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Institutions for Promoting Tax Compliance in Sub-Saharan Africa¹

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Abstract

This paper examines the role of institutional factors in shaping taxpayer behaviour, using survey data from approximately 70,000 individuals across 29 Sub-Saharan African countries in 2011 and 2016. The results show that individuals are more likely to comply with tax obligations when they perceive greater difficulties in evading taxes, have confidence in the tax administration, and view it as less corrupt. Compliance is also higher when respondents perceive higher-quality public goods and services and do not perceive ethnic discrimination in government policies. We present heterogeneous analysis based on the natural resource abundance status of respondents' countries.

JEL Classification Codes : H3, K42, O43.

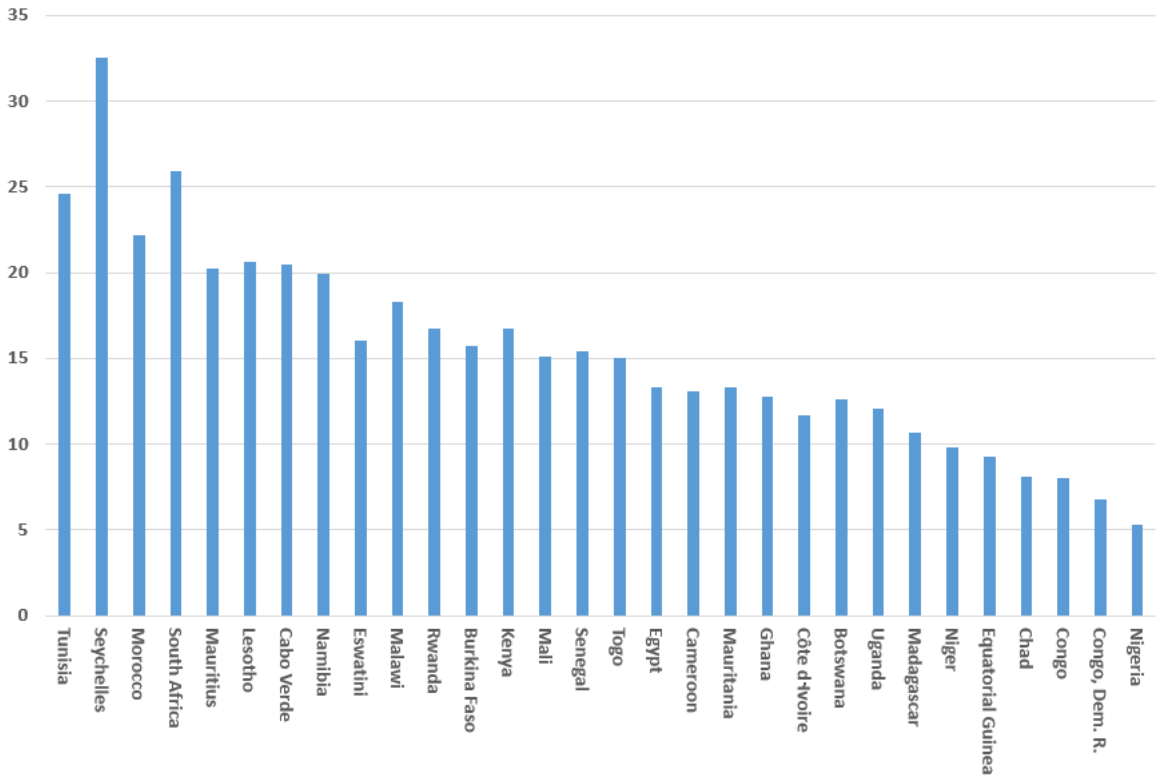
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1. Introduction

Taxation plays a critical role in enabling governments to finance essential public goods and services such as education, health and infrastructure. In Sub-Saharan Africa (SSA), however, the tax revenue to GDP ratio in many countries (Figure 1) remains below the United Nations’s (UN) minimal tax revenue threshold of 20% required to finance the development goals (UNDP, 2010). Low tax revenue can generally be attributed to two main factors: compliance gap and policy gap (e.g. Keen, 2013). This paper focusses on the compliance gap by examining taxpayer behaviour and attitudes towards taxation in Sub-Saharan Africa.

Figure 1: Tax revenue in Sub-Saharan Africa (2019, % GDP)



Sources: OECD (Revenue statistics in Africa), 2021. Notes: tax revenue excluding social security contributions

Three institutional theories help explain taxpayer behaviour.² First, the **economic deterrence** theory predicts that the increase expected costs associated with penalties and enforcement actions by tax authorities encourages greater compliance (Allingham and Sandmo, 1972; Becker, 1968). Empirical studies provide mixed evidence for this theory. (McKee 2006,

² Institutions are rules, enforcement characteristics of rules, and norms of behaviour that structure repeated interaction of people (North, 1989)

Andreoni et al, 1998). For instance, Andreoni et al. (1998) review the US evidence and observe the effect of deterrence on tax compliance is limited. Frey (2003) did not find evidence when analysing data from European countries. Case studies from Africa offer also offer support for the deterrence theory, including evidence from Ethiopia (Shimeles et al, 2017), and from Kenya, Uganda, south Africa, Tanzania (Ali et al, 2014).

Second, the **fiscal exchange** theory elucidates taxpayer behaviour through the expectations regarding the delivery of public goods and services by the government. Empirical evidence in support of this theory has been found by Bodea and Lebas (2014) for Nigeria, Fernandez Sierra et al. (2025) in Mexico. In contrast, Fjeldstad (2004) little empirical support for the theory for South Africa. Thirdly, the theory of **social interactions** posits that taxpayer behaviour is influenced by individuals' perceptions of their treatment in society compared to others, their confidence in tax authorities and any other social relationship in society. Empirical evidence supporting this theory has been reported by Torgler (2003) in Costa Rica, Koumpias et al. (2021) in 92 countries, and Nikiema (2025) in Burkina Faso, whereas Ali et al. (2013) find no such evidence in their case studies of Kenya and Uganda.

This paper jointly examines the relevance of the three institutional theories in a unified framework, using data from 70,000 individuals across 29 Sub-Saharan Africa countries collected in 2011 and 2016 during rounds 5 and 6 of the Afrobarometer surveys. Institutional quality is conceptualised as a latent variable within the framework of Generalised Structural Equation Modelling (GSEM) to capture its relationship with individual taxpayer behaviour as declared by survey respondents. We employ binary and ordered logit models to accommodate the discrete nature of taxpayer behaviour data. The survey includes two types of questions on tax compliance: direct and indirect questions. The benchmark analysis defines a tax compliance measure that combines the two questions, while the robustness analysis employs each measure of the direct and indirect questions separately. A heterogeneous analysis based on the natural resource abundance status of respondents' countries is presented. This analysis enables the identification of specific institutional weaknesses and strengths that influence tax compliance differently across contexts. For instance, in many resource-rich nations, governments tend to rely heavily on resource revenues rather than broad-based taxation, which may, in turn, shape how institutions are structured and how they interact with taxpayers.

The results show that individuals are more likely to comply with tax obligations when they perceive greater difficulties in evading taxes, have confidence in the tax administration, and

view it as less corrupt. Compliance is also higher when respondents perceive high-quality public goods and services—particularly in electricity, health, and transport infrastructure—and do not perceive ethnic discrimination in government policies. A heterogeneity analysis shows interesting differences between resource-rich countries and non-resource-rich countries. For instance, the impact of confidence in the tax administration on tax compliance is much higher in resource-rich countries. Robustness analyses indicates that our results are qualitatively unchanged. First, we re-estimate the GSEM model using alternative definitions of the dependent variable derived separately from the direct and indirect questions. Second, we assess robustness by employing an alternative estimation strategy based on a generalized structural equation model with instrumental variables (GSEM-IV).

A number of country case studies analyse tax compliance in Africa (e.g. Nikiema, 2025, Ethiopia, Shimeles et al, 2017, and Ali et al, 2014). Our paper contributes to this literature by jointly examining different institutional theories within a cross-country analysis for Sub-Saharan Africa, using multiple rounds of survey data. We also contribute to the macroeconomic literature on the relationship between institutional quality and tax revenue collection in Africa (e.g. Caldeira et al, 2023, Bourguignon et al., 2023, Ahlerup et al., 2015, Houssa and Megersa, 2017). Specifically, our contribution lies in developing a framework that determines which institutional factors most strongly promote tax compliance in the region.

