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## How does petty corruption affect tax morale in sub-Saharan Africa? An empirical analysis

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## WIDER Working Paper 2017/8

# How does petty corruption affect tax morale in sub-Saharan Africa?

An empirical analysis

Björn Jahnke\*

January 2017

**Abstract:** Revenues from taxation gain importance to finance economic development in sub-Saharan Africa. Extortion of bribes by public officials can provide one obstacle for tax compliance. This paper uses micro-level data from the Afrobarometer to analyse how petty corruption erodes tax morale. A mediation analysis shows that petty corruption directly reduces tax morale but also diminishes trust in the tax department and hence indirectly affects tax morale. The effect on tax morale is more severe in countries and regions where fewer people are affected by petty corruption and becomes insignificant if extortion of bribes is particularly prevalent.

**Keywords:** corruption, tax morale, economic development, mediation analysis, regional disaggregation

**JEL classification:** D73, H26, K42, F63

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## **1 Introduction**

Tax morale has gained importance in the context of recent reforms in tax systems in many sub-Saharan African countries as they attempt to improve their fiscal capacity. Declarations of taxable income increasingly depend on voluntary compliance and self-assessment by the taxpayers (Fossat and Bua 2013; Moore 2014). This shift implies a significant change in the relationship between taxpayers and the state. Increased autonomy of the taxpayers enhances the relevance of their motivation to cooperate with the government and pay taxes.

Besley and Persson (2013) argue that corruption is one obstacle to the emergence of tax compliance norms in developing countries and, thus, provides a reason as to why developing countries have lower tax revenues. Corruption can have different forms. One form is petty corruption, defined as the ‘everyday abuse of entrusted power by low- and mid-level public officials in their interactions with ordinary citizens, who often are trying to access basic goods or services’ (Transparency International 2016). Petty corruption is pervasive in many sub-Saharan African countries and related to reduced trust in public institutions (Lavallée et al. 2008). Petty corruption, thus, can undermine the attempts to increase fiscal capacities in sub-Saharan African countries. However, petty corruption can come into effect through different ways. It can be related to different types of public goods, occur more or less frequently, have external effects on the perception of other institutions, and affect more or less people across countries and regions.

The remainder of this article is organized as follows: Section 2 discusses related literature. Section 3 provides an overview about the data and gives descriptive statistics. Section 4 analyses the relationship between petty corruption and tax morale. Section 5 explores how confidence in the tax department influences tax morale. Section 6 discusses the problem of reverse causation and introduces the mediation analysis as an approach to disaggregate the total effect of petty corruption on tax morale. Section 7 identifies that petty corruption has an inverse effect on tax morale depending on the share of people affected in a regional area. Section 8 concludes.

## **2 Related literature**

### **2.1 Corruption and economic development**

Corruption affects economic development in different dimensions. Bayley (1967) and Becquart-Leclercq (1989) argue that bribe payments reduce red tape and bureaucratic burden. Corruption, thus, increases the efficiency of the economy and leads to better economic development. This approach is known as the ‘efficient grease’ hypothesis. However, no convincing evidence has been provided for this hypothesis. Mauro (1995) and Méon and Sekkat (2005) show that investments and economic growth are lower in economies with higher corruption. Dreher and Herzfeld (2005) estimate that higher levels of corruption are related to lower gross domestic product (GDP) growth and human development. Tanzi and Davoodi (2000), Bird et al. (2008), and Besley and Persson (2014) demonstrate that corruption is related to lower shares of taxation in GDP. Low-income countries lack resources to finance economic development. Thus, more recent literature emphasizes the importance of the absence of corruption as a fundamental prerequisite for sustainable development (Aidt 2011) and compliant taxpayers (Rothstein 2013).

## **2.2 Corruption in tax departments**

Corruption in tax departments plays an important role to explain lower tax intakes. Tax officials are in a position to extort bribes, collude with taxpayers, and embezzle public revenues (for an overview, see Martini 2014). Transparency International (2013) estimates that payment of bribes to tax officials is particularly prevalent in African countries. More than 60 per cent of individuals in Sierra Leone and Liberia reported having paid bribes to tax officials in 2013 as opposed to the global average of 15 per cent. Aiko and Logan (2014) provide evidence that people are aware of widespread corruption in tax departments. Thirty-five per cent of respondents to the Afrobarometer believe that the majority of tax officials are involved in corruption. However, the perceived extent of corruption in tax departments varies across countries depending on the average dispersion of corruption. Alm et al. (2016) focus on the impact of corrupt tax officials and tax payments by firms. They use data from the World Enterprise Survey and the Business Environment and Enterprise Performance Survey to show that corruption payments—either voluntarily offered to or extorted by corrupt officials—significantly reduce reported sales and hence tax payments of firms. Experiences with the tax department shape the intrinsic motivation of taxpayers to cooperate. Kasper (2016) provides evidence that positive experiences with tax departments in 14 Eastern European countries improve the intrinsic motivation to comply and, in some cases, even encourages report of past non-compliance.

## **2.3 Tax morale**

The concept of tax morale evolved from the economic analysis of tax evasion. This strand of literature was pioneered by Allingham and Sandmo (1972). The authors considered cheating on taxes as a risky decision and used an expected utility model to show that the concealed amount of income is negatively related to the audit and penalty structure, assuming the taxpayer to be risk averse. Later studies showed that the actual tax compliance is much higher than predicted by Allingham and Sandmo (1972). Alm et al. (1992) demonstrate that the relative risk aversion must be extraordinarily high to explain actual tax compliance, given that actual audit probabilities and costs of detection are very low even in industrialized countries. Baldry (1986) conducted two experiments and invited participants to consider tax evasion as a gamble. Many players did not evade taxes despite the invitation. Baldry (1986) argues that taxpayers incur moral costs from feelings of guilt or shame, which shape the intrinsic motivation of taxpayers to comply. Smith (1992) argues that tax compliance is shaped not only by intrinsic motivation but also by extrinsic factors. He emphasizes that the perceived fairness of the tax system and the reliability of the political system affect the motivation to comply with tax payments. Corruption in public institutions provides one mechanism that influences the perceived reliability of public institutions and the motivation of individuals to comply with taxes.

## **2.4 Corruption and tax morale**

Corruption in public authorities can severely harm tax morale. From a theoretical point of view, corruption can discourage people to comply because of perceived unfairness in the relationships in the exchange between taxpayers and the state (Feld and Frey 2007) and induce vertical inequities from additional monetary burdening (Fortin et al. 2007). Torgler (2003) shows that taxpayers are more likely to comply if they feel fairly treated by the government. Torgler (2006) argues that countries with high levels of corruption lack the social norm of paying taxes to the government. He finds that Transparency International's Corruption Perceptions Index is negatively correlated

with tax morale. Ali et al. (2014) analyse the impact of satisfaction with public services on tax morale of people in the sub-Saharan African countries of Kenya, Tanzania, Uganda, and South Africa. The authors use the perceived number of corrupt tax officials to control for the satisfaction of people with the tax administration in the four countries. Their study finds significantly negative effects on tax morale of people in Uganda and South Africa. However, the perceived number of corrupt tax officials only provides a vague measure of actual corruption in tax administration and gives no explanation about how corruption affects tax morale. Their study furthermore gives no satisfactory explanation for the selection of the four countries.

## 2.5 Petty corruption and trust in public institutions

Although the influence and extent of perceived corruption has been widely studied in the literature, only few studies focus on the impact of petty corruption payments. Cho and Kirwin (2007) use data from the Afrobarometer to show that petty corruption reduces trust in public institutions. They further find that petty corruption can induce a vicious circle. Prevalent corruption increases the expectations of bribe offers and thus increases the frequency of petty corruption experiences. Clausen et al. (2011) use data from the Gallup World Poll to prove the causality of petty corruption experiences for reduced trust in institutions. They estimate that effects from reduced trust in institutions need to be very high to reverse the direction of the effects from petty corruption. Lavallée et al. (2008) use data from the Afrobarometer to analyse the efficient grease hypothesis. The study finds that higher corruption never increases trust in public institutions. Lavallée et al. (2008) further find different effects of perceived and experienced corruption on trust in public institutions. First, the negative effect from perceived corruption is more severe the higher the satisfaction with public services. Second, the negative effect from experienced corruption decreases the higher the satisfaction with public services. However, Lavallée et al. (2008) argue that people are more concerned about petty corruption if it is an obstacle to get access to public services.

## 2.6 Corruption and social norms

The specific effects of corruption on people's behaviour are discussed in the literature on social norms. Hauk and Saez-Marti (2001) argue that small-scale corruption is not necessarily considered negative in public opinion. Banuri and Eckel (2012) state that corruption norms constitute specific types of social norms and determine the expectations of individuals on the extent of corruption. Cameron et al. (2009) analyse corruption behaviour and attitudes of students from low-corruption countries (Australia and Singapore) and from high-corruption countries (India and Indonesia). Their study finds that the more tolerant attitudes of students towards corruption can be explained by more prevalent corruption in their countries of origin. Byrne et al. (2010) argue that everyday corruption can become normalized. The authors highlight the role of the media to make people aware of injustice and mobilize opposition. Case studies on Uganda and Tanzania show that institutionalization and normalization of corruption can be observed in the sub-Saharan Africa region (Panth 2011; Heilman and Ndumbaro 2002).

Thus, the different forms of corruption lead to a different perception of fairness in the vertical relationship between individuals and the state. Perceived corruption in the tax administration can severely worsen the motivation to contribute to the public budget if people are more satisfied with public services. Institutionalization and normalization of corruption makes people more tolerant towards corruption. However, experiences with corruption payments for public goods raise concerns about ill-functioning institutions, particularly among people who were affected by

corruption. This might weaken their motivations to pay taxes. The question being explored is how petty corruption and perceived corruption affect the tax morale of people in sub-Saharan Africa.

