. More educated people may also be more likely to perceive the actions of bureaucrats as corrupt, even when, in fact, they are not. They may therefore be more attentive to corruption as a socially unacceptable form of exchange, which creates upward bias in the level of corruption they report. On the other hand, if prevailing norms identify corruption as socially unacceptable, there is also a chance that highly educated people – attempting to conform to those norms – will underreport their own payments of bribes to government officials. In any case, if education-induced social desirability effects confound our findings, we should be able to detect this by replicating the results excluding the respondents with the highest levels of education. We have therefore tested the sensitivity of our results to excluding respondents with secondary and/or tertiary education from the regressions. Importantly, doing so does not change the results (details are available in the online appendix). While this does not prove the absence of social desirability effects, it is at least consistent with the view that our results are not driven by bias due to the education of respondents.

A final type of social desirability effect that may arise particularly in survey data from countries where democracy and the rule of law are relatively weakly institutionalized is bias due to people's beliefs about who are conducting and sponsoring the survey. In particular, if people believe that the survey is administered on behalf of their government, they may be inclined to underreport engagement in corrupt exchanges out of fear that such behavior might be punished. Fortunately, towards the end of the interview (Q100), respondents are asked: 'Who do you think send us to do this interview?' A relatively large proportion of respondents answer 'the government'. To check that our results are not biased by the answers of people who believe the government is the source of the survey, we have replicated the results excluding all respondents answering 'the government' (national, regional or local). This has no effect on our results. Details are available in the online appendix.

Table 1: Descriptive statistics for bribe variables

	Bribe, dichotomous				Bribe, ordinal				Bribe, continuous				Observations
	Mean	***SD***	***Min***	***Max***	***Mean***	***SD***	***Min***	***Max***	***Mean***	***SD***	***Min***	***Max***	
All countries	***0.26***	***0.44***	***0***	***1***	***0.58***	***1.06***	***0***	***3***	***0.05***	***0.13***	***0***	***1***	***24842***
Botswana	0.04	0.19	0	1	0.06	0.36	0	3	0.01	0.03	0	0.47	1131
Cape Verde	0.06	0.24	0	1	0.13	0.55	0	3	0.01	0.07	0	1	1232
Malawi	0.10	0.30	0	1	0.18	0.60	0	3	0.02	0.07	0	1	1190
Lesotho	0.11	0.31	0	1	0.16	0.52	0	3	0.01	0.04	0	0.53	1150
South Africa	0.15	0.36	0	1	0.34	0.88	0	3	0.04	0.11	0	1	2357
Tanzania	0.21	0.41	0	1	0.44	0.94	0	3	0.04	0.12	0	1	1263
Mali	0.24	0.43	0	1	0.47	0.94	0	3	0.04	0.09	0	0.93	1212
Senegal	0.24	0.43	0	1	0.50	0.99	0	3	0.05	0.12	0	1	1161
Madagascar	0.25	0.43	0	1	0.49	0.95	0	3	0.04	0.09	0	0.73	1328
Namibia	0.26	0.44	0	1	0.63	1.15	0	3	0.07	0.16	0	1	1182
Zambia	0.29	0.45	0	1	0.51	0.93	0	3	0.04	0.10	0	1	1195
Benin	0.30	0.46	0	1	0.60	1.03	0	3	0.05	0.11	0	0.87	1197
Ghana	0.31	0.46	0	1	0.69	1.14	0	3	0.07	0.16	0	1	1157
Zimbabwe	0.33	0.47	0	1	0.71	1.14	0	3	0.07	0.14	0	1	1030
Mozambique	0.38	0.47	0	1	0.93	1.28	0	3	0.12	0.21	0	1	1103
Nigeria	0.42	0.49	0	1	1.00	1.30	0	3	0.11	0.18	0	1	2340
Uganda	0.42	0.49	0	1	0.93	1.23	0	3	0.09	0.14	0	0.93	2383
Kenya	0.48	0.50	0	1	1.09	1.28	0	3	0.11	0.17	0	1	1231

Countries are organized from least to most corrupt according to dichotomous bribe variable. SD=standard deviation. Numbers are rounded.

On this background, we are relatively confident that our corruption measure validly captures an important dimension of administrative corruption in Africa. Table 1 shows summary statistics for the three bribe variables. The table ranks countries according to the mean of the dichotomous bribe variable, which shows the proportion of people who, at least once, have had to bribe a government official to obtain a public service. Across all countries, a quarter of the population reports that they have used bribes to get services from government officials, but there is considerable variation in the use of bribery both across and within countries. The least corrupt countries are Botswana and Cap Verde, where only around 5 percent of the population has experience with paying bribes. At the other end of the scale, bureaucratic corruption appears to be widespread in countries such as Nigeria, Uganda, and Kenya, where nearly 50 percent of the population have had to pay bribes to government officials. Even so, individuals' use of bribes within countries varies a lot, as witnessed by the large standard errors in many countries.

Explanatory variables: Measuring poverty in Africa

In the absence of reliable household data on income, measuring material poverty in Africa is a major challenge (Bratton et al., 2004; Bratton, 2008). To assess poverty at the individual level, we need a measure which can account for the possibility that many people in Africa may not have a clear account of their annual cash income, and that a large proportion of people work outside the formal economy or are self-sustaining and make a living through, e.g., farming (Bratton, 2008, 31-32; Poku and Mdee, 2011, 54). We therefore follow the standard established by the work of Mattes et al. (2003), Bratton et al. (2004), and Bratton (2008), who use *Afrobarometer* survey questions to develop the so-called *Index of Lived Poverty*. This index assesses poverty by asking respondents how frequently they lack access to basic household necessities. Specifically, respondents are asked how often during the past year, they or anyone in their family have gone without: a) enough food to eat, b) enough clean water for home use, c) medicines or medical treatment, d) enough fuel to cook food, e) a cash income.[11] Respondents' answers are coded on a five-point scale from "never" to "always". In accordance with the literature (Mattes et al., 2003; Bratton et al., 2004; Bratton, 2008; Justesen, 2011) we create a combined poverty index based on these five items, where high values reflect that people live in poverty and deprivation, while low values indicate that people are well-off and live in materially good conditions, in the sense that they do not lack basic necessities on a regular basis. A principal component analysis shows that the five items load onto a single component, with Cronbach's alpha equaling 0.78. This corroborates that the poverty index works as a good measure of people's actual experience with being deprived of basic material necessities like food, water, and medicine.[12] In addition, the index has the benefit that it fits closely with our theoretical conceptualization of poverty.

Since the argument linking poverty to corruption has implications at the macro-level too, we also include real GDP per capita as a country-level explanatory variable (cf. Montinola and Jackman, 2002; Svensson, 2005; Treisman, 2007). This will allow us to test whether economic wealth and poverty has an effect on average levels of bribery at the national level. GDP data are from the Penn World Table (Heston et al., 2006).

Control variables

To guard against spurious correlations, we include a number of control variables that may affect both experience with corruption and selection into poverty. The multilevel structure of the data allows us to include data at both the levels of individuals (Level 1) and countries (Level 2). To ensure that we do not capture the effect of simply using public services, it is important to distinguish people who have used public services from people who have not (Hunt 2007). We cannot, of course, rule out the possibility of endogeneity in the relationship between public sector use and bribery, in the sense that people who expect to pay bribes

[11] We do not include question Q8F on school expenses for children, because a large number of respondents report having no children. It is unclear whether these people would lack money to school expenses if they had children. Although we do not include this variable, the results (available upon request) are entirely robust to doing so.

