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in Sub-Saharan Africa**

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Financial development and small firms' tax compliance in Sub-Saharan Africa

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November 1, 2021

Abstract

Lack of fiscal space in sub-Saharan Africa is a major preoccupation, particularly in the context of shocks. The majority of firms in the region are primarily in the informal sector and consequently do not pay taxes. This paper explores the effect of financial development on small firms' compliance with value-added tax, profit tax and local tax. It equally explores the mitigating impact of informal finance on financial development's role in driving small firms' tax compliance. To demonstrate this, we estimate a recursive trivariate probit model. The results show that financial development increases the likelihood of firms being tax compliant. In contrast, access to informal finance decreases that likelihood. It also emerges that the lower the taxes, the greater the effects of low costs of banks on tax compliance. Another finding is that informal finance mitigates the effect of financial development on small firms' tax compliance.

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JEL Classification:D22-E26-H26

1 Introduction

In sub-Saharan Africa, about 40% of low-income countries face debt issues or at risk of debt distress (IMF, 2018). Sub-Saharan Africa is the region with the lowest revenue to GDP ratio (IMF, 2018), therefore, broadening the tax base is a must. One of the main reasons for a small tax base is the prevalence of the informal economy. In developing countries, the informal economy comprises more than half of total employment (La Porta and Andrei, 2014; ILO, 2013). In Sub-Saharan Africa, it ranges from 32% to 82% (ILO, 2013).¹ There is increasing recognition of the informal sector contribution to the overall economy. In light of the COVID19 pandemic, many governments in the region are resource-constrained.² There have been calls to grant debt-service suspension to the poorest countries to help them manage the severe impact of the COVID-19.³ This initiative is to give them fiscal space for their policy responses to the pandemic. However, in many sub-Saharan countries, most informal firms could not benefit from the packages offered by governments since they cannot be identified. It is, therefore, of utmost importance to understand what can drive small firms to the formal economy to make them reachable and to increase the governments' resources.

Besides, a large informal economy means that the countries' statistics are unreliable and incomplete, which may affect public policy planning (Bayar and Ozturk, 2016). The productivity of the informal sector is equally low. According to La Porta and Andrei (2014), there is a productivity gap between informal and formal firms of the same size. Indeed, the value-added of informal firms per employee is only 21% of formal firms. The informal sector generates losses in fiscal revenue and contributes to resource misallocation. Public finances are affected as the tax base shrinks, and as a result, growth prospects are compromised due to a lack of social infrastructures (Blackburn et al., 2012). Another concern arises from the informal competition that formal firms face. A recent study shows that a formal firm's innovation is affected by the competition from informal firms (Avenyo et al., 2020).

Consequently, there is a vast literature on the determinants of formalisation. As highlighted by Elgin and Erturk (2019), taxation, regulation, and enforcement stand out

¹ In South and East Asia, the share of informal employment ranges from 42% to 84%.

² Table A.1 shows that over the period 2009-2020, the year 2020 has seen the highest fiscal deficit in sub-Saharan Africa.

³ <https://www.worldbank.org/en/topic/debt/brief/covid-19-debt-service-suspension-initiative>.

as the most frequently studied determinants of informal economic activity. However, as argued by [ILO \(2016\)](#), the role of finance in driving formalisation has not received much attention, while financing is one of the main incentives for firms to register. The strand of the research that looks at the finance channel in the explanation of choice to operate informally focuses on the opportunity cost of the choice to operate within the informal sector when there is financial development⁴ ([Berdiev and Saunoris, 2016](#); [Capasso and Jappelli, 2013](#); [Straub, 2005](#)). The assumption is that financial development leads to an easier access to finance and, thus, increases the opportunity costs of operating informally. Therefore, it increases the incentives to shift towards the formal sector. One prediction of these models is that financial development is associated with a smaller size of the informal sector. Much of this evidence relies on macroeconomic data and does not consider the financial market specificity of sub-Saharan countries with a prevalent informal finance market.⁵

Besides, most of the indicators of financial development used are macro. They do not consider the micro aspect of financial development, knowing that firms may face different access to finance translated by diverse costs of bank transactions and loans. Indeed a study in Ghana shows that the interest rates applied by banks depend on several factors, among which the size of the bank plays a significant role ([Mensah and Abor, 2012](#)).

We contribute to the previous literature in two ways. We provide empirical evidence to support the discussion between financial development and tax compliance ([Capasso and Jappelli, 2013](#); [Straub, 2005](#); [Blackburn et al., 2012](#)) by looking at how low costs of banks⁶ affect tax compliance. Notable exceptions are [Alm et al. \(2019\)](#) and [Beck et al. \(2014\)](#). In their study [Alm et al. \(2019\)](#) focus on the role of financial constraints faced by firms on their tax evasion since most of the sampled firms are already

⁴ We adopt the definition of the IMF ([Sahay et al., 2015](#)) and define financial development as a combination of depth (size and liquidity of markets), access (ability of individuals to access financial services), and efficiency (ability of institutions to provide financial services at low cost and with sustainable revenues, and the level of activity of capital markets).

⁵ Notable exception is [Straub \(2005\)](#), who considers in a general equilibrium model both the formal financial sector and the informal credit market. However, the study is theoretical and considers one specific type of informal finance: informal lenders who use coercive force for loan repayment.

⁶ Our main proxy of financial development is low costs of banks. We will use in our robustness analysis another proxy of financial development which is the accessibility of banks.

formal.⁷ We use in this paper a sample of small firms.⁸ Second, we provide the first empirical evidence of the roles of financial development and informal finance on the tax compliance of small firms. We specifically show that the existence of informal finance⁹ undermines the effect of financial development on the firm's tax compliance.

The article is structured as follows. Section 2 presents a brief review of the literature. Section 3 presents the data and the descriptive statistics. It is followed by section 4 which introduces the empirical approach. Section 5 presents the results and section 6 concludes.

2 Review of the literature

In 2003, the Seventeenth International Conference of Labour Statisticians defines the informal economy as the total number of informal jobs (without any type of social protection or contract), whether carried out in formal sector enterprises, informal sector enterprises or households. [Kanbur \(2009\)](#) considers informality as a lack of compliance with any regulation. We focus on compliance with taxes, namely value-added tax, profit tax, and local tax paid to municipalities.

We first, present the literature on the role of financing in decreasing informality. We then introduce the literature on the choice between informal finance and formal finance. This is crucial to understand that businesses are not necessarily relying on informal finance when they cannot have access to loans from banks. But, instead, some businesses, particularly in the African context, might prefer informal finance. This will shed light on how relying on informal finance might mitigate the effect of financial development on the choice to operate formally.

⁷ The data used is the 2002 and 2005 Business Environment and Enterprise Performance Survey (BEEPS), which is a firm-level survey of a representative sample of an economy's private sector.

⁸ Small economic units make up together with own account workers 80% of total employment in Sub-Saharan Africa ([ILO, 2019](#)).

⁹ For informal finance, we adopt the definition of [Abor and Biekpe \(2006\)](#) and consider informal finance as finance comprised of loans from family/friends, moneylenders and so on and that operates without formal intermediation.

2.1 Financing and the informal economy

Much of the literature looking at the finance channel focuses on the effect of financial development on the size of the informal economy. Because financial development is associated with lower costs of credit, it is considered as the main benefit of formalisation (Antunes and Cavalcanti, 2007). To access credit, firms need to meet some prior requirements, such as being registered and disclosing their revenues. If the cost of credit is low there is a high opportunity cost of operating informally. Indeed, lower costs of credit mean more accessible loans or formal financial transactions and higher benefits drawn from registering or being compliant with taxation. Hence, financial development will be associated with smaller informal economies. This argument is supported both theoretically and empirically.

Theoretically, Blackburn et al. (2012) study the relationship between the underground economy and financial development in a model of tax evasion and bank intermediation. They show that the marginal net benefit of income disclosure (formality) increases with the level of financial development. This is supported both theoretically and empirically by Capasso and Jappelli (2013). They demonstrate that financial development (a reduction in the cost of external finance) can reduce the size of the underground economy. They test the predictions of the model by using Italian data.¹⁰ They find that local financial development is associated with a smaller size of the underground economy. As highlighted by Antunes and Cavalcanti (2007), individuals choose between a formal and an informal sector by weighting the costs of entry and tax obligations in the formal sector against higher financial costs in the informal sector.

