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Access to credit and informal firm performance: Evidence from Sub-Saharan Africa

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Abstract

The informal sector forms a significant proportion of the private sector of many developing economies. Despite challenges in exact measurement of its size, the informal sector is noted for its role in employment creation as well as economic output in sub-Saharan Africa. However, access to formal credit is a major challenge for informal firms due to the nature of their operations. This leads many entrepreneurs in the informal sector to resort to informal credit. Using the World Bank's Informal Enterprise Surveys, this study investigates the effect of type of finance on the performance informal firms. The results show that the use of informal finance is associated with lower performance, while formal finance is associated with better performance. This study recommends integrating community-based group lending schemes with credit information systems to make it easier to assess informal enterprises for access to credit.

Keywords: Informal finance; Informal firms; Firm performance; Sub-Saharan Africa.

1. Introduction

The informal sector, or shadow economy, as it is sometimes called, forms a significant proportion of the private sector of many economies, especially in developing countries. Despite challenges in exact measurement of its size, the informal sector is noted for its role in employment creation as well as economic output in sub-Saharan Africa. Schneider, Buehn, & Montenegro (2011) estimated that the size of the informal sector in sub-Saharan Africa is close to 40% of Gross Domestic Product (GDP). Also, excluding those employed in agriculture, 76.8% of employment in sub-Saharan Africa comes from the informal sector (ILO, 2018). Despite their important economic contributions, the informal sector in sub-Saharan Africa is faced with a number of challenges, including crime, theft, access to finance, and corruption (Stein, Ardic, & Hommes, 2013). Among these challenges, access to finance is often cited as most detrimental to the growth and sustainability of informal firms (Stein *et al*., 2013).

Indeed, improved access to finance has been shown to be a key factor in the performance of both the informal as well as formal private sector. As noted by Beck & Cull (2014), the availability of finance tends to increase the number of startups in the economy, and also enhances the ability of existing firms to exploit opportunities for growth and investment. Also, a business environment where there is easier access to finance and a small credit gap for enterprises, especially in developing countries, enhance economic wellbeing by promoting employment (Ayyagari, Beck, & Demirgüç-Kunt, 2007). Goal 8 of the Sustainable Development Goals (SDGs) seeks to "promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all" (IAEG-SDGs, 2016). One of the targets under this goal is aimed at promoting policies that support the growth of micro, small and medium-sized enterprises (MSMEs), through improved access to finance. This further highlights the key role played by access to finance in driving development, especially in developing countries.

Many informal firms, however, face a severe challenge in accessing finance due to the nature of their operations. Firms operating in the informal sector are predominantly small, and do not mostly keep appropriate financial records (Straub, 2005). The lack of proper record keeping creates a problem of information asymmetry when they attempt to access credit from formal financial institutions. This is because they are not able to meet the demands of banks and other formal financial institutions for collateral and/or documentation (Benjamin *et al*., 2012). In sub-Saharan Africa, many informal firms faced with

such a situation, resort to borrowing from informal sources, mostly family and friends, as well as unregulated moneylenders. Klapper & Singer (2015) found that loans from family and friends formed the largest proportion of new loans in sub-Saharan Africa.

These informal sources reduce the problem of information asymmetry, where borrowers, in this case firms, have more information concerning their ability to repay loans, as well as the riskiness of investments they intend to undertake, than lenders. This is because informal borrowing relies mostly on personal or community relationships. The problem, however, is that unlike formal financial institutions, they usually do not have the ability to scale up credit amount as firms grows and expand their activities (Degryse, Lu, & Ongena, 2016). Informal credit, particularly from family and friends, may also stifle risk taking and thus reduce investment (Lee & Persson, 2016). This hampers their growth prospects, employment and hinders their contribution to the growth of the national economy.

In this paper, we examine how credit from informal sources impact the performance of informal firms across selected countries in sub-Saharan Africa. Our study deviates from existing studies on the impact of firm financing in several ways. First, our focus on the informal sector deviates from the large number of previous studies that have studied the formal sector (Dinh, Mavridis, & Nguyen, 2010; Fowowe, 2017). Studies on the heterogeneous effects of different sources of external finance in sub-Saharan Africa are also scant in the literature, with existing studies being focused on China (Allen *et al*., 2019; Ayyagari *et al.*, 2010; Degryse *et al.*, 2016). In addition to these, our cross-country approach allows us to explore the relevance of informal credit through different contexts while controlling for country specific covariates. Using data from the World Bank's Informal Enterprise Survey (IFS), this study investigates the relationship between different sources of external finance and the performance of informal firms in sub-Saharan Africa.

The remainder of this paper is organized as follows; section 2 provides a review of relevant literature on the nature of the informal sector in sub-Saharan Africa and the the impact of sources of finance on firm performance. Section 3 introduces the data and offers summary statistics on the variables used in the study. Section 4 shows the model specification used for the study. Section 5 presents a discussion of results while section 6 concludes the study and offers some policy alternatives to addressing the problem of finance for the informal sector in Africa.