[12] Results are available upon request. We have tested the robustness the results to using two alternative variables, which ask people to assess their living conditions. The results are robust to using these variables. However, individuals' subjective assessments of their own living conditions are not necessarily good indicators of poverty. We therefore prefer to use the index of experienced poverty as the key explanatory variable.

may select out of the public sector. Nevertheless, to ensure that poverty does not work as a proxy for people's propensity to use public services, we evaluate the impact of poverty on bribe paying conditional on using public services. To this end, we create an index based on five questions (Q71A–A71E) that enable us to distinguish respondents who find it difficult or easy to obtain government services from those who report they 'never try' to do so. For each of the five constituent variables, we categorize people who report that, in their experience, obtaining government services is either difficult or easy as public sector users (1). People who answer that they 'never try' to obtain government services are classified as non-users (0). The five dummy variables are then aggregated into an index ranging from 0 to 5, with high values indicating extensive experience with using government services.

In a related fashion, we want to ensure that the poverty index does not capture general demands for government services, which may lead to increased use of corruption by government officials and staff. To do so, we use four variables (Q32A-Q32D) based on questions asking respondents how often during the past year they have contacted: a) a local government councilor, b) a member of parliament, c) a government ministry official, or d) a political party official, in order to solve a problem or to express personal views. Including all four variables seems relevant, since we are dealing with bribes paid to precisely people who are employed in and affiliated with the public sector. Moreover, the variables also capture any effect on bribery of simply establishing contact with people in specific job functions related to the government sector, e.g., a political party official or a local government councilor. For each question, respondents can answer on a four-point scale from 'never' to 'always'. Unfortunately, these questions were not asked in Zimbabwe. We therefore run regressions that both include and exclude these four variables. Importantly, this also works as a test of the robustness of the results to excluding Zimbabwe from the analyses, which, no doubt, is the least democratic country in the *Afrobarometer* sample.

We also control for respondents' membership of various civil organizations. Specifically, questions Q28A-Q28D ask people whether they are members (active, inactive or leaders) of a) religious groups, b) trade unions or farmers association, c) professional or business association, or d) community development organizations. Membership of such organizations may both increase the demand and supply of corruption. On the demand-side, organization members may both act as lobbyists and rent-seekers on behalf of their organization to obtain specific government services in return for payment of bribes. On the supply-side, government officials may target members of a specific organizations to obtain bribes. To allow for these possibilities, we include all four variables measuring organizational membership.

Finally, we include a series of socio-economic and demographic controls that may correlate with both poverty and corruption. We control for whether people live in urban (1) or rural (0) areas, which is important because poverty is particularly widespread in rural areas (Poku and Mdee, 2011: 54). Moreover, people living in rural areas may have little or no access to alternative service providers--i.e. few exit options. Since our theoretical argument requires that opting out of public services is feasible for at least some citizens, addressing urban-rural differences is particularly important. Below, we do so in two ways: We first control for urban-rural residence, and later we include an interaction term for poverty and urban-rural residence, thereby allowing the poverty effect to depend on the existence of viable exit options. To ensure that the impact of poverty is distinguished from the impact of employment, a dummy variable indicating whether respondents have a paid job (1) or not (0) is included. Similarly, we control for education attainment using a 10-point scale ranging from a minimum value (0) reflecting no education to a maximum value (9) indicating a post-graduate degree. All regressions also include controls for gender (females=1) and age.

Four variables are included at the country-level (Level-2). Other than GDP per capita, the first of these is a measure of institutional quality, which may also affect corruption (Treisman, 2000, 2007; Dreher et al., 2007, 2009; Bjørnskov, 2011). As a proxy for institutional quality, we use the property rights component from the Heritage Foundation's (2011) Index of Economic Freedom. This is a quite encompassing variable that comprises information on the security of property rights, the rule of law, and the extent of corruption in the judicial system. It therefore captures potential effects of variations in institutional quality, broadly construed, on average levels of bribery across countries. However, since the literature offers other valid measures of

institutional quality and corruption across countries, we emphasize that all regressions have been replicated using the 'rule of law' and 'control of corruption' indicators from the World Governance Indicators (Kaufmann et al., 2005) and the 'business regulation' index from the Heritage Foundation (2011). Doing so does not change the results. Finally, we include two variables measuring economic and ethnic fragmentation. As a measure of economic inequality, we use data on the Gini coefficient from Solt (2009).[13] And as a measure of ethnic fractionalization we use data from Alesina et al. (2003). Both types of fractionalization may imply that government officials favor members of their own ethnic or socio-economic group and prefer to collect bribes from members of 'out-groups' (Aidt, 2009, 278). For both variables, we expect countries with higher levels of economic and ethnic fractionalization to have higher average levels of corruption (Mauro, 1995; Glaeser et al., 2003). Summary statistics and detailed descriptions of the variables are available in the appendix.

Multilevel Regressions

Given the hierarchical nature of the data, with individuals surveyed in 18 different countries, we use multilevel regression models to estimate the relationship between poverty and corruption. These models have previously been used in the context of *Afrobarometer* data (Harding, 2010; Bratton et al., 2011; Justesen, 2011) and allow us to estimate the impact of both individual- and country-level variables, allowing for unobserved country-specific heterogeneity (Snijders and Bosker, 1999; Steenbergen and Jones, 2002; Gelman and Hill, 2007; Rabe-Hesketh and Skrondal, 2008). With a continuous dependent variable, the starting point of the analyses is a linear multilevel model, where individuals' experience with paying bribes is a function of the set of individual- and country-level regressors described above. Using the logit link function to relate the explanatory variables to the expected values of the dependent variable, the basic idea of the linear model is easily applied to the non-linear binary and ordered logistic multilevel models which we also use in the empirical analyses (Snijders and Bosker, 1999; Rabe-Hesketh and Skrondal, 2008).

For individuals (*i, ..., N*) nested in countries (*j, ..., J*) countries, the linear level-1 (individual-level) equation is:

$$y_{ij} = \alpha_{\mathrm{j}} + \beta_1 \mathrm{Poverty}_{\mathrm{ij}} + \beta_2 \boldsymbol{I}_{\mathrm{ij}} + \varepsilon_{ij} \qquad (5)$$

In equation (5), the experience of individual *i* in country *j* with paying bribes, y_{ij}, is a linear function of poverty, a series the individual-level control variables outlined above, given by the vector $\boldsymbol{I}$, and a level-1 error term, ε_{ij}. The main interest is therefore on the effect of poverty, given by β_1; in subsequent models, we allow for non-linear effects. In the multilevel model, we allow the constant, α_j, to vary across countries (Snijders and Bosker, 1999; Steenbergen and Jones, 2002). We can further treat α_j as either a set of random or fixed effects. In the multilevel literature, interest usually centers on modeling the constant as a function of a set of country-level regressors in the level-2 equation (6).

$$\alpha_{\mathrm{j}} = \mu + \gamma_1 \mathrm{GDPcap} + \gamma_2 \boldsymbol{C}_{\mathbf{j}} + \eta_{\mathrm{j}} \qquad (6)$$

Here, the constant, α_j, from the level-1 equation is partitioned into an intercept common to all countries, μ, a part explained the country-level regressors, $\boldsymbol{C}$, and a country-specific random part, η_{j}. Therefore, η_{j} expresses random country-level variation around the common intercept, μ, and attempts to account for the between-country heterogeneity in the dependent variable that remains after controlling for the vector of regressors $\boldsymbol{C}$. Substituting (6) into (5) produces the multilevel model (7).

$$y_{ij} = \mu + \beta_1 \mathrm{Poverty}_{\mathrm{ij}} + \beta_2 \boldsymbol{I}_{\mathrm{ij}} + \gamma_1 GDPcap_j + \gamma_2 \boldsymbol{C}_{\mathrm{j}} + \eta_{\mathrm{j}} + \varepsilon_{ij} \qquad (7)$$

Assuming that $\eta_j \sim N(0, \sigma_\eta^2)$, equation (7) is a standard random effects model consisting of both individual-

[13] Data for Benin and Zimbabwe are from the CIA World Factbook.

and country-level explanatory variables with corresponding fixed coefficients, and random country-specific intercepts, summarized by their variance around the constant (Gelman and Hill, 2007, 257; Rabe-Hesketh and Skrondal, 2008, 94-95). The major advantage of the multilevel model with random effects is that we allow individual-level responses, y_{ij}, to vary according to both individual- and country-level characteristics, and that we attempt to directly model heterogeneity and random variation in the dependent variable across countries (Snijders and Bosker, 1999, 43; Steenbergen and Jones, 2002, 221). In this way, we allow the average level of bribery across countries to vary with country-level explanatory variables, and we can estimate the impact of variables such as GDP per capita that vary only between countries.