Recent studies have provided empirical evidence to support these findings. Alm et al. (2019) use the World Bank Business Environment and Enterprise Performance Survey to examine the effects of financial constraints (a proxy of financial development) on firms' tax evasion. One of the main incentives to operate in the informal sector is the absence of developed financial markets (Alm et al., 2019). Alm et al. (2019) found that more financially constrained firms are more likely to evade taxes. This result supports the theory that firms faced with costly bank credit have fewer incentives to operate formally. Bayar and Ozturk (2016) study the relationship between shadow

¹⁰ They use a variable of local financial development, which measures the probability that households have access to credit locally.

economy, financial development, and institutional quality in European countries. They use domestic credit to the private sector as a percentage of GDP as a proxy for financial development. Using MIMIC data, they found that financial development reduces the size of the shadow economy in the long run. Over the period 1960-2009, [Berdiev and Saunoris \(2016\)](#) examine the relationship between financial development and the shadow economy. They used data from 161 countries and find that the development of the financial sector reduces the spread of the shadow economy. Other studies find similar results ([Din et al., 2019](#); [Liu-Evans and Mitra, 2019](#); [Omri, 2020](#)).¹¹

However, these studies miss an essential specificity of the financial market in sub-Saharan Africa, which is the importance of the informal credit market. The previous studies do not incorporate the existence of informal finance in mitigating the effects of financial development on the choice to comply with regulations, particularly taxes. An analysis of informal firms in Sub-Saharan Africa and Latin America, and the Caribbean [Farazi \(2014\)](#) finds that informal firms that are willing to register are those relying less on informal funding channels and are those citing financial access as their greatest constraint. This might be because informal firms that cannot rely on informal funding channels face a greater opportunity cost while operating within the informal sector.

Firms relying more on informal funding channels may see fewer benefits associated with the formal sector. Indeed, the biggest benefit associated with formalisation by informal firms is better access to credit ([Farazi, 2014](#); [Antunes and Cavalcanti, 2007](#)).¹²

2.2 Choice of finance

As we emphasised previously, it is crucial to discuss the choice of firms between informal finance and bank's credit to understand how such preference can mitigate the effect of financial development on informality.

Between outside sources of finance, one distinguishes informal finance and formal finance. As argued by [Kounouwewa and Chao \(2011\)](#), in most of the literature, it is

¹¹ There is also evidence that financial development leads to higher employment formalisation in sectors that are more dependent on external finance in Brazil and Uruguay ([Catão et al., 2009](#); [Gandelman and Rasteletti, 2016](#)).

¹² [Ivlevs \(2016\)](#) finds in 6 transition economies that receiving remittances is associated with a higher likelihood of informal work. Remittances can be considered as a source of informal finance.

assumed that firms that rely heavily on informal finance do so primarily because they are rationed out of formal credit. One of the main reasons provided is asymmetry information, making it difficult for formal lenders to sort out borrowers. However, firms might prefer informal credit due to several reasons. [Kounouwewa and Chao \(2011\)](#) test the hypothesis that firms choose informal credit over formal credit to avoid predatory regulators and onerous regulations. As they argue, firms may choose to entirely forego formal finance if the benefits do not outweigh the costs (e.g. regulatory harassment). Their results on 16 African countries show that firms facing higher and more frequent demand for bribes are more likely to prefer informal finance. Some studies support the hypothesis of a preference for informal finance over formal finance.

[Turvey and Kong \(2010\)](#) argue that informal borrowings amongst friends and relatives is culturally driven in rural China. They make the point that trust, combined with social preferences on the use of debt, can explain farm households' different uses of formal and informal credit (p.545). They use a survey of 1565 farm households in China and find that borrowing informally is preferred to formal lending. [Peters et al. \(2016\)](#) run an experiment on borrowers' preferences over bank and family loans in rural Rwanda. The results of their analysis on a sample of 480 households show that there is no significant difference in preferences over these two choices. The preference for informal finance may be due to its low cost, as most of the informal investors expect negative returns ([Bygrave and Hunt, 2004](#)). The only costs associated with it is the loss of social ties ([Karlan et al., 2009](#); [Jain, 1999](#); [Karaivanov and Kessler, 2018](#)).

The previous literature shows that it is highly likely that firms might prefer informal finance to bank's credit. Therefore, when they already have access to informal lending, they will be less likely to comply with regulations to get a loan from banks. This is supported by the study of [Mukorera \(2019\)](#), who finds that an improvement in financial constraints will decrease the odds of willingness to formalise among informal micro and small-scale firms in Zimbabwe. And as emphasised by [Antunes and Cavalcanti \(2007\)](#) and [Straub \(2005\)](#), the main benefit of being compliant with regulations is access to formal finance.

Hence, our study seeks to fill the gap regarding the mitigation effect of informal lending on the impact of financial development on tax compliance. More precisely, we investigate how low costs of banks will increase the probability to be tax compliant and how access to informal lending through family and friends will mitigate that effect. We

argue that low costs of banks reflect the level of financial development since a developed formal financial market means easier access to finance and lower costs due to competition. Therefore, in the remaining document low costs of banks will be used as our proxy of financial development.

3 Data and Empirical approach

3.1 Data and information sources

The data used are the Small Business Access and Usage Survey in thirteen African countries collected in 2011-2012. Random sampling was performed in four steps for businesses. First, the national census sample frames was split into urban and rural Enumerator areas (EAs). Second, EAs were sampled for each stratum using probability proportional to size (PPS). Third, for each EA, one listing was compiled for businesses. The listings serve as a sample frame for the simple random sections. Fourth, 24 Households and 10 businesses were sampled using a simple random sample for each selected EA. The survey collects various information on small businesses related to their characteristics, the type of finance used to create the business, their access to finance and ICT, and their productivity. The survey is nationally representative. The countries covered are Botswana, Cameroon, Ethiopia, Ghana, Kenya, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Tanzania, and Uganda. The total number of businesses is 6441.

3.2 Data construction

Financial development

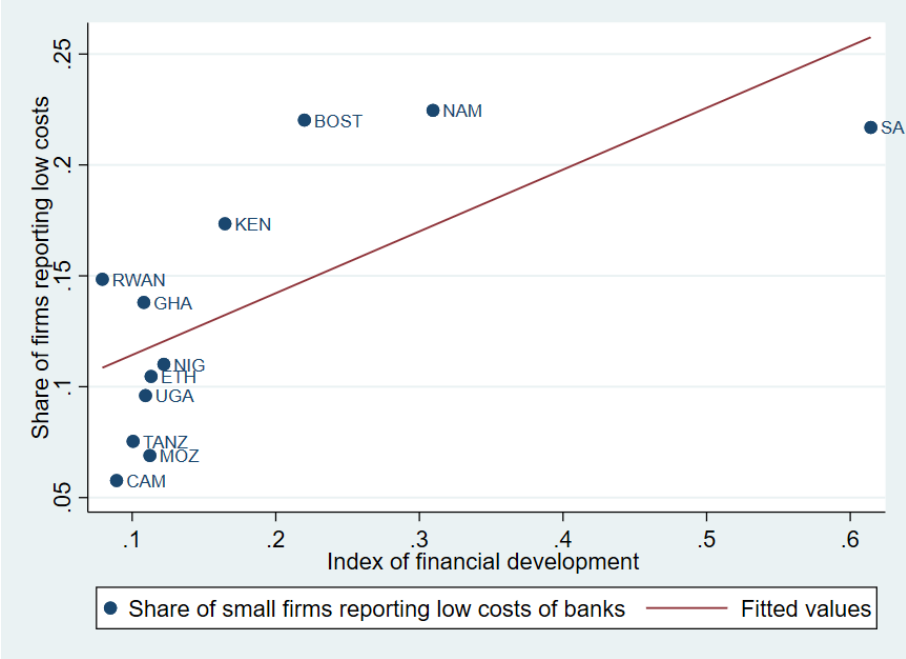
We measure financial development at the micro-level, and we follow [Alm et al. \(2019\)](#). They use self-reported financial constraints as a proxy of financial development to show their effects on tax evasion.¹³ Our measure of financial development is also at the micro-

¹³To show the relevance of self-reported financial constraints as proxies of financial development, they plot the aggregated average score of these variables against country-level indicators of the ratio of private credit to GDP and the ratio of banks' assets to GDP across countries.

level. We use a self-reported measure of banking costs of transactions. Firms that report that banks are not expensive will have a value of 1, and firms that think otherwise will be coded 0. This variable is similar to one of [Alm et al. \(2019\)](#), where one of their proxy of financial development is low credit costs. We choose this variable because the primary role of financial development is to reduce the costs of financial transactions. Financial sector development occurs when financial instruments, markets, and intermediaries ease the effects of information, enforcement, and transactions costs.¹⁴

To check the relevance of our measure, we plot the statistical mean of the variable at the country level against the country index of financial development. The graph comprises all 12 countries in our sample, namely South Africa, Rwanda, Kenya, Namibia, Tanzania, Mozambique, Ghana, Botswana, Nigeria, Ethiopia, Cameroon and Uganda. Figure 1 shows that there is a strong correlation between our variable and the country level index of financial development.

