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FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: A COMPARATIVE ANALYSIS OF NIGERIA AND SOUTH AFRICA

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ABSTRACT

Advances in the financial system have been acclaimed to improve economic growth, drawing from theories of the latter. This study set out to test this hypothesis with respect to financial institutions and markets in the two largest economies of Sub-Saharan Africa. Economic growth for both countries is measured by gross domestic product annual growth, as the explained variable. Financial development is measured by institutions and markets. The dependent variable by financial institutions includes money supply, bank branches, interest rate spread, and bank capital to asset ratio. For financial markets, market capitalization, traded value excluding top 10 traded companies to total traded value, market turnover, and stock price volatility. Data is obtained from the World Bank for both countries. Two models are developed, one for each country. For analysis, the Augmented Dickey-Fuller unit root test, and autoregressive distributive lag are employed. The results indicated that of all variables considered only money supply (financial depth by the institution) had a significant, yet negative influence on economic growth in Nigeria. No dimension of financial development is related to output in the long term for South Africa. The study inferred that financial development in both countries is yet to advance sufficiently to make desired effect on economic growth. Expansion of financial institution market and institutions in the form of exchange growth scheme (for small and medium businesses) and rural bank branching was recommended by the study.

KEYWORDS

Financial Development Cum-Growth, Comparative Analysis.



1. Introduction

A greater number of African countries have been listed among the least developed or developing countries in the world (Department of State, 2020). Nigeria and South Africa are currently the two largest economies in Sub Saharan Africa, and one of the two largest in Africa. Both countries are characterized by aggregate output proxied by their gross domestic product (GDP) of over 3.5 million US Dollars; yet they are not a par. Like most African countries, Nigerian and South African economies depended largely on rich mineral reserves and agriculture.

Recently, South Africa enhanced its financial services, e-commerce, and technology, and advanced its economy by developing tertiary sectors in the automotive industry, tourism, communications and trade. Its capital market now holds a remarkable position on global charts; and this is supported by a well improved regulatory environment and infrastructures due to its persistent observation of Basel Accord recommendations (Syden & Sibanisezwe, 2019). Her financial institutions were rated second most sound out of 144 countries surveyed by the World Economic Forum's Global Competitive index for 2012 and 2013 (Ilesanmi & Tewari, 2019). In its Federal Register (2020) under the Office of the United States Trade Representative, the United States of America reclassified South Africa from an emerging (developing) economy to a developed economy (Department of State, 2020). In the same publication, Nigeria was classified under Least – Developed Countries and has remained so due to its dismal Human development index value.

Čihák, Demirguc-Kunt, Feyen, and Levine (2013), without particular reference to the form of financial market in place, stated that some countries have been comparatively successful at developing financial systems that reduced market imperfection costs which impede growth. Nigeria, just as South Africa has undergone and initiated a series of structural reforms especially in its financial sector to boost its economic outlook, yet the country remains at this level. These include the 1986-liberalization of lending and deposit interest rates (aimed at guaranteeing efficient allocation of resources) and deregulation of entry barriers into the banking sector. This was followed by the deregulation of the capital market in 1993 and full reform in 1999; licensing and review of structures of financial institutions to enhance financial access and depth (CBN, 2013). Other reforms include the 2004- recapitalization and bank consolidation (to break the existing monopoly and bring about efficiency and stability); the insurance reforms (2007), and most recently introduction of cashless banking among other efforts. Despite these measures, Nigeria's major economic challenges persist. Nigeria has been described as an expanding economy endowed with abundant human capital and natural resources, with great economic potentials, yet with unacceptable levels of poverty (Ugbede, 2021).

In the case of South Africa, major reforms include the South African Reserve Bank (SARB) becoming an active contributor and effector of the Basel Bank Supervision standards, and a signatory to the Core Principles for Effective Banking Supervision of 1997. All other Bank Acts and amendments since then have been carefully tailored to meet international standards as prescribed in each Basel accord. Its financial sector became open to the world. The financial sector in South Africa is acclaimed as well regulated with only 19 registered banks which are legally recognized to take a deposit (Ilesanmi and Tewari, 2019). South African financial institutions were rated as the second most sound of the 144 countries surveyed by the World Economic Forum's Global Competitive Index in 2012/13 (Ilesanmi and Tewari, 2019). The South African stock market is worth almost twice the country's output. It was larger than the bourses of countries like Mexico, Indonesia and Turkey significantly larger economies (Hassan, 2013). In July 2014, the South African Financial Sector Development and Reform Program (FSDRP) was launched. It had two main pillars- (i) financial sector regulation, integrity and stability

and (ii) financial inclusion. According to Hassan (2013), the Johannesburg Stock Exchange (JSE) has been consistently rated as one of the world's twenty largest stock markets; and the sixth largest among emerging economies (after China, Brazil, India, Taiwan and South Korea). It is by far the largest in Africa, with over 400 firms listed, and market capitalization in excess of 900 billion US dollars in early 2013. Its currency- the rand is consistently among the world is twenty most heavily traded currencies. Average daily foreign exchange turnover in South Africa is however 21 billion US dollars. Local trade accounts approximately for 34 percent of spot, 48 percent of forward, and 35 percent of swap transactions (Ilesanmi and Tewari, 2019).

Nigeria's indices for economic growth - GDP was at 455 billion USD in 2012, grew to 547 billion in 2014, and began to steadily decline. Since then till date, it has not gone above 450 billion USD (World Bank, 2021). Similarly, Nigeria's GDP per capita was at 2,723 USD in 2012; it rose to 3,098 in 2014, and declined to 2,718 in 2015 and since then has not risen above 2,300 USD; rather it declined further to 2,083 USD in 2020. While in South Africa, its economy (GDP) was at 396 billion USD as at 2012; it declined steadily averaging 334 billion USD till 2017 when it rose to 349; and has continued to grow to date. Its GDP per capita was at 7,501 USD in 2012, it declined to 6,433 in 2014 after which it declined further like that of Nigeria but rebounded in 2018 at 6,374 USD, and has remained above 6,000 USD since then. Between 2012 to 2020, the South African economy has grown by 25%; while that of Nigeria rather declined by 9% (-9% growth). Major international rating agencies rated both countries as Speculative, based on economic, financial and political performance. South Africa was rated ahead of Nigeria as Non- Investment Grade Speculative - Standard and Poor's (S&P): BB-, Moody's: Ba2, Fitch: BB (Trading Economics, 2020). Nigeria was rated as Highly Speculative and faced major uncertainties- S&P: B-, Moody's: B2-, Fitch: B. According to these statistics, it is obvious that while South Africa is easily acknowledged as Africa's most developed economy, Nigeria is at the other extreme. Consequently, it has become imperative to carry out a study to analyze the influence(s) of financial development in these two great economies; and determine the extent to which this can provide objective explanation on the disparity between both nations.

Most studies on this subject matter have analyzed financial development considering just an aspect, rather than the four dimensions of depth, access, efficiency and stability as prescribed by the World Bank (2013). Some studies have proxied financial development as a whole by money supply alone, which is only a proxy for the dimension of depth (Sunde, 2012; Puatwoe&Piabuo 2017; Abel, Nyamutowa, Mutonhori, & Le Roux 2019). Some studies only considered depth of the financial market using stock market capitalization (Osakwe, Ogbonna & Obi-Nwosu, 2020; Michael, Effah, Joel & Nkwantabisa, 2021). Some studies considered only proxies under the dimension of access using bank branches (Dinabandhu, and Debashis, 2018; Kabiru, Wan, Ali & Umar, 2019; Migap, Ngutsav, & Andohol, 2020; Omar & Inaba, 2020, Rosmah, Zulkefly, Aisay, & Tamat, 2020; Some other studies concentrated on only the dimension of financial efficiency, by considering the interest rate spread (Mohamed & Yao, 2017; Rateiwa, 2018; Ilesanmi and Tewari, 2020; Nyamweya, and Obuya, 2020; Toan 2020; Alam, Rabbani, Tausif & Abey 2021). Others looked at financial development using the proxy of stability- Bank capital to asset ratio (Sotiropoulou, Giakuomatos, & Petropoulos, 2019; Mande, Salisu, Jimoh, Dosumu, & Adamu, 2020; and Abbas, Yousaf, Ali, & Wong, 2021). Some studies used a mixture of proxies, but did not cover the four dimensions (Adenuga & Omotosho 2014; Hoi, Hoang, & Thuy, 2019; Ijaz, Hassan, Taraz, & Fraz 2020).

Of these studies outlined here, especially within the context of Africa, none considered analyzing financial development from these four dimensions in either the market or institutions at once. Therefore, with respect to Nigeria and South Africa, there is still a scarcity of literature on

investigating the finance-growth nexus from the four pillars of financial development (access, efficiency, stability, and depth) by institutions and markets, as defined by the World Bank. The key concern of this study is the necessity to objectively address this through empirical examination from the standpoint of the four aspects of financial development, while making comparison of the outcome in both countries.

