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Financial Depth and Stock Returns in Sub-Saharan Africa: A Three-Country Comparative Study

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Abstract: *This study examined the relationship between financial depth indicators and the stock returns in three selected Sub-Saharan African (SSA) countries from 1990-2019 comparatively. Specifically, the study investigated the effect of financial depth variables (ratios of market capitalization to the Gross Domestic Product (GDP); monetary/liquidity in circulation (M3) to the GDP; lending/savings rate spread, financial sector contribution to GDP; credit to private sector to GDP; Central Bank assets to GDP and commercial banks liabilities to GDP) on the stock market returns of the selected Anglophone SSA countries (Kenya, Nigeria and South Africa). The study employed descriptive statistics, correlations, Johansen co-integration, vector autoregressive (VAR) and Granger causality to analyze the data of selected countries and compare the results to identify the different natures of effects of financial depth on stock returns. Results revealed, that, to a large extent, financial depth variables promote stock market growth in Kenya but there was no evidence that the former significantly affected the latter in Nigeria. However, in South Africa, financial depth variables have significant negative effect on stock returns, at least, in the short-run. These results imply that, comparatively, there are marked differences among the three countries with respect to the effect of financial depth on stock returns. Nevertheless, there is evidence of causal relationship between the variables in the three countries. The study concluded that financial depth has significant effects on stock returns in Kenya and South Africa but not in Nigeria. It is therefore recommended that monetary authorities should develop strategies that will minimize monetary policy lags which delay the transmission of policy effects on the target in the short run. Also, governments and the Central Banks of the countries under study, especially Nigeria and South Africa should re-appraise their financial depth efforts vis-à-vis stock market development.*

Keywords: *Financial Depth; Granger Causality; Stock Returns; Sub-Saharan Africa; VAR*

Introduction

The financial market is a highly complex and integrated system involved in fund mobilization and allocation in all economies of the world. Questions have been raised, over the years and especially after the global financial crises of 2008, on the role of financial institutions in maintaining financial depth necessary for the growth of both the real and the monetary sectors of economies. As reported by the International Monetary Fund, IMF (2007), in the 1980s and 1990s, many Sub-Saharan African countries undertook major reforms aimed at liberalization of financial systems. Such reforms include partial or total deregulation of interest rates, removal of credit ceilings, banks restructuring, indirect monetary controls among others. However, the Fund notes that these reforms achieved only little results as the financial markets of many Sub-Saharan African countries remained relatively shallow and undeveloped.

The stock market as a subset of the financial system plays an integral role in the provision of vehicle for long term capital mobilization for economic growth. The market, through its liquidity creation process, affects economic activities. However, many of these activities require long-term finance which funds owners may not be willing to provide. Hence, the stock market provides a platform for savers to acquire long-term securities that they can sell to raise funds at very short notices. Goldsmith (1969) notes that the stock market also helps in price discovery/determination, transfer of risks, efficient fund re-channeling and transaction cost reduction. In essence, an effective stock market promotes economic efficiency particularly in private investment, which in turn affect stock return positively. This is possible through a financial system with effective intermediation process that fosters financial depth. King and Levine (1993) submit that financial depth refers to a multi-faceted and complex system in which financial institutions and markets facilitates good payment systems; pool savings from surplus units; allocate surplus funds to productive

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investments and reduce financial and liquidity risks.

Improved financial depth is regarded as a major vehicle through which the pace of stock market can be increased. Goldsmith (1969) notes that an effective and efficient financial system as well as goal oriented monetary policies produce strong and highly liquid capital markets. These liquid capital markets, according to Levine (1986) promote better financial resource allocation which brings about economic growth. Although enhanced financial depth does not automatically remove the problem associated with restrains caused by asymmetry information in the stock market according to Stiglitz (2000). Bumann, Hermes and Lensink, (2013) believe that it strengthens the price mechanisms and endear competition which can spur rise in savings deposit interest. This rise in interest rate on savings implies that the institutions can equally make more funds available for investors in stocks.

Ample literature exists on the link between financial depth variables and stock returns in many countries in Africa. However, to the best of this researcher's knowledge, published empirical works on the relationship between financial depth and stock returns that have a combination of Sub-Saharan African countries are scanty.

This research is motivated by the need to examine how financial deepening efforts of Central Banks have aided stock market growth and development in different emerging economies but the same sub-continent like the Sub-Sahara Africa. The study should ordinarily have been extended to capture other SSA countries and wider number of years but for the paucity of data, especially on stock returns. This study therefore examines the effect of financial depth indicators and stock returns for three Anglophone Sub-Saharan African countries from 1990 – 2019 using vector autoregressive (VAR) and Granger causality techniques. The three countries were selected due to the leading position of their economies in their regions. We selected Kenya (East Africa), Nigeria (West Africa) and South Africa (South Africa) because these are the emerging economies from their respective regions in Sub-Saharan Africa. The overall objective of this research is to examine, comparatively, the relationship between financial depth and stock returns of three Sub-Saharan African countries: Kenya, Nigeria and South Africa between 1990 and 2019. Times Series data of financial depth variables (ratios of market capitalization, liquid liabilities (M3), financial sector contribution, credit to private sector, Central Banks' assets and commercial banks' assets) to the GDP as well as lending – savings rate interest spread and stock returns for individual countries were obtained and analyzed using descriptive statistics, correlations, unit root test, Johansen co-integration test, VAR and Granger causality.