An alternative to the random effects model is to treat α_j in equation (5) as a series of country-specific fixed effects. Treating α_j as fixed effects obviates the need to specify equation (6), because the fixed effects capture the impact of all factors that are common to individuals within countries and which therefore vary only between countries. This eliminates bias due to omitted variables at the country-level, and turns attention towards within-country variation. Moreover, in contrast to the random effects model, which requires that the random effects and the regressors are orthogonal, the fixed effects model allows for consistent estimation in the presence of any type of correlation between country fixed effects and regressors (Wooldridge, 2002, 266). In this way, the fixed effects model relaxes an important assumption of the random effects model. The main downside of the fixed effects model is that – because all variation between countries is eliminated by construction – we cannot estimate the impact of country-level variables on bribery across countries. For the linear and binary logistical models, the analyses below report results from both random effects models, allowing us to directly model the impact of country-level variables, and fixed effects models, which enables us to control away any source of omitted variable bias originating from the country level. The ordered multilevel logistics regressions are performed using random effects regressions.

RESULTS

We start by testing Hypothesis 1, concerning the simple relationship between poverty and bribery. Table 2 shows results from a total of ten multi-level regressions with the bribery measures as dependent variables. The poverty index is the key micro-level explanatory variable, while GDP per capita accounts for the relationship between bribery and wealth at the macro-level. The odd-numbered columns (1, 3, 5, 7, and 9) show results for all 18 countries. The even-numbered columns include the variables measuring respondents' contact with people working in jobs related to the government sector, e.g. local councilors or political party officials. Including these variables means that data for Zimbabwe are dropped from the analyses, but this has little effect on the results. In models 1-4, results are obtained using linear regressions with the continuous bribery index as dependent variable. Models 1-2 allow for randomly varying intercepts, while models 3-4 treat the intercepts as fixed effects. Models 5-8 use the binary bribery indicator. Models 5-6 use random effects logistic regressions, while models 7-8 use (conditional) fixed effects logistic regressions. Finally, models 9-10 use ordered logistic regressions with random intercepts, using the ordinal bribery measure as dependent variable. The bottom part of the table displays the individual- and country-level variance components and the intra-class correlation, showing the proportion of the residual variance that is attributable to the country-level (Snijders and Bosker, 1999, 48).

Table 2: Poverty and Bribery in Africa: Results from Multilevel Regressions

Model	1	2	3	4	5	6	7	8	9	10
Method	Linear RE	Linear RE	Linear FE	Linear FE	Logit RE	Logit RE	Logit FE	Logit FE	Ologit RE	Ologit RE
Scale of dependent variable	Continuous	Continuous	Continuous	Continuous	Binary	Binary	Binary	Binary	Ordinal	Ordinal
Individual-level regressors										
Poverty	0.064***	0.060***	0.064***	0.060***	0.979***	0.963***	0.978***	0.963***	1.068***	1.052***
	(6.16)	(5.62)	(6.17)	(5.63)	(13.12)	(12.45)	(10.87)	(10.33)	(12.29)	(11.35)
Public sector user	0.013***	0.012***	0.013***	0.012***	0.244***	0.239***	0.244***	0.239***	0.257***	0.255***
	(5.68)	(5.42)	(5.63)	(5.37)	(16.07)	(15.49)	(10.77)	(11.11)	(12.18)	(14.29)
Religious assoc. member	-0.004	-0.005	-0.004	-0.005	0.008	-0.017	0.008	-0.017	-0.002	-0.018
	(-1.38)	(-1.60)	(-1.43)	(-1.66)	(0.21)	(-0.39)	(0.16)	(-0.34)	(-0.04)	(-0.38)
Union member	0.006*	0.003	0.006*	0.003	0.072	0.020	0.073	0.020	0.076	0.021
	(1.79)	(0.83)	(1.80)	(0.84)	(1.64)	(0.43)	(1.13)	(0.29)	(1.25)	(0.30)
Business assoc. member	0.024***	0.021***	0.024***	0.021***	0.306***	0.250***	0.306***	0.250***	0.314***	0.248***
	(4.61)	(3.99)	(4.60)	(3.98)	(6.03)	(4.79)	(4.26)	(3.21)	(4.71)	(3.44)
Community assoc. member	0.012***	0.008***	0.012***	0.008**	0.217***	0.152***	0.216***	0.151***	0.221***	0.153***
	(3.81)	(2.96)	(3.77)	(2.91)	(5.41)	(3.68)	(4.49)	(3.41)	(4.84)	(3.73)
Local councillor contact	-	0.007***	-	0.007***	-	0.098***	-	0.099***	-	0.114***
		(4.43)		(4.42)		(4.49)		(2.89)		(4.92)
MP contact	-	0.010***	-	0.010***	-	0.037	-	0.037	-	0.080*
		(3.24)		(3.24)		(1.12)		(0.85)		(1.83)
Bureaucracy contact	-	0.007**	-	0.007**	-	0.082***	-	0.082	-	0.092*
		(2.42)		(2.39)		(2.60)		(1.49)		(1.87)
Political party contact	-	0.006**	-	0.006**	-	0.177***	-	0.176***	-	0.163***
		(2.26)		(2.24)		(6.59)		(4.74)		(4.23)
Urban	0.016***	0.016***	0.016***	0.016***	0.235***	0.240***	0.231***	0.236***	0.237***	0.246***
	(3.77)	(3.85)	(3.75)	(3.84)	(6.40)	(6.31)	(3.22)	(3.48)	(3.61)	(3.87)
Employment	0.005*	0.003	0.005*	0.003	0.172***	0.157***	0.169**	0.154**	0.175***	0.155**
	(1.91)	(1.29)	(1.88)	(1.27)	(4.80)	(4.24)	(2.24)	(1.96)	(2.65)	(2.43)
Education	0.003***	0.002	0.003**	0.002	0.061***	0.037***	0.061***	0.038	0.062***	0.043**
	(2.63)	(1.63)	(2.64)	(1.64)	(6.00)	(3.52)	(2.79)	(1.64)	(3.21)	(2.05)
Gender	-0.013***	-0.010***	-0.013***	-0.010***	-0.298***	-0.259***	-0.298***	-0.259***	-0.305***	-0.259***
	(-4.74)	(-4.03)	(-4.74)	(-4.03)	(-8.82)	(-7.36)	(-6.27)	(-5.10)	(-6.78)	(-5.30)
Age	-0.000*	-0.000***	-0.000*	-0.000**	-0.011***	-0.013***	-0.011***	-0.013***	-0.010***	-0.013***
	(-1.95)	(-2.72)	(-1.94)	(-2.72)	(-8.81)	(-9.79)	(-5.17)	(-5.62)	(-4.41)	(-5.42)
Country-level regressors										
GDP per cap.	-0.002	-0.002	-	-	-0.193***	-0.192***	-	-	-0.165***	-0.137***
	(-0.72)	(-0.77)			(-3.23)	(-3.08)			(-11.86)	(-15.66)
Institutional quality	-0.001**	-0.001	-	-	-0.021***	-0.019**	-	-	-0.018***	-0.020***
	(-2.00)	(-1.41)			(-2.96)	(-2.02)			(-15.25)	(-13.20)
Inequality	0.001	0.001	-	-	0.034**	0.036**	-	-	0.027***	0.032***