The remainder of the paper is structured as follows. Section 2 reviews the theoretical and empirical literature. Section 3 presents the methodology. Section 4 discusses empirical results. The last section concludes. Additional results are presented in the appendices.

2. Literature Review

The behaviour of taxpayers has attracted considerable attention in the academic literature. In fact, five institutional theories have been identified in the literature on taxpayer behaviour: economic deterrence, fiscal exchange, social influences, comparative treatment and political legitimacy. The review below integrates the last three features into the theory of social interactions.

2.1. Economic deterrence theory

The economic deterrence theory is predicated on the notion that certain elements exert influence on taxpayer behaviour, including tax rates and penalties associated with tax evasion. The

seminal work of Allingham and Sandmo (1972) is widely regarded as a foundational contribution to this theoretical framework, as it was the first to propose a theoretical model of taxpayer behaviour based on Becker (1968)'s seminal model of the economics of crime. The authors of this theory posit that taxpayers have the option of either fully declaring their income or declaring only a portion of it. In the event of partial disclosure, the tax liability is contingent on the tax authority's decision to investigate the taxpayer's integrity and the imposition of penalties for non-compliance. The authors hypothesise that as the tax rate increases, taxpayers are less inclined to fully disclose their assets due to the reduced income and heightened risk aversion associated with higher taxes. It is further theorised that agents, when confronted with low-income levels, exhibit a propensity for risk-taking behaviour. The study's findings also suggest that an escalation in the penalty rate results in an augmentation of the income statement, thereby increasing the likelihood of detection and, consequently, prompting an increase in reported income. This theoretical framework posits that individuals engage in a cost-benefit analysis.

This seminal work by Allingham and Sandmo (1972) has given rise to a substantial corpus of subsequent research, the aim of which has been to gain a more profound understanding of taxpayer behaviour. Notwithstanding the criticism it has received, particularly with regard to the simplicity of its assumptions (see Devos, 2014), the work has had a significant impact on the field.³ Utilising survey data from the United States in 1969, Clotfelter (1983) discovered empirical evidence that substantiates this theoretical proposition. He found that the marginal tax rate has a significant effect on the income statement, and that a higher tax rate stimulates tax evasion. This conclusion was corroborated by Alm et al. (1992) through the implementation of laboratory experiments. Furthermore, Alm and McKee (2006) utilised laboratory experiments to demonstrate that when individuals are aware they will be audited, they behave in accordance with tax legislation. However, it should be noted that these experimental studies employed students as subjects, rather than real taxpayers, which may have resulted in biased outcomes. The studies also employed a limited number of observations, which hinders the ability to generalise the findings to the complexity of a national policy issue (Mascagni et al., 2015).

However, the validity of this theory remains unconfirmed by other empirical studies. Indeed, as Blumenthal et al. (2001) found, there was an absence of compelling evidence for the aggregate

³ Yitzhaki (1974) considers that the penalty is calculated on evaded tax rather than undeclared income as in Allingham and Sandmo (1972)'s paper; which is more realistic (Fookien et al., 2014).

effect of normative appeals on tax payments, using novel methods on tax experiments in Minnesota. These tax experiments provide large-scale data and capture real behaviour, as they deal directly with taxpayers (Mascagni, 2015). However, these experiments require a strong collaboration with the tax authority, which may be problematic in some Sub-Saharan African (SSA) countries due to the potential for corruption within the tax authority. Frey (2003) further posits that sanctions alone are inadequate for motivating individuals to pay taxes, as this act is considered a matter of civic virtue and morality, rather than a purely voluntary one. He further asserts that the use of sanctions as a deterrent is problematic, as it is inconsistent with democratic principles and is costly in terms of promoting the underground economy. In addition, Reckers et al. (1994) demonstrated that ethical values significantly influence tax behaviour, yet these values appear to be absent from decision-making models. In a similar vein, several authors (Cowell and Gordon, 1988; Frey, 2003; Kirchler et al., 2011) have demonstrated that fiscal policy should not be based solely on that theory. These concerns have thus stimulated a search for other fundamental causes of fiscal behaviour.

2.2. Theory of fiscal exchange

The present theory operates under the assumption that the behaviours of agents are motivated by the efforts of the government to provide public goods and services. Individuals pay taxes when they perceive that it actually serves to finance public goods. They think that their contributions could be used for purposes other than those intended and would need evidence or motivations to support this. This thesis is similar to the gift theory, where the government receives taxpayer resources and in return provides public goods. It could also refer to the notion of "tax of Lindahl."⁴

The empirical outcomes of this theoretical framework are equivocal. Das et al. (2014) demonstrated that in India, the annual tax cost associated with the absence of primary teachers is 1.5 billion dollars. The quality of education services provided by the state emerges as a pivotal factor in elucidating the observed tax behaviour. The authors posit that augmenting the number of inspectors to monitor teachers would lead to a reduction in the tax loss. Conversely, Cowell and Gordon (1988) posit that the provision of public goods in large quantities relative to private goods fosters tax compliance. Furthermore, they posit that even within a dynamic tax analysis, where an escalation in the tax rate engenders an underground economy, there is a decline in tax

⁴ A tax of Lindahl is a form of taxation in which individuals pay for public goods following the marginal benefit they receive.

evasion when adequate public goods are supplied. In contrast, Koumpias et al. (2021) posit that the impact of trust in government organisations responsible for implementing and delivering public goods and services to the community on tax morale is significantly larger.

In a similar manner, Bodea and LeBas (2014) conducted a study of the Urban Area in Nigeria, the findings of which demonstrated that individuals pay taxes with regard to the supply of public goods. Utilising logit regression on survey data, they demonstrated that when individuals acquire club goods in the absence of state intervention, they are less inclined to perceive the tax as an obligation. The authors further concluded that in conflict-affected areas where the provision of club goods is constrained, individuals perceive the tax as a mandatory contribution. This theory has been further substantiated by empirical evidence, as demonstrated in the works of Alm et al. (1992) and Timmons (2005). Fernandez Sierra et al. (2025) show that property tax compliance increase with the provision of local public good. In addition, Ali et al. (2013) indicated that in Tanzania and Uganda, individuals who are satisfied with the government's provision of basic health services and educational needs are more likely to have a compliant attitude. In Kenya, it was found that individuals who were more satisfied with the provision of infrastructure, such as roads and electricity, were more likely to have a tax-compliant attitude. In South Africa, individuals who were more satisfied with the issuance of identity cards and the procurement of household and police services were more likely to have a tax-compliant attitude. However, Fjeldstad (2004) found no solid empirical evidence of this theory in South Africa.

D'Arcy (2011) posited that tax behaviour should be considered as a multifaceted phenomenon, extending beyond the conventional relationship between taxpayers and tax administrations. The decision to evade taxes is influenced by the interaction between the taxpayer and the tax authorities, as well as the broader social context. The taxes paid by one individual contribute to the financing of public goods, which are then consumed not only by that individual but also by other members of society. This phenomenon is partly explained by the nature of "non-exclusion" of public goods. This perspective lends itself to a self-interested interpretation of the taxpayer, potentially providing a rationale for the utilisation of non-economic justifications for taxpayer behaviour.

2.3. Theory of social interactions

This theory places significant emphasis on the relationship between social interactions and tax payment. Indeed, the agent's actions are influenced by the behaviour of his peers, including

parents, neighbours and friends. The tendency to emulate the behaviour of these individuals is a key factor in the development of this theory. Furthermore, the influence of social relationships, such as those found in neighbourhoods, can shape individual behaviour, potentially influencing their propensity to engage in fraudulent or tax evasion activities. The agent may be disincentivised from paying tax due to the fear of social sanctions (Besley et al., 2014). This theory is particularly pertinent in the context of SSA, where social relations and family dynamics play a significant role.

Empirically, Torgler (2003) demonstrated that individuals' perceptions regarding the attitudes of others towards tax compliance exert a significant influence on their own tax payment behaviour. In Costa Rica, for instance, the perception that others do not comply with tax regulations has been found to have a negative effect on individuals' tax payment behaviour. Ali et al. (2013) identified a significant impact of social influence on tax payment behaviour in Tanzania. This contrasts with the findings in South Africa, Kenya and Uganda, where the influence was not significant. Utilising an experimental approach, Alm et al. (2013) demonstrated that individuals' perceptions of others' behaviours significantly influence their own actions. In a similar vein, Banerjee (1992) developed a model of "herd behaviour", which posits that equilibrium resulting from copycat behaviour is inefficient.