2. Theoretical Framework

Economic growth as defined by the International Monetary Fund- IMF (2021) is the increase in market value of goods and services produced by an economy over time. This is usually measured as the percent rate of increase in real gross domestic product (GDP) annually.

McKinnon (1973) and Shaw (1973), posited that credit creation by the financial system can grow production bringing about economic growth. This occurs where the financial sector (institutions and markets) reforms and is allowed to expand to efficiently allocate resources as it responds to the market forces. Čihák et al. (2013) defined financial development as the improvement in quality of the five key functions of the financial system which includes:

- a. Producing and processing information ex-ante about possible investments and allocate capital, thereby enhancing the quality of information about firms and the efficiency of resource allocation;
- b. Monitoring (individuals and firms) investments and exerting sound corporate governance over the bodies to which they funnel resources;
- c. Providing and facilitating effective mechanisms for trading, managing, pooling, and diversifying risk;
- d. Mobilizing and pooling savings from disparate savers so that these resources can be allocated to the most promising projects in the economy; and
- e. Easing and facilitating the exchange of goods, services, and financial instruments.

Therefore, according to Čihák et al. (2013), when financial institutions and markets carry out these functions properly they expand economic opportunities and foster growth. Čihák et al. (2013) also advocated for the measurement of financial development through the four major characteristics of a well-developed system- by depth, access, stability and efficiency. Meaning that, an efficient expansion of a stable and reliable financial sector in depth and breadth, should positively relate with economic growth.

Authorities like Schumpeter (1934) supported this view and highlighted the possibility that financial institutions could actively spur innovation and growth by funding productive investments. Beck, Demirguc-Kunt and Peria (2005) and Fry (1988) confirmed this view, asserting that components of financial intermediation were found to grow; there was a positive growth in the real sector.

This view has not been without contention. Samuelson (1951) of the Prior savings theory had a different opinion, arguing that the financial system functioned merely as a bridge connecting prior savings mobilized to investment units. This view suggests that reforms in the financial system are of no particular consequence in the growth process. This view was supported by Lucas (1988), who argued based on his findings that financial development and economic growth were rather independent and not related, proposing the independence hypothesis.

Another contender of the finance-growth nexus hypothesis, Robinson (1954), asserted that the financial system was rather a passive sector that only responded to the needs of the real sector. Hence the financial sector grows as the real economy grows. Thus, suggesting that economic growth is

actually what defines the functioning and reforms that lead to development of the financial system, and not the other way round.

This debate on the nature of relationship between finance and economic growth has given rise to several studies, and there is yet a definite conclusion to be drawn.

Empirical Review

Osakwe, Ogbonna and Obi-Nwosu (2020) carried out a study relating to financial development in Nigeria and South Africa, but focused solely on the Stock market. The study's purpose was to execute a comparative study of the impact of stock market capitalization on economic growth in Nigeria and South Africa for the period 2000-2018. They employed time series Ordinary Least Square (OLS) regression to analyze the data. The study had only two parameters; gross domestic product growth rate as proxy for economic growth (dependent variable), and market capitalization ratio as the independent variable. The data were sourced from the 2018 World Development Indicators. The study found that the relationship between market capitalization ratio to GDP and economic growth was positive for both countries, but only significant in South Africa. Thus, the economic growth was found to be positively correlated with the size of both countries' capital markets, though the size of South Africa capital market had better contribution to economic growth compared to Nigeria. The study recommended that there is a need to increase the size of the markets in both countries by increasing the number of financial instruments available to investors so as to increase trading as well as improve liquidity in the markets. The study like others provided evidence of a link between finance and growth in both countries, but did not go further to tell what nature or the direction of causal relationship holds.

Yousio and Ekio (2020) sourced time series data from CBN between 1981 and 2018, to investigate the interaction between financial deepening and growth in output in Nigeria. The classical multiple regression method was employed in analysis. Deepening was measured via institution and market as the explanatory variables. For institution the model had credit to private sector, broad money supply, national savings, all as ratios of GDP. The model had for market- stock market capitalization to GDP ratio. The model also had a dummy represented military regime. GDP growth proxied growth as the explained variable. The results showed that stock market capitalization and credit had a positive and significant influence on growth. Savings had a significant and relationship with growth. Money supply had a positive yet insignificant effect on growth. The study concluded that of all measures considered, money supply was the most ineffective tool in influencing growth, and make recommendations accordingly.

Michael, Effah, Joel and Nkwantabisa (2021) similarly studied stock market development, financial deepening and economic growth in 8 African countries (Nigeria, Algeria, Namibia, Kenya, Eswatini (formally Swaziland), Mauritius, Tunisia and South Africa). They sought to establish the interrelationship between Africa's developing capital markets and their economies. They sourced secondary data from 1996 to 2019 from the World Bank database to fulfil their objective. They employed the dynamic autoregressive distributed lag bounds test, co-integration test and Granger causality test to examine the long-run and short run interrelationship among financial deepening, stock market development and economic growth in these countries. The independent variables for the study were broad money (M2) to GDP ratio (M2/GDP ratio) as the measure of financial deepening and stock market capitalization to GDP ratio as the stock market development indicator. Others were Savings to GDP ratio, private sector credit to GDP ratio, annual inflation rate, and annual official

exchange rate. The dependent variable economic growth was measured by the GDP. The results showed that the series in five countries (Nigeria, Algeria, Namibia, Kenya and Mauritius) were co-integrated; while in three other countries they were not. The result from the Granger causality test established bi-directional causality between economic growth and stock market development in Algeria, Namibia and Mauritius which implies a symbiotic relationship. In the other five countries (Nigeria, Kenya, Eswatini, Tunisia and South Africa), only unidirectional causality from economic growth to stock market development was recorded, implying that financial development in these places were demand following. The results of their panel analysis revealed a positive relationship between stock market development and financial deepening. They found a positive relationship between economic growth and financial deepening for all the countries except for Eswatini and Mauritius. For results on the long run relationship between economic growth and stock market development the outcomes were mixed across the countries. However, the results from the panel regression found no significant effect from both financial deepening and stock market development in Africa. The study revealed that the countries with highly active and liquid stock markets had positive causal relationship between stock market and economic growth, whereas no causal relationship was recorded in countries with less active and illiquid small stock markets.

In South Africa, Ilesanmi and Tewari (2020) evaluated financial stress index and economic activity in South Africa. Their aim was to develop a financial stress indicator for the South African financial market. The study constructed a single aggregate indicator to reflect the systemic nature of financial instability and to measure the vulnerability of the financial system to both internal and external shocks. The Financial Stress index was developed based on four market categories in South Africa embracing - Money, bond, equity and foreign exchange. Monthly data from January 2006 (M1) until December 2017 (M12) that captured financial stress in the system were obtained from the South Africa Reserve Bank (SARB), IMF-IFS, Bloomberg and investing.com. The data included 10-year government bonds, interbank rates, three-month treasury bill, interest rates (Repo rate), JSE all-share index. Also included was the South African exchange rates against the following foreign currencies- US dollar, British pounds (GBP), Euros (EUR) and the US 10-year bond yield. In specific terms the money market stress indicator (reflecting liquidity and counterparty risk in the interbank market)- realized volatility of the 3-month interbank rate calculated as the monthly average of the absolute daily rate of change. The interbank liquidity spread which involves the interest rate spread between the 3-month JIBAR rate and 3-month treasury bills; and the Interbank cost of borrowing for which Repo rate was used. For the Bond market - The realized volatility of the 10-year government bond index measured by the bond market yield spread between the 10-year government bond index and the US 10-year government index, with the same applying for the UK and the Euro; and Sovereign bond spread measured by the difference between the South African bond yield (SABY) and that of the US (USBY). For foreign exchange market they had - Realized volatility of the foreign exchange markets measured by volatility between South African Rands (ZAR) and three other major currencies, namely US dollars (USD) (VUZ), British Pounds (GBP) (VGZ) and the Euro (EUR) (VEZ) and the Maximum cumulative loss for USD (MUZ), GBP (MGZ) and EUR (MEZ) to ZAR. Equity market had- Realized volatility of the equity market which was returns monthly sum of the all-share index and the Maximum cumulative loss for the all-share index. Using the principal component analysis (PCA), the results show that financial stress could be identified by the financial stress indicator developed. Furthermore, the study went a step further to analyze the relationship between the Financial Stress Index and South Africa's real economy. Using a recursive Vector Auto regression (VAR) model it estimated the impact

of financial stress on output (GDP) and investment (gross capital formation). The study results showed that financial stress had a negative impact on economic growth and investment in South Africa, though not immediately but with a certain time lag.

