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Citizens' Perception of Tax Authorities and Tax Efficiency in Africa

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ABSTRACT

This paper examines the relationship between citizens' perceptions of tax authorities and the governments' efficiency in collecting VAT and CIT revenues in Africa. Drawing on data from 32 countries over 2014-2019, we find a negative and significant association between negative perceptions of trust in authorities (the tax department) from the Afrobarometer survey and tax efficiency for these revenue categories. A 1 percent increase in the share of citizens' perception of little or no trust in the tax department leads to a 0.22 percent decrease in VAT tax efficiency, controlling for macroeconomic indicators. The magnitude of the effect is significantly greater in fragile compared to non-fragile states. For corporate income tax productivity focusing on tax payments of corporates we find a significant effect only in fragile states. Perceptions about corruption in tax authorities have a similar effect on VAT and CIT tax efficiency since perceptions about trust and corruption capture the tendency to misappropriate revenues but we are unable to distinguish the two effects except for fragile states. Our findings suggest that in the face of fragility, policies aimed at improving fiscal capacity should place a high importance on ensuring that citizens believe resources will be used properly, an aspect of tax policy not typically prioritized.

JEL Classification Numbers: H21, H25, H26

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Keywords:	Trust in authorities; fragility; tax efficiency; Africa

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WORKING PAPERS

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Prepared by Telma Yamou, Alun Thomas, and Kaihao Cai[1]

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1. Introduction

Fiscal capacity is essential for economic development. However, several countries in Africa face great challenges in generating tax revenues. This leads to a large gap between the amount they could collect based on the existing tax structure and what they actually collect (Mascagni et al., 2014 and Besley and Mueller, 2021).

To help countries improve mobilization of own-revenuesemphasis is placed on technical aspects of tax policies (Fjeldstad, 2014 and Basley and Mueller, 2021). For instance, technical assistance is often provided on reforming tax laws, simplifying tax structures, widening the tax base, and increasing tax rates. When it comes to fragile and conflict-affected settings (referred to in this paper as fragile states)[1], the political economy of taxation (e.g., the perception of trust in tax authorities to safeguard resources) may be as important as technical advice. For example Estevao et al. (2022) note that "..the willingness to pay taxes and support reform is higher when trust in the state is strong". Indeed, with many hard-to-tax informal sectors in Africa, enhancing voluntary tax compliance becomes imperative (Boly et al., 2021).

In this paper, we examine the relationship between citizens' perceptions of trust in the tax authority and governments' efficiency in collecting value-added tax (VAT) and CIT (corporate income tax) in Africa using a panel of 32 and 24 countries respectively for the period 2014-2019.[2] We chose Africa as the region for our case study because it has the lowest average VAT efficiency (i.e., VAT C-efficiency ratio – ratio of actual VAT revenues to potential revenues) and CIT Productivity according to data from IMF's Fiscal Affairs Department (FAD) for the period 2000-2021.[3] Taxes on goods and services are the main source of tax revenues among African countries, supporting our choice of analyzing VAT tax collection. They accounted for 52 percent of tax revenues in 2021, twenty percent higher than the share for OECD countries. Corporate taxes are also an important component of tax revenues in Africa, accounting for 19 percent of tax revenues, compared to only 9 percent of tax revenues for OECD countries (Figure 1).

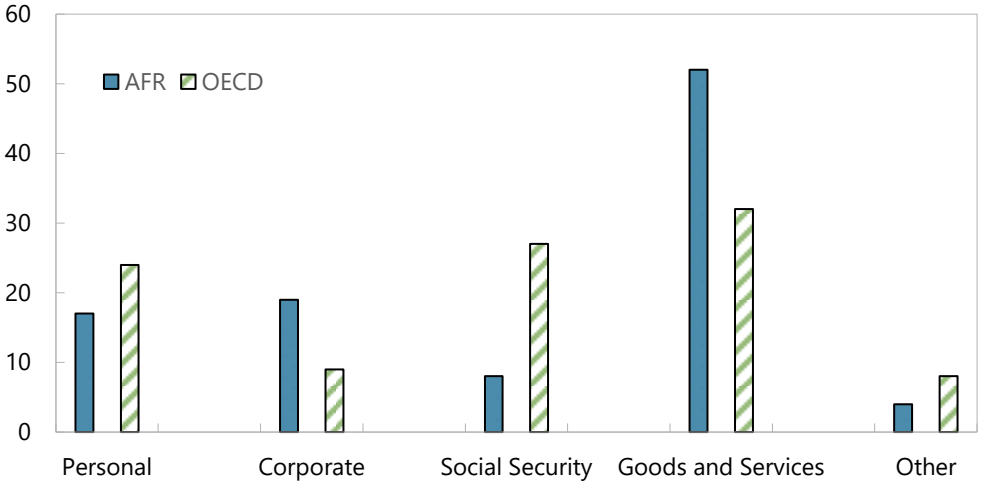
[1] According to the World Bank's Classification of Fragile and Conflict-Affected Situations (2023), a fragile state is one characterized by an extremely low level of institutional and governance capacity which significantly impedes the state's ability to function effectively, maintain peace and foster economic and social development. A country is conflict-affected if it is in a situation of acute insecurity driven by the use of deadly force by a group with a political purpose or motivation.

[2] It would have been interesting to consider the effect of lack of trust on the efficiency of personal income tax (PIT) payments but this data is not available.

[3] Hutton, Eric, 2017, "The Revenue Administration – Gap Analysis Program: Model and Methodology for Value-Added Tax Gap Estimation", IMF Technical Notes and Manuals.