Figure 1: Proxy of financial development and financial development index



¹⁴ <https://www.worldbank.org/en/publication/gfdr/gfdr-2016/background/financial-development>.

Informal finance

In the questionnaire, businesses have been asked which type of finance they used to create the enterprise. We create a binary variable that captures those who used informal finance to create their business. The variable captures those who report that they have used a loan from family/friends.

Outcomes variables

We consider several measures of tax compliance. These measures are related to whether or not a business complies with formal regulations. We mainly consider compliance with tax registration. More precisely, we consider compliance with valued added tax, profit tax and local tax.

Control variables

We consider several variables. The area where the business operates (urban or rural area). Firms that are in urban area are more likely to be formal and use some types of financing. We also include the number of years the business has been operating. The demographic variables of the business' owners are equally important. We consequently include gender and the level of education. To account for sector differences, dummies of the sector of activity are included. Some sectors are more likely to operate in the informal sector than others. It is widely acknowledged that a firm formality depends on its size. We therefore use the number of employees as a proxy. Younger and older firms may have different behaviours when it comes to formalisation. Hence, we include the age of the firm in the analysis.

3.3 Descriptive statistics

We will analyse the distribution of registered small firms across countries (Botswana, Cameroon, Ethiopia, Ghana, Kenya, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Tanzania, Uganda, and Tunisia). Figure 2 (a) reports the percentages of small firms paying tax at a local level. As expected, the percentage of firms paying local taxes is higher than the percentages of firms paying profit tax and VAT. For local tax, fewer

countries have more than half of their small firms paying local taxes, with the countries being Rwanda (81.56%), Ethiopia (80.14%), Kenya (56.53%) and Uganda (58.2%).

Figure 2 (b) depicts the share of firms that are registered for the value-added tax in each country. Only 4 countries, South Africa, Namibia, Rwanda and Uganda, have a percentage of small firms registered for VAT superior to 20%. With South Africa having the highest percentage of about 29.98%. Ethiopia experiences the lowest share of small firms registered for VAT of about 2.85%. Figure 2 (c) reports the percentage of firms paying profit tax. Conversely to VAT, most countries experience a share of small firms paying profit tax superior to 20%, with South Africa still having the highest share (31.26%). Mozambique, Botswana and Ethiopia are the countries with the lowest percentages of small firms paying profit tax. Overall, for all countries in our sample, most small firms are not registered for VAT and profit tax. This supports the view that in Sub-Saharan countries, the majority of small firms are informal or businesses are barely registered.

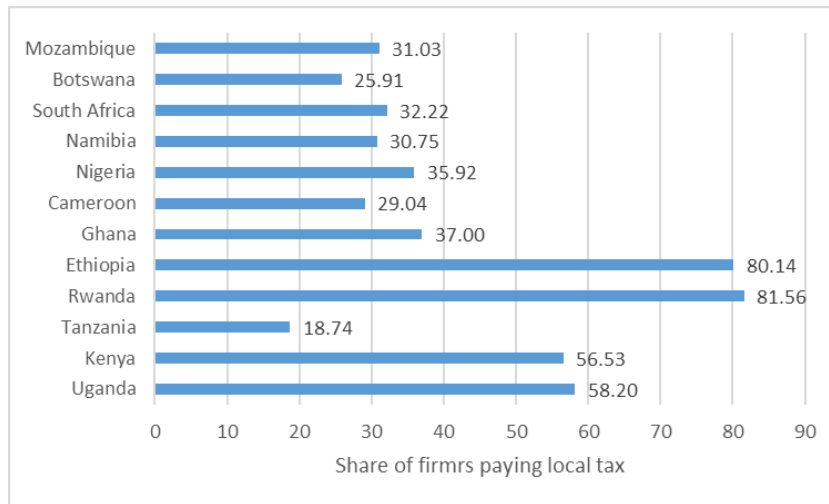
Different factors could be associated with the choices of firms in terms of types of registration, particularly access to finance.

We analyse the statistics of the different variables shown in Table 1. We start first with informal finance: 13% of our sample have access to informal finance. Regarding the variable financial development, 13.2% of small firms reports a low cost of banks.

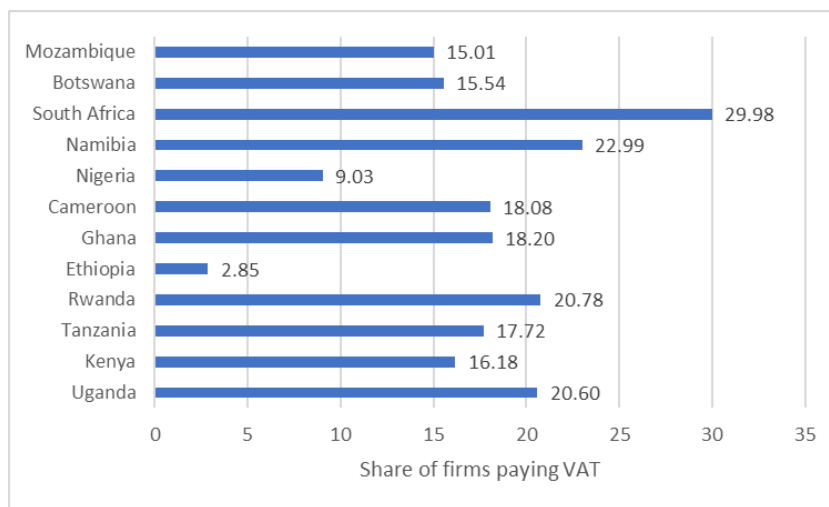
Regarding the characteristics of the businesses, the majority are in an urban area (61.7%), and most of them are male-owned (45.9%). The highest level of education attained by most owners is a primary level of education (41.6%). Most of the businesses are in the trading sector (47.4%) and in other services (35.7%).

On average, the businesses in our sample are around 8 years old. As previously seen, small firms are more likely to register locally (44%), or to pay local tax (46.2%) than to register for VAT (16.7%) or pay profit tax (22.2%).

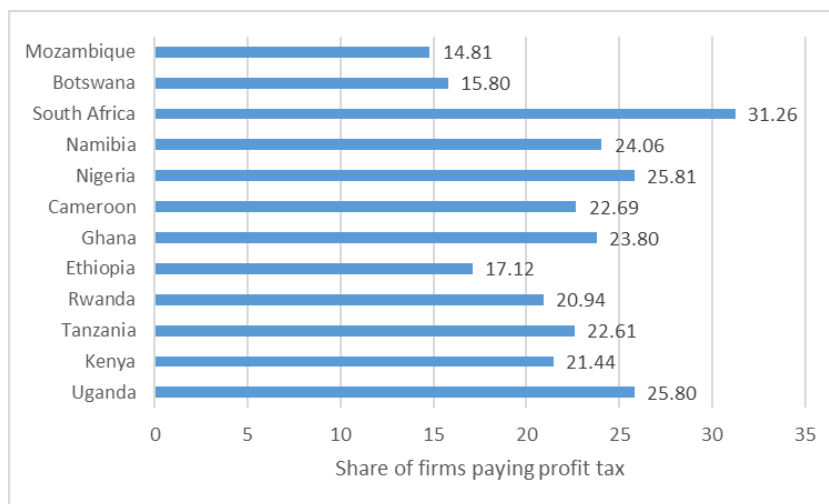
Figure 3 shows the relationship between financial development and the size of the informal economy for the period 2011 in 45 African economies. The index of financial development from the World Bank development indicators is negatively correlated with the size of the informal economy.



(a Local tax)



(b Value added tax)



(c Profit tax)

Figure 2: Percentages of compliant firms by country.

