European Journal of Political Economy 60 (2019) 101751

Contents lists available at ScienceDirect

European Journal of Political Economy

journal homepage: www.elsevier.com/locate/ejpe

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

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ARTICLE INFO

JEL classification:
D73
H26
K42

Keywords:
Corruption
Tax morale
Effect heterogeneity
Mediation analysis

ABSTRACT

Revenues from taxation gain in importance to finance economic development in Sub-Saharan Africa. One obstacle to enhancing the willingness to remit taxes can be the extortion of bribes by public officials. Using micro-level data from the Afrobarometer, we show that petty corruption erodes 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. Differing levels of civic participation and potential access to tax funded services are also found to induce heterogeneous reactions to corruption experience. Applying a mediation analysis, we demonstrate that petty corruption not only has a direct effect on tax morale but also diminishes confidence in tax authorities and therefore affects tax morale indirectly. The harmful effects of corruption experience, however, operate mainly through a generally lowered inclination to uphold high levels of tax morale.

1. Introduction

Tax morale has gained in 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 taxpayers enhances the relevance of their motivation to cooperate with the government and pay taxes.

Besley and Persson (2013) provide theoretical arguments how corruption can be an obstacle to the emergence of tax compliance norms in developing countries, and thus, they provide a reason as to why developing countries may have lower tax revenues. Corruption can take on 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). Given the fact that petty corruption is pervasive in many Sub-Saharan African countries (Transparency International, 2013) and related to reduced trust in public institutions (Lavallée et al., 2008), it is still an open question how these phenomena are related to individual tax morale.

The literature on the nexus of tax morale and corruption so far either focuses on Transparency International's Corruption Perception Index (Torgler, 2006) or perceived trust in the tax department (Ali et al., 2014). In contrast, we provide a detailed mirco-level investigation of the interrelation of individual petty corruption experience and tax morale. Our focus rests on 29 Sub-Saharan African

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https://doi.org/10.1016/j.ejpoleco.2018.09.003
Received 2 September 2017; Received in revised form 14 July 2018; Accepted 17 September 2018
Available online 19 September 2018

countries, providing a conclusive sample for the region. After establishing the basic relationship, we demonstrate that the estimated effect strength depends on the *spread of corruption* across various domains of daily life and the *frequency of corruption* an individual encounters in a given domain. Furthermore, we investigate in which domains corruption experiences are especially harmful with respect to tax morale.

We conduct a mediation analysis to suggest a mechanism how individual corruption experience might impact on tax morale. Within this approach, we can first demonstrate that lower levels of *confidence in tax authorities* are plausibly associated to lower tax morale. Diminished confidence in tax authorities, in turn, can be explained by corruption experience. Ultimately, this mediation analysis allows to separate the direct and the indirect effect of petty corruption experience, via confidence in tax authorities, and to quantify the effects' relative impact.

As part of our heterogeneity analysis we re-estimate our baseline results, but allow for effect heterogeneity across groups. More precisely, we ask whether varying levels of *civic participation* or *access to public services* might translate into varying degrees of sensitivity with respect to corruption experience. We find notable differences across groups, especially related to regular news consumption and being part of a societal majority. We subject our results to a number of sensitivity analyses, such as controlling for various levels of geographic fixed effects and corruption exposure levels. Moreover, we also account for historical levels of corruption exposure which might be indicative of habituation to a specific corruption level. By applying a pseudo-panel approach to the repeated cross-sectional data, we can confirm our basic results with respect to *spread* and *frequency of corruption* experiences.

The remainder of this article is organized as follows: Section 2 discusses the related literature. Section 3 provides an overview of the data and descriptive statistics. Section 4 analyses the basic relationship between petty corruption and tax morale. Section 5 encompasses our heterogeneity and sensitivity analyses. Section 6 introduces the mediation analysis as an approach to disaggregate the total effect of petty corruption on tax morale. Section 7 concludes.

2. Literature review

2.1. 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), who interpreted cheating on taxes as a risky decision within an expected utility model. Eventually, they demonstrate that the concealed amount of income is negatively related to the audit and penalty structure. 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) conducts experiments and invites participants to consider tax evasion as a gamble. Many players do not evade taxes despite the invitation. Taxpayers seem to incur moral costs from feelings of guilt or shame, which shape the intrinsic motivation to comply, and thus, tax morale. 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 taxes.

2.2. 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 exchange between taxpayers and the state (Feld and Frey, 2007) and induce vertical inequities from additional monetary burdening (Fortin et al., 2007). Rose-Ackerman and Palifka (2016) indicate that bribery distorts the price mechanism and erodes government legitimacy. 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 individuals in four Sub-Saharan African countries. The authors use the perceived number of corrupt tax officials as proxy for citizens' satisfaction with the tax administration. Their study finds significant negative effects on tax morale in Uganda and South Africa, but not in Kenya and Tanzania.

2.3. 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 actual petty corruption payments. Cho and Kirwin (2007) show that petty corruption reduces trust in public institutions and 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 test the efficient grease hypothesis. They point out that higher corruption never increases trust in public institutions. This relates to the argument by Fisman and Golden (2017) who stress the importance of the origins of laws for the appraisal of positive effects from bribery. The authors indicate that bad laws are implemented in the interest of politicians attracting bribe payments in order to circumvent government regulations. 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

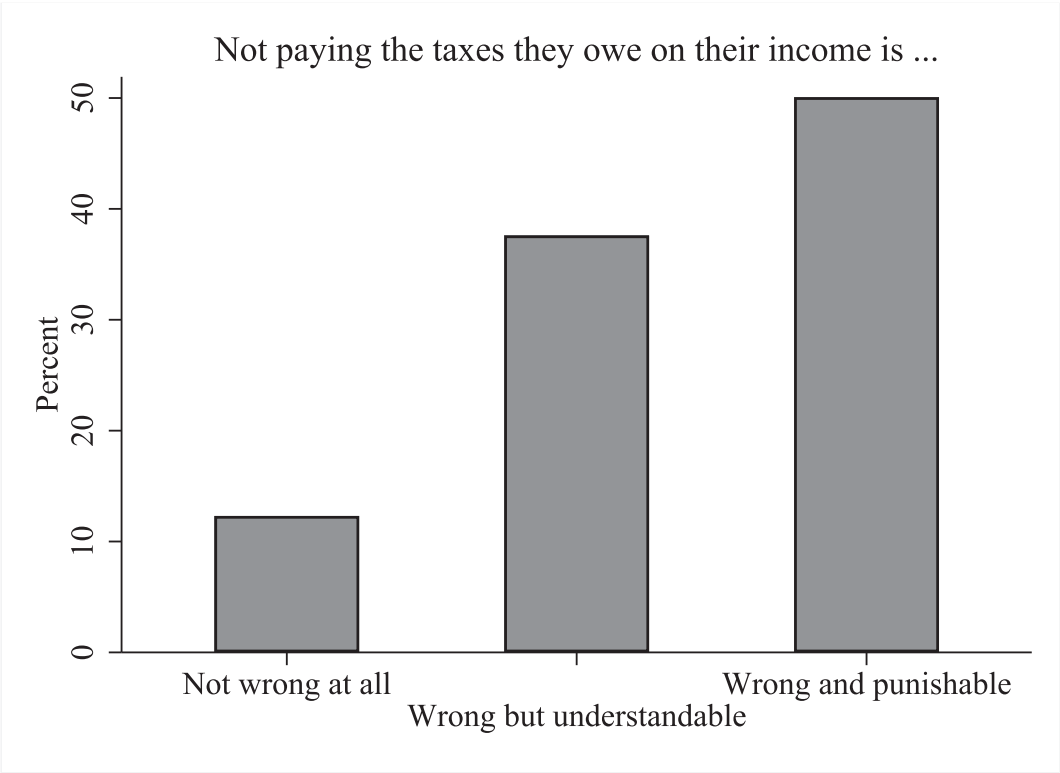


Fig. 1. Tax morale (round 5).

effect from experienced corruption decreases the higher the satisfaction with public services. However, Lavallée et al. (2008) argue that individuals are more concerned about petty corruption if it is an obstacle to get access to public services.