Figure 1. Components of Tax Revenue OECD vs African Countries

(in share of total tax revenues in 2021)



Source: Components of Tax Revenue in 2021: OECD vs African Countries (OECD Revenue Statistics in Africa 2023)

Since we are concerned with the behavioral aspect of the payment of tax, we decided to use the concept of tax efficiency rather than the revenue ratio as our tax handle. Our hypothesis is that when more citizens perceive that the government will use resources effectively for public welfare, this would lead to higher tax compliance reflected in a higher tax efficiency value. We also test the hypothesis that the effect is stronger in fragile states since it has been argued that limited trust in authorities is a symptom of fragile economies (International Growth Center (IGC), 2018 in Besley and Mueller, 2021). The choice of the concept of tax efficiency versus the actual tax to GDP ratio is also motivated by the concern that GDP is highly correlated with many of the macroeconomic controls that we use in the paper including GDP per capita (see below).

Our regression results support these hypotheses. We measure the perception of trust in national tax authorities from the Afrobarometer survey as the response to the question whether "the individual trusts the tax department a little or not at all". We then regress VAT C-efficiency and the CIT efficiency on this lack of trust variable controlling for a few macroeconomic variables. We find a negative and significant association between the lower values of the perceptions of trust variable and VAT C-efficiency ratio (henceforth as VAT efficiency). Specifically, a 1 percent increase in the share of citizens' perception of little or no trust in the tax department is associated with a 0.22 percent decrease in VAT efficiency, ceteris paribus. Moreover, the effect appears significantly greater in fragile than non-fragile states. Similarly, there is also a significant negative association between the perception of lack of trust in the tax authority and CIT efficiency (productivity) for fragile state countries. A 1 percent increase in the

share of citizens' perception of little or no trust in the tax department is associated with a 1 percent decrease in CIT efficiency for fragile state countries.

The literature on the determinants of tax revenues has pointed to factors such as a country's trade openness, share of agriculture in GDP, GDP per capita, control of corruption (e.g., Sarmento, 2016; Castro and Camarillo, 2014), tax rate, tax base (Amaglobeli et al., 2022 and Sarmento, 2016), and tax administration capacity (Chang et al., 2020). These studies have shown that a higher tax rate (in advanced and emerging economies), GDP per capita, broader tax base, and improved tax administration are associated with a higher amount of tax revenue or higher tax revenue as a percent of GDP. On the other hand, a higher share of agriculture in GDP (indicative of a larger informal sector) and a higher level of perceived corruption both reduce tax revenues. Trade openness can have either a positive or negative effect: trade could present more opportunities for collecting taxes or an open economy has lower trade tariffs that could negatively affect tax collection. Addison and Levin (2012) found a positive and significant effect of trade in SSA.

There are few studies that specifically look at tax efficiency. For instance, Cevik et al. (2019) examined the effect of structural transformation – as measured by an increase in the share of services value-added in GDP – on VAT efficiency. Controlling for country and time fixed effects in their panel regression, the study estimated a 3.3% decrease in the VAT efficiency for a 10% increase in the share of services. This finding was attributed to the fact that services tend to benefit more from tax exemptions and is often subject to reduced VAT rates. Further analysis revealed that the effect is significantly higher in advanced compared to developing economies. A more recent study (Kitsios, 2022) explored the effect of government digitalization on VAT efficiency and CIT productivity, with a focus on Bangladesh. Results showed that countries with more digitalized government services tend to be significantly more efficient in collecting taxes.

We are not aware of any study that examines the association between perceptions of trust in tax authorities and VAT/CIT efficiency, even though previous papers have emphasized that this type of relationship may exist based on the notion of a social contract between the citizen and the tax authorities (Slemrod, 2003). Much of the related literature on perceived trust/corruption has studied its effect on intended tax payment behavior or on tax revenue to GDP ratio. For example, Boly et al. (2021) investigated the causal effect of perceived corruption on attitude towards paying taxes, using the Afrobarometer survey with thirty-six African countries for the period 2011-2015. Findings from their IV estimation revealed that when citizens perceive that at least some (relative to none) of the officials in the president's/prime minister's office are corrupt, they are more likely to report that they denied paying taxes in the past year. They are also less likelyto agree that tax authorities have the right to make people pay taxes. Using data from the World Value Survey from 2010 to 2014, Kouame (2021) examined the causal effect of trust in public institutions and respondents' neighborhood on individual tax

morale in four African countries. The study measured tax morale using the responses to a question that asked respondents if cheating on tax can always be justified, never be justified, or something in between. Results revealed that higher levels of perceptions of trust in public institutions and respondents' neighborhood are associated with more positive attitudes towards taxes. Gebrihet et al. (2023) explored the relationship between trust in authorities and tax compliance in fragile states in Africa using data from Afrobarometer survey round seven. Tax compliance was captured based on whether respondents agree or disagree to a statement regarding whether people must pay taxes. Respondents who trust authorities (the ruling party and electoral commission) were shown to have a greater likelihood of complying with tax obligations, and perceived corruption exacerbates the negative effect of distrust on compliance. Similar qualitative results were reported in Besley and Mueller (2021), Batrancea et al. (2019), Anderson (2017), and Wahl et al. (2010). These studies found a positive relationship between high trust in authorities and willingness to pay taxes. Moreover, Ouedraogo and Sy (2022) document a negative relationship between digitalization and the lack of trust in the tax authority using similar Afrobarometer data.

Regarding studies on perceptions of corruption and tax revenues to GDP ratio, Baum et al. (2017) examined its effect (using the Transparency International's Corruption Perception Index and the World Bank's Control of Corruption Index) on tax revenues (in percent of GDP) using a dataset of 147 countries spanning the years 1995-2014. Results revealed that corruption is negatively associated with overall tax revenues and with most tax components (e.g., PIT and VAT. Thornton (2008) equally finds a negative and significant effect of corruption on overall tax revenues but the effect on PIT and CIT is not significant.