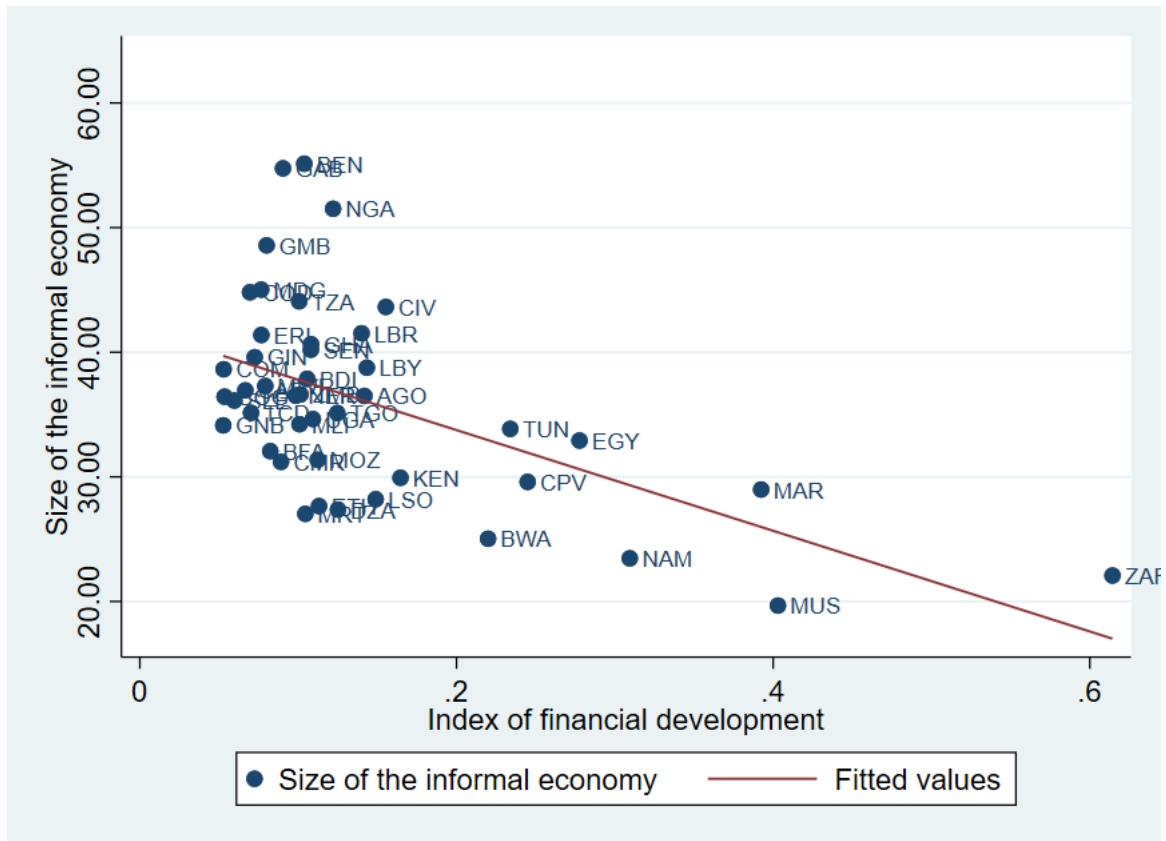


Figure 3: Size of the informal economy and financial development index . Source: Global Financial Development data and IMF data for the year 2011

Table 1: Summary statistics

Variable	Obs	Mean	Std. Dev.
Main independent variables			
Informal finance	6,438	0.131	0.337
Low costs of Banks	6,439	0.132	0.23
Outcomes variables			
Business pay tax on its profit	6,439	0.222	0.415
Business registered for VAT or sales tax	6,439	0.167	0.373
Business pay local or municipal taxes (tax stamps etc)	6,439	0.462	0.499

Continued on next page...

Table 1 – continued

Control variables			
Urban	6,389	0.617	0.486
Years of the business	6,418	7.83	6.98
Full time employees	6351	1	3.16
Male owner	6,430	0.459	0.498
Female owner	6,430	0.384	0.486
Owned by Male and female	6,430	0.157	0.364
Primary education	6,431	0.416	0.493
Secondary education	6,431	0.327	0.469
Tertiary education	6,431	0.120	0.325
Vocational education	6,431	0.024	0.153
No education	6,431	0.113	0.317
Trading	6,439	0.474	0.499
Manufacture	6,439	0.061	0.239
Agriculture	6,439	0.027	0.161
Other sectors	6,439	0.081	0.273
Other services	6,439	0.357	0.479
Informal means of sending money	6,439	0.836	0.369
Use of bank for transactions	6,439	0.060	0.23

4 Model specification

Our main explanatory variables are on finance. A firm’s finance often involves several decisions that are intertwined and endogenously chosen by managers/owners (Wang, 2015). For instance, some unobserved factors may explain both the decision to get a loan and formally operate. One main source of endogeneity could be reverse causality, where the formalisation status explains financial development. Hence, in our particular context, the issue may arise because of reverse causality, measurement errors, and omitted variable bias. In the previous empirical literature, financial development is often considered endogenous. The usual approach to solve the issue is implementing

an instrumental variable approach (Alm et al., 2019; Capasso and Jappelli, 2013; Berdiev and Saunoris, 2016).

We adopt a recursive, simultaneous-equations model to handle the endogeneity of the informal finance variable and the endogeneity of the financial development variable. It consists of a system of three equations of univariate probit models that are simultaneously solved. In other words, the model estimates three potentially correlated binary outcomes, in this instance, the binary decision by a firm to formalise, the use of informal finance and the financial development that the firm faces. The model assumes that the error terms in the equations are correlated. Correlation between the error terms suggests that there are unobserved variables and or reverse causality.

$$y_1^*{}_i = \beta_1 X_{1i} + \gamma_{11} y_2^*{}_i + \gamma_{12} y_3^*{}_i + \varepsilon_{1i}, y_{1i} = 1(y_1^*{}_i > 0) \quad (1)$$

$$y_2^*{}_i = \beta_2 X_{2i} + \varepsilon_{2i}, y_{2i} = 1(y_2^*{}_i > 0) \quad (2)$$

$$y_3^*{}_i = \beta_3 X_{3i} + \varepsilon_{3i}, y_{3i} = 1(y_3^*{}_i > 0) \quad (3)$$

where $y_1^*{}_i$, $y_2^*{}_i$, and $y_3^*{}_i$ are the latent variables that determine the observed binary outcomes y_1 , y_2 and y_3 ; y_1 is the binary variable of formalisation (value added tax registration, profit tax registration, book keeping, separate finances, local registration and local tax payment); y_2 is the binary variable of informal finance; y_3 is the binary variable of perceived financial development (low costs of banks); X_1 and X_2 and X_3 are vectors of explanatory variables and includes the control variables specified above (urban or rural area, the number of years the business, the gender and the level of education, dummies of the sector of activity, the number of employees, country dummies.) ; X_2 and X_3 equally include the instrument variables for informal finance and for financial development that are excluded from the outcome equation; β_1 , β_2 , and β_3 γ_{11} , γ_{12} are vectors of parameters; and ε_{1i} , and ε_{2i} , ε_{3i} are the error terms. Assume that ε_{1i} , ε_{2i} , and ε_{3i} are jointly normally distributed.

$$\begin{bmatrix} \varepsilon_{1i} \\ \varepsilon_{2i} \\ \varepsilon_{3i} \end{bmatrix} \sim N \left(\begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}, \begin{pmatrix} 1 & \rho_{12} & \rho_{13} \\ \rho_{12} & 1 & \rho_{23} \\ \rho_{13} & \rho_{23} & 1 \end{pmatrix} \right) \quad (4)$$

where ρ_{12} and ρ_{13} are the correlations between ε_1 , ε_2 and ε_1 , ε_3 , and ρ_{23} is the correlation between ε_2 and ε_3 .

We use variables of exclusion which will be excluded from the main equation. For the equation of informal finance, the variables excluded from the main equation are the main mean of sending money used by the firm and the main communication channel. We posit that those who rely on informal finance mostly use informal means of sending money, such as asking someone or in-person and use informal means of communication. The exclusion variable for the equation of low costs of banks is whether the person uses bank transactions with its customers. The firms that use banks as a primary mean of a transaction with their customers likely have lower costs of banks. We will consider another proxy of financial development in our robustness analysis, and we will consider another instrument.

We estimate a simultaneous tri-variate model. The conditional mixed process assumes that the error terms from both the formalisation equation, the informal finance equation and the financial development equation can be correlated and are thus trivariate normally distributed (Roodman, 2011). The conditional mixed process uses a full information maximum likelihood estimation procedure to simultaneously estimate the three equations.

5 Results

Table 2 reports the effects of informal finance and low costs of banks on tax compliance (value added tax, profit tax and local tax). As explained above, we estimate a model to correct for the endogeneity of informal finance and low cost of banks. We present the results of the joint estimation of the tax compliance equations, the low costs of banks equation and the informal finance equation. We report the results of the outcome equations. The full Tables of estimation are reported in Tables A.3, A.4 and A.5. We report the results of three specifications for each of our outcomes variables. Columns

(1) (4) (7) include basic control variables. Columns (2) (5) (8) add to the previous control variables the sectors of activities. Finally, columns (3) (6) (9) include the country dummies.

The values of ρ_{12} are significant in all specifications, rejecting the null hypothesis of exogeneity of informal finance. It means that the estimates of a simple probit of tax compliance would overestimate the effect of informal finance.¹⁵ The values of ρ_{13} are equally significant (except for local tax).

We then proceed to analyse our main results from the outcome equations.