In specific terms, the objectives of the study are to: examine the effect of financial depth on the stock returns of selected Sub-Saharan African countries; compare the effects of financial depth on the stock return in selected Sub-Saharan African countries; and ascertain the causal relationship between financial depth and stock return of selected Sub-Saharan African countries.

Literature Review

Financial Depth

According to Goldsmith (1969), deepening finance is a main strategy in quickening the pace of both financial market growth and development and general economic growth. This is because the financial market performs the fund mobilization and channeling. Goldsmith (1969) believed that well-designed financial deepening strategies promote a well-lubricated capital market which in turn spur stock prices and returns. The Word Bank (2020) defines financial depth is defined as the share of the economy attributable to the financing efforts of financial institutions, markets, and policies. It represents the financial sector relative to the entire economy captured by the size of financial institutions, quantum and quality of financial instruments and the impact of financial markets. A traditional measure of financial depth is the ratio of credit to private sector to the gross domestic product for a particular year because it is strongly linked to

economic development and reduction in poverty level. However, the World Bank (2012) had earlier reported that this measure should be taken with caution as many economies with high ratios experience economic crises over the years. This finding is similar to those of King and Levine (1993) and Demirgüç-Kunt and Levine (2008).

A more robust measure according to the World Bank is the ratio of assets of the banking system to the GDP. It is more comprehensive because it is a measure of the size which also incorporates other credits.

Although data availability has constrained researchers to tend to rely solely on the banking system in ascertaining the level of financial depth, its measure should also include activities of other financial institutions such as insurance companies, mutual funds, and discount houses among others. Thus, researchers have broadened the indicators of financial depth to include ratio of liquid liabilities (money supply) and total assets of the financial system to GDP (Global Financial Development Index, 2019). Furthermore, Levine and Zervos (1998) had earlier included ratio of stock market capitalization to GDP as a measure of financial depth.

Calvin and Schumacher (2007) observed that Sub-Saharan African financial markets ranked among the undeveloped globally due to misguided policies, political instability and focus on the real sector of the economy. Prior to the global financial crises of 2008, Dahou, Omar and Pfister (2009) posited that weak regulatory system, lack of access to bank services and narrow, illiquid markets characterized Sub-Saharan African financial system. The authors suggested measures such as reforms in the regulatory framework, banking system reform and concrete steps towards expanding the scope and instruments in the capital markets. Part of the steps taken by Sub-Saharan African leaders to tackle the bad economic and financial conditions were the relaxation of official controls on financial institutions, making the Central Banks have higher level of autonomy, liberalization of interest rates, recapitalization of the banks among other measures (Mehran, Ugolini, Briffaux, Iden, Lybek, Swaray & Hayward, 1998).

Stock Returns in Sub-Saharan Africa

As in other continents, stock exchanges have witnessed considerable development in Africa since the early 1990s. Yartey and Adjasi (2007) reported that from five stock exchanges in the Sub-Saharan Africa and three in North Africa before 1989, other exchanges have joined the trail. The World Bank (2020) reported that as at May 2020, there are about 29 stock exchanges in Africa, 25 of which are in the Sub-Saharan region. Tafirenyika (2012) as well as World Bank (2014) stated that despite the economic meltdown of 2008, some Sub-Saharan African economies still grew by 4.7%, though natural resources form major part of this growth, that the financial system was positively impacted. For example, the Nigeria Stock Exchange (2019) reported that the market has considerable increases in the number of listed securities, volume of deals and the all share index consistently over the last years. This is also similar to what obtains in many other stock exchanges in the Sub-Saharan Africa.

However, despite the increases in most of stock market indicators in the Sub-Saharan African countries, the returns on stock have not maintained consistent rise.

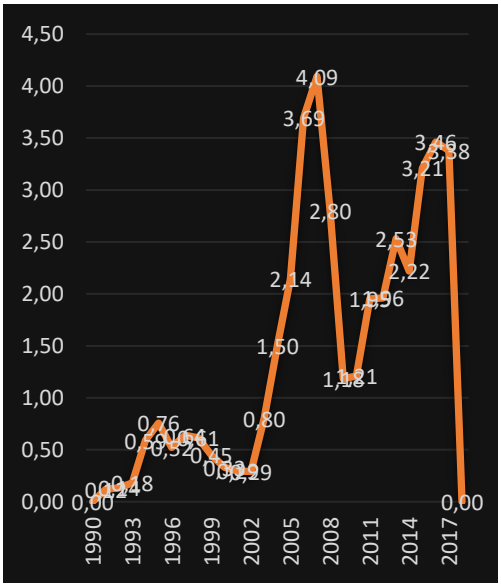

Figure 1. Stock Return in Kenya (1990-2018)
Source: Kenya Stock Exchange (2021)