This study examines the effect of perceptions of trust in tax authorities on VAT efficiency and CIT productivity to capture the behavioural aspect of tax payment and this specification avoids the multicollinearity problem of using GDP as a dependent and explanatory variable via the tax ratio and GDP per capita. Supporting our priors, we find that perceptions of trust in the tax authority is a significant determinant of VAT and corporate tax efficiency after controlling for the macroeconomic indicators previously used in the literature.

The remainder of the report is structured as follows. Section 2 describes the data sources, Section 3 includes our econometric specification, and the results are reported and discussed in section 4. Section 5 concludes with the policy implications of the findings.

2. Data

To examine the association between lack of trust in the tax department and VAT and CIT efficiency, a panel dataset is constructed using data from five sources which we summarize in Table 1.

First, we obtained data on perceptions of trust in the tax department (our independent variable of interest) from the Afrobarometer survey. The Afrobarometer is a non-profit organization that collects and analyzes high-quality survey data on African attitudes, experiences, and aspirations. It is a nationally representative survey on African countries which captures citizens' views on economic, social, and political issues. The data collection process involves face-to-face interviews with a randomly selected sample of 1,200-2,400 adult citizens in each country and the survey asks consistent questions across countries in each wave/round. We targeted three survey rounds (rounds 6, 7, and 8).The "trust in tax department" variable was constructed from one question which did not appear in round 7, generating missing observations for years associated with round 7 for this variable. Respondents were asked: "*how much do you trust each of the following, or haven't you heard enough about them to say?"* Several authorities were listed, but we were interested in the tax department - the unit directly in charge of tax collection. There were five possible options to choose from: *"not at all", "just a little", "somewhat", "a lot",* and *"don't know/haven't heard (DNR)"*. We coded DNR responses and those who refused to answer as missing (Appendix I shows the number of respondents in each survey round for each country). In constructing our variable, we used the share of respondents who said they trust *"not at all"* or *"just a little"*. We computed this share for each country and in each survey round, resulting in an unbalanced panel of 39 countries for the period 2014-2019. The time (year) variable for this panel was created using the exact year fieldwork was conducted in a country and wave. For instance, round 6 survey was conducted during the period 2014-2015, but we used the year 2015 for a country like Cameroon because this was when fieldwork in Cameroon was undertaken. However, for round 8, we used the year 2019 for all countries regardless of the exact date fieldwork was conducted. This was because data on our outcomes variable after 2019 is limited.

Table 1: Variables and Data Source

Variables	Description	Data Source
Lack of trust in tax department	Share of citizens with little or no trust in tax department	Afrobarometer Survey
VAT Efficiency	Ratio of actual VAT revenues to the product of the standard VAT rate and final consumption	FAD at IMF
CIT Productivity	Ratio of CIT revenues (as percent of GDP) to the CIT rate	FAD at IMF
GDP per capita	Expressed in current international dollar and converted by PPP conversion factor	World Bank
Agriculture	Share of agriculture value-added in GDP (in percentage)	World Bank
Informality	Share of informal sector in GDP (in percentage)	Medina and Schneider (2018)
Trade	Sum of imports and exports as a share of GDP (in percentage)	World Bank
Online Service Index	Captures scope and quality of public sector online services. Value between 0 and 1	UN e-government survey
Human Capital Index	Proxy for digital literacy. Values between 0 and 1	UN e-government survey
Government Effectiveness Index	Measure of institutional quality. Ranges from -2.5 to 2.5	World Bank

Second, annual data on VAT efficiency (the dependent variable) was sourced from the FAD Department at the IMF. The variable is defined as the ratio of actual VAT revenues to the product of the standard VAT rate and final consumption.

Third, we used many macroeconomic controls informed by the literature. Four controls were taken from the World Bank's database: annual data on GDP per capita expressed in current international dollars and converted by the purchasing power parity (PPP) conversion factor; government effectiveness[4]; trade (sum of import and exports of goods and services) as a share of GDP proxying trade openness; and the share of agriculture in GDP.

[4] Government effectiveness captures "perceptions of the quality of public services, quality of civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies." The value ranges from -2.5 to 2.5.

Fourth, data on the share of the informal sector in GDP was obtained from Medina and Schneider (2018) and captures the size of the informal sector. Since the data ended in 2017, we used a two-year lag to address the missing variable issue since informality moves slowly over time (correlation between the years 2012 and 2014 is 0.990 and between 2013 and 2015 is 0.983).

Fifth, annual data on the other two controls were obtained from the United Nation's e-government development database. Similar to Kitsios (2022), we used the online service index to reflect the extent of digitalization of government operations. This index captures the scope and quality of public sector online services. In addition, we used the human capital index which is computed using four components – adult literacy rate, gross enrolment ratio, expected years of schooling and average years of schooling. The index is used as a proxy for digital literacy (similar to Kitsios, 2022) with the assumption that more educated persons tend to better utilize online services and better understand online information. The two indices take a value between 0 and 1.

We merged the VAT efficiency and controls with the survey data on lack of trust and arrived at an unbalanced panel of 32 countries[5] between 2014 and 2019. We moved from 39 to 32 countries because seven countries had no data on VAT efficiency and so were dropped. We had a subset of countries (24) with data on CIT efficiency which we used for the CIT analysis. Since the controls span the years 2014-2019 while the lack of trust variable covers 2014/2015 and 2019 (due to the absence of the variable in Afrobarometer survey round 7 as explained earlier), we dropped all observations associated with the years 2016-2018.