Effects of informal finance and low costs of banks on tax compliance

Specific to the effect of informal finance on tax compliance, the effect is negative and significant at 1%, and the results are consistent across all our specifications. More precisely, access to informal finance reduces the probability to be tax compliant with value-added tax, profit tax and local tax. In our preferred specification which includes all covariates and the country dummies (columns (3), (6) and (9)), informal finance reduces value-added tax compliance by approximately 28.5%, profit tax registration by 44.9% and local tax compliance by 42.1%.

As highlighted by [Antunes and Cavalcanti \(2007\)](#), the main benefit of formalisation is access to finance. Firms that can access other types of finances will see fewer benefits in registering their businesses for tax payment. In particular, in an African context whereby informal loans are quite widespread. There is evidence of a reluctance from informal entrepreneurs to get a loan from formal financial institutions knowing that they have access to informal sources of finances.¹⁶ As discussed by [Kounouwewa and Chao \(2011\)](#), firms may choose informal credit over formal credit to avoid predatory regulators and onerous regulations.

Regarding the variable low costs of banks, the marginal effects are significant and positive, and the results are consistent across all specifications. Firms that consider banks' costs to be low are more likely to be tax compliant. Low costs of banks increase the likelihood of firms to be compliant with value-added tax, profit tax and local tax.

¹⁵ This interpretation is supported by the results in Table A.2 where we estimate a simple probit model of our outcomes variables.

¹⁶ <https://web.facebook.com/JTAfrique/videos/1405929239564566/>

More precisely, low costs of banks increase compliance with value-added tax by 27.2% in column 1, compliance with profit tax by 23% and compliance with local tax by 41.2%. This supports the previous evidence in the literature of the role of the costs of banks in decreasing tax evasion (Alm et al., 2019; Capasso and Jappelli, 2013; Catão et al., 2009; Gandelman and Rasteletti, 2016).

This result is explained by the opportunity costs of staying informal when formal credit is cheap. Firms may weigh the costs and benefits of formalisation and based on the costs involved, decide to register or not. And the incentives to register may depend on the level of costs involved. We observe that the marginal effect of low costs of banks is higher for local tax, followed by VAT and profit tax. The marginal effect for local tax is almost double, meaning that the lower the tax, the higher the effect of low costs of banks. Indeed, the costs of local taxes are often low.¹⁷ The decision to be tax compliant is still related to the opportunity costs. Low costs of banks combined with low taxes give more incentives to small firms to join the formal sector. This result shows that governments can play on three aspects to convince more small firms to be tax compliant. They can either decrease the costs of taxes or make the financial market more competitive to reduce the costs. They can also combine the two for more significant results.

¹⁷ <https://www.cmi.no/publications/file/5098-local-government-taxation-in-sub-Saharan-africa.pdf>.

Table 2: The effects of informal finance and low costs of banks on tax compliance

	VAT			Profit tax			Local tax		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Informal finance	-0.408*** (0.029)	-0.408*** (0.030)	-0.285*** (0.082)	-0.505*** (0.021)	-0.508*** (0.021)	-0.449*** (0.049)	-0.330*** (0.084)	-0.337*** (0.085)	-0.421*** (0.068)
Low costs of banks	0.283*** (0.039)	0.278*** (0.039)	0.272*** (0.040)	0.247*** (0.059)	0.233*** (0.055)	0.230*** (0.084)	0.313** (0.134)	0.366*** (0.136)	0.412*** (0.124)
Owned by male	0.073*** (0.011)	0.068*** (0.011)	0.056*** (0.011)	0.099*** (0.012)	0.093*** (0.012)	0.081*** (0.013)	0.223*** (0.016)	0.208*** (0.017)	0.131*** (0.018)
Owned by male and female	0.102*** (0.014)	0.100*** (0.014)	0.099*** (0.014)	0.080*** (0.016)	0.080*** (0.017)	0.086*** (0.018)	0.234*** (0.024)	0.195*** (0.024)	0.177*** (0.026)
Urban	0.043*** (0.011)	0.038*** (0.011)	0.053*** (0.011)	0.035*** (0.012)	0.029** (0.011)	0.031** (0.013)	0.040** (0.016)	0.043*** (0.016)	0.066*** (0.018)
Primary education	0.047** (0.023)	0.044* (0.023)	0.012 (0.023)	-0.003 (0.020)	-0.008 (0.020)	0.026 (0.021)	-0.035 (0.023)	-0.047** (0.023)	0.030 (0.024)
Secondary education	0.106*** (0.024)	0.104*** (0.024)	0.098*** (0.023)	0.039* (0.021)	0.038* (0.021)	0.107*** (0.023)	0.080*** (0.030)	0.079*** (0.030)	0.222*** (0.031)
Tertiary education	0.147*** (0.026)	0.144*** (0.026)	0.145*** (0.026)	0.079*** (0.027)	0.077*** (0.026)	0.158*** (0.032)	0.258*** (0.046)	0.242*** (0.048)	0.407*** (0.049)

Continued on next page...

Table 2 – continued

Vocational education	0.162*** (0.034)	0.159*** (0.034)	0.153*** (0.032)	0.167*** (0.036)	0.165*** (0.036)	0.237*** (0.038)	0.158*** (0.056)	0.166*** (0.058)	0.306*** (0.057)
Number of full employees	0.018*** (0.004)	0.018*** (0.004)	0.018*** (0.004)	0.015*** (0.004)	0.015*** (0.004)	0.019*** (0.004)	0.056*** (0.008)	0.053*** (0.008)	0.104*** (0.011)
Years of the business	0.002*** (0.001)	0.003*** (0.001)	0.005*** (0.001)	0.003*** (0.001)	0.003*** (0.001)	0.002* (0.001)	0.010*** (0.001)	0.010*** (0.001)	0.007*** (0.001)
Manufacture		-0.019 (0.021)	-0.024 (0.020)		0.018 (0.023)	0.022 (0.023)		-0.147*** (0.034)	-0.140*** (0.035)
Agriculture		-0.103*** (0.038)	-0.071* (0.039)		-0.130*** (0.038)	-0.163*** (0.041)		0.181*** (0.048)	0.065 (0.046)
Other sectors		-0.051*** (0.020)	-0.031 (0.019)		-0.103*** (0.021)	-0.049** (0.023)		-0.120*** (0.030)	0.024 (0.033)
Other services		0.036*** (0.011)	0.021* (0.011)		0.033*** (0.012)	0.036*** (0.013)		0.154*** (0.016)	0.076*** (0.019)
rho_12	0.838*** (0.05)	0.843*** (0.052)	0.649*** (0.17)	0.879*** (0.038)	0.888*** (0.039)	0.756*** (0.099)	0.63*** (0.10)	0.634*** (0.11)	0.69*** (0.09)
rho_13	-0.405*** (0.0950)	-0.39*** (0.075)	-0.43*** (0.08)	-0.32*** (0.098)	-0.30*** (0.093)	-0.294* (0.144)	0.015 (0.183)	-0.082 (0.18)	-0.19 (0.185)
rho_23	-0.040	-0.062	-0.062* (0.011)	-0.024	-0.018	-0.025	-0.039	-0.035	-0.056

Continued on next page...

Table 2 – continued

	(0.0362)	(0.0362)	(0.036)	(0.034)	(0.035)	(0.036)	(0.036)	(0.036)	(0.037)
N	6271	6271	6271	6271	6271	6271	6271	6271	6271
Wald	2380.297	2398.105	2642.689	2560.140	2606.694	2609.241	1385.648	1569.678	2595.377
P value of Wald test	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Full information maximum likelihood estimations. Columns (1), (4) and (7) include all the control variables except the sectors of activity. .

Columns (2) (5) and (8) include all the control variables. Columns (3), (6) and (9) include additionally the the country dummies

Standard errors between parentheses.

Marginal effects are reported.

Other drivers of tax compliance

We now analyse the other explanatory variables. Enterprises owned by men are more likely to pay taxes compared to female-headed businesses. Indeed the marginal effects are positive and significant for all our outcomes (value-added tax, profit tax and local tax). The results are consistent across all our specifications. These results are consistent with previous literature on the determinants of formalisation (Khamis, 2014; Benhassine et al., 2015; Ishengoma, 2018). One of the main explanations provided relates to the fact that women entrepreneurs are more motivated by reproductive objectives such as providing for the household or paying the education of their children rather than business development (Xheneti et al., 2019; Neves and du Toit, 2012). Women may also face more financial constraints to bear the costs of tax compliance. As expected, businesses in urban areas are more likely to comply with valued added tax, profit tax, and local tax.

The level of education is equally an essential factor associated with tax payment. Businesses whose owners have a higher level of education are more likely to be formal than those whose owners are not educated. Owners with secondary education, tertiary education, and vocational education are more likely to comply with valued added tax, profit tax, and local tax than owners without a formal education. The marginal effects of these categories are all significant and positive. Besides, the size of the marginal effects increases with the level of education. This supports previous evidence on the role of education in driving formalisation (McCulloch et al., 2010; Khamis, 2014; Benhassine et al., 2015; Ishengoma, 2018). Education may be a proxy for the level of knowledge the business has on several regulatory compliances and its benefits. It may also reflect the level of resources the firm has access to to support the costs of taxes.

