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FINANCIAL DEEPENING, INTEREST RATE SPREAD AND ECONOMIC GROWTH: NEW EVIDENCE FROM SUB-SAHARA AFRICA

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ABSTRACT

This study examines the nexus between financial deepening, interest rate spread and economic growth using data from Sub-Sahara African (SSA) countries. A dynamic panel approach is employed in estimating the parameters of the specified equation using the Sargan test of over-identification restriction in assessing the validity of the instruments used in addressing potential endogeneity problems of the data. The results show that whilst financial deepening positively drives growth, interest rate spread adversely affect growth in countries studied. In terms of relative effects, the results indicate that enhancing financial deepening by10.0 percent induces economic growth on average by a margin of 4.2 percentage points. On the contrary, however, raising interest rate spread by 10.0 percent reduces growth on average by a margin of 3.6 percentage points in countries studied. Based on these findings, there is a strong need for the implementation of policies that promote financial deepening. In particular, there is a strong need for financial authorities supervising the activities of commercial banks to ensure low interest rate spreads with a view to promoting the efficiency of banks in effectively playing their financial intermediation role to boost economic growth for poverty reduction in SSA countries.

1. INTRODUCTION

The critical role of financial deepening in economic growth has received considerable attention in the economic literature (Gurley and Shaw, 1967; Goldsmith, 1969; Jao, 1976). Ndebbio (2004) observes that a good number of developed economies are characterized by high financial depth and thus argued that financial systems in such countries contribute significantly in promoting economic growth. Additionally, Meier (1984) notes that for the world's largest economy (the United States), the growth of financial assets as a ratio of GNP has increased faster from about unity at the beginning of the last century to 4.5 times in the 1980s. In the case of Japan, Meier observes that the ratio of financial assets to GNP rose from 10.0% in 1885 to over 150.0% in the 1980s. Ndebbio (2004) further notes that when the depth of the financial system is high in any country, that country is highly likely to have the ability to generate high employment rates, improved productivity and hence economic growth. He, however, observes that growth and employment performance in Sub-Sahara African (SSA) countries has been poor owing mainly to the existence of shallow financial depths due to inappropriate economic policies as well as financial repression.

Notwithstanding the widespread implementation of financial reforms[1] in SSA countries since the early 1980s, a good number of these countries continue to suffer from financial markets inefficiency, illiquidity, and thinness. Most of SSA's financial systems are characterized with shallow depth and high interest rate spread[2]. Consequently, a good number of SSA countries continue to experience high levels of capital flight. According to Senbet and Otchere (2005) SSA has recorded the highest proportion of private wealth held abroad than any other region[3]. In addition, the prevalence of informal savings channels was in view of the grossly underdeveloped formal financial systems. All these features – lack of private international capital, low levels of domestic resource mobilization, capital flight, and the grossly untapped resources in the informal sectors – accounted significantly for the perennial financing gaps which had adverse effects on growth and poverty across SSA countries.

Table-1. Financial Deepening and Interest Rate Spread (2000 -2013)

Country	Financial Depth				Interest Rate Spread		
	2000 - 2010	2011	2012	2013	2000 - 2010	2011	2012
Selected Sub-Sahara African Countries							
The Gambia	36.2	54.9	53.2	55.1	13.6	16.3	16.5
Kenya	40.4	50.0	51.2	51.7	10.4	9.4	8.2
Liberia	21.4	40.1	34.9	38.2	12.6	10.7	10.0
Madagascar	22.6	25.0	24.7	23.4	19.2	41.9	49.5
Malawi	18.7	35.7	36.6	38.7	21.8	19.6	21.3
Mauritius	103.7	98.9	100.5	99.8	8.7	1.8	2.4
Mozambique	31.2	39.4	45.6	46.9	8.9	6.1	5.4
Nigeria	24.7	20.1	20.7	20.6	7.2	10.3	8.4
Seychelles	86.2	57.9	52.5	61.1	6.8	9.1	8.9
Sierra Leone	16.1	21.7	20.5	17.5	13.2	10.7	10.6
South Africa	70.3	76.9	75.6	74.4	4.3	3.3	3.3
Tanzania	26.0	34.7	32.8	30.3	10.2	8.2	5.9
Uganda	20.1	27.0	24.2	23.9	11.5	8.8	10.1
Zambia	21.5	23.1	24.2	25.7	16.5	11.8	5.1
Selected Advanced Economies							
Australia	82.4	100.6	102	106.2	4.4	3.4	3.1
China	155.4	180	187.5	194.5	3.3	3.1	3.0
Japan	212.2	238	241	249	1.5	1.0	0.9
Malaysia	130.0	138	141.2	144.1	3.2	2.0	1.8
South Korea	114.4	131.4	133.3	134.5	1.7	1.6	1.7
Switzerland	138.7	168.3	188	192.1	2.5	2.7	2.7