2.4. Corruption in tax departments

Corruption in tax departments plays an important role to explain lower tax revenues. Tax officials are in a position to extort bribes, collude with taxpayers, and embezzle public revenues (cf. Martini, 2014). Transparency International (2013) estimates that bribe payments to tax officials is particularly prevalent in some 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) highlight that individuals are aware of widespread corruption in tax departments: 35 per cent of respondents to the Afrobarometer believe that the majority of tax officials are involved in corruption. Alm et al. (2016) demonstrate that corruption-related payments - either voluntarily offered to or extorted by corrupt tax officials - significantly reduce reported sales and hence firms' tax payments. Positive experiences with Eastern European tax departments, in turn, can improve the intrinsic motivation to comply and even encourage the report of past non-compliance (Kasper, 2016).

2.5. Corruption and social norms

The specific effects of corruption on individual 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 regarding the extent of corruption. Cameron et al. (2009) analyse corruption behaviour and attitudes of students from low-corruption countries and high-corruption countries. They find that more tolerant attitudes 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 mobilise opposition. Case studies on Uganda and Tanzania show that institutionalisation and normalisation of corruption can be observed in Sub-Saharan Africa as well (Panth, 2011; Heilman and Ndumbaro, 2002).

3. Descriptive statistics of main variables

Our main analysis draws upon data from Afrobarometer (2016, round 5), which was carried out from 2011 to 2013 in 33 African

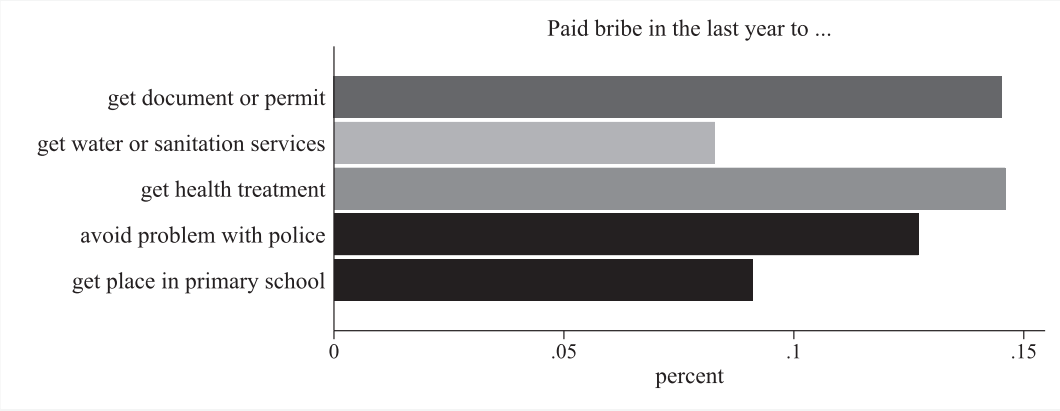


Fig. 2. Corruption experience in various domains.

countries; 29 from the Sub-Saharan region.[1] The survey consists of nationally representative samples, varying between 1200 and 2400 respondents who are at least 18 years of age. The baseline sample of the included Sub-Saharan countries encompasses 45,598 persons. Due to missing data, the sample size decreases by approximately 10 per cent in most of our estimations. The countries included in this paper are Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Côte d'Ivoire, 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.

Our main dependent variable is *tax morale*, based on question 76B 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.' In the full sample, approximately 50% of the respondents declare that not paying the taxes was wrong and punishable (Fig. 1).

For most of our estimations, we rely on a binary version of the dependent variable. A value of 1 captures that the respondents consider not paying taxes as wrong and punishable (high tax morale), and 0 if they consider it as wrong but understandable or not wrong at all (low tax morale). As presented in Appendix Fig. A2, tax morale varies between the Sub-Saharan countries. Respondents in Malawi and Uganda exhibit the highest tolerance for non-compliant taxpayers whereas around two-thirds of the respondents in Burundi, Cameroon, Ghana, Liberia, Mali and Niger answered that cheating on taxes is wrong and punishable.

Using such an indirect question to evaluate individual tax morale has become standard in the literature on tax morale (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).[2] Torgler et al. (2010), however, show a robust correlation between the indirectly measured tax morale and the actual level of tax evasion. Halla (2012) provides evidence for a causal link between tax morale and actual tax compliance.

With respect to our main explanatory variable, i.e. overall corruption experience, the survey includes several questions eliciting bribe experiences in various daily life situations. These items refer to the above definition of petty corruption. Question 61 from the Afrobarometer asks whether 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, a place in primary school or to avoid problems with the police. The survey offers four possible answers: never, once or twice, a few times, or often. Fig. 2 illustrates the shares of respondents who were confronted with petty corruption in the previous year, irrespective of the frequency. In particular, paying bribes or offering gifts is necessary to get documents, access to health services or to avoid problems with the police.

Based on the various forms of petty corruption we derive three distinct aggregate measures of corruption experience: The first is a binary indicator (*corruption experience*) which is set to one whenever a respondent made a corruption experience in any of the five domains. As presented in Appendix Fig. A2, and aside from Botswana, Cape Verde, Mauritius and Namibia, corruption experiences are quite prevalent in Sub-Saharan Africa.

The second indicator (*spread of corruption*) reflects the number of domains (zero to five) in which a respondent encountered corruption. The third measure (*corruption frequency*) documents the most frequent exposure to corruption in any of the five domains. Due to the bribe experience elicitation, we cannot construct an indicator summing up the exact frequency of corruption experience across the domains in any meaningful manner.

Within our main analysis, we also control for the following set of socio-demographic characteristics (*X*, see Appendix Table A1): gender, age, employment status, educational attainment, and urban residence. As the Afrobarometer survey does not provide information about the income of the respondents, we follow the approach by Justesen and Bjørnskov (2014) and construct an *index of lived poverty*. This poverty indicator reflects how frequently respondents have been deprived of food, water, medical care, cooking fuel and

[1] In our heterogeneity and sensitivity analyses we also integrate data from rounds 2 to 4.

[2] For this reason, we also run auxiliary estimations with an alternative dependent variable, which relates to the legitimacy of enforcing tax payments.

Table 1
Tax morale and corruption experiences.

	Average marginal effects			
	(1)	(2)	(3)	(4)
Petty corruption experience	−0.0323*** (0.0057)	−0.0305*** (0.0057)	−0.0396*** (0.0052)	−0.0507*** (0.0052)
Socio-demographic controls				
Female	−0.0256*** (0.0050)	−0.0237*** (0.0048)	−0.0230*** (0.0045)	−0.0189*** (0.0044)
Age	0.0011*** (0.0002)	0.0011*** (0.0002)	0.0010*** (0.0002)	0.0003* (0.0002)
Education				
High	0.0525*** (0.0113)	0.0541*** (0.0112)	0.0591*** (0.0103)	0.0400*** (0.0099)
Medium	0.0286*** (0.0059)	0.0269*** (0.0058)	0.0312*** (0.0053)	0.0314*** (0.0052)
Self-employed	−0.0325*** (0.0054)	−0.0241*** (0.0055)	−0.0260*** (0.0049)	−0.0069 (0.0048)
Urban	0.0184*** (0.0055)	0.0154***(0.0063)	0.0234*** (0.0050)	0.0224*** (0.0049)
Poverty	−0.0168*** (0.0017)	−0.0184*** (0.0017)	−0.0166*** (0.0015)	−0.0106*** (0.0015)
Country FE	Yes	No	Yes	Yes
Region FE	No	Yes	No	No
N	39,561	39,561	39,561	39,979
Pseudo R^2	0.0455	0.0858	0.0401	0.0384