	(0.66)	(0.93)			(2.18)	(2.19)			(9.06)	(8.90)
Ethnic fractionalization	0.089***	0.093***	-	-	2.221***	2.472***	-	-	1.933***	2.690***
	(4.72)	(3.56)			(4.40)	(3.98)			(15.97)	(23.49)
Constant	-0.070	-0.071	-0.024	-0.019	-4.150***	-4.449***	-	-	-	-
	(-1.34)	(-1.11)	(-1.35)	(-1.02)	(-5.26)	(-4.96)				
Cut 1	-	-	-	-	-	-	-	-	4.079***	4.259***
									(20.65)	(19.62)
Cut 2	-	-	-	-	-	-	-	-	4.620***	4.808***
									(23.77)	(23.58)
Cut 3	-	-	-	-	-	-	-	-	5.074***	5.266***
									(25.63)	(25.85)
Random effects										
Level-2 std. dev.	0.022	0.023	0.033	0.035	0.353	0.367	-	-	0.253	0.370
Level-1 std. dev.	0.127	0.126	0.127	0.126	$\sqrt{(\pi^2/3)}$	$\sqrt{(\pi^2/3)}$	-	-	$\sqrt{(\pi^2/3)}$	$\sqrt{(\pi^2/3)}$
ρ (intra-class correlation)	0.029	0.033	0.065	0.072	0.036	0.039	-	-	0.019	0.040
Log (pseudo)likelihood	14119.2	13659.0	-	-	-11300.5	-10600.0	-11199.0	-10503.7	-17307.7	-16248.3
(Pseudo-)R^2 (within)	-	-	0.05	0.06	-	-	0.04	0.04	-	-
(Pseudo-)R^2 (between)	-	-	0.24	0.18	-	-	-	-	-	-
(Pseudo-)R^2 (overall)	0.10	0.13	0.05	0.06	0.15	0.20	-	-	-	-
Observations	21.901	20.872	21.901	20.872	21.901	20.872	21.901	20.872	21.901	20.872
Countries	18	17	18	17	18	17	18	17	18	17

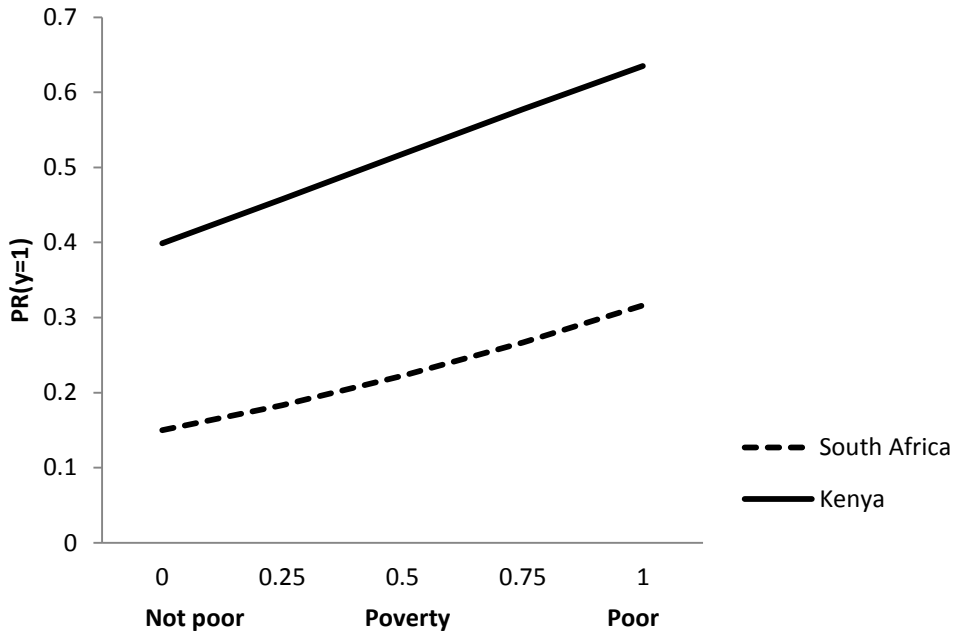
Dependent variables are respondents experience with paying bribes to government officials to obtain services (permits & documents, school placement, household service, medical services, avoid problem with police). Models 1-4 use the continuous bribe index. Models 5-8 use the binary bribe variable. Models 9-10 use the ordinal bribe variable. Low values on the poverty index denote that people are materially well-off; high values denote that people are poor. All results are generated in Stata 12. *Linear RE* denotes random effects linear multilevel models obtained through maximum likelihood estimation, estimated using the *xtmixed* command. *Linear FE* denotes fixed effects regressions, implemented using the *xtreg, fe* command. *Logit RE* denotes random effects logistic regression, implemented using the *xtmelogit* command. *Logit FE* is conditional (fixed effects) logistic regression, implemented using the *clog* command. *Ologit RE* denotes random effects ordered logistic regression, estimated using the *gllamm* command. In models 5-6 and 9-10 the level-1 standard deviation following from the logistic distribution is defined as $\sqrt{(\pi^2/3)}$ (Snijders and Bosker 1999, 224; Rabe-Hesketh and Skrondal 2008, 256-257). In the logit models, the pseudo R^2 is the improvement in the log-likelihood (ll) of the full model compared to the null model without explanatory variables, $(ll_{null}–ll_{full})/ll_{null}$. Country-level variables not included in fixed effects regressions because there is no within-country variation in the presence of fixed effects. Cut 1–3 are the cut points for the ordered logistic regressions. Standard errors are robust and clustered by country. Absolute value of z-statistics are shown in parentheses *** p<0.01, ** p<0.05, * p<0.1.

The results for the poverty variable in Table 2 show a consistent pattern across different model specifications. Throughout all models, poverty has a highly significant impact on people's experience with paying bribes to government officials. This effect is robust to including country fixed effects in models 3-4 and 7-8, which allows us to rule out that omitted country-level variables are confounding the results. Recall that high values on the poverty index indicate that people are poor and regularly suffer from shortage of basic household necessities. The positive sign therefore shows that people's experience with paying bribes increases with increasing levels of poverty. This is similar to saying that, compared to wealthier groups, poor people are more exposed to corruption and more likely to pay bribes in return for obtaining services from government officials. Regardless of the choice of dependent variable and estimation techniques, this result is extremely robust and suggests that poverty is an important determinant of corruption at the micro-level in Africa. With the exception of the linear regressions in models 1 and 2, GDP per capita also has the expected effect, with higher levels of GDP being associated with lower bribery at the macro-level. That is, poorer African countries generally suffer from higher levels of bribery and bureaucratic corruption than the wealthiest countries, such as Botswana and South Africa.

Although the effect of poverty is very strong, it appears to be weakest in models 1-4, which may be because the skewed distribution of the dependent variable gives a relatively poor fit with the linear model. In these models, the magnitude of coefficients for the poverty variable is around 0.06 and is fairly similar across the random and fixed effects models. Substantially this means that increasing the poverty index from the lowest (0) to the highest (1) value, corresponding to a movement from being well-off to being very poor, leads to an increase 0.06 percentage points on the continuous bribery index. In the binary and ordered logistic regressions in models 5-10, the coefficients of the poverty index are both large and stable. Compared to the linear models, the effect also becomes much stronger, as shown by the double-digit *z*-values. In both the random and fixed effects logistic regressions in models 5-8, the coefficients show that a change from being well-off to being very poor increases the estimated log odds by around 0.96-0.98. This corresponds to a multiplicative effect on the odds ratio of $e^{0.96}=2.61$ (Gelman and Hill, 2007, 82-83; Rabe-Hesketh and Skrondal, 2008, 249), meaning that a change from the lowest to the highest value on the poverty index on average increases the odds of paying bribes by nearly a factor three. Compared to a well-off person, a poor person is therefore almost three times more likely to pay bribes to government officials in return for obtaining public services, all else equal. The estimates from the ordered logistic regressions are slightly larger and also highly significant, with a multiplicative effect on the odds of paying bribes around $e^{1.05}=2.86$. This means that the likelihood of being a victim of more extensive corruption—i.e. the likelihood of moving into a higher category on the ordinal bribe variable—increases as poverty increases. These findings strongly corroborate Hypothesis 1 that micro-level poverty is significantly related to individuals' exposure to corruption and their experience with paying bribes.