Source: World Bank Development indicators 2014 and author's calculation of average period
Note: Figures in black represent financial depth whilst those in red represent interest rate spread

As presented in Table 1, for SSA countries, only Mauritius, South Africa, Seychelles recorded average financial depths[4] in excess of 50.0% of GDP over the period 2000 − 2013. This set of countries are the few that have well-developed financial systems when compare to other SSA countries. Mauritius, in particular, had an average financial depth of about 103.7% of GDP between 2000 and 2010. In 2012 and 2013, Mauritius' financial depth stood at around 100.5 % and 99.8% of GDP respectively. This compared favorably to those of South Africa and Seychelles with financial depths between 2000 and 2010 averaging around 70.3% and 86.2% of GDP respectively. With regards to interest rate spread, South Africa recorded the lowest, with an average of 4.4 between 2000 and 2010

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[1] Partly motivated by the Structural Adjustment Programme (SAP) advocated by the World Bank and the International Monetary Fund(IMF)

[2] Interest rate spread is defined as the difference between the lending and deposit rates of Commercial Banks. It is normally used as a measure of the efficiency of commercial banks. The larger the interest rate spread the less efficient the banking system is. Alternatively, the smaller the interest rate spread the more efficient is the banking system.

[3] SSA estimates ranging from 30 to 40%, versus estimates for Latin America and East Asia at 8 and 3%, respectively.

[4] Measured as M2 as % of GDP

compared to Mauritius and Seychelles with averages of 8.7 and 6.8 respectively over the same period. However, in 2012, interest rate spread in Mauritius plummeted to around 2.4, making it the country with the least interest rate spread in SSA.

A good number of SSA countries including Liberia, Madagascar, Malawi, Nigeria, Sierra Leone, Uganda and Zambia are characterized by shallow financial systems as their average financial depth between 2000 and 2010 went below 25% of GDP. These countries also suffer from high interest rate spreads ranging from 11.5 to around 49.5 (see Table 1). The low level of financial deepening in these countries is reflective of the underdevelopment of their banking sector which partially explains the tenacity of high interest rate spreads in these countries. This fact is being acknowledged by Ndung'u and Ngugi (2000) who argue that high interest rate spread discourages potential savers due to low returns on deposits and thus limits financing for potential borrowers and thus reduce the level of financial intermediation. For developed economies like Australia, China, Japan, Malaysia, South Korea and Switzerland, it could be observed from Table 1 that the reverse is the case. In this group of countries, whilst the financial systems are characterised by high depths, interest rate spreads are rather very low when compared to SSA countries. In Japan, for instance, spread between the lending and deposit rates of commercial banks was as low as 0.9 in 2012 as compared to Madagascar with a spread of 49.5 for the same year. Since interest rate spread is an indicator used in appraising the efficiency of the Banking sector, the higher the spread, the lower the efficiency of the banking sector and vice versa. Table 1, therefore, shows that the preponderance of shallow financial systems in SSA partly explained their inefficiency as reflected by high interest rate spreads. On the contrary, the existence of deep financial systems in advanced economies explained their high level of efficiency as reflected in low interest rate spreads.

In recent years, a good number of SSA countries were observed to have recorded phenomenal economic growth despite the preponderance of shallow financial systems. For instance, in 2013, The Gambia, Liberia, Nigeria, Sierra Leone, Uganda and Zambia recorded growth rates of 5.6%, 11.3%, 5.4%, 20.1%, 5.8%, and 6.4% respectively. On the contrary, the more financially developed economies like Australia, Japan, Malaysia, South Korea and Switzerland, recorded growth rates of 2.7%, 1.5%, 4.7%, 3.0%, and 1.9% respectively during the same period. On the basis of the conflicting picture presented in the above comparison between the advanced economies and those of SSA countries, the key questions, therefore, are, (i) What explains SSA's recent growth episodes given that their financial systems are not as developed as those of their counterparts in advanced economies?. (ii) Does financial deepening plays a significant role in SSA's recent growth episodes, and (iii) Are interest rate spreads relevant in SSA's recent growth process?. In order to provide answers to the above questions, the general objective of this study, therefore, is to identify the key drivers of growth in SSA countries. Specifically, this study aims at assessing the relative effects of financial deepening and interest rate spreads on economic growth in SSA.

