

Digitalization, Corruption, and Trust in Tax Officials in Africa

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ABSTRACT

This chapter explores the impact of digitalization on corruption perception and trust in tax officials in Africa. The findings are threefold. First, a higher level of digital adoption is negatively associated with the perception of corruption of tax officials. The chapter shows that, on average, the adoption of digital tools is correlated with a reduction of perception of corruption in the tax administration by around 4.3 percentage points. Second, the chapter demonstrates that trust in tax officials is significantly higher in countries with a higher level of digital adoption. Third, the alleviating effect of digitalization on corruption perception is reduced when the government intentionally shuts down the internet, while a successful promotion of Information and Communications Technology (ICT) by the government amplifies the dampening effect of digitalization on corruption perception. The findings of the chapter suggest that African countries should step up digitalization to combat corruption on the continent, while managing the associated risks and challenges. They should avoid intentionally shutting down the internet and instead establish policies to promote the development of ICT.

INTRODUCTION

With the outbreak of the COVID-19 pandemic, the importance of digitalization has never been clearer. In the race to contain the spread of a highly transmissible virus, countries have quickly deployed digital technologies to facilitate planning, surveillance, testing, contact-tracing, and quarantine. Governments around the world have used digital tools to raise public awareness, safeguard citizens' health, operate essential public services, and provide targeted support to vulnerable populations and companies to cushion the impact of the crisis (IMF 2020). In the area of public finance, depending on the prevailing social and economic circumstances, several tax agencies have focused on maintaining the operation of essential business processes, including taxpayer registration, taxpayer services, tax return, and payment-processing through online platforms. One would also hope

that digitalization could help to strengthen the governance of the use of funds allocated to combat the COVID-19 pandemic.

In recent years, many sub-Saharan African countries have adopted new digital tools in their tax administrations to reduce bureaucracy and combat corruption of tax officials. Digitalization is increasingly transforming how tax administrations operate, helping to improve process efficiency and service delivery and reduce the scope for corruption (Gupta and others 2017). For countries that already have a high level of corruption, digitalization is associated with better control of corruption, as it reduces human interactions (IMF 2019). In principle, digitalization can help promote transparency, accountability, and citizen participation, facilitate advocacy, and allow for closer interaction between government and citizens (IMF 2018; IMF 2019). In an environment characterized by imperfect information, high transaction costs, and discretionary rent-seeking tasks, digitalization can help reduce search costs, disseminate information in a cost-effective way, and reduce the moral hazard problem attached to monitoring public sector agents. Digital technology can also improve or provide educational services for public servants and the broader population at a lower cost.

However, digitalization can also create new opportunities for corruption. These opportunities are mostly related to cybercrime or simply through the misuse of well-intended technologies such as digital public services. Digital records and public service systems can be manipulated by corrupt officials with high IT skills. Digital systems are also vulnerable to cyberattacks, which can disrupt government functions and jeopardize citizens' digitally stored private information, particularly in countries with limited administrative capacity and underfunded security systems (IMF 2018; World Bank 2016). Therefore, the impact of digitalization on corruption is unclear. There is a paucity of empirical studies on the potential effect of digitalization on the perception of corruption in Africa.

This chapter fills in this gap in the literature by estimating the effect of digitalization on the perception of corruption of tax officials in Africa. Individual-level data from the sixth wave of the Afrobarometer survey and various indicators of digitalization are used. Moreover, the chapter explores whether digitalization could affect citizens' trust in tax officials by introducing transparency and reducing the opportunities for bribes and influence. The chapter estimates nonlinearity effects by exploring whether intentional internet shutdowns, as well as government success in promoting ICT matter. Partial or total intentional outage of the internet prevents free access to online information, intrudes on the rights of citizens to get accurate information and undertake fact-checking, and interrupts the ability of businesses to conduct transactions. Internet blackouts can undermine the trust of citizens in the internet and government actions and raise the perception that the government is corrupt and has something to hide. Regarding the promotion of ICT, government policies are very important, not only in terms of regulations but also in terms of the education in and availability of tools related to ICT.