As expected, being in the agricultural sector significantly decreases the probability to comply with most of the taxation outcomes compared to firms in the trading sector. Businesses in the agricultural sectors are less likely to register for value-added tax, profit tax. Agricultural activities are well known to be mostly informal. Having activity in other service sector activities significantly increases the likelihood to comply with all registration procedures than firms in trading activities.

The number of employees shows that bigger firms are more likely to comply with valued added tax, profit tax, and local tax than smaller firms. The marginal effects of

the variable number of employees are positive and significant for all estimations. This supports previous evidence in the literature (Ishengoma, 2018; McCulloch et al., 2010; Ng'ang'a and Gitonga, 2015). As explained by Ng'ang'a and Gitonga (2015), larger firms may have more financial capabilities to bear the costs of formalisation. Also due to their size, it is difficult to avoid the government's attention. The firm's age also significantly increases the probability to comply with value added tax, profit tax, and local tax compared to younger firms.

Does informal finance mitigate the effect of low costs of banks on tax compliance?

The previous results showed that informal finance negatively affects the likelihood of firms to register for value-added tax, profit tax and local tax. We equally provided evidence that the effect of low costs of banks on tax compliance depends on the level of taxes. These results imply that when firms consider complying with one type of regulation, they will consider both the costs and the benefits. As we already mentioned, the benefits are mainly related to access to formal financial services. When a firm has access to informal finance, the opportunity cost it faces decreases, and the incentives will be significantly lower when tax compliance involves high costs.

To assess our hypothesis, we report the marginal effects of low costs of banks at varying values of informal finance (0 or 1). Table 3 reports the results. The marginal effects of low costs of banks on VAT and local tax are barely significant (10%) when informal finance is 1. Besides, the marginal effect of low costs of banks on profit tax is insignificant when informal finance is 1.

This result implies that the effect of low costs of banks on profit tax compliance is lower for those who have access to informal finance. The main explanation may be the lower opportunity costs of not complying when there is another source of finance. However, the costs may be related to the tax compliance process and the fees associated with obtaining credit or the costs related to financial transactions. High costs incurred in the financial system equally decrease the opportunity cost of remaining informal.

Table 3: The mitigating effects of informal finance on the effects of low costs of banks

	VAT		Profit tax		Local tax	
	No	Yes	No	Yes	No	Yes
Informal finance						
Low costs of banks	0.372*** (0.056)	0.087* (0.048)	0.267*** (0.035)	0.032 (0.094)	0.267*** (0.062)	0.251* (0.130)
N	6271					

Standard errors between parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

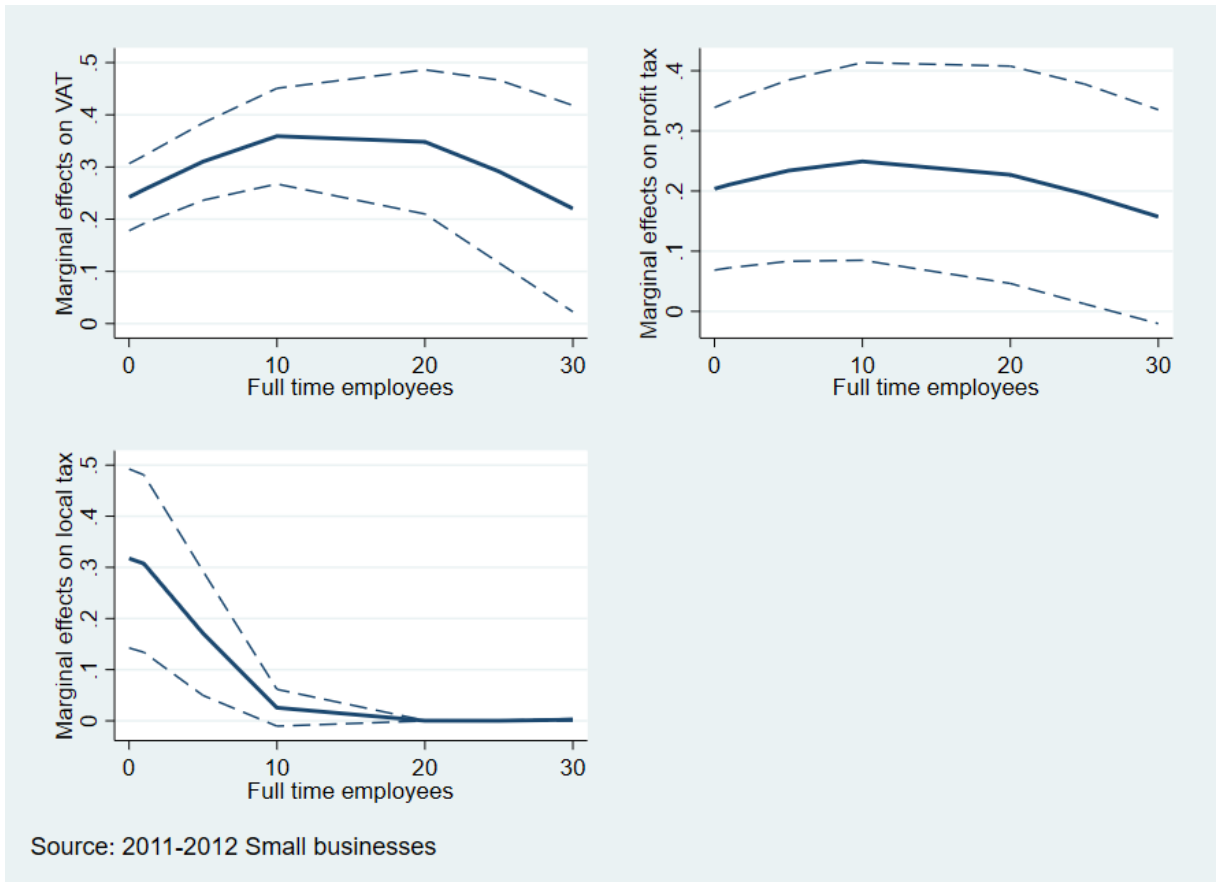
Marginal effects of low costs of banks for varying values of informal finance (yes,no). The estimations in all columns include the control variables, the sector dummies and the country dummies.

Note: Marginal effects are reported.

Heterogeneous effects of low costs of banks

This sub-section explores the heterogeneous effects of low costs of banks on small firms' compliance with taxes by the firm's size. Figure 4 shows the effects of the low costs of banks by the size of the firm. For VAT and profit tax, the effects are increasing with the firm's size until ten employees and start decreasing. One possible explanation is that firms with employees of 10 or less are more resource constraint. Subsequently, when the costs of banks are low, they give more significant incentives to those firms to comply with taxation. Suppose we consider the number of employees as the proxy for the size of a firm; when firms become larger (after ten employees), their ability to use internal funds increases. Therefore, low costs of banks have less impact on their decision to be tax compliant. For local taxes, the reverse is observed, and the effect becomes insignificant after 10 employees. One possible explanation is the level of local taxes that is usually low compared to VAT and profit tax.

Figure 4: Marginal effects of low costs of banks by firms' size



5.1 Robustness analysis

Alternative proxy of financial development

Financial development has several dimensions. The previous proxy that we used is related to the efficiency of the financial sector in providing financial services at low costs. Another equally important dimension is financial access. It is mainly measured through the number of bank branches in a country or an area. We consequently consider another proxy of financial development with a question in the survey asking businesses whether the next bank branch is far. We consider the variable access to be 1 when the answer is no and 0 otherwise. Table 4 reports the results of the estimation. We observe that the signs of the coefficients on access are all as significant and positive as the coefficients of low costs. Besides, the sizes of the coefficients are relatively close,

with access increasing VAT compliance and profit tax compliance by respectively 27.1% and 21.3% compared to 27.2% and 23% for low costs of banks. A similar situation is noted for local tax compliance, with access increasing local tax compliance by 40.04% compared to 41.2% for low costs.

Table 4: The effects of informal finance and financial access on firms' tax compliance

	VAT	Profit tax	Local tax
Informal finance	-0.284*** (0.074)	-0.455*** (0.046)	-0.435*** (0.062)
Access	0.271*** (0.033)	0.213*** (0.063)	0.404*** (0.089)
N	6271.000	6271.000	6271.000
Wald	2939.421	3069.024	3019.939
Wald_Pvalue	0.000	0.000	0.000

Standard errors between parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The estimations in all columns include the control variables, the sector dummies and the country dummies.

Note: Marginal effects are reported.