3. Econometric Specification

To examine the link between citizens' lack of trust in the tax department and governments' efficiency in generating tax revenues, we estimate the following linear regression model:

$$VATEff_{it} = \beta_0 + \beta_1 lack\_trust_{it} + \beta_2 GDP_{it} + \beta_3 Agr_{it} + \beta_4 informality_{it} + \beta_5 trade_{it} + \beta_6 OSI_{it} + \beta_7 HCI_{it} + \beta_8 GovEff_{it} + \varepsilon_{it}$$

where $VATEff_{it}$ is the log of the VAT efficiency for country i at time t, *lack_trust* is the log of the share of citizens with little or no trust in the tax department, chosen to reflect those citizens who do not trust the tax department, *GDP* is the log of GDP per capita, *informality* is the log of the

[5] The countries include – Benin, Botswana, Cape Verde, Cote d'Ivoire, Egypt, Eswatini, Gabon, Ghana, Guinea, Kenya, Lesotho, Madagascar, Malawi, Mauritius, Morocco, Namibia, Senegal, Sierra Leone, South Africa, Tanzania, The Gambia, Togo, Tunisia, Uganda, Zambia, Burkina Faso, Burundi, Cameroon, Ethiopia, Mali, Mozambique, and Nigeria. The last seven are fragile states following the World Bank's Classification of Fragile and Conflict-Affected Situations.

share of the informal sector in GDP, *Agr* is the log of the share of agriculture in GDP, *trade* is log of trade as a share of GDP (trade openness), *OSI* is the log of the online service index, *HCI* is the log of the human capital index, *GovEff* is the log of government effectiveness which was transformed (before taking the log) by multiplying the index by 20 and adding 51 so that the least possible value is 1 (recall that the index takes a value between -2.5 and 2.5), ε_{it} is the error term assumed to be independently and identically distributed, and β_0 to β_8 are the coefficients to be estimated. We use the log specification so that we can easily discuss the results in terms of elasticities. The macroeconomic variables chosen as controls are those previously used in the literature but they are subject to multicollinearity (see Appendix II). [6] The same regressors are used for the effect of lack of trust on CIT efficiency.

Our a priori expectations are as follows. We expect *lack_trust* to have a negative coefficient. When more citizens perceive that the tax department is less trustworthy, it can lead to less willingness to pay taxes and hence reduces VAT efficiency. As a proxy for a country's level of development, *GDP* is expected to be positive. With an increase in development, a country's formal sector could expand making taxes easier to collect. In addition, consumption of goods and services can increase including those that are subject to the standard VAT rate. Next, we expect *Agr* to be negative given that the agricultural sector tends to benefit from a policy of lower taxes in the African region to assist low-income farmers. We anticipate *informality* would have a negative sign. A larger informal sector reduces actual revenues relative to their potential since the informal sector is difficult to tax, and more informal sectors could mean fewer corporations which could affect the CIT base. The variable *trade* is expected to be positive. Being more open to trade could mean a better application of the VAT applied on imports. In addition, a country's competitiveness and formality could improve (including via more firms investing due to more favourable trade policies), presenting more possibilities for tax collection. The scope and quality of public sector online services (*OSI*) is expected to have a positive effect. Having information online (including tax-related info) which is readily accessible and easy to understand can enhance tax compliance by simplifying tax procedures. Digitalization can also improve government's efficiency in implementing its tax policies by facilitating the processing of relevant information. Finally, *HCI* and government effectiveness (*GovEff*) are expected to be positive.

4. Results

4.1 Summary Statistics

[6] The correlation signs are intuitive although some are weaker than expected (e.g. lack of trust and government effectiveness)

Table 2 presents the summary statistics of all our variables in their original form (not log-transformed). We report the statistics for the VAT efficiency, CIT Productivity and lack of trust for the full sample and for fragile vs non-fragile states.

Table 2: Summary Statistics

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
VAT Efficiency					
Full sample	53	0.366	0.156	0.081	0.691
Fragile states	11	0.337	0.133	0.146	0.514
Non-fragile states	42	0.374	0.161	0.081	0.691
CIT Productivity					
Full sample	38	0.723	0.387	0.205	1.743
Fragile states	8	0.882	0.538	0.324	1.743
Non-fragile states	30	0.680	0.336	0.205	1.348
Lack of *Trust in tax department*					
Full sample	53	0.517	0.119	0.146	0.723
Fragile states	11	0.547	0.118	0.423	0.723
Non-fragile states	42	0.509	0.119	0.146	0.696
Controls					
GDP per capita	53	5,953	5,261	729	24,681
Share of agriculture in GDP (%)	53	17.29	12.40	1.82	58.76
Share of informal sector in GDP (%)	53	33.07	7.62	17.77	53.81
Share of trade in GDP (%)	51	68.14	24.83	21.33	125.89
Online Service Index	53	0.36	0.21	0	0.83
Human Capital Index	53	0.48	0.15	0.16	0.73
Government Effectiveness Index	53	-0.49	0.54	-1.30	1.16

Source: Authors' calculation based on data from Afrobarometer survey, IMF FAD, World Bank, Medina and Schneider (2018), and UN e-government survey.

As shown in Table 2, the average VAT efficiency is about 0.37. When we compare fragile and non-fragile states, we see that the ratio is higher in non-fragile states (0.37 vs 0.34). The mean CIT Productivity is 0.72 and the value is surprisingly higher for fragile relative to non-fragile states. Regarding lack of trust in the tax authority, the mean share of citizens with little or no trust is about 0.52 (or 52 percent). The share is higher for fragile (0.55) relative to non-fragile states (0.51), and the maximum value (0.72) is for Nigeria (a fragile state). In the same light, the minimum share of citizens with little or no trust in the tax authority in fragile states is about three times that of non-fragile countries. This statistic is consistent with the fact that a low level of trust in institutions is a characteristic of fragile economies, as indicated earlier in the paper. Turning to the controls, government effectiveness is quite low (mean value of -0.49). The mean online service index (0.36) and human capital index (0.48) are below 0.5, though their maximum

values are quite high. Finally, countries seem highly open to trade (mean share of trade in GDP is 68 percent) and have large agricultural (17.29 percent of GDP) and informal sectors (33.1 percent of GDP).