### 3 Descriptive statistics of main variables

The data used in the empirical analysis are taken from the Afrobarometer. The analysis in Sections 4–7.1 use data from Round 5, which was carried out during 2011–13 in 33 African countries, 29 from the Sub-Saharan region. The survey consists of nationally representative samples, varying between either 1,200 or 2,400 respondents who are at least 18 years of age. The baseline sample of the included Sub-Saharan countries encompasses 45,599 persons but is smaller in most of the regressions because of missing data. The countries included in this paper are Benin, Botswana, Burkina Faso, Burundi, Cameroon, Côte d'Ivoire, Cape Verde, Ghana, Guinea, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Senegal, Sierra Leone, South Africa, Swaziland, Tanzania, Togo, Uganda, Zambia, and Zimbabwe. The dataset provides demographic information about the employment status of the respondents, their education level, and whether they live in urban or rural areas. As the survey does not provide information about the income of the respondents, a wealth indicator was constructed by using principal component analysis. The indicator consists of information as to whether the respondents possess a radio, television, motor vehicle, and/or mobile phone, have access to water and toilet, and the type of roof material in their homes (see Appendix Tables A1 and A2 for descriptive statistics of all variables). Identical questions on taxation and perceived and personal corruption experiences were asked in all countries considered in this paper. The main dependent variable is set as tax morale, and is taken from question 76B (Q76B) from the Afrobarometer: 'I am now going to ask you about a range of different actions that some people take. For each of the following, please tell me whether you think the action is not wrong at all, wrong but understandable, or wrong and punishable: Not paying the taxes they owe on their income.'

As in other studies, a binary dependent variable is used in most of the regressions. A value of 1 captures that the respondents consider not paying taxes as wrong and punishable, and 0 if they consider it as wrong but understandable or not wrong at all. As presented in Appendix Table A3, tax morale varies between the Sub-Saharan countries. Respondents in Malawi and Lesotho exhibit the highest tolerance for non-compliant taxpayers whereas two-thirds of the respondents in Cameroon, Ghana, Liberia, and Burundi answered that cheating on taxes is wrong and should be punished. Using an indirect question to estimate personal tax morale has become standard in the literature on tax morale (see Ali et al. 2014; Frey and Torgler 2007; McGee 2008). Some scholars questioned the reliability of this proxy and argued that it might not reflect actual behaviour (e.g. Elffers et al. 1987). Recent studies give evidence of a causal relationship. Torgler et al. (2010) show a robust correlation between the indirectly measured tax morale and the actual level of tax evasion. Halla (2010) provides evidence for a causal link between tax morale and actual tax compliance. The survey includes several questions about corruption. The main explanatory variable of interest captures the actual bribery experience of the respondents. Question 61 from the Afrobarometer asks whether the respondents 'had to pay a bribe, give a gift, or do a favour to government officials in order to get a document or a permit, water or sanitation services, treatment at a local health clinic or hospital, avoid problems with the police, place in primary school'.

The survey offers four possible answers—never, once or twice, a few times, or often—capturing the frequencies of bribe experiences. As presented in Appendix Table A4, corruption experiences are quite prevalent in sub-Saharan Africa. In particular, paying bribes or offering gifts is necessary to get documents or health services or to avoid problems with the police. Corruption in these

categories is most prevalent in Kenya and Sierra Leone. In contrast, people from Botswana and Namibia have very little experience with bribing.

#### 4 Tax morale and corruption experiences

Table 1 presents the estimates of the impact of petty corruption experiences on tax morale. All regression models include country dummies and standard errors clustered at the country level. The first model uses a probit regression with a binary coded explanatory variable taking the value of 1 if the respondent has experienced corruption in at least one type of petty corruption during the last year. The marginal effect indicates that corruption experiences have a significantly negative effect at the 1 per cent confidence level. Corruption experiences during the last year reduce the probability of exhibiting the highest level of tax morale by some 5 per cent. The significantly negative effect persists if other estimation models are used. Only if the full scale of tax morale is used in the ordinary least squares (OLS) model does the magnitude of the estimation deviate substantially from the other results. In contrast to other studies (Ali et al. 2014; Frey and Torgler 2007), females exhibit lower tax morale than males. Moreover, wealthy people and those with high education attainments have a high tax morale whereas those who are self-employed are significantly less likely to uphold the highest level of tax morale.

Table 1: Tax morale and corruption experiences

Model	Marginal effects		Coefficients	
	Probit (1)	Ordered probit (2)	OLS (binary) (3)	OLS (full scale) (4)
(1) Corruption bribe paid during the last year	-0.0442*** (0.0109)	-0.0518*** (0.0097)	-0.0424*** (0.0104)	-0.0758*** (0.0138)
(2) Demographics				
Females	-0.0267*** (0.0058)	-0.0241*** (0.0056)	-0.0257*** (0.0056)	-0.0341*** (0.0082)
Age	0.0009*** (0.0003)	0.0007*** (0.0003)	0.0008*** (0.0026)	0.0010*** (0.0004)
High education	0.0405** (0.0186)	0.0049** (0.0176)	0.0386** (0.0179)	0.0573*** (0.0237)
Self-employed	-0.0366** (0.0145)	-0.0307** (0.0135)	-0.0352** (0.0139)	-0.0431** (0.0192)
Urban	0.0167 (0.0121)	0.0189* (0.0109)	0.0162 (0.0116)	0.0282* (0.0157)
Wealth	0.0149*** (0.0038)	0.0175*** (0.0033)	0.0144** (0.0037)	0.0251*** (0.0047)
(3) Country fixed effects	Yes	Yes	Yes	Yes
N	37,043	37,043	37,043	37,043
Pseudo R <sup>2</sup>	0.0398	0.0358		
R <sup>2</sup>			0.0540	0.0691

Notes: Dependent variable is tax morale. The marginal effects in model 2, ordered probit, estimated at the highest level of tax morale, are presented. If the variable is binary coded in probit and OLS (binary) regressions, 1 gives wrong and punishable and 0 all else. Robust standard errors, clustered at country level, are reported in parentheses. The reference group is given by males with primary education or lower, who are not self-employed and live in rural areas; they also have no experience with petty corruption during the year before they were interviewed. Significance levels: \* $p<0.1$ , \*\* $p<0.05$ , \*\*\* $p<0.01$ .

Source: Author's calculation based on Afrobarometer (2016) data.

To estimate whether corruption frequency influences tax morale, a set of dummy variables was created. The variables consist of the sum of corruption experiences per individual in the sample. A value of 0 indicates that the respondent has no experience with corruption. A value of 1 indicates that the respondent experienced corruption once or twice in one or two of the listed types of corruption or a few times in one type. A value of 2 indicates that the respondents often encountered instances of bribery in one of the groups or once or a few times in at least two groups. A value of 3 indicates more corruption experiences.

Table 2 indicates that tax morale negatively depends on bribe frequency. All three frequency dummies included in the regression are of statistical significance. Even though the marginal effects

increase with higher frequencies the differences are of no statistical significance. I used the Wald test post estimation methodology and found  $p$  values of 0.1259 between bribe frequency measures 1.2 and 1.1 and 0.3514 between frequency measures 1.3 and 1.2.

Table 2: Tax morale and bribe frequency

Probit estimation	Marginal effects
(1) Bribe experience	
(1.1) One or two times	-0.0266** (0.0130)
(1.2) Often in one group or once or a few times in two groups	-0.0531*** (0.0171)
(1.3) More times	-0.0718*** (0.0201)
(2) Socio-demographic controls	
Females	-0.0271*** (0.0058)
Age	0.0009*** (0.0003)
Education high	0.0408** (0.0185)
Self-employed	-0.0365*** (0.0145)
Urban	0.0167 (0.0121)
Wealth	0.0150*** (0.0390)
(3) Country fixed effects	Yes
N	37,043
Pseudo $R^2$	0.0401

Notes: Dependent variable is tax morale. If the variable is binary coded, 1 gives wrong and punishable and 0 all else. Robust standard errors, clustered at country level, are reported in parentheses. The reference group is given by males with primary education or lower, who are not self-employed and live in rural areas; they also have no experience with petty corruption during the year before they were interviewed. Significance levels: \* $p<0.1$ , \*\* $p<0.05$ , \*\*\* $p<0.01$ .

Source: Author's calculation based on Afrobarometer (2016) data.

Appendix Table A5 presents estimations for the individual types of bribe experiences. Models 1–5 analyse each type of corruption in single regressions. All types of petty corruption have statistically significant effects on tax morale. Bribes paid to circumvent problems with the police reduce the probability of reporting the highest level of tax morale by 5.3 per cent. Bribes paid to get access to the water or sewage system reduce tax morale by 6.6 per cent and hence have the largest effect. The difference between the marginal effects of water or sanitation access and bribes paid to police officers is of statistical significance, as a  $p$  value of 0.0256 indicates on using the Wald test to compare the individual regressions. No significant difference was found when comparing the estimations for bribes paid to police officers and bribes paid to get documents.

## 5 Tax morale and trust in the tax administration

This section takes a closer look at the influence of the perception of the tax administration on tax morale. The Afrobarometer survey provides no information about the actual bribe experiences of individuals with tax officials. However, the survey asks questions regarding trust in several governmental institutions. Among them, the survey asks how much the respondents trust in the tax department (Q59D). They could choose between not at all, just a little, somewhat, or a lot. To allow for more intuitive interpretation of the regression results, the scale was recoded meaning that no trust in the tax department receives the highest value of four. Additionally, the survey asks the respondents how many tax officials they think are involved in corruption (Q60F) and provides the answers: none, some of them, most of them, all of them. I use these questions as proxies to estimate the effect of corruption by the tax authorities on tax morale. This information is not included in the questions regarding the actual bribe experiences.

The estimations presented in Table 3 indicate that the two proxies for the impact of the performance of the tax administration on tax morale are of highest statistical significance. A decrease of trust in the tax department by one unit (e.g. from trusting the tax department a lot to somewhat) reduces the probability of having the highest level of tax morale by 3.6 per cent. A one unit increase in the perception of the number of tax officials who might be involved in corruption (e.g. from none to some of them) decreases the probability of having the highest tax morale by 3.4 per cent.

Table 3: Tax morale and trust in the tax department

Probit estimation	(1) Marginal effects	(2) Marginal effects
(1) Trust in tax department	-0.0364*** (0.0051)	
(2) Perceived number of corrupt tax officials		-0.0340*** (0.0065)
(3) Socio-demographic controls		
Females	-0.0240*** (0.0057)	-0.0238*** (0.0057)
Age	0.0008*** (0.0003)	0.0010*** (0.0003)
Education high	0.0381** (0.0176)	0.0425** (0.0188)
Self-employed	-0.0361*** (0.0142)	-0.0403*** (0.0144)
Urban	0.0173 (0.0129)	0.0184 (0.0126)
Wealth	0.0141*** (0.0087)	0.0138*** (0.0035)
Country fixed effects	Yes	Yes
N	33,767	33,767
Pseudo R <sup>2</sup>	0.0419	0.0405

Notes: Dependent variable is tax morale. If the variable is binary coded, 1 gives wrong and punishable and 0 all else. Robust standard errors, clustered at country level, are reported in parentheses. The reference group is given by males with primary education or lower, who are not self-employed and live in rural areas; they also have no experience with petty corruption during the year before they were interviewed. Significance levels: \* $p<0.1$ , \*\* $p<0.05$ , \*\*\* $p<0.01$ .

