Revisiting Financial Development And Economic Growth In Sub-Saharan African Low-Income Countries: A Panel Data Approach

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Abstract- The aim of this paper is to re-assess the relationship between financial development and economic growth in17 Sub-Saharan African Low-Income Countries(SSALIC) over the period of 2000 to 2015.Both static and dynamic panel estimation techniques are used to re-assess relationship.

On the static model, although, liquid liability and commercial bank central bank are statistically insignificant, the private sector credit and openness are positive and highly statistically significant, consistent with many of theoretical and empirical studies while, the dynamic panel analysis provides no clear indication on the relationship between financial development and economic growth.

Consequently, this empirical difference provides some insight and a good basis for reflection on stipulated relation between indicators of financial development and economic growth.

Index Terms- Economic growth, Financial development, Panel data

JEL Classification:F10, F14

I. INTRODUCTION

Ongoing debate has revolved around whether financial development is one of the engines of growth. However, there are mixed findings and opinions on the relationship between financial development and economic growth.

The number of studies has agreed that financial sector development has positive effect on growth (Beck, Levine, & Loayza, 2000; Christopoulos & Tsionas, 2004; Jedidia, Boujelbene, &Helali, 2014; Khan & Senhadji, 2000; King & Levine, 1993a, 1993b; Levine, 1997; Levine, Loayza, & Beck, 2000).

Recent empirical studies, however, offer contradictory evidence (Kaminsky and Reinhart, 1999; Deidda and Fattouh, 2002; Wachtel, 2003; Favara, 2003; Rousseau and Wachtel, 2011 and Arcand et al., 2011 and Demetriades and Rousseau, 2011).

Despite the wealth of research in these areas, the absence of consensus of the opinion has meant that no one theory has gained the full support of the entire economic community. On contrary, somewhat conflicting and often contradicting findings has left many deeply puzzled.

To shed light on this puzzle, this study re-assess the relationship between financial development and economic grow thin the context of Sub-Saharan African Low-Income Countries.

This study however differ from the previous studies, we are re- assessing relationship between financial development and economic growth using alternative estimation techniques to identify the empirical differences in findings that might have profound implication on stipulated relationship.

This paper is structured into five sections after the introduction, a review of relevant literature is presented in section two while the third section discusses the methodology and data whereas, section four presents the results and discussions and the conclusion comes last.

II. DISCUSSION OF RELATED LITERATURE

2.1. Theoretical foundations

The economic theory postulates three channels on which financial development affect economic growth. First, payment methods are the least expensive services offered by the financial system that promote efficiency of the economy by reducing the transaction cost (Kindleberger, 1993). Secondly, a volume effect, where the financial activity increases savings and thus resources can be a source of investment financing.

Financial development → Capital accumulation→ Economic growth.

Thirdly, an allocation effect, that financial development improves the allocation of resources for investment.

Through Capital accumulation → Economic growth

↑

Financial development

2.2. Empirical studies

The theoretical literature has occasioned in ample studies and empirical works to support the relation of financial development. Initially, the works of Schumpeter (1912), Gurley and Shaw (1955) and Goldsmith (1969) holds that a well-developed financial system stimulates growth by channelling savings to the most productive investment projects.

Recently empirical studies done by Beck et al. (2000), using a sample of 74 developed and developing countries use two methodological approaches to take account of the endogeneity of the financial development variable in a growth model over the

period 1960-1995. He concluded for the existence of a positive link between the exogenous component of financial development and economic growth. By applying Generalized Moments in dynamic panel show that the development level of the banks (measured by the ratio of credits to the private sector in proportion of GDP) and the development level of stock exchange markets (measured by the turnover ratio) independently exercise each a positive impact on economic growth.

Despite the number of empirical studies which find a positive relationship between financial development and economic growth, a new emerging literature calls the robustness of this relationship into interrogation.