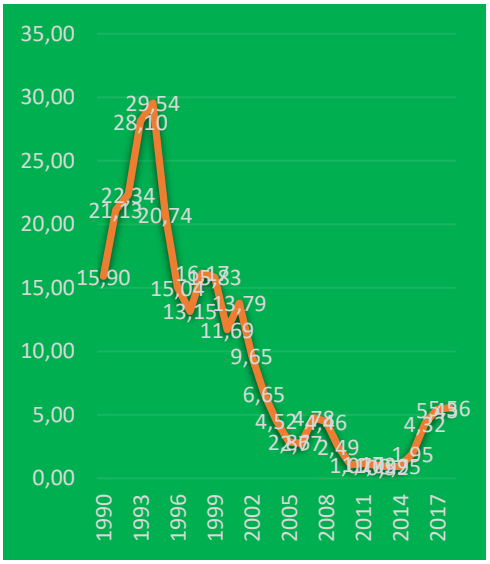

Figure 2. Stock Return in Nigeria (1990-2018)
Source: Nigeria Stock Exchange (2021)

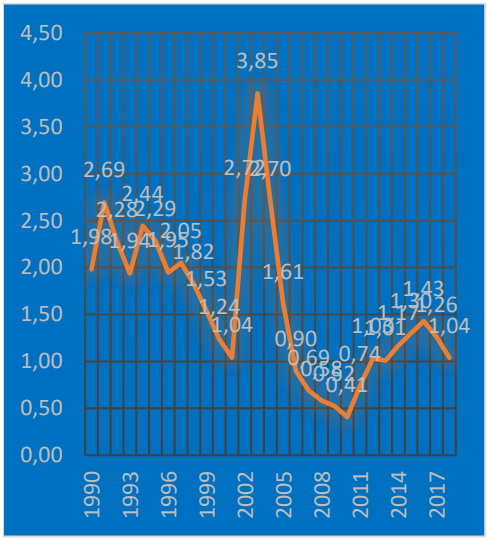

Figure 3. Stock Return in South Africa (1990-2018)
Source: South Africa Exchange (2021)

A sample of three countries from three regions from the sub-continent (which also form the focus of the study) confirms this trend. As shown in Figures 1-3, the stock returns in Kenya, Nigeria and South Africa peaked around 2006, 1994 and 2004 respectively. While it maintains a zig-zag nature in Kenya after its peak, it consistently fell in Nigeria until 2016/2018 when it witnessed mild increases. In South Africa, it consistently fell until 2010 when it slowly picked up.

Theoretical and Empirical Literature

The theories of financial intermediation were developed starting from the 1960's in the 20th century, the starting point being the work of Gurley and Shaw (1960). The modern theory of financial intermediation analyzes, mainly, the functions of financial intermediation, the way in which the financial intermediation influences the economy on the whole and the effects of government policies on the financial intermediaries. Notable theories in this regard include the information asymmetry that inform imperfect capital market (Leland & Pyle, 1977 and Diamond & Dybvig, 1983); the transaction cost theory (Benston & Smith Jr., 1976 and Fama, 1980); monetary regulation approach (Guttentag, & Lindsay, 1968 and Merton, 1995); demand following and supply leading hypotheses (Patrick, 1966; Goldsmith, 1969; Shaw, 1973 and McKinnon, 1973); and the financial repression hypothesis (Cameron,1972 ; McKinnon, 1973 and Shaw, 1973).

Of particular relevance to this research is the financial repression hypothesis (FRH). The FRH advocates a financial system that is free from stringent regulatory controls. Proponents of this hypothesis argue that the financial system can only contribute meaningfully to economic growth if monetary authorities will relax stringent controls and allow a relatively free and competitive operating environment. Among other propositions, the FRH advocates a deregulated interest rate system; relaxation of sectoral credit ceilings; more accommodating prudential guidelines and removal of other measures that tend to hinder competition among financial institutions.

The Sub-Saharan Africa is made up of 49 countries in Africa, occupying a major part of the continent and forming about 85% of its population (ACCA, 2014). The three countries selected are from three regions namely, Nigeria (West Africa); Kenya (East Africa) and South Africa (South Africa). This choice is determined by the availability of requisite data for the period covered by the study.

Empirical literature on the financial depth – stock return nexus in the Sub-Saharan Africa is scanty. Majority of studies conducted

dealt with the effect of financial depth on economic growth or development in the region. In Nigeria, Nnanna (2014) examines the effect of financial depth on stock returns and finds that a measure of financial depth (ratio of market capitalization to GDP) has positive and significant effect on stock returns while ratio of traded stock value to GDP has no significant effect on it. Alenoghena, Enakali-Osoba and Mesagan (2014) studied the impact of financial depth on the performance of the Nigerian capital market and the findings revealed that there is positive association between financial depth and the stock market returns in Nigeria. Micahel, Effah, Joel and Nkwantabisa (2021) used the dynamic ARDL and Granger causality test to ascertain the long- and short-run connection among financial deepening, financial market and economic growth of 8 selected African countries between 1996-2019. The authors found that financial deepening strategies affect stock market development in five of the eight countries selected while it did not affect it in three countries.

