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Revisiting the Financial Development and Economic Growth Nexus in Nigeria: Issues at Stake

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Abstract: This research work contribute to the never ending debate in the finance-growth literature by examining the complimentary and substitution effects of banks and stock market as they both affect economic growth in Nigeria. A revisit of this subject matter is necessary to check the preparedness of Nigeria's financial system to key into the global finance goal of 'financialization' and also to overcome financial issues militating against her economic growth. Dwelling on the issues of sustainability and liquidity which is paramount for the gains of financial development to translate to economic growth, linear and interaction models that equate bank, stock market and growth variables to economic growth are specified and estimated. Particularly, our findings reveal the importance and strength of the value of stock traded to economic growth when it interacts with bank variables and when on its own. Contrary to previous studies in developed countries, substitution effects are observed in the short run while complimentary effects are observed in the long run. It is believed that this could have been caused by too much of government intervention and control. We therefore recommend an institutional-centric approach for Nigeria's financial system.

Keywords: Banks; Stock market; Substitution- effect; Complementary-effect; Absorptive-capacity

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1. Introduction

In any financial system, intermediation between lenders and borrowers is a basic function. Financial system itself is made up of financial institutions and markets which are either bank or stock market based. Therefore, development in the financial

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system has been attributed to the bank based financial development and stock market development.

Banks maintain a closer relationship with individuals and firms and serve as intermediaries easing the information friction between savers and borrowers. They specialize in the assessment of potential borrowers and by so doing, reduce the cost of acquiring and processing information about individuals and firms. In addition, banks function as asset and maturity transformers. They reduce liquidity risk by pooling savings and by investing in both short term and long term assets. They also reduce transaction costs of investors by pooling and sharing of risk (Beck, 2003).

Above all other benefits, stock markets offer liquidity to investors. Liquid markets provide investors the incentive to invest based on available information and the likelihood to realize a good return on investment by trading in the market. In addition, stock market provides the opportunity to raise long term capital. Liquidity risk is also mitigated in the stock market as investors can sell rapidly converting equity claims to cash (Levine, 1991).

The stock market has become the most vibrant in the financial market. As a matter of fact, it accounts for a larger percentage of the activities of the financial market (Smith, 2001; Rousseau & Watchel 2000; Kim & Singal 2000). The stock market provides a platform for trading between the surplus unit and the deficit unit based on information. Unlike Banks, the stock market does not have a direct relationship with players however, its operation is guided by efficiency measured by how well available information on the side of both the firm and investor is reflected in stock prices (Beck, 2003).

Bank development contribute to economic growth through the credit administered to industries, especially agriculture (Werner, 2015; Hahn, 2015). Stock market also contribute immensely to economic growth through the financial instruments offered and traded in stock exchanges, reduction in transaction cost, profitable returns on equity investments, increase in the number of listed companies and most importantly, facilitation of international capital flows (Mishkin, 2004; Levine, 2003).

Overtime, there's has been a debate regarding the relative roles played by the bank based and the market based arm of the financial system in enhancing economic growth and development. The argument has centered on the twin issues of liquidity and sustainability in the operation of the two and the investment opportunities they provide.

On the one hand, proponents of the bank-based are of the opinion that banks provide highly liquid securities inducing higher quality and quantity of investment. This is unlike the investment in the market-based which is considered highly volatile and sensitive to fluctuations and shocks in security prices. In addition to the liquidity risk, they may not also be sustainable in the long run (Choi & Cook, 2006). Bank

based system is reputed for providing a platform for intimate relationship between banks and business with information passing freely from one end to the other thereby overcoming one of the major fallouts of imperfect market based system. This relationship makes it possible for investments to continue from banks to business, business to banks even in the face of recession (Hoshi et al. 1990). In addition, the bank based is also reputed to be a facilitator of government industrial policies. Directives on special lending rates or specialized credits for industrial sector is easily carried out and achieved via the bank-based system than the market based system (Pollin, 1995).