The study of Anderson and Trap (2003) have shown that the positive relationship between financial development and per capita growth not always borne out in all sample and the period. Brought to light by Levine, Loayza and Beck(2000) restricted to some countries, for developing countries witnessed crises during the 1980s,when they liberated their financial sectors and put more rapid liberalization reforms in place that the significant impact on growth. Aghion, Howitt and Mayer-Foulkes (2004) have also found an insignificant direct impact of financial development (measured by credit/GDP) on economic growth. But the coefficients of the crossed variable of the financial development level and of the initial level of GDP per head(relative to that of the United States), presents a negative and significant sign. They highlight an ambiguous relationship between financial development and economic growth. The level of credits as a percentage of GDP influences growth only in the intermediary stages of development.

III. METHODOLOGY

3.1. Data and sample selection

This study applied balanced panel data covers 17Sub-Saharan Africa Low-Income Countries (SSALIC) as classified by the World Bank in 2010. The data set spanning from 2000 to 2015. The dependent variable is the log of real per capita GDP taken from the World Development Indicators (WDI)[1]. The main regressors are three different proxies for financial development at the country level, namely, liquid liabilities(LIQLIAB), commercial-central bank (DMA), and private credit(CPRS), all taken from the International Financial Statistics (IFS) database[2]. Liquid liabilities are defined as the liquid liabilities of the financial system (currency plus demand and interest-bearing liabilities of banks and non-bank financial intermediaries) divided by GDP. Commercial-central bank is defined as the assets, of deposit money banks divided by assets of deposit money banks plus central bank assets. Private credit refers to the credit by deposit money banks and other financial institutions to the private sector divided by GDP. Finally, the following control variable is also considered: openness to trade (OPN) from WDI. The openness to trade (the ratio of exports plus imports to GDP as a proxy for the importance of international factors in influencing economic activity.

3.2. Analytical procedure and model specifications

In this study, both the static and dynamic panel estimation techniques are used. The reason for using both techniques is to identify the empirical differences in the output.

a. Static models

The static panel setup is given by the following model:

$$Y_{it} = \beta X'_{it} + \eta_i + \varepsilon_{it} \quad \ldots\ldots(1)$$

where Y_{it} is the logarithm of real per capita GDP, X_{it}represents a vector of regressors.

Where, i and t denote country and time respectively,$\eta_i$is the unobserved time-invariant specific effects. Finally, $\varepsilon_{ijt}$is the two-way error component term of the model assumed to be normal, independent and identically distributed (IID)

with £(ε_{it}.)=0; Var (ε_{it}) = $\sigma^2 > 0$.Under this static model specification the Hausman (1978)test helps us to select the most suitable model.

b. Dynamic panel model

We use the generalized method of moments (GMM) estimators developed for dynamic models of panel data by Arellano and Bond (1991) and Arellano and Bover (1995).

Let rewrite the model (1) to capture the dynamism in our model in the following setup

$$Y_{it} = \alpha Y_{it-1} + X'_{it}\beta + \eta_i + \varepsilon_{it} \quad \ldots\ldots(2)$$

where $Y_{it-1}$is the initial level of per capita income.

To eliminate country-specific effects, we take first differences of equation (2)

$$\Delta Y_{it} = \alpha \Delta Y_{it-1} + \beta \Delta X'_{it} + \Delta\varepsilon_{it} \quad \ldots\ldots(3)$$

To deal with the likely endogeneity of the financial development and economic growth and because by construction the new error term ($\varepsilon_{it} - \varepsilon_{it-1}$) in (3) is correlated with the lagged dependent variable, ($Y_{it-1} - Y_{it-2}$).

The first GMM panel estimator uses the following moment conditions:

E[Y_{it}− s($\varepsilon_{it} - \varepsilon_{it-1}$)] = 0 for s ≥ 2; t = 3, ..., T

E[X'_{it} −s($\varepsilon_{it} - \varepsilon_{it-1}$)] = 0 for s ≥ 2; t = 3, ..., T

The first GMM panel estimator shows that when the explanatory variables are persistent over time, lagged levels of these variables are weak instruments for the regression equation in differences. To reduce the potential biases associated with the difference estimator, the system GMM estimator combines the differences and levels regression by adding moment conditions for the second part of the system which is the regression in levels are:

[1] Source: World Development Indicators online database (accessed November 10,2019)

[2] Source: International Financial Statistics (IFS) online database (accessed November 10, 2019)

$E[(Y_{it-s} - Y_{it-s-1})(\eta_i + \varepsilon_{it})] = 0$ for s = 1
$E[(X'_{it-s} - X'_{it-s-1})(\eta_i + \varepsilon_{it})] = 0$ for s = 1
These moment conditions above employs a GMM procedure to generate consistent and efficient parameter estimates.