Following the introduction, the remaining part of this paper is divided into four sections as follows: Section 2 deals with the review of the relevant literature. In section 3, the study discusses the method of analysis as well as the sources of data. Section 4 does the presentation, analysis and interpretation of the study's findings. Finally, section 5 concludes and proffers some policy recommendations based on the findings of the study

2. LITERATURE REVIEW

The theoretical link between financial deepening and growth remains a controversial issue among researchers. A number of studies have highlighted the role of financial development in better identifying viable investment opportunities to boost economic growth. By mobilizing indigenous savings for investment and facilitating foreign capital inflows, the financial sector plays an essential role in promoting investment in both physical and human capital, thereby enhancing productivity and hence economic growth. King and Levine (1993b) contend that the financial sector plays a key role in appraising investment projects and financing those that are most promising ones. It is further argued that, better financial systems improve the probability of successful innovations and thereby

accelerate economic growth. The financial sector also performs an active role in appraising, managing and funding entrepreneurial activities thereby enhancing productivity growth. Fry (1995) argues that financial systems in developing economies are primarily dominated by commercial banks, insurance and pension companies, and agricultural banks. He also notes that though there exists a sizeable number of stock markets in developing countries, their financial intermediation role is still trivial.

Whilst a number of economists have demonstrated the positive role of financial deepening on economic growth (Jung, 1986; Demetriades and Hussein, 1996; Neusser and Kulger, 1998; Christopoulos and Tsionas, 2004) the existence of wide spreads between lending and deposit rates in most developing countries has been noted for having a mitigating effect on economic growth by reducing the efficiency of financial intermediaries. The difference between the deposit and lending rates of commercial banks (the interest rate spread), has important implications for economic growth. For instance, Ngugi (2004) shows that low interest rates and narrow spreads promote economic growth in Kenya. Similarly, Ndung'u and Ngugi (2000) argue that if the banking sector's interest rate spread is large, it discourages potential savers due to low returns on deposits and thus limits financing for potential borrowers, thereby reducing the level of financial intermediation. A wide interest rate spread is not only indicative of the extent of inefficiency of the banking sector, but also implies an underdevelopment of the financial sector (Randall, 1998; Brock and Rojas-Suárez, 2000; Crowley, 2007).

Empirically, a number of research works on the relationship between economic growth and financial development have often used broad money and private sector credit to GDP ratios as measures of financial sector development. For instance, the World Bank (1994) shows that policies that would raise the M_2/GDP ratio by 10% would increase the long-term per capita growth rate by 0.2–0.4% points. On the other hand, Arestis et al. (2001) use measures like stock market capitalization (scaled by GDP) and report that stock markets have made significant contributions to growth in Germany, Japan, and France. In a study of forty countries over the period 1978-1992, Mattesini (1996) uses the lending-deposit spread as a proxy for monitoring cost related to asymmetric information and find that the spread is particularly significant in explaining the growth performance for the whole sample and for the subsample of developed economies

A variety of time-series techniques have also been utilized in empirical studies to examine the finance-growth relationship. A number of such time-series based techniques (Jung, 1986; Demetriades and Hussein, 1996; Arestis and Demetriades, 1997) frequently employ Granger-type causality tests as well as vector autoregressive (VAR) methodologies in analysing the nature of the finance-growth nexus. Luintel and Khan (1999) for example, examine the long-run causality between financial development and economic growth in a multivariate time series framework using data from 10 sample countries. Their results show bi-directional causality between financial development and economic growth in the sample countries analyzed. Jung (1986) and Demetriades and Hussein (1996) use measures of financial development such as overall financial depth (ie the ratio of M_2 to GDP). They also find bi-directional causality between financial development and economic growth for a number developing economies. Using measures of the value added provided by financial system instead of simple measures of the size of the financial system, Neusser and Kulger (1998) find that finance supports growth. In a similar fashion, Christopoulos and Tsionas (2004) provided evidence in support of the hypothesis that long –run causality runs from financial development to growth.