Source: Author's calculation based on Afrobarometer (2016) data.

## 6 Mediated and direct effects

To understand the ways in which petty corruption affects tax morale, it is important to identify the extent to which specific channels determine this relationship. The regression results presented so far indicate that corruption experiences and trust in the tax administration are significantly correlated with tax morale. The underlying assumption behind the second finding is that corruption experiences with public goods affect trust in other public institutions and, in this paper, the tax administration. Corruption experiences, thus, not only have direct effects on tax morale but also have indirect effects on tax morale because they are mediated through reduced trust in the tax administration. However, the estimated correlation gives no information about the extent of the indirect effects of petty corruption. It is unclear whether petty corruption causes the effects or whether reduced trust in public institutions drives corruption experiences. The latter situation can come into effect if people with low trust in public institutions experience more bribe extortions by corrupt officials.

The literature on the effects of petty corruption on trust in institutions discusses the direction of causality. Cho and Kirwin (2007) and Lavallée et al. (2008) use instrumental variables to provide evidence that corruption experiences cause reduced trust in public institutions. The exclusion restriction requires that reliable instruments need to predict experiences of petty corruption but are unrelated to trust in public institutions. Neither the instruments used by Cho and Kirwin (2007)—(i) respondents' overall trust in others and (ii) perceptions of the political influence of ethnic groups—nor those used by Lavallée et al. (2008)—(iii) chief of household is respondent to the survey and (iv) the respondent is willing to pay a bribe—convincingly fulfil the exclusion restriction

for reliable instruments. The experiences from Cho and Kirwin (2007) and Lavallée et al. (2008) rather indicate that cross-sectional data from the Afrobarometer cannot provide convincing instruments.

Clausen et al. (2011) take a different approach. The authors argue that it is very unlikely for governmental officials to know about each individual's perceived trust in institutions and, thus, petty corruption experiences are less prone to reverse causation than to perceived corruption. The authors show that petty corruption experiences have smaller effects and are of lower significance than the effects from perceived corruption. They estimate that the effects from reduced trust in institutions need to be extremely high in order to reverse the direction of effects from petty corruption.

On the basis of the findings by Clausen et al. (2011), I consider petty corruption as an exogenous experience that can directly and indirectly influence tax morale. I use mediation analysis to estimate the effects. A mediation analysis facilitates the partitioning of a total effect into direct and indirect effects. Appendix Figure A1 illustrates the underlying scheme of the mediation analysis used. I analyse the composition of the total effect,  $c$ , that results from the effect of the petty corruption experience ( $X$ ), on tax morale ( $Y$ ). Petty corruption has a direct effect,  $c'$ , on tax morale and an indirect effect via the mediator ( $M$ ), trust in the tax department. The impact from both measures of trust in the tax administration is captured in the indirect effect. The mediation analysis focuses on four single equations that are interrelated in the form of a structural estimation model (SEM):

$$Y = i_1 + cX + e_1 \quad (1)$$

$$Y = i_2 + c'X + b_1M_1 + b_2M_2 + e_2 \quad (2)$$

$$M_1 = i_3 + a_1X + e_3 \quad (3)$$

$$M_2 = i_4 + a_2X + e_4 \quad (4)$$

Equation 1 provides the total effect. Equation 2 estimates the direct and indirect effects from the mediators on tax morale. Equations 3 and 4 give the effects from petty corruption on the mediators. I use the binary mediation program in Stata to estimate the equations from the SEM. Table 4 presents the results. Model 1 and 2 refer to Equations 3 and 4. Petty corruption has significant effects on both variables in the mediator. Having paid bribes for public goods increases the perceived number of corrupt tax officials and reduces trust in the tax department. Model 3 gives the total effect as formalized in Equation 1. Having paid bribes reduces the probability of having the highest level of tax morale by 10.9 per cent. Model 4, based on Equation 2, shows that corruption experiences have a lower effect on tax morale if the mediator variables are included. The corruption experiences directly reduce the probability of having high tax morale by 7.57 per cent. This indicates that 30.6 per cent of the total effect is transmitted through the mediator variables, as estimated by the proportion of total effect mediated.<sup>1</sup>

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<sup>1</sup> The estimation of 30 per cent for the share of indirect effect is confirmed when using the seemingly unrelated regression method with multiple mediators as indicated by Preacher and Hayes (2008). However, this methodology is applicable only in the case of a continuous dependent variable. I used it as a robustness check because of the similarity of the probit and OLS model estimations with binary dependent variables in Table 1.

Table 4: Mediation analysis

Binary mediation model	Coefficient	Standard error
(1) Trust in tax department		
Petty corruption experience	-0.2643***	(0.0118)
Constant	1.5550***	(0.0068)
(2) Corrupt tax officials		
Petty corruption experience	0.3047***	(0.0096)
Constant	1.3372***	(0.0055)
(3) Tax morale		
Petty corruption experience	-0.1087***	(0.0142)
Constant	0.0527***	(0.0082)
N	35,173	
Pseudo $R^2$	0.0012	
(4) Tax morale		
Trust in tax department	0.0718***	(0.0068)
Corrupt tax officials	-0.0473***	(0.0084)
Bribe payment experience	-0.0757***	(0.0145)
Constant	0.0047	(0.0195)
N	35,173	
Pseudo $R^2$	0.0054	
Estimation of single effects		
Effect from trust in tax department = -0.0089		
Effect from perceived number of corrupt tax officials = -0.0089		
Total indirect = -0.0156		
Direct effect = -0.0354		
Total effect = -0.0512		
c_path = -0.0512		
Proportion of total effect mediated = 0.3060		
Ratio of indirect to direct effect = 0.4409		
Ratio of total to direct effect = 1.4409		

Notes: Significance levels: \* $p<0.1$ , \*\* $p<0.05$ , \*\*\* $p<0.01$ .

Source: Author's calculation based on Afrobarometer (2016) data.

## 7 Inverse effect of petty corruption

As demonstrated, petty corruption worsens tax morale. People who need to pay bribes for public services show higher tolerance for non-compliant taxpayers. From a theoretical point of view, this observation is in line with arguments on the exchange process between taxpayers and the state by Torgler (2003) and Feld and Frey (2007). Bribe payments go into the pocket of corrupt officials but are not related to costs of public services. This induces vertical inequities and thus harms the perceived fairness in the relationship between the government and the taxpayers.

Appendix Table A4 shows that the share of people with corruption experiences varies across the considered countries. Sixty-three per cent of people in Sierra Leone and 56 per cent in Kenya had to pay a bribe for at least one of the five public goods during the year before the survey started. In contrast, only 4 per cent of respondents from Botswana and 6 per cent in Namibia reported having paid a bribe.

The analysis in Section 4 has shown that increased frequencies of bribe payments per individual do not lead to significantly higher effects on the morale. However, the literature discussed in Section 2 indicates that corruption levels can have different effects across countries. One strand of the literature argues that corruption can be normalized in highly corrupt countries and make people more tolerant towards paying bribes. Thus, the perceived fairness in the relationship with the government can be less affected by everyday experiences with petty corruption. Another strand of

the literature finds that people are more concerned about bribe payments if it is an obstacle to get access to public services.

This section analyses whether the differences in national shares of people with corruption experiences are related to different effects on tax morale. The analysis consists of two parts where each respondent received a variable with a value of the national shares of people who encountered instances of petty corruption in their own country. In the first part, three groups of corruption levels are defined: high, medium, and low. Countries are assigned to one of the three groups. In the second part, the national shares of corruption experiences are used in a continuous variable. Whether the effect from corruption experiences on tax morale varies between groups of countries and across the total sample is to be determined.

## 7.1 Analysis of country groups

Appendix Table A4 shows that, on average, 30 per cent of individuals in each country encountered corruption experiences during the year before the survey was conducted. I use a deviation of 10 per cent to identify three levels of corruption and assign each country into one group in accordance with their national shares of people encountering instances of corruption. The group of countries with higher levels of corruption, where more than 40 per cent encountered bribe experiences, consists of six countries: Cameroon, Guinea, Kenya, Liberia, Sierra Leone, and Uganda. The group of countries with lower levels of corruption, where less than 20 per cent encountered experiences, consists of seven countries: Botswana, Cape Verde, Mauritius, Malawi, Namibia, South Africa, and Swaziland. The remaining 16 countries are grouped as medium-level corruption countries. The defined groups of countries do not systematically vary in their overall economic performance, with Cameroon and Kenya among those with a high rate of corruption and Botswana and South Africa in the group with lower levels of corruption. An interesting observation from the descriptive statistics is that the average tax morale in the three groups of countries is fairly at the same level: 52.38 per cent of people in countries with lower levels of corruption, 50.2 in countries with medium levels, and 54.39 per cent in countries with higher levels of corruption answer that withholding taxes is wrong and punishable. This observation indicates that the effects from petty corruption are estimated on equally distributed levels of tax morale. I include dummies for low and medium levels of corruption in the first analysis and use the high-corruption groups as default. I assume that institutional differences with an effect on tax morale are reflected in the estimations of the dummies for the corruption levels and do not include country fixed effects. As the analysis in Section 4 has shown, there is a significant overall effect from petty corruption on tax morale across all countries, if the country fixed effects are included.

The estimations of country differences are presented in Model 1 in Table 5. The corruption levels have significantly negative effects on the tax morale. The defined medium- and low-corruption country dummies are related to significantly more sizable effects on tax morale. The estimations of the coefficients for the interactions indicate that corruption experiences have more negative effects on the tax morale in countries with low and medium corruption levels than in countries with higher corruption levels.