Since even high odds ratios can conceal small differences in real probabilities (Keefer, 2010, 15), Figure 4 shows predicted probabilities of effects of poverty on the likelihood of paying bribes, based on model 6 in Table 2. Figure 4 plots the individual-level effect of poverty for two different contexts, with country-specific random effects and values on the country-level regressors corresponding to South Africa and Kenya. While the national levels of corruption in Kenya and South Africa differ markedly from the sample mean, as shown in Table 1, both countries are geographically large, coastal, and populous countries that have formerly been subjected to British colonial rule. The two countries receive the same score on the measure of institutional quality, and both are highly fractionalized along ethnic and economic lines, although South Africa's level of economic inequality is somewhat higher than Kenya's. South Africa, however, is much wealthier than Kenya, with a GDP per capita that is nearly five times as large. Although all country characteristics are certainly not similar, Figure 4 nevertheless illustrates both the impact of individual-level poverty on corruption within countries, as well as differences in corruption between countries that differ markedly in their levels of national wealth.

Figure 4. Predicted probabilities of paying bribes, by poverty and national context



Since logistic regressions model non-linear relationships, predicted probabilities depend on the values at which the explanatory are evaluated. Accordingly, Figure 4 plots the effect of poverty for a male person who is 37 year old, employed, lives in an urban area, has completed primary school, is not a member of any civil organization, has an average level of public sector use, and an average level of contact with people in jobs affiliated with the government sector. Given these individual-level characteristics, the bold line represents predicted probabilities for a person living in South Africa, while the punctuated line shows corresponding probabilities for an identical individual living in Kenya.

Figure 4 clearly depicts the strong relationship between individual-level poverty and the likelihood of paying bribes to government officials. While the relationship applies across national context, the predicted probabilities of paying bribes vary substantially both within and across countries. In the case of South Africa, an individual living in good material conditions has a 15 percent probability of being met by demands for bribes in return for access to government services. For a similar individual who is poor, the corresponding probability is 32 percent – more than twice the likelihood of a well-off person. In Kenya, this pattern is reproduced but at a much higher level. As Table 1 showed, administrative corruption is widespread across Kenya. People in Kenya are therefore generally much more likely to experience corruption than people in South Africa. This is also evident from the prediction lines in Figure 4. Even so, poor people in countries like Kenya face a much higher likelihood of experiencing corruption than wealthier people. Specifically, a person living in good material conditions has a 40 percent likelihood of paying bribes, while for a poor person the probability is 63 percent, a difference of more than 20 percentage points. This difference is substantially very large, and means that poor people are systematically more liable to be victims of corruption than wealthier people. Living in conditions of poverty therefore means that people are much more likely to be exploited by corrupt government officials who demand bribes in return for delivering public services.

The results for the remaining variables in Table 2 show that the relationship between poverty and bribery applies conditional on controlling for a number of other relevant factors which may affect both individuals' experience with paying bribes and their propensity of being poor. Unsurprisingly, the results in Table 2 consistently show that people who use public services are more likely to pay bribes to government officials. However, the

relationship between poverty and bribery applies even conditional on using public services. This means that the effect of poverty does not arise simply because poor people are more likely to use public services. Membership of civil organizations does not have uniform effects on individuals' exposure to corrupt behavior by government officials, but rather depends on the type of organization. Membership of religious organizations and unions, what Knack and Keefer (1997) denote 'Putnam groups', is largely unrelated to bribery, while people who are members of business or community organizations ('Olson groups' more clearly identifiable as special interests) are significantly more likely to pay bribes. Similarly, contacting people in job functions related to the government sector in order to solve a problem also increases the likelihood of paying bribes. Particularly people who seek help from local government councilors, bureaucrats in government ministries, and political party officials are more exposed to paying bribes in the process. This finding probably reflects that people employed in such positions are often relatively influential, and may use this influence to actually help people, but at a cost. There are some indications that contacting members of parliament has similar effects, but this result is less robust and disappears in models 6 and 8.

Finally, the results for the socio-economic controls reveal some systematic patterns. People living in urban areas are significantly more likely to pay bribes to government officials than people who live in rural area, arguably because cities and urban areas have a higher concentration of public sector activity. Similarly, employment and education also raise the likelihood that people pay bribes, although in both cases the relationships are significantly weaker in the linear regressions (models 1-4). Finally, exposure to bribery appears to be systematically biased by gender and age, with males and younger people being significantly more likely to pay bribes than women and older people.

Other than economic wealth, the quality of legal institutions also affects bribery at the country-level. Even in this sample of African countries, stronger legal institutions significantly lower the levels of bribery and work as a barrier to corruption (cf. Bjørnskov, 2011). The most robust effect of among the country-level variables is clearly ethnic fractionalization, with higher levels of fractionalization being associated with larger aggregate levels of bribery (cf. Mauro, 1995; Aidt, 2009). By raising bribery at the country level, economic inequality works in a similar manner. Thus, countries that are highly fractionalized along ethnic and economic lines seem much more likely to suffer from corruption than more homogenous countries, most likely since ethnic divisions in Africa substantially alter individuals' norms and sense of moral community (Uslaner, 2008).

Testing conditional and non-monotonic effects

While the results in Table 2 present strong evidence that the likelihood of paying bribes increases with poverty, our theoretical model suggests that this relationship may be more complex. First, Hypothesis 1 states that the relationship between poverty and corruption applies only conditional on exit options being *de facto* available to citizens. In Table 2 we addressed this issue by controlling for urban-rural residence, assuming that the effect (the coefficient) of poverty on bribery is similar for rural and urban dwellers, while allowing the level of bribery (the intercept) to vary between citizens in urban and rural areas. However, if exit options are more frequently available to people living in towns and cities, a more appropriate way of testing this hypothesis is to include a multiplicative interaction term between poverty and urban-rural residence, which allows the effect of poverty on bribery to differ between rural and urban dwellers. Secondly, as stated in Hypothesis 2 and illustrated in Figure 2, corruption risk may increase with income for the poorest groups until a certain threshold, after which the relationship reverses. We cannot say *a priori* precisely at what threshold value the relationship between corruption risk and poverty changes, except that it is likely to occur at a relatively high level of poverty. Finally, Hypothesis 3 provides another complication derived from the model, namely that the effect of poverty may decrease as the quality of countries' legal systems increases.

Table 3: Poverty and Bribery in Africa: Testing conditional and non-monotonic relationships