Odedokun (1996) uses a sample of 71 developing economies over varying periods spanning the1960s and 1980s in order to generate information about the causality issue. The findings are strongly in favor of the "finance causes growth" hypothesis. Calderon and Liu (2003) adopt an innovative econometric technique to analyze data on from 109 countries over the period 1960 -1994. Though they find a bi-lateral causation between financial development and growth, however, the impact of financial development on growth was more important in their study. Over the long period, they observe that the impact of growth on financial sector development becomes negligible. Fritz (1984) uses the Philippines as a sample economy to conduct causality tests for a time-series of

quarterly date from 1969 till 1981. He finds evidence for the hypothesis that in the initial stage of the development process, causality runs from financial deepening to growth. In the later stages of the process causality is reversed, with the real economy demanding an increase in financial services.

In another development, Gelbard and Pereira (1999) consider six major aspects of financial development[5] in their survey of 38 Sub-Saharan African countries. By computing a composite index that measures the overall level of financial development for each of the six aspects of financial development, they found that Ghana, Kenya, Mauritius, Namibia, South Africa and Zambia have a largely developed financial system in 1997. The study also find out that whilst measure of credit supply has deteriorated in countries classified as largely developed, ownership in the banking sector has evolved significantly from predominantly state-owned to more privately owned system. Their study also found that changes in the indexes of financial liberalization, the institutional environment, and the range of financial products positively affect growth.

From the review of the literatures so far, there is hardly any study that has examined the joint effects of financial deepening and banking sector efficiency/inefficiency (measured by interest rate spread) on economic growth in Sub-Sahara Africa. This study contributes in the existing literature by jointly examining the relative effects of financial deepening and interest rate spread on economic growth in Sub-Sahara Africa. This is one of the few studies that uses a dynamic panel approach to examine the joint effects of financial deepening and interest rate spread on growth using a sample of African countries.

3. METHODOLOGY

3.1. Model Specification

Bencivenga and Smith (1991) noted two main ways by which financial development can affect real output growth. Firstly, financial development can enhance the volume of investment through facilitating the mobilization of resources for the financing of viable investment projects. Secondly, financial development can improve on the volume and structure of savings.

On account of the growing empirical evidences supporting the positive role of financial development on economic growth (Greenwood and Jovanovic, 1990; King and Levine, 1993b; Fry, 1995; Odedokun, 1996; Gelbard and Pereira, 1999; Ndikumana, 2000) and Levine *et al.* (2000) the role of financial factors can be captured into a growth equation. Thus, by controlling for non-financial factors that influence long run growth[6], we generalize the specification of a growth equation that accounts for the effects of financial development as follows:

$$y_{it} = \alpha + \beta F_{it} + \lambda X_{it} + \eta_i + \varepsilon_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..(1)$$

Where y_{it} is the growth rate of per capita GDP in country i at time t , F_{it} represent measures of financial development in country i at time t, X_{it} is a set of control variables , η_i represents the unobserved country-specific effect and ε_{it} is the error term.

Equation (1) above is the growth equation to be estimated in this study using financial and control variables defined as follows:

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[5] These were (i) the market structure and competitiveness of the financial system, (ii) the range of financial products available in the market, (iii) the degree of financial liberalization, (iv) the institutional environment under which the financial system operates , (v) financial openness, and (vi) the degree of sophistication of monetary policy instruments.

[6] The traditionally based neoclassical theory of growth focused only on physical capita and labour inputs as the principal determinants of growth

FD = the overall financial depth of the financial system (measured as the ratio of broad money to GDP, ie M2/GDP)

CREDS = domestics credit supply to the private sector as a ratio of GDP

IRS = interest rate spread (calculated as the difference between the deposit and lending rates

SAV = gross national savings as a share of GDP

FDI = foreign direct investment as a share of GDP

EXPORT = total export as a share of GDP

INF = inflation

The coefficient of the variable representing the overall financial depth (FD) of the financial system (measured as the ratio of broad money to GDP, ie M2/GDP) is expected to be positive. This is because, reducing the overall financial depth by lowering the supply of broad money through increased interest rates would lower private sector investment and hence gross domestic product (GDP) Alternatively, increasing the overall financial depth by raising money supply through a reduction of interest rates would raise private sector investment and hence GDP.

The coefficient of the variable representing the supply of credit to the privates sector (CREDS) is expected to be positive because, an increase in the access of credit to the private sector will raise the level of investment in an economy and thus boost economic growth through increased productivity by private investors. It is thus expected that the higher the supply of credits to the private sector the higher the level of investment and hence the higher the level of gross domestic product (GDP).

The coefficient of the variable representing interest rate spread (IRS) is expected to be negative. This is because, the higher the interest rate spread the lower the efficiency of commercial banks and hence the higher the cost of borrowing money to finance investment. A high interest rate spread implies that the lending rates of commercial banks are far higher than the deposit rates, thus implying that investors wishing to borrow money from the banks will do so at higher costs. This will thus discourage private sector investment and hence hampers economic growth. Alternatively, the lower the interest rate spread the lower the cost of borrowing from commercial banks to finance investment projects to boost economic growth.