The findings of this chapter are threefold: First, a higher level of digital adoption is negatively associated with perception of corruption of tax officials. The chapter shows that, on average, the adoption of digital tools is correlated with a

reduction of corruption perception in the tax administration by about 4.3 percentage points. Second, the chapter demonstrates that trust in tax officials is significantly higher in countries with a higher level of digital adoption. Third, the alleviating effect of digitalization on corruption perception is reduced when the government intentionally shuts down the internet, while a successful promotion of ICT by the government amplifies the dampening effect of digitalization on corruption perception. The findings of the chapter imply that African countries should step up digitalization to combat corruption on the continent, while managing the associated risks and challenges. They should avoid intentionally shutting down the internet and instead establish policies to promote the development of ICT.

The rest of the chapter is organized as follows: The following section describes the data sources and the empirical methodology and provides some stylized facts. The next section presents the results from the empirical analysis. Next, the chapter focuses on nonlinearity effects by exploring whether the effect of digitalization on corruption depends on the outcome of the government promotion of ICT and of the intentional internet outages. Finally, some concluding remarks are provided.

DATA SOURCES, EMPIRICAL METHODOLOGY, AND STYLIZED FACTS

This section describes the data sources and the empirical methodology used to explore the effects of digitalization on corruption perception.

Data Sources and Empirical Methodology

The data presented in this chapter are from the sixth round of Afrobarometer surveys conducted in 2014 and 2015. As an independent, nonpartisan research project that measures the social, political, and economic conditions in Africa, Afrobarometer represents a strong, reliable source of public opinion data within African states (Isaksson and Kotsadam 2018; Konte 2016). Nationally representative samples of individuals who are more than 18 years old were selected from both rural and urban areas of the different countries. The sample used in this chapter covers more than 23,000 individuals from 26 African countries.

To capture the perception of corruption of tax officials, the responses to Afrobarometer's question Q53F were examined. This question asks, "How many of the following people (Tax Officials, like Secretary of Treasury, Internal Revenue Service or State and Local tax administration) do you think are involved in corruption?" Possible responses include "None," "Some of them," "Most of them," and "All of them." For the purposes of the research conducted for the present chapter, the responses were coded as follows: 0 if the response was "None," 1 if the response was "Some of them," 2 if it was "Most of them," and 3 if the answer was "All of them."

To capture the perception of trust in tax officials, the responses to question Q52D were examined. Q52D asks, "How much do you trust each of the following Tax Officials (including Secretary of Treasury, Internal Revenue Service or

State and Local tax administration)?” Possible answers include “Not at all,” “Just a little,” “Somewhat,” and “A lot.” Again for the purposes of the present chapter, the responses have been coded as follows: 0 if the answer is “Not at all,” 1 if the answer is “Just a little,” 2 if the response is “Somewhat,” and 3 if it is “A lot.”

To examine digitalization, the World Bank’s Government Digital Adoption Index (DAI), year 2014, is used. The DAI is the simple average of three indicators: core administrative systems, online public services, and digital identification. The International Budget Partnership’s Open Budget Index and the World Bank’s E-Filing Index were also used. The Open Budget Index measures the extent to which government budget data are made accessible to the public (online) in an editable (machine-readable) and reusable format, without any restrictions (free and legally open). The E-Filing Index is a binary variable taking the value of 1 if the government provides online tax-filing services and 0 otherwise. The United Nations data on e-government and e-participation are also used. The E-Government Index measures the scope and quality of online services, including each country’s national website and the websites of the key ministries, and, in particular, the ministries of finance. The E-Participation Index is similar to the E-Government Index but focuses on the use of online services to facilitate the provision of information by governments to citizens, interactions with stakeholders, and engagement in decision-making processes.

Given that this chapter estimates the effect of digitalization—measured at the country level—on individuals’ perception of the corruption of tax officials, it is important to account for the hierarchical structure of the data. For the research presented in this chapter, a multilevel (hierarchical) model was used; this model is specific to hierarchical data and accounts for the clustering of data upon different categories (levels). The model allows for the estimation of how two factors—(1) the perception of corruption in tax officials, as reported by individuals, and (2) individuals’ trust in the tax officials—relate to digitalization, while accounting for the sociodemographic conditions of respondents, country specifics, and religious and ethnic effects (Box 15.1).