Mande, Salisu, Jimoh, Dosumu, and Adamu (2020) investigated the extent to which financial stability mattered for income growth in emerging markets. Using dynamic panel estimation techniques, they explored both stock market and banking sector dimensions of the financial system. Their aim was to show that both stock market volatility and non-performing loans were detrimental to income growth in these markets. To measure financial stability of the stock market, they employed stock market volatility index which was measured as the 360-day standard deviation of the return on the national stock market index. From the perspective of banking, they used non-performing loans. To complement these individual indicators of financial stability, they added the Z-score (a composite of (i) bank profitability, (ii) capital ratio, and (iii) return volatility). The model also had other determinants included- population growth (as an indicator of labor force growth); gross fixed capital formation as a ratio of GDP and credit to private sector as a ratio of GDP (to capture investment in physical capital); gross enrolment ratio in secondary education (as a measure of human capital); government consumption as a ratio of GDP (to accommodate the government sector in the growth regressions); inflation rate (to reflect the macroeconomic environment); and trade openness measured as the sum of exports and imports scaled by GDP (to capture the importance of international factor flows in influencing economic activities). The dependent variable in the model had per capita GDP as proxy for income growth. Secondary Data were sourced from the World Bank's online database on the 26 developing countries that qualified as emerging markets. The study results showed that investment in government consumption, human capital, and credit to private sector were statistically significant in explaining income growth in emerging market economies. They showed that when compared to credit to the private sector, the magnitude of impact government consumption and human capital had on income growth was relatively more pronounced. As expected, human capital had a positive relationship with income growth, while government consumption and credit to private sector exhibited a negative relationship. They argued credit to the private sector which was expected to promote economic growth, rather educed growth, indicating poor and inefficient credit allocation to projects that were not beneficial for economic activity and do not improve economic growth. They found that investment in physical capital, inflation and trade openness exerted no significant impacts on income growth. The results also showed that when financial instability was measured by stock market volatility, it had a negative and significant impact on income growth. They explained that this means that despite the widespread assertion of a positive relationship between finance and growth, instability in the stock market may prompt investors to seek more riskless investments, which would, consequently, harm economic growth. From the dimension of banking sector financial stability, the results showed that non-performing loans had a negative and statistically significant impact on growth. The study suggested that this could be due to ineffectiveness in the credit allocation process. This they claim, has the effect of reducing profitability, increasing financial costs, reducing credit supply to the private sector, and, in turn, reducing economic growth. The results summarily indicated that the magnitude of the impact of financial instability was higher when measured by stock market volatility than when measured by nonperforming loans. Therefore, they concluded that the magnitude of impact of instability would be relatively more pronounced when the underlying source in the financial system is stock market volatility. They also suggested from their findings that the impact of financial stability on income growth is more statistically relevant when measured using the individual indicators of financial instability as compared to their composite indicator.

Studies using more than one dimension of FD

Güvercin and Gök (2019) examined the effect of rule of law and regulatory quality on economic growth, through their impact on the stock market development and banking development. Panel vector autoregressive model was employed for the European Union (EU)-15 countries over the period of 1996-2012 in order to account for the endogenous interrelations among the variables. The study variables included – stock market index made up of annual stock market capitalization to GDP Percent; annual stock market total value traded to GDP Percent, and annual stock market turnover ratio (value traded/capitalization) percent. The three indices were averaged to have more accurate proxy of the stock market development. For institutional development a bank development index was created from- liquid liabilities to GDP; private credit by deposit money banks and other financial institutions to GDP. Economic growth had as proxy, GDP per capita as the dependent variable. The institutional variables in the model were governance index of rule of law and governance index of regulatory quality. All data were obtained from the World Bank and analyzed using Panel VAR estimation model. Estimation results indicated that both indicators of institutions (governance index of rule of law and governance index of regulatory quality) increased banking development as well as stock market development. Additionally, the findings indicated that banking development complements stock market development, rather than substitutes. Capital market development was found to increase income per capita whereas banking development decreased income per capita. Measures provided in the study to proxy financial development mostly centered around depth and efficiency, leaving out the dimensions of access and stability which are a major part of the whole.

In Europe, Sotiropoulou, Giakoumatos, and Petropoulos (2019) analyzed the relationship between financial development, financial stability and economic growth over the period 2004 and 2014. Secondary data was sourced from 28 European Union countries from the database of World Bank and the Penn World Tables. The study's empirical model was based on a growth equation developed by Barro (2003), and analyzed through the dynamic panel data techniques by applying the generalized method of moments (GMM) estimator. The indices used for the study included the explained variable - economic growth (GDP per capita). The explanatory variables were - financial development and stability (private credit, liquid liabilities, bank assets, market capitalization, value traded, turnover ratio, non-performing loans, and stock market volatility). Other control factors included in the model were investment, inflation, trade openness, government expenditure, and human capital. The results indicated that the development of banking systems had a negative impact on economic growth in the region. The study therefore suggested that the allocation of private credit was inefficient and did not improve economic growth. Also, the results for the impact of financial market(s) development were mixed. Specifically, the size of the stock markets had a positive impact on economic growth, whereas market liquidity negatively influenced economic growth. The results also showed that financial instability had a negative impact on economic growth. The study explained that the rates of non-performing loans increased due to financial crisis in the European Union member countries and constituted a detrimental factor for economic growth. Investment and trade openness were found to positively and significantly influence economic growth in the region. However, inflation and government expenditure had a negative relationship with economic growth. The study findings corresponded with theoretical positions which suggest the existence of a relationship between financial development and economic growth.

Iheonu, Asongu, Odo and Ojiem (2020) evaluated the impact of financial sector development on domestic investment in ECOWAS region using data from 1985 to 2017 from 7 countries. Secondary

data were sourced from the World Bank database. The dependent variable was domestic investment (fixed capital formation). The independent variables include financial development which was proxied by - domestic credit to the private sector as a percentage of the GDP, bank credit to bank deposit, (bank efficiency), and broad money growth. Other control factors added to the model include- GDP per capita and personal remittances. The study employed the augmented mean group procedure and the Granger non-causality test in the presence of cross-sectional dependence. The results showed that the impact of financial sector development on domestic investment differed among the countries and depended greatly on the measure of financial sector development utilized. The results revealed that domestic credit to the private sector had a positive but insignificant influence on domestic investment in ECOWAS. On the other hand, banking intermediation efficiency and broad money supply negatively and significantly influenced domestic investments. The study also showed that domestic credit to the private sector Granger caused domestic investment in the region. The study recommended that domestic credit to the private sector should be given priority when forecasting future domestic investment.

Contrary to the prescriptions of the World Bank Global Financial Development Reports, most of these studies reviewed proxied financial development as a whole by just one variable, or from one dimension, or randomly selected financing functions as proxies for financial development. This study seeks to fill the gap, by investigating the role of financial development in economic growth process in Nigeria and South Africa to draw a comparison, relying on the four dimensions of financial depth, access, efficiency, and stability as prescribed by the World Bank.

3. Methodology

The study is a comparative analysis of the relationship between the financial system and economy of the two largest economies in Sub-Saharan Africa- Nigeria and South Africa between 1996 – 2020. These constitute the population for this study; and time series data is sourced from the World Bank Global Financial Development Database. Essentially, the relationship between the dependent variable (economic growth) and the explanatory variables- financial development (dimensions of depth, access, efficiency, and stability) has been theoretically expressed by Čihák, Demirgüç-Kunt, Feyen and Levine (2013). They postulated that economic growth is dependent and explained by financial development, emphasizing a positive relationship between economic growth and financial inclusion (financial development).

This is represented *functionally* as:

Economic Growth = f (Financial Development)

This implies the relationship between dimensions of financial development and economic growth by institutions and market. It can be further presented thus:

Economic Growth = f (financial depth, financial access, financial efficiency, financial stability) (3.1)

For this purpose, two models are generated:

Model 1: Economic growth and Financial Development in Nigeria

GDPRN = f (MSGN, BKBN, DLSN, CTAN, SMGDN, VT10N, STON, SPVN) (3.2)

Where:

GDPRN is Gross domestic product growth rate (economic growth) in Nigeria;

MSGN is Broad Money supply (financial institution depth) in Nigeria;

BKBN is Bank branch per 100,000 adults (financial institution access) in Nigeria;

DLSN is the Lending – Deposit rates Spread (financial institution efficiency) in Nigeria;

CTAN is Capital- Asset ratio (financial institution stability) in Nigeria;

SMGDN is Stock market capitalization to GDP (financial market depth) in Nigeria;

VT10N is Value traded excluding top 10 traded companies to total value traded (%) (Financial market access) in Nigeria;

STON is Stock Market Turnover ratio (financial market efficiency) in Nigeria; and

SPVN is Stock price volatility (stability) in Nigeria.

All measured in percentages.

Equation 3.2 implies that the level of economic growth (GDPRN) in Nigeria, is a function (f) of its financial development (MSGN, BKBN, DLSN, CTAN, SMGDN, VT10N, STON, SPVN).

For estimation purposes, equation 3.2 is re-written as:

$$GDPRN_{it} = \alpha + \alpha_1MSGN_{it} + \alpha_2BKBN_{it} + \alpha_3DLSN_{it} + \alpha_4CTAN_{it} + \alpha_5SMGDN + \alpha_6VT10N + \alpha_7STON + \alpha_8SPVN + \varepsilon_{it} \quad (3.3)$$

Where:

GDPRN, MSGN, BKBN, DLSN, CTAN, SMGDPN, VT10N, STON, SPVN retain their previous notations.