The coefficient of gross national savings (SAV) is expected to be positive. This is because, an increase in gross national savings will boost domestic resource mobilization to support private sector investment and hence economic growth.

The coefficient of foreign direct investment (FDI) is expected to be positive or negative. FDI is expected to have a positive effect on economic growth by enhancing the transfer of technology from developed to developing countries, create employment opportunities and raising labor productivity through capacity building of local employees. This would enhance economic growth in the recipient country. On the contrary, FDIs are also known to have adverse effects on resource allocation and thus slow down economic growth of host countries due to trade, price, financial and other distortions.

The coefficient of total export as a share of GDP (EXPORT) is expected to be positive. This is because an increase in a country's export of goods and services would generate foreign exchange that will ease the pressure on its balance of payment and create employment opportunities. Exports generally stimulate economic growth through production and demand linkages, economies of scale due to larger international markets as well as enhancing increased efficiency through the adoption of advanced technologies embodied in foreign produced capital goods.

The coefficient of inflation (INF) is expected to be negative. This is because inflation affect economic growth adversely through its effects on the cost of capital, exchange rate and employment. Firstly, high inflation raises the cost of borrowing for investment purposes through a rise in interest rates. During an inflationary period, interest rates are forced to rise, thereby raising the cost of capital and thus reduces the level of investment. This will therefore affect economic growth negatively. Secondly, inflation will induce a depreciation of the local currency and hence reduces the competitiveness of the country through a fall in its export thereby affecting growth negatively.

Inflation can also induce a general increase in the cost of production as wages and capital goods prices rise. This will induce a general decline in productivity and hence economic growth.

3.2. Estimation Techniques

Equation (4) is the basis for estimating the relationship between growth in GDP and our measures of financial development. As can be noted in equation (4), if the unobserved country-specific effects, η_i, are uncorrelated with

the explanatory variables (i.e if η_i is orthogonal to all the explanatory variables) then we can apply the pooled

OLS estimator to fit our model. However, when there is a strong correlation between the unobserved individual

component, η_i and the explanatory variables of the model, the pooled OLS estimator will be biased and inefficient.

In this situation, the fixed effects model is a suitable candidate for carrying out estimations of the model's parameters. If the standard random effects assumptions hold but the model does not actually contain an unobserved effect, the pooled OLS is efficient and all the associated pooled OLS statistics are asymptotically valid. To test for the absence of unobserved effect, we employ a simple AR (1) test for serial correlation. This test is appropriate

because the idiosyncratic errors are serially uncorrelated under the null $H_0 : \sigma_\eta^2 = 0$, given that the explanatory

variables are exogenous. The detection of serial correlation amongst the idiosyncratic errors thus validates the presence of unobserved effect. In many applications, however, the whole point of using panel data is to allow for the

unobserved effects, η_i, to be arbitrarily correlated with the set of explanatory variables, thus necessitating the

application of a fixed effects estimation procedure. In this study, the choice between the fixed effects and random effects model for the levels estimation will be based on the Hausman specification test. A large value of the Hausman test statistic leads to the rejection of the null hypothesis that the individual-specific effects are uncorrelated with the regressors and to the conclusion that fixed effects are present.

Following the approach by Arellano and Bond (1991); Arellano and Bover (1995) and Blundell and Bond (1998) we develop a dynamic panel setting in establishing the relationship between growth in GDP in country i at time t to some exogenous factors by applying first difference transformation from the following equation:

$$y_{i,t} - y_{i,t-1} = (\alpha - 1)y_{i,t-1} + \beta' X_{i,t} + \eta_i + \varepsilon_{i,t} \quad \text{………………….. (5)}$$

Where $y_{i,t} - y_{i,t-1}$ is the growth rate of real GDP per, $X_{i,t}$ is the set of explanatory variables, including our

measures of financial development, η_i is the unobserved country-specific effect, and $\varepsilon_{i,t}$ is the error term. By

rewriting equation (5) above we have:

$$y_{i,t} = \alpha' y_{i,t-1} + \beta' X_{i,t} + \eta_i + \varepsilon_{i,t} \quad \text{………………. (6)}$$