2. Literature review

A large proportion of the literature on the informal sector and informal enterprises in developing countries have mainly focused on their size and significance to the economies, as well as the factors that affect their transition to the formal economy (Loayza, 1996; Straub, 2005). Many estimates indicate that sub-Saharan Africa has one of the largest informal sectors globally (Schneider *et a*l., 2011; Schneider & Enste, 2000). For this reason, the region and countries within it have featured prominently in research on the informal sector. Benjamin & Mbaye (2014) examine some characteristics of the informal sector in sub-Saharan Africa. They note that like other regions of the developing world, the informal sector in sub-Saharan Africa is made up of a large number of small firms, where size is measured by the number of employees. This is because most of these informal firms are mainly own-account enterprises that primarily provide self-employment (ILO, 2018).

Benjamin *et al.* (2012) however highlight the existence and operations of large informal firms. These are firms that may match formal firms in characteristics such as size and access to finance, but like informal firms, do not mostly keep proper accounts. Furthermore, these large informal firms are managed by individuals with relatively little formal education, and many times do not last beyond the demise of the owner. Another characteristic of the region's informal sector is that it is dominated by women. It is estimated that more than 80% of women in employment in sub-Saharan Africa are employed in the informal sector (Benjamin & Mbaye, 2014; Chen, 2001).

Lastly, despite the fact that along with sub-Saharan Africa, Latin America is noted among the regions with the largest informal sectors, the informal sectors in the two regions differ in one key way. Studies have shown that in Latin America, a significant proportion of informal entrepreneurs voluntarily exit formal employment to form their own informal enterprises, which is seldom the case in sub-Saharan Africa where informal enterprises usually spring up due to the inability to enter the formal labour market (Benjamin *et al*., 2012; Maloney, 2004).

Access to external finance by firms has been identified as one of the primary channels through which financial development contributes to economic growth and poverty reduction (Beck & Cull, 2014; Green *et al*., 2006; Rajan & Zingales, 1998). Various studies have, however, documented the challenges faced by firms in sub-Saharan Africa in accessing finance and have mostly focused on formal firms. Kuntchev *et al*. (2013) found sub-Saharan Africa to be among the top

three regions where firms face the toughest level of credit constraint. Using the World Bank's Enterprise Survey data (ES), Dinh & Clarke (2012) also indicate that access to finance is among the most binding constraint for firms in sub-Saharan Africa, second only to electricity access. Apart from the problem of credit constraint in sub-Saharan Africa, a common finding in these studies is that small firms are more likely to face credit constraints than large firms. The implication of this is that the majority of informal enterprises in sub-Saharan Africa are more likely to face challenges in accessing credit, since they are mostly small. This is proven empirically in studies such as Aga & Reilly (2011) and Wellalage & Locke (2016).

While much of the research on access to credit has focused on credit from formal financial institutions, recent studies have recognized the need to examine the role of informal finance for firms, especially in developing countries. The literature suggests that informal credit markets coexist with formal financial institutions mainly because of information asymmetries. Many small firms who lack the necessary documentation required by formal institutions to assess risk and credit worthiness of borrowers, resort to informal sources to meet their credit needs (Allen *et al*., 2019). In sub-Saharan Africa, the most popular source of informal finance is friends and family (Klapper & Singer, 2015).

Even though informal sources provide an alternative for entrepreneurs who would otherwise be credit constrained, some studies have shown that informal finance and formal finance could have heterogeneous effects on the performance of firms (Ayyagari *et al*., 2010; Degryse *et al.*, 2016; Lee & Persson, 2016). What this implies is the effects of the type of finance, formal and informal, on firm performance may differ. It is thus important to understand these effects to inform policy on addressing the financial challenges of the informal sector in sub-Saharan Africa and to enhance their performace in the region.

2.1. Conceptual framework

A number of studies on firm performance using the Enterprise Surveys have relied on Gibrat's law as the framework for analyzing the impact of finance on firm performance. Gibrat's law postulates that a firm's growth over a given period is independent of its size at the beginning of the period. These studies rely on growth in sales or the number of permanent employees over a given period as a measure of firm performance (Ayyagari *et al*., 2006; Dinh *et al*., 2010). The Informal Enterprise Survey, however, contains data on the sales in a regular month, and the number of employees in a regular month. It is therefore not feasible to measure firm performance by growth in sales or employees.

Following Djossou *et al.* (2020), we rely on the microeconomic theory of production as the conceptual model for the study. Under this theory, a firm's output (production) is dependent on the labour and capital inputs available to it. Credit has been shown to be an important capital input that helps to improve firm performance and encourage entrepreneurship (Beck & Cull, 2014). Most firms in the sample for the study were own-account workers (i.e. with no hired workers)[1]. Employment was therefore not likely to vary sufficiently to allow its use as a measure of firm performance. Thus, following studies such as Amin & Islam (2015), Allen *et al.* (2019) and Degryse *et al.* (2016), Sales was chosen as the measure of firm performance in the study.