α_0 is the constant for equation 3.3;

$\alpha_1 - \alpha_8$ are the coefficient of the explanatory variables - MSGN, BKBN, DLSN, CTAN, SMGDPN, VT10N, STON, SPVN in Nigeria.

ε is the stochastic error term which is a surrogate or proxy for all the omitted or neglected variables that may affect the dependent variable (GDPRN), but are not or cannot be included in the regression model.

i is the cross-sectional variable from 1, 2, 3 ... nth; t is the time series variable from 1, 2, 3...nth

A Priori Expectation:

$$\alpha_1 > 0, \alpha_2 > 0, \alpha_3 < 0, \alpha_4 > 0, \alpha_5 > 0, \alpha_6 > 0, \alpha_7 > 0, \alpha_8 < 0$$

Model 2: Economic growth and Financial development in South Africa:

$$GDPRS = f(\text{MSGs, BKBS, DLSS, CTAS, SMGDS, VT10S, STOS, SPVS}) \quad (3.4)$$

Where:

GDPRS is Gross domestic product growth rate (economic growth) in South Africa;

MSGs is Broad Money supply (financial institution depth) in South Africa;

BKBS is Bank branch per 100,000 adults (financial institution access) in South Africa;

DLSS is the Lending – Deposit rates Spread (financial institution efficiency) in South Africa;

CTAS is Capital- Asset ratio (financial institution stability) in South Africa;

SMGDS is Stock market capitalization to GDP (financial market depth) in South Africa;

VT10S is Value traded excluding top 10 traded companies to total value traded (%) (financial market access) in South Africa;

STOS is Stock Market Turnover ratio (financial market efficiency) in South Africa; and

SPVS is Stock price volatility (stability) in South Africa.

All measured in percentages.

Equation 3.4 implies that the level of economic growth (GDPRS) in South Africa is a function (f) of financial development (MSGs, BKBS, DLSS, CTAS, SMGDS, VT10S, STOS, SPVS) in South Africa.

For estimation purposes, equation 3.4 is re-written as:

$$GDPRS_{it} = \beta_0 + \beta_1MSGs_{it} + \beta_2BKBS_{it} + \beta_3DLSS_{it} + \beta_4CTAS_{it} + \beta_5SMGDS_{it} + \beta_6VT10S_{it} + \beta_7STOS_{it} + \beta_8SPVS_{it} + u_{it}; \quad (3.5)$$

Where:

GDPRS, MSGS, BKBS, DLSS, CTAS, SMGDS, VT10S, STOS, SPVS retain their previous notations.

β_0 is the constant for equation 3.5

$\beta_1 - \beta_6$ are the coefficient of the explanatory variables - MSGS, BKBS, DLSS, CTAS, SMGDS, VT10S, STOS, SPVS.

u is the stochastic error term which is a surrogate or proxy for all the omitted or neglected variables that may affect the dependent variable (GDPRS), but are not or cannot be included in the regression model.

i is the cross-sectional variable from 1, 2, 3 ... nth; t is the time series variable from 1, 2, 3...nth

A Priori Expectation:

$\beta_1 > 0, \beta_2 > 0, \beta_3 < 0, \beta_4 > 0, \beta_5 > 0, \beta_6 > 0, \beta_7 > 0, \beta_8 < 0$

Decision rule: is based on the critical value of significance which in this case is 5%. Therefore, we reject the null hypothesis for both models at a 5% level of significance.

The ARDL test is a cointegrating technique applied to predict nature of relationships especially in the long run. The ARDL bound test through its F-Statistic signifies the presence of a long run relationship where this value exceeds the critical value. The ARDL test is employed under the following conditions as pointed out by Bhattari (2015):

- a. Small sample size: It is recommended that where the sample size of a study is rather small (less than 30), the ARDL is the most appropriate cointegration test to apply.
- b. Fractional integration: Where the time series of variables in the study are integrated at level $I(0)$, or $I(1)$ or a mixture of both, but not at $I(2)$. Hence a unit root analysis is often advised to determine if any of the time series of the study variables is integrated at order 2 – $I(2)$.

The current study covers a 26year period, from 1996 to 2020. This is less than 30 years, hence considered a small sample size. This indicates that the best test in determining long run relationship for this study at this time is the ARDL, irrespective of stationarity order.

By integrating the short run adjustments and long run equilibrium without losing data, through simple linear transformation, the ARDL long run form test can provide an error correction mode (Gujarati, 2004). This is indicated by the Cointegrating equation (CointEq). A negative signed coefficient and probability value less than the study critical value indicates error correction. The ECM is often employed to modify for the deviations from estimated relationships due to possible shocks in any one or more of the times series variables employed in the short run; hence short-run interactions and subsequent adjustments to eventual long-run equilibrium conditions are vital.

4. Data Analysis and Results:

Data is presented, analyzed, results interpreted, and findings discussed here. Study Data is presented in Appendix 1. The results of the analyzes are presented in Tables 1-8 and Figures 1-3 and interpreted under each Table/Figure.

Table 1: Descriptive statistics Nigeria:

	GDPRN	MSGN	BKBN	DLSN	CTAN	SMGDN	VT10N	STON	SPVN
Mean	4.870110	18.73649	4.862400	7.793086	11.47253	12.22187	1.244768	8.986967	16.54621
Median	5.307924	21.35585	4.500000	7.700833	11.87368	11.48144	0.932500	8.174050	15.40600
Maximum	15.32916	27.37879	6.560000	11.06417	17.95485	30.80067	6.298354	34.78530	27.52800
Minimum	-1.794253	9.063329	3.780000	3.268333	1.904068	2.488777	0.189650	2.474498	8.570380
Std. Dev.	3.671617	6.227289	0.909209	1.707920	4.350341	6.655909	1.382906	6.542316	4.831689
Skewness	0.466956	-0.206904	0.678633	-0.268746	-0.610061	1.057360	2.821575	2.715803	0.763054
Kurtosis	4.098469	1.384036	2.063782	3.601995	2.372768	4.049588	10.05215	11.02951	2.953579
Jarque-Bera	2.165446	2.898517	2.831952	0.678433	1.725274	5.805908	84.97704	97.89109	2.136895
Probability	0.338672	0.234744	0.242689	0.712328	0.422048	0.054861	0.000000	0.000000	0.343541
Sum	121.7527	468.4121	121.5600	194.8271	252.3957	305.5468	31.11920	224.6742	364.0167
Sum Sq. Dev.	323.5386	930.6990	19.83986	70.00780	397.4348	1063.227	45.89828	1027.246	490.2497
Observations	25	25	25	25	22	25	25	25	22

Table 2: Descriptive statistics South Africa:

	GDPRS	MSGS	BKBS	DLSS	CTAS	SMGDS	VT10S	STOS	SPVS
Mean	2.193414	69.86243	7.797727	3.798978	6.666562	233.0865	67.32799	28.23078	18.03707
Median	2.592598	72.59044	9.145000	3.357915	6.913637	233.3324	66.98899	27.58289	16.96885
Maximum	5.603798	82.80305	10.83000	5.759170	8.796157	352.1564	135.7951	41.98000	34.37600
Minimum	-6.959604	52.71050	3.290000	2.825000	4.389400	121.3611	27.99245	18.81459	13.37940
Std. Dev.	2.722828	8.489768	2.708271	0.793078	1.390974	64.66186	26.61037	5.870004	5.186434
Skewness	-1.710503	-0.595893	-0.539547	0.975914	-0.131446	0.163577	0.767854	0.456107	1.641366
Kurtosis	6.923006	2.278822	1.684029	2.981050	1.691514	2.223879	3.533912	2.945636	5.547208
Jarque-Bera	24.83548	1.778748	2.654870	3.492496	1.632810	0.650278	2.423170	0.765500	15.82589
Probability	0.000004	0.410913	0.265157	0.174427	0.442018	0.722427	0.297725	0.681983	0.000366
Sum	48.25511	1536.973	171.5500	83.57751	146.6644	5127.904	1481.216	621.0771	396.8155
Sum Sq. Dev.	155.6897	1513.599	154.0294	13.20842	40.63100	87804.29	14870.34	723.5959	564.8811
Observations	22	22	22	22	22	22	22	22	22

From Table 1 Average economic progression of Nigeria (GDPRN) through the period of study stood at 4.87%. That of South Africa (GDPRS) stood at 2.19% as shown on Table 2. The table also showed that the highest rate of growth in Nigerian economy was recorded in 2002, at 15.33% growth rate; and least in 2020 with a negative growth rate of -1.79%. For South Africa, as shown in table 4.2, its highest economic expansion was recorded in 2006, at 5.6%; and least in 2020 with a negative growth rate of -6.96%.

Average value of Nigeria's financial institution depth (MSGN) was 18.74%; recording its highest depth in 2016 at 27.38%; and its' shallowest in 1996 at 9.06%, all from Table 1. South Africa's financial institution depth (MSGS) averaged 68.86%. Its highest depth was in 2020 at 82.8%; and its' shallowest in 1997 at 52.71%.