Notes: The dependent variable is tax morale (first three columns) and tax legitimacy (fourth column). The variable is binary coded in columns 1, 2 and 4, such that 1 refers to the highest levels of tax morale (or tax legitimacy) and 0 comprises intermediate and low levels of tax morale. In column 3, the original ordinal scale of the dependent variable (not paying taxes is wrong at all, wrong but understandable, wrong and punishable) is maintained. Robust standard errors are reported in parentheses. Significance levels: $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.

cash income in the previous year.[3]

4. Tax morale and corruption experiences

4.1. Baseline model

As discussed in the literature section, corruption could harm tax morale through various channels, e.g. as reaction related to perceived unfairness in fiscal exchange or siphoning resources off. In our analysis, we first establish a general relationship between tax morale and individual corruption experience and later investigate a potential mechanism. The general relationship is based on the following estimation equation:

$$P(T_i = high) = \Phi(\beta Corruption_i + \gamma X_i + \tau_i) \quad (1)$$

With Φ as standard normal cumulative density function, the Probit model represented in equation (1) estimates the probability that individual *i* displays a high level of tax morale (T). Controlling for socio-demographic characteristics X_i the coefficient estimate β informs then about the interrelation of individual corruption experience and tax morale. We recognise that there might exist a number of unobserved factors which could be correlated with both corruption experience and tax morale, introducing bias to our estimate of β. Likely candidates are aspects of local governance, administrative procedures, cultural norms or habituation. We address this concern in more detail in our sensitivity analysis (section 5) and by introducing geographic fixed effects τ_i. In order to highlight the robustness of our findings, we apply two different sets of geographic fixed effects: one captures unobserved confounding factors at the country level, the second addresses potentially omitted regional factors.[4]

The first two columns of Table 1 present average marginal effects (AME) of the impact of petty *corruption experiences* (binary measure) on *tax morale*. The first column refers to our baseline Probit estimation with country-level FE; the second column contains average marginal effects from the model with region-level FE. Since the underlying tax morale item was elicited with three outcomes categories, we also estimated an ordered Probit model (column 3) to account for the ordinal nature of responses. In contrast to the first three columns, the last documents results from an estimation where the dependent variable refers to *tax legitimacy*. This variable also implies legal consequences for non-compliance with tax regulations and is based on an alternative item (48C) asking: 'For each of the following statements, please tell me whether you disagree or agree? The tax authorities always have the right to make people pay taxes'. A high level of tax legitimacy is inferred when respondents (strongly) agree.

The derived marginal effects indicate that corruption experiences have a significantly negative effect at the 1 per cent significance level. Corruption experiences during the last year reduce the probability of exhibiting the highest level of tax morale by about 3 percentage points. The significantly negative effect persists across different specifications. In contrast to other studies (Ali et al., 2014; Frey and Torgler, 2007), women exhibit lower tax morale than males. Moreover, less deprived (less poor) people and those with high education attainments have relatively higher tax morale whereas those who are self-employed are significantly less likely to uphold the

[3] We base our index on binary variables, indicating whether individuals had been deprived in any of these dimension, regardless the frequency.

[4] The factual power and the administrative level of regions across countries might vary notably (a region in one country might be considered a province in another or a larger district in a third country). Also, unambiguous legislative power, e.g. with respect to taxes, will prevail on the national level. Since our results from the country- and the region-level FE specifications are highly comparable, we will not always present region-level FE results.

Table 2
Tax morale and petty corruption prevalence.

	(1) spread of corruption	(2) corruption frequency	(3) domain-specific corruption experience
No. of domains with corruption experience			
One	−0.0149**(0.0074)		
Two	−0.0421***(0.0096)		
Three	−0.0558***(0.0123)		
Four	−0.0691***(0.0157)		
Five (all)	−0.0312*(0.0173)		
Highest corruption frequency in any domain			
Once or twice		−0.0221*** (0.0075)	
A few times		−0.0513*** (0.0088)	
Often		−0.0276*** (0.0096)	
Bribe paid to			
Get document or permit			0.0068 (0.0080)
Get water/sanitation service			−0.0248** (0.0105)
Get health treatment			−0.0076 (0.0085)
Avoid problem with police			−0.0312*** (0.0082)
Get place in primary school			−0.0197** (0.0097)
Socio-demographic controls			
Female	−0.0259*** (0.0050)	−0.0256*** (0.0050)	−0.0256*** (0.0050)
Age	0.0011*** (0.0002)	0.0011*** (0.0002)	0.0011*** (0.0002)
Education			
High	0.0535*** (0.0113)	0.0526*** (0.0113)	0.0521*** (0.0114)
Medium	0.0289*** (0.0059)	0.0287*** (0.0059)	0.0280*** (0.0059)
Self-employed	−0.0323*** (0.0054)	−0.0326*** (0.0055)	−0.0324*** (0.0054)
Urban	0.0188*** (0.0055)	0.0184*** (0.0055)	0.0188*** (0.0055)
Poverty	−0.0164*** (0.0017)	−0.0167*** (0.0017)	−0.0165*** (0.0017)
Country FE	Yes	Yes	Yes
N	39,561	39,561	39,561
Pseudo R^2	0.0458	0.0456	0.0458

Notes: The dependent variable is tax morale. Robust standard errors are reported in parentheses. Significance levels: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

highest level of tax morale. Our estimates are robust with respect to the two alternative sets of geographic fixed effects. Moreover, the size of the negative effect is only slightly higher if an ordered Probit model is employed.[5] Finally, our estimations are robust to employing the alternative dependent variable (*tax legitimacy*). Having paid a bribe in order to get access to public services reduces the probability of agreeing that the tax authorities always have the right to make people pay taxes, and thus accepting tax legitimacy, by 5 percentage points.

4.2. Corruption prevalence

In order to obtain a more comprehensive picture of the relationship between corruption and tax morale, we substitute the binary aggregate *corruption experience* measure from the baseline model by more specific corruption measures. The first, *spread of corruption*, accounts for the number of domains (zero to five) in which respondents faced corruption. With five domains elicited in Afrobarometer round 5, a value of two would imply that corruption was spread across 40% of the domains of daily life a respondent encountered. *Corruption frequency*, on the other hand, reflects the most severe prevalence of corruption in any of the five domains (never, once or twice, a few times, often). We also re-estimate the baseline model after we substituted the aggregate binary corruption experience measure by *domain-specific corruptions experiences*. Due to their binary nature, we can directly infer whether corruption experiences in some domain might have more severe repercussions than comparable experiences in other domains.

The estimates in Table 2 (column 1) indicate that the relationship between the *spread of corruption* and tax morale is negative, but non-monotonic[6]: The strongest effects can be observed if individuals encountered corruption in three or four of the five included domains of daily life. If a respondent encountered corruption in four out of five domains, the probability that this respondent displays a high level of tax morale is reduced by 6.9 percentage points, compared to someone with no corruption experience. We further tested whether the severity of the effect on tax morale is affected by the frequency of bribe experiences across domains (column 2). The results show that having paid a bribe a few times is related to a higher effect on tax morale (−5.1 percentage points) than having paid a bribe only once or twice (−2.2 percentage points), this differences is also highly significant. On the other hand, the effect from having paid a bribe often (−2.8 percentage points) is not significantly higher than having paid a bribe once or twice, but significantly lower than

[5] We also re-run the ordered Probit model, relaxing the parallel line assumptions (Williams, 2006). The resulting petty corruption experience effect was −0.032.

[6] Applying Wald tests to asses AME differences support our claim: AMEs for intermediate levels of spread of corruption are also significantly different from the AME for corruption experience in only one domain. The same holds for a comparison of the AMEs in case of the two highest levels of spread of corruption.

Table 3
Tax morale and general exposure to corruption.