3. Methods and data

3.1. Methodology

In order to examine the impact of formal and informal finance on the performance of informal firms, we make use of dummy variables within the IFS dataset indicating whether or not a particular source of finance was used for the day-to-day operations of the business. The sources include internal funds, credit from suppliers, moneylenders, microfinance institutions, banks, and friends/relatives. The exact amounts borrowed from these sources are, however, not captured. In this study, formal sources of finance are defined to include funds that are obtained from banks and microfinance institutions. Informal sources are defined to include funds obtained from moneylenders and friends/relatives.

$$lnSales = \beta_0 + \beta_1 Finance + \beta_3 lnSize + \beta_4 lnAge + \beta_5 Female + \beta_6 lnExper + \beta_7 Education + \beta_8 Account + \beta_9 Loan + \beta_{10} Industry + \beta_{11} Country + \epsilon \quad (1)$$

In equation (1), the log of sales in a regular month is our indicator of firm performance. Finance is a set of dummy variables indicating whether a firm's activities were financed from formal sources or informal sources. The control variables in equation (1) are firm size measured as the number of employees; firm age measured in years of operation since inception; owner/manager experience and education, where experience is measured in years and education is captured as the level of education of the owner/manager; whether or not the largest owner is female; whether the firm has a bank account for its operations; and whether or not the firm has a loan. We further add country, and industry

[1] About 42% of firms in the sample were own account workers, and about 88% of firms employed less than 5 workers.

fixed effects to account for observed and unobserved country and industry heterogeneity, respectively.

In equation (1), we only consider whether the firm used formal finance or informal finance. We do this for the entire sample and also partition our sample into relatively small and large firms using the number of employees. Following Amin & Islam (2015), we define small firms as those with employees less than the median number of firms, while large firms are firms with employees greater than the median number of employees. This is done to identify whether the effect of finance differs according to the size of the informal firm. In doing this, we re-estimate equation (1) for the partitioned sample.

Further, we explore the sources of formal and informal finance and the impact they have on the performance of firms. This is specified as equation (2). In estimating this relationship, the Finance variable is categotrised into a set of 4 dummy variables indicating the source of external finance for the firm; *Banks*, *Microfinance (MFI)*, *FandF (Friends and family)*, and *Moneylenders*. The control variables in equation (2) are as defined in equation (1).

$$\begin{aligned} lnSales = {} & \beta_0 + \beta_1 Banks + \beta_2 MFI + \beta_3 FandF + \beta_4 Moneylenders + \beta_5 lnSize \\ & + \beta_6 lnAge + \beta_7 Female + \beta_8 lnExper + \beta_9 Education + \beta_{10} Account \\ & + \beta_{11} Loan + \beta_{12} Industry + \beta_{13} Country + \epsilon \end{aligned} \quad (2)$$

Equations (1) and (2) are estimated using the ordinary least squares estimator. This is because the variable sales is a continues variable measuring the sales of the informal firm in a regular month. Following Ayyagari *et al.* (2010) and Degryse *et al.* (2016), we estimate all the equations using OLS with Huber-White robust standard errors, since our diagnostic tests indicates the presence of heteroscedasticity in the models. All analyses in this study were conducted with Stata 13.0.

3.2. Data

The study uses data from the Informal Enterprises Survey (IFS) conducted by the World Bank. The IFS is designed to capture data on informal business activities and assess the business environment for informal enterprises. The definition of informality used in the survey is non registration. This means that a firm is considered as informal if it is not registered with the appropriate authority designated to register business activities in that country. For instance, informal firms in Ghana are those that are not registered with the Registrar General's Department, while informal firms in Rwanda are those

that are not registered with the Rwanda Development Board. Since informal firms are not registered with government bodies, it is difficult to establish an appropriate sampling frame from which to extract a sample for the survey. The sample obtained may, therefore, not necessarily be representative of the entire informal sector of the country or even the city. The survey was conducted in selected urban centres in each country to coincide with the locations where the formal Enterprise Surveys are conducted. The total number of interviews was determined beforehand, and distributed across the selected urban centres. These urban centres are chosen based on criteria such as their population and the intensity of business activity. Each urban centre was divided into an appropriate number of sampling zones, which were selected based on local knowledge with respect to the concentration of informal business activities. To ensure that the survey captures diversity of informal economic activity, the sample was designed in such a way that there is equal representation for the manufacturing sector and the service sector.

At the time of this study, data was available for the following sub-Saharan African countries: Angola, Botswana, Burkina Faso, Cameroon, Côte d'Ivoire, Democratic Republic of Congo (DRC), Ghana, Kenya, Madagascar, Mali, Mauritius, Mozambique, Niger, and Rwanda. Apart from DRC and Cameroon, which had IFS data available for 2 separate years, the remaining countries each had 1 survey available. Surveys conducted before 2007 were however excluded from the sample to ensure that information on all variables required to run baseline regressions across all firms was available. Niger was therefore dropped from the sample because the only survey data available was from 2005. Data on Cameroonian firms in 2006 was also excluded. IFS data for Zimbabwe was also excluded to ensure completeness of data used in running our regressions. The sample used for our analysis in this study is therefore made up of 2,765 informal firms from 13 sub-Saharan African countries[2].