Table 5: Effects of petty corruption across countries

Probit estimation	(1) Coefficients	(2) Coefficients
(1) Corruption experience		
Bribe paid to government officials	-0.0861*** (0.0262)	-0.2072*** (0.0384)
Group of corruption level (High corruption level is default)		
Low corruption level	-0.2446*** (0.0256)	
Medium corruption level	-0.1081*** (0.0212)	
(3) Continuous corruption level		0.0725 (0.0577)
(4) Continuous corruption level		0.2671*** (0.1012)
Bribe experience $\times$ National corruption level		
(5) Socio-demographic controls		
Females	-0.0611*** (0.0133)	-0.0580*** (0.0133)
Age	0.0031*** (0.0005)	0.0030*** (0.0005)
Education high	0.1110*** (0.0295)	0.1349*** (0.0294)
Self-employed	-0.1174*** (0.0135)	-0.0849*** (0.0133)
Urban	0.0996 (0.0155)	0.0910*** (0.0133)
Wealth	0.0463*** (0.0274)	0.0449*** (0.0050)
Constant	0.0019 (0.0274)	-0.1442*** (0.0268)
N	37,043	37,043
Pseudo R <sup>2</sup>	0.0117	0.0086

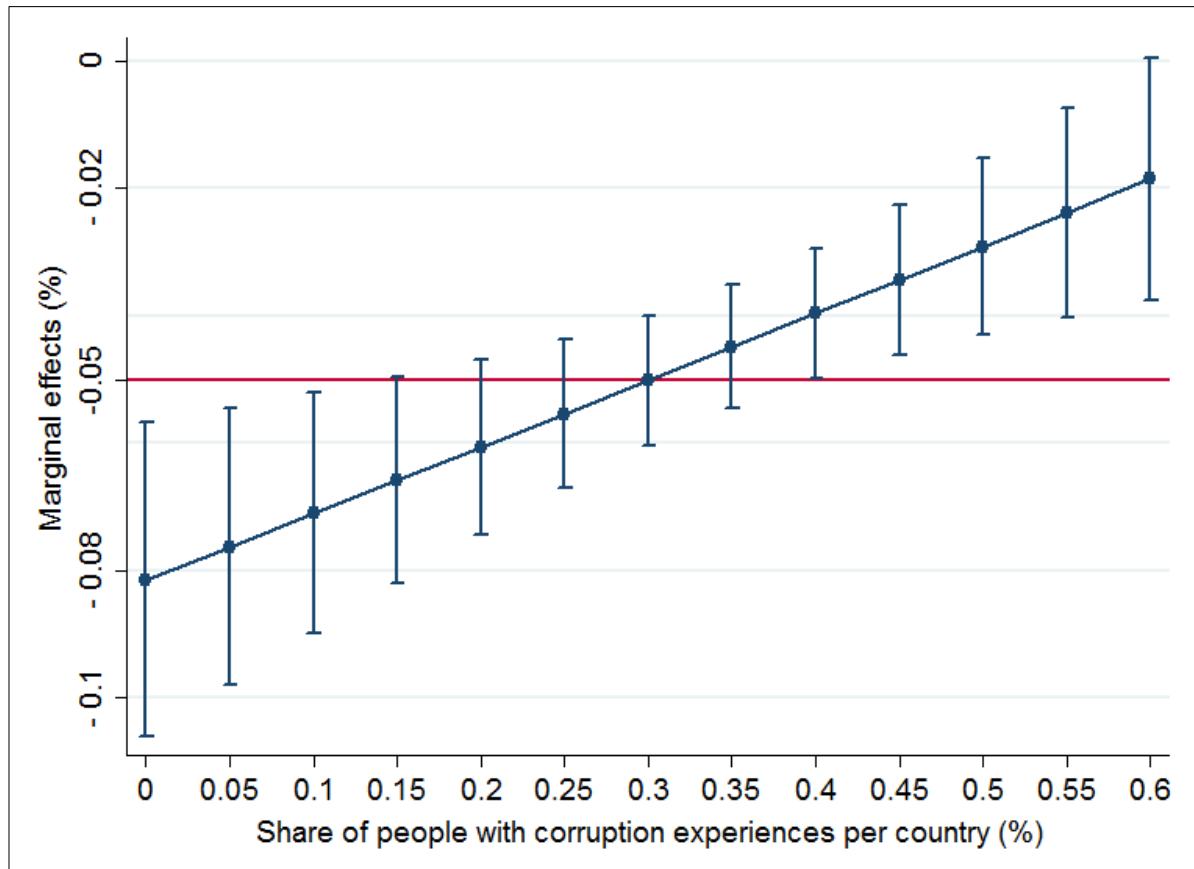
Notes: Dependent variable is tax morale. If the variable is binary coded, 1 gives wrong and punishable and 0 all else. Robust standard errors, clustered at country level, are reported in parentheses. The reference group is given by males with primary education or lower, who are not self-employed and live in rural areas; they also have no experience with petty corruption during the year before they were interviewed. Significance levels: \* $p<0.1$ , \*\* $p<0.05$ , \*\*\* $p<0.01$ .

Source: Author's calculation based on Afrobarometer (2016) data.

One may argue that the identification of low-, medium- and high-corruption countries based on 10 per cent deviations from the regional average is an arbitrary choice. As robustness checks, I use a variable that gives continuous shares of people per country who encountered experiences with petty corruption and hence proxy national levels of petty corruption. I interact these values with the dummy of having encountered petty corruption on the individual level.

The results are presented in Model 2 in Table 5. The dummy of having made a bribe payment is significantly negative. The interaction between having incurred a bribe experience and the national corruption level is significantly positive, which indicates that the impact from petty corruption diminishes with increasing share of people per country having made corruption payments. Figure 1 shows the marginal effects of the interaction at different extents of petty corruption across countries. The effect on tax morale varies between -10 and 0 per cent and steadily decreases the higher the national corruption level. The effect is significantly higher for countries where, on average, up to 15 per cent of respondents reported corruption experiences compared to countries where more than 40 per cent of respondents reported corruption experiences. This inference originates from the observation that the confidence intervals for the estimated marginal effects do not overlap at the horizontal line included at the -0.05 per cent effect level. This observation allows inferring that petty corruption has significantly more severe effects on the tax morale of people in countries where corruption is less prevalent (i.e., in Botswana, Cape Verde, Mauritius, Malawi, Namibia, and South Africa than in Cameroon, Guinea, Kenya, Liberia, Sierra Leone, and Uganda) and, thus, supports the identification of levels of corruption in three countries.

Figure 1: Average marginal effects of bribe experience on tax morale with 90 per cent confidence intervals (CIs)



Source: Author's calculation based on Afrobarometer (2016) data.

## 7.2 Robustness check with regional levels of corruption

So far, this study used cross-sectional data from Round 5 of the Afrobarometer survey. However, cross-sectional data only provide the opportunity to capture effects at a specific point in time. Corruption within public authorities typically has its roots in historical conditions (Blundo et al. 2006) and extortion of bribes is a repeated phenomenon rather than a single event (Cho and Kirwin 2007). Thus, it is of importance to analyse whether the estimated difference of the impact from petty corruption on tax morale is robust over earlier periods in time and whether the estimated pattern holds if smaller units of national areas are considered.

Analysing preceding effects from petty corruption on tax morale with Afrobarometer (2016) data is restricted by several constraints. First, the Afrobarometer started in Round 2, conducted in 2002–03, asking questions on incidences of petty corruption. However, the questions vary over subsequent rounds, including different numbers of questions and types of public services (see Appendix Table A6). Second, the Afrobarometer asks about the justifiability of cheating on taxes—the tax morale—only in Round 5 and does not follow the same individuals over different points in time. These constraints indicate that data from several periods cannot be analysed in a panel study. However, the Afrobarometer gives nationally representative samples over all rounds and provides information about the regions where each individual was interviewed. The Afrobarometer comprises an increasing number of countries over time. I only use data from Botswana, Cape Verde, Ghana, Kenya, Lesotho, Malawi, Mali, Mozambique, Namibia, Nigeria, Senegal, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe because they are included in Rounds 2–5. The

absolute number of regions varies for some countries. Recent rounds of the Afrobarometer give more detailed information about the regions than earlier rounds. The most disaggregated case is Nigeria of which the second round of the Afrobarometer lists seven regions, whereas it gives 37 regions in Round 5. I decided to use the most limited number of regions over Rounds 2–5 and aggregated regions in accordance with their regional proximity. The sizes of regional subsamples do not substantially vary across the rounds of the Afrobarometer considered for this study if aggregated subsamples are compared. I estimated regional averages of the number of people who encountered experiences with bribe payments to get access to public services at each round. As before, I created a dummy with a value of 1 if the respondent paid a bribe at least once during the year before the survey was conducted and assigned the regional averages to the respondents interviewed in that region in Round 5. Appendix Table A7 provides information about the number of regions used and the estimated averages.

The regional averages supply a proxy for the possibility that an individual encountered experiences with petty corruption in the past and gives information about the prevalence of petty corruption at a smaller level than the country average. I analysed the effects of regional proxies in a two-step approach. Table 6 uses the regional averages in separate regressions to control whether experiences with petty corruption have effects on tax morale in Round 5. I included country fixed effects to absorb institutional differences (e.g. tax rates) and clustered standard errors at the regional level. Model 1 controls the robustness of the effect for the set of 16 countries. The estimation confirms that individual bribe experiences have significant effects on the tax morale if only the respondents from the 16 countries are considered. Model 2 provides evidence that the regional extent of petty corruption has a significant effect on the tax morale. However, Models 3–5 show that the earlier incidences of bribe payments have no significant effects on tax morale in Round 5.

In the second step, I analysed whether the prevalence of petty corruption has significant effects on tax morale and whether a certain range where petty corruption has more or less severe effects on tax morale exists. I used interactions between the dummy of an individual's bribe experience and the regional level of petty corruption as specified in Table 7. Then, I estimated and plotted the marginal effects of bribe experience at different levels of people having encountered petty corruption payments. Figure 2 presents the estimations of the interaction in Round 5 and confirms that petty corruption has a higher impact on tax morale in countries with a lower average number of people affected by petty corruption. However, for the sample of 16 countries the size of the effect is not significantly different. Paying bribes to get access to public services loses significance if more than 46 per cent of the people in a country are affected. Figure 3 presents the marginal effects at certain regional levels. Estimations of petty corruption at the regional level in general have a higher variance than estimations at the country level. However, estimations of the marginal effect become insignificant at a threshold of 53 per cent. Figure 4 presents estimations of the effect of petty corruption incidences on tax morale when the shares of people affected in a region in Round 4 are considered. Again the sizes of the marginal effects are significantly different. However, the effect on tax morale becomes insignificant if more than 53 per cent of the people in a region are affected, which also gives the probability that the interviewed person in Round 5 encountered bribe payments a round before. The observation is robust if earlier rounds of the Afrobarometer are considered. Appendix Figures A2 and A3 show that the effects of petty corruption on tax morale remain significantly negative if the regional averages are below 50 per cent in Round 3 and 40 per cent in Round 2.