Model	Country-level		Region-level	
	Linear	Quadratic	Linear	quadratic
Petty corruption experience	−0.0342***(0.0060)	−0.0330***(0.0062)	−0.0330***(0.061)	−0.0348***(0.0064)
Corruption exposure	−1.1826***(0.1296)	−1.1735***(0.1303)	−0.0345 (0.0263)	−0.0382 (0.0314)
Socio-demographic controls	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
N	39,561	39,561	39,561	39,561
Pseudo R^2	0.0455	0.0455	0.0858	0.0858

Notes: The dependent variable is tax morale. The set of socio-demographic controls consists of the following variables: gender, age, educational attainment, self-employment, urban residence and poverty.

compared to intermediate corruption frequency.

We also find that respondents feature different sensitivities to corruption across the five domains (column 3): Bribes paid to circumvent problems with the police reduce the probability of reporting the highest level of tax morale by 3.1 percentage points and hence have the largest effect. Bribes paid to get access to the water or sewage system (−2.5 percentage points) or to get a place in primary school (−2 percentage points) diminish the probability of having the highest level of tax morale significantly as well.

5. Heterogeneity and sensitivity analyses

The analysis in Section 4 has shown that an increased frequency or spread of bribe payments per individual is associated with stronger effects on tax morale. This relationship, however, seems to be non-monotonic (Table 2, columns 1 and 2), i.e. reflecting habituation to bribe experience. This finding is in line with the literature discussed in Section 2, indicating that corruption levels can have different effects across countries. One strand of the literature argues that corruption can be normalised in highly corrupt countries and make people more tolerant towards paying bribes. Thus, the perceived fairness in the relationship with the government might be affected less 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.

In this section, we extend our analysis to account for additional factors which might introduce heterogeneous reactions to corruption experiences across otherwise similar individuals. Ignoring these factors, some of them potentially correlated with tax morale and corruption experience, might otherwise introduce bias to our estimates of interest.[7] To account for this in a more structured way, we address recent individual and general exposure to corruption-prone situations. We also account for a more persistent effect of corruption on tax morale. Eventually, we investigate how access to public services or civic participation might translate into diverging levels of tax morale.

5.1. Exposure to corruption

We define *exposure to corruption* as living in a situation where encountering corruption becomes more likely. We investigate the impact of exposure to corruption from two analytical perspectives: the first focuses on the general level of exposure to corruption, the second on the individual level.

The general corruption exposure captures an environment in which corruption is a behaviour respondents are accustomed to. We derive proxies for the general level of corruption exposure (*CE*) as the average corruption experience we observe on the country and region level. The resulting measures are bound between zero and one. Assuming a sufficient degree of representativeness, these averages supply a proxy for the likelihood that any individual in a certain geographic area would make experiences with petty corruption. In order to examine heterogeneous reactions with respect to the prevailing corruption exposure, we draw upon the following specification

$$P(T_i = high) = \Phi\left(\beta_0 Corruption_i + \sum_{j=1}^{2} \beta_j Corruption_i \times CE_i^j + \sum_{j=1}^{2} \delta_j CE_i^j + \gamma X_i + \tau_i\right) \quad (2)$$

Heterogeneity is modelled by the interaction terms of individual *corruption experience* and general *corruption exposure* level (*CE*). If we impose $\beta_2 = \delta_2 = 0$ we have a purely linear interaction setting, otherwise we can trace non-linearities. Results are documented in Table 3. Controlling for contemporaneous corruption exposure does not change the impact of individual corruption experience on tax morale. A one percent increase in country-level exposure to corruption is associated to a 1.2 percentage point decline in the likelihood that an individual displays a high level of tax morale. There is no similar relation between region-level corruption exposure and tax

[7] In our sensitivity analysis we aim at addressing concerns regarding endogeneity by applying country- and region-level fixed effects and explicitly integrating potentially relevant, yet previously omitted variables. We do not apply an IV estimation since in the context of tax morale, previously used instruments, such as respondents' overall trust in others, perceptions of the political influence of ethnic groups, household head is respondent to the survey and the respondent is willing to pay a bribe (Cho and Kirwin, 2007; Lavallée et al., 2008), do not convincingly fulfil the exclusion restriction. We also follow the argument by Clausen et al. (2011) that it is very unlikely for governmental officials to know about each individual's perceived trust in institutions, which could potentially introduce a reverse causality channel.

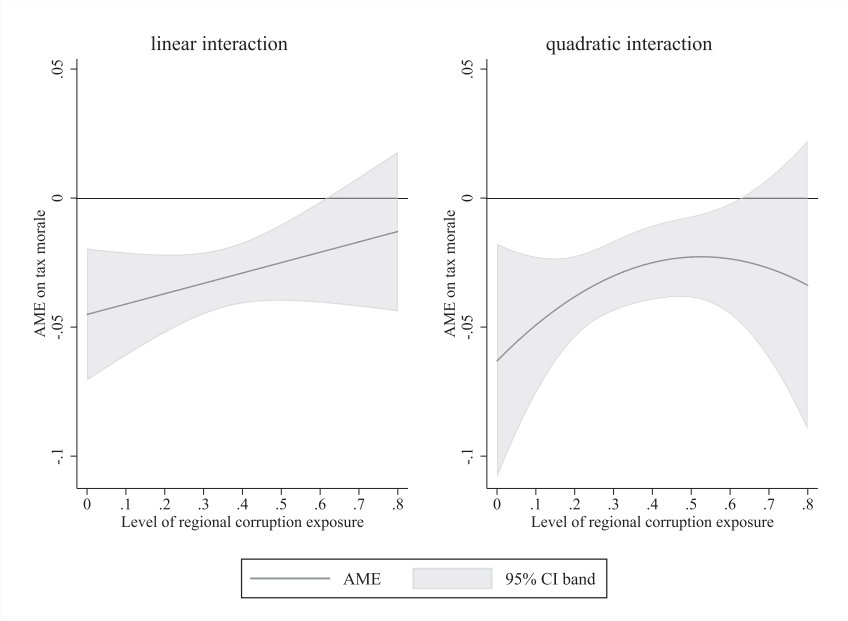


Fig. 3. Average marginal effects of petty corruption experience on tax morale.

Table 4
Average marginal effects of domain-specific corruption experience and exposure.

	Access to	(1)		(2)	
		YES	NO	YES	NO
Corruption experience to					
Get document or permit	–	0.008 (0.008)		0.006 (0.008)	
Get water/sanitation service	Piped water	−0.022 (0.015)	−0.009 (0.015)	−0.007 (0.015)	−0.013 (0.015)
	Sewage system	−0.045**(0.020)	−0.006 (0.013)	−0.041**(0.019)	−0.000 (0.012)
Get health treatment	Health clinic	−0.004 (0.010)	−0.010 (0.013)	−0.005 (0.010)	−0.006 (0.013)
Avoid problem with police	Police station	−0.042***(0.013)	−0.026**(0.010)	−0.036***(0.012)	−0.024**(0.010)
	Roadblock	−0.051*(0.029)	−0.031***(0.009)	−0.030 (0.029)	−0.028***(0.008)
Get place in primary school	School	−0.021**(0.010)	−0.030 (0.030)	−0.027***(0.010)	−0.036 (0.030)
Country FE		Yes	Yes	No	No
Region FE		No	No	Yes	Yes
N		38,952		38,952	
Pseudo R^2		0.0465		0.0866	

Notes: The dependent variable is tax morale. There is no unique authority which can be directly linked to the domain of documents or permits. The reported AME thus refers to the baseline estimate β_0. Significance levels: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

morale.

Fig. 3 illustrates the average marginal effects of individual bribe experience in various regional-level corruption exposure settings. Across both the linear and the quadratic interaction specification we find negative average marginal effects for individual bribe experiences. For regional-level corruption exposure above 0.6, i.e. when more than 60% of respondents in a region report bribe experiences, our estimates lose their significance. Overall, the adverse effects of individual bribe experience on tax morale may be lower in a setting with higher general exposure to corruption. Yet, aside from individuals living in regions above the 95th exposure percentile, there is no complete adaption, i.e. a significant negative effect prevails.