The theory of social interactions is also related to the perception of individuals about their treatment compared to other individuals in society, and refers to the fairness of the rules in society. When there is an equality of the law among individuals within a country, people tend to pay tax; however, they refuse to pay it when the law is perceived to be unfair. D'Arcy (2011) found empirical evidence of this thesis. The study revealed that fair treatment by the state, both of individuals and of groups, fosters increased willingness to pay tax. This assertion was further substantiated by Kirchler et al. (2011), who demonstrated that confidence in the tax system increases when it is perceived as impartial. Subsequent research by Ali et al. (2013) corroborated this theory in the context of Tanzania and South Africa, though no significant effects were observed in Kenya and Uganda.

At the government level, the prevailing theory posits that enhanced government accountability is associated with increased tax revenues. Indeed, the confidence that people have in the tax authority is very decisive in their tax behaviour (Kirchler et al., 2011), since the tax area is characterised by an asymmetry of information. This phenomenon can be attributed to the adoption of third-party reporting in more developed countries, a practice that has been

instrumental in mitigating information asymmetries and enhancing tax compliance. However, it should be noted that this technique requires a more formal context and is associated with significant implementation costs, which may limit its effectiveness in SSA countries. Empirical evidence supporting this theory has been found by authors such as Torgler (2005), Torgler and Schneider (2007), Koumpias et al. (2021) and Nikiema (2025). Torgler and Schneider (2007) indicate that individuals perceive the increase in corruption as a misutilisation of their tax burden. This has the potential to act as a deterrent to tax contribution, particularly in contexts where corruption is rife, thus potentially leading to the expansion of the informal sector (Buehn and Schneider, 2009). In addition, Alm et al. (2014) identified a correlation between corruption and tax evasion. Their findings indicate that in instances where the tax administration is perceived as corrupt, there is a decline in the reporting rate of turnover for tax, ranging from 4 to 10%. For Koumpias et al. (2021), individual trust in government leads to high tax compliance. In the same vein, Nikiema (2025), has shown that the satisfaction with the political system, the perception of non-corrupt president and officials, and the trust in tax administration led to high tax morale.

Notwithstanding the extensive theoretical corpus, the phenomenon of tax behaviour remains equivocal. The extant empirical literature is equivocal. The ensuing section delineates a methodology for the analysis of the relationship between taxpayer behaviour and institutions.

3. Methodology

3.1. Empirical model

The model assumes that an endogenous latent variable representing institutional quality determines individual tax compliance behaviour. This endogenous latent factor is, in turn, assumed to be explained by several exogenous latent variables. To capture these relationships, we employ a Generalised Structural Equation Modelling (GSEM) approach, which allows us to jointly analyse both endogenous and exogenous latent variables within a unified framework that combines structural measurement equations.

GSEM extends the structural equation modelling (SEM), which originated in the psychometric literature and was introduced by Wright (1920). SEM has since been applied across a wide range of disciplines (Lomax and Schumacker, 2010). Conceptually, SEM can be viewed as an extension of traditional multiple regression models, allowing the inclusion of both endogenous and exogenous latent variables. In the standard SEM frameworks, dependent variables are

continuous, and the relationships are modelled using linear regression models. By contrast, GSEM is more general, as it allows the dependent variables to be continuous, binary, ordinal, count, or multinomial, and accommodates both linear and nonlinear regression models. Moreover, GSEM simultaneously estimates direct and indirect effects within a multivariate framework while accounting for measurement errors and latent constructs, thereby improving model accuracy and interpretability (see Appendix 1, for the graphical representation of our model).

Structural equation

An endogenous latent factor η_j , measuring the quality of institution perceived by an individual j , is assumed to follow this equation (e.g. Joreskog and Goldberger, 1975, and Muthén, 1984):

$$\eta_j = \alpha + \Gamma\xi_j + \zeta_j, \quad \zeta_j \sim N(0, \psi_j) \quad (1)$$

where, ξ_j is a $nx1$ vector of exogenous latent factors capturing the quality of institution perceived by the individual. α is the constant term parameter; Γ comprises parameters capturing the relations among the endogenous and latent factors, which are measured by observed predictors; ζ_j is the error term assumed to have zero mean and variance ψ_j .

Measurement model

The measurement equation reads as follows

$$Y_j = v + \Lambda\eta_j + Kx_j + \varepsilon_j, \quad (2)$$

where Y_j is a vector of individuals tax behaviour, v represents a vector of constant terms, Λ and K are matrices of parameters, x_j include co-variates, and ε_j are idiosyncratic terms. Appendix 1 provides a graphical representation of the GSEM framework.

We apply a logit model (e.g. Rabe-Hesketh and Skrondal, 2005) to Equation 2 because our dependent variable Y_j is a categorical variable. The model is estimated using information in the variance-covariance matrix of the observables.

Identification of the model involves imposing constraints on its parameters in order to obtain a unique solution. There are two types of constraints. On the one hand, substantive constraints require the number of parameters in the model not exceed $P(P + 1)/2$, where P is the number of observed variables. On the other hand, regulatory constraints require the coefficients on η_j in Equation 2 be normalized to 1.

3.2. Data

Introduction

Data come from the Afrobarometer database, which comprises ten rounds of surveys; however, our analysis focuses on rounds 5 and 6, as these are the only rounds that include information on tax behaviour. The surveys of rounds 5 and 6 were undertaken in 2011-2012 and 2015-2016, respectively. Afrobarometer evaluate citizens' attitudes toward democracy and governance, taxes, markets and civil society, etc. The original dataset covers 34 SSA countries, with at least 1,200 individuals aged 18 and over surveyed in each country. These countries were selected by the Afrobarometer based on three criteria. First, the political environment must allow individuals to express their views freely. Second, the country must be able to support a nationally representative sample, requiring an adequate sample size as well as sufficient security and logistical capacity. Finally, a national partner is required in the country to ensure the proper implementation of the survey. Within each country, respondents were selected using a random sampling procedure. The average sampling error is approximately $\pm 3\%$ for samples of 1200 respondents and $\pm 2\%$ for samples of 2400 individuals.

Different individuals were surveyed across the rounds; according, our study relies on pooled repeated cross-sectional data, rather than a panel design. This approach does not compromise the validity of our results, as questionnaires, sampling frames and probability sampling methods were consistent across countries and survey rounds. Survey weights were applied to ensure representativeness. In addition, our GSEM specifications include comprehensive demographic and socioeconomic controls to account for observable differences between samples.

Due to data availability on our key variables of interest (tax behaviour), we restrict our sample to 29 countries, amounting to around 40,000 individuals per round, or about 80000 individuals in total. These individuals were located in 372 regions across the 29 countries. In the regression analysis the dataset reduces to about 70000 individuals after accounting for missing data and data cleaning. Appendix 2 reports details on number of individuals and regions across countries.

The rest of the section presents our tax compliance indicator. We then discuss the institutional quality indicators, followed by a brief description of the control variables used in the regression analysis.

Tax compliance

Two types of information are used to construct the measures of tax compliance. The first is related to the following direct question: *Please tell me whether you, personally, refused to pay a tax or fee to government during the past year. If not, would you do this if you had the chance?*

Four modalities of answers are available to this question:

- 1) *No, would never do this,*
- 2) *No, would if I had the chance*
- 3) *Yes, once or twice*
- 4) *Yes, several times or often.*

Table 1 shows that almost all respondents (92-95%) report having complied with tax obligations or state that they would never refuse to pay (modalities 1 and 2). Even when using a more conservative measure of tax compliance, the majority of respondents still display a positive attitude (72-73%).

Table 1: Refuse or not to paying taxes

<i>Please tell me whether you, personally, refused to pay a tax or fee to government during the past year. If not, would you do this if you had the chance?</i>				
	Round 5		Round 6	
	Observation	Percentage	Observation	Percentage
No, would never do this	32,175	73.41	31,644	71.81
No, would if I had the chance	8,140	18.57	10,074	22.86
Yes, Once or twice	1,372	3.13	1,006	2.28
Yes, several times or often	2,142	4.89	1,344	3.05
Total	43,829	100.00	44,068	100.00

Source: Authors, with Afrobarometer data.

The survey also includes the following indirect question: *"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 "*. Four modalities of answers are available to this question:

1. *not wrong at all*,
2. *wrong but understandable*,
3. *wrong and punishable*,
4. *do not know*.