Model	1	2	3	4	5	6	7	8	9	10	11	12
Method	Linear RE	Logit RE	Ologit RE	Linear RE	Logit RE	Ologit RE	Linear RE	Logit RE	Ologit RE	Linear RE	Logit RE	Ologit RE
Dep.Variable	continuous	binary	ordinal	continuous	binary	ordinal	continuous	binary	ordinal	continuous	binary	ordinal
Individual-level regressors												
Poverty	0.046***	0.809***	0.915***	-	-	-	0.084***	2.359***	2.414***	0.025	0.544*	0.642*
	(3.68)	(8.39)	(6.61)				(3.40)	(10.38)	(7.41)	(0.85)	(1.81)	(1.74)
Poverty squared	-	-	-	-	-	-	-0.032	-1.786***	-1.728***			
							(0.93)	(6.54)	(4.24)			
Poverty **x** urban	0.040***	0.405***	0.354*				-	-	-	-	-	-
	(4.05)	(2.68)	(1.72)									
Extremely poor	-	-	-	*Reference group*	*Reference group*	*Reference group*	-	-	-	-	-	-
Very poor	-	-	-	-0.014	-0.015	-0.052	-	-	-	-	-	-
				(1.11)	(0.16)	(0.43)						
Poor	-	-	-	-0.026*	-0.166*	-0.233*	-	-	-	-	-	-
				(1.75)	(1.86)	(1.82)						
Not poor	-	-	-	-0.040***	-0.392***	-0.480***	-	-	-	-	-	-
				(2.61)	(4.36)	(3.85)						
Wealthy	-	-	-	-0.056***	-0.886***	-0.973***	-	-	-	-	-	-
				(3.80)	(8.68)	(8.42)						
Country-level regressors												
GDP per cap.	-0.002	-0.191***	-0.135***	-0.002	-0.182***	-0.121***	-0.002	-0.183***	-0.114***	-0.002	-0.196***	-0.164***
	(0.75)	(3.07)	(14.79)	(0.70)	(2.89)	(11.22)	(0.71)	(2.90)	(8.57)	(0.95)	(3.15)	(21.68)
Institutional quality	-0.001	-0.018**	-0.020***	-0.001	-0.019**	-0.020***	-0.001	-0.018**	-0.045***	0.001	0.015	0.013***
	(1.40)	(2.00)	(11.50)	(1.42)	(2.02)	(10.56)	(1.41)	(1.98)	(22.92)	(1.26)	(1.61)	(3.77)
Inequality	0.001	0.036**	0.032***	0.001	0.034**	0.030***	0.001	0.034**	0.044***	0.001	0.036**	0.023***
	(0.92)	(2.18)	(8.38)	(0.90)	(2.09)	(7.21)	(0.89)	(2.07)	(12.68)	(1.07)	(2.24)	(9.06)
Ethnic fractionalization	0.094***	2.489***	2.703***	0.094***	2.525***	2.739***	0.094***	2.525***	2.843***	0.092***	2.469***	2.605***
	(3.66)	(4.02)	(22.10)	(3.65)	(4.05)	(21.52)	(3.61)	(4.02)	(12.05)	(3.52)	(4.00)	(20.66)
Cross-level interaction												
Poverty **x** inst.	-	-	-	-	-	-	-	-	-	0.001	0.010	0.010
										(1.46)	(1.45)	(1.26)
Full set of controls included?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Log (pseudo) likelihood	13671.8	-10596.4	-16245.3	13659.2	-10580.6	-16621.5	13661.5	-10578.2	-16223.8	13662.8	-10598.9	-16236.6
(Pseudo)R^2 (overall)	0.13	0.20	-	0.13	0.20	-	0.13	0.20	-	0.13	0.20	-
Observations	20,872	20,872	20,872	20,872	20,872	20,872	20,872	20,872	20,872	20,872	20,872	20,872
Countries	17	17	17	17	17	17	17	17	17	17	17	17

Fixed effects estimates												
Poverty	0.046***	0.809***	-	-	-	-	0.085	2.365	-	-	-	-
	(3.68)	(6.10)					(3.39)	(7.39)				
Poverty squared	-	-	-	-	-	-	-0.032	-1.794	-	-	-	-
							(-0.94)	(-4.52)				
Poverty **x** urban	0.039***	0.402	-									
	(4.05)	(1.97)**										
Extremely poor	-	-	-	*Reference Group*	*Reference group*		-	-	-	-	-	-
Very poor	-	-	-	-0.014	-0.0128	-	-	-	-	-	-	-
				(1.10)	(-0.11)							
Poor	-	-	-	-0.026*	-0.163	-	-	-	-	-	-	-
				(1.75)	(-1.40)							
Not poor	-	-	-	-0.040***	-0.390***	-	-	-	-	-	-	-
				(-2.61)	(-3.32)							
Wealthy	-	-	-	-0.056***	-0.884***	-	-	-	-	-	-	-
				(-3.80)	(-7.85)							

The table only shows results for individual-level poverty variables, country-level regressors, and interactions. The full set of results is available in the online appendix. The dependent variables are same as in Table 2. Low values on the poverty index denote that people are poor; high values denote that people are well-off. Poverty **x** urban is a multiplicative interaction between the poverty and urban variables. Poverty **x** inst. is a multiplicative cross-level interaction term between poverty and institutional quality. In models 7-9, the measure of institutional quality is reversed. The bottom part of the table shows corresponding fixed effects estimates. Absolute value of z-statistics are shown in parentheses. *** p<0.01, ** p<0.05, * p<0.1. For other details, see note to Table

For comparison we show fixed effects estimates at the bottom of the table; these are very similar to the random effects estimates. Models 1-3 test Hypothesis 1, but rather than treating urban-rural residence as a standard (additive) control variable, it is included in a multiplicative interaction term with poverty. Doing so implies that the effect of poverty is conditional on people's residential location. Specifically, if exit options are more frequently available in urban areas, we would expect the marginal effect of poverty to increase for people living in urban areas. Similarly, if there are fewer exit options, which is often the case in rural areas, citizen threats of opting out of corrupt public services are less credible, meaning that corrupt bureaucrats have better access to extract bribes from wealthier people too, which should weaken the relationship between poverty and corruption in rural areas.

Models 1-3 correspond closely to this expectation. Interaction terms are complicated to interpret in non-linear probability models (models 2 and 3), and therefore the easiest way of interpreting the interaction effect is to look at the linear regression in model 1. Since urban-rural residence is a dummy variable equal to 0 for people in rural areas, the coefficient of poverty shows the effect of poverty on bribery for rural residents. Interestingly, poverty continues to be positively and significantly related to bribery even in rural areas. The coefficient, however, of the interaction term is positive and—with a correctly calculated standard error (Brambor et al., 2006) and highly significant.[14] This means that the marginal effect of poverty on bureaucratic corruption increases significantly for people living in urban area, which is precisely what we would expect provided that exit options are more widely available in urban areas. Overall, this result corroborates the expectation that the effect of poverty on bureaucratic corruption is strongest is urban areas where people can credible threaten to opt out of public service provision, making bureaucrats distribute the burden of corruption disproportionately on the poor.

In models 4-9 we test Hypothesis 2. Models 4-6 use dummy variables to categorize respondents into five groups on the poverty variable (details of the coding are available in the online appendix). The reference group is the 'extremely poor', defined as people who report that they always lack basic necessities on all the dimensions of poverty we measure. In contrast, the category labeled 'wealthy' is people who say they never lack any basic necessities. On the one hand, the results in models 4-6 show that the likelihood of paying bribes is decreasing with material wealth. On the other hand, the difference between the poorest groups is insignificant. Since this does not provide clear evidence for a non-monotonic effect, the results provide only mixed support for Hypothesis 2. In models 7-9 we include a squared term of the poverty variable to test for non-monotonicity in the relationship between poverty and bribery. These results are generally consistent with Hypothesis 2. Since high values on the poverty index imply that people are poor, the negative coefficient of the squared term suggests that the likelihood of paying bribes increases as the poorest groups obtain access to more basic material goods. While this provides evidence of a non-monotonic effect of poverty on bribery, the optimum on the bribery index in the linear regression (model 7) is located at extreme levels of poverty, falling outside the scale we actually observe.[15] Within the observed scale of the poverty index, the effect of poverty is always positive, consistent with the results in Table 2. This suggests that the major differences in encountering administrative corruption is between people who are well-off and people who are not and lack basic necessities on a regular basis.

Finally, models 10-12 test whether the effect of poverty is conditional on institutional quality, as stated in Hypothesis 3. We test this hypothesis by including a cross-level interaction term between individual-level poverty and country-level institutional quality. To make high values on the poverty index compatible with high values on the institutional variable, we have reversed the latter meaning that, in models 10-12, high values denote poor institutional quality. Although the sign of the interaction term is positive, appropriately calculated marginal effects (Brambor et al. 2006) show that the effect is weak and insignificant. On this ground, there is not much evidence to support Hypothesis 3 in the sample of countries we use.

[14] A plot of the marginal effect and calculations of correct standard errors are available in the online appendix.
[15] The optimum on the bribery index in model 7 is given by $-\beta_1/2\beta_2$, where β_1 and β_2 are the coefficients of poverty and its square, respectively. The optimum level of bribery is therefore located at a value of poverty equal to 1.31.