Most informal firms have no proper bookkeeping practices to allow them to provide adequate information for sales for the fiscal year. However, the IFS asks owners/managers to give an estimate of their sales in a regular month, the slowest month, and the busiest month. In capturing the various sources of finance available to firms, the IFS requests firms to indicate whether or not a particular source of finance was used for the day-to-day operations

[2] Angola, Botswana, Burkina Faso, Cameroon, Côte d'Ivoire, DR Congo, Ghana, Kenya, Madagascar, Mali, Mauritius, Mozambique, and Rwanda.

of the business. The sources include internal funds, credit from suppliers, moneylenders, microfinance institutions, banks, and friends/relatives. In this study, formal sources of finance are defined to include funds that are obtained from banks and microfinance institutions. Informal sources are defined to include funds obtained from moneylenders and friends/relatives.

The study also controls for various firm characteristics, ownership/management characteristics, as well as industry and country fixed effects. The firm characteristics used include size of the firm and age of the firm. The total number of workers in a usual month. In this study, the size of the firm is measured by the log of the number of workers in a usual month. Manager characteristics used in the study include (log of) the number of years of experience the main decision maker has working in the sector; dummies indicating the highest level of education of the largest owner; and a dummy variable that equals 1 if the largest owner is female, and 0 otherwise. Following Amin & Islam (2015), we also use two dummy variables to control for whether or not firms have a bank account to run the business, and whether or not the owner has a loan for the business.

4. Results

4.1. Summary statistics

Table 1 provides summary statistics for variables used in the study. We see from the Table 1 that while only about 9.4% of firms in the sample used finance from formal sources, about 25% of the firms reported the use of informal sources of finance. This suggests that informal finance is the predominant source of funds for the operation of informal firms in the sample. The size of the firm, which is measured by the number of employees, varies from 1 to 61 workers. Also, 54.7% of firms reported using electricity for their activities. Firms in the sample are also between 1 to 52 years old. About 42% of firms in the sample have the largest owner being female, suggesting significant activity of females in the informal sector. Experience of the main decision maker varies substantially across the sample, with a minimum of 1 year and a maximum of about 50 years. With respect to educational level of the owner/manager, about 6.8% of firm managers had no education. The majority (about 36.1%) have only completed secondary education. About 26% of managers had primary education, 18.3% had vocational training, and 12.1% had attended professional school. Only about 0.05% of managers had university training. This highlights the fact that most informal firms are managed by individuals with relatively low levels of

education. Lastly, about 30.6 % of firms indicated that they had a bank account for running their business, while 7.9 % of firms reported having a loan.

Table 1: Summary Statistics of Independent Variables

Variable	Mean	Std. Dev.	Min.	Max.
Formal	0.094	0.292	0	1
Informal	0.254	0.436	0	1
Size of the firm (log values)	0.630	0.674	0	4.111
Age of the firm (log values)	1.525	0.987	0	3.970
Electricity	0.547	0.498	0	1
Female owner	0.426	0.495	0	1
Experience (log values)	1.766	0.968	0	3.912
No education	0.068	0.252	0	1
Primary education	0.260	0.439	0	1
Secondary education	0.361	0.480	0	1
Vocational training	0.183	0.387	0	1
Professional school	0.121	0.326	0	1
University training	0.005	0.073	0	1
Undergraduate degree	0.002	0.042	0	1
Has bank account	0.306	0.461	0	1
Has loan	0.079	0.270	0	1

Source: Authors' computation from IFS

A breakdown of the sample is provided in Tables A1 and A2, presented in the Appendix. In Table A1 we see that Ghana, DRC, and Mozambique have the highest number of firms in the sample of informal firms. Close to 20% (549) of informal sector firms included in the sample for this study are from DR Congo, with about 19.4% coming from Ghana, and approximately 17% coming from Mozambique. The country with the lowest number of informal firms in the sample for this study is Angola, forming about 2.1% of the sample. Second to Botswana is Mali, for which there are a total of 70 firms, forming 2.53% of firms in the sample. Table A2 presents the performance of firms in the sample. We see that overall, average sales in the sample is about USD 413.78. Also, the lowest value for sales is recorded by Mozambique (USD 152.02), while the highest is obtained in Cameroon (USD 860.70). Table A3 in the Appendix outlines the sources of finance used by firms in the sample. We see from the table that informal firms use both formal and informal sources to finance their

activities. However, informal finance, particularly from family and friends, is the largest source of external finance, with 23.07% of the sample using this source of finance, compared to 3.44% and 6.98% for bank finance and microfinance respectively.

Table A4 presents the results for means tests for differences in performance (as measured by sales) by grouping firms based on their usage of formal or informal finance, as well as size. In Panel A, we compare mean sales for firms that use formal finance only (i.e. do not use any informal finance), and those that use informal finance only (i.e. do not use any formal finance). We find means sales is higher for firms that use formal finance only, and that the difference in mean sales is statistically significant. Panel B compares firms that use formal finance and those that do not. Here also, we find mean sales to be higher for those firms that use formal finance, and that the difference between mean sales between the two groups is statistically significant.. The results in Panel C shows that mean sales for firms that use informal finance is lower, as compared with mean sales for firms that did not use formal finance. The difference was however not statistically significant. Panel D compares mean sales between large firms and small firms. We find here that large firms have higher average sales than small firms. The difference in average sales between large firms and small firms was also statistically significant.