Next, we address individual level corruption exposure by focusing on the interaction likelihood between an individual and a potentially corrupt official. This individual-specific interaction likelihood is assessed based on items which asked the respondents whether a domain-specific facility was in their vicinity.[8] Any domain-specific exposure measure ($CE_{k,i}$) is coded as zero whenever a respective service or facility was not in the household's vicinity. It is important to note that this does not imply that a household has no access at all. Instead, due to a lower accessibility a household would make less frequent use of such a service, and thus, was less likely to be exposed to a corrupt official.

[8] The survey defines vicinity as being in the primary sampling unit, the enumeration area or in walking distance. There is, however, no corresponding facility which can be linked to the domain 'getting document or permit'. In other cases, there are two plausible individual exposure measures, i.e. police station and police roadblocks.

Table 5
Average marginal effects of recent experiences and past corruption exposure.

	(1)	(2)	(3)	(4)
Petty corruption experience	−0.032***(0.007)	−0.033***(0.007)	−0.026***(0.007)	−0.026***(0.007)
General petty corruption exposure in t-1		−1.325***(0.143)		−0.708 (0.840)
Socio-demographic controls	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	No	No
Region FE	No	No	Yes	Yes
N	29,554	29,554	29,554	29,554
Pseudo-R^2	0.0416	0.0416	0.0818	0.0818

Notes: The dependent variable is tax morale. All specifications include socio-demographic covariates, which control for gender, age, education, poverty, living in urban areas, and being self-employed. The sample consists of those 22 countries included in round 4 and 5. Significance levels: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

Our starting point is equation (1) with domain-specific corruption experiences ($Corruption_{k,i}$), yet we augment the model by interacting the $k = 5$ individual level experiences with individual-domain-specific exposures

$$P(T_i = high) = \Phi\left(\begin{array}{c}\sum_{k=1}^{5}\beta_{0k}Corruption_{k,i} + \sum_{k=1}^{5}\sum_{j=1}^{2}\beta_{1k,j}Corruption_{k,i} \times CE_{k,j,i} \\ + \sum_{k=1}^{5}\sum_{j=1}^{2}\delta_{k,j} \times CE_{k,j,i} + \gamma X_i + \tau_i\end{array}\right) \tag{3}$$

Controlling for levels of individual exposure to a bribe-prone environment provides several insights (Table 4): Bribe experience related to get water/sanitation services or a place in primary school and bribe experience to avoid problems with the police retain their explanatory power. Moreover, the estimated effects seem to be more pronounced for respondents with higher levels of individual exposure (access YES). This highlights the importance of local infrastructure or administrative environment. A higher individual likelihood to be exposed to bribe extraction, i.e. having more direct access to a certain facility, does not mitigate the adverse ramifications with respect to tax morale. Instead, individuals react more sensitively to potential bribe extractions in their sphere of interest than they do in a generally more bribe-prone environment (as indicated by the positive gradient in Fig. 3).

5.2. Persistence of corruption

So far, we used cross-sectional data from round 5 of the Afrobarometer (2016). However, cross-sectional data only provide the opportunity to capture effects at a specific point in time, i.e. the most recent corruption experience or exposure. 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 related to 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 data is restricted by several constraints. First, the Afrobarometer started in round 2 asking questions on incidences of petty corruption. However, the questions vary over subsequent rounds, including different numbers of questions and types of public services. Second, the Afrobarometer asks about the justifiability of cheating on taxes, i.e. our tax morale measure, only in round 5 and does not follow the same individuals over different points in time.

Nevertheless, past levels of corruption exposure might be informative with respect to present levels of tax morale. They might be informative, e.g. with respect to institutional quality or habituation over time. Their omission might thus have biased our baseline results. To address this concern, we re-estimate our baseline model accounting for country and regional levels of corruption exposure in Round 4 (CE_{t-1}) based on the following equation:

$$P(T_i = high) = \Phi\left(\beta_0 Corruption_i + \beta_{t-j}Corruption_i \times CE_{i,t-1} + \delta_{t-j}CE_{i,t-1} + \gamma X_i + \tau_i\right) \tag{4}$$

To minimise the impact of a decreasing or selective sample, i.e. consisting of those countries featuring more reliable institutions, we do not include data from rounds with much fewer countries participating.[9] Table 5 documents the results for those 22 countries included in round 4 and 5.

The estimated effects of individual bribe experience in the reduced sample (29,554 observations, column 1 in Table 5) are highly comparable to the results in the baseline specification with country-level FE. The effect's magnitude in the region-level FE specification is somewhat diminished, but overall still comparable to the results from Table 1. In both cases, the inclusion of past levels of exposure to corruption does not alter the findings with respect to the impact of individual bribe experience. A one percentage point higher past general exposure to corruption on the country level, however, is indicative of a 1.3 percentage point lower likelihood of a respondent

[9] Earlier rounds with fewer countries lack representativeness for the sub-continent because the sample consisted of mostly open, reform-oriented governments (Little and Logan, 2009).

Table 6
Tax morale and corruption experience in a Pseudo-Panel approach.

Linear probability models	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Petty corruption experience	−0.153***	−0.187***	−0.206***	−0.256***			−0.256***
	(0.050)	(0.059)	(0.067)	(0.075)			(0.086)
Number of domains with bribe experience							
One					−0.027 (0.129)		
Two					−0.424**(0.195)		
Three					−0.240 (0.203)		
Highest bribe frequency in any of the three persistent domains							
Once or twice						−0.348***(0.127)	
A few times						0.028 (0.173)	
Often						−0.281 (0.204)	
Separate cohort FE	Yes	Yes	No	No	No	No	No
Complete set of cohort FE	No	No	Yes	Yes	Yes	Yes	Yes
Socio-demographic covariates	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Analytical weights	No	Yes	No	Yes	Yes	Yes	Yes
Restricted to round 2 countries	No	No	No	No	No	No	Yes
Number of cohorts	486	486	432	432	432	432	336
R^2 (adjusted)	0.582	0.613	0.507	0.526	0.514	0.513	0.447

Notes: The binary dependent variable is based on the level of agreement to a statement relating to the obligation to pay taxes (tax legitimacy). Socio-demographic covariates include in addition to the average poverty indicator the following cohort-specific shares: medium/high education, part-time/full-time employment, urban residence. Significance levels: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

displaying a high level of tax morale.

In order to investigate the robustness of our baseline results across time, i.e. in order to determine whether we detect some general patterns or something specific to round 5, we construct a Pseudo-Panel based on stable cohorts (Deaton, 1985). The cohorts are defined based on country, age group and gender, resulting in 486 cohorts with an average cohort size of 221.[10] Due to data availability, tax morale is now assessed based on the item (*tax legitimacy*) referring to whether individuals see the enforcement of tax payments as legitimate ($T^* = 1$) or not ($T^* = 0$). For each cohort, we calculate an average of corruption experience and other socio-demographic variables, denoted as $\overline{X}$. Eventually, we estimate a linear probability model of the cohort-specific average probability of displaying a high tax morale based on the following equation[11]:

$$\overline{P}\left(T^*_{c,a,g,t} = high\right) = \beta\overline{Corruption}_{c,a,g,t} + \gamma\overline{X}_{c,a,g,t} + \tau_{c,a,g} + \tau_t \tag{5}$$

Time trends are absorbed by τ_t, whereas $\tau_{c,a,g}$ represents two specifications of cohort fixed effects. One integrates separate FE by country (τ_c), age group (τ_a) and gender (τ_g). The other is the complete set of cohort FE ($\tau_{c,a,g}$). Analogously to section 4, we account for the average petty corruption experience in a cohort, the average spread of corruption (the share of individuals with a corruption experience in zero, one, two or three domains) and the cohort-specific frequency of bribe experience (the share of respondents who did experience corruption never, once or twice, a few times or often) in any of these three domains. The restriction to three domains accounts for the changing number (and domain) of bribe-related items over time. We integrate only those domains included in all four rounds (bribes to get documents, avoid problems with the police or to get household services/sanitation).