6 Conclusion

Lack of fiscal space in sub-Saharan countries is a major preoccupation, notably in the context of shocks. A large informal sector primarily drives the resource constraint. Financial development may be a catalyst for driving small firms that constitute the bulk of the economy to be tax compliant.

This paper explores the effect of low costs of banks on small firms compliance with value-added tax, profit tax and local tax. It equally explores the mitigating

impact of informal finance on the role of low costs of banks in driving small firms' tax compliance. We estimate a recursive trivariate probit model that simultaneously estimates an equation of tax compliance, an equation of informal finance, and an equation of low costs of banks.

The results show that low costs of banks increase the likelihood of firms being tax compliant. In contrast, access to informal finance decreases that likelihood. It also emerges that the lower the taxes, the greater the effects of low costs of banks on tax compliance. Another finding is that informal finance mitigates the effect of low costs of banks on tax compliance.

The major implications are the following. For governments to increase their tax base thanks to financial development, they can undertake different actions. Governments can reduce the level of taxes or make the financial sector more competitive to decrease the costs in sub-Saharan Africa, where informal finance is widespread. Indeed, a decrease in the costs of banks will not likely have the same effect on tax compliance as in developed economies. In the region, many firms can rely on informal finance from family and friends. Consequently, to effectively leverage the effect of low costs of banks on tax compliance, lower costs are needed.

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APPENDIX

Figure A.1: Fiscal deficit of sub-Saharan countries 2009-2021 with respect to GDP

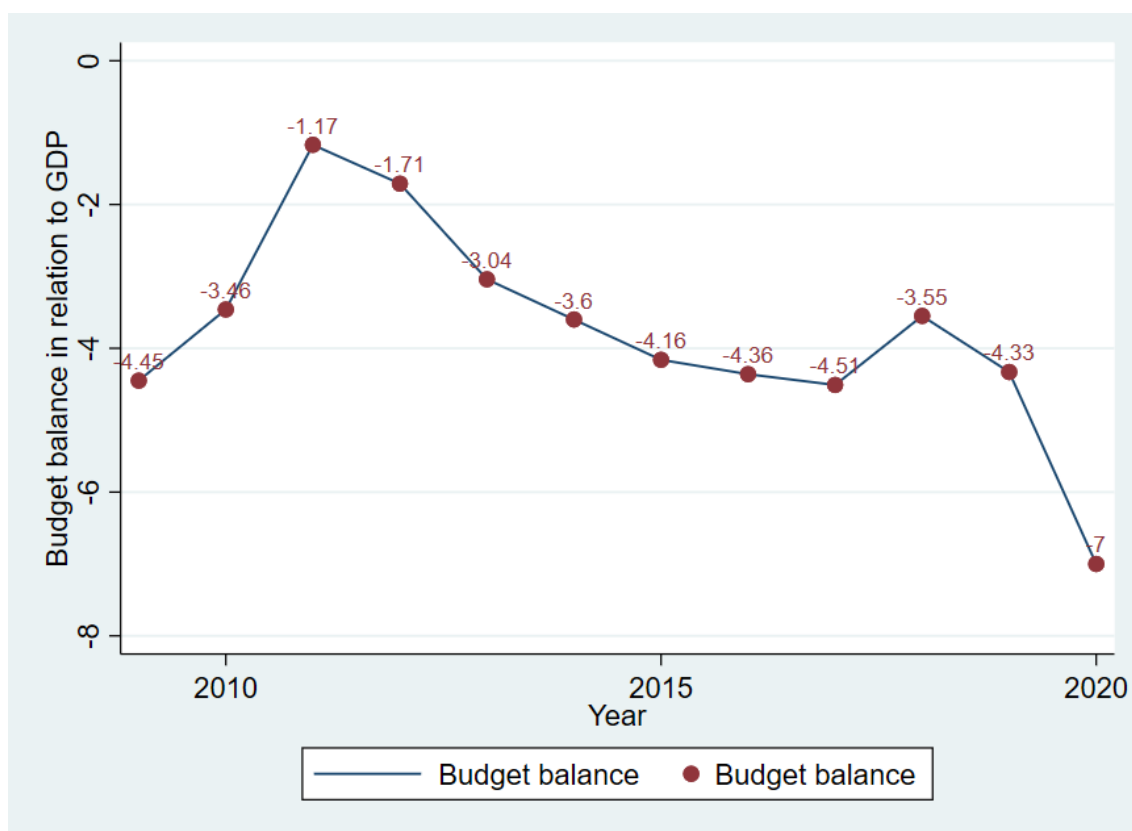


Table A.1: Definition of the variables

Variable	Definition
Main independent variables	
Informal finance	Use of loan from family and friends to create the business
Low costs of banks (proxy of Financial development)	Firms do not think that banks are expensive
Outcomes variables	
Profit tax	Business pays tax on its profit
VAT	Business is registered for VAT or sales tax
Local tax	Business pays local tax

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Control variables

Urban	Business is in an urban area
Years of the business	Number of years the business has been established
<i>Gender of the business owner</i>	
Male owner	The owner of the business is a man
Female owner	The owner of the business is a woman
Male and female	The business is owned by females and males
<i>Education</i>	
Primary education	Primary education of the business owner
Secondary education	Secondary education of the business owner
Tertiary education	Tertiary education of the business owner
Vocational education	The business owner has vocational education
No education	No education of the business owner
<i>Sector of activity</i>	
Trading	The business is in the trading sector
Manufacture	The business is in the manufacturing sector
Agriculture	The business is in the agricultural sector
Other sectors	The business is in other sectors
Other services	The business is in other service sector

Instruments

<i>Exclusion restriction for informal finance</i>	
Informal means of sending money	Asking someone or in person
<i>Exclusion restriction of Low costs of banks</i>	
Use of bank for transactions	Use of bank for transactions with customers

Table A.2: Simple probit of the effects of informal finance and costs of banks on tax compliance

VARIABLES	(1) VAT	(2) Profit tax	(3) Local tax
Informal finance	-0.0283** (0.0144)	-0.0748*** (0.0175)	0.0289 (0.0214)
Low costs of banks	0.0920*** (0.0113)	0.0808*** (0.0150)	0.286*** (0.0308)
Male	0.0617*** (0.00973)	0.0958*** (0.0121)	0.137*** (0.0165)
Male and female	0.108*** (0.0124)	0.108*** (0.0163)	0.190*** (0.0240)
Urban	0.0629*** (0.00965)	0.0458*** (0.0118)	0.0714*** (0.0166)
Primary education	0.0238 (0.0217)	0.0478** (0.0208)	0.0485** (0.0231)
Secondary education	0.115*** (0.0212)	0.143*** (0.0216)	0.247*** (0.0266)
Tertiary education	0.191*** (0.0230)	0.236*** (0.0252)	0.454*** (0.0388)
Vocational education	0.165*** (0.0304)	0.276*** (0.0359)	0.330*** (0.0552)
Manufacture	-0.0355** (0.0174)	0.000319 (0.0222)	-0.168*** (0.0337)
Agriculture	-0.0762* (0.0392)	-0.188*** (0.0426)	0.0689 (0.0472)
Other sectors	-0.0259 (0.0176)	-0.0497** (0.0229)	0.0251 (0.0323)
Other services	0.0164 (0.0102)	0.0302** (0.0126)	0.0693*** (0.0185)
Number of employees	0.0195*** (0.00377)	0.0220*** (0.00428)	0.103*** (0.0107)
Years of the business	0.00537*** (0.000702)	0.00302*** (0.000871)	0.00786*** (0.00140)
Country dummies	YES	YES	YES
Observations	6,271	6,271	4,625

standard errors between parentheses; * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Note: Marginal effects are reported.