Now, by taking the first difference of both the endogenous and exogenous variables in equation (6), we have:

$$y_{i,t} - y_{i,t-1} = \alpha' \left(y_{i,t-1} - y_{i't-2} \right) + \beta' \left(X_{i,t} - X_{i,t-1} \right) + \left(\varepsilon_{i,t} - \varepsilon_{i,t-1} \right) \text{………(7)}$$

As can be noted in equation (7) above, the lagged difference in real GDP is correlated with the error term, which by implication of the potential endogeneity of the explanatory variables, provokes the use of instrumental variables. To address this problem, the system difference estimator uses the lagged level of the explanatory variables as instruments under the conditions that the error term is serially uncorrelated and that that the lagged

level of the explanatory variables are weakly exogenous . Given that these conditions hold, we then apply the following moment conditions to calculate the difference estimator:

$$E\left|y_{i,t-s}\left(\varepsilon_{i,t}-\varepsilon_{i,t-1}\right)\right|=0 \quad \text{for } s\geq 2; t=3,...,T \dots\dots (8)$$

$$E\left|X_{i,t-s}\left(\varepsilon_{i,t}-\varepsilon_{i,t-1}\right)\right|=0 \quad \text{for } s\geq 2; t=3,...,T \dots\dots(9)$$

Blundell and Bond (1998) show that when the dependent variable and explanatory variables are persistent over time, lagged levels of these variables can be used as instruments for the regression equation in differences. In the same way, for regressions in levels, the lagged differences of the dependent variable and the explanatory variables can be used as valid instruments. Since persistence in the explanatory variable may adversely affect the small sample and asymptotic property of the difference estimator, it is recommended that the difference estimator should be further combined with an estimator in levels to produce a system estimator. A key benefit arising from the inclusion of a levels equation in a dynamic setting is that, it allows us to use information on cross-country heterogeneity, which is not possible by using the difference estimator alone. In practice, the use of lagged differences of the explanatory variables as instruments in an equation in levels is guaranteed under two conditions. First, the error term should be white noise. Secondly, there should exist no correlation between the difference in the explanatory variables and the error term. This therefore implies that the following stationarity properties must

hold: $E\left|y_{i,t}+{}_{p}\eta_{i}\right|=E\left|y_{i,t}+{}_{g}\eta_{i}\right|$ and $E\left|X_{i,t}+{}_{p}\eta_{i}\right|=E\left|X_{i,t}+{}_{g}\eta_{i}\right|$ for all p and g. The additional moments conditions for the regression in levels are:

$$E\left|\left(y_{i,t}-y_{i,t-s-1}\right)\left(\eta_{i}+\varepsilon_{i,t}\right)\right|=0 \quad \text{for } s=1 \dots\dots(10)$$

$$E\left|\left(X_{i,t}-X_{i,t-s-1}\right)\left(\eta_{i}+\varepsilon_{i,t}\right)\right|=0 \quad \text{for } s=1 \dots\dots(11)$$

Following Blundell and Bond (1998) this study employs two specification tests . The first is a Sargan test of over-identification restriction which tests the validity of the instruments. The second is a test of second order serial correlation of the error term, which tests whether the error term in the differenced equation model follows a first order moving average process.

3.3. Data Sources

The data used in this study was collected from the World Bank's World Development Indicators 2014. The World Bank Development indicators comprises of a wide range of data set on key financial and macroeconomic variables suitable for carrying out the analysis for this study.

4. PRESENTATION AND INTERPRETATION OF RESULTS.

In this section, the study first presents and analyses the summary statistics of the data set obtained from a panel of 22 Sub-Saharan African countries[7] over the period 2000 - 2013. The main reason for selecting these countries is that they are the only set of countries with complete data on the list of variables required to estimate the specified model. This is because many other African countries don't have complete data on interest rate spread (see World Bank Development Indicators (2014)). The summary statistics for our sample of Sub-Sahara African countries is presented in Table 2.

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[7] The countries in the sample are Benin, Cape Verde, Cameroon, Chad, Congo Republic, The Gambia, Kenya, Liberia, Madagascar, Malawi, Mauritius , Mozambique, Namibia, Nigeria, Rwanda, Seychelles. Sierra Leone, South Africa, Swaziland, Tanzania, Uganda and Zambia.