Referring to the first four columns in Table 6, the reported estimates have the following interpretation: if the cohort-specific share of individuals with petty corruption increases by one percentage point, the share of cohort-specific individuals displaying a high tax morale declines by 0.15–0.26 percentage points. Applying the complete set of cohort fixed effects, or implementing analytical weights, typically results in estimates which are larger in absolute size.

With respect to the spread of corruption we see a consistent picture, yet obtain significant estimates only for the second highest spread level. In case of corruption frequency, a one percentage point increasing share of individuals with moderate bribe experience (only once or twice in any domain) is associated with a 0.35 percentage point decline in the share of individuals with displaying a high level of tax morale. Since we observe an increase in average cohort tax morale over the years (from 68.8% to 73.1%), we cannot rule out that our results might be driven by compositional effects. We therefore restrict our model to those 14 countries which were included in all four rounds (Table 6, column 7). Our findings remain robust.

[10] In each round we have a number of cohorts equal to six times the number of included countries. The number of countries in rounds 2 to 5 is 14, 18, 20 and 29, respectively. We refrain from introducing more cohorts in order to maintain reasonable cohort sizes. The 10th percentile amounts to a cohort size of 72; the minimum is 19 and the maximum 757. We address the variation in group size by applying cohort weights as robustness check. The age cohorts refer to young adults (18–25 years), prime-working age individuals (26–50 years) and elderly (above 50 years).

[11] We chose the linear probability model in order to apply analytical weights. These weights can account for cohort-size differentials, which relate to the variance of cohort-specific averages.

Table 7
The influence of participation and access – AMEs of corruption experience for various subgroups.

		Participation		Access	
		(1)	(2)	(3)	(4)
Regular news via					
Newspaper	Yes	−0.043***(0.011)			
	No	−0.029***(0.007)			
Radio	Yes	−0.032***(0.006)			
	No	−0.037***(0.014)			
TV	Yes	−0.046***(0.008)			
	No	−0.020**(0.008) †			
Country is a democracy	No		−0.027*(0.017)		
	Yes, with major problems		−0.009 (0.010)		
	Yes, with minor problems		−0.035***(0.009)		
	Yes, a full democracy		−0.058***(0.013)		
Ethnic group treated unfairly	Never			−0.027***(0.008)	
	Sometimes			−0.027**(0.012)	
	Often			−0.047***(0.013)	
Sharing country's main religion	Yes				−0.066***(0.009)
	No				−0.013*(0.007)†
Socio-demogr. controls		Yes	Yes	Yes	Yes
Country FE		Yes	Yes	Yes	Yes
N		39,326	37,916	36,001	39,561
Pseudo R^2		0.046	0.047	0.047	0.046

Note: Table reports average marginal effects of experienced petty corruption by group, e.g. getting regular news via newspaper. The symbol † indicates significant effect differences at the conventional levels. Significance levels: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

5.3. Heterogeneity related to civic participation and access to public services

Paying taxes amounts to contributing to the provision of public services. In this regard, individuals' tax morale might be influenced by their perception of the tax system's fairness and the availability of public services (Luttmer and Singhal, 2014; Feld and Frey, 2007). In this section, we investigate how corruption experience may affect tax morale in heterogeneous ways, depending on the level of individual participation in and access to public life. Once again, we model heterogeneous reactions to corruption experiences by introducing interactions with various participation and access measures (*PA*):

$$P(T_i = high) = \Phi\left(\beta_0 Corruption_i + \sum_{j=1}^{J} \beta_j Corruption_i \times PA_{i,j} + \sum_{j=1}^{J} \delta_j PA_{i,j} + \gamma X_i + \tau_i\right) \quad (6)$$

First, we ask whether individuals displaying different information procurement strategies feature differing sensitivities with respect to corruption experience. Individuals interested in being informed, e.g. regarding government (spending) activities, and thus possibly also participating in public discourse, might react more sensitively to bribe extortions by officials. We therefore construct three binary information procurement variables, each indicating whether someone gets *regular news* (at least several times a month) from newspapers, the radio or TV.[12]

In a second participation specification we account for individuals' perception of how democratic their country is organised. In this regard, the *perceived level of democracy* might be an important omitted variable: larger democratic accountability is related to higher tax morale (Frey and Torgler, 2007) and a more pronounced democratic accountability might make officials less likely to extort bribes.

We also estimate the relevance of possible access to public services by following two main lines of thought: Members of minorities might be (partially) excluded from some public services, which might lower their willingness to contribute via taxes. Vulnerable minorities could also face more frequent attempts of bribe extractions. This aspect is modelled based on a variable which reflects the frequency a respondent thinks his or her ethnic group is treated unfairly. In addition to ethnic discrimination we also account for discrimination based on religious grounds, by introducing a variable indicating membership of the majority religion. In this regard, Xin Li (2010) demonstrates that ethnic identity, measured by language, religion and ethnic group status, shapes tax morale.

Table 7 reports the average marginal effects for various subgroups. Individuals acquiring news regularly via TV react more sensitively to bribe experiences (−4.6 percentage points reduced likelihood of having a high tax morale) than those getting news infrequently from TV (−2 percentage points). This difference is significant at the 5% level. There is also some evidence that individuals who perceive their country to be fairly democratic react stronger to bribe extractions by officials (column 2). Individuals who experience frequent (rare or no) unfair treatment of the own ethnic group are 4.7 (2.7) percentage points more likely to have a low tax morale. Distinguishing respondents by whether they share the country's main faith or not yields, at first glance, a surprising result: those being part of the majority, display significantly stronger effects (−6.6 percentage points) than those being member of a minority religion (−1.3 percentage points). This finding can be reconciled, considering that minorities might anticipate to face less lenient authorities in case of

[12] We also applied different frequency thresholds, i.e. daily news consumption. The results remain highly comparable.

Table 8
Tax morale and confidence in tax authorities.

	(1)	(2)
Trust in tax department		
Somewhat	−0.0632*** (0.0075)	
Just a little	−0.0871*** (0.0075)	
Not at all	−0.1114*** (0.0080)	
Perceived number of corrupt tax officials		
Some of them		−0.0338*** (0.0087)
Most of them		−0.0565*** (0.0094)
All of them		−0.0986*** (0.0110)
Socio-demographic controls	Yes	Yes
Country FE	Yes	Yes
N	36,560	34,964
Pseudo R^2	0.0486	0.0466

Notes: The dependent variable is tax morale. Robust standard errors are reported in parentheses. Significance levels: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

committing a misdemeanour, and thus, display a lower decrease of tax morale.

Overall, our findings point to the relevance of individual levels of (civic) participation and access possibilities to publicly provided services. Although individual bribe experiences seem to be consistently associated with lower levels of tax morale, the severity of such an experience is related to socio-cultural integration.

6. Mechanisms: The role of tax authorities

In this section we examine a mechanism how experienced petty corruption will eventually translate into declining tax moral. First, we provide evidence that trust in tax authorities is related to tax morale. In a next step, we apply a mediation analysis and demonstrate that petty corruption can influence tax morale directly and indirectly, i.e. via decreasing confidence in tax authorities.

6.1. Tax morale and confidence in tax authorities

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 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. Respondents could choose between not at all, just a little, somewhat, or a lot. Additionally, the survey asks the respondents how many tax officials they think are involved in corruption and provides the answers: none, some of them, most of them, all of them. We use these questions as proxies to estimate the effect of confidence in tax authorities on tax morale.

The average marginal effects presented in Table 8 indicate that the two proxies for the impact of confidence in tax authorities on tax morale are of high statistical significance. A decrease of trust in the tax department (e.g. from trusting the tax department a lot to somewhat) reduces the probability of having the highest level of tax morale by 6.3 percentage points. If respondents perceive that more tax officials might be involved in corruption (e.g. going from none to some of them) the probability of displaying the highest level of tax morale decreases by 3.4 percentage points.