Table 6: Tax morale and corruption incidences

Probit models	(1)	(2)	(3)	(4)	(5)
(1) Corruption					
Bribe paid (Round 5)	-0.0415*** (0.0127)				
Average regional corruption level					
Round 5		-0.2262* (0.1231)			
Round 4			0.1003 (0.1277)		
Round 3				-0.0739 (0.0959)	
Round 2					0.1470 (0.1027)
(2) Demographics					
Females	-0.0203*** (0.0064)	-0.0179*** (0.0063)	-0.0182*** (0.0063)	-0.0181*** (0.0063)	-0.0181*** (0.0063)
Age	0.0012*** (0.0026)	0.0012*** (0.0003)	0.0012*** (0.0003)	0.0012*** (0.0003)	0.0012*** (0.0003)
High education	0.0340*** (0.0111)	0.0356*** (0.0106)	0.0327*** (0.0111)	0.0328*** (0.0111)	0.0317*** (0.0108)
Self-employed	-0.0322** (0.0143)	-0.0348** (0.0144)	-0.0341** (0.0144)	-0.0340** (0.0143)	-0.0330** (0.0144)
Urban	0.0129 (0.0113)	0.0131 (0.0113)	0.0087 (0.0112)	0.0134 (0.0118)	0.0071 (0.0110)
Wealth	0.0131*** (0.0043)	0.0129*** (0.0042)	0.0118*** (0.0043)	0.0121*** (0.0043)	0.0119** (0.0043)
(3) Country fixed effects	Yes	Yes	Yes	Yes	Yes
N	25,532	25,532	25,532	25,532	25,532
Pseudo R <sup>2</sup>	0.0434	0.0437	0.0426	0.0426	0.0430

Notes: Dependent variable is attitudes towards the legitimacy of not paying taxes. If the variable is binary coded, 1 gives wrong and punishable and 0 all else. Marginal effects are estimated at average values of explanatory variables. Robust standard errors, clustered at the region level, are reported in parentheses. The reference group is given by males with primary education or lower, who are not self-employed and live in rural areas. Significance levels: \* $p<0.1$ , \*\* $p<0.05$ , \*\*\* $p<0.01$ .

Source: Author's calculation based on Afrobarometer (2016) data.

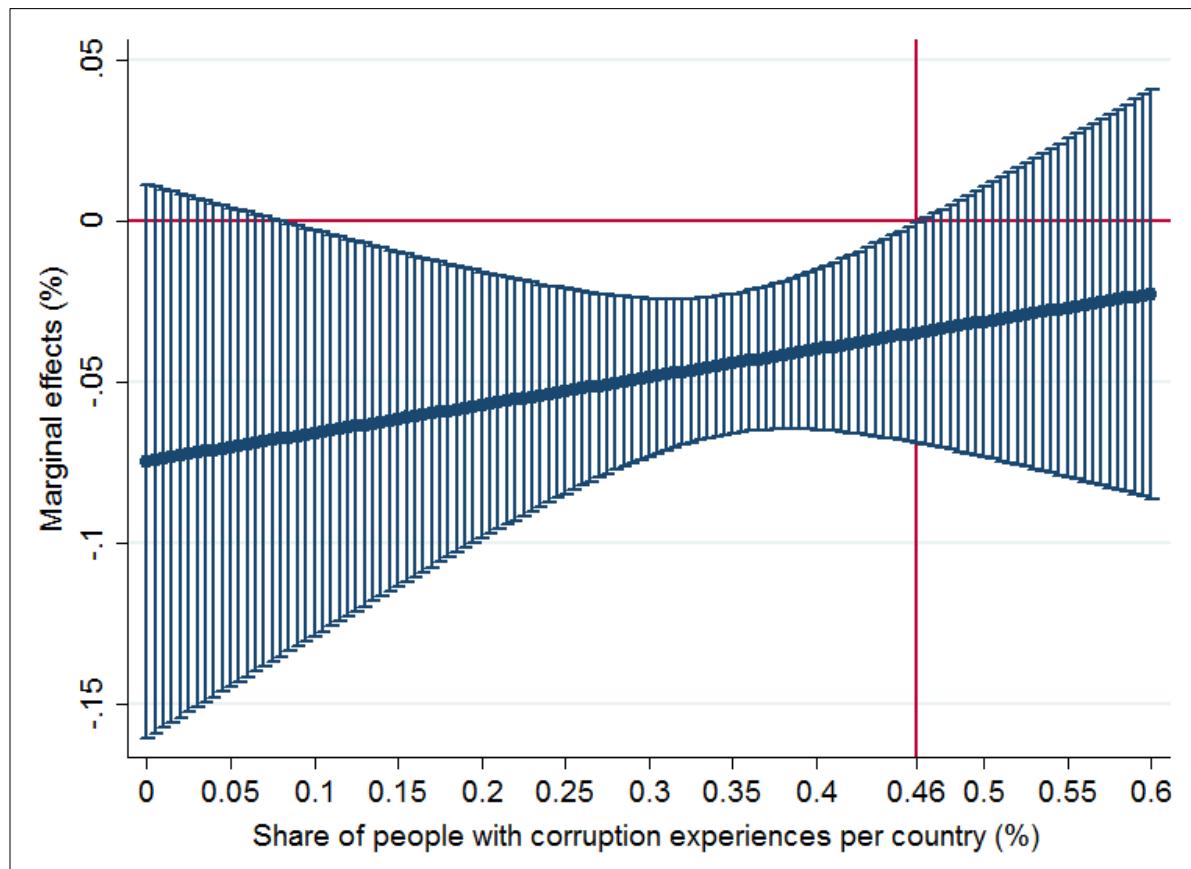
Table 7: Interactions between bribe experiences and levels of affected people

Probit models	(1)	(2)	(3)	(4)	(5)
Interaction I					
National corruption level (Round 5)	-0.3041 (0.4625)				
Bribe experience (Round 5)	-0.1900 (0.1339)				
National corruption level (Round 5) × Bribe experience (Round 5)	0.2185 (0.3724)				
Interaction II					
Regional corruption level (Round 5)		-0.4941 (0.3785)			
Bribe experience (Round 5)		-0.0719 (0.0770)			
Regional corruption level (Round 5) × Bribe experience (Round 5)		-0.0477 (0.2228)			
Interaction III					
Regional corruption level (Round 4)			0.2784 (0.3731)		
Bribe experience (Round 5)			-0.1148 (0.0739)		
Regional corruption in Round 4 × Bribe experience in Round 5			0.0142 (0.2547)		
Interaction IV					
Regional corruption level (Round 3)				-0.1959 (0.2658)	
Bribe experience in Round 5				-0.1091*** (0.0810)	
Regional corruption level (Round 3) × Bribe experience in Round 5				-0.0013 (0.2653)	
Interaction V					
Regional corruption level (Round 2)					0.3274 (-0.1643)
Bribe experience in Round 5					-0.1643*** (0.0599)
Regional corruption level (Round 2) × Bribe experience in Round 5					0.1978 (0.2272)
Socio-demographic covariates	Yes	Yes	Yes	Yes	Yes
Country fixed effects	No	Yes	Yes	Yes	Yes
<i>N</i>	25,532	25,532	25,532	25,532	25,532
<i>R</i> <sup>2</sup>	0.0126	0.0443	0.0436	0.0436	0.0440

Notes: Dependent variable is attitudes towards the legitimacy of not paying taxes. If the variable is binary coded, 1 gives wrong and punishable and 0 all else. Robust standard errors, clustered at the region level, are reported in parentheses. Significance levels: \* $p<0.1$ , \*\* $p<0.05$ , \*\*\* $p<0.01$ . All specifications include individual-level covariates, which control for gender, age, higher education, wealth, living in urban areas, and being self-employed.

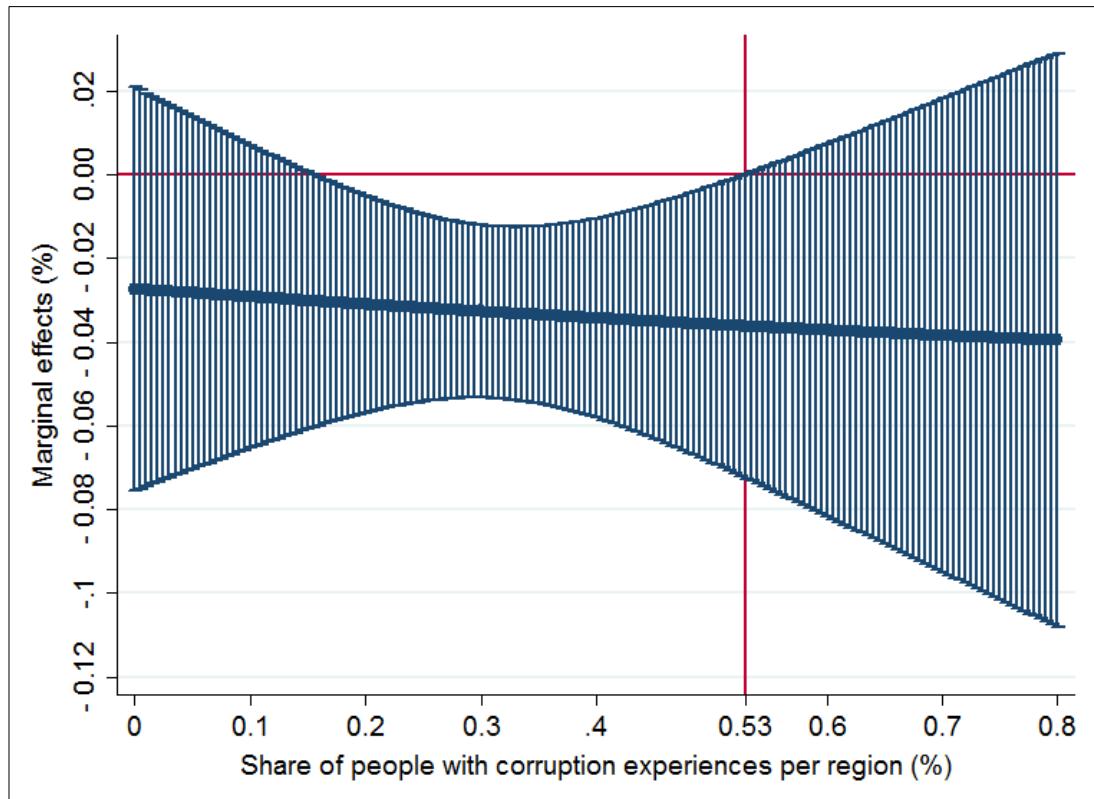
Source: Author's calculation based on Afrobarometer (2016) data.