On the other hand, the market based system school of taught argue that the bank-based system lack the ability to efficiently allocate capital to all the sectors where it is needed, thereby making them vulnerable to concentration risks. The high concentration of loans coming as a result of intimate relationships with some firms and individuals is most likely to result in high debt-ratio. In terms of information efficiency, bank based may be able to overcome the issue of adverse selection but the moral hazard is almost insurmountable for them (Greenspan, 1999)

While the theories on financial intermediation and markets predicts a positive relationship among financial intermediaries, markets and economic growth, empirical evidences available suggest there are counter-productive effects that could result when banks and stock market operate side-by-side. Empirical evidences on the separate and joint effect of bank development and stock market on economic growth (Ezeibekwe, 2019; Osakwe & Ananwude, 2017; Lazarov, Miteva-kacarski & Nikoloski, 2016; Kadenge & Tafirei, 2014; Beck, 2003) reveal that the two could have different effects on economic growth at different stages of development of a country. Bank development is said to precede stock market development and at the earlier stage, the existence of both could result in some positive interactions and hence, favourable consequences for economic growth (Dermitriades & Rousseau, 2016; Soultanaeva, 2010; Arestis, Demetriades & Luintel 2001; Stiglitz, 1985). At another stage of development, the two could offer services that serve as substitutes resulting in their negative interactions which could have negative consequences on economic growth (Stiglitz, 1985).

Empirical evidences of bank development preceding stock market development have led to the investigation of the likely relationship between the two as they both affect economic growth. The spectrum of investigation cuts across the developed and developing countries. Zhang et al. (2012) using data from China under the least square framework found that bank development is positively related to stock market development and both exert a positive effect on economic growth. Hewartz and Walle, (2014) using annual data of 1975-2011 for 73 economies comprising of high income, middle income and low income with a flexible semi-parametric approach concluded that a positive relationship exist among bank development, stock market

development and economic growth. However, they pointed out that the positive relationship is stronger in high income economies. Apart from showing a positive sign of relationship, their results also show that banks and other financial intermediaries determine the stock market activities thereby making both complements rather than substitutes. However, some other studies examining the relationship using data from developed and developing countries have arrived at a negative association between the two (Ayadi et al., 2015; Mhadhbi 2014; Narayan & Narayan, 2013; Singh, 1997; Garcia, 1986). Their argument was that the 'final arbiter' role played by the Central Banks in controlling and monitoring the money supply and credit creation could instigate a negative movement in the stock market.

Dermitriades and Rousseau (2016), Yartey (2008) clarified the conflicting results above by arguing that relationship between the two systems is non-monotonic. It could be positive or negative at different times. They explain that at the early stage of stock market development, it could serve as a complement to bank development thereby bringing positive effects and positive correlation. However, as the stock market begins to develop alongside the developed bank based system, the two become competitive and negative effects and correlations could be observed. Beck (2003) argue for non-linearity in the relationship between stock market activity and economic growth. He concludes there are threshold effects from bank development to economic growth. Beyond a threshold level of bank development, economic growth and stock market activity are positively related. The study could not establish a correlation in bank, stock market and economic growth variables in countries with small stock markets. Therefore, stock market could have no significant or little impact on the economic activities of these countries. The threshold effect was also supported by Samargandi, Fidrmuc & Ghosh (2015); Law & Singh (2014). Some other authors dwelling on the threshold effect have discovered the vanishing effect (Arcand, Berkes & Panizza 2015; Rousseau & Watchtel, 2011). The vanishing effect refers to the negative effect on economic growth that could result after bank development (credit to private sector) has reached the threshold.

Pradhan, Arvin, Bahmani, Hall and Norman (2017) examined the finance-growth nexus in ASEAN region using data from 1991-2011 (using method). They established a long run co-integration relationship in banking sector development, bond development, stock market development, insurance sector development and per capita (similar to the conclusion of Ghirmay, 2004). They however raised concerns about the choice of financial development proxy as each can have a different causal effect on economic growth. Their result shows a uni-directional causality from banking sector development to economic growth, bi-directional causality between stock market development and economic growth, and insurance sector development and economic growth.

Investigation of the relationship between the bank based and market based system in Africa and Nigeria specifically has come in varying degrees with too many controversies trailing the results. This has obstructed the flow in understanding the true position and relationship that exist between the two all important parts of the financial system. Osinubi and Amaghionyediowe (2003) using Nigerian data for the period 1980-2000 suggest that stock market development has no significant impact on economic growth in Nigeria. They adduce the inability of the stock market to contribute significantly to economic growth to the existence of retrogressive policies which distort the effectiveness of the transmission link between stock market activities and economic growth. Odhiambo (2010) using data from South Africa establish that stock market activity is positively determined by some macroeconomic variables (real income and inflation rate).