6.2. 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 estimation results presented so far indicate that both corruption experiences (Sections 4 & 5) and confidence in tax authorities (Section 6.1) are significantly correlated with tax morale. These findings can be linked, assuming that corruption experiences with public services would also affect trust in other public institutions, such as the tax administration. Corruption experiences may then not only have direct effects but also indirect effects on tax morale, mediated through reduced levels of confidence in the tax authorities.

A mediation analysis facilitates the partitioning of a total effect into direct and indirect effects. Appendix Fig. A1 illustrates the underlying scheme of the mediation analysis used. We analyse the composition of the total effect (β) that results from the effect of the petty corruption experience (*corruption*), on tax morale (T). Petty corruption has a direct effect (β^D) on *tax morale* and an indirect effect (β^I) via the mediator (M_j), confidence in tax authorities. In the mediation analysis, we transformed the ordinal mediator variables into binary variables, indicating low trust in the tax department and the perception of most tax officials being corrupt. The mediating effect of both measures of confidence in tax authorities is captured in the indirect effect. Eventually, the mediation analysis relies on three single equations which are partially interrelated in the form of a structural equation model:

$$P(T_i = high) = \Phi(\beta Corruption_i + \gamma X_i + \tau_i) \tag{7.1}$$

Table 9
Binary mediation analysis.

	(1) M_1: Trust in tax department	(2) M_2: Corrupt tax officials
Bootstrap sample estimates of the		
Total effect of corruption on tax morale (β)	−0.0330 [-0.0445 -0.0210]	−0.0334 [-0.0448 -0.0212]
Direct effect of corruption on tax moral (β^D)	−0.0300 [-0.0419 -0.0180]	−0.0295 [-0.0414 -0.0174]
Indirect (mediated) effect (β^I)	−0.0029 [-0.0038 -0.0020]	−0.0039 [-0.0051 -0.0027]
% of total effect mediated	0.0868 [0.0646 0.1371]	0.1154 [0.0866 0.1825]
In-sample average marginal effects of		
β^W	0.0829***(0.0069)	−0.0395***(0.0056)
β^M	−0.0379***(0.0048)	0.0921***(0.0061)
Socio-demographic controls	YES	YES
Country FE	YES	YES
N	32,939	32,939

Notes: Reported 95% confidence intervals (in square brackets) are based on a bootstrap procedure with 1000 replications. In-sample AMEs refer to the effects of corruption on a mediator (β^M) and the effect of a mediator on tax morale (β^W) in the real-world sample, based on robust standard errors (reported in parentheses). Significance levels: *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

$$P(T_i = high) = \Phi\left(\beta^D Corruption_i + \beta^w M_{i,j} + \gamma X_i + \tau_i\right) \tag{7.2}$$

$$P\left(M_{i,j} = high\right) = \Phi\left(\beta^M Corruption_i + \gamma X_i + \tau_i\right) \tag{7.3}$$

Equation (7.1) corresponds to our baseline specification, providing a coefficient estimate related to the total effect. From equation (7.2) we may retrieve the direct effect β^D and the first component (β^w) required to obtain the indirect (mediated) effect of corruption experience on tax morale. The second component (β^M) informs about the sensitivity of confidence in tax authorities with respect to corruption. Eventually, the indirect effect β^I is a rescaled combination of the two.[13] In all equations we control for the potentially confounding factors, known from our baseline model.

Drawing upon the algorithm by Hicks and Tingley (2011), we estimate the equations from the depicted structural model. In order to quantify the relevance of any detected indirect (mediated) effect, we derive 95% confidence intervals based on a bootstrap procedure with 1000 replications. Table 9 presents the average total effect, the average direct effect and the average mediated effect across the 1000 replication samples and the related confidence intervals.

Having paid bribes reduces the probability of having the highest level of tax morale by 3.3 percentage points in the slightly reduced mediation analysis sample (3.2 percentage points in the full baseline sample). Based on the 95% confidence intervals we can detect significant indirect effects: By lowering trust in the tax department, corruption experiences exert a mediated effect of −0.29 percentage points on tax morale. This amounts to 9 per cent of the total effect. The indirect effect is more pronounced in case of the mediator relating to the perception of corruption amongst tax officials – the mediated affect accounts for 11 per cent of the total effect, and thus, a corruption experience lowers tax morale indirectly by 0.39 percentage points.

While these findings point to the existence of significant indirect effects, via a diminished confidence in tax authorities, their relative size indicates that the harmful effect of corruption experience operates on a more general level: paying bribes seems to erode the willingness to contribute to the funding of public services directly. In other words, the damage done by corrupt officials in general can hardly be undone by immaculate tax authorities.

7. Conclusion

This paper delivers micro-level evidence that petty corruption payments significantly reduce tax morale of citizens in 29 Sub-Saharan countries. Moreover, we provide compelling evidence of a non-monotonic relationship of the prevalence of corruption and tax morale. Individuals with intermediate corruption experiences display the strongest sensitivity: they are 5–7 percentage points less likely to exhibit high levels of tax morale. Separating the potential effects by the respective domain corruption is encountered in, we find the most pronounced harmful effects for corruption experiences in a situation with direct representatives of the government, i.e. the police.

We also uncovered a notable degree of heterogeneity, i.e. with respect to civic participation and potential access to public services. Potential tax payers who are better informed, e.g. consume news on a regular basis, react much more sensitively to petty corruption experience. The same can be observed for those who perceive that their ethnic group is often treated unfairly. In this case, a lower tax morale in case of facing bribe extortion can be interpreted as a form of negative reciprocity.

Our analyses demonstrate further that there is no complete habituation to corruption experience. Individuals living in an institutional setting where corruption is most prevalent still display a diminished tax morale once being extorted a bribe payment. It is, however, not only the abstract perception of corruption prevalence on the country- or regional-level that matters, but also the individual-level risk of encountering a corrupt official in the local sphere of interest, i.e. the daily life. We also investigate to which extent petty corruption and confidence in institutions, i.e. tax authorities, may jointly impact on tax morale. Approximately 10 per cent

[13] In case equations (7.2) and (7.3) are estimated as linear models, the indirect effect could be directly retrieved as $\beta^I = \beta^w \beta^M$.

of the total effect observed is an indirect effect, e.g. attributable to a reduced confidence in tax authorities as a consequence of petty corruption experience. This implies, eventually, that the adverse consequences of petty corruption do not solely affect confidence in institutions but undermine the willingness to contribute in general.

These findings have important implications for the goal of national governments to ensure their citizens pay taxes. A highly robust and mostly non-monotonic relationship of petty corruption and tax morale indicates that, especially, well informed individuals living in an institutional environment characterised by intermediate levels of petty corruption are most prone to refuse to pay taxes. Countries with such features and demographic structures could benefit most from implementing policies to curb petty corruption or to foster the reliability of their institutions. Once petty corruption is normalised, the fiscal returns to the implementation of anti-corruption policies might not outweigh the related politico-economic costs.

The importance of petty corruption regarding citizens' attitudes towards tax payments urge more research in this direction. It would be insightful to investigate the interrelation of bribe amounts and accounts of individual tax payments. Furthermore, a more detailed elicitation of corruption domains would enable more refined analyses: For one, related to the limited number of domains in the Afrobarometer, the actual extent of individuals with corruption experiences might be notably underestimated. In addition, analysing which types of a wider range of corruption experiences may cause the strongest reactions would be helpful in terms of inferring appropriate policy recommendations in order to enhance tax morale and tax compliance.

Funding

Bjoern Jahnke acknowledges support by the United Nations University World Institute for Development Economics Research (UNU-WIDER) and the German Research Foundation (DFG).