4.2. Regression Results of Main specification

Table 3 reports our linear regression results. Column I shows that lack of trust in the tax department has a negative and significant effect on VAT efficiency. A one percent increase in the proportion of citizens with little or no trust in the tax department is associated with a 0.22 percent decrease in governments' efficiency in generating VAT revenues, ceteris paribus. When more citizens lack trust in tax authorities, they are less likely to pay taxes. It could be argued that VAT payments are direct and should not be dependent on people' views of the tax system. However, in our study setting the payment of VAT is not automatic since the economies are largely informal which can reduce the revenue ratio/tax efficiency.[7] This behavior would indicate some implicit collusion between the buyer and seller of products and services subject to VAT or the decision of the business not to remit VAT receipts to the authorities. Support for this view is provided by the difficulty of enforcing the use of electronic billing machines in developing countries. In Rwanda, for example, the introduction of electronic billing machines only increased tax revenues by 5 percent in nominal terms and the improvement slowed over time (Ghirmai, Logan, Murray, 2016).

The VAT efficiency variable is the combination of the VAT policy gap (i.e. policies that divert from collecting all revenues at the official rate) and the compliance gap, closer to the measure that we are focused on in this paper. A separation of these two effects would allow us understand whether the effect of trust on the tax efficiency is driven by the effectiveness of revenue administration and taxpayer compliance (compliance gap) or by tax policy choices (policy gap). However, we could not investigate the relationships due to data constraints – i.e., we arrived at only three observations when we included available data on these two measures. An alternative measure of the policy gap is the magnitude of tax revenues lost on account of policy measures that deviate from the standard tax rate (tax expenditures). Information on tax expenditures is more widespread than the tax policy gap for African countries but the sample was still reduced by about half by including this tax expenditure variable and the variable was insignificant (results available on request).

[7] To supplement this finding, we could have equally investigated the effect of perceptions regarding how well government uses tax revenues. We have not examined this additional relationship due to data constraints (i.e. the variable on government use of taxes is asked only in one of the survey rounds). Nevertheless, we find a high correlation (0.61) between (log) trust in the tax department and (log) government use of taxes. This means that trust mimics the latter, and so we could likely see a lower tax compliance with more dissatisfaction with the use of tax revenues for the well-being of citizens.

Table 3: Effect of Trust in Authorities on VAT Efficiency

Dependent Variable: *VATEff*		
Variables	**I**	**II**
lack_trust	-0.222*	-0.199*
	(0.120)	(0.117)
trust_fragile	-	-0.434*
		(0.242)
Agr	-0.237***	-0.216***
	(0.076)	(0.071)
informality	-0.395	-0.280
	(0.242)	(0.268)
trade	0.464***	0.485***
	(0.159)	(0.161)
GDP	-0.394***	-0.340***
	(0.135)	(0.115)
OSI	0.189*	0.178**
	(0.101)	(0.084)
HCI	0.438*	0.542**
	(0.247)	(0.247)
GovEff	0.161	0.253
	(0.404)	(0.393)
Constant	2.076	0.765
	(1.814)	(1.914)
Obs.	50	50
R^2	0.627	0.665

Robust standard errors in parentheses. * denotes p-value < 0.10, ** p-value< 0.05 and *** p-value<0.01. The variable, "*trust_fragile*" is the interaction between *lack_trust* and a dummy for fragile states.

For the chosen specification all the controls have the expected signs except GDP which has a significant negative sign which may be associated with the high collinearity across variables (see section 4.3 for a robustness analysis with an insignificant GDP per capita effect). Countries open to trade have a higher VAT efficiency. This finding could be due to taxes on imports or because of the positive impact trade may have on the competitiveness and formality of an economy, which presents more opportunities for tax collection (Castro and Ramirez, 2014). The result mimics that of Cevik et al. (2019) on developing countries. Consistent with Kitsios (2022), the *OSI* and *HCI* have a positive effect on VAT efficiency. More digitalized governments tend to be more efficient in collecting taxes and the level of digital literacy equally matters probably due to its role in enhancing tax compliance. The size of the agricultural sector has a negative impact on tax efficiency. Addison (2012) finds similar results for the determinants of tax revenues in SSA. This finding could be driven by the fact that the agricultural sector tends to benefit from low taxes/subsidies especially in our study context. The negative effect of informality on the VAT efficiency is not statistically significant but this could be related to its high correlation with the agriculture variable. In the robustness analysis when we drop the agriculture variable, informality as a percent of GDP becomes significantly negative (Appendix III).

If we look at Column II, we see that the magnitude of the effect of lack of trust is significantly higher in fragile compared to non-fragile states. This finding aligns with the fact that low level of trust in authorities is more prevalent in fragile states thereby hindering the state's capacity to raise revenues (Besley and Mueller, 2021).

Table 4 reports the effect of citizens' perceptions about corruption of tax officials on VATefficiency. The variable, "*tax_corrupt"*, was constructed from the Afrobarometer survey and represents the (log of the) share of respondents who said most or all of tax officials are involved in corruption. The mean share of corruption in our full sample is about 0.39 and the share is higher in fragile (0.47) relative to non-fragile states (0.36). Similar to lack of trust, this variable is not present in round 7 of the survey. Although in Column I (Table 4) the effect of corruption is not statistically significant (p value = 0.101), when the effect of corruption on VAT efficiency is separated between fragile and non-fragile states, the coefficient estimates closely resemble those of the lack of trust variable (columns II in tables 3 and 4). Given the high correlation (0.62) between lack of trust and corruption[8], the message remains that the VAT efficiency decreases as perceived corruption increases and the effect appears stronger in fragile states. This finding indicates that corruption works in a similar manner as lack of trust in explaining tax efficiency, which is intuitive since both variables are likely associated with the tendency to misappropriate revenues – hence the difficulty in separating the effect of the two variables as shown in Columns III and IV of Table 4.

