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INFORMAL SECTOR AND FINANCIAL DEVELOPMENT IN SUB-SAHARAN AFRICA

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ABSTRACT

Since a persistent increase is seen in the size of the informal sector and its continuous coexistence alongside the formal sector and institutional development, this study empirically examines the effect of informal sector size on the financial development in Sub-Saharan Africa for the period 1996-2019. The study represents financial market development by the financial market depth, which is regressed against informal sector size, growth rate of GDP, interest rate, trade openness, and institutional quality index. The study relied on the estimates of the Discroll-Kraay and IV-2LS. Results indicate that informality repressed financial development, while trade openness, growth rate of gross domestic product, interest rate, and institutional quality have a positive impact on financial development. It is therefore recommended for policymakers to reduce the size of informality to improve the financial sector.

JEL classification: G15, J46, E44

Keywords: Financial development, Informal sector size, Discroll-Kraay, Institutional quality, Principal component analysis

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1. INTRODUCTION

The informal sector has not only become persistent but also been on the rise, defying theory as hypothesized by Arthur Lewis (Sirisankanan, 2017). It continues to coexist alongside the formal sector and institutional development. This situation has become problematic and constitutes economic, social and political challenges not only peculiar to developing and transition economies, but developed nations as well. The problem arises when the informal sector worsens the government's financial standing and social welfare institutions, which eventually distorts investment and growth opportunities (Imamoglu, 2016). The informal sector is generally used to describe employment and economic activities that are unrecorded, unregulated, unobserved, and irregular including those that are hidden and undertaken underground (Khuong et al., 2021). Since the informal economy is usually not accounted for, its activities and participants are excluded from the gains, security and rights of formal regulations and structures, including the formal financial system.

Consequently, informal sector participants usually evade tax and resort to informal financing for their ventures and growth, which has been found to have ambiguous effects on financial development. Alberola and Urrutia (2020) document a positive effect of informality on financial development as informality was found to reduce the impact of demand and financial shocks on the financial sector while Elgin and Uras (2013) found a two-way effect; a positive impact by enhancing financial development through reducing capacity constraint and a negative impact by promoting financial repression arising mostly from tax evasion. Two crucial influencing factors in this relationship are the level of institutional development and size of informality (Elgin and Uras, 2013). The consequential effect of informal sector on financial development is therefore, not only uncertain, but has the tendency to aggravate financial underdevelopment especially in developing economies experiencing the largest size of informality.

A myriad of literature exists on the relationship between the informal sector and financial development in various countries at different time periods. Research focus has largely been on the effect of financial development on informality (Katircioglu and Imamoglu, 2020; Henri, 2018; Sirisankanan, 2017). Literature is very scant on how informality affects financial development as only Elgin and Uras (2013) has dwelled on this aspect to the best of the authors' knowledge. This study is among the very few to devote attention to

the aforementioned neglected aspect by examining how informal sector size influences financial development, particularly, in sub-Saharan Africa (SSA). Specifically, the paper explores the different channels through which the informal sector affects financial development in SSA.

SSA is chosen as the region of study as it experiences one of the highest incidences of informality in the globe, estimated at 66% of aggregate non-agricultural employment in the region (ILO, 2015); this goes as high as 50% - 65% in countries such as Nigeria and Tanzania. Also, 80% of employees in the region were estimated to be employed in vulnerable employment with unpaid family workers accounting for 76.6%, which is prominently higher than the 45% global average. This may be largely due to the typically low income levels in the region given that informality is indicated to bear a direct relationship with income (Medina, Jonelis, and M. Cangul, 2017). In addition, the informal economy in SSA is found to be dominated by self-employment rather than wage employment, accounting for 53% of non-agricultural informal employment. When disaggregated by gender, female participation in non-agricultural informal employment is recorded at 74% in contrast to 61% for males (ILO, 2015). The International Labor Organization (ILO) (2015) report further indicates informal employment to be the employment mainstay for youths in SSA, with about 80% engaged in the informal economy. This sector provides livelihoods by employing a whopping 90% of SSA's non-agricultural labor force and contributing about 70% of output (Henri, 2018). There exists much heterogeneity in the size of the SSA informal sector – ranging from a low 20% to a high 65% (Medina et al., 2017). These highlighted features and peculiarities of the informal economy in SSA allows for a comprehensive analysis as various degrees of informality are accounted for in the analysis which contributes to the uniqueness, robustness and generalization of results.