Acknowledgements

The authors would like to acknowledge Miguel Niño-Zarazúa for his critical input on an earlier version of this paper and the provision of data. Useful comments from the UNU-WIDER Symposium on the Political Economy of Social Protection Systems in Mexico City, Mexico, the 10th Annual Conference of the Poverty Reduction, Equity and Growth Network in Berlin, and the 71st Annual Congress of the International Institute of Public Finance in Dublin, Ireland are appreciated. The authors acknowledge Afrobarometer data, [Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Côte d'Ivoire, 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], [Rounds 2–5], [2004–2013], available at http://www.afrobarometer.org.

Appendix

Table A1
Descriptive statistics.

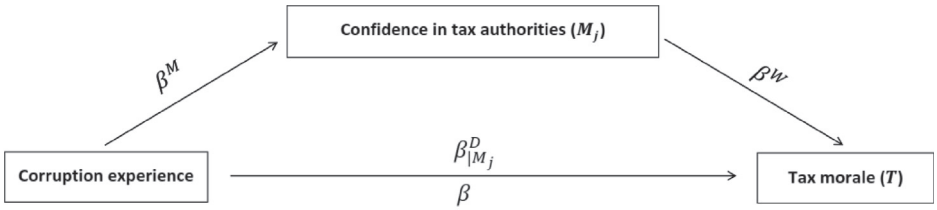
Variable	Short description	Mean/ share	Min	Max	N
Socio-demographic controls					
Female	0: no, 1: yes	0.50	0	1	45,598
Age	in years	37.09	18	105	45,183
Education	0: low	0.53	0	2	45,509
	1: medium	0.42			
	2: high	0.06			
Self-employed	0: no, 1: yes	0.50	0	1	43,560
Urban residence	0: no, 1: yes	0.37	0	1	44,911
Poverty index	based on deprivation in the domains: food, water, medical care, cooking fuel, and cash income	0.00	−2.68	2.02	45,023
Tax morale (not paying taxes is …)	0: not wrong at all	0.12	0	2	42,974
	1: wrong but understandable	0.38			
	2: wrong and punishable	0.50			
Tax morale (high)	1: yes	0.50	0	1	42,974
Tax legitimacy	1: enforcing tax payments is legitimate	0.73	0	1	43,581
Corruption					
Petty corruption experience	0: no, 1: yes	0.30	0	1	44,834
Domain-spec. corruption experience					
Get document or permit	0: no, 1: yes	0.16	0	1	45,358
Get water/sanitation service	0: no, 1: yes	0.08	0	1	45,266
Get health treatment	0: no, 1: yes	0.15	0	1	45,388
Avoid problem with police	0: no, 1: yes	0.14	0	1	45,307
Get place in primary school	0: no, 1: yes	0.10	0	1	45,355
Spread of corruption (across the five domains)		0.62	0	5	45,511
Corruption frequency (maximum, across all domain)	0: never	0.70	0	3	45,511
	1: once or twice	0.13			

(*continued on next page*)

Table A1 (*continued*)

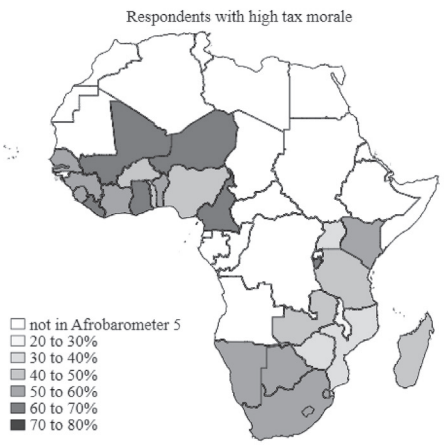
Variable	Short description	Mean/ share	Min	Max	N
	2: a few times	0.09			
	3: often	0.08			
General corruption exposure per country	avg. corr. exper. in a country	0.30	0.04	0.64	45,598
General corruption exposure per region	avg. corr. exper. in a region	0.30	0.00	0.84	45,598
General corruption exposure ($t-1$)	avg. corr. exper. in a country in round 4	0.22	0.03	0.40	34,537
Individual exposure/access to					
Piped water	0: no, 1: yes	0.52	0	1	45,518
Sewage system	0: no, 1: yes	0.24	0	1	45,227
Health clinic	0: no, 1: yes	0.59	0	1	45,387
Police station	0: no, 1: yes	0.35	0	1	45,398
Roadblock	0: no, 1: yes	0.05	0	1	45,598
School	0: no, 1: yes	0.88	0	1	45,470
Regular news via					
Newspaper	0: no, 1: yes	0.29	0	1	45,340
Radio	0: no, 1: yes	0.80	0	1	45,557
TV	0: no, 1: yes	0.49	0	1	45,484
Country is a democracy	0: not a democracy	0.09	1	4	42,834
	1: democracy with major problems	0.31			
	2: democracy with minor problems	0.39			
	3: full democracy	0.21			
Ethnic group treated unfairly	0: never	0.60	0	2	41,150
	1: sometimes	0.22			
	2: often	0.18			
Sharing country's main religion	0: no, 1: yes	0.37	0	1	45,598
Confidence in tax authorities					
Trust in tax department	0: not at all	0.22	0	3	40,371
	1: just a little	0.29			
	2: somewhat	0.27			
	3: a lot	0.22			
Perceived no. of corrupt tax officials	0: none	0.12	0	3	38,366
	1: some of them	0.46			
	2: most of them	0.29			
	3: all of them	0.13			

Note: In case of categorical variables the shares of the respective categories are reported instead of the overall mean.



Note: The coefficient β relates to the total effect, comparable to our baseline estimate. The coefficient $\beta^D_{|M_j}$ represents the direct effect, conditional on mediator M_j, and thus, accounting for the indirect effect.

Fig. A1. Graphical representation of the mediation analysis.



country	high tax morale (%)	corruption experience (%)	N
Benin	51.5	24.0	1,200
Botswana	59.7	4.2	1,200
Burkina Faso	43.1	24.6	1,200
Burundi	63.1	28.8	1,200
Cameroon	66.2	45.4	1,200
Cape Verde	38.1	5.2	1,208
Côte d'Ivoire	56.1	36.5	1,200
Ghana	64.2	23.1	2,400
Guinea	54.3	56.8	1,200
Kenya	54.0	55.4	2,399
Lesotho	43.5	20.2	1,197
Liberia	64.1	45.9	1,199
Madagascar	42.3	26.9	1,200
Malawi	28.0	13.9	2,407
Mali	65.6	17.3	1,200
Mauritius	73.1	4.5	1,200
Mozambique	39.9	37.9	2,400
Namibia	51.1	6.1	1,200
Niger	63.6	32.4	1,199
Nigeria	41.3	34.9	2,400
Senegal	56.3	25.2	1,200
Sierra Leone	55.5	63.7	1,190
South Africa	57.3	12.3	2,399
Swaziland	59.4	18.9	1,200
Tanzania	46.5	34.9	2,400
Togo	43.6	33.3	1,200
Uganda	32.4	47.5	2,400
Zambia	44.2	20.8	1,200
Zimbabwe	38.5	37.8	2,400
All	50.1	29.8	45,598

Note: N refers to the total number of respondents in the Afrobarometer.

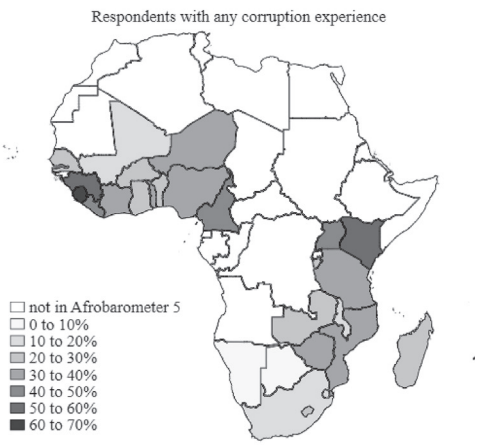


Fig. A2. Country overview (Afrobarometer, round 5).

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