Nigeria's financial depth by market (SMGDN), as indicated on Table 1 averaged 12.22%. Its highest value was in 2007- 30.8%, and its shallowest was in 2002, 2.49%. South Africa's average financial depth by market (SMGDS) was 233.09%. Its highest value was in 2017- 352.16%, and its shallowest was in 2001, 121.36%.

From Table 1, financial access by institution, in Nigeria (BKBN) averaged 4.86% within the period. The highest value for financial access by institutions in Nigeria was recorded in 2010 - 6.56%; its least in 2006 - 3.78%. Financial access by institution (BKBS) for South Africa as shown on Table 2,

averaged 7.79% within the period. The highest value for financial access by institutions in South Africa was recorded in 2011 - 10.83%; its least in 2001 - 3.29%.

In Nigeria, financial access by markets (VT10N) averaged 1.24%; while that of South Africa (VT10S) it averaged 62.33%. In Nigeria financial institution access (VT10N), was highest in 2007 at 6.29%; and least in 1999- 0.19%. For South Africa's financial market (VT10S), access was highest in 2016 at 135.8%; and least in 1997- 27.99%.

For Nigeria's financial institution efficiency (DLSN) was best in 2008 with a minimum spread of 3.27%, and recorded its highest spread in 2010 at 11.06%; averaging 7.79% within the study period. In South Africa, (DLSS) interest rate spread was best in 2020 with a minimum spread of 2.82%, and recorded its highest spread in 1999 at 5.76%; averaging 3.8% within the study period.

Financial efficiency by Nigerian market (STON) was at its peak in 2008 - 34.79%, and its least in 1996 at 2.47%. It averaged 8.99% within the period. In South Africa, (STOS) was at its peak in 2008 - 41.98%, and its least in 1997 at 18.81%. It averaged 23.23% within the period

Financial stability by institution (CTAN) averaged 11.47%; and was at its peak in 2008 at 17.95% and its minimum value in the period was recorded in 2010 at 1.9%. South Africa's financial stability by institution (CTAS) averaged 6.67%; and was at its peak in 2007 at 8.8% and its minimum value in the period was recorded in 2002 at 4.39%.

Nigeria's financial market indicator (SPVN) averaged 16.54%; peaked at 27.52 and least at 8.57. South Africa's financial market stability (SPVS) averaged 18.04%. It had a maximum value of 34.38% in 2007 and least value in 2003 at 13.38%

Stationarity (Unit Root) Results

Table 3: Stationarity (Unit root) Results for Nigeria:

Variable	ADF statistic	1%	5%	10%	Probability	Decision
GDPRN - I(1)	-3.863764	-3.788030	-3.012363	-2.646119	0.0085	Stationary at all critical levels - I(1)
MSGN - I(1)	-4.084920	-3.752946	-2.998064	-2.638752	0.0047	Stationary at all critical levels - I(1)
BKBN - I(1)	-5.286332	-3.788030	-3.012363	-2.646119	0.0004	Stationary at all critical levels - I(1)
DLSN - I(0)	-3.822653	-3.752946	-2.998064	-2.638752	0.0086	Stationary at all critical levels - I(0)
CTAN - I(1)	-5.020389	-3.831511	-3.029970	-2.655194	0.0008	Stationary at all critical levels - I(1)
SMGDN - I(1)	-5.433054	-3.752946	-2.998064	-2.638752	0.0002	Stationary at all critical levels - I(1)
VT10N - I(1)	-4.702142	-3.769597	-3.004861	-2.642242	0.0012	Stationary at all critical levels - I(1)
STON - I(0)	-4.962869	-3.752946	-2.998064	-2.638752	0.0006	Stationary at all critical levels - I(1)
SPVN - I(1)	-4.841358	-3.920350	-3.065585	-2.673459	0.0017	Stationary at all critical levels - I(1)

Table 4: Stationarity (Unit root) Results for South Africa

Variable	ADF statistic	1%	5%	10%	Probability	Decision
GDPRS - I(1)	-4.111801	-3.752946	-2.998064	-2.638752	0.0045	Stationary at all critical levels - I(1)
MSGS - I(2)	-4.979844	-3.769597	-3.004861	-2.642242	0.0007	Stationary at all critical levels - I(1)
BKBS - I(1)	-4.587258	-3.920350	-3.065585	-2.673459	0.0028	Stationary at all critical levels - I(1)
DLSS - I(1)	-6.070791	-3.769597	-3.004861	-2.642242	0.0001	Stationary at all critical levels - I(1)
CTAS - I(1)	-5.361121	-3.920350	-3.065585	-2.673459	0.0007	Stationary at all critical levels - I(1)
SMGDS - I(1)	-4.664224	-3.857386	-3.040391	-2.660551	0.0019	Stationary at all critical levels - I(1)
VT10S - I(1)	-4.621736	-3.857386	-3.040391	-2.660551	0.0021	Stationary at all critical levels - I(1)
STOS - I(0)	-3.926084	-3.737853	-2.991878	-2.635542	0.0065	Stationary at all critical levels - I(0)
SPVS - I(1)	-4.414594	-3.752946	-2.998064	-2.638752	0.0022	Stationary at all critical levels - I(1)

The results of the test indicate the order of integration of the variables in consideration. Based on the test statistic, it was found that all of the series considered were stationary either at level I(0) or after first differencing I(1).

The variables - GDPRN, MSGN, BKBN, CTAN, SMGDN, VT10N, STON, and SPVN, for Nigeria were all stationary only after first differencing as shown in table 4.3 above. While, GDPRS, MSGS, BKBS, DLSS, CTAS, SMGDS, VT10S, and SPVS for South Africa were all stationary after first differencing. DLSN for Nigeria and STOS for South Africa were stationary at level.

These test results show fractional integration for both Nigeria and South Africa. This along with the 26year period data available, further reinforce the need for adoption of the Auto Regressive Distributive Lag (ARDL) test as the only feasible methodology.

The unit root test also checks global utility of the study model, which is confirmed.

Table 5 Lag Length Criteria (Model 1 - Nigeria)

VAR Lag Order Selection Criteria
 Endogenous variables: GDPRN MSGN BKBN DLSN CTAN SMGDN VT10N STON SPVN
 Exogenous variables: C
 Date: 10/06/21 Time: 05:09
 Sample: 1996 2020
 Included observations: 21

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-404.9352	NA	1068915.	39.42240	39.87005	39.51955
1	-245.9874	166.5168*	1354.654*	31.99880*	36.47532*	32.97032*

* indicates lag order selected by the criterion
 LR: sequential modified LR test statistic (each test at 5% level)
 FPE: Final prediction error
 AIC: Akaike information criterion
 SC: Schwarz information criterion
 HQ: Hannan-Quinn information criterion
 Source: Author’s computation from E-views 9.

Lag Order Selection Criteria test is a prerequisite for the process of Auto Regressive Distributive Lag (ARDL) test computation. The test indicates the Lag Length that best suites the model and series considered.

Table 6 Lag Length Criteria (Model 2 –South Africa)

VAR Lag Order Selection Criteria
 Endogenous variables: GDPRS MSGS BKBS DLSS CTAS SMGDS VT10S STOS SPVS
 Exogenous variables: C
 Date: 10/06/21 Time: 05:13
 Sample: 1996 2020
 Included observations: 21

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-453.8609	NA	1.13e+08	44.08200	44.52965	44.17915
1	-308.7548	152.0160*	534534.5*	37.97665*	42.45317*	38.94817*

* indicates lag order selected by the criterion
 LR: sequential modified LR test statistic (each test at 5% level)
 FPE: Final prediction error
 AIC: Akaike information criterion
 SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion
 Source: Author's computation from E-views 9.

For Nigeria, Table 5 shows the results of the lag length criteria. All criteria indicators from the test results indicate the sufficiency of Lag Length 1. The LR, FPE, AIC, SC, and HQ all asterisk Lag 1. Based on this, all subsequent tests on Model 1 relating to Nigeria will use lag 1 as maximum lag.

For South Africa, a similar result was generated from the lag length criterion test as shown on Table 6. LR, FPE, AIC, SC, and HQ all asterisk Lag 1 as well. Therefore, all subsequent tests on Model 2 relating to South Africa will use lag 1 as maximum lag.