The significance of this paper is novel as it contributes to literature in three ways. First, the paper explores the relatively uncharted aspect of financial development and brings to the fore the role and transmission channels of informality on financial development. Second, the study employs financial market depth to measure financial development. This captures both the stock market and money market aspect of the financial sector unlike previous studies (e.g., Elgin and Uras, 2013) that utilized broad money supply and credit to the private sector which does not factor in the stock

market. Lastly, the paper adopts the Multiple Indicators Multiple Causes (MIMIC) model (Medina and Schneider, 2018) to measure the informal sector size. This approach captures various causes and outcome indicators of informality and evaluates informal activities over a certain period and across different countries (Elgin et al., 2019). Hence, the study contributes to the literature on the effect of informal sector size on financial development by filling the aforementioned gaps.

This paper is structured in five sections. Following this introductory section is Section Two which expounds the theoretical and empirical review. Section Three details the methodology adopted while Section Four presents and discusses the empirical results. The final Section is devoted to conclusions and policy implications.

2. LITERATURE REVIEW

2.1 DETERMINANTS OF FINANCIAL DEVELOPMENT

The theoretical foundation of financial development could be traced to the works of McKinnon (1973), and Shaw (1973). McKinnon and Shaw opined that government intervention, such as high-interest rate ceiling and reserve requirement ratio in order to reduce inflation rate are the major sources of financial market underdevelopment. This phenomenon is termed "financial repression." This is because an interest rate ceiling discourages domestic savings and investment due to a negative real interest rate, which slows financial market development. Hence, McKinnon and Shaw predict a positive association between real interest rate and financial development since a higher real interest rate is expected to increase financial development by mobilizing savings (Law and Habibullah, 2009). King and Levine (1993) also assert that an economy's health influences the financial development level. This is because a healthier economy has more savings in liquid assets than poorer economies. This assertion suggests that highly developed economies are likely to experience financial market development.

Empirically, aside from growth and interest rate, other relevant drivers of financial market development are trade openness and institutions. Kim, Lin, and Suen (2010) used the estimate of a pooled mean group to investigate the dynamic effect of trade openness on financial development of 88 countries. The result shows that trade openness has a positive impact on financial development in the long run. Similarly, Baltagi, Demetriades, and Law (2008), Law and

Habibullah (2009), Zhang, Zhu, and Lu (2015), and Ho and Iyke (2018) found a positive relationship between trade openness and financial development in the long run. The short-run impact of trade openness on financial development, however, produced mixed results in the existing literature.

Takyi and Obeng (2013) employed an autoregressive distributive lag model to examine the short and long run determinants of financial development in Ghana. The study employed annual data from 1988-2010 and found that trade openness and per capita income have positive and significant impact, while inflation, interest rate and reserve requirement have negative impact on financial development in Ghana. The result is similar to that of Zainudin and Nordin (2017) that examined the determinants of financial development in 4 selected ASEAN countries, namely Malaysia, Singapore, Thailand and the Philippines and found that real income and trade openness have the most important and significant impact on financial development in the countries selected.

Also, using a generalized method of moment, Ibrahim and Sare (2018) examined the interactive effect of trade openness and human capital on financial development. Their findings revealed that human capital and trade openness are substitute determinants of financial development. In a similar and more recent study, Maghfiroh and Purwono (2021), examined the determinants of financial development in 19 emerging market countries between 2008 – 2017. Adopting the Dynamic Panel GMM estimation technique, the study found that savings and human capital contribute to increasing financial development, while, trade openness and government openness had no significant effect on financial development.