In another mutli-country study carried out by Rahman and Mustafa (2017), which includes South Africa, to compare the effect of financial depth on stock market returns between developed and developing economies, the authors found out that the effect of financial depth on stock return is weaker in developing economies than in the developed ones. For example, the study revealed that the error correction term that measures the speed of adjustment to equilibrium was very low and insignificant in the developing economies whereas it was high and significant in the developed economies. The need for Sub-Saharan African countries to strengthen their weak financial intermediation process had, several years before, been advocated by Ndebbio (2004) while studying the relationship between financial depth and economic development in 34 Sub-Saharan African countries.

To the much we know, empirical researches comparatively linking financial depth to stock market returns on regional basis in Sub-Saharan Africa are relatively scant, hence the need for this study. Therefore, this study examined the nexus between these two variables from three-country-three regions comparative perspectives between 1990 and 2019 using vector autoregressive (VAR) and Granger causality methodologies. The paper is divided into five parts, namely, (1) introduction, (2) literature review, (3) research methods, (4) results and discussion and (5) summary, conclusion and recommendations.

Research Methods

Data and Research Model

This research is an attempt to ascertain the effect of financial depth indicators on stock returns of three selected Sub-African countries. Since stock return is one of the indicators of stock market development, this study is premised on the FRH as proposed by Mckinnon (1973) and Shaw (1973). The study used a panel data of three Sub-Saharan African countries from 1990 – 2019 to examine the short and long-run relationship between financial depth indicators and stock market returns. The three Sub-Saharan African countries selected include Kenya (East/Central Africa, South Africa (South Africa) and Nigeria (West Africa). The choice of these countries is based on the availability of data for the variables used in the study. According to The World Bank (2017), annual data for stock returns and stock market capitalization for most African countries were not available until around 1990. This study used panel data analytical techniques to examine the effect of financial depth ratios, namely, market capitalization to the Gross Domestic Product (GDP); monetary/liquidity in circulation (M3) to the GDP; financial sector contribution to GDP; credit to private sector to GDP; Central Bank assets to GDP and commercial banks liabilities to GDP on the stock market returns of the selected countries. The data used were sourced from The World Bank Global Financial Development Index for the respective years under study.

The relationship between financial depth and stock market returns can be linearly expressed as:

STRS = f(FDI) .....(3.1)

and expressed in a model form equation (3.1) becomes

STRS = θ0 + θ 1FDIit + εit ..... (3.2)

Where STRS = Stock returns for countries selected; FDI = Financial depth indicators; FDI = MKCGDP, M3GDP; LDSRS, FSCGDP, CPSCDP, CBNGDP; and CBLGDP.

Substituting the FDI into equation (3.2), the model for this study is expressed as:

STRS = θ0 + θ1MKCGDPit + θ2 M3GDP + θ3LSRSit + θ4FSCGDPit + θ5CPSCDPit + θ6CBNGDPit + θ7CBLGDPit + εit ..... (3.3)

Where STRS = Stock returns for each of the selected countries (annual); MCAP/GDP = Ratio of stock market capitalization to gross domestic product for each of the selected countries; M3GDP = Ratio of liquid liabilities to gross domestic product for each of the selected countries; LDSRS = Lending/Savings rate spread; FSCGDP = Ratio of financial sector contribution to gross domestic product for each of the selected countries; CPSCDP = Ratio of credit to private sector to gross domestic product for each of the selected countries; CBNGDP = Ratio of Central Bank's assets to gross domestic product for each the selected countries; CBAGDP = Ratio of commercial banks' liabilities to gross domestic product for each the selected countries; θ i,.... θ 6 = Regression coefficients; εit = Error term.

Pre-Estimation Tests

For the purpose of examining the effect of financial depth on stock returns, this study first subjected the variables to three basic pre-estimation tests: descriptive statistics, correlation and stationarity tests. Test of stationarity helps in specifying the most appropriate estimation techniques so as to overcome the possibility of spurious regression and bias results. This study used the Augmented Dickey Fuller (ADF) unit root test technique to ascertain the order of stationarity of all the variables analyzed. Furthermore, the variables are subjected to co-integration test in order to first determine whether there exists relationship between the dependent and independent variables. This study used the Johansen-Fisher combined (Trace and Max-Eigen) co-integration test for this purpose.

Estimation Techniques

Having determined the correlations, order of stationarity and the existence of co-integrating equations using correlation matrix, ADF unit root and Johansen co-integration tests respectively, this study used the Vector Autoregressive (VAR) to establish the relationship between stock returns and financial depth indicators. Furthermore, the study used the Granger causality test to determine if there exists causality between the dependent and each of the independent variables.

From equation (3.2), the relationship between STRS and FDI is:

$$\Delta(\text{STRS})t = \theta 0 + \theta 1(\text{STRS})t-1\ \theta 2(\text{FDI})t-1 + \sum_{t=1}^{p}\theta 3\Delta(\text{STRS})t-1 + \sum_{t=1}^{p}\theta 4\Delta(\text{FDI})t-1 + \sum_{t=1}^{p}\theta 4\Delta(\text{STRS})t-1 + \sum_{t=1}^{p}\theta 5\Delta(\text{FDI})t-1 + \sum_{t=1}^{p}\theta 6\Delta(\text{FDI})t-1 + \sum_{t=1}^{p}\theta 7\Delta(\text{FDI})t-1 + \varepsilon it \ldots \ldots \ldots (3.4)$$

Where Δ = difference operator; θ 1 ... θ 2 = long-run effect coefficients; θ 3 ... θ 7 = short-run effects coefficients; p = lag length.