Studies conducted in recent past on the effectiveness of the stock market and money market in Africa separately and jointly have produced more facts supporting the initial position of authors on the subject matter. For instance, Adajaski and Biekpe (2008) using samples of 14 African countries consisting of low income, middle income and upper middle income, were able to establish that stock market development has had a positive impact on economic growth in upper middle income economies (method). The upper middle income economies are moderately capitalized while the low middle incomes and low income economies especially have less capitalized stock markets. This is similar to the conclusion of Shen & Lee (2006); Hewartz&Walle (2014).

In South Africa, Nigasha and Odhiambo (2014) using the Autoregressive Distributed Lag (ARDL) bounds test with data from (1980-2012) conclude that while a positive relationship exist between bank based activities and economic growth, there is no relationship between the stock market activities and economic growth both in the long and short run. Nigasha and Odhiambo (2015) repeated the same study in Kenya using ARDL. The result shows that market based activities had a positive impact on economic growth. The bank based activities were found to have no impact on the economic growth of Kenya.

In Nigeria, Olofin and Afangideh (2008) establish that a positive relationship exist between stock market development and economic growth. The authors employ three stage least squares with data from 1970-2005. They were the first to combine the stock market based activities with the bank based activities for Nigeria in their analysis. Their result show that both bank and stock market activity have significant impact (jointly and separately) on the real domestic sector of the economy thus supporting the views of Levine (1998). However, the study did not look at the interaction effects between the two.

Ewah, Esang and Bassey (2009) carried out a study on the effect of stock market efficiency on Nigerian economic growth. Amongst others, the coefficient of the log

of money supply is found negative. Arising from this, the authors followed the path of Ndebbio (2006) to raise the issue of low absorptive capacity of the Nigerian stock exchange. This they believe explains the negative relationship between money supply and stock market efficiency. The low absorptive issue was also raised by Abaenewe and Ndugbu (2012). They concluded that the equities market has not significantly absorbed the monetary policy impulses and therefore cannot be taken as a good transmission channel for monetary policy implementation. Osamwonyi and Evbayiro-Osagie (2012) analyze the relationship between macroeconomic variables and stock market index in Nigeria. Only two of the macroeconomic variables which are bank based (exchange rate and money supply) were found to have significant effects. While money supply has a negative effect on stock market index (SMI), exchange rate has a positive effect.

Oluwatosin et al. (2013) re-iterated the low absorptive capacity issue when they investigated the impact of capital market on economic growth in Nigeria. Two of their findings are relevant to this study. First, capital market variables (market capitalization and number of listed securities) jointly predict economic growth insignificantly whereas, value of total transaction a major indicator in the stock market independently and significantly predicts economic growth. Second, market capitalization another major indicator of stock market development has a negative effect on economic growth. Further studies carried out in the recent past on the relationship between stock market development and economic growth (Alajekwu & Ezeabasili, 2012; Maduka & Onwuka, 2013; Osho, 2014) all have findings which reveal the negative effects of stock market on economic growth. Although, some like Maduka and Onwuka (2013) used the entire financial structure without separating stock market from bank based finance, still Yadichuckwu and Chigbu (2014) examined the impact of capital market on economic growth in Nigeria and concluded that an inverse relationship exist between stock market capitalization and long run economic growth.

Some studies in the recent past have explored the causal relationship between stock market and economic growth. Adefeso et al (2013) used variables from both the stock market activities and bank based activities to analyze causality with economic growth. First, they established a long run relationship amongst all (i.e stock market activities, banking activities and economic growth). Their causality result reveals a uni-directional causality which flows from economic growth to both stock market and banking activities. Earlier, Chizea (2012); Kolapo and Adaramola (2012) had concluded that a bi-directional relationship exist between stock market development and economic growth. However, Osuala et al. (2013); Ojofedo and Edez (2014) maintain that causality runs from market capitalization to GDP (proxy for economic growth). Ogunmuyiwa (2010); Ovat (2012) raised the issue of market size while examining the causality between stock market and economic growth. Their causality

test reveal a bi-directional causality between stock market and economic growth with market size having little or no effect on economic growth.