4.2. Empirical analysis

Studies on firm performance and access to credit usually deal with the problem of endogeneity. This problem arises from two main sources: self-selection and reverse causality. The self-selection problem arises because certain unobservable characteristics, such as the motivation of the owner/manager may influence the acquisition and use of formal credit. Such unobservable factors may correlate with the outcome variable and bias the estimates. Reverse causality, on the other hand, arises from the possibility that while access to formal finance may affect performance, better performing firms are also more likely to be able to access formal credit. It should, however, be noted that these studies were conducted on formal firms, which tend to have easier access to formal credit. We, therefore, conduct a formal test of endogeneity using the chi-square test for endogeneity. The null hypothesis of the test is that the specified endogenous regressor can actually be treated as exogenous. The results for the test, The results from Table 2 fails to reject the null that the regressors are exogenous at the 5 percent level of significance. We, therefore, proceed to estimate our models using OLS. The

results of the effect of the source of finance on firm performance are presented in Tables 3 and 4.

Table 2: Formal Test of Endogeneity

Test of Endogeneity	Test Statistic	p-value
Durbin-Wu-Hausman Chi-Squared Test	Chi-Sq (1) = 0.126	0.722

Source: Author's computation

In Table 3, we have estimated three models; model 1 used a dummy equal to one if the firm used *Informal finance and zero otherwise*. In model 2, we used a dummy equal to one if the firm used formal finance and zero otherwise. In model 3, we introduce both formal and informal finance against the other sources of finance for the firms. The resuls shows that informal finance affects the performance of firms, as shown by the negative and statistically signifincat coefficients of models 1 and 3. The coefficients of *Informal* indicate in models 1 and 3 suggest that the use of informal finance is associated with about 13.1% and 13.5% less sales in a regular month for firms compared to other sources of finance. Similarly, the results indicate that formal finance has a positive and significant effect on performace of firms as indicated in models 2 and 3. The coefficients of *Formal finance* in models 2 and 3 suggest that firms that use formal finance have about 29.6% and 30.5% higher sales in a regular month compared to firms that do not. These results corroborate those of Ayyagari *et al.* (2010) and Degryse *et al*. (2016) for China. The results further show that size, manager's education and experience, and having a bank account are positively associated with the performance of informal firms. Firms whose largest owner is female, however, have significantly lower performance. Firm age, having a loan, and use of electricity were found not to have a significant effect on performance.

As noted earlier, the informal sector in SSA, though dominated by small firms, there are also some large informal firms that mimic formal enterprises in certain aspects of their operations (Benjamin *et al.*, 2012). We, therefore, extend our analysis by disaggregating the sample into large and small informal firms. The results for the disaggregated sample is shown in Table 4. Models (1) to (3) show the results for small firms, whereas Models (4) to (6) show the results for large firms. While the signs of the estimated coefficients of *Formal* and *Informal* are identical to the results in Table 3, they are only statistically significant for the sample of large firms. This suggests that while the source of finance may have an effect on performance of large informal firms,it may not

matter for relatively small firms. We also find that electricity use and manager's experience have positive and significant effects on performance of large firms, but have no statistically significant effect on small informal firms. Having a bank account for the business activity, however, has a positive and significant effect on both small and large informal firms. The owner's education is also found to significantly affect performance for both large and small firms. The negative effect of female ownership is also statistically significant for large informal firms but not for small firms.

In our analysis, we further group the type of informal finance by considering family and friends as one group and money lenders as another group. Also, we group the type of formal finance by considering banks and microfinance institutions. We do this to determine the heterogeneous effect of each of the components of the two broad sources of finance examined in this study. The results are shown in Table 5. Models (1) and (2) examine the sources of informal finance, while models (3) and (4) look at sources of formal finance. We see from the results that finance from moneylenders and microfinance institutions have no statistically significant effect on the performance of informal firms. Financing from family and friends is, however, shown to negatively affect firm performance, while bank credit has a positive effect on firm performance. These results suggest that our results for the effect of the source of finance on firm performance may be driven by bank finance and finance from family and friends.