Finally, the variables are subjected to a panel causality test to determine the presence or otherwise of causal relationship between stock returns and financial depth indicators. The Granger causality test is used for this purpose in the study. The Granger causality test determines if previous changes in variable that is stationary (Pt) can predict present changes in a second stationary variable (Qt) more than what previous changes in P itself can predict. If this is so, then P is said to Granger cause Q and vice-versa. A standard causality test model between two variables P and Q is expressed as:

$$Q_t = \sum_{i=1}^{k} a_i P_{t-i} + \sum_{j=1}^{k} b_j Q_{t-j} + u_{1,t} \ldots\ldots\ldots (3.5)$$

$$P_t = \sum_{i=1}^{k} c_i Q_{t-i} + \sum_{j=1}^{k} d_j P_{t-j} + u_{2,t} \ldots\ldots\ldots (3.6)$$

where P and Q are panel data variables.

A-Priori Expectation

In theory, financial depth variables are expected to have positive and significant effect on stock returns. This relationship is such that:

$\theta 1..., \theta 7 > 0$

Results and Discussions

Analysis of Data

This section contains the analysis of data collected for the three selected countries. The descriptive statistics, correlations, unit root tests, co-integration test, vector autoregressive (VAR) and granger causality are carried out in the section. For brevity purpose, only the results that are directly relevant to our analyses are revealed here.

Descriptive Statistics

For Kenya, the coefficients of skewness for STR, MKCGDP, M3GDP, LDSRS, FSLGDP, CPSCDP, CBNGDP and CBAGDP shows that all these variables are skewed positively to the right and are not too far from the mean with coefficients 0.69889, 0.087009, 0.306645, 0.533410, 0.213029, 0.207280, 1.290784 and 0.225640 respectively. Based on the Kurtosis, while STR, MKCGDP, LDSRS, FSLGDP, CPSCDP and CBAGDP are platykurtic with coefficients 2.223967, 2.042514, 2.058376, 2.691416, 2.364832 and 2.227311 respectively, M3GDP and CBNGDP are leptokurtic with coefficient 3.290753 and 3.798133 respectively. The Jarque-Bera statistics reveal that except CBNGDP with probability value 0.016455, all other variables, namely, STR, MKCGDP, M3GDP, LDSRS, FSLGDP, CPSCDP and CBAGDP are normally distributed with probabilities less than 0.05 (0.237475, 0.587005, 0.771728, 0.320162, 0.855840, 0.723536 and 0.637377 respectively).

For Nigeria, the descriptive statistics revealed that the coefficients of skewness for STR, MKCGDP, M3GDP, LDSRS, FSLGDP, CPSCDP, CBNGDP and CBAGDP shows that all these variables are skewed positively to the right and are not too far from the mean with coefficients 2.577447, 1.087524, 2.028944, 0.083113, 1.813081, 2.798775, 0.822927 and 2.095906 respectively. The kurtosis coefficients revealed that all the variables examined except CBNGDP are leptokurtic with STR, MKCGDP, M3GDP, LDSRS, FSLGDP, CPSCDP and CBAGDP having kurtosis of 8.99348, 3,121455, 8.296225, 3.376849, 7.961910, 11.16325 and 8.144235 respectively. CBNGDP is platykurtic with kurtosis 2.491465. STR, M3GDP, FSLGDP, CPSCDP and CBAGDP are not normally distributed with Jarque-Bera probability of 0.00000 for each of these

Table 1. Descriptive Statistics

				KENYA				
	STR	MKCGDP	M3GDP	LDSRS	FSLGDP	CPSCDP	CBNGDP	CBAGDP
Skewness	0.698869	0.087009	0.306645	0.533410	0.213029	0.207280	1.290784	0.225640
Kurtosis	2.223967	2.042514	3.290753	2.058376	2.691416	2.364832	3.798133	2.227311
Jarque-Bera	2.875389	1.065444	0.518245	2.277855	0.311343	0.647210	8.214192	0.900789
Probability	0.237475	0.587005	0.771728	0.320162	0.855840	0.723536	0.016455	0.637377
				NIGERIA				
	STR	MKCGDP	M3GDP	LDSRS	FSLGDP	CPSCDP	CBNGDP	CBAGDP
Skewness	2.577447	1.087524	2.028944	0.083113	1.813081	2.798775	0.822927	2.095906
Kurtosis	8.993498	3.121455	8.296225	3.376849	7.961910	11.16325	2.491465	8.144235
Jarque-Bera	78.11869	5.931983	55.64557	0.212058	47.21200	122.4641	3.709307	55.04304
Probability	0.000000	0.051509	0.000000	0.899399	0.000000	0.000000	0.156507	0.000000
				SOUTH AFRICA				
	STR	MKCGDP	M3GDP	LDSRS	FSLGDP	CPSCDP	CBNGDP	CBAGDP
Skewness	0.132245	0.175996	0.466813	-0.056459	0.011868	-0.085334	0.691494	-0.241196
Kurtosis	3.046469	1.569670	1.890694	2.142648	1.809644	2.589016	3.065615	2.100303
Jarque-Bera	0.084133	2.531365	2.452587	0.872436	1.653762	0.231041	2.236458	1.215850
Probability	0.958806	0.282047	0.293378	0.646477	0.437411	0.890902	0.326858	0.544479