<i>Table 7 Auto Regressive Distributive Lag (ARDL) Test Estimation (Short – run) – (Model 1 - Nigeria)</i>					<i>Table 8 Auto Regressive Distributive Lag (ARDL) Test Estimation (Short – run) - (Model 2 –South Africa)</i>				
Dependent Variable: GDPRN Method: ARDL Date: 09/28/21 Time: 15:27 Sample (adjusted): 2000 2020 Included observations: 21 after adjustments Maximum dependent lags: 1 (Automatic selection) Model selection method: Akaike info criterion (AIC) Dynamic regressors (1 lag, automatic): MSGN BKBN DLSN CTAN SMGDN VT10N STON SPVN Fixed regressors: C Number of models evaluated: 256 Selected Model: ARDL(1, 1, 1, 1, 0, 0, 1, 1, 1)					Dependent Variable: GDPRS Method: ARDL Date: 10/05/21 Time: 18:23 Sample (adjusted): 2000 2020 Included observations: 21 after adjustments Maximum dependent lags: 1 (Automatic selection) Model selection method: Akaike info criterion (AIC) Dynamic regressors (1 lag, automatic): MSGS BKBS DLSS CTAS SMGDS VT10S STOS SPVS Fixed regressors: C Number of models evaluated: 256 Selected Model: ARDL(1, 0, 1, 0, 1, 1, 1, 1, 0)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*	Variable	Coefficient	Std. Error	t-Statistic	Prob.*
GDPRN(-1)	-0.248096	0.236600	-1.048590	0.3424	GDPRS(-1)	-0.231510	0.305039	-0.758953	0.4766
MSGN	-1.371364	0.314783	-4.356543	0.0073	MSGS	0.199040	0.210809	0.944170	0.3815
MSGN(-1)	1.240061	0.511081	2.426348	0.0596	BKBS	0.934270	0.470798	1.984442	0.0944
BKBN	4.130413	2.215665	1.864187	0.1213	BKBS(-1)	0.687193	0.541302	1.269520	0.2513
BKBN(-1)	-4.266973	2.246847	-1.899094	0.1160	DLSS	6.322638	4.135227	1.528970	0.1771
DLSN	1.411819	0.945286	1.493536	0.1955	CTAS	5.48E-05	6.95E-05	0.787561	0.4609
DLSN(-1)	0.623948	0.637298	0.979052	0.3725	CTAS(-1)	7.04E-05	8.41E-05	0.837379	0.4345
CTAN	0.819137	0.448208	1.827583	0.1272	SMGDS	-0.023305	0.020128	-1.157832	0.2909
SMGDN	0.006989	0.313590	0.022289	0.9831	SMGDS(-1)	-0.070862	0.025054	-2.828371	0.0300
VT10N	-1.427282	2.337945	-0.610486	0.5682	VT10S	0.000551	0.046944	0.011736	0.9910
VT10N(-1)	-4.112117	1.808397	-2.273901	0.0721	VT10S(-1)	0.169619	0.057296	2.960407	0.0253
STON	0.745122	0.539374	1.381457	0.2257	STOS	-0.027291	0.126535	-0.215679	0.8364
STON(-1)	1.096882	0.332125	3.302614	0.0214	STOS(-1)	-0.384386	0.156914	-2.449669	0.0498
SPVN	-0.031330	0.185989	-0.168453	0.8728	SPVS	0.330997	0.175457	1.886482	0.1082
SPVN(-1)	-0.192239	0.188951	-1.017400	0.3556	C	-31.56750	33.88327	-0.931655	0.3875
C	-21.57716	14.08274	-1.532171	0.1861					
R-squared	0.932302	Mean dependent var	5.307350		R-squared	0.935891	Mean dependent var	2.183577	
Adjusted R-squared	0.729208	S.D. dependent var	3.819190		Adjusted R-squared	0.786303	S.D. dependent var	2.789668	
S.E. of regression	1.987417	Akaike info criterion	4.300274		S.E. of regression	1.289590	Akaike info criterion	3.522334	
Sum squared resid	19.74914	Schwarz criterion	5.096100		Sum squared resid	9.978248	Schwarz criterion	4.268421	
Log likelihood	-29.15288	Hannan-Quinn criter.	4.472989		Log likelihood	-21.98450	Hannan-Quinn criter.	3.684254	
F-statistic	4.590498	Durbin-Watson stat	2.829505		F-statistic	6.256469	Durbin-Watson stat	2.013553	
Prob(F-statistic)	0.049128				Prob(F-statistic)	0.016510			
Source: Author's computation from E-views 9.					Source: Author's computation from E-views 9.				

Auto Regressive Distributive Lag (ARDL) Test is employed to identify the short run dynamics among the studied series. The estimations are shown for Model 1 on Nigeria in table 4.7; while that of Model 2 on South Africa is shown in table 4.8.

The ARDL short run test indicates the adjusted R². This statistic is important as it measures the proportion of variations in the dependent variable, explained by only independent variables that truly help explain the dependent variable. It excludes independent variables that do not help in

predicting the dependent variable. For Nigeria, table 4.7 shows that the adjusted R^2 of 0.73 indicated that 73% of changes in economic performance in Nigeria (reflected by GDP_{PRN}) are caused jointly by these dimensions of FD in Nigeria in the short run. Only 27% captured by the error term indicates contribution of other factors outside the dimensions of FD in Nigeria in the short run. In the case of South Africa as indicated in table 4.8 above, the adjusted R^2 of 0.79 indicates that 79% of changes in the economic performance (GDP_{RS}) are explained jointly by changes in the dimensions of FD of the country in the short run. The remaining 21% captured by the error term are other factors outside these dimensions that account for changes in South Africa's economic progression in the short run.

For both models, the Durbin Watson indicates the absence of autocorrelation, suggesting the result is void of spurious observations. For model 1 on Nigeria, the Durbin Watson was 2.8. For model 2 on South Africa, the Durbin Watson was 2.0. The F-Statistic which indicates globally fitness of the significance of the models is statistically significant for both countries. The probability of the F-Statistic in both models are 0.049 for model 1 on Nigeria, and 0.01 for model 2 on South Africa. Both values are above the 5% criteria level (95% confidence level). This indicates that both study models are significant.

At a 0.05 significance level, from table 4.7 on Nigeria, in the short run only the dimensions of financial institution depth - MSGN (money supply) and financial efficiency by markets - STON (stock turnover) are statistically significant. MSGN indicated a negative relationship, which is contrary to our expectation in the short run. It shows that a unit rise in MSGN- Money Supply will bring about a decline in Nigeria's economic expansion by 1.3 units in the short run. STON after one lag was significant and positive, meeting the study's expectation in the short run. This result indicates that a unit rise in STON- stock market turnover will have a lagged effect on Nigeria's economic advance to the tune of 1.097 units' increase in the short run. In the case of South Africa, financial efficiency by markets - STOS (stock market turnover) was also significant after one lag, but negative. The results indicate that a unit rise in South Africa's stock market turnover would lead to a lagged effect on its economic growth to the tune of 0.38 units' decrease in the short run. Although Money supply (MSGS) was not significant in South Africa in the short run, it was positively signed, unlike in the case of Nigeria. Other dimensions that were significant in the short run for South Africa include the dimensions of financial market depth - SMGDS (Stock market capitalization), and financial market access - VT10S (value of traded stocks outside 10 top stocks). South Africa's SMDGS had a significant but negative lagged relationship with its economic expansion in the short run, contrary to our expectation. This indicates that a unit rise in South Africa's Stock market capitalization (SMDGS) would lead to a lagged effect on its economic growth to the tune of 0.07 units' decrease in the short run. In Nigeria, although this dimension (SMDGN) is not significant, but is positively signed as expected in the short run. For South Africa's financial market access - VT10S, in the short run the relationship is significant and positive as expected. The results indicate that a unit rise in value of traded stocks outside 10 top stocks (VT10S) would give rise to a lagged effect on South Africa's output to the tune of 0.17 units' increase in the short run. In Nigeria, value of traded stocks outside 10 top stocks (VT10N)

For bank branches (access of financial institutions)- BKBN and BKBS in both countries their relationship with economic expansion in their respective countries were not statistically significant in the short run. Although each of them was positively signed in the short run as expected. In the case of Nigeria, its lag effect turned negative, although not significant. Surprisingly interest rate spread (efficiency of financial institutions)- DLSN and DLSS which were expected to be negatively signed, had positive signs for both countries in the short run. This is contrary to our expectations. Although

this relationship was insignificant with Nigeria and South Africa’s economic growth respectively in the short run. Bank capital to asset ratio (stability of financial institutions) – CTAN and CTAS were both insignificant yet positively signed in their respective countries in the short run. The positive relationship aligned with our expectation, even though the relationship is not significant. Stock price volatility (stability of financial markets)- SPVN and SPVS were both not significant in their respective countries in the short run. For Nigeria, Stock price volatility- SPVN was negatively signed as expected; but in South Africa – SPVS its equivalent was positively signed.

Table 9 Auto Regressive Distributive Lag (ARDL) Bounds Test – (Model 1 - Nigeria)

ARDL Bounds Test

Date: 09/28/21 Time: 15:51

Sample: 2000 2020

Included observations: 21

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	3.606685	8

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	1.95	3.06
5%	2.22	3.39
2.5%	2.48	3.7
1%	2.79	4.1

Table 10 Auto Regressive Distributive Lag (ARDL) Bounds Test - (Model 2 –South Africa)

ARDL Bounds Test

Date: 10/05/21 Time: 18:52

Sample: 2000 2020

Included observations: 21

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	1.613485	8

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	1.95	3.06
5%	2.22	3.39
2.5%	2.48	3.7
1%	2.79	4.1

The Auto Regressive Distributive Lag (ARDL) Bounds test indicates the prevalent relationship in the long run.