TABLE 3: INFORMAL/FORMAL FINANCE AND PERFORMANCE OF INFORMAL FIRMS

	Model (1)	**Model (2)**	**Model (3)**
Informal	-0.141***		-0.145***
	(0.052)		(0.052)
Formal		0.259***	0.266***
		(0.087)	(0.087)
Size	0.441***	0.438***	0.437***
	(0.043)	(0.043)	(0.043)
Age	0.012	0.008	0.005
	(0.039)	(0.039)	(0.038)
Female owner	-0.128***	-0.132***	-0.131***
	(0.047)	(0.047)	(0.047)
Experience	0.147***	0.145***	0.148***
	(0.041)	(0.041)	(0.041)
Owner's education (ref=No educations)			
Primary school	0.153	0.140	0.153
	(0.107)	(0.107)	(0.107)
Secondary school	0.359***	0.353***	0.363***
	(0.110)	(0.109)	(0.109)
Vocational training	0.458***	0.436***	0.444***
	(0.117)	(0.116)	(0.117)
Professional school	0.638***	0.626***	0.638***
	(0.132)	(0.131)	(0.131)
University training	0.811***	0.775***	0.819***
	(0.247)	(0.244)	(0.248)
Undergraduate degree	1.188***	1.142***	1.139***
	(0.402)	(0.392)	(0.417)
Account	0.421***	0.407***	0.406***
	(0.054)	(0.054)	(0.054)
Loan	0.183**	0.040	0.060
	(0.084)	(0.091)	(0.091)
Electricity	0.132***	0.133***	0.128***
	(0.048)	(0.049)	(0.048)
Constant	5.399***	5.365***	5.408***
	(0.377)	(0.374)	(0.375)
N	2765	2765	2765
R-Squared	0.337	0.337	0.339
Adjusted R-Squared	0.330	0.330	0.332

Source: Produced by the author using Enterprise data
Note: Significance levels: * p<0.10, ** p<0.05, *** p<0.01; Huber-White robust standard errors in parentheses

TABLE 4: INFORMAL/FORMAL FINANCE AND PERFORMANCE OF INFORMAL FIRMS (BY SIZE)

	Small firms			Large firms		
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**
Informal	-0.134*		-0.141*	-0.151**		-0.145**
	(0.076)		(0.076)	(0.072)		(0.072)
Formal		0.088	0.113		0.435***	0.429***
		(0.123)	(0.123)		(0.122)	(0.121)
Age	0.046	0.049	0.042	0.025	0.017	0.018
	(0.060)	(0.060)	(0.060)	(0.054)	(0.053)	(0.053)
Female owner	-0.020	-0.024	-0.020	-0.254***	-0.255***	-0.257***
	(0.066)	(0.066)	(0.066)	(0.069)	(0.069)	(0.069)
Experience	0.124**	0.117*	0.127**	0.155***	0.153***	0.153***
	(0.063)	(0.062)	(0.063)	(0.056)	(0.056)	(0.056)
Owner's education (ref=No education)						
Primary school	0.337**	0.316**	0.338**	-0.014	-0.016	-0.013
	(0.153)	(0.152)	(0.153)	(0.152)	(0.150)	(0.151)
Secondary school	0.570***	0.554***	0.573***	0.185	0.190	0.192
	(0.158)	(0.157)	(0.158)	(0.154)	(0.152)	(0.153)
Vocational training	0.728***	0.704***	0.718***	0.206	0.194	0.194
	(0.175)	(0.174)	(0.175)	(0.160)	(0.158)	(0.158)
Professional school	0.791***	0.775***	0.788***	0.472***	0.474***	0.479***
	(0.194)	(0.194)	(0.194)	(0.179)	(0.178)	(0.178)
University training	0.916***	0.838***	0.928***	0.648*	0.642*	0.649*
	(0.234)	(0.236)	(0.236)	(0.393)	(0.385)	(0.391)
Undergraduate degree	1.021***	1.051***	1.023***	1.081**	0.990**	0.988*
	(0.197)	(0.196)	(0.198)	(0.479)	(0.479)	(0.507)
Account	0.479***	0.471***	0.473***	0.433***	0.405***	0.404***
	(0.084)	(0.085)	(0.085)	(0.071)	(0.071)	(0.070)
Loan	0.150	0.084	0.104	0.246**	0.013	0.032
	(0.123)	(0.129)	(0.130)	(0.110)	(0.127)	(0.126)
Electricity	0.155**	0.159**	0.152**	0.146**	0.148**	0.144**
	(0.075)	(0.075)	(0.075)	(0.066)	(0.066)	(0.066)
Constant	6.533***	6.543***	6.531***	6.109***	6.045***	6.108***
	(1.116)	(1.111)	(1.115)	(0.383)	(0.379)	(0.379)
N	1203	1203	1203	1562	1562	1562
R-Squared	0.272	0.271	0.273	0.280	0.284	0.286
Adjusted R-Squared	0.256	0.254	0.255	0.267	0.272	0.273

Source: Produced by the author using Enterprise data
Note: Significance levels: * p<0.10, ** p<0.05, *** p<0.01; Huber-White robust standard errors in parenthesis