Currently, international financing is looking toward 'financialization' which is the emergence of the financialized capitalism (Foster et. al. 2021; Mader 2017; Sawyer, 2013). It is important to know how banks and stock markets in different countries especially the emerging economies at different stages of their development interact for the achievement of this global finance goal. This research therefore contributes to the on-going debate on the efficacy of either the bank based with the restrict focus policy, the market based with the structure focus policy or a concentration on financial services offered by either the bank or the stock market.

The recent spate of bank mergers and acquisitions in Nigeria (KPMG 2019; Otobo 2016), high inflation rate (Focus Economics, 2021), unstable exchange rate (Nwanma, 2021), depletion in market capitalization (Akinmade, Adedoyin & Bekun, 2020) in the Nigerian stock exchange coupled with the need to achieve the economic recovery growth plan may be a signal for another reform in Nigeria's financial sector. For policy considerations, we therefore ask; does the Nigerian stock market provide substitutable or complementary financial services with the banking sector? In this paper, we seek to examine the interaction that exist between the stock market and banking sector as they both affect economic growth. Issues bothering on the stock market, bank development and economic growth relationship will also be analyzed. The rest of the paper is divided into four parts. Section 2; Data and methods, Section 3; Result and discussion, Section 4; Conclusion and recommendation.

2. Data and Method

We recognize the twin issues of liquidity and sustainability upon which the debate on bank based or stock market based development is premised. Therefore we follow the works of (Beck et. al. 2017; Prats & Sandoval, 2016; Yadichukwu & Chigbu, 2014; Adjasi & Biekpe, 2008; Gamolya 2006, Demitriades & Hussein, 1996, De-Gregorio & Guidotti, 1995) to use the value of stock traded ratio (a measure of market liquidity) and market capitalization ratio (a measure of market sustainability). Banking sector development indicators as found in the extant literature generally measure depth of financial services and financial innovations. Bank credit which is measured as credit to private sector to GDP (Levine et. al., 2014; 2000; Adu, Mabuah & Mensah, 2013; Beck et. al., 2000) captures the depth of financial services, while both M2/M1 broad money to narrow money, M2 to GDP capture financial innovations (Qamnizzaman & Wei, 2017; Bara & Mudzingiri, 2016, Ansong et. al. 2011). Economic growth is measured using the growth in nominal GDP (Dyan &

Sheiner 2018). This is done to conform to the measure of depth (development) already stated for both the stock market and banking sector.

2.1. Modelling and Estimation Issues

Given our focus on the interaction of bank and stock market development in the short run and long run and their effects on economic growth, we first specify a basic growth regression that incorporates variables of bank development, stock market development and economic growth. This is followed by an interaction model. The interaction model is meant to resolve the complementarity or substitutability issue, the absorptive capacity issue and the short run and long run effects of bank development and stock market development on economic growth.

2.1.1. Incorporating Variables into the Basis Growth Model

We consider a growth regression which incorporates explanatory variables that originally determine the level of growth in any economy. They are; physical capital, human capital and population growth. Physical capital is proxied with GFCF/GDP, Human capital is proxied with human capital investment into education and health– HCE and HCH) Osoba and Tella (2017). Human capital index, a better indicator of human capital accumulation is not available for Nigeria for the duration of years our research covers (1981-2019). Trade openness- (export + import)/GDP (Yanikkaya 2003; Samargandi, Fidmuc, and Ghosh 2015; Menyah et al. 2014) and inflation- CPI (Levine et. al., 2000; Christopolous & Tsionas, 2004).

In addition to the variables above, we introduce policy variables to the growth regression representing bank development and stock market. The result is the following empirical specifications stated in the functional form;

$$GDP = f\left[K', HCE, OPEN, IF, MKR, VST, BCRED, INNOV\right]. \quad (1)$$

Where;

$K' = GCF / GDP$ = gross capital formation as percent of GDP, HCE = Human Capital Expenditure on Education, OPEN = degree of trade openness, MKR is Market capitalization ratio, VST = volume of stock traded as a percent of GDP, IF = Inflation rate, BCRED = bank credit (measured as credit to the private sector as share of GDP, INNOV= financial innovation (measured broad money as share of GDP)