Source: Author's Computation (2021)

variables. MKCGDP, LDSRS and CBAGDP are however normally distributed with JB probabilities 0.051509, 0.899399 and 0.156507 respectively.

In South Africa, LDSRS, CPSCDP and CBAGDP skewed to the left (coefficient = -0.241196, -0.056549 and 0.085334 respectively), STR, MKCGDP, M3GDP, FSLGDP and CBNGDP are skewed to the right with coefficients 0.132245, 0.175996, 0.466813, 0.11868 and 0.691494 respectively. The kurtosis revealed that STR, CPSCDP and CBNGDP are normally distributed with approximately 3 while MKCGDP, M3GDP, LDSRS, FSLGDP and CBAGDP are all platykurtic with kurtosis of 1.569670, 1.890694, 2.142648, 1.809644 and 2.100303 respectively. All the variables are normally distributed as revealed by the probabilities of JB statistics which are greater than 0.05 level of significance.

Correlations

From Table 2, it was revealed that in Kenya, the dependent and explanatory variables are moderately correlated which suggest that..... In Nigeria, the variables are also moderately correlated ranging from about 35% to 81% correlation coefficients, and the result implies that..... However, in South Africa, stock return is considerably low for LDSRS and FSLGDP, and it indicate that..... STR correlation with MKCGDP, M3GDP, CPSGDP, CBNGDP and CBLGDP is moderately low as revealed which suggest that.....

Test of Stationarity

This study used the Augmented Dickey-Fuller unit root test to ascertain the order of stationarity of each of the variables. The benchmark for taking decision on the stationarity or otherwise of a variable in this study is to compare the probability (p-value) of ADF statistics with the 5% significance level.

Table 2. Correlation Matrix (Kenya, Nigeria and South Africa)

				KENYA				
	STR	MKCGDP	M3GDP	LDSRS	FSLGDP	CPSCDP	CBNGDP	CBAGDP
STR	1.000000							
MKCGDP	0.640822	1.000000						
M3GDP	0.511327	0.630073	1.000000					
LDSRS	-0.614795	-0.262077	-0.335626	1.000000				
FSLGDP	0.572250	0.611202	0.985073	-0.399832	1.000000			
CPSCDP	0.505027	0.359888	0.859517	-0.460104	0.913550	1.000000		
CBNGDP	-0.612574	-0.191268	-0.584036	0.593836	-0.670044	-0.796662	1.000000	
CBAGDP	0.521839	0.439310	0.899099	-0.479218	0.943278	0.985487	-0.779227	1.000000
				NIGERIA				
	STR	MKCGDP	M3GDP	LDSRS	FSLGDP	CPSCDP	CBNGDP	CBAGDP
STR	1.000000							
MKCGDP	0.635192	1.000000						
M3GDP	0.550688	0.017807	1.000000					
LDSRS	-0.450510	-0.115551	-0.370534	1.000000				
FSLGDP	0.667989	0.051160	0.905166	-0.309315	1.000000			
CPSCDP	0.803021	0.328991	0.849476	-0.336293	0.923092	1.000000		
CBNGDP	-0.357117	-0.027793	0.031831	-0.093765	-0.374961	-0.327953	1.000000	
CBAGDP	0.812786	0.269058	0.833414	-0.286605	0.951226	0.972563	-0.441943	1.000000
				SOUTH AFRICA				
	STR	MKCGDP	M3GDP	LDSRS	FSLGDP	CPSCDP	CBNGDP	CBAGDP
STR	1.000000							
MKCGDP	0.398588	1.000000						
M3GDP	-0.370585	-0.691930	1.000000					
LDSRS	0.019860	-0.475430	0.386080	1.000000				
FSLGDP	0.087564	0.794930	-0.525013	-0.508601	1.000000			
CPSCDP	0.164365	0.651091	-0.347650	-0.130514	0.858449	1.000000		
CBNGDP	-0.297781	-0.683915	0.219960	0.453569	-0.726539	-0.738329	1.000000	
CBAGDP	0.157062	0.753133	-0.481945	-0.269091	0.936002	0.971432	-0.757955	1.000000

Source: Author's Computation (2021)

Once the p-value is significant ($p<0.05$), the null hypothesis of the presence of unit root cannot be accepted. Table 3 contains the summary of analysis of unit root tests for the variables used in this study.