TABLE 5: SOURCES OF FORMAL AND FINANCE AND EFFECT ON FIRM PERFORMANCE

	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Informal (Family and friends)	-0.132**	-0.136**		
	(0.054)	(0.054)		
Informal (Moneylenders)	-0.102	-0.119		
	(0.100)	(0.100)		
Formal		0.273***		
		(0.086)		
Formal (Banks)			0.379***	0.378***
			(0.140)	(0.138)
Formal (Microfinance)			0.154	0.164*
			(0.096)	(0.095)
Informal				-0.143***
				(0.052)
Size	0.440***	0.436***	0.437***	0.435***
	(0.043)	(0.043)	(0.043)	(0.043)
Age	0.012	0.005	0.008	0.006
	(0.039)	(0.038)	(0.039)	(0.038)
Female	-0.127***	-0.130***	-0.132***	-0.131***
	(0.047)	(0.047)	(0.047)	(0.047)
Experience	0.147***	0.149***	0.143***	0.147***
	(0.041)	(0.041)	(0.041)	(0.041)
Owner's education (ref=No education)				
Primary school	0.154	0.154	0.138	0.151
	(0.107)	(0.107)	(0.107)	(0.107)
Secondary school	0.358***	0.362***	0.352***	0.363***
	(0.110)	(0.109)	(0.109)	(0.110)
Vocational training	0.458***	0.444***	0.431***	0.440***
	(0.117)	(0.117)	(0.117)	(0.117)
Professional school	0.639***	0.638***	0.620***	0.632***
	(0.132)	(0.131)	(0.131)	(0.131)
University training	0.805***	0.811***	0.755***	0.799***
	(0.247)	(0.248)	(0.243)	(0.246)
Undergraduate degree	1.185***	1.135***	1.162***	1.159***
	(0.401)	(0.416)	(0.384)	(0.409)
Account	0.423***	0.408***	0.399***	0.399***
	(0.054)	(0.054)	(0.054)	(0.054)
Loan	0.185**	0.061	0.040	0.059
	(0.085)	(0.092)	(0.093)	(0.093)
Electricity	0.131***	0.127***	0.135***	0.130***
	(0.048)	(0.048)	(0.049)	(0.048)
Constant	5.395***	5.404***	5.355***	5.398***
	(0.377)	(0.375)	(0.373)	(0.373)
N	2765	2765	2765	2765
R-Squared	0.337	0.339	0.338	0.340
Adjusted R-Squared	0.330	0.332	0.331	0.332

Source: Produced by the author using Enterprise data

Note: Significance levels: * p<0.10, ** p<0.05, *** p<0.01; Huber-White robust standard errors in parenthesis

5. Discussion of results

Our results have shown that while formal finance has a positive impact on the performance of informal firms, informal finance tends to negatively affect performance. A disaggregation of the sample showed that this result is particularly significant for large informal firms. This may be explained by the motives and risk behavior of small and large informal firms. Lee & Persson (2016) note that informal finance, especially from family and friends limits the incentive of entrepreneurs to undertake relatively risky (but profitable) investments. They explain that this is due to the tendency to protect social relations, which may be jeopardized in the case that the investment does not yield favourable returns and they are thus unable to pay back.

Many small informal enterprises are usually set up as a means of subsistence for the owner/manager and his/her family, and many times are ran from within the household (Sasidharan & Raj, 2014). The incentive for risk may therefore be lower for such firms. Large informal firms are however more similar to formal firms and tend to be more profit-oriented. They, therefore, have a higher incentive to take risky investments. This result is also interesting considering that studies on formal firms have shown that the negative impact of credit constraint tends to be stronger for small firms than for large firms (Beck & Demirgüç-Kunt, 2006; Beck, Demirgüç-Kunt, Laeven, & Levine, 2008). Our results however suggest that the opposite may be true for informal firms: large informal firms stand to benefit more from improved access to formal finance compared to smaller firms.

We further find that the negative impact of informal finance is driven by finance obtained from family and friends, while finance from moneylenders had no statistically significant effect on firm performance. This may be explained by the fact that finance from family and friends is a less costly source of informal finance, and also tends to be the most popular source of credit in sub-Saharan Africa (Klapper & Singer, 2015; Lee & Persson, 2016). Informal finance from moneylenders may, however, involve usurious rates of interest as well as recourse to threats or violence in the case of default (Allen *et al*., 2019; Straub, 2005). This makes it less attractive for credit constrained firms.

The positive impact of formal finance on firm performance was also found to be driven by bank finance, with finance from microfinance institutions not being significantly associated with firm performance. This may not be surprising considering our finding that the source of finance matters for large informal firms but not for small ones. Large informal firms are described by

Benjamin *et al.* (2012) as "giants with clay feet." Despite the lack of structure that characterizes firms in the informal sector, large informal firms are noted to rival formal firms in terms of size (as measured by volume of sales), and tend to have access to bank credit (Benjamin *et al.*, 2012). This suggests that these large firms are more likely to resort to the use of bank finance than credit from microfinance institutions, which tend to provide relatively smaller loan amounts (Stein *et al.*, 2013).

6. Conclusion and policy implications

In this study, we employed the World Bank's Informal Enterprise Survey (IFS) dataset to examine the heterogeneous impacts of the source of finance on the performance of informal firms operating in sub-Saharan Africa. Our results suggest that informal finance is associated with lower sales, while formal finance is associated with higher sales. This result is consistent for both small and large informal firms. The impact of informal finance is found to be driven by finance from family and friends, as opposed to moneylenders, whereas the impact of formal finance is driven by bank finance, as opposed to credit from microfinance institutions. Our results therefore point to the need for continued efforts to reduce credit constraint in sub-Saharan Africa.