Institutional role in financial market development has received academic attention in recent years. Baltagi et al. (2008) examined the impact of economic institutions on financial market development. The study used five political risk services indices to measure economic institutions and found that higher economic institution spurs financial market development. This finding is aligns with the work of Herger, Hodler, and Lobsiger (2008), which found a positive association between an institutional factor and financial market development. Beck (2002) empirically found that the effect of trade openness on financial development depends on the institution level. This implies that institutional quality plays a major role in a country's financial development. Law and Habibullah (2009) also

found a positive association between institutional quality and financial development.

2.2 FINANCIAL DEVELOPMENT-INFORMAL SECTOR PERFORMANCE NEXUS

The relationship between informal sector activities and financial development has received attention from scholars recently. This is because the informal sector activity could harm financial sector development due to tax evasion, which is peculiar to the informal sector. On the other hand, it could also enhance financial development by easing the financial sector capacity constraints (Elgin and Uras, 2012). The Elgin and Uras (2012) empirical study investigated the relationship between informal sector activities and financial development in 152 countries. The study employed annual data between 1999-2007 and found that informal sector size has an inverted U relationship with financial development.

Similarly, Blackburn, Bose, and Capasso (2012) explored to what extent financial development is related to agents' decision to indulge in the informal economy due to their undeclared full incomes to avoid government taxes and their business in the formal sector. The study employed a tax evasion and financial intermediation model to analyze informal market activity with credit market development. Their study employed analysis on three types of financial development regimes by highlighting that an increase in economic growth from lower to an intermediate and then high development growth would reduce the percentage of tax-evading agents. The results showed a negative relationship between tax evasion practices and financial development level. Recently, Alberola and Urrutia (2020) used a general equilibrium model to examine the effect of informal sector size on inflation stability in Mexico. The study found that informal sector performance reduces the impact of financial shock on wages and inflation.

Reducing informal employment has been a great challenge for most economies. While finding the possible solution to informal employment growth, Sirisankanan (2015) utilized a data set of 59 countries between 1990-2002 to investigate how financial development could control the growing informal sector employment. The study found that a more developed financial sector coupled with a strong institution will curb the negative effect of the informal sector on the economy. In a similar study, Katircioglu and Imamoglu (2020) examined the role of financial development on informal sector size in Turkey. The study employed time series data between 1970-2017 to

investigate the long-run effect of financial development on informal activities. This study reveals that financial development impact on the informal sector varies at different levels of financial development.

Also, recent growth of informal sector in Pakistan prompted Khuong et al. (2021) to examine to what extent informal sector size influences formal sector growth. The study employed an autoregressive distributive lag model, with annual data from 1973-2017. It found that the informal economy affects formal economic growth negatively in Pakistan.

To examine the empirical relationship between informality and financial development across countries, Lahura and Vargas (2021) exploit panel data of 152 countries from 1991 to 2018. Adopting several panel cointegration techniques, the study found evidence of a negative long-run relationship between informality and several financial development measures. The study further grouped the countries into developing, developed and Latin America and found evidence of double causality between informality and financial development in developing countries and Latin America.

The role of informal economy in the convergence of financial development across countries and over time was explored in Sever and Yucel (2021). The study explored a cross country panel data of 156 countries over the period 1991 – 2017. Using a panel regression estimation technique, the study finds that lower informality is associated with stronger financial development. The implication of the findings suggests that policies that reduce informality can help countries with lower financial development catch up with those countries having developed financial systems.

From the literature review, it can be seen that some of the past studies focused on cross-sectional data or household panel from individual countries, while some used a cross-country panel data for their analysis. This is because the widely available unified data for informality is very few over time and are not enough to carry out country specific analysis. Lack of data is one of the major determinants of the scope of most of the studies carrying out a secondary data analysis. Also, most of the studies using panel data focused on countries across the world with only a few concentrating on specific region such as Sub-Saharan Africa. Hence the present study adds to the few existing studies in this regard.