Table 2 shows that, across the two survey rounds, most respondents (48-56%) believe that not paying taxes is *wrong and punishable* (3). We assume that these respondents are the most likely to comply with tax obligations. The next largest group (33-36%) consists of individuals who consider tax evasion *wrong but understandable* (2). Those who state that the action is *not at all wrong* (1) account for 7-11% of the sample. We assume that individuals in these two subgroups are the least most likely to comply with tax obligations. Finally, 4-5% of respondents answer, “*do not know*”. Because it is difficult to infer the true behaviour of these respondents, they are excluded from the regression analysis.

Table 2: wrong or not wrong to not paying taxes

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

	Round 5		Round 6	
	Observation	Percentage	Observation	Percentage
1-Not wrong at all	5,068	11.56	3,242	7.36
2-Wrong but understandable	15,628	35.66	14,597	33.12
3-Wrong and punishable	21,041	48.01	24,500	55.60
4-Do not know	2,092	4.77	1,728	3.92
Total	43,829	100.00	44,067	100.00

Source: Authors calculation based on data from Afrobarometer

To reduce the bias related to the direct question, we pull information from the two questions to define our benchmark measure of tax compliance. Specifically, we define a binary variable that takes the value **1** if an individual answers both modalities “*No would never do this*” (modality 1 in Table 1) and “*Wrong and punishable*” (modality 3 in Table 1). All other combinations of answers are assigned the value **0**. As an alternative, we also estimate an ordered logit model based on the following three modalities:

- 2 if the answer is both ‘*wrong and punishable*’ and ‘No, would never do this’;

- 1 if the answer is both '*wrong but understandable*' and no, would if I had the chance';
- 0 if the answer is both '*not wrong at all*' and “yes (once, twice, several times or often).

Table 3 shows data related to this combined measure across the two rounds. We see that about 42% of respondents would never refuse to pay taxes and think that the action is wrong and punishable. This figure represents a significant decline from using only the direct measure of tax compliance of Table 1 (72-73%). In our benchmark regression analysis presented in Section 4 below, these respondents are assumed to represent those who comply with tax payment.

Table 3: Direct and indirect questions (% of total respondents)

Indirect/Direct	Yes	<i>No, would if I had the chance</i>	<i>No, would never do this,</i>	Total
Not wrong at all	1.10	2.67	5.60	9.37
<i>Wrong but understandable</i>	2.99	8.67	24.31	35.97
<i>Wrong and punishable</i>	3.06	9.40	42.20	54.65
Total	7.15	20.75	72.11	100.00

Source: Authors calculation based on data from Afrobarometer

Institutional quality indicators

Institutional variables are identified regarding the literature. Indeed, the possibility of taxpayers to “cheat” is considered as a variable affecting the quality of institutions and has been considered by the literature. It is a binary variable taking the value 1 *if there is difficulty to cheat* and 0 otherwise. When it is difficult to cheat, the ability of the state to collect taxes is stronger and this indicates a good performance in tax collection institutions. Considering the theory of deterrence, the difficulty to fraud causes an increase in the payment of the tax. We therefore expect a positive relationship between these variables and tax compliance.

In addition, variables expressing the quality of education, healthcare, water and electricity services, and quality of maintaining roads and bridges are retained. They take the value 1 *when the quality is good* and 0 otherwise. In accordance with the fiscal exchange theory, higher-quality public services strengthen perceptions of institutional quality and thereby tax compliance. Accordingly, a positive relationship is expected between the quality of public good and tax compliance. We examine a wide range of public goods and services to assess which ones unambiguously support this theoretical prediction.

Variables such as confidence in tax administration, perception of corruption in tax administration, ethnic discrimination are considered. These variables refer to the theory of social interactions. Indeed, confidence in the tax administration would imply an improvement in the quality of institutions. Similarly, when there is absence of corruption and fair ethnic treatment, institutional quality improves, and individuals pay taxes. All these variables are binary variables taking the value 0 and 1 except for confidence which takes three values 0, 1 and 2. We expect a positive sign between these variables and the quality of institutions and therefore between these variables and the tax.

Control variables

Control variables capture the characteristics of individuals that may influence their decision to pay taxes. Referring to Torgler (2003), variables such as gender and education explain the taxpayer behaviour. Education takes ordinal values from 0 to 3, reflecting the lack of formal education to post-secondary level. We also control for other characteristics such housing area (Urban or semi-urban or rural), employment status, wealth (radio, television, car), use of internet, and freedom of speech. Country fixed effects such as GDP per capita and the regional dummies. The definition of all variables used are provided in Appendix 3.

4. Empirical Results

We begin with the main empirical results (Section 4.1). Subsequently, we discuss heterogeneities (Section 4.2) and robustness analyses (Section 4.3).

4.1. Main results

Table 4 reports the estimated odds ratios of the binary and ordinal logit models, in columns 1 and 2, respectively.⁵ In particular, the results indicate that perceptions of corruption, difficulty in evading taxes, the quality of public goods and services (health, education, electricity, water and sanitation, roads and bridges), confidence in the tax administration, and perceptions of ethnic discrimination in government policies significantly explain tax compliance behaviour in SSA. Overall, we find empirical support for the three institutional theories jointly in Sub-

⁵ An odd ratio less than 1 indicates that the effect is negative, while a value greater than 1 implies that the effect is positive

Saharan Africa. The remainder of this section discusses three points: i) specific institutional factors; ii) control variables; and iii) model fit and model comparison.

Specific institutional factors

First, individuals who perceive difficulties in evading taxes are 11.60% and 15.06% more likely to paying taxes (respectively for binary and ordinal logit). This finding is consistent with the *economic deterrence theory*. When credible penalties upon detection are implemented by the public administration, taxpayers adjust their behaviour in anticipating punishments from regulatory institutions and they are more likely to comply with tax obligations. Second, our findings are also consistent with the *fiscal exchange theory*. Individuals who have good perception on how the government handle to provide public goods and services (health, education, roads and bridges) are more likely to comply with tax obligations. For instance, taxpayers who perceive good-quality health services are 15.31% and 15.03% more willing to pay taxes. Similarly, individual who perceive education services as being of good quality are 11.37% and 12.64% more willing to pay taxes. These findings suggest the need to promote the provision of good-quality public services and to communicate their provision to the population.

Contrary to expectations, however, the results indicate a negative effect (odd ratio smaller than 1) on tax compliance when respondents perceive that the government is performing well to improve water and sanitation services. While the provision of public goods would generally foster trust and tax compliance, in some contexts, it may reduce individual's perceived urgency to pay taxes. This situation may occur when citizens believe that certain services are largely financed by external donors or can be privately funded by households. In such cases, citizens may be less inclined to view these services as a justification for tax payments, instead shifting their attention to other perceived government failures or inefficiencies.

Third, in line with the *social interactions theory*, individuals who perceive confidence in the tax administration, absence of corruption and perceptions of no ethnic discrimination in government policies are willing to pay more taxes. In particular, the odds ratios for total confidence (about 49.28%) are much higher than partial confidence (14.70%), suggesting that the stronger public credibility toward the government plays a key role in tax compliance. In addition, individuals who perceive the tax officials as not corrupt and those who perceive no ethnic discrimination are about 19.82% and 22.89% more likely to comply with tax obligations respectively. Overall, the results suggest that social interaction theory mechanisms play a particularly important role in explaining tax compliance, with strong trust in the tax

administration and the absence of ethnic discrimination emerging as especially influencing factors. This finding underscores the pivotal role of government in fostering trust and credibility, which in turn is central to ensuring tax compliance.