Our results highlight the importance of expanding access to formal financial services in sub-Saharan Africa as a means of encouraging entrepreneurship, especially to micro and small scale entreprises that make up the large informal sector in the region. The results also suggest that informal firms may benefit significantly from having access to banking services. Policymakers can therefore provide banks the needed incentives to encourage them to expand the range of credit services offered to accommodate the nature of informal sector operations.

Efforts to train informal entrepreneurs in basic book keeping practices can also prove useful. They can help enhance the possibility of meeting the documentation requirements of formal financial institutions in accessing finance for their operations. This will not only improve their performance, it will also contribute to their employment generation, improved incomes and therefore enhanced standards of living as the literature has shows that the informal sector provides employment to a large number of people in SSA. This, as our results have shown, will help to improve the performance of informal firms in sub-Saharan Africa, enhance general private sector performance, and ultimately contribute to improving macroeconomic performance in the region.

Biographical Notes

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Appendices

TABLE A1: SUMMARY OF FIRMS IN THE SAMPLE

Country	Number of Firms	Percentage
Angola	58	2.10
Botswana	89	3.22
Burkina Faso	101	3.65
Cameroon	118	4.27
Côte d'Ivoire	60	2.17
DR Congo	549	19.86
Ghana	537	19.42
Kenya	390	14.10
Madagascar	120	4.34
Mali	70	2.53
Mauritius	81	2.93
Mozambique	460	16.64
Rwanda	132	4.77
Total	2,765	100

Source: Authors' computation from IFS

TABLE A2: SALES IN A REGULAR MONTH (IN USD), BY COUNTRY

Country	Mean	SD	Min.	Max.
Angola	528.992	612.473	51.445	2,057.782
Botswana	635.896	927.039	10.127	5,523.845
Burkina Faso	691.183	1,383.389	13.531	11,839.560
Cameroon	860.704	1,291.884	33.828	8,456.960
Côte d'Ivoire	343.091	783.777	16.916	5,074.828
DR Congo	850.109	5,617.248	10.812	39,041.850
Ghana	238.071	432.581	5.300	6,183.079
Kenya	377.008	940.120	7.863	11,794.54
Madagascar	288.740	1,550.157	6.893	1,6542.73
Mali	722.219	869.839	50.747	5,074.734
Mauritius	636.707	1,006.611	0.246	5,472.315
Mozambique	152.020	272.187	0.094	2,817.073
Rwanda	279.605	1,155.762	7.509	12,871.86
Total	413.778	1,314.797	0.094	39, 045.850

Source: Authors' computation from IFS

TABLE A3: SOURCES OF FINANCE FOR WORKING CAPITAL FOR INFORMAL FIRMS (PERCENTAGES)

Country	N	Internal finance	Bank finance	Micro finance	Trade credit	Money lenders	Family and Friends
Angola	58	89.66	8.62	5.17	12.07	1.72	27.59
Botswana	89	98.88	0.00	2.25	7.87	10.11	35.96
Burkina Faso	101	98.02	6.93	8.91	34.65	8.91	26.73
Cameroon	118	88.14	2.54	11.02	39.83	17.80	36.44
Côte d'Ivoire	60	85.00	1.67	0.00	8.33	1.67	28.33
DR Congo	549	97.45	1.28	3.10	11.29	4.01	19.31
Ghana	509	94.79	3.54	9.68	10.61	2.23	10.24
Kenya	390	87.44	9.74	18.21	19.23	8.72	34.10
Madagascar	120	94.17	0.00	6.67	16.67	0.00	15.00
Mali	70	88.57	2.86	0.00	18.57	0.00	20.00
Mauritius	81	93.83	1.23	0.00	11.11	2.47	12.35
Mozambique	460	83.04	1.74	2.39	10.00	5.65	30.00
Rwanda	132	90.91	3.03	5.30	19.70	9.09	21.57
All firms	2,765	91.57	3.44	6.98	14.79	5.39	23.07

Source: Produced by authors using IFS data

TABLE A4: MEANS TESTS ACROSS SOURCE OF FINANCE AND SIZE

Panel A: Firms that use informal finance versus those that use formal finance					
Observations		Mean Sales			
Informal	Formal	Informal	Formal	t-statistic	p-value
610	167	5.005	5.743	-6.147	0.000
		(1.355)	(1.444)		
Panel B: Firms that use formal finance versus those that do not					
Observations		Mean Sales			
Other	Formal	Other	Formal	t-statistic	p-value
2505	260	5.034	5.572	-5.893	0.000
		(1.398)	(1.419)		
Panel C: Firms that use informal finance versus those that do not					
Observations		Mean Sales			
Other	Informal	Other	Informal	t-statistic	p-value
2062	703	5.100	5.039	0.992	0.322
		(1.428)	(1.353)		
Panel D: Small firms versus large firms					
Observations		Mean Sales			
Small	Large	Small	Large	t-statistic	p-value
1203	1562	4.628	5.436	-15.55	0.000
		(1.275)	(1.407)		

Source: Produced by authors using IFS data
Note: Standard deviations in parentheses.