IV. RESULTS AND DISCUSSIONS

4.1. Preliminary analysis

The aim of this section is to re-evaluate the effect of financial development on economic growth and descriptive statistics are summarised in Table 1.

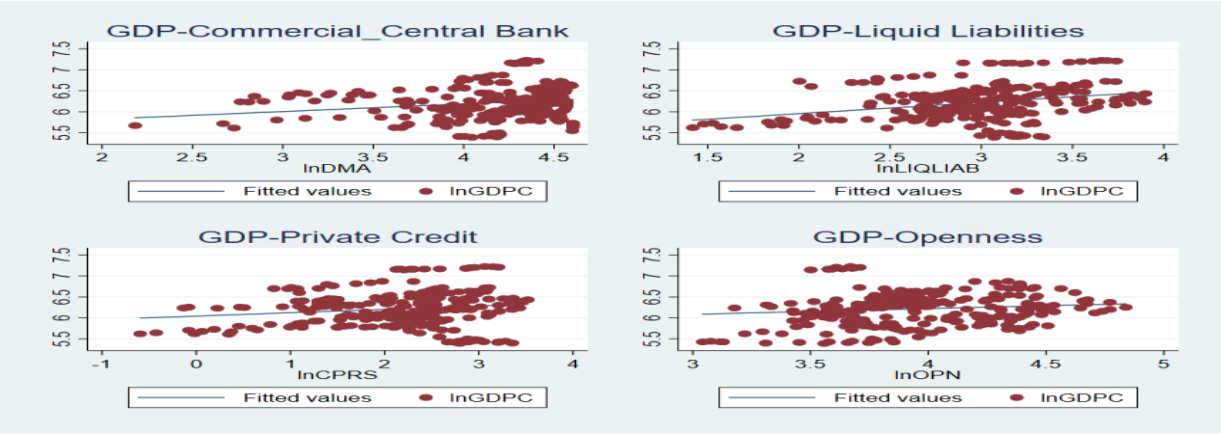
Table1. Descriptive statistics

VARIABLES	N	Mean	sd	Min	Max	skewness	kurtosis
lnGDPC	272	6.215	0.413	5.391	7.225	0.321	3.065
lnDMA	272	4.157	0.419	2.183	4.605	-1.738	6.314
lnLIQLIAB	272	2.971	0.452	1.418	3.900	-0.714	4.178
lnCPRS	272	2.127	0.788	-0.595	3.520	-0.868	3.678
lnOPN	272	3.947	0.361	3.043	4.839	0.134	2.455

Source: Own computation

The general observations from the results in the table1 is that the sample countries experienced volatility in GDP growth rates showing a mean value of GDP per capita growth of approximately 6% and a standard deviation exceeding 4 % for the sample. The DMA appeared to be stable, averaging almost 4% within the sample period, while average LIQLIAB and OPN show results with a mean value of 3% whereas CPRS indicate around 2%.This data variability is suitable for our panel specification and analysis.

Figure:1Scatter plots of financial development indicator and economic growth



Source: Author's computation

We extend the analysis using partial scatter plots for indicators of interest. This show an intuitive contribution of financial indicator to GDP per capita growth to identify the nature of the relations. The overall indicator show broadly resemblance positive linear association with GDP growth.

4.2. Regression estimates

This section provides both static and dynamic regressions results of the relationship between financial development and economic growth. For static regression comprised by: OLS, LSDV,RE and for the dynamic panel model the FDGMM(Arellano and Bond, 1991) and SYS GMM(Blundell and Bond, 1995) have been used.