Figure 2: Average marginal effects of bribe experience on tax morale with 90 per cent CIs (Round 5)



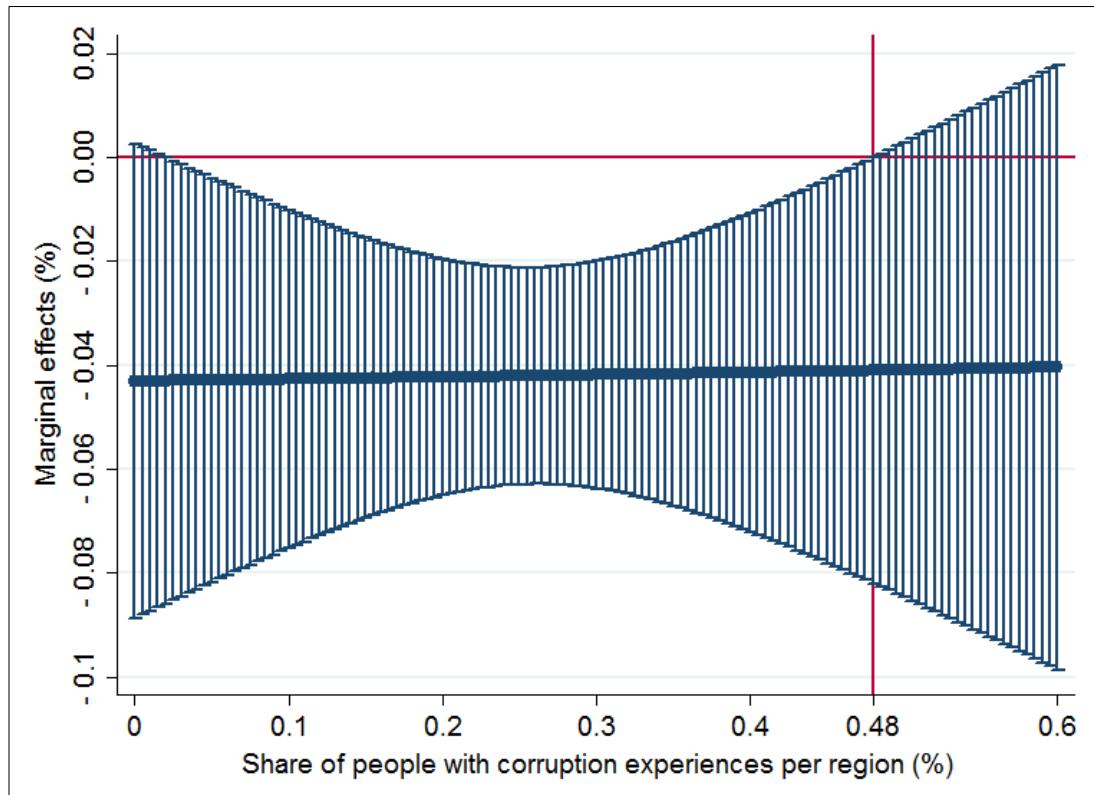
Source: Author's calculation based on Afrobarometer (2016) data.

Figure 3: Average marginal effects of bribe experience on tax morale with 90 per cent CIs (Round 5)



Source: Author's calculation based on Afrobarometer (2016) data.

Figure 4: Average marginal effects of bribe experience on tax morale with 90 per cent CIs (Round 4)



Source: Author's calculation based on Afrobarometer (2016) data.

## 8 Conclusion

Fair treatment by the government is an important mechanism to motivate people to contribute towards the public budget. The extortion of bribes induces vertical inequities that make people more tolerant of tax evasion. This paper delivers evidence that petty corruption payments significantly reduce tax morale of people in sub-Saharan Africa. The frequency with which people are extorted per year is not as important as the instances of it happening. Corruption instances not only contribute directly towards a reduction in tax morale but also result in an indirect reduction in the reduced trust on the tax administration. The negative effects from extorted bribes are more severe the less prevalent is petty corruption in a country or region. Thus, this paper finds support for the hypothesis that higher corruption prevalence leads to normalization of corruption and has less severe effects on people's perception of everyday corruption.

The findings have important implications for the goal of national governments to make people pay taxes. The inverse effect from petty corruption on tax morale indicates that individual experiences with corruption make people highly vulnerable to refuse to pay taxes in countries where corruption levels are less prevalent. These countries need to accompany tax reforms with explicit policies that keep the levels of corruption low. They need to carefully focus on keeping corruption out of more powerful and independent tax administrations. Countries where petty corruption can be currently considered normalized need to treat information about the harmful effects of corruption with care because it can raise attention to the everyday phenomena and make existing unfairness salient. However, the high prevalence of corruption in these countries can be expected to rip apart people's resources, which they need to pay taxes. Thus, these countries have a clear need to reduce the extent of petty corruption. They could focus on the incentives of public officials to extort bribes for access to public services and increase their salaries or improve checks and balances in public administrations. These more 'silent' reforms seem to be more promising than increasing overall public awareness about corruption. The importance of petty corruption on people's attitudes about tax payments urge more research in this direction. It would be interesting to accompany the analysis with information about the amount of money spent on bribes and accounts of tax payments of the respondents. The Afrobarometer covers only a limited number of types of public services. The actual extent of people being required to pay bribes can be expected to be higher than the estimated national average of 30 per cent. It would be interesting to analyse how the effects change if a more complete estimation of petty corruption experiences is used. Finally, it would be useful to have an estimator that clearly focuses on the effects of experienced bribe extortions on the perception of public institutions, in particular the tax administration.

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## Appendix

Table A1: Descriptive statistics

Variable	Mean	Minimum	Maximum	Observations
(1) Socio-demographic characteristics				
Females	0.50	0	1	45,599
Age	37.09	18	105	45,184
Education high	0.11	0	1	45,599
Education medium	0.50	0	1	45,599
Education low	0.38	0	1	45,599
Self-employed	0.49	0	1	43,560
Urban	0.37	0	1	44,904
Wealth	0.00	-2.86	2.86	41,592
(2) Corruption				
Bribe experiences	1.33	0	18	45,599
(3) Trust in tax administration				
Tax department	2.49	1	4	40,376
Perceived number of corrupt tax officials	2.43	1	4	38,365

Source: Author's calculation based on Afrobarometer (2016) data.

Table A2: Variables included in wealth index

Variable	Code	Code
Personally owns a radio	1 = Yes	0 = No
Personally owns a TV	1 = Yes	0 = No
Personally owns a motor vehicle, car, or motorcycle	1 = Yes	0 = No
Personally owns a mobile phone	1 = Yes	0 = No
Source of water	1 = Inside the house or compound	0 = Outside the compound
Toilet or latrine	1 = Inside the house or compound	0 = Outside the compound or not available
Roof material	1 = Metal, tin or zinc, tiles, shingles	0 = Thatch or grass, plastic sheets, asbestos, multiple materials

Source: Author's calculation based on Afrobarometer (2016) data.

Table A3: Attitudes towards justifiability of cheating on taxes—tax morale (in percentage of national sample)

Country	Wrong and punishable	Wrong but understandable	Not wrong at all	Observations
Benin	51.47	43.73	4.79	1,189
Botswana	59.67	33.64	6.69	1,091
Burkina Faso	43.07	46.63	10.30	1,126
Burundi	63.12	19.92	16.96	1,185
Cameroon	66.17	30.22	3.61	1,135
Côte d'Ivoire	56.11	38.27	5.62	1,121
Cape Verde	38.11	40.65	21.23	1,121
Ghana	64.24	29.63	6.12	2,352
Guinea	54.28	29.23	16.49	1,146
Kenya	53.98	34.84	11.18	2,262
Lesotho	43.45	22.42	34.13	1,008
Liberia	64.09	26.31	9.61	1,072
Madagascar	42.34	37.60	20.06	1,032
Malawi	27.99	43.12	28.89	2,347
Mali	65.63	30.09	4.27	1,193
Mauritius	73.13	24.23	2.64	1,176
Mozambique	39.86	40.86	19.27	1,899
Namibia	51.10	39.79	10.11	1,137
Niger	63.68	25.04	11.28	1,126
Nigeria	41.25	48.34	10.41	2,344
Senegal	56.32	39.49	4.19	1,170
Sierra Leone	55.46	38.13	6.41	1,154
South Africa	57.31	37.27	5.42	2,270
Swaziland	59.36	36.94	3.69	1,164
Tanzania	46.53	32.85	20.62	2,347
Togo	43.58	48.01	8.41	1,129
Uganda	32.38	47.94	19.68	2,307
Zambia	44.16	47.78	8.05	1,105
Zimbabwe	38.45	51.01	10.45	2,286
All countries	50.08	37.61	12.31	42,975

Source: Author's calculation based on Afrobarometer (2016) data.

Table A4: Petty corruption experiences (in percentage of national sample)

Country	Get a document	Get water or sanitation	Get a health treatment	Solve problem with police	Get a place in primary school	Share of people with bribe experience	Observations
Benin	13.17	6.25	7.17	7.42	7.00	23.00	1,200
Botswana	1.75	0.50	0.50	3.00	0.58	4.17	1,200
Burkina Faso	12.50	2.75	6.75	10.25	9.42	25.08	1,200
Burundi	14.83	4.75	7.33	14.08	7.67	29.08	1,200
Cameroon	25.25	13.92	24.75	25.17	16.42	45.42	1,200
Côte d'Ivoire	20.25	7.92	16.75	17.17	14.17	36.92	1,200
Cape Verde	3.39	1.90	2.81	1.41	0.99	5.30	1,208
Ghana	10.79	7.58	8.13	11.33	6.04	23.12	2,400
Guinea	19.33	16.58	41.48	20.50	28.92	56.67	1,200
Kenya	38.77	17.38	27.55	31.85	17.05	56.19	2,399
Lesotho	15.54	3.09	2.76	5.43	1.34	20.05	1,197
Liberia	23.10	15.51	32.53	27.02	26.19	46.62	1,199
Madagascar	14.42	3.33	14.50	6.17	8.50	27.00	1,200
Malawi	4.11	3.37	3.49	5.94	3.07	13.88	2,407
Mali	8.25	2.75	5.92	7.42	4.33	17.33	1,200
Mauritius	1.83	0.50	0.33	2.50	0.42	4.50	1,200
Mozambique	21.29	13.88	21.88	14.92	18.79	38.08	2,400
Namibia	2.58	1.00	1.83	2.58	2.08	6.08	1,200
Niger	9.58	3.50	18.83	13.58	4.33	33.08	1,200
Nigeria	17.92	10.21	14.83	19.58	9.29	35.04	2,400
Senegal	19.08	6.17	8.83	4.08	4.42	25.42	1,200
Sierra Leone	34.62	25.38	40.25	36.47	32.44	63.28	1,190
South Africa	5.42	5.79	7.29	6.34	5.50	12.55	2,399
Swaziland	12.50	2.17	2.58	8.42	3.50	18.92	1,200
Tanzania	15.88	9.83	24.33	13.17	8.71	34.96	2,400
Togo	19.42	4.92	12.92	13.67	10.75	33.83	1,200
Uganda	20.21	16.92	29.96	20.83	17.46	47.54	2,400
Zambia	10.08	4.00	6.50	8.00	7.83	21.08	1,200
Zimbabwe	21.25	7.92	11.00	23.00	8.58	23.00	2,400
All countries	15.59	8.22	14.53	13.89	10.00	29.50	45,599

Source: Author's calculation based on Afrobarometer (2016) data.