Stylized Facts

Figure 15.1 highlights the perception of corruption of tax officials (Figure 15.1.1) and the relationship between the Government DAI and the perception of corruption of tax officials (Figure 15.1.2). There is a very high perception of corruption of tax officials in Africa, as around 9 out of 10 people surveyed responded that tax officials are corrupt in some way (Figure 15.1.1). Among them, 44 percent of respondents think that some tax officials are corrupt, 30 percent argue that most are corrupt, and 16 percent believe that all tax officials are corrupt. Only 11 percent of individuals think that none of tax officials are corrupt. Figure 15.1.2 shows that in countries with higher government digital adoption indices, the perception of corruption of tax officials is lower, and vice versa.

Figure 15.2 presents the descriptive statistics for the variable trust in tax officials and the relationship between the Government DAI and trust in tax officials.

Box 15.1. Estimating the Impact of Digitalization on Corruption and Trust

This box explains in more detail the empirical approach—the use of a multilevel (hierarchical) model—employed in this chapter.

According to several studies (Luke 2004; Moerbeek 2004; Van den Noortgate, Opdenakker, and Onghena 2005), ignoring the hierarchical structure of data, as well as ignoring the higher clustering of data, could lead to misattributed response variation within the already included levels, biased standard errors of the estimates, and wrong conclusions about the covariates' effects.

The observed outcomes (corruption of tax officials and trust in tax officials) are ordinal variables, with values ranging from 0 to 3. A multilevel ordered probit model with two levels (the individual level and the country level) was used to estimate the effect of digitalization on the perception of corruption of tax officials and trust in tax officials.

The advantage of multilevel over the traditional ordinary least squares (OLS) method is that it allows for correctly modeling hierarchical data that do not satisfy the basic assumption of independence of observations. The following equation was separately modeled:

$$\text{Corruption}_{ic} = \pi \text{Digitalization}_c + \beta X_{ic} + \mu_c + \varepsilon_{ic} \quad (1)$$

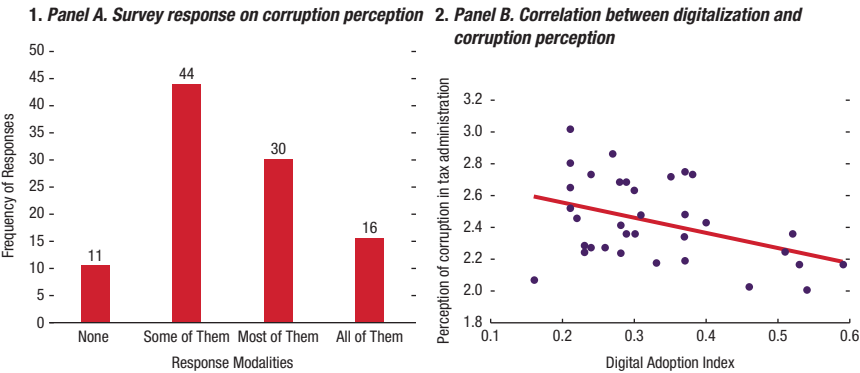
$$\text{Trust}_{ic} = \theta \text{Digitalization}_c + \tau_{ic} + \sigma_c + \delta_{ic} \quad (2)$$

where Corruption_{ic} represents the level of perception of corruption in tax officials reported by individual i in country c . Trust_{ic} is trust in the tax officials. Digitalization_c is the independent variable of interest, which is the level of adoption of digitalization of country c . X_{ic} and Y_{ic} stand for the individual-level characteristics controlled for in the regressions. ε_{ic} , σ_c , δ_{ic} , and μ_c represent the unobserved individual and country effects, each assumed to be normally distributed. In addition, religious and ethnic effects were controlled for in the estimates. The coefficients π and θ are the parameters of interest and measure the impact of digitalization on corruption perception and trust in tax officials, respectively.