Table 9 indicates the result of ARDL Bounds test for Model 1 on Nigeria. The F-Statistic of 3.6 is above the critical value bounds at of 5% significance level- I0- 2.22 and I1 3.39. Therefore, indicating that there is a long run relationship between dimensions of FD and economic growth in Nigeria at this time.

Model 2 for South Africa has its ARDL Bounds test results indicated on table 4.10. The F-Statistic of 1.6 from the results is not above critical value bounds at of 5% significance level- I0- 2.22 and I1 3.39. This indicates that there is also no long run relationship between dimensions of FD and output in South Africa at this time.

Table 11 Auto Regressive Distributive Lag (ARDL) Long Run Form - (Model 1 - Nigeria)

ARDL Cointegrating And Long Run Form

Dependent Variable: GDPRN

Selected Model: ARDL(1, 1, 1, 1, 0, 0, 1, 1, 1)

Date: 09/28/21 Time: 15:55

Sample: 1996 2020

Included observations: 21

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MSGN)	-1.371364	0.314783	-4.356543	0.0073
D(BKBN)	4.130413	2.215665	1.864187	0.1213
D(DLSN)	1.411819	0.945286	1.493536	0.1955
D(CTAN)	0.819137	0.448208	1.827583	0.1272
D(SMGDN)	0.006989	0.313590	0.022289	0.9831
D(VT10N)	-1.427282	2.337945	-0.610486	0.5682
D(STON)	0.745122	0.539374	1.381457	0.2257
D(SPVN)	-0.031330	0.185989	-0.168453	0.8728
CointEq(-1)	-1.248096	0.236600	-5.275135	0.0033

Table 12 Auto Regressive Distributive Lag (ARDL) Long Run Form - (Model 2 –South Africa)

ARDL Cointegrating And Long Run Form

Dependent Variable: GDPRS

Selected Model: ARDL(1, 0, 1, 0, 1, 1, 1, 1, 0)

Date: 10/05/21 Time: 19:01

Sample: 1996 2020

Included observations: 21

Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MSGS)	0.028989	0.210809	0.137513	0.8951
D(BKBS)	1.029834	0.470798	2.187425	0.0713
D(DLSS)	-1.139489	4.135227	-0.275557	0.7921
D(CTAS)	0.000055	0.000070	0.787561	0.4609
D(SMGDS)	-0.023305	0.020128	-1.157832	0.2909
D(VT10S)	0.000551	0.046944	0.011736	0.9910
D(STOS)	-0.027291	0.126535	-0.215679	0.8364

D(SPVS)	0.330997	0.175457	1.886482	0.1082
CointEq(-1)	-1.607269	0.305039	-5.269060	0.0019

The ARDL Long Run form test indicates the speed of adjustment in the long run.

In Table 11 showing results for Nigeria, the CointEq. value is negatively signed as required (-1.2) and statistically significant at an alpha of 5% (0.003). This indicates that errors which occurred in the short run were corrected to the tune of 1.2 units. The results also indicate that the dimension of financial institution depth (MSGN- Money Supply) is statistically significant, and negatively signed. This is very similar to the outcome of the ARDL short run test presented in table 4.6 above.

Model 2 Long run form test is indicated in Table 12 above for South Africa. Like that of Nigeria, the CointEq. is significant at 0.05 significance level with prob-value of 0.0019. The coefficient is also negatively signed as required, -1.6. This indicates that errors which occurred in the short run were corrected to the tune of 1.6 units. Unlike in the case of Nigeria, none of the variables is statistically significant at 0.05 significance level.

Discussion of Findings

The Auto Regressive Distributive Lag (ARDL) Bound test analysis for both countries revealed no significant relationship between composite FD indicators and output in the long-run in both countries. However, the ARDL long run form test, indicated a significant and negative relationship in Nigeria only. The same result was indicated in the short run ARDL test for Nigeria, also. This indicates that an increase in Money supply perhaps through expansionary monetary policies, would rather reduce output than enhance it. In the case of South Africa, though positive, yet insignificant. The findings in Nigeria from the long run form test short run relationship are also contrary to our a priori expectation. From empirical studies, these findings also contradict with that of Yousuo and Ekiou (2020). In spite of the contrary findings, these results agree with the findings of some other studies in Africa and other parts of the world. These findings agree with that of Michael, Effah, Joel and Nkwantabisa (2021). They explained that the negative relationship could be as a result of financial instability, domination of the financial market by government (large borrowings), and the problem of huge non-performing loans. Nkoro and Uko (2013), attributed this finding the presence of unfavorable macroeconomic environment which could impact negatively on business organizations and impede productivity. According to them, in 2013 Nigeria was rated the most expensive place to conduct a business. Harsh economic conditions promoted by lack of basic infrastructures have occasioned the closure or relocation of most major business firms from the country in the past few years. The ARDL Bound test and ARDL long form tests also indicated no significant relationship between bank branches and economic growth for both countries. This means irrespective of efforts made in expansion of financial access through bank density, there has been no significant impact on national productivity for Nigeria or South Africa. This is contrary to our a priori expectation, as it contradicts the suggestions of theories by McKinnon (1973) and Čihák, et al (2013). The insignificant relationship also contradicts the findings of Dinabandhu, and Debashis, (2018). This means irrespective of efforts made in expansion of financial access through bank density, there has been no significant impact on national productivity for Nigeria or South Africa. This is contrary to our a priori expectation. Migap, Ngutsav, and Andohol (2020) attributed the dismal effect of financial institution access efforts on the economy, to the over concentration of banks in the urban centers, which is the trend in most African countries, Nigeria and South Africa inclusive. The ARDL short run test and ARDL Bound test both confirmed an insignificant relationship between interest rate spread and

economic growth in Nigeria and South Africa. From the long run form test, it remained positively signed for Nigeria, and turned negative for South Africa; although insignificant in both countries. These findings are contrary to our a priori expectation, and empirically contradict that of Mohamed and Yao (2017). Ajayi, Oladipo, and Nwanji (2017) explained that literature has shown that in Nigeria, interest was inconsequential for economic progression, and the economy's growth was rather traceable to growth in savings deposit. For financial stability by institution, the short run analysis showed that although the variable was positively signed, yet insignificant. This further confirmed the non-existence of a significant relationship between Bank capital to asset ratio and GDP growth in Nigeria and South Africa respectively. These findings contradict our a priori expectations. The finds are also not in agreement empirically with findings of Sotiropoulou, Giakoumatos, and Petropoulos (2019). It rather conformed with the findings of Mande, Salisu, Jimoh, Dosumu, and Adamu (2020). Considering financial development through the market, for financial depth (stock market capitalization), in the short run, the ARDL test showed significant yet negative lagged relationship with economic expansion in South Africa only. In the long run no significant relationship was found in both countries. This also contradicts our a priori expectation. From empirical studies, it supports findings of Osakwe, Ogbonna and Obi-Nwosu (2020). Karimo and Ogbonna (2017) explained that these findings could be as a result of the small size of the markets in Africa. For financial access by markets, value traded excluding top 10 traded companies to total value traded no significant relationship was found in the long run. This means irrespective of efforts made in expansion of financial access through value traded outside top 10 stocks, there is no significant impact on national productivity. This is contrary to our a priori expectation. Although not a very popular measure due to scarcity of data; yet this finding hold the Schumpeterian independent stage hypothesis. In the short run analysis, however, this variable was found to have a significant and positive relationship with economic expansion, only in South Africa. This implies that, trading activities related to smaller companies in the stock market asides the top 10 trading stocks, actually influence South Africa's economic expansion in the short run. According to Hassan (2013), the Johannesburg Stock Exchange (JSE) has been consistently rated as by far the largest in Africa, with over 400 firms listed, although number of firms listed has declined steadily between the late 1990s. For financial efficiency by market, stock market turnover and growth had no significant long-run relationship in Nigeria and South Africa. However, in the case of Nigeria the short run relationship was positive as expected but a lagged effect. For South Africa, the short run relationship, although significant, yet negative; contrary to expectation. Owusu (2018) explained that a country with under-developed banks but a well-developed stock markets (increasing the development of the stock markets relative to banks) does not significantly promote economic progression. Perhaps this could explain the reason for South Africa's Stock market failing to make the expected positive impact on its economy, in spite of its well celebrated stock market activities. Financial stability by market- stock price volatility in both countries were found to be insignificant in the long run. The findings conform to Louw (2016) who suggested that where the financial system is comfortable in being non-significant in growing the economy, its stability would be of no consequence in the economic expansion process. In Nigeria where the relationship was found to be negative, in both the long and short run, Mande, Salisu, Jimoh, Dosumu, and Adamu (2020) explained the possible effect. They suggested that, in the event of any form of instability in the stock market may prompt investors to seek more riskless investments. This would consequently, harm economic progression.

5. Conclusion and Recommendations

From the findings, we conclude that:

- Amongst the explanatory variables of this study (money supply, bank branches, interest rate spread, capital to asset ratio, stock market capitalization, value traded excluding top 10 traded companies to total value traded, Stock Market Turnover, and stock price volatility)- only money supply is valuable in determining economic growth in Nigeria. Whereas, the rest are not valuable. For South Africa, none is statistically important in predicting her economic growth.