Table A5: Tax morale and types of public services

Probit estimations	(1)	(2)	(3)	(4)	(5)
Bribe paid to/for	-0.0320*** (0.0131)				
(1) Get documents					
(2) Police officer		-0.0531*** (0.0141)			
(3) Water or sanitation			-0.0663*** (0.0193)		
(4) Health treatment				-0.0465*** (0.0153)	
(5) Place in primary school					-0.0543*** (0.0186)
Socio-demographic variables included	Yes	Yes	Yes	Yes	Yes
Country fixed effects	Yes	Yes	Yes	Yes	Yes
N	36,831	36,831	36,831	36,831	36,831
Pseudo R <sup>2</sup>	0.0391	0.0395	0.0396	0.0394	0.0395

Notes: Dependent variable is tax morale. If the variable is binary coded, 1 gives wrong and punishable and 0 all else. Robust standard errors, clustered at country level, are reported in parentheses. The reference group is given by males with primary qualifications or lower, who live in rural areas, are not self-employed, and have no experience of petty corruption during the year before they were interviewed. Significance levels: \* $p<0.1$ , \*\* $p<0.05$ , \*\*\* $p<0.01$ .

Source: Author's calculation based on Afrobarometer (2016) data.

Table A6: Public services related to incidences of petty corruption

Variable	Wave 5	Wave 4	Wave 3	Wave 2
Document or permit	Yes	Yes	Yes	Yes
School placement	Yes	—	Yes	Yes
Household service	—	—	Yes	Yes
Water and sanitation	Yes	Yes	—	—
Avoid problem with police	Yes	Yes	Yes	Yes
Get a medicine or medical treatment	Yes	—	Yes	—
Cross a border	—	—	—	Yes

Source: Author's calculation based on Afrobarometer (2016) data.

Table A7: People affected by petty corruption per region (in percentage)

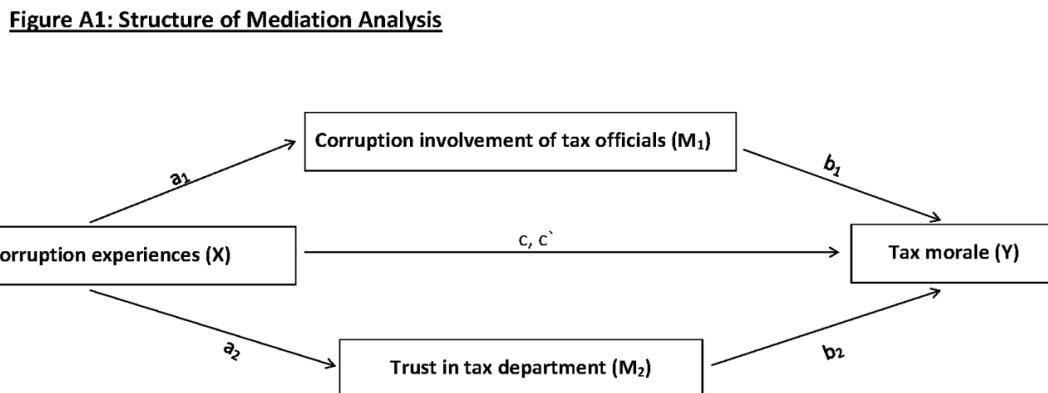
Country	Region	Round 5	Round 4	Round 3	Round 2	Observations
Botswana	Barolong	3.20	2.84	4.08	4.35	344
	Central Boteti	5.36	3.13	5.36	10.71	56
	Central Mahalapye	11.03	4.86	6.62	11.02	144
	Central Serowe/Palapye	8.33	8.33	0.00	0.00	24
	Central Tutume	0.00	0.00	0.00	0.00	8
	Chobe	3.13	0.00	3.13	0.00	32
	Francistown	8.93	2.08	0.00	7.14	56
	Gaborone	4.89	0.60	4.76	2.50	184
	Ghanzi	6.25	0.00	0.00	4.17	16
	Jwaneng	2.50	0.00	3.13	9.38	40
	Kgalagadi North	2.88	6.25	0.96	0.00	104
	Kgatleng	3.13	3.13	0.00	6.25	32
	Kweneng East	6.25	6.25	5.00	6.25	48
	Kweneng West	1.67	5.00	5.83	2.50	120
	Santo Antão	5.56	18.30	4.50	8.59	144
	São Vicente	3.13	12.95	3.17	4.26	256
	Santiago-Interior	7.04	20.27	12.16	8.87	696
	Fogo	8.93	5.80	4.52	13.95	112
Ghana	Western	18.97	28.33	40.00	16.96	232
	Central	22.60	12.50	41.35	32.69	208
	Greater Accra	21.54	20.65	25.54	55.98	376
	Volta	51.29	27.88	43.27	15.38	232
	Eastern	21.97	27.21	34.81	25.00	264
	Ashanti	18.41	18.10	31.74	20.26	440
	Brong Ahafo	11.61	7.14	18.75	10.00	224
	Northern	27.82	19.64	46.43	37.50	267
	Upper East	14.29	33.93	23.21	39.29	112
	Upper West	31.25	27.50	30.00	27.50	64
Kenya	Nairobi	60.48	46.59	54.17	53.98	248
	Central	55.63	39.17	16.45	39.53	320
	Eastern	82.50	26.88	30.21	31.79	360
	Rift Valley	49.58	31.06	60.74	40.75	591
	Nyanza	56.41	58.55	62.50	51.42	312
	Western	43.95	50.78	56.94	37.87	248
	North Eastern	56.25	38.54	65.63	46.67	112
	Coast	45.67	33.33	57.03	41.83	208
	Maseru	30.56	9.72	9.30	15.26	72
	Mafeteng	22.22	22.92	12.24	12.10	207
Lesotho	Mohale's Hoek	22.83	11.88	15.44	9.82	184
	Quthing	27.95	15.71	14.58	20.31	254
	Qacha's Nek	21.67	5.83	12.50	14.29	120
	Mokhotlong	14.29	9.82	13.28	4.17	112
	Butha-Buthe	15.00	2.78	3.41	26.39	80
	Leribe	27.50	10.42	3.13	12.56	40
	Berea	12.50	9.38	11.25	22.60	56
	Thaba Tseka	8.33	13.75	13.54	12.68	72
	Central	13.89	13.73	7.38	9.65	1,015
	North	6.09	15.79	14.47	10.53	312
Mali	South	17.04	8.21	11.96	3.39	1,080
	Kayes	27.72	14.29	40.48	29.38	184
	Koulikoro	16.52	29.69	36.98	10.36	224
	Sikasso	7.76	7.41	28.70	36.60	232
	Sègou	17.00	18.75	14.35	27.27	200
Mozambique	Moçambique	18.45	11.96	11.96	14.12	168
	Bamako	19.79	29.17	25.00	42.62	192
	Maputo Province	59.52	31.94	54.69	19.33	168
	Maputo City	69.74	48.44	33.75	31.56	152
	Gaza	36.03	25.00	50.00	57.50	136
	Inhambane	20.83	26.25	47.73	20.83	144
	Sofala	52.17	43.27	44.23	19.17	184
	Tete	36.57	32.14	35.23	40.00	216
	Manica	40.00	37.50	28.75	31.09	160
	Zambezia	38.89	28.02	53.57	14.17	432
	Nampula	40.47	40.18	41.81	34.12	472