Table 4: Quality of institutions and tax compliance

Variables		Dependent: Tax compliance	
		Binary logit	Ordinal logit
Deterrence	Difficulty to cheat	1.1160*** (.0402)	1.1506*** (.0425)
Fiscal exchange			
	Health	1.1531*** (.0351)	1.1503*** (.0331)
	Education	1.1137*** (.0320)	1.1264*** (.0321)
	Water and sanitation provision	.9460** (.0265)	.9415** (.0250)
	Electricity	1.0412 (.0351)	1.0249 (.0343)
	Roads and bridges	1.0976*** (.0341)	1.0918*** (.0331)
Social interactions			
	Partial confidence in tax admin.	1.1470*** (.0402)	1.1722*** (.0396)
	Total confidence in tax admin.	1.4928*** (.0580)	1.5158*** (.0578)
	No Ethnic discrimination	1.2289*** (.0416)	1.2438*** (.0419)
	Less corruption	1.1982*** (.0572)	1.1705*** (.0557)
	Constant	.5034** (.1679)	-
	Controls (others)	Yes	Yes
	Country (GDP)	Yes	Yes
	Regional fixed effects	Yes	Yes
	Round fixed effects	Yes	Yes
	Observations	70,070	70,070
	Number of Countries	29	29
Robust Std. Err. adjusted for 372 clusters in region in parenthesis- ***p<0.01		*p<0.10	**p<0.05

Source: Authors calculation based on data from Afrobarometer

Control variables

The decision to pay taxes is contingent on a number of control variables, which are indicative of the characteristics of the individuals. Results are reported in Appendix 4.1. These variables include age, gender, educational level, wealth, and freedom to say what you think. First, the results demonstrate that the probability of tax compliance increases with age, relative to the 18-25 age group used as the reference category in the empirical model. These findings align with the conclusions of Kirchler et al. (2011) and underscore the necessity for awareness policies to be more effectively targeted towards younger demographics.

Second, women demonstrate a lower propensity to pay taxes in comparison to men. This outcome stands in contrast to the findings of Torgler (2003), who reported that women in Costa Rica demonstrated higher levels of tax compliance than men. Our result could be attributed to the higher participation of women in the informal sector in SSA (Gardner, et al. 2022), which may result in increased tax evasion among this demographic. The implementation of policies aimed at reducing gender inequality could potentially support tax policy objectives.

Third, the results show a positive association between education and tax compliance, but the result is only statistically significant for the post-secondary level. In the same vein, freedom to speech and wealth (television, radio) influence positively tax compliance. However, the area of residence, the employment status, and the use of internet were found to be non-statistically significant in explaining tax payment.

Model Fit and Model Comparison

We conclude this section with likelihood-based model comparison, relying on likelihood ratio (LR) tests and information criteria (AIC, BIC), and we also report log pseudolikelihood values for completeness. All these tools are appropriate for assessing GSEM specifications. Appendices 4.2 et 4.3 report the results. Overall, the results indicate that the benchmark model reported in Table 4 better captures the variation of tax compliance across Sub-Saharan Africa. In particular, the full model in Table 4 outperforms alternative specification in which each institutional variable is omitted one at a time. These findings suggest that the model adequately captures the mechanisms through which the institutional factors help explain tax compliance in the region.

4.2. Heterogeneities

This section presents a heterogeneous analysis based on the country's natural resource abundance status. The sample was stratified according to the 2016 IMF classification of resource-intensive (oil exporters and other resource intensive countries) and non-resource-intensive countries (IMF, regional economic outlook for Sub-Saharan Africa, 2017 report). Resource-rich countries were defined based on the criteria that net oil exports make up at least 30 percent of total exports or non-renewable natural resources represent at least 25 percent of total exports, respectively. Appendix 5 reports information on the resource abundance status for each country. Table 5 reports the empirical results for tax compliance in the respective columns for the two groups of countries.

Overall, the results confirm the positive effect of institutional quality on tax compliance, but there are slight differences in the significance and magnitude of certain variables across the two groups. Three main findings can be derived from Table 5. First, in some cases, the odds ratios are smaller in resource-rich countries. For instance, in the ordinal logit model, estimated odds ratio for total confidence in the tax administration is 2.18 (118%) in non-resource-intensive countries, whereas it is only 1.44 (44%) for resource intensive countries. This stands to reason, as non-resource countries must raise a significant amount of tax revenue to finance public goods, thereby requiring stronger tax administrations. However, this pattern does not hold for the perception of corruption in the tax administration, where the estimated odds ratios are of similar magnitude across the two groups. Second, the odds ratios are slightly higher for the perception of ethnicity discrimination for resource-rich countries. Third, the effect of perception of electricity quality and the provision of water and sanitation are statistically insignificant.

Table 5: Heterogeneities: resource intensive vs non-resource intensive countries

Variables		<i>Resource-intensive</i>		<i>Non-Resource-intensive</i>	
		Binary logit	Ordinal logit	Binary logit	Ordinal logit
Deterrence	Cheat	1.0893* (.0543)	1.1461* (.0864)	1.1533*** (.0564)	1.2923*** (.1150)
	Fiscal exchange				
	Health	1.1094*** (.0411)	1.1213** (.0582)	1.1530*** (.0574)	1.2154*** (.0769)
	Education	1.1000** (.0426)	1.1198* (.0668)	1.1343*** (.0450)	1.2259*** (.0727)
	Water and sanitation provision	.9587 (.0379)	.9434 (.0494)	.9570 (.0373)	.9311 (.0462)
	Electricity	.9868	.9635	1.0698	1.0736

		(.0492)	(.0581)	(.0456)	(.0644)
	Roads and bridges	1.1177**	1.1335**	1.0997**	1.1370**
		(.0505)	(.0614)	(.0471)	(.0709)
Social interactions					
	Partial confidence in tax admin.	1.0981**	1.1420**	1.2263***	1.3884***
		(.0502)	(.0688)	(.0608)	(.0962)
	Total confidence in tax admin.	1.3827***	1.4409***	1.6788***	2.1817***
		(.0740)	(.1576)	(.0852)	(.1915)
	No ethnic discrimination	1.3464***	1.4541***	1.1001***	1.1734***
		(.0603)	(.1803)	(.0477)	(.0735)
	Less Corruption in tax admin.	1.2217***	1.2451**	1.2030***	1.2222**
		(.0899)	(.1299)	(.0718)	(.1067)
	Constant	1.3717	-	1.1001*	-
		(.7590)		(.0477)	
	Controls (others)	Yes	Yes	Yes	Yes
	Country fixed effects (GDP)	Yes	Yes	Yes	Yes
	Round fixed effects	Yes	Yes	Yes	Yes
	Observations	38,686	38,686	31,384	31,384
	Number of Countries	29	29	29	29

Robust Std. Err. adjusted for 213 (resource-rich) or 159 (non-resource rich) clusters in region in parenthesis-
*p<0.10 **p<0.05 ***p<0.01

Source: Authors Calculation based on data from Afrobarometer

4.3. Robustness

This section provides two types of robustness analyses for the benchmark results reported in Sections 4.1 and 4.2.

4.3.1. Tax compliance : direct versus indirect questions

We estimated the GSEM model using alternative definitions of the dependent variable derived separately from the direct and indirect questions. The results are presented in Appendices 6 and 7. We find that the theory of deterrence is supported for both the direct and indirect questions, although the results for the indirect question are not highly statistically significant. The fiscal exchange and the social interaction theories are also supported; however, unexpected results persist for water and sanitation service provision and electricity quality, as already observed in the benchmark estimates. Finally, the results of the heterogeneous analysis are qualitatively similar to those of the benchmark analysis.

4.3.2. Instrumental variable approach

We further assess the robustness of our results by employing an alternative estimation strategy based on a generalized structural equation model with instrumental variables (GSEM-IV). It is plausible that an individual's perception of institutional quality is influenced by the average perception of institutional quality in a region. People are influenced by their social environment, as well as by the prevailing norms and experiences of their community. Accordingly, we use the regional average perception of specific institutional quality—excluding the individual's own perception—as an instrument.⁶ The results reported in Appendix 8 support the validity of the instruments. Moreover, the estimated GSEM-IV odds ratios are broadly consistent with those obtained from the baseline GSEM specification (Table 4). In particular, the findings continue to support deterrence and the social interaction theories. Evidence in favor of the fiscal exchange theory is also found for health, education, and infrastructure. By contrast, the results for water and sanitation provision remain unexpected.

⁶ We thank a referee for this suggestion

5. Conclusion

The behaviour of individuals in their decisions to pay tax is a challenge for Sub-Saharan African countries. This study sought to elucidate the effect of institutional quality on the individuals tax compliance. To this end, an indicator of institutional quality was constructed, which was intended to serve as a latent variable given that the quality of institutions is not directly observable. Using logit regression models, the study employs the generalized structural equations modelling (GSEM) technique, based on data from the Afrobarometer rounds 5 and 6, covering a sample of around 70000 individuals across 29 SSA countries. The analysis shows a positive impact of institutional quality through variables associated with theoretical-founded determinants, including the theory of economic deterrence, fiscal exchange and social interactions.