3. METHODOLOGY

3.1 DATA SOURCE AND VARIABLES DESCRIPTION

This study employed data from the World Bank Development Indicators for trade openness, GDP growth rate, real interest rate, and institutional quality index. The informal sector size was retrieved from Medina and Schneider (2018), while financial market depth variables were retrieved from the IMF financial statistics that define depth with stock market capitalization to GDP, international debt securities to GDP, stock traded to GDP, total debt securities of financial corporations to GDP, and total debt of non-financial corporations to GDP (Svirydzenka, 2016). These variables are used in computing the financial market depth using principal component analysis. The institutional quality index used in this study is computed using principal component analysis, while the informal sector size was measured using the MIMIC model. The data spanned from 1996 to 2019 for 27 countries in Sub-Saharan Africa. The choice of these countries is due to missing data for other countries in the region. Also, these countries account for over 58% of the SSA, and have homogeneous features with other countries in the region. Hence, they are fit to represent the entire SSA countries. The list of countries is presented in Appendix 2. The description of variables, measurement, and a priori expectations are presented in the following Table 1.

TABLE 1
Description of the Variables

Variables	Description	Measurement	Source	A priori expectations
FinDev	Financial Development	This is represented by the stock market's size, activity, and financial and non-financial corporations' international and domestic debt securities. (Voronkova, 2004)	IMF	-

TABLE 1 *(continued)*

Variables	Description	Measurement	Source	A priori expectations
GRGDP	The growth rate of GDP	The annual growth rate of GDP (%)	WDI	Positive
TO	Trade as a % of GDP	This is the sum of import and export of goods and services as a % of GDP	WDI	Positive
INST	Institutional quality Index	This is computed using the principal component analysis of all the six governance indicators	WDI	Positive/ Negative
RIR	Real interest rate	Real interest rate (%)	WDI	Positive
INFSS	Informal sector size	This measures the size of the informal activities using MIMIC method		Positive/ Negative

Note: the comprehensive list of all the countries used in this study is presented in the appendix.

3.2 MODEL SPECIFICATION

Following the McKinnon-Shaw model of financial repression as well as the Elgin and Uras (2012) model that the size of informal sector can either repress or contribute to financial development, the following model is specified to examine the impact of informal sector size on financial development in Sub-Saharan Africa:

$$(1) \qquad lnFinDEV_{it} = \beta_0 + \beta_1 lnINFSS_{it} + \beta_2 lnINST_{it} + \beta_3 lnGRGDP_{it} + \beta_4 lnRIR_{it} + \beta_5 lnTO_{it} + \varepsilon_{it}$$

Where FinDev represents financial market development (proxy by financial market depth) as explained by INFSS as the informal sector size, INST as the institutional quality index, RIR is the real interest rate, and TO is the trade openness. The stochastic error term is captured by ε_{it}, which captures the country specific effects of each of the explanatory variables on the dependent variable. We introduced a natural logarithm to all the variables to avoid time series data dynamic properties association. All coefficients are expected to be positive except that of INFSS and INST which are expected to be positive or negative.

3.3 DATA ANALYSIS METHOD

This study employed the panel ordinary least squares, fixed and random effect regression, Driscoll-Kraay standard error estimate, and IV- 2 stage OLS technique. The study employed Driscoll-Kraay to account for the possibility of autocorrelation, cross-sectional dependence, and heteroscedasticity problems, which are peculiar to panel studies (Hoechle, 2007). We employed IV-2SLS to tackle possibility of endogeneity problem, which is also peculiar to panel studies.

In this study, informal sector size was treated as endogenous because most previous empirical studies suggest that financial development influences informal sector size while examining the reverse. Following the study by Shittu et al. (2021), this study introduced the lags of INST, RIR, TO and GRGDP as instruments in the IV-2SLS estimation technique.

4. RESULTS AND DISCUSSION

The descriptive statistics of the model, including mean, standard deviation, minimum, and maximum of the variables used in the model, are presented in Table 2. With data from 27 Sub-Saharan African countries spanning from 1996-2019, it is evident that the mean and standard deviation values of financial development, informal sector size, trade openness, the GDP growth rate, institutional quality index, and real interest rate are positive. Trade openness produced the highest mean value, while the institutional quality index has the lowest mean value. All the variables have a relatively wide deviation from their mean values except for GDP growth rate.