Table 3. Summary of ADF Unit Root Test Results

	At Level		At First Difference		
Variable	**ADF Stat**	**Prob.**	**ADF Stat**	**Prob.**	**Order**
			KENYA		
STRS	-2.273	0.187	-4.089	0.0045	1(1)
MKCGDP	-2.964	0.050	-	-	1(0)
M3GDP	-2.402	0.150	-5.4489	0.0001	1(1)
LDSRS	-2.024	0.275	-3.4115	0.0202	1(1)
FSLGDP	-1.958	0.302	-5.8129	0.0001	1(1)
CPSCDP	-1.823	0.361	-3.4425	0.0209	1(1)
CBNGDP	-11.28	0.000	-	-	1(0)
CBAGDP	-1.836	0.356	-6.1498	0.0000	1(1)
			NIGERIA		
STRS	-2.339	0.168	-5.5424	0.0001	1(1)
MKCGDP	-3.367	0.021	-	-	1(0)
M3GDP	-3.172	0.032	-	-	1(0)
LDSRS	-3.724	0.009	-	-	1(0)
FSLGDP	-2.636	0.097	-5.2243	0.0002	1(1)
CPSCDP	-2.595	0.105	-4.7990	0.0006	1(1)
CBNGDP	-0.802	0.803	-4.2790	0.0024	1(1)
CBAGDP	-2.366	0.159	-4.8838	0.0005	1(1)
			SOUTH AFRICA		
STRS	-3.832	0.007	-	-	1(0)
MKCGDP	-1.175	0.670	-5.0138	0.0005	1(1)
M3GDP	-2.320	0.173	-4.5470	0.001	1(1)
LDSRS	-4.446	0.001	-	-	1(0)
FSLGDP	-0.785	0.807	-3.6535	0.011	1(1)
CPSCDP	-2.286	0.183	-3.5991	0.013	1(1)
CBNGDP	-2.972	0.050	-	-	1(0)
CBAGDP	-1.785	0.379	-3.7464	0.009	1(1)

Source: Author's Computation (2021)

From Table 3 the stationarity of the variables is a mixture of level and first difference; 1(0) and 1(1), providing the premise for testing for co-integration and determining the preferred estimation techniques.

Co-integration Tests

In order to ascertain the long run effect between variables, it must first be established that there exists a long run relationship between them. This test combines the results of the Trace test and the Maximum-Eigen test to draw conclusion on whether the variables have co-integrating relationship. Appendices 1(a), 1(b) and 1(c) shows that in Kenya and South Africa, Johansen co-integration tests revealed that there were eight (8) and six (6) co-integrating equations for Trace and Max-eigen tests respectively. Furthermore, in Nigeria, there were eight (8) and four (4) co-integrating equations for Trace and Max-eigen tests.

Long-Run Regression Estimation Results (VAR)

Having established that there exists long run relationship between the dependent and independent variables, this study used the vector autoregressive VAR technique to examine the nature of such relationship.

Table 4. Vector Autoregressive Results

	Dependent Variable = STR			
	Kenya (East)	Nigeria (West)	South Africa (South)	
Variable	Statistics*	Statistics*	Statistics*	Remarks
MKCGDP(-1)	0.216583 (0.0112)+	0.067677 (0.4230)	0.381842 (0.0873)	Different among three
MKCGDP(-2)	-0.12746 (0.1061)	-0.04539 (0.4862)	-0.686046 (0.0068)+	
M3GDP(-1)	-1.19996 (0.0733)	-0.09377 (0.8543)	-2.154375 (0.4084)	Not different
M3GDP(-2)	-0.50808 (0.3872)	0.726769 (0.2715)	4.282794 (0.2373)	
LDSRS(-1)	0.062803 (0.7007)	0.062254 (0.8040)	-18.86780 (0.0517)+	South Africa different from Kenya and Nigeria
LDSRS (-2)	-0.22908 (0.1858)	-0.19649 (0.4673)	0.683288 (0.9193)	
FSLGDP(-1)	1.428033 (0.1006)	-0.88348 (0.2095)	9.127651 (0.1085)	South Africa different from Kenya and Nigeria
FSLGDP(-2)	0.321461 (0.5841)	-0.24934 (0.6812)	-12.22265 (0.0435)+	
CPSCDP(-1)	1.088220 (0.0109)+	-0.31967 (0.4616)	-1.275104 (0.8710)	Kenya different from South Africa and Nigeria
CPSCDP(-2)	-0.10991 (0.7334)	-0.24668 (0.6403)	-6.182605 (0.3320)	
CBNGDP(-1)	0.064048 (0.6232)	0.206839 (0.5109)	-28.46982 (0.0164)+	South Africa different from Kenya and Nigeria
CBNGDP(-2)	-0.04115 (0.7688)	-0.38055 (0.0728)	35.76809 (0.0086)+	
CBAGDP(-1)	-0.94280 (0.0173)+	1.010231 (0.0776)	-2.609364 (0.7658)	Kenya different from South Africa and Nigeria
CBAGDP(-2)	0.287608 (0.0973)	-0.27169 (0.6690)	11.58715 (0.1499)	
R^2	0.958235	0.869091	0.839972	
Prob. (F-Stat)	0.000792	0.007269	0.051834	

Source: Author's Compilation (2021)
***Coefficients and probabilities (in parenthesis)**
+ Significant