Specifically, the results show that individuals are more likely to comply with tax obligations when they perceive greater difficulties in evading taxes, have confidence in the tax administration, and view it as less corrupt. Compliance is also higher when respondents do not perceive ethnic discrimination in government policies. Similar patterns of compliance are observed when respondents perceive higher-quality public goods and services, although the results not always consistent for the provision of education, water and sanitation services. A heterogeneous analysis based on the natural resource abundance status of respondents' reveals interesting differences. Overall, these findings suggest the need to promote the provision of high-quality public services and to effectively communicate their delivery to the population. Importantly, improvements in institutional quality will also play a catalytic role in fostering economic development in the region.

Despite controlling for several characteristics and providing detailed robustness analyses, the present study may still be subject to a number of limitations inherent in the subjective nature of the data. Subjective individual responses may be fundamentally disconnected from macroeconomic reality due to perception biases, information asymmetries, and cognitive limitations in how individuals interpret economic conditions. In addition, categorical variables — particularly binary or low-cardinality ordinal measures— may not adequately capture the continuous and multifaceted nature of institutional quality. Future research could integrate multiple data sources, combining survey data with economic indicators and administrative records. Moreover, the use of longitudinal designs could facilitate monitoring the evolution of subjective expectations in relation to actual economic changes.

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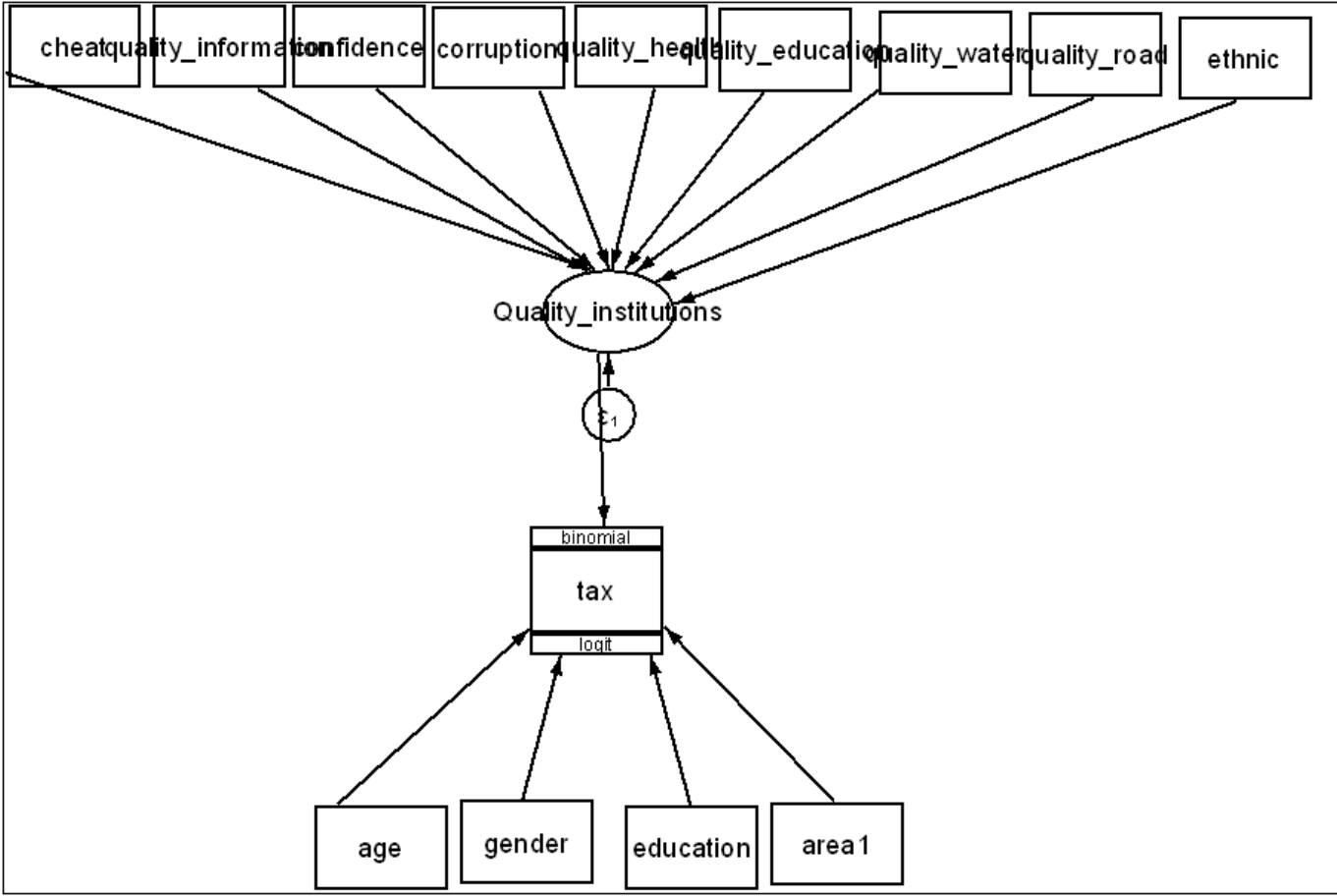
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Appendix 1: Graphic representation of generalized structural equation modelling



Source: Authors calculation

Note: This graph illustrates the structure of the GSEM estimation model. Institutional quality, which is a latent variable, is represented by a circle. This latent variable is explained by variables represented by rectangles with arrows pointing from these variables to the latent variable. The latent variable then explains the variable of interest, which is tax compliance, represented by an arrow pointing from the latent variable to the tax variable. The tax variable is also explained by other observable variables in addition to the latent variable.

Appendix 2: Number of regions per country and number of observations per region

Countries	Number of regions	Number of Obs. (min)	Number of Obs. (max)
Benin	12	57	174
Botswana	24	8	149
Burkina Faso	13	40	187
Burundi	17	32	104
Cameroon	12	39	187
Cape Verde	5	90	365
Cote D'Ivoire	31	6	238
Eswatini	4	199	320
Ghana	10	56	440
Guinea	8	94	196
Kenya	8	98	569
Lesotho	10	26	300
Liberia	15	19	368
Madagascar	22	12	201
Malawi	3	267	961
Mali	10	13	208
Mauritius	10	52	289
Mozambique	11	108	431
Namibia	14	22	224
Niger	7	32	267
Nigeria	34	26	177
Senegal	14	16	288
Sierra Leone	4	230	378
South Africa	9	121	552
Tanzania	30	23	261
Togo	6	103	334
Uganda	5	101	583

Zambia	10	42	194
Zimbabwe	10	97	436

Source: Authors calculation based on data from Afrobarometer

Appendix 3: Definition of variables

Variables	Questions	Definitions
Dependent Variable		
Tax compliance (direct question, binary)	<i>Please tell me whether you, personally, refused to pay a tax or fee to government during the past year. If not, would you do this if you had the chance?</i>	1= No, would never do this, 0= No, would if I had the chance or Yes (once, twice, several times or often)
Tax compliance (Direct question, ordinal)	<i>Please tell me whether you, personally, refused to pay a tax or fee to government during the past year. If not, would you do this if you had the chance?</i>	2= No, would never do this, 1=No, would if I had the chance; 0=Yes, once or twice, several times or often.
Tax compliance (indirect question, binary)	Please tell me whether you think the action is not wrong at all, wrong but understandable or wrong and punishable: not paying the tax they owe on their income.	1= wrong and punishable; 0= not wrong at all, wrong but understandable .
Tax compliance (indirect question, ordinal)	Please tell me whether you think the action is not wrong at all, wrong but understandable or wrong and punishable: not paying the tax they owe on their income.	2= wrong and punishable; 1= wrong but understandable; 0= not wrong at all.
Tax compliance (combination of not wrong at all, wrong but understandable or	(1) Please tell me whether you think the action is	1= Wrong and punishable and No, would never do this; 0= otherwise

direct and wrong and punishable: not paying the tax they
 indirect owe on their income. (2) Please tell me whether
 questions, you, personally,
 binary) refused to pay a tax or fee to government during
 the past year. If not, would you do this if you had
 the chance?

Tax compliance (1) Please tell me whether you think the action is
 (combination of not wrong at all, wrong but understandable or
 direct and wrong and punishable: not paying the tax they
 indirect owe on their income. (2) Please tell me whether
 questions, you, personally,
 ordinal) refused to pay a tax or fee to government during
 the past year. If not, would you do this if you had
 the chance?