Table 2: Financial Development and Economic growth: Static Panel Models

	OLS	LSDV	FE	RE
lnDMA	0.278***	0.043	0.043	0.046
	(0.08)	(0.03)	(0.03)	(0.03)
lnLIQLIAB	0.492***	-0.059	-0.059	-0.050
	(0.09)	(0.05)	(0.05)	(0.05)
lnCPRS	-0.244***	0.121***	0.121***	0.116***
	(0.07)	(0.03)	(0.03)	(0.03)
lnOPN	0.018	0.228***	0.228***	0.226***
	(0.07)	(0.04)	(0.04)	(0.04)
N	272	272	272	272
AIC	259.473	-413.914	-445.914	.
Log-likelihood	-124.737	227.957	227.957	
R-Squared	0.140	0.936	0.400	
F stat	10.834	182.539	41.832	
RMSE	0.386	0.109	0.109	0.109

Standard errors in parentheses
The dependent variable is lnGDPC.
Specific effects dummies in LSDV not shown to save space
Source: own computations.
*p< 0.1, **p< 0.05, ***p< 0.01
Source: Author's estimation

The Hausman tests (Prob>chi2 = 0.6705) do not reject the null hypothesis, thus the random effects model yields consistent estimates.

For the RE model, although, liquid liability and commercial bank central bank are statistically insignificant, the private sector credit and openness are positive and highly statistically significant. This is implying that if the private sector credit and openness increase by 1% the par capital GDP increases by 0.11% and 0.22% respectively Ceteris paribus, consistent with many of theoretical and empirical models.

Table 3: Financial Development and Economic growth: Dynamic Panel Model

	OLS	FE	FDGMM	SYSGMM
L.lnGDPC	1.000***	0.848***	0.801***	0.891***
	(0.008)	(0.028)	(0.040)	(0.149)
lnDMA	0.016	0.008	-0.002	0.150
	(0.013)	(0.018)	(0.024)	(0.253)
lnLIQLIAB	-0.028**	-0.054**	-0.070*	0.082
	(0.013)	(0.024)	(0.036)	(0.133)
lnCPRS	0.005	0.020	0.026	-0.114
	(0.009)	(0.016)	(0.023)	(0.169)
lnOPN	0.027***	0.073***	0.083***	0.105
	(0.010)	(0.018)	(0.023)	(0.110)
N	255	255	238	255
R^2	0.986	0.889		
AIC	-789.668	-857.018	.	.
N countries				
Log likelihood	411.834	445.509		
AR(1)			-4.770	-1.649
AR(1) (p-value)			0.000	0.099
AR(2)			-0.997	-0.732
AR(2) (p-value)			0.319	0.464

Hansen	0.000
Hansen (df)	56.000
Hansen (p-value)	1.000

Standard errors in parentheses
$^{*}p< 0.1$, $^{**}p< 0.05$, $^{***}p< 0.01$
Source: Author's estimation

The lag of real GDP per capita has a significant coefficient and a positive effect on growth for both FDGMM and SYSGMM estimators, which points to a downwards bias respectively from 80% to 89% in our simulations. whereas the direct impact of the three financial development variables considering openness as control variable are statistical insignificant on growth. This finding is similar with some studies (Anderson and Trap (2003),Aghion, Howitt and Mayer-Foulkes (2004))shown that direct effect of financial development and economic growth can be observed at the transition stage of financial development.

The diagnostics test for both Sargan-Hansen and second-order serial correlation tests do not reject the null hypothesis, thus the instruments are exogenous and valid.

V. CONCLUSIONS

The study re-examined the relationship between financial development and economic growth in Sub-Saharan Africa Low Income Countries over the period 2000-2015.

The relationship has been revisited by using both static and dynamic panel data. The Hausman test showed that random effects model yields consistent estimates, although the liquid liability and commercial bank central bank are statistically insignificant. The private sector credit and openness are positive and highly statistically significant. While the dynamic panel analysis, allows us to determine the relative changes in growth rate following the changes in the level of financial development, provides no clear indication on the direction of the relationship between financial development and economic growth.

Consequently, this empirical difference provides some insight and a good basis for reflection on stipulated relation between indicators of financial development and economic growth.

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