This study therefore makes the following recommendations:

- For money supply as a measure of financial depth to give rise to desired positive and significant impact on the economy for countries, more Point of Sale (POS) machines and other allied financial services and products must be created. They must also be made massively available to help mop more cash in circulation into the formal financial system. This would also ensure effectiveness of monetary policies in the economies.
- To intensify the possible positive relationship between financial access through bank branches in Nigeria and South Africa, more rural bank branching schemes, the recent mobile banking products and kiosks must be further enhanced. This would intensify bank density and increase banking habit which should increase deposit mobilization and credit allocation in Nigeria and South Africa respectively.
- For financial institutions' efficiency to make the desired impact on economic growth in Nigeria and South Africa, the establishment, sustenance and effective management of development finance institutions is necessary. This should enhance financial access and deepen competition for the Banks and reduce the cost of lending further. Also, more competitive banking environments can harness financial resources into productivity growth.
- For bank capital to asset ratio as a measure of stability of financial institutions to make desired impact in Nigeria and South Africa, regulated capital needs to be increased to enhance the quality and soundness of financial institutions in the intermediation process. A relatively high capital adequacy ratio helps banks absorb losses and reduces the likelihood of insolvency.
- For Nigeria's stock market capitalization and stock market turnover to give desired significant impact in the economy, there is need to growth the size of the stock market. The current NSE growth board scheme initiated to encourage listing of companies with high growth potential through less stringent listing requirements, must target more firms outside the oil and gas sector to ensure stability and encourage further foreign participation.
- In South Africa, to reverse the negative effect of stock market capitalization and stock turnover, there is need for the stock market to adopt more remote operating measures. This should be done, such that even in the face of a pandemic or economic shut down as was the case within the period of study, the market can still function and continue to expand. This would mean digitalizing the stock system fully asides in-person operations. Also, use the Exchange growth board to encourage the technology sector and companies whose production processes are more technologically based to register and trade in the exchange, as they survived and thrived through the period.
- Value traded excluding top 10 traded companies should be able to make desired impact on the economies of Nigeria and South Africa, the current scheme run for MSMEs (Micro, Small and Medium Scale Enterprise) in both stock markets (Alternative Securities Market - ASeM board- Nigeria and Johannesburg Stock Exchange Alternative Market- AJSE AltX- South Africa) have to be enhanced. Further advertisement with the goal of enhancing public financial literacy be embarked on from the

cities to the sub-urban regions to create awareness of these opportunities for these MSMEs as well as investors. As the MSMEs seize the opportunity to register and participate in the capital market, they gain access to long term funds at cheaper rates. This gives a greater chance for these businesses to thrive and expand, which should reflect positively in aggregate production. This would as well boost trading activities further.

- Stock price volatility as an indicator of stability of the financial market, can provide desired impact on economic growth in Nigeria if further market liberalization is encouraged. Price volatility can also be further indirectly influenced by factors such as interest rates through monetary policies to reduce the effect of inflation and any form of repression that may increase volatility.

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Appendix 1: Nigerian Data

YEAR	GDPRN	MSGN	BKBN	DLSN	CTAN	SMGDN	VT10N	STON	SPVN
1996	4.195924	9.063329	3.87	6.7775	-	24.89339	0.615986	2.474498	-
1997	2.937099	9.725269	3.99	10.62583	-	23.06197	0.91636	3.973469	-
1998	2.581254	10.93903	4.01	8.075833	-	18.90276	1.116254	5.905246	-
1999	0.584127	12.76339	4.01	7.479167	14.8765	4.951071	0.18965	3.830479	8.57038
2000	5.015935	14.66963	4	9.583333	14.05689	4.7328	0.9325	4.2345	12.139
2001	5.917685	15.90097	4.1	8.1825	14.0934	3.6107	0.228555	5.34598	12.9668
2002	15.32916	13.527	4.3	8.100833	15.01789	2.488777	0.4567	7.3245	12.7797
2003	7.347195	13.02659	4.5	6.496667	15.2054	6.993	0.93889	8.54509	14.048
2004	9.250558	11.75879	4.7	5.482494	15.39845	11.63312	1.23226	10.59269	24.18
2005	6.438517	11.30051	4.18	7.415833	15.45687	12.62901	1.109251	8.783357	18.645
2006	6.059428	11.72897	3.78	7.141667	15.343	13.90511	1.523731	10.95807	14.6085
2007	6.59113	19.29109	5.21	6.650833	15.66348	30.80067	6.298354	20.44875	15.7599
2008	6.764473	23.81187	6.27	3.268333	17.95485	14.2603	4.960489	34.7853	15.0521
2009	8.036925	25.14416	6.48	6.0325	4.079681	11.03994	1.539238	13.94245	26.0195
2010	8.005656	21.35585	6.56	11.06417	1.904068	13.98408	1.412385	10.09995	27.528
2011	5.307924	22.47905	6.41	10.3275	10.61782	9.636792	0.956047	9.920804	17.7042
2012	4.230061	24.92823	5.82	8.386667	10.82064	12.33919	0.898526	9.1	11.8921
2013	6.671335	25.44805	5.9	8.7775	10.39229	15.84647	1.224295	8.0532	12.3282
2014	6.309719	22.68961	5.61	7.210833	10.42327	11.48144	0.93893	8.177811	12.9917
2015	2.652693	22.36683	4.98	7.700833	12.37568	10.26572	0.839125	8.17405	19.117
2016	-1.61687	27.37879	4.74	9.372815	11.37169	7.362519	0.373074	5.358713	20.5805
2017	0.805887	24.78142	4.44	7.998847	5.679811	9.904982	0.587126	5.867925	16.9689
2018	1.922757	25.36246	4.3	7.203185	8.107747	7.935877	0.651124	8.204812	17.3481
2019	2.208429	23.92961	4.5	6.47607	7.294229	9.801294	0.606223	6.1851	19.3241
2020	-1.79425	25.04167	4.9	8.995394	6.262093	13.08578	0.57413	4.387436	13.465

Appendix 2: South African Data

YEAR	GDPRS	MSGS	BKBS	DLSS	CTAS	SMGDS	VT10S	STOS	SPVS
1996	4.299999	49.36725	-	4.6125	-	163.6572	18.05234	11.03058	11.1388
1997	2.600002	52.49439	-	4.625	-	150.7606	27.57068	18.28772	12.3961
1998	0.500001	55.07585	-	5.29583	-	122.3272	39.3998	32.20853	23.9464
1999	2.399996	55.73438	3.45	5.75917	4.7234	190.1014	53.29561	28.03535	26.2248
2000	4.200003	52.7105	3.45	5.30417	4.896787	149.8225	51.70203	34.50885	19.5357
2001	2.699995	57.30775	3.29	4.4	46789	121.3611	29.10128	23.97908	19.8934
2002	3.700382	58.25776	4.5	4.13	4.3894	157.5984	41.2932	26.20153	17.1333
2003	2.949079	60.63115	4.56	4.55	5.456789	148.7806	27.99245	18.81459	13.7772
2004	4.554553	61.59694	4.69	4.73833	5.59048	193.5866	36.64568	18.92986	17.7434
2005	5.277056	66.97005	7	4.5825	5.6098	213.0987	43.18271	20.26418	20.4779
2006	5.603798	73.1851	7.23	4.02833	6.789036	261.8305	63.9599	24.42798	23.5825
2007	5.360476	79.08595	5.88	4.01417	5.7892	276.6007	86.07587	31.11918	34.376
2008	3.191047	80.79989	7.68	3.5125	5.679644	168.3231	70.66205	41.98	23.9153
2009	-1.53809	77.67791	9.07	3.17167	6.654652	269.9984	73.50014	27.22244	17.1075
2010	3.039731	75.79961	9.77	3.36833	7.046002	246.4389	73.85752	29.96991	16.8302
2011	3.284168	74.63563	10.24	3.3275	7.226878	189.4816	54.23169	28.62109	13.3794
2012	2.213355	72.94244	9.92	3.31333	7.789356	229.0306	57.24081	24.99265	13.5433
2013	2.485201	71.01361	10.07	3.3475	7.920265	257.0165	63.31293	24.6338	14.4063
2014	1.846992	70.87028	10.83	3.32417	7.577384	266.1495	70.01807	26.3078	17.9375
2015	1.193733	73.46572	10.42	3.26333	7.038238	231.7058	73.66917	31.79427	14.8816
2016	0.399088	72.40453	10.13	3.28667	8.198022	321.0045	135.7951	38.36802	14.9767
2017	1.414513	72.18008	10.4	3.12917	8.796157	352.1564	117.2114	25.73785	15.0789
2018	0.787056	72.77634	10.16	3.085	8.421543	234.9589	80.10353	34.09257	13.436
2019	0.152583	74.12479	9.59	3.116667	8.505467	300.5823	81.04467	33.1328	14.555
2020	-6.9596	82.80305	9.22	2.825	7.886975	348.2763	97.32002	27.94333	14.0236