TABLE 2
Descriptive Statistics

Var		Mean	Std. Dev.	Min	Max	Obs
FinDev	overall	23.815	32.598	-18.7980	161.392	N = 675
	between		31.315	4.1966	133.162	n = 27
	within		10.813	-28.9240	80.211	T = 25
INFSS	overall	37.062	9.328	15.890	72.730	N = 675
	between		7.556	21.003	56.162	n = 27
	within		5.654	18.039	72.815	T = 25
TO	overall	48.570	33.895	1.0000	161.392	N = 675
	between		32.056	3.2000	113.401	n = 27
	within		12.566	-4.1696	104.966	T = 25
GRGDP	overall	4.502	4.520	-28.100	26.417	N = 675
	between		1.981	1.775	10.040	n = 27
	within		4.081	-25.770	26.425	T = 25
INST	overall	0.132	0.995	-1.884	2.881	N = 675
	between		0.949	-1.333	2.312	n = 27
	within		0.349	-1.199	1.330	T = 25
RIR	overall	4.812	24.24496	-133.860	132.360	N = 675
	between		17.30397	-43.973	48.789	n = 27
	within		17.29315	-86.333	88.391	T = 25

Sources: Authors computation

The pairwise correlation matrix, which explains the degree of relationship among all the variables used in this study, is presented in Table 3. All the correlation coefficients fall within the range of +1 and -1, as expected.

The table shows that only INFSS has a negative relationship with financial market development among all the variables used in this study. The correlation coefficients also suggest no evidence of multicollinearity among the variables. This is in line with the VIF statistics shown in the post-estimation result.

TABLE 3
Correlation Analysis

Variables	FinDev	INST	TO	GRGDP	INST	RIR
FinDev	1					
INFSS	-0.370***	1				
TO	0.476***	-0.344***	1			
GRGDP	0.0831*	-0.00449	-0.0203	1		
INST	0.449***	-0.555***	0.374***	-0.0476	1	
RIR	0.0538	-0.142***	0.0312	0.0565	0.0303	1

Notes: * p < 0.05, ** p < 0.01, *** p < 0.001denote statistically significance at 1%,5% and 10%, respectively.
Source: Authors computation.

TABLE 4
Regression Estimates

VARIABLES	FE	RE	POLS	Driscoll-Kray	IV-2SLS
GRGDP	0.159*	0.165*	0.165*	0.432*	0.959*
	(0.0681)	(0.0776)	(0.0776)	(0.201)	(0.451)
INFSS	-0.251***	-0.256***	-0.256***	-0.443***	-0.413**
	(0.0741)	(0.0735)	(0.0735)	(0.0551)	(0.161)
INST	5.192***	5.398***	5.398***	8.224***	8.453***
	(1.154)	(1.125)	(1.125)	(1.928)	(1.340)
RIR	0.0592**	0.0602**	0.0602**	0.117***	0.0930*
	(0.0239)	(0.0237)	(0.0237)	(0.0286)	(0.0495)
TO	0.302***	0.306***	0.306***	0.327***	0.317***
	(0.0326)	(0.0318)	(0.0318)	(0.0657)	(0.0341)
Constant	18.73***	18.73***	18.73***	25.77***	27.39***
	(3.462)	(6.342)	(6.342)	(5.036)	(6.475)
Observations	675	675	675		
Hausman chi^2 stat	12.08*				
F-Stat/Wald chi^2	23.82***	130.69***	130.69***		
Pesaran CDS test	4.161***				

Notes: Figures in parentheses represent the standard errors, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$ denote significance at 1%,5% and 10%, respectively. The instruments are L. TO, L.RIR, and L. INST, while GRGDP and INFSS are treated as endogenous variables.
Source: Authors computations.

Although the Hausman chi^2 statistics favor the fixed effect estimates as against the random effect and pooled OLS, our post-estimation tests suggest that the fixed effect estimate is inefficient as

it suffers from autocorrelation, heteroscedasticity, and cross-sectional dependence problems. This necessitates using the Driscoll-Kraay estimate, which accounts for these problems with a robust standard error (Shittu, Adedoyin, Shah, and Musibau, 2021). The IV-2SLS was employed to account for any possibility of endogeneity problem and to serve as a robustness check on the former estimation technique.