[8] See Appendix II for correlation matrix of all our explanatory variables

Table 4: Effect of Corruption on VAT Efficiency

	Dependent Variable: *VATEff*			
Variables	**I**	**II**	**III**	**IV**
tax_corrupt	-0.199	-0.193*	-0.122	-0.103
	(0.118)	(0.110)	(0.208)	(0.198)
corrupt_fragile	-	-0.374**	-	-0.539
		(0.183)		(0.507)
lack_trust	-	-	-0.133	-0.153
			(0.225)	(0.231)
trust_fragile	-	-	-	0.211
				(0.662)
Agr	-0.229***	-0.201**	-0.229***	-0.199**
	(0.078)	(0.075)	(0.078)	(0.076)
informality	-0.373	-0.291	-0.389	-0.328
	(0.236)	(0.253)	(0.243)	(0.280)
trade	0.421**	0.460***	0.441**	0.489**
	(0.158)	(0.161)	(0.177)	(0.188)
GDP	-0.419***	-0.370***	-0.401***	-0.356***
	(0.131)	(0.112)	(0.138)	(0.121)
OSI	0.172*	0.154**	0.179*	0.159*
	(0.098)	(0.075)	(0.104)	(0.081)
HCI	0.433*	0.541**	0.432*	0.537**
	(0.244)	(0.237)	(0.247)	(0.244)
GovEff	0.200	0.321	0.154	0.283
	(0.392)	(0.388)	(0.402)	(0.402)
Constant	2.145	0.775	2.131	0.792
	(1.857)	(1.925)	(1.854)	(1.958)
Obs.	50	50	50	50
R^2	0.627	0.671	0.630	0.674

Robust standard errors in parentheses. * denotes p-value < 0.10, ** p-value< 0.05 and *** p-value<0.01. The variable, "*corrupt_fragile*" is the interaction between *tax_corrupt* and a dummy for fragile states.

Next, we consider the effect of perceptions of lack of trust and corruption in the tax authority on a separate tax handle – CIT Productivity that is charged to corporations. The latter is measured as the ratio of CIT revenues (as percent of GDP) to the CIT rate (Kitsios, 2022). Table 5 reports the results on lack of trust and CIT productivity.

Table 5: Effect of Trust in Authorities on CIT Productivity

Dependent Variable: *CIT Prod*		
Variables	**I**	**II**
lack_trust	0.153	0.055
	(0.313)	(0.297)
trust_fragile	-	-1.104***
		(0.295)
Agr	-0.193	-0.152
	(0.114)	(0.100)
informality	-0.038	0.083
	(0.514)	(0.519)
trade	0.449	0.430*
	(0.297)	(0.223)
GDP	-0.247	-0.046
	(0.265)	(0.259)
OSI	0.190	0.154
	(0.164)	(0.113)
HCI	0.279	0.303
	(0.384)	(0.244)
GovEff	0.143	0.292
	(0.936)	(0.783)
Constant	0.375	-2.538
	(4.582)	(4.061)
Obs.	36	36
R^2	0.303	0.484

Robust standard errors in parentheses. * denotes p-value < 0.10, ** p-value< 0.05 and *** p-value<0.01. The dependent variable, "*CIT Prod*" is the log of CIT Productivity and "*trust_fragile*" is the interaction between *lack_trust* and a dummy for fragile states.

The results in Table 5 reveal that the influence of perceptions of lack of trust is only significant in fragile states. The significant negative effect could be due to the prevalence of bribes in fragile states. For instance, the Afrobarometer data (rounds 6 and 8) show that 51 percent of respondents in fragile states agreed to have paid a bribe to the police within the last year to obtain assistance as opposed to 31 percent in non-fragile states. Similarly, 42 percent of people in fragile states said they paid a bribe to the police to avoid problems compared to 30 percent in non-fragile states. As such, firms in fragile states might have a higher propensity to bribe authorities to avoid paying corporate taxes and this is reflected in a low CIT productivity.

Table 6 presents the results on corruption and CIT productivity. Similar to perceptions of lack of trust (Table 5), Columns I and II show that corruption has a significant effect only in fragile states. When we include both lack of trust and corruption in the model (Columns III and IV), we see that the effect of perceptions of lack of trust is stronger in the fragile states grouping. This indicates that perceptions of lack of trust better explains the differences in CIT productivity, unlike with VAT efficiency where we are unable to separate the effect of trust and corruption. In

general, there is considerable support for the view that citizens are more willing to pay taxes if they can see the beneficial effects of the tax receipts, assuming that people's perception of trust is related to the misappropriation of revenues. In our view, this is why trust in the authorities and the absence of corruption play such an important role in explaining the weakness of VAT and CIT efficiency in Africa. Support for this view is also provided in the Afrobarometer survey because data from round 8 of the survey reveals that up to 83 percent of respondents report that it is either very difficult or difficult to find out how government uses tax revenues. The 2024 Sub Saharan Africa Regional Economic Outlook (IMF 2024) also makes the point that trust in the government's ability to use public resources is still relatively low in many countries of the region.