Results on Tables 4 reveals that using the VAR model, MKCGDP significantly affected STR positively and negatively in Kenya and South Africa (coef. 0.216583, p = 0.0112 and -0.686046, p = 0.0068) respectively. Its effect on STR is not significant in Nigeria. There is no significant relationship between M3GDP and STR in any of the countries studied. LDSRS and FSLGDP affect STR negatively but significantly only in South Africa (coef. -18.86780 p = 0.0517 and -12.22265, p = 0.0435 respectively). CPSCDP only affects STR positively and significantly in Kenya without significant effect on it in Nigeria and South Africa. CBNGDP significantly but negatively affects STR in South Africa (lag 1, coef. -28.46982, p = 0.0164) and significantly and positively affects it lag 2 (coef. 35.76809, p = 0.0086). Its effect on STR in both Kenya and Nigeria are not significant. Finally, CBAGDP has a significantly but negative effect on STR in Kenya, but with no significant effect on it in Nigeria and South Africa.

Table 4 also reveals that the coefficients of determination (R2) implied that as much as 0.9582 (96%), 0.8690 (87%) and 0.8399 (84%) of the variations in STR are explained by the explanatory variables in Kenya, Nigeria and South Africa respectively. The models for the three countries are also reliable as depicted by the F-statistic probabilities. The D-W statistics for Kenya, Nigeria and South Africa's models are approximately 2 (2.102, 2.012 and 2.269 respectively) implying all the variables under study are free from autocorrelation problem (Gujarat, 2004). These findings revealed that financial depth has significant mixed effects on stock return in Kenya and South Africa and insignificant effect on it in Nigeria.

Causality Test

The second objective of this study is to ascertain if there exists causal relationship between stock returns and financial depth in the selected Sub-Saharan African countries. Appendices 2(a), 2(b) and 2(c) contains the extract from the causality tests carried out on the data of the three countries. Based on the probabilities of F-Statistics, in Kenya, only two of the seven variables (LDSRS and CPSCDP) have uni-directional causal relationship with stock returns which runs from the latter to the former. In Nigeria, however, there exists a unidirectional causality from STR to five of financial depth variables, namely, M3GDP, LDSRS, FSLGDP, CPSSDP and CABGDP. Finally, in South Africa, there exists a uni-directional causality from STR to three financial depth variables, namely, FSLGDP, CPSCDP and CBAGDP.

Implication of Findings, Conclusion and Recommendations

Economic and financial theories posited that financial depth should encourage individuals and corporate organizations to invest more in stocks traded on the Stock Exchange. This increase in demand for stocks should push up its price and returns on it to the shareholders. The null hypotheses tested in this study are: that the effect of financial depth on stock returns does significantly differ among countries in Sub-Saharan Africa and there is no causal relationship between financial depth and stock returns in the selected countries.

Results of the VAR analyses revealed that effects of financial depth variables on stock return in Kenya are mixed. Whereas market capitalization and credit to private sector ratios to GDP positively affected stock return in agreement with the apriori expectation, commercial banks' liabilities negatively affected it. This means that, to a large extent, financial depth variables promote stock market growth in Kenya and that there is need for the Kenyan commercial banks to manage its liabilities effectively to aid stock market growth. The null hypothesis of no significant relationship between financial depth and stock returns cannot be accepted in Kenya. In Nigeria, though effects of financial depth on stock return are mixed, they are not significant. This implies that financial depth variables have not significantly contributed to Nigerian stock market growth in terms of return to stockholders. Here, the null hypothesis of no relationship between financial depth and stock return cannot be rejected. In South Africa, financial depth variables have significant negative effect on stock returns, at least, in the short-run, implying also that the former had

done more harm than good on the latter over the years in the country. The ratio of South African Central Bank assets to GDP however positively affected stock returns in the long-run. The null hypothesis that financial depth does not have significant effect on stock return in South Africa cannot be accepted.

The existence of causality between financial depth and stock return in the selected countries and the negative and other insignificant positive effects of financial depth on stock market growth and development should arouse concern from researchers, policy makers and the governments. Well-articulated and efficient monetary policy has financial market growth as one of its main objectives. Among the countries examined, Kenyan stock market return appeared to be the most positively affected by financial depth variables while the Nigerian stock market return is the worst hit as there is no significant relationship between financial depth and stock returns. Economists tend to attribute failure of monetary policy to positively influence stock market growth to policy lags, transmission problems, mismatch, instability and non-compliance by operators in the financial market, particularly banks among other factors.

This study concluded that financial depth significantly affects stock returns in two of the three selected Sub-Saharan African countries and that the effects differ among the three selected countries. We recommend that, first, monetary authorities should endeavor to develop strategies that will minimize monetary policy lags that delay the transmission of policy effects on the target, especially stock market development. Countries such as Nigeria and South Africa may need a complete re-appraisal of their financial depth strategies vis-à-vis stock market development both for short- and long-term policy targets.

Finally, this study was conducted on the data of three Sub-Saharan African countries, which is just about 6% of total countries in the region. Further studies that will include more countries and make comparative analysis among the countries are advocated.

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