Several control variables from the sixth wave of Afrobarometer surveys are included, namely, the sociodemographic conditions of respondents (age, education, employment status, gender, living area, wealth); the respondents' assessments of the difficulty of finding which taxes to pay; and the handling by government of various public services (those related to health and education services, living standards, infrastructure, fighting crime). Also taken into account were the respondents' perception of democracy and treatment of their own ethnic group compared to the other ethnic groups in the country, and their perceived satisfaction of politicians. Finally, the quality of the business environment was accounted for by using the World Bank's Doing Business database.

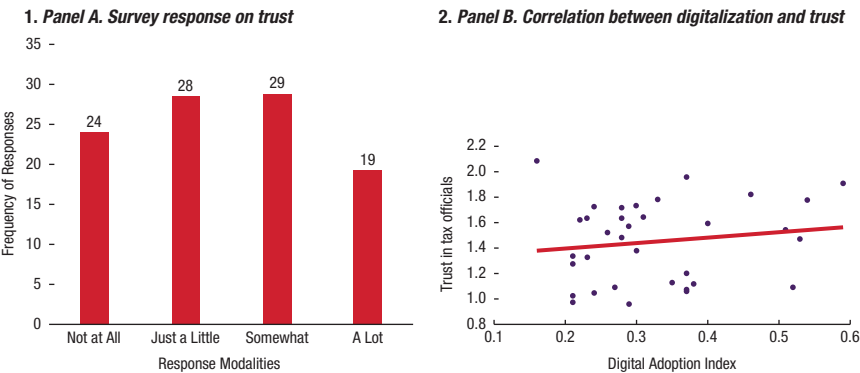
Only 1 out of 5 individuals surveyed have full trust in tax officials, which suggests that mistrust in tax departments seems to be common in Africa (Figure 15.2.1). Nearly one-quarter of individuals do not trust tax officials at all, while around one-third either trust tax officials a little or somewhat. Figure 15.2.2 shows the relationship between the Government DAI and trust in tax officials: in countries where digitalization is higher, so is trust in tax officials. On the contrary, trust in tax officials seems to be lower in countries with a low digital adoption rate.

Figure 15.1. Relationship between Digital Adoption and Corruption of Tax Officials



Sources: Afrobarometer; and authors' calculations.

Figure 15.2. Relationship between Trust in Tax Official and Digitalization



Sources: Afrobarometer; and authors' calculations.

RESULTS

Impact of Digitalization on Corruption of Tax Officials

The results of the estimates are reported in Table 15.1. Column (1) provides an estimate of how closely the perception of tax officials is associated with the Government DAI as an indicator of digitalization. The coefficient associated with this index is negative and significant at the 1 percent level, suggesting that digitalization is negatively correlated with the level of perception of corruption of tax officials. Quantitatively, Table 15.1 shows that an increase in the index of

government digital adoption from the first quartile to the third quartile is associated with a decline in the probability that respondents answer that all tax officials are corrupt from 14.9 to 12.5 percentage points,¹ while the probability that respondents answer that no tax officials are corrupt increases from 8.8 to 10.7 percentage points.

TABLE 15.1.

Impact of Digitalization on Corruption Perception					
Variables	(1)	(2)	(3)	(4)	(5)
Government DAI	-0.5142*** (0.191)				
E-Government Index		-1.4582*** (0.357)			
E-Participation Index			-0.5912*** (0.150)		
Open Budget Index				-0.8162*** (0.154)	
E-Filing					-0.3867*** (0.047)
Number of Observations	23,343	25,356	25,356	24,491	25,356
Number of Regions	301	334	334	310	334
Number of Countries	26	26	26	26	26
Region Fixed Effects	Yes	Yes	Yes	Yes	Yes
Ethnicity Fixed Effects	Yes	Yes	Yes	Yes	Yes
Religion Fixed Effects	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes

Source: Authors' estimates.