Table 6: Effect of Corruption on CIT Productivity

	Dependent Variable: *CIT Prod*			
Variables	**I**	**II**	**III**	**IV**
tax_corrupt	0.325	0.280	0.707	0.582
	(0.275)	(0.282)	(0.806)	(0.824)
corrupt_fragile	-	-0.718***	-	1.299
		(0.254)		(1.889)
lack_trust	-	-	-0.577	-0.494
			(0.868)	(0.909)
trust_fragile	-	-	-	-2.780*
				(1.559)
Agr	-0.205*	-0.167	-0.176	-0.158
	(0.117)	(0.102)	(0.110)	(0.100)
informality	-0.002	0.041	-0.093	0.193
	(0.499)	(0.509)	(0.479)	(0.536)
trade	0.527*	0.516**	0.670*	0.565*
	(0.273)	(0.222)	(0.332)	(0.288)
GDP	-0.201	-0.109	-0.036	0.207
	(0.217)	(0.221)	(0.322)	(0.275)
OSI	0.194	0.163	0.190	0.159
	(0.171)	(0.115)	(0.181)	(0.112)
HCI	0.280	0.354	0.232	0.185
	(0.377)	(0.223)	(0.417)	(0.264)
GovEff	0.171	0.448	-0.115	-0.070
	(0.891)	(0.812)	(0.883)	(0.737)
Constant	-0.296	-2.436	-1.007	-4.093
	(4.457)	(4.142)	(4.491)	(3.973)
Obs.	36	36	36	36
R^2	0.330	0.464	0.350	0.552

Robust standard errors in parentheses. * denotes p-value < 0.10, ** p-value< 0.05 and *** p-value<0.01. The dependent variable, "*CIT Prod*" is the log of CIT Productivity, and "*corrupt_fragile*" is the interaction between *tax_corrupt* and a dummy for fragile states.

4.3. Robustness Analysis

The previous section has shown that the impact of lack of trust and the presence of corruption in the tax department both significantly impair tax collection, controlling for standard macroeconomic variables previously used in the literature. However, we also noted that real GDP per capita had a significantly negative effect on tax efficiency and this effect could be influencing the strength of the survey variables.

To test the robustness of our results, we simplify the specification of the macroeconomic variables to ensure that all variables have the correct signs if significant. This requires dropping agriculture as a share of GDP and the human capital variables because of their high correlation with real GDP per capita (see Appendix II). When these two variables are dropped, the informality variable becomes significantly negative, but the digitalization variables lose economic power (Appendix III). Interestingly, the negative effect of perceptions of trust on tax efficiency strengthens, but now there is no distinction between fragile and non-fragile states. If we add corruption to the specification, the survey variables are insignificant, except for the regression that separates the effect of these survey variables between fragile and non-fragile states. In this case, high corruption levels among tax authorities in fragile states significantly impair VAT efficiency. Finally, for CIT, the impact of lack of trust and corruption in tax authorities in fragile states is significantly negative, but in this case the effect of lack of trust dominates when both survey variables are included in the same regression. See Appendix III for the regression results.

5. Conclusion

In this paper, we have examined the relationship between citizens' perception of trust in the tax department and governments' efficiency in collecting VAT and CIT in Africa. We also assessed whether in the face of fragility, the impact of the perception of trust in the tax authority is more prevalent.

Our results reveal a negative and significant association between citizens' perception of lack of trust in the tax department and VAT efficiency. As the share of citizens with perceptions of little or no trust in the tax department increases by 1 percent, VAT efficiency decreases by 0.22 percent, ceteris paribus. We find that the magnitude of this effect is significantly greater in fragile relative to non-fragile states, thus underscoring the importance of the impact of trust in the tax department in fragile economies. The results also reveal that perceptions about corruption have a similar impact on tax efficiency. When more citizens perceive that corruption is prevalent in the national tax authority it leads to a decrease in the VAT efficiency with the effect being significantly higher for fragile states. When we use a separate tax measure for corporations– the CIT productivity – we find that the effect of perceptions of lack of

trust/corruption is significant only in fragile states and that lack of trust plays a stronger role in explaining CIT productivity than corruption.

Otherwise, a higher share of trade in GDP, more digitalized governments, and a higher degree of digital literacy are linked to higher VAT efficiency. Larger informal and agricultural sectors lead in turn to lower VAT efficiency, although the effects of the informal sector is only statistically significant in the regression without the agriculture output share.

Taken together, our results suggest that increasing citizens' perceptions of trust in tax authorities is very important to revenue mobilization in Africa and also fostering trust in government more generally. . Policies aimed at building fiscal capacity should place a high importance on ensuring that citizens believe resources will be properly used, especially in fragile states where distrust in public institutions seems to be higher on average and the negative effect on VAT and CIT efficiency of lack of trust in the tax authority is generally stronger. In this respect, enhancing fiscal transparency including publishing details about the use of government expenditures, is recommended to help address this issue. There is also a role for technical assistance to revenue administrations to help them improve their effectiveness and support digitalized tax submissions that would help limit and better track non-payment.

Our analysis was performed on fifty observations since data on perceptions of trust/corruption is not available in one of the survey rounds. Given the small sample size, our results should be seen as a starting point for discussions around the role of trust and perceptions of trust in tax authorities in influencing tax efficiency, and the importance of this issue for fragile economies. Secondly, it would have been useful to separate the effect of perceptions of lack of trust on the VAT policy gap and the compliance gap but we were unable to do this because of data constraints. Lastly, it is hard to make causal statements with the use of linear regression models. As such, our results should be interpreted as demonstrating the importance of trust in the tax authority in improving tax compliance in Africa. Once the public sees that tax revenues are being effectively used for their assigned purposes, it can reasonably be inferred that they are more likely to accept paying taxes.

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APPENDIX I. Number of Observations

Table I.1 shows the number of observations per country and survey round for the trust in the tax department variable obtained from the Afrobarometer survey. The observations include respondents who said they trust the tax department "*not at all", "just a little", "somewhat"* or *"a lot".* The countries include the 32 we used for our econometric analysis.