DISCUSSION

Overall, our results point to two important findings. Firstly, while the relationship between poverty and corruption seems to apply across all countries in sub-Saharan Africa, people living in less developed countries are generally more exposed to bribery and corruption. The general level of economic development therefore does seem to affect the incentives of government officials to collect bribes in return for delivering public services. This finding is consistent with previous work from macro-level studies on corruption (Treisman, 2000, 2007; Montinola and Jackman, 2002; Svensson, 2005; Bjørnskov, 2011). Secondly, regardless of country context, poverty strongly increases the likelihood that individuals face demands for bribes in return for obtaining services from government officials, particularly in urban areas.

To the best of our knowledge, this is a novel finding that has not previously been demonstrated in an African context. Nevertheless, our results stand in contrast to the findings reported by Mocan (2008), who examines various micro- and macro-level determinants of corruption across countries, and finds that wealthier people are more likely to pay bribes. However, of the 49 countries included in Mocan's analysis, only four are from sub-Saharan Africa, and two of these, Botswana and South Africa, are the wealthiest in the region and have below-average levels of corruption (see Table 1 and Mocan, 2008, 497-498). Conversely, our results provide much more comprehensive evidence from a larger set of countries in sub-Saharan Africa. Although we cannot extrapolate beyond the countries in the sample, the findings in this paper consistently show that poverty significantly increases the probability of paying bribes across African countries. The results in our paper are partially consistent with the work of Hunt and Laszlo (2012) who examine the relationship between income and corruption in Peru and Uganda. On the one hand, and in contrast to our findings, their results suggest that rich people are more likely to bribe and, on average, pay larger bribes. On the other hand, the bribes paid by the poor constitute a larger share of their income, which, in accordance with our findings, suggests that the burden of corruption may be relatively more severe for poor groups. This finding is in line with the evidence presented by Kaufmann et al. (2008), who also use Peruvian data and find corruption disproportionately affects the poor. Finally, our results are related to the work of Hunt (2006, 2007) and Olken (2006). Using household data from Peru, Hunt (2007) shows that victims of misfortune, such as crime and job loss, are more likely to pay bribes to government officials compared to people who are not subject to such events. In a related study, Olken (2006) finds that corruption impairs the welfare effects of redistributive programs targeted at the poor. Specifically, the findings from Olken's (2006) study of an Indonesian anti-poverty program allocating subsidized rice to the poor show that corruption significantly reduces the amount of rice that actually reaches the poor. Our results are consistent with this work in the sense that, in Africa too, adverse conditions like poverty increase the likelihood that people become victims of corruption. Indeed, while the differences in corruption risk between the poorest groups in Africa are relatively small, the poor are unambiguously more likely to be victims of administrative corruption than wealthier groups.

These results are, of course, subject to the caveat that data constraints do not allow us to say anything about how much money people pay in bribes, given that they pay bribes. It seems perfectly reasonable to assume that the absolute value of bribes is increasing with income (Hunt and Laszlo, 2012). However, this does not rule out that poor groups pay bribes more often and suffer relatively more under a regime of bureaucratic corruption, either because they are left with few options other than to rely on the services of corrupt bureaucrats, as our model suggests, or because the money paid in bribes constitutes a greater share of their income and therefore causes a relatively larger welfare loss (Kaufmann et al., 2008).

Confidence in our results, however, is strengthened by the fact that they are extremely robust to a number of tests. Even when we account for a rich set of individual- and country-level controls, and country-level random or fixed effects, the relationship between poverty and bribery remains strong and significant in both statistical and substantial terms. At the micro-level, our estimates suggest that poor people are, on average, almost three times more likely to pay bribes to public bureaucrats compared to wealthier people. This adverse effect of poverty exists both in contexts where corruption is relatively widespread and in contexts where it is less common, but is stronger in urban areas in which viable exit options are more likely to exist. Consequently,

micro-level poverty is not only one of the variables that is most significantly related to bribery; it also has very large effects on the likelihood that people will have to engage in exchanges involving bribes in order to obtain services from the public sector. This provides strong evidence that the costs of corruption in the relationship between citizens and government officials fall disproportionately upon those who are underprivileged to begin with—the poor.

CONCLUSION

The literature on corruption has documented a number of severe, negative economic consequences of corruption. Nevertheless, only few studies have examined who bears the costs of corruption and how micro-level wealth and poverty affect the likelihood that people engage in exchanges with corrupt street-level bureaucrats. In this paper, we attempt to address these questions. We do so by testing the implications of a simple agent-client model in which bribes serve an insurance purpose, using micro-level survey data from sub-Saharan Africa.

At its simplest, the theoretical framework shows that corrupt bureaucrats prefer to demand bribes from richer clients, who are generally more willing to pay for access to public services. However, given that we relax the assumption that bureaucrats operate as monopolists, and allow clients to use costly exit mechanisms to opt out of public service provision—e.g. by moving to different neighborhoods or using private health and school facilities—implying that corruption drives the relatively rich away from general public services. This creates an adverse selection problem, where rich clients can credibly opt for the costly exit option, while poor groups continue to rely on the services of corrupt bureaucrats, because they cannot afford to opt out of public services. Under these conditions, the poor will be more likely to pay bribes, and corruption comes to work as a regressive tax that hits people who are disadvantaged at the outset.

Using data from the *Afrobarometer* survey for 18 sub-Saharan African countries, the results clearly corroborate that poor people are more likely to pay bribes than wealthier people, and that the average likelihood of paying bribes is higher for people living in poorer countries. These results shed new light on the relationship between poverty and bribery in Africa by showing that poverty appears to be a major determinant of differences in bribery at both the micro- and macro-level. While we cannot assess the size of bribes with the present data, our results suggest that costs are suffered disproportionately by the poor.

Ultimately, these findings point to a genuine dilemma for agencies and policy-makers engaged in anti-corruption campaigns and public sector reform in developing countries. On the one hand, breaking down public monopolies and introducing exit mechanisms for clients of public services weaken the power of government bureaucrats and work as a constraint on corrupt behavior. This may serve to modify the overall burden of corruption in society. On the other hand, the introduction of exit mechanisms are likely to distribute the costs of corruption disproportionately towards the poor, precisely because these are the groups that have few alternatives but to rely on the services of corrupts bureaucrats. In so far as costly exit mechanisms constitute a remedy for fighting corruption, its effects may therefore materialize only conditionally on people becoming richer. In this sense, the combination of poverty reduction and anti-corruption reform in the public sector are important steps in the fight against corruption.

REFERENCES

Anderson, Staffan and Paul M. Heywood 2009. "The politics of perception: Use and abuse of Transparency International's approach to measuring corruption". *Political Studies* 57, 746-767.

Aidt, Toke. 2003. Economic Analysis of Corruption: A Survey. *The Economic Journal*, 113, F632-F652.

Aidt, Toke. 2009. Corruption, Institutions, and Economic Development. *Oxford Review of Economic Policy*, 25, 271-91.

Alesina, Alberto, Arnaud Devleeschauwer, William Easterly, Sergio Kurlat and Romain Wacziarg. 2003. Fractionalization. *Journal of Economic Growth*, 8, 155-194.

Banerjee, Abhijit, Rema Hanna and Sendhil Mullainathan. 2012. Corruption. NBER working paper no. 17968.

Banfield, Edward C. 1975. Corruption as a Feature of Governmental Organization. *Journal of Law and Economics*, 18, 587-605.

Bjørnskov, Christian. 2011. Combating Corruption: On the Interplay between Institutional Quality and Social Trust. *Journal of Law and Economics*, 54, 135-159.

Bjørnskov, Christian and Andreas Freytag. 2011. An Offer You Can't Refuse: Murdering Journalists as an Enforcement Mechanism of Corrupt Deals. Jena Economic Research Papers 2011-014.

Brambor, Thomas, William R. Clark and Matt Golder 2006. Understanding Interaction Models: Improving Empirical Analysis. *Political Analysis* 14, 63-82.