2= “Wrong and punishable and no, would never do this”
 1= wrong but understandable and “no but would if I had the chance”
 0=otherwise

Institutional variables

Confidence	How much do you trust the tax department or haven't you heard enough about them to say?	2= A lot (total confidence) ; 1= Just a little or somewhat (partial confidence); 0= Not at all, do not know (no confidence)
quality of health	How well or badly would you say the current government is handling for improving basic health services?	1= very well or fairly well; 0= very badly, fairly badly, do not know or haven't heard enough.

quality of water	How well or badly would you say the current government is handling for improving water and sanitation services?	1= very well or fairly well; 0= very badly, fairly badly, do not know or haven't heard enough.
Quality of maintaining roads and bridges	How well or badly would you say the current government is handling for maintaining roads and bridges	1= very well or fairly well; 0= very badly, fairly badly, do not know or haven't heard enough
Corruption	How many of the tax officials' people do you think are involved in corruption or haven't you heard enough about them to say?	1= none; ; 0= some of them, most of them
cheat	Based on your experience, how easy or difficult to avoid paying the income of property taxes you owe to government?	0= very easy or easy; 1 =difficult, very difficult or do not know.
quality of education	How well or badly would you say the current government is handling for addressing educational needs?	1= very well or fairly well; 0= very badly, fairly badly, do not know or haven't heard enough.
quality of electricity	How well or badly would you say the current government is handling for providing a reliable supply of electricity?	1= very well or fairly well; 0= very badly, fairly badly, do not know or haven't heard enough.
ethnic	In your opinion, how often, in this country are your ethnic group treated unfairly by the government?	1=never or rarely; 0= often, sometimes, always or do not know.
Control variables		
Age group	How old are you?	5=over 65 ; 4=56-65 ; 3=46-55 ; 2=36-45 ; 1=26-35 ; 0=18-25
gender	Respondent's gender	1=female ; 0=male

Education	What is the highest level of education you have completed?	3= post-graduate, university completed, some university, post-secondary qualifications other than university; 2= secondary school/high school completed, some secondary school/ high school completed ; 1= primary school completed, some primary schooling; 0= no formal school, informal schooling only, do not know.
Employment	Do you have a job that pays cash income?	1= Yes; 0=No
Use of internet	How often do you use internet?	1= Every day, a few times a week, a few times a month, less than once a month; 0=Never
Free to say what you think	In this country how free are you to say what you think?	1=Somewhat free or completely free; 0= Not at all free or not very free
Wealth	Which of these things do you personally own?	Radio (1=yes; 0= no); Television (1= yes; 0= No); Car (1=yes; 0= No)
Area	Do you come from rural, semi-urban or urban area?	2=rural; 1=semi-urban ; 0= urban
Country fixed effects	Country's GDP	Log GDP per capita

Regional fixed effects

Regional dummy variables

Dummy variables (Southern Africa,
Northern Africa, East Africa, West
Africa)

Source: Authors Calculation based on data from Afrobarometer

Appendix 4: Additional results for Table 4

Appendix 4.1: Quality of institutions and tax compliance (control variables)

Control variables	Dependent: tax compliance	
	Binary logit	Ordinal logit
Age 26-35	1.0598** (.0260)	1.0461* (.0243)
Age 36-45	1.1489*** (.0339)	1.1253*** (.0321)
Age 46-55	1.2545*** (.0395)	1.2238*** (.0379)
Age 56-65	1.4839*** (.0558)	1.4613*** (.0529)
Age over 66	1.4255*** (.0674)	1.4129*** (.0628)
Semi-Urban	.8959 (.1129)	.9180 (.1033)
Rural	1.0012 (.0449)	.9969 (.0430)
Female	.9707* (.0154)	.9837 (.0153)
Primary education	.9319 (.0406)	.9539 (.0415)
Secondary education	1.0235 (.0489)	1.0626 (.0497)
Post-secondary education	1.2704*** (.0718)	1.3188*** (.0737)
Employment	1.0351 (.0384)	1.0280 (.0368)
Free to say what you think	1.2454*** (.0643)	1.2752*** (.0647)
Use of internet	1.0071 (.0329)	.9781 (.0308)
Radio	1.0484* (.0290)	1.0319 (.0278)
Television	1.0763* (.0387)	1.0813** (.0374)
Car	.9213 (.0400)	.9867 (.0388)

Source: Authors calculation based on data from Afrobarometer

Appendix 4.2: Log-likelihood, AIC and BIC

	Log pseudolikelihood	AIC	BIC
Full model (Table 4)	-46577.93	93221.87	93524.06

Model excluding all institutional variables	-47213.39	94472.78	94683.44
Model excluding only deterrence variable	-46598.54	93261.07	93554.11
Model excluding only fiscal exchange variables	-46793.66	93643.32	93899.77
Model excluding only social interaction variables	-46883.59	93825.17	94090.73
Excluding water and sanitation	-46602.35	93268.71	93561.75
Excluding education	-46606.79	93277.59	93570.63
Excluding electricity	-46595.36	93254.72	93547.76
Excluding health	-46611.87	93287.75	93580.78
Excluding Roads and bridges	-46601.46	93266.92	93559.96

Source: Authors calculation based on data from Afrobarometer

Appendix 4.3: Likelihood Ratio Test

	LR chi2	Prob > chi2
Full model vs excluding all institutional variables	chi2(10)= 1104.92	0.0000
Full model vs excluding only deterrence variable	chi2(1)= 36.06	0.0000
Full model vs excluding only fiscal exchange variables	chi2(5) = 270.76	0.0000
Full model vs excluding only social interaction variables	chi2(4) 611.31	0.0000
Full model vs excluding water and sanitation	chi2(1) = 8.86	0.0029
Full model vs excluding Education	chi2(1) = 28.44	0.0000
Full model vs excluding Electricity	chi2(1) = 4.36	0.0369
Full model vs excluding Health	chi2(1) = 51.23	0.0000
Full model vs excluding Roads and bridges	chi2(1) = 30.39	0.0000

Source: Authors calculation based on data from Afrobarometer

Appendix 5: Countries and resource abundance status definition

Countries	Observations round 5	Observations round 6	Resource-intensive countries (2016)
Benin	1,058	1,116	
Botswana	1,133	1,126	Yes
Burkina Faso	1,158	1,130	Yes
Burundi	1,155	1,178	
Cameroon	1,169	1,127	Yes
Cape Verde	1,175	1,167	
Cote D'Ivoire	1,175	1,095	
Ghana	2,351	2,308	Yes
Guinea	1,154	1,118	Yes
Kenya	2,310	2,377	
Lesotho	1,098	1,170	
Liberia	1,146	1,115	Yes
Madagascar	1,138	1,121	
Malawi	2,231	2,226	
Mali	1,161	1,176	Yes
Mauritius	1,102	1,032	
Mozambique	2,183	2,173	
Namibia	865	982	Yes
Niger	1,154	1,084	Yes
Nigeria	2,279	2,320	Yes
Senegal	1,182	1,064	
Sierra Leone	1,138	1,112	Yes
South Africa	2,205	2,224	Yes
Eswatini (Swaziland)	1,155	1,127	
Tanzania	2,294	2,349	Yes
Togo	1,184	1,166	
Uganda	2,254	2,292	
Zambia	1,099	1,083	Yes
Zimbabwe	2,251	2,311	Yes
Total	42,957	42,869	

Source: Authors calculation based on data from Afrobarometer

Appendix 6: Quality of institutions and tax compliance (direct question)

Appendix 6.1: Overall results with direct question

		Dependent: tax compliance	
	Variables	Binary logit	Ordinal logit
Deterrence	Difficult to Cheat	1.2426*** (.0549)	1.2948*** (.0697)
<hr/>			
Fiscal exchange	Health	1.1438*** (.0400)	1.1919*** (.0473)
	Education	1.1455*** (.0441)	1.1739*** (.0533)
	Water and sanitation provision	.9129** (.0345)	.8858*** (.0380)
	Electricity	.9415 (.0411)	.9178* (.0450)
	Roads and bridges	1.0739* (.0411)	1.0443 (.0456)
<hr/>			
Social interactions	Partial confidence in tax admin.	1.1346*** (.0445)	1.1255*** (.0494)
	Total confidence in tax admin.	1.2859*** (.0588)	1.3265*** (.0711)
	No ethnic discrimination	1.3425*** (.0616)	1.4704*** (.0798)
	Less Corruption in tax admin	1.1369** (.0643)	1.1668** (.0750)
	Constant	1.8471 (.8360)	-
<hr/>			
Control variables	Controls (others)	Yes	Yes
	Country fixed effects (GDP)	Yes	Yes
	Regional fixed effects	Yes	Yes
	Round fixed effects	Yes	Yes
<hr/>			
	Observations	70,070	70,070
<hr/>			
	Number of countries	29	29