Table I.1: Number of observations per country and survey round

Countries	Round 6 (2014-2015)	Round 8 (2019-2021)
South Africa	2236	1477
Egypt	979	Not surveyed
Botswana	1088	1070
Burundi	1106	Not surveyed
Cameroon	1119	1187
Cabo Verde	1076	1072
Benin	1160	1189
Ethiopia	Not surveyed	2240
Gabon	1187	1197
The Gambia	Not surveyed	1135
Ghana	2295	2218
Guinea	1144	1178
Cote D'Ivoire	1125	1171
Kenya	2060	2296
Lesotho	882	973
Madagascar	1190	Not surveyed
Malawi	2182	1127
Mali	1191	1168
Mauritius	1140	1132
Morocco	1028	1162
Mozambique	2058	1049
Nigeria	2260	1427
Senegal	1043	1112
Sierra Leone	1034	993
Namibia	1173	1092
Eswatini	1095	1103
Tanzania	2225	2237
Togo	1105	1177
Tunisia	1085	1068
Uganda	2108	1067
Burkina Faso	1151	1173
Zambia	1086	1029

APPENDIX II. Correlation matrix between the empirical model variables

Table II.2: Correlation Matrix of Explanatory Variables

	Agr	*informality*	*trade*	*GDP*	*trust*	*tax_corrupt*	*OSI*	*HCI*	*GovEff*
Agr	1.000								
informality	0.461	1.000							
trade	-0.499	-0.411	1.000						
GDP	-0.787	-0.388	0.325	1.000					
trust	0.191	0.092	-0.085	-0.069	1.000				
tax_corrupt	0.572	0.339	-0.400	-0.492	0.617	1.000			
OSI	-0.254	-0.149	0.013	0.432	-0.074	-0.331	1.000		
HCI	0.661	-0.323	0.263	0.657	-0.113	-0.404	0.182	1.000	
GovEff	-0.744	-0.592	0.471	0.775	-0.254	-0.594	0.450	0.512	1.000

Note: trust = lack of trust

APPENDIX III. Robustness results

Effect of Lack of Trust on VAT Efficiency

Dependent Variable: VATEff		
Variables	**I**	**II**
lack_trust	-0.337*** (0.123)	-0.325** (0.121)
trust_fragile	-	-0.287 (0.236)
informality	-0.502* (0.298)	-0.433 (0.307)
trade	0.577*** (0.172)	0.587*** (0.170)
GDP	-0.102 (0.099)	-0.053 (0.092)
OSI	0.135 (0.136)	0.126 (0.128)
GovEff	0.265 (0.474)	0.309 (0.492)
constant	-1.944 (2.073)	-2.833 (2.294)
Obs	50	50
R squared	0.491	0.509

Effect of Corruption on VAT Efficiency

Dependent Variable: VATEff				
Variables	**I**	**II**	**III**	**IV**
tax_corrupt	-0.338**	-0.337**	-0.255	-0.217
	(0.143)	(0.133)	(0.212)	(0.195)
corrupt_fragile	-	-0.275	-	-0.709*
		(0.175)		(0.391)
lack_trust	-	-	-0.145	-0.196
			(0.200)	(0.198)
trust_fragile	-	-	-	0.557
				(0.475)
informality	-0.467	-0.414	-0.485	-0.484
	(0.290)	(0.297)	(0.294)	(0.314)
trade	0.501***	0.522***	0.522***	0.564***
	(0.172)	(0.164)	(0.189)	(0.189)
GDP	-0.151	-0.104	-0.132	-0.101
	(0.094)	(0.083)	(0.103)	(0.093)
OSI	0.110	0.095	0.117	0.099
	(0.125)	(0.112)	(0.134)	(0.123)
GovEff	0.290	0.357	0.240	0.328
	(0.441)	(0.461)	(0.457)	(0.479)
constant	-1.570	-2.539	-1.578	-2.404
	(2.064)	(2.213)	(2.079)	(2.261)
Obs	50	50	50	50
R squared	0.501	0.526	0.504	0.533

Effect of Trust on CIT Productivity

Dependent Variable: CITProd		
Variables	**I**	**II**
lack_trust	0.018	-0.066
	(0.321)	(0.291)
trust_fragile	-	-1.130***
		(0.276)
informality	-0.144	-0.012
	(0.530)	(0.512)
trade	0.531*	0.493**
	(0.277)	(0.210)
GDP	-0.067	0.117
	(0.225)	(0.214)
OSI	0.158	0.125
	(0.170)	(0.102)
GovEff	0.249	0.385
	(0.878)	(0.691)
constant	-2.322	-4.905
	(4.036)	(3.404)
Obs	36	36
R squared	0.254	0.444

Effect of Corruption on CIT Productivity

Dependent Variable: CITProd				
Variables	**I**	**II**	**III**	**IV**
tax_corrupt	0.256	0.216	0.782	0.648
	(0.255)	(0.254)	(0.760)	(0.779)
corrupt_fragile	-	-0.722***	-	1.279
		(0.256)		(1.108)
lack_trust	-	-	-0.772	-0.669
			(0.804)	(0.859)
trust_fragile	-	-	-	-2.782*
				(1.448)
informality	-0.085	-0.046	-0.190	0.111
	(0.515)	(0.514)	(0.484)	(0.526)
trade	0.588**	0.561**	0.767**	0.652**
	(0.268)	(0.220)	(0.319)	(0.280)
GDP	-0.046	0.040	0.144	0.367
	(0.196)	(0.198)	(0.271)	(0.235)
OSI	0.162	0.132	0.162	0.134
	(0.180)	(0.117)	(0.193)	(0.110)
GovEff	0.376	0.639	-0.048	-0.006
	(0.835)	(0.729)	(0.861)	(0.667)
constant	-3.146	-5.061	-3.530	-6.365*
	(4.071)	(3.679)	(3.968)	(3.425)
Obs	36	36	36	36
R squared	0.274	0.411	0.312	0.523

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