Table-2. Summary Statistics for the overall sample of SSA Countries

Variables	Growth	IRS	SAV	FD	CREDS	FDI	INF	EXPORT
Mean	6.04	10.72	16.42	35.95	25.33	6.39	7.76	35.38
Minimum	0.12	0.5	-3.0	1.6	1.6	-3.3	-1.2	6.0
Maximum	33.7	49.5	86.0	111.2	167.5	91.0	37.0	101.0
Std. Dev	4.78	6.27	10.29	24.51	31.84	9.91	5.62	21.41
Correlation Matrix								
Growth	1. 000							
IRS	-0.5133	1. 000						
SAV	0.6228	-0.2717	1. 000					
FD	0.5164	-0.3631	0.2614	1. 000				
CREDS	0.1998	-0.3978	0.1625	0.4243	1.000			
FDI	0.2664	0.1409	0.2213	-0.0201	-0.1295	1. 000		
INF	-0.312	0.1743	-0.1443	-0.1917	-0.1545	0.1336	1. 000	
EXPORT	0.6879	-0.1744	0.0638	0.3132	0.1013	0.2237	-0. 0232	1. 000

Source: Author's calculation using data compiled from the World Development Indicators 2014

From the summary statistics presented in Table 2, growth in GDP for the sample of SSA countries over the period under review averaged around 6.04% with a standard deviation of 4.79.This relatively high standard deviation implies significant variation in growth performance across countries over the period under consideration. This can be noted in the large difference between the maximum and minimum growth rates recorded by this group of countries over the period under review. It could also be noted from Table 2 that the average interest rate spread (IRS) across countries in the sample stood at around 10.72 with a standard deviation of 6.27. This is also indicative of large variations in interest rate spreads across SSA countries further demonstrated by the large difference between the maximum and minimum spreads recorded over the period under review. The remaining variables also demonstrate similar patterns in terms of variations across countries as presented in Table 2. The results from the correlation matrix as presented in the lower part of Table 2 indicate no strong correlation amongst the explanatory variables, implying the absence of potential problems of multicolinearity in the estimation of the specified equation.

Table-3. Panel Estimation Results: Growth as the Dependent Variable

Variables	Fixed Effect Model	Random Effect Model	Dynamic Model
Constant	2.32917 (2.90)**	3.0621(6.19)***	---------
Growth$_{-1}$	-----------	-----------	0.13743(2.23)**
FD	0.4887(2.01)**	0.3931(1.91)*	0.4177(2.13)**
CREDS	0.21484(1.24)	0.31046(1.05)	0.31863(0.98)
IRS	-0.3218(-2.42)**	-0.35474(-2.34)**	-0.36245(-2.29)**
SAV	0.20748(1.91)*	0.20304(2.12)**	0.21283(2.32)**
FDI	0.05536(0.74)	0.09631(1.05)	0.04277(1.09)
EXPORT	0.2197(2.49)**	0.29609(2.56)**	0.39171(3.01)***
INF	-0.08124(-1.02)	-0.091958(-1.07)	-0.037214(-0.91)
No. of Obs.	308	308	308
R^2	0.6312	0.6133	----------
F-Statistics	F(7,272)= 1.61 (0.1364)	Wald Chi2(11) =46.75 (0.000)	----------
Hausman Test	Chi2(7) = 34.81 (0.000)		----------
Test for Second order Serial correlation	-----------	-----------	H$_0$:No autocorrelation Z = -3.61 (0.0003)
Sargan Test	-----------	-----------	Chi 2(22)=39.8(0.867)

Note: where the variables are expressed in log form and t –values are reported in parenthesis. The variables entering the Dynamic model are in first difference and their coefficients are interpreted as growth elasticities . Both the fixed effects and random effects models are in levels. The dynamic model is based on the Arellano-Bond Estimation procedure.

The results from the panel regressions are presented in Table 3. As can be observed from Table 3, the estimates from the Hausman test indicate that the country-specific unobserved effects are not correlated with the

explanatory variables of the model, implying that the fixed effects estimates provide better results than those of the random effects model. On that note, the study only takes into consideration the fixed effects model when discussing the results from the levels estimates. Additionally, the result from the Sagan test as presented in the lower part of Table 3 shows that the set of instruments used for correcting potential problems of endogeneity from the data used in estimating the dynamic panel model are valid. Furthermore, the results from the test for second order serial correlation show no serious problem of serial correlation of the residuals from the dynamic panel regression. Based on the results of the above tests, the discussion of the regression results presented in Table 3 only focuses on the fixed effects and the dynamic panel estimates. Furthermore, it could be noted from Table 3 that only four out of the seven explanatory variables are statistically significant. Consequently, the discussion of findings will only focus on these four statistically significant variables.