Table A.3: Full table of the effect of financing on VAT compliance

	VAT					
	(1)	(2)	(3)	(4)	(5)	(6)
	Informal fin.	Low costs	Informal fin.	Low costs	Informal fin.	Low costs
Male owned business	0.174*** (0.045)	0.180*** (0.047)	0.151*** (0.045)	0.196*** (0.048)	-0.007 (0.048)	0.213*** (0.050)
Owned by Male and female	0.146** (0.062)	0.234*** (0.063)	0.116* (0.063)	0.261*** (0.064)	-0.031 (0.071)	0.272*** (0.066)
Urban	0.048 (0.043)	0.268*** (0.047)	0.042 (0.043)	0.265*** (0.048)	-0.002 (0.049)	0.297*** (0.051)
Primary education	-0.261*** (0.061)	0.143 (0.087)	-0.270*** (0.062)	0.145* (0.087)	-0.090 (0.067)	0.184** (0.090)
Secondary education	-0.300*** (0.067)	0.568*** (0.087)	-0.299*** (0.067)	0.566*** (0.088)	-0.006 (0.076)	0.575*** (0.092)
Tertiary education	-0.455*** (0.091)	0.865*** (0.097)	-0.459*** (0.093)	0.870*** (0.097)	-0.229** (0.107)	0.869*** (0.103)
Vocational education	-0.251* (0.140)	0.456*** (0.146)	-0.260* (0.141)	0.446*** (0.146)	0.030 (0.153)	0.457*** (0.148)
Manufacture			0.124 (0.084)	0.004 (0.088)	0.245*** (0.089)	-0.010 (0.089)
Agriculture			0.107 (0.118)	-0.256* (0.151)	0.042 (0.129)	-0.236 (0.152)
Other sectors			-0.236***	0.185**	-0.009	0.054

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Table A.3 – continued

			(0.090)	(0.075)	(0.098)	(0.083)
Other services			0.114**	-0.040	0.088*	-0.041
			(0.045)	(0.048)	(0.051)	(0.053)
Number of full employees	0.006	0.018**	0.006	0.018**	0.002	0.016**
	(0.009)	(0.008)	(0.009)	(0.008)	(0.008)	(0.008)
Years of the business	0.008***	0.008***	0.008***	0.009***	-0.008**	0.009***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)
Informal means of communication	0.211***		0.223***		0.135**	
	(0.042)		(0.042)		(0.059)	
Informal means of sending money	0.306***		0.311***		0.161	
	(0.062)		(0.062)		(0.099)	
Use of Bank for transactions		0.580***		0.568***		0.513***
		(0.084)		(0.085)		(0.090)
Constant	-1.385***	-1.964***	-1.402***	-1.978***	-1.531***	-2.292***
	(0.098)	(0.095)	(0.100)	(0.096)	(0.183)	(0.134)
Observations	6,271	6,271	6,271	6,271	6,271	6,271

Standard errors between parentheses.

Equations of informal finance and low costs of banks. Full information maximum likelihood estimations.

Columns (1), (2) include all the control variables except the sectors of activity. Columns (3) (4).

include all the control variables. Columns (5), (6) include additionally the country dummies.

Table A.4: Full table of the effect of financing on profit tax compliance

	Profit tax					
	(1)	(2)	(3)	(4)	(5)	(6)
	Informal fin.	Low costs	Informal fin.	Low costs	Informal fin.	Low costs
Male owned business	0.167*** (0.045)	0.176*** (0.048)	0.142*** (0.045)	0.193*** (0.048)	-0.001 (0.048)	0.213*** (0.050)
Owned by Male and female	0.156** (0.061)	0.240*** (0.063)	0.124** (0.062)	0.266*** (0.064)	0.010 (0.069)	0.280*** (0.066)
Urban	0.036 (0.042)	0.264*** (0.048)	0.034 (0.043)	0.264*** (0.048)	0.001 (0.049)	0.298*** (0.051)
Primary education	-0.263*** (0.061)	0.144* (0.087)	-0.272*** (0.061)	0.143* (0.086)	-0.069 (0.068)	0.178** (0.089)
Secondary education	-0.298*** (0.066)	0.572*** (0.087)	-0.297*** (0.066)	0.567*** (0.087)	0.017 (0.075)	0.568*** (0.092)
Tertiary education	-0.463*** (0.089)	0.884*** (0.096)	-0.469*** (0.090)	0.886*** (0.096)	-0.193* (0.102)	0.878*** (0.102)
Vocational education	-0.237* (0.139)	0.452*** (0.146)	-0.247* (0.138)	0.443*** (0.146)	0.084 (0.151)	0.444*** (0.148)
Manufacture			0.099 (0.085)	-0.001 (0.089)	0.229*** (0.089)	-0.009 (0.090)
Agriculture			0.138	-0.241	0.061	-0.221

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Table A.4 – continued

			(0.113)	(0.152)	(0.123)	(0.153)
Other sectors			-0.228***	0.197***	-0.032	0.065
			(0.089)	(0.075)	(0.098)	(0.083)
Other services			0.119***	-0.042	0.093*	-0.026
			(0.045)	(0.048)	(0.050)	(0.052)
Number of full employees	0.003	0.020**	0.004	0.020**	0.004	0.017**
	(0.009)	(0.008)	(0.009)	(0.008)	(0.009)	(0.008)
Years of the business	0.008***	0.007**	0.007***	0.008***	-0.007*	0.009***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.003)
Informal means of communication	0.255***		0.268***		0.204***	
	(0.039)		(0.039)		(0.054)	
Informal means of sending money	0.224***		0.228***		0.165**	
	(0.057)		(0.057)		(0.075)	
Use of Bank for transactions		0.513***		0.499***		0.441***
		(0.082)		(0.083)		(0.089)
Constant	-1.313***	-1.959***	-1.332***	-1.974***	-1.603***	-2.298***
	(0.094)	(0.094)	(0.096)	(0.096)	(0.159)	(0.132)
Observations	6,271	6,271	6,271	6,271	6,271	6,271

Standard errors between parentheses.

Equations of informal finance and low costs of banks. Full information maximum likelihood estimations.

Columns (1), (2) include all the control variables except the sectors of activity. Columns (3) (4).

Continued on next page...

include all the control variables. Columns (5), (6) include additionally the country dummies.

Table A.5: Full table of the effect of financing on local tax compliance

	Local tax					
	(1)	(2)	(3)	(4)	(5)	(6)
	Informal fin.	Low costs	Informal fin.	Low costs	Informal fin.	Low costs
Male owned business	0.148*** (0.045)	0.188*** (0.049)	0.126*** (0.046)	0.201*** (0.049)	-0.022 (0.048)	0.215*** (0.051)
Owned by Male and female	0.071 (0.066)	0.235*** (0.070)	0.042 (0.066)	0.257*** (0.070)	-0.075 (0.069)	0.265*** (0.069)
Urban	0.039 (0.043)	0.271*** (0.048)	0.032 (0.044)	0.269*** (0.048)	-0.004 (0.049)	0.307*** (0.051)
Primary education	-0.262*** (0.062)	0.133 (0.086)	-0.273*** (0.062)	0.134 (0.086)	-0.074 (0.066)	0.175* (0.090)
Secondary education	-0.288*** (0.072)	0.562*** (0.087)	-0.294*** (0.071)	0.559*** (0.087)	0.023 (0.076)	0.572*** (0.092)
Tertiary education	-0.516*** (0.097)	0.886*** (0.097)	-0.533*** (0.097)	0.888*** (0.097)	-0.226** (0.103)	0.886*** (0.103)

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Table A.5 – continued

Vocational education	-0.227 (0.150)	0.456*** (0.147)	-0.249* (0.149)	0.447*** (0.147)	0.085 (0.154)	0.451*** (0.149)
Manufacture			0.121 (0.084)	0.003 (0.090)	0.248*** (0.087)	-0.010 (0.091)
Agriculture			0.144 (0.122)	-0.258* (0.151)	0.052 (0.131)	-0.237 (0.151)
Other sectors			-0.228** (0.089)	0.194** (0.076)	-0.015 (0.100)	0.070 (0.084)
Other services			0.110** (0.045)	-0.035 (0.049)	0.072 (0.051)	-0.029 (0.052)
Number of full employees	-0.006 (0.007)	0.022*** (0.008)	-0.006 (0.007)	0.022*** (0.008)	-0.003 (0.007)	0.019** (0.008)
Years of the business	0.009*** (0.003)	0.008** (0.003)	0.008*** (0.003)	0.009*** (0.003)	-0.005 (0.004)	0.009*** (0.003)
Informal means of communication	0.186*** (0.049)		0.186*** (0.048)		0.204*** (0.055)	
Informal means of sending money	0.158** (0.066)		0.154** (0.066)		0.060 (0.070)	
Use of Bank for transactions		0.446*** (0.088)		0.443*** (0.090)		0.407*** (0.094)
Constant	-1.224*** (0.102)	-1.963*** (0.096)	-1.223*** (0.102)	-1.977*** (0.098)	-1.431*** (0.141)	-2.284*** (0.136)

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Table A.5 – continued

Observations	6,271	6,271	6,271	6,271	6,271	6,271
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Standard errors between parentheses.

Equations of informal finance and low costs of banks. Full information maximum likelihood estimations.

Columns (1), (2) include all the control variables except the sectors of activity. Columns (3) (4).

include all the control variables. Columns (5), (6) include additionally the country dummies.

Table A.6: Number of observations

Country	Observations	Percentage
UGA	500	7.77
KEN	513	7.97
TANZ	491	7.63
RWAN	640	9.94
ETH	841	13.06
GHA	500	7.77
CAM	520	8.08
NIG	554	8.6
NAM	374	5.81
SA	627	9.74
BOST	386	5.99
MOZ	493	7.66

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