The coefficients of GRGDP and RIR produced a positive and significant relationship with financial development, as shown in the estimates of Driscoll-Kraay and IV-2SLS in Table 4. A percentage increase in output and interest rate increases financial development by 0.46% and 0.1%, respectively. This is in line with our theoretical expectations as put forward by McKinnon (1973) and Shaw (1973). This is also in line with the empirical studies of Law and Habibullah (2009), which show that output influenced financial development positively. It implies that a healthier economy in terms of real output and real interest rate growth impacts financial development through adequate savings mobilization.

Coefficient of informal sector size produced a negative and significant relationship with financial market development. A percentage increase in the informal sector size reduces financial development by 0.4%. This result is in line with the a priori expectations, although the negative effects contradicts the empirical findings of Elgin and Uras (2012), which found a positive effect. The inverted U relationship found in their paper shows that informality portrays a non-linear relationship with financial development. The negative result may also be because tax evasion may be prevalent among Sub-Saharan African countries, which may hamper financial market development by reducing output level. In addition, the International Labour Organization (ILO) shows that the majority of workers in Africa are employed in informal employment, hence their transition to formality has not improved the level of financial development in the region.

From the Dricoll-Kraay estimate, the coefficient of institutional quality shows a positive and significant relationship between the two variables. A percentage increase in institutional quality increases financial market development by 8.2%. This result aligns with that of Baltagi et al. (2008) and Herger et al (2008), which found that economic and other institutional quality spurs financial market development. The institutional quality of most African countries is low as compared to other regions. Institutional quality

positive impact on financial development means that improving these institutional quality indices would go a long way to further developing the regional financial market.

Finally, the coefficient of trade openness has a positive and significant impact on financial development in the selected Sub-Saharan Africa countries. A percentage increase in trade openness increases financial market development by 0.3%. This result agrees with the studies of Zhang et al. (2015) and Ho and Iyke (2021), showing that trade openness has positive impact on financial market development. The positive impact of trade openness on financial market integration could result from different regional trade policies that enhance the free-flow of goods and services within the region and the multilateral engagements of Sub-Saharan African countries, which boost capital inflows.

5. CONCLUSION AND RECOMMENDATION

Given the increasing informal sector size, this study empirically examines the effect of informal sector size on financial development in the Sub-Saharan Africa region for the period 1996-2019. An empirical model was specified based on the McKinnon-Shaw model of financial repression as well as Elgin and Uras (2012) model that the informal sector size can either repress or contribute to financial development. The empirical results show that the coefficient of informality is negative and significant; thus it can be concluded that informal sector size has negative effect on financial development. This suggests that informality represses financial development in the selected Sub-Saharan African countries. Policymakers hence are recommended to reduce the informal sector size to enhance financial development.

This study also found that economic growth and real interest rates have positive and significant effect on financial development. Similarly, the coefficients of institutional quality and trade openness are positive and significant as well. So, it can be concluded that they have positive impact on financial development. These factors are important determinants to be considered by policymakers in financial sector development. Future researchers can extend this study by examining how tax-burden can affect the informal sector-financial development relationship. This is beyond the scope of the present study.

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APPENDIX 1

Multicollinearity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of fmd
chi2(1) = 281.79
Prob > chi2 = 0.0000

Variable	VIF	1/VIF
INST	1.54	0.650223
INFSS	1.53	0.654915
TO	1.20	0.833204
RIR	1.03	0.973552
GRGDP	1.01	0.993466
Mean VIF	1.26	

APPENDIX 2
List of Countries

S/N	Countries
1	Angola
2	Botswana
3	Burkina Faso
4	Burundi
5	Comoros
6	Cote d'ivoire
7	Ethiopia
8	Gambia
9	Guinea
10	Guinea-Bissau
11	Kenya
12	Lesotho
13	Liberia
14	Madagascar
15	Mali
16	Mauritania
17	Mauritius
18	Mozambique
19	Namibia
20	Niger
21	Nigeria
22	Rwanda
23	Senegal
24	Sierra Leone
25	South Africa
26	Uganda
27	Zambia