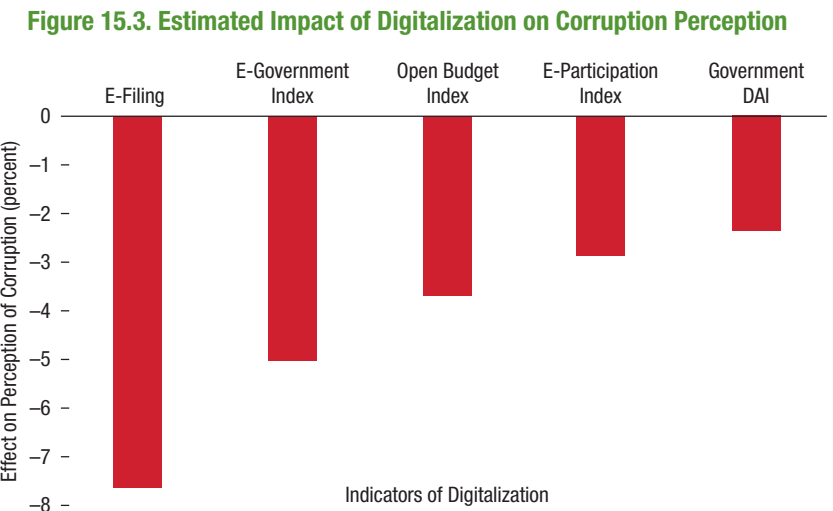
Note: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

In columns (2) and (3), the E-Government and E-Participation indices are used, respectively. Notably, the coefficients associated with the two variables are still negative and statistically significant at the 1 percent level. This finding highlights the conclusion that publication of data and information online, as well as citizens' interactions with stakeholders and engagement in decision-making processes, are correlated with a lower perception of corruption of tax officials. Finally, the specific use of digital tools in public finances is considered through the use of the Open Budget Index and the e-filing indicator. The results are reported in columns (4) and (5). They suggest that there is a negative correlation among the online openness of the budget process to the public, the deployment of e-filing services in public finance, and the perception of corruption of tax officials. In order words, the higher the online transparency of the budget process, the lower the level of perception of corruption of tax officials. Similarly, the level of the perception of corruption of tax officials is lower in countries that provide e-filing

¹ These are estimated marginal effects at the mean values.

services. Quantitatively, the provision of e-filing services could lower the perception of corruption by up to 7.6 percentage points.

Figure 15.3 provides the quantified effects of the different indicators of digitalization on the perception of corruption. These quantified effects are calculated based on the movement from the first quartile to the third quartile of the digitalization indicator, except in the e-filing indicator, where the comparison is made between countries with and without e-filing services. The impact varies according to the indicator used to capture digitalization. E-filing appears to have the biggest impact in dampening the perception of corruption of tax officials.



Source: Authors' calculations.

Impact of Digitalization on Trust in Tax Officials

This section explores whether digitalization improves trust in tax officials. The use of digital tools helps to create more direct channels of feedback and communication between citizens and government, reducing the opacity of government transactions and promoting trust. To test this assumption, the effect of digitalization on the level of trust in tax officials was estimated, using the same specifications as in Table 15.1. The results are reported in Table 15.2. The coefficients associated with the different indicators of digital adoption are positive and highly significant at the 1 percent level in all columns. This finding suggests that trust in tax officials appears to be higher in countries with a high level of digital adoption. Considering column (1), where the Government DAI is used, an increase in the index from the first quartile to the third quartile is associated with an increase in the trust in all tax officials from 15.2 to 16.8 percentage points. At the same time, the probability that none of the tax officials is trusted declines from 21.9 to 20 percentage points.

TABLE 15.2.