The coefficient of the financial deepening (FD) variable is positive and statistically significant in both the fixed effects and dynamic panel regressions. In particular, the value of this coefficient is 0.4177 when we consider the dynamic panel regression. This therefore implies that, enhancing financial deepening by 10.0 percent will induce economic growth by approximately 4.2 percentage point on average in countries studied. This finding is consistent with those of Fritz (1984) the World Bank (1994); Demetriades and Hussein (1996); Christopoulos and Tsionas (2004) and Ndebbio (2004) who found a positive relationship between financial deepening and economic growth.

The coefficient of the interest rate spread (IRS) variable is negative and statistically significant in all the regressions. For the dynamic panel regression, the coefficient of the interest rate spread variable is -0.36245 and significant at the 5 percent level. This implies that an increase in the spread between the lending and deposit rates of commercial banks will have an adverse effect of economic growth. In terms of relative impact, the result from the dynamic model therefore indicates that raising interest rate spread by 10.0 percent reduces economic growth on average by a margin of approximately 3.6 percentage points in countries studied. As interest rate spread is normally used as a measure for banking efficiency, this finding thus implies that, the lesser the efficiency of the banking system (indicated by high interested rate spread), the higher its adverse effect on economic growth. This finding is therefore consistent with those of Quaden (2004) and Valverde (2004) who found that more efficient banking systems promotes economic growth.

In terms of the control variables, the relationship between gross national savings (SAV) and economic growth (Growth) is positive and statistically significant in all the regressions. In particular, the coefficient of the gross national savings (SAV) variable is 0.21283 when we consider the dynamic panel regression. In terms of relative effects, this implies that an increase in gross national savings by 10.0 percent will induce economic growth on average by a margin of approximately 2.1 percentage point in the sample of countries studied. This result is not surprising because, in a well-developed financial system, an increase in gross national savings will boost resource mobilization by financial intermediaries to support private sector investment and hence economic growth.

Finally, the coefficient of the total export (EXPORT) variable is positive and statistically significant in all the regressions. This therefore indicates that raising a country's export promotes economic growth. Specifically, the coefficient of the export variable is 0.3917 when we consider the dynamic panel regression. This coefficient implies that raising total exports by 10.0 percent on average promotes economic growth by a margin of approximately 3.9 percentage points in the sample of countries studied. This result is not surprising because, an increase in a country's export earnings following a rise in its exports will promote the stability of its exchange rate, reduces external borrowing and generally promotes macroeconomic stability. This will provide a conducive atmosphere for productive investment which in turns promotes economic growth as found in this study.

5. CONCLUSION

This study endeavours to examine the relationship between financial deepening, interest rate spread and economic growth using data from Sub-Sahara African (SSA) countries over the period 2000 − 2013. Owing to the

difficulty of obtaining complete data on interest rate spread and other relevant variables required for estimating the specified model, only a sample of 22 SSA countries with complete data on these variables were considered. Given the longitudinal nature of the data, a panel estimation technique guided by the Hausman specification test was employed. The result from the Hausman test indicates that the unobserved individual country-specific effects are uncorrelated with the explanatory variables, implying a preference for the fixed effects over the random effects estimates. Additionally, the estimates from the Sargan test for over-identification restrictions show that the set of instruments used in correcting for potential problems of endogeneity in the dynamic panel regression are all valid. Likewise, the test for second order serial correlation show the absence of serial correlation from the residuals.

A key finding emerging from this study is that, whilst financial deepening, gross national savings and exports induce a significantly positive impact on economic growth, interest rate spread induces an adverse impact on growth in the sample of countries studied. In terms of relative effects, the results from this study show that enhancing financial deepening by 10.0 percent induces economic growth on average by a margin of 4.2 percentage points in countries studied. The results also show that raising gross national savings and exports by 10.0 percent will induce economic growth on average by margins of 2.1 and 3.9 percentages points respectively. With regards to interest rate spread, the study shows that widening the spread between the lending and deposit rates of commercial banks by 10.0 percent will reduce growth on average by a margin of 3.6 percentage points in countries studied. The findings from this study have pertinent policy implications given the urgent need for the promotion of policies that will boost economic growth across SSA countries in order to address poverty related challenges. In order to achieve this, there is a strong need for policymaker in SSA countries to promote policies that will encourage financial sector development through financial deepening as well as enhancing the efficiency of financial markets, particularly the banking sector. More specifically, there is a strong need for the relevant financial authorities supervising the activities of commercial banks to ensure low spreads between the lending and deposit rates of commercial banks with a view to promoting the efficiency of banks in effectively playing their role as financial intermediaries.

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