	Cabo Delgado	32.24	42.19	39.58	6.48	152
Namibia	Niassa	27.72	26.04	30.65	44.04	184
	Caprivi	3.57	4.17	26.79	32.14	56
	Erongo	1.25	25.00	34.38	44.79	80
	Hardap	2.50	6.25	25.00	7.14	40
	Karas	4.17	16.67	17.86	7.14	48
	Kavango	0.00	3.91	35.58	21.15	128
	Khomas	11.98	21.15	21.50	19.00	192
	Kunene	4.17	12.50	25.00	2.50	48
	Ohangwena	6.25	6.62	32.81	7.90	144
	Omaheke	7.50	8.33	42.50	10.00	40
	Omusati	9.03	30.15	18.38	0.00	144
	Oshana	12.50	9.62	19.23	3.85	96
	Oshikoto	4.81	3.13	22.92	1.04	104
	Otjozondjupa	6.25	15.00	22.73	15.91	80
Nigeria	Lagos	34.24	56.02	26.36	43.56	184
	North East	57.32	27.10	29.78	37.84	328
	North West	21.65	28.33	48.13	34.40	448
	North Central	24.38	24.45	42.18	37.58	320
	South East	43.27	33.05	59.02	59.33	208
	South West	29.94	32.04	49.31	55.63	344
	South South	41.02	36.23	41.69	53.38	568
Senegal	Dakar	27.33	32.03	33.78	29.87	344
	Diourbel	27.50	22.66	10.83	31.53	120
	Fatick	30.36	15.28	18.75	31.94	56
	Kaffrine	25.83	23.44	24.31	37.42	120
	Kaolack	33.33	8.33	34.09	21.74	48
	Kédougou	25.00	18.75	26.25	29.69	80
	Louga	10.00	25.00	33.75	31.96	80
	Matam	22.92	19.12	37.50	41.67	96
	Saint-Louis	27.94	22.62	17.86	20.32	136
	Sédhiou	25.83	8.93	25.00	35.94	120
South Africa	Eastern Cape	7.50	8.33	13.61	4.69	320
	Free State	13.27	15.20	3.19	1.83	196
	Gauteng	14.08	14.18	24.26	15.74	412
	Kwazulu Natal	19.50	19.07	20.88	16.15	400
	Limpopo	28.91	24.06	29.10	28.69	211
	Mpumalanga	7.69	14.42	10.11	15.56	208
	North West	9.31	18.52	17.65	10.10	204
	Northern Cape	9.21	7.50	5.00	3.45	152
	Western Cape	7.09	7.67	9.78	3.52	296
Tanzania	Dodoma	26.79	19.64	26.79	12.96	112
	Arusha	36.36	31.25	31.25	16.67	88
	Kilimanjaro	25.00	27.50	30.36	31.25	96
	Tanga	31.73	19.64	26.79	1.79	104
	Morogoro	19.17	4.69	25.00	26.15	120
	Pwani	26.79	25.00	20.00	3.13	56
	Dar es Salaam	40.22	31.25	48.75	40.91	184
	Lindi	28.57	12.50	37.50	12.50	56
	Mrwara	30.56	20.00	25.00	10.00	72
	Ruvuma	54.17	7.50	25.00	5.00	72
	Iringa	29.17	20.00	23.21	4.17	96
	Mbeya	33.09	4.69	25.00	19.44	136
	Singida	40.28	15.00	12.50	20.00	72
	Tabora	19.64	7.14	3.57	28.57	112
	Rukwa	34.72	17.50	12.50	20.00	72
	Kigoma	53.75	5.36	12.50	22.92	80
	Shinyanga	38.07	12.50	36.54	12.50	176
	Kagera	35.83	15.28	5.56	30.56	120
	Mwanza	56.82	13.46	19.23	24.04	176
	Mara	51.14	17.50	21.43	18.75	88
	Manyara	40.28	12.50	20.00	35.00	72
	Unguja Kaskazini	21.88	12.50	12.50	12.50	32
	Unfuja Kusini	4.17	12.50	12.50	12.50	24
	Mjini Magharibi	21.88	12.50	15.63	33.33	96
	Pemba Kaskazini	33.33	20.83	12.50	56.25	48
	Pemba Kusini	47.50	8.33	37.50	75.00	40

Uganda	Central	34.49	36.31	52.59	36.27	632
	West	47.09	34.94	38.47	25.74	584
	North	54.04	36.45	31.99	33.27	544
	East	58.13	55.67	44.86	23.36	640
Zambia	Lusaka	33.19	37.50	25.57	36.20	232
	Central	28.57	17.50	45.54	15.38	112
	Copperbelt	20.50	23.00	35.23	24.23	200
	Eastern	19.85	11.18	15.63	15.91	136
	Luapula	19.32	6.82	37.50	2.91	88
	Northern	12.50	14.47	21.88	8.09	152
	North-Western	15.63	5.56	26.25	23.94	64
	Southern	19.85	14.58	25.00	30.07	136
	Western	13.75	19.79	38.54	27.17	80
	Harare	39.38	51.50	50.00	37.50	320
	Bulawayo	48.91	50.00	25.00	30.56	184
	Midlands	43.18	44.12	55.64	22.92	264
Zimbabwe	Masvingo	39.45	24.22	28.13	18.75	256
	Mashonaland East	41.81	20.54	19.79	31.67	232
	Mashonaland West	55.65	21.32	42.73	17.97	248
	Mashonaland Central	41.53	21.15	18.60	37.50	248
	Matebeleland South	19.89	22.22	14.55	16.67	176
	Matebeleland North	15.50	15.28	15.63	18.06	200
	Manicaland	33.09	17.86	31.94	22.50	272

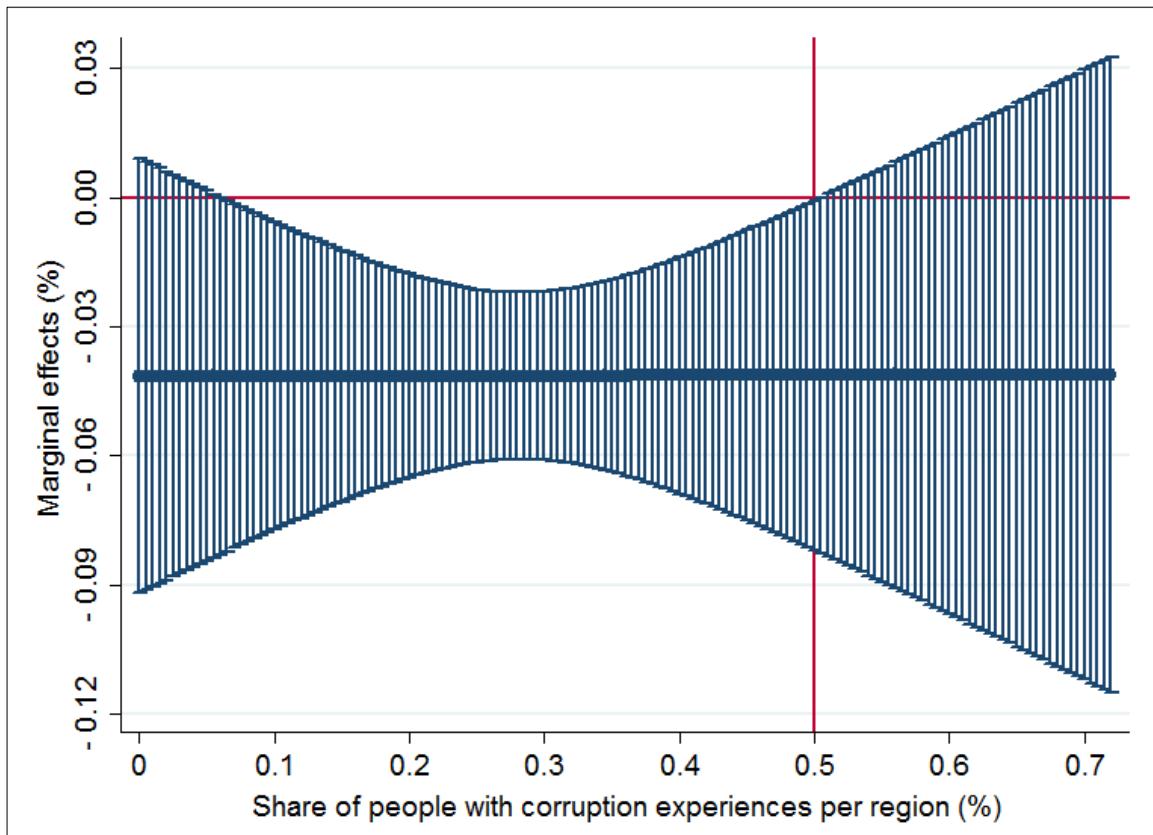
Source: Author's calculation based on Afrobarometer (2016) data.

Figure A1: Structure of mediation analysis



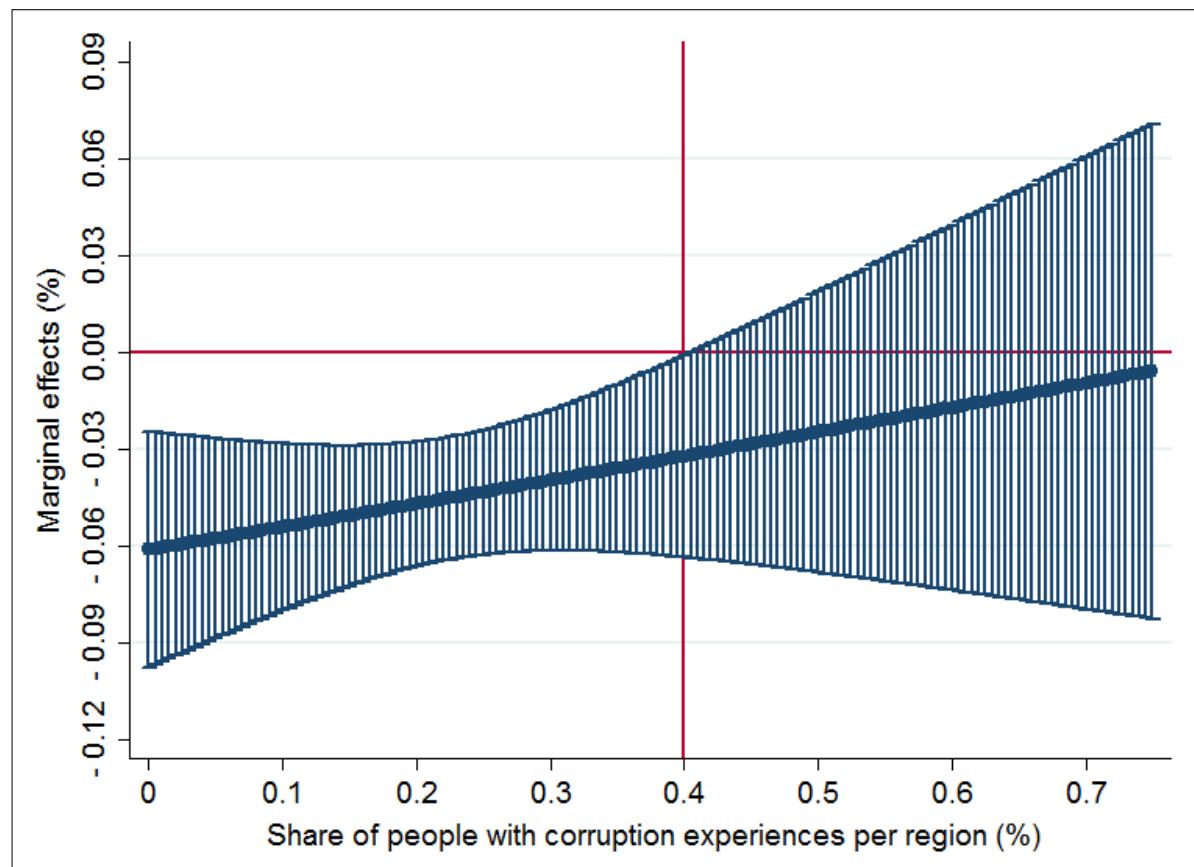
Source: Author's interpretation.

Figure A2: Average marginal effects of bribe experience on tax morale with 90 per cent CIs (Round 3)



Source: Author's calculation based on Afrobarometer (2016) data.

Figure A3: Average marginal effects of bribe experience on tax morale with 90 per cent CIs (Round 2)



Source: Author's calculation based on Afrobarometer (2016) data.