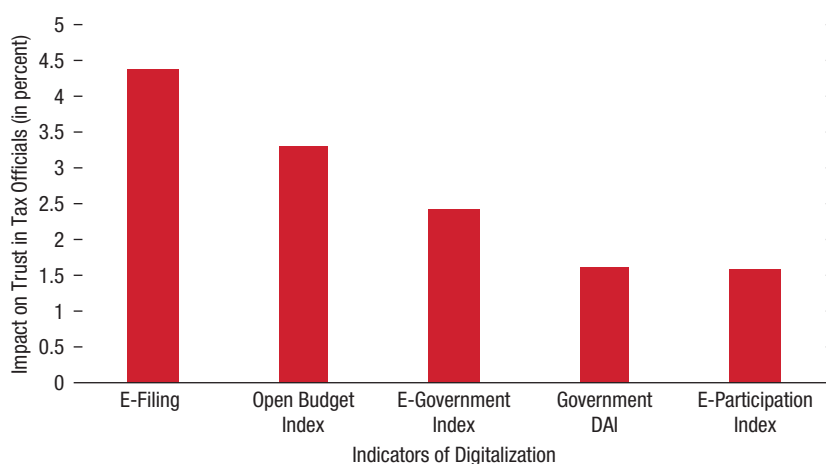
Impact of Digitalization on Trust in Tax Officials					
Variables	(1)	(2)	(3)	(4)	(5)
Government DAI	0.3084** (0.121)				
E-Government Index		0.6189** (0.308)			
E-Participation Index			0.2929** (0.129)		
Open Budget Index				0.5851*** (0.122)	
E-Filing					0.1882*** (0.042)
Number of Observations	23,752	25,808	25,808	24,950	25,808
Number of Regions	301	334	334	310	334
Number of Countries	26	26	26	26	26
Region Fixed Effects	Yes	Yes	Yes	Yes	Yes
Ethnicity Fixed Effects	Yes	Yes	Yes	Yes	Yes
Religion Fixed Effects	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes

Source: Authors' estimates.

Note: Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

Figure 15.4 shows the estimated impact of the different indicators of digitalization on trust in tax officials. As in Figure 15.3, the estimation is based on the move from the 25th percentile to the 75th percentile of each indicator, except for e-filing, where the comparison is made between countries with and without e-filing services. Figure 15.4 shows that provision of e-filing services has the biggest impact in boosting trust in tax officials, while e-participation has the lowest impact.

Figure 15.4. Estimated Impact of Digitalization on Trust in Tax Officials



Source: Authors' calculations.

INTERNET SHUTDOWNS AND GOVERNMENT SUCCESS IN THE PROMOTION OF ICT

This section explores whether the effects of digitalization on corruption perception depends on Internet shutdowns and the successful promotion of ICT by the government.

Internet Shutdowns

An internet shutdown is an intentional disruption of internet-based communications, rendering them inaccessible or effectively unavailable, for a specific population, location, or mode of access, often to exert control over the flow of information. The intentional use of internet blackouts as a method of controlling the information landscape can have economic and human rights impacts and breach the trust of citizens in government actions. In fact, internet shutdowns undermine users' trust in the internet and the reliability of critical online government services, and raise the perception that the government has something to hide. Internet shutdowns can deprive people of vital information and restrict the ability of citizens to hold government or public officials to account. To explore whether the blackout of the internet can alter the relationship between digitalization and the perception of corruption, data on the number of internet shutdowns were extracted from the Internet Society and NetBlocks.² The number of internet shutdowns was then interacted with the different indicators of digitalization, and equation (1) was then estimated. The coefficient associated with the interactive variables between digitalization and the number of internet shutdowns is positive and significant in all columns (Table 15.3). This implies that the dampening effect of digitalization on the perception of corruption of tax officials is reduced in countries with a high number of internet blackouts.

Government Success in Promoting ICT

A successful implementation of ICT has proven to be an effective instrument for connecting not only citizens and public officials but also disparate government communication networks at every level. To achieve this, several countries have implemented initiatives to significantly increase the participation of citizens in public decision-making and providing citizens with a central window to government services, while other countries have introduced policies aiming at making ICT tools accessible to the public. To explore whether a successful promotion of ICT tools matters, an interactive variable was created between the different indicators of digitalization and the index of government success in promoting ICT, which was extracted from the World Economic

² NetBlocks, accessed in December 2019, <https://netblocks.org/projects/cost>.

Forum. This index was constructed based on survey responses from all countries, with respondents being asked, “In your country, how successful is the government in promoting the use of ICTs?” Possible answers ranged from “1 = not successful at all” to 7 = extremely successful.” The results reported in Table 15.4 show that the coefficients associated with the interactive variable between digitalization and the index of government success in promoting ICT are negative and strongly significant in all columns, except column (3). Therefore, a successful promotion of ICT could amplify the extent to which digitalization decreases the public perception of corruption among tax officials.