Bratton, Michael. 2008. Poor people and democratic citizenship in Africa. In *Poverty, Participation, and Democracy: A Global Perspective*, ed. Anirudh Krishna. Cambridge: Cambridge University Press.

Bratton, Michael, Robert Mattes and E. Gyimah-Boadi. 2004. *Public Opinion, Democracy, and Market Reform in Africa*. Cambridge: Cambridge University Press.

Bratton, Michael, Ravi Bhavnani and Tse-Hsin Chen. 2011. Voting Intentions in Africa: Ethnic, Economic, or Partisan? *Afrobarometer Working Paper No. 127*. www.afrobarometer.org

De Soto, Hernando. 2000. *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else*. New York: Basic Books.

Dreher, Axel, Christos Kotsogiannis, and Steve McCorriston. 2007. Corruption around the World: Evidence from a Structural Model. *Journal of Comparative Economics*, 35, 443-466.

Dreher, Axel, Christos Kotsogiannis, and Steve McCorriston. 2009. How Do Institutions Affect Corruption and the Shadow Economy? *International Tax and Public Finance*, 16, 773-96.

Friedman, Eric, Simon Johnson, Daniel Kaufmann and Pablo Zoido-Lobaton. 2000. Dodging the Grabbing Hand: Determinants of Unofficial Activity in 69 Countries. *Journal of Public Economics*, 76, 459-93.

Gelman, Andrew and Jennifer Hill. 2007. *Data Analysis Using Regression and Multilevel/Hierarchical Models*. New York: Cambridge University Press.

Glaeser, Edward, Jose Scheinkman and Andrei Shleifer. 2003. The Injustice of Inequality. *Journal of Monetary Economics*, 50, 199-222.

Gupta, Sanjeev, Hamid Davoodi and Rosa Alonso-Terme. 2002. Does Corruption Affect Income Inequality and Poverty? *Economics of Governance*, 3, 23-45.

Harding, Robin. 2010. Urban-Rural Differences in Support for Incumbents across Africa. *Afrobarometer Working Paper No. 120*. www.afrobarometer.org

Hellman, Joel, Geraint Jones, and Daniel Kaufmann. 2003. Seize the State, Seize the Day: State Capture and Influence in Transition Economies. *Journal of Comparative Economics* 31, 751-73.

Heritage Foundation. 2011. *2011 Index of Economic Freedom*. Washington, DC: Heritage Foundation.

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

Hunt, Jennifer. 2006. Why Are Some Public Officials More Corrupt Than Others? In *International Handbook of the Economics of Corruption*, ed. Susan Rose-Ackerman. Cheltenham UK: Edward Elgar Publishing, 323-351.

Hunt, Jennifer. 2007. How Corruption Hits People When They Are Down. *Journal of Development Economics* 84, 574-589.

Hunt, Jennifer and Sonia Laszlo. 2012. Is Bribery Really Regressive? Bribery's Costs, Benefits, and Mechanisms. *World Development*, 40, 355-372.

Justesen, Mogens K. 2011. Too Poor to Care? The Salience of AIDS in Africa. *Afrobarometer Working Paper No. 133*. www.afrobarometer.org

Keefer, Philip. 2010. The Ethnicity Distraction? Political Credibility and Partisan Preferences in Africa. *Afrobarometer Working Paper No. 118*. www.afrobarometer.org

Kaufmann, Daniel, Aart Kraay and Massimo Mastruzzi. 2005. Governance Matters IV: Governance Indicators for 1996–2004. *Policy Research Working Paper No. 3630*. World Bank, Washington, D.C.

Kaufmann, Daniel, Judit Montoriol-Garriga and Francesca Recanatini. 2008. How Does Bribery Affect Public Service Delivery? Micro-evidence from Service Users and Public Officials in Peru. *Policy Research Working Paper No. 4492*. World Bank, Washington, D.C.

Knack, Stephen. 2007. Measuring Corruption: A Critique of Indicators in Eastern Europe and Central Asia. *Journal of Public Policy*, 27, 255-291.

Knack, Stephen and Philip Keefer. 1997. Does Social Capital Have an Economic Payoff? A Cross-Country Investigation. *Quarterly Journal of Economics*, 112, 1251-1288.

Leff, Nathaniel H. 1964. Economic Development through Bureaucratic Corruption. *American Behavioral Scientist*, 8, 8–14.

Mattes, Robert. 2007. Public opinion research in emerging democracies. In *The SAGE Handbook of Public Opinion Research*, eds. Wolfgang Donsbach and Michael W. Traugott. London: SAGE Publications: 113-120.

Mattes, Robert, Michael Bratton and Yul Derek Davids. 2003. Poverty, Survival, and Democracy in Southern Africa. *Afrobarometer Working Paper 23*: 1-59.

Mauro, Paolo. 1995. Corruption and Growth. *Quarterly Journal of Economics*, 110, 67-95.

Méon, Pierre-Guillaume and Khalid Sekkat. 2005. Does Corruption Grease or Sand the Wheels of Growth? *Public Choice*, 122, 69-97.

Mocan, Naci. 2008. What Determines Corruption? International Evidence from Microdata. *Economic Inquiry*, 46, 493-510.

Montinola, Gabriella and Simon Jackman. 2002. Sources of Corruption: A Cross-Country Study. *British Journal of Political Science*, 32, 147-70.

Nunn, Nathan and Leonard Wantchekon. 2012. The Trans-Atlantic Slave Trade and the Evolution of Mistrust in Africa: An Empirical Investigation. Forthcoming in *American Economic Review*.

Olken, Benjamin. 2006. Corruption and the costs of redistribution. *Journal of Public Economics*, 90, 853-70.

Olken, Benjamin. 2009. Corruption Perceptions vs. Corruption Reality. *Journal of Public Economics*, 93, 950-64.

Poku, Nana K. and Anna Mdee. 2011. *Politics in Africa: A New Introduction*. London: Zed Books.

Rabe-Hesketh, Sophia and Anders Skrondal. 2008. *Multilevel and Longitudal Modeling Using Stata.* 2nd edition. Texas: Stata Press.

Shleifer, Andrei. 1997. Government in transition. *European Economic Review*, 41, 385-410.

Shleifer, Andrei and Robert W. Vishny. 1993. Corruption. *Quarterly Journal of Economics* 108, 599-617.

Snijder, Tom and Roel Bosker. 1999. *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modelling*. London: Sage Publications.

Steenbergen, Marco R. and Bradford S. Jones. 2002. Modeling Multilevel Data Structures. *American Journal of Political Science* 46(1): 218-237.

Solt, Frederick. 2009. Standardizing the World Income Inequality Database. *Social Science Quarterly*, 9, 231-242.

Svensson, Jacob. 2003. Who Must Pay Bribes and How Much? *Quarterly Journal of Economics*, 118, 207-30.

Svensson, Jacob. 2005. Eight Questions about Corruption. *Journal of Economic Perspectives*, 19, 19-42.

Treisman, Daniel. 2000. The Causes of Corruption: A Cross-National Study. *Journal of Public Economics*, 76, 399-457.

Treisman, Daniel. 2007. What Have We Learned about the Causes of Corruption from Ten Years of Cross-National Empirical Research? *Annual Review of Political Science*, 10, 211-244.

Rose-Ackerman, Susan. 2006. Introduction and Overview. In *International Handbook of the Economics of Corruption*, ed. Susan Rose-Ackerman. Cheltenham UK: Edward Elgar Publishing, *xiv-xxxviii*.

Uslaner, Eric M. 2008. *Corruption, Inequality, and the Rule of Law: the Bulging Pocket*. Cambridge: Cambridge University Press.
Wooldridge, Jeffrey M. 2002. *Econometric Analysis of Cross Section and Panel Data*. Cambridge, MA: MIT Press.
Yavas, Cemile. 2007. The Ghost of Corruption. *B.E. Journal of Economic Analysis and Policy*, 7, art. 38, 1-19.

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