Robust Std. Err. adjusted for 372 clusters in Region in parenthesis-
*p<0.10 **p<0.05 ***p<0.01

Source: Authors calculation based on data from Afrobarometer

Appendix 6.2: Heterogeneities with direct question

		Dependent: tax compliance			
Variables		Resource-intensive countries		Non-Resource-intensive countries	
		Binary logit	Ordinal logit	Binary logit	Ordinal logit
Deterrence	Difficulty cheat	1.1896*** (.0599)	1.2113** (.1030)	1.2017*** (.0643)	1.12200*** (.0731)
Fiscal exchange					
	Health	1.0580 (.0461)	1.0598 (.0478)	1.1255*** (.0460)	1.1288*** (.0446)
	Education	1.0574 (.0476)	1.0687 (.0581)	1.1742*** (.0546)	1.1757*** (.0545)
	Water and sanitation provision	.9270* (.0384)	.9174* (.0462)	.9487 (.0417)	.9475*** (.0410)
	Electricity	.9100* (.0479)	.9027 (.0602)	.9479 (.0405)	.9514 (.0405)
	Roads and bridges	1.0815* (.0483)	1.0708 (.0478)	1.0718 (.0526)	1.0690 (.0529)
Social interactions					
	Partial confidence in tax admin.	1.0860** (.0438)	1.0801* (.0489)	1.1493*** (.0542)	1.1430*** (.0549)
	Total confidence in tax admin.	1.1294** (.0602)	1.1222* (.0688)	1.4034*** (.0643)	1.3956*** (.0635)
	No ethnic discrimination	1.4533*** (.0727)	1.4645*** (.1679)	1.1402*** (.0537)	1.1582*** (.0552)
	Less Corruption in tax admin	1.1375* (.0852)	1.1392* (.0893)	1.1206 (.0693)	1.1031 (.0697)
	Constant	1.3460 (.8294)	-	.2552*** (.0958)	-
	Controls (others)	Yes	Yes	Yes	Yes
	Country fixed effects (GDP)	Yes	Yes	Yes	Yes
	Round fixed effects	Yes	Yes	Yes	Yes
	Observations	38,686	38,686	31,384	31,384
	Number of countries	29	29	29	29

Robust Std. Err. adjusted for 213 (resource-rich) or 159 (non-resource rich) clusters in region in parenthesis- *p<0.10 **p<0.05 ***p<0.01

Source: Authors calculation based on data from Afrobarometer

Appendix 7: Quality of institutions and tax compliance (indirect question)

Appendix 7.1: Overall results with indirect question

Variables		Dependent: Tax compliance	
		Binary logit	Ordinal logit
Deterrence	Difficulty to cheat	1.0511 (.0375)	1.1021* (.0554)
Fiscal exchange			
	Health	1.1095*** (.0329)	1.1435*** (.0455)
	Education	1.0675** (.0295)	1.1197*** (.0429)
	Water and sanitation provision	.9730 (.0269)	.9532 (.0354)
	Electricity	1.0795** (.0333)	1.0933** (.0485)
	Roads and bridges	1.0933*** (.0344)	1.1239*** (.0459)
Social interactions			
	Partial confidence in tax admin.	1.1411*** (.0386)	1.3148*** (.0652)
	Total confidence in tax admin.	1.5811*** (.0643)	1.9436*** (.1254)
	No Ethnic discrimination	1.1157*** (.0390)	1.1536*** (.0595)
	Less corruption in tax admin.	1.1795*** (.0540)	1.1191 (.0769)
	Constant	1.0857 (.3285)	-
	Controls (others)	Yes	Yes
	Country fixed effects (GDP)	Yes	Yes
	Regional fixed effects	Yes	Yes
	Round fixed effects	Yes	Yes
	Observations	70,070	70,070
	Number of countries	29	29
Robust Std. Err. adjusted for 372 clusters in region in parenthesis-		*p<0.10	**p<0.05 ***p<0.01

Source: Authors calculation based on data from Afrobarometer

Appendix 7.2: Heterogeneities with indirect question

			Dependent: tax compliance			
Variables			Resource-intensive countries		Non-Resource-intensive countries	
			Binary logit	Ordinal logit	Binary logit	Ordinal logit
Deterrence	Difficulty to cheat		1.0267 (.0493)	1.0341 (.0488)	1.1056* (.0589)	1.1869** (.0910)
Fiscal exchange	Health		1.0913** (.0415)	1.0858** (.0402)	1.1092** (.0522)	1.1444** (.0745)
	Education		1.0837** (.0428)	1.0800** (.0414)	1.0732* (.0406)	1.1507*** (.0599)
	Water sanitation provision	and	.9875 (.0385)	.9895 (.0374)	.9690 (.0376)	.9407 (.0498)
	Electricity		1.0456* (.0491)	1.0371 (.0476)	1.1037** (.0456)	1.1361* (.0760)
	Roads bridges	and	1.1026** (.0475)	1.1032** (.0460)	1.1019** (.0501)	1.1297** (.0675)
Social interactions	Partial confidence in tax admin.		1.1186** (.0542)	1.1621*** (.0565)	1.1727*** (.0536)	1.3988*** (.0944)
	Total confidence in tax admin.		1.5375*** (.0908)	1.5566*** (.0930)	1.6502*** (.0898)	2.0945*** (.1995)
	No ethnic discrimination		1.1668*** (.0536)	1.1686*** (.0531)	1.0443 (.0451)	1.0229 (.0664)
	Less Corruption in tax admin		1.2010*** (.0782)	1.1566** (.0779)	1.1785*** (.0728)	1.0842 (.1064)
	Constant		1.2411 (.6879)	-	.3822*** (.1300)	-
	Controls		Yes	Yes	Yes	Yes
	Country fixed effects (GDP)	fixed	Yes	Yes	Yes	Yes
	Round fixed effects	fixed	Yes	Yes	Yes	Yes
	Observations		38,686	38,686	31,384	31,384
	Number of countries		29	29	29	29

Robust Std. Err. adjusted for 213 (resource-rich) or 159 (non-resource rich) clusters in region in parenthesis-
*p<0.10 **p<0.05 ***p<0.01

Source: Authors calculation based on data from Afrobarometer

Appendix 8: Robustness results with IV-GSEM estimation

Variables	Dependent: Tax compliance	
	binary variable	ordinal variable
Deterrence Difficulty to cheat	1.0855*** (.0203)	1.1138*** (.0199)
Fiscal exchange		
Health	1.1055*** (.0224)	1.1029*** (.0213)
Education	1.1230*** (.0232)	1.1290*** (.0222)
Water and sanitation provision	.9657* (.0184)	.9623** (.0174)
Electricity	.9884 (.0198)	.9768 (.0188)
Roads and bridges	1.0734*** (.0205)	1.0681*** (.0195)
Social interactions		
Confidence in tax admin.	1.2011*** (.0151)	1.2123*** (.0146)
No Ethnic discrimination	1.2142*** (.0215)	1.2365*** (.0209)
Less corruption	1.1490*** (.0295)	1.1190*** (.0279)
Constant	.2702*** (.0425)	-
Controls (others)	Yes	Yes
Country (GDP)	Yes	Yes
Regional fixed effects	Yes	Yes
Round fixed effects	Yes	Yes
Validity of instruments	75.2528	75.2528
Minimum eigenvalue statistic		
Wald test of exogeneity	chi2(9) = 614.48 Prob > chi2 = 0.0000	chi2(9) = 614.48 Prob > chi2 = 0.0000
Test of endogeneity		
Robust score	chi2(10)= 507.182 (p = 0.0000)	chi2(10)= 579.738 (p = 0.0000)
Robust regression	F(10,70027)= 51.8857; (p= 0.0000)	F(10,70027)= 59.6806; (p= 0.0000)
Observations	70,070	70,070
Number of countries	29	29
Std. Err. in parenthesis- *p<0.10 **p<0.05 ***p<0.01		

Source: Authors calculation based on data from Afrobarometer