TABLE 15.3.

Digitalization, Corruption, and Internet Shutdowns					
Variables	(1)	(2)	(3)	(4)	(5)
Government DAI	-0.4718** (0.223)				
Government DAI*—Internet Shutdown	0.146** (0.063)				
E-Government Index		-1.5372*** (0.412)			
E-Government Index*—Internet shutdown		0.2409*** (0.019)			
E-Participation Index			-0.8980*** (0.221)		
E-Participation Index*—Internet shutdown			0.2448* (0.139)		
Open Budget Index				-0.9095*** (0.179)	
Open Budget Index*—Internet Shutdown				0.0048* (0.003)	
E-Filing					-0.4500*** (0.055)
E-Filing*—Internet Shutdown					0.0571** (0.021)
Internet Shutdown	0.1067 (0.116)	-0.0067 (0.108)	-0.0010 (0.048)	-0.1127 (0.128)	0.0891* (0.051)
Number of Observations	23,235	25,248	25,248	24,383	25,248
Number of Regions	296	329	329	305	329
Number of Countries	26	26	26	26	26
Region Fixed Effects	Yes	Yes	Yes	Yes	Yes
Ethnicity Fixed Effects	Yes	Yes	Yes	Yes	Yes
Religion Fixed Effects	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes

Source: Authors' estimates.

Note: Standard errors in parentheses. *** p < 0.01, ** p < 0.05, * p < 0.1.

TABLE 15.4.

Digitalization, Corruption, and ICT Promotion					
Variables	(1)	(2)	(3)	(4)	(5)
	-2.6842*** (0.674)				
Government DAI					
Government DAI*—Government Success	-1.7249*** (0.515)				
		-2.0900*** (0.556)			
E-Government Index					
E-Government Index*—Government Success		-0.3408* (0.167)			
			-0.6203** (0.307)		
E-Participation Index					
E-Participation Index*—Government Success				-0.0083 (0.272)	
				-0.2329 (1.478)	
Open Budget Index					
Open Budget Index*—Government Success				-0.6278** (0.215)	
					-0.3720*** (0.132)
E-Filing					
E-Filing*—Government Success					-0.5897** (0.229)
Number of Observations	21,258	22,950	22,950	22,085	22,950
Number of Regions	284	315	315	291	315
Number of Countries	25	25	25	25	25
Region Fixed Effects	Yes	Yes	Yes	Yes	Yes
Ethnicity Fixed Effects	Yes	Yes	Yes	Yes	Yes
Religion Fixed Effects	Yes	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes	Yes

Source: Authors' estimates.

Note: Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

CONCLUSION

This chapter empirically tested the relationship between digitalization, the perception of corruption, and trust in tax officials in Africa. The findings can be summarized as follows:

- First, government digital adoption is associated with a lower perception of corruption and a higher trust in tax officials. On average, the adoption of digital tools is correlated with a reduction of corruption perception of tax officials by about 4.3 percentage points, while increasing trust in tax officials by 2.7 percentage points. By enabling transparency and reducing the opportunities for bribes and influence, digitalization can improve trust in government officials.

- Second, internet shutdowns by governments undermine the potential dampening effect of digitalization on the perception of corruption. In contrast, government policies to promote ICT strengthen the impact of digitalization in reducing the perception of corruption of tax officials.

African countries should step up the adoption of digital tools to combat corruption and improve trust in tax officials. Such policy will be key to improving tax compliance and helping African countries mobilize much-needed resources. Furthermore, African countries should refrain from intentionally shutting down the internet, which not only undermines private business but also limits the right of citizens to access public information. Instead, African countries should promote ICT to improve digital infrastructure and increase citizen access to digital tools. Going forward, more work is needed to understand the payoffs of different investments to spur digitalization on African economies, starting with providing basic infrastructure, such as electricity, to making available affordable and reliable internet services, to designing relevant applications and services. Managing risks, keeping digital systems up to date, and adapting to highly challenging and evolving digital environment will require boosting human capital and digital infrastructure.

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