2.1.2. Interaction Model

Using the standard linear-interactive model where x and z affect y and the effects of x and z on y each depend on the other variable, the model is expressed as a relation from x and z to y along with an intercept and then to allow the intercept and the co-

efficient on x and z each to depend on the level of x and z. The interactive model for the estimation of y using the linear regression is given thus as;

$$Y = \gamma_0 + \beta_x X + \beta_z Z + \beta_{xz} XZ + \varepsilon \quad (2)$$

The co-efficients expected from the linear-interactive model above are;

$$\beta_x = \gamma_1 + \delta_1$$

$$\beta_z = \gamma_2 + \delta_3$$

$$\beta_{xz} = \delta_2 + \delta_4$$

We go further to state explicitly our interaction model for this study. We incorporate the bank development, stock market development and economic growth variables identified earlier into the model. We also introduce some control variables which are considered essential in the growth equation. They are human capital investment in education, physical capital, trade openness and inflation. The resulting equations are presented below;

$$\Delta GDP_t = \beta_0 + \beta_1 S1 + \beta_2 B1 + \beta_3 S1 * B1 + \beta_4 H1 + \beta_5 H2 + \beta_6 P1 + \beta_7 OP + \beta_8 IF + \varepsilon_t \quad ...(3)$$

$$\Delta GDP = \gamma_0 + \gamma_1 S1 + \gamma_2 B2 + \gamma_3 S1 * B2 + \gamma_4 H1 + \gamma_5 H2 + \gamma_6 P1 + \gamma_7 OP + \gamma_8 IF + \mu_t \quad .....(4)$$

$$\Delta GDP = \lambda_0 + \lambda_1 S2 + \lambda_2 B1 + \lambda_3 S2 * B1 + \lambda_4 H1 + \lambda_5 H2 + \lambda_6 P1 + \lambda_7 OP + \lambda_8 IF + \psi_t \quad .....(5)$$

$$\Delta GDP = \tau_0 + \tau_1 S2 + \tau_2 B2 + \tau_3 S2 * B2 + \tau_4 H1 + \tau_5 H2 + \tau_6 P1 + \tau_7 OP + \tau_8 IF + \upsilon_t \quad .....(6)$$

Where:

$$S1 = MKR, S2 = VST, B1 = \frac{CPS}{GDP}, B2 = \frac{M_2}{GDP}, P1 = \frac{GCF}{GDP}, H1 = HCE,$$

$$H2 = HCH, IF = Inflation, OP = OPEN$$

2.2. Data Collection

We source for data on the specified variables from the Central Bank of Nigeria annual report; statistical bulletin (2020), the Nigerian stock exchange bulletin (2020) and World Development Indicators (2020).

3. Results and Discussion

3.1. Descriptive Statistics

The statistics for bank, stock market and some other macroeconomic variables used in this study are presented in table 1. The test of normality reveals that all the variables are significant except the log of expenditure on health and education, market capitalization and trade openness. All the variables also satisfy the conditions for skewness and kurtosis as their values fall between < 10 for kurtosis and < 3 for skewness (Kline 2009), except for some overshoots coming from value of stock traded and gross capital formation. The abnormal movement in these set of variables is understandable as financial variables, especially those of the capital market are known to be highly volatile and characterized by kurtosis and skewness (Ivanovski, Stojanovski & Narasanov, 2015).

Table 1. Descriptive Statistics of the Variables

	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Prob.	Obs
B1	9.21	8.17	19.63	4.96	3.56	1.19	4.00	10.90	0.00	39
P1	0.16	0.14	0.58	0.07	0.10	3.19	13.19	234.67	0.00	39
GRATE	3.15	4.20	15.33	-13.13	5.47	-0.87	4.64	9.23	0.01	39
IF	19.15	12.55	72.84	5.39	17.06	1.78	5.00	27.16	0.00	39
H2	2.85	3.78	6.00	-1.83	2.78	-0.51	1.81	3.99	0.14	39
H1	2.05	2.81	5.55	-3.22	2.96	-0.37	1.66	3.81	0.15	39
B2	16.14	13.40	27.38	9.06	5.77	0.65	1.80	5.07	0.08	39
S1	8.64	8.80	30.80	0.11	7.78	0.76	3.25	3.83	0.15	39
OP	32.30	34.02	53.28	9.14	12.40	-0.37	2.25	1.80	0.41	39
S2	0.78	0.44	6.30	0.01	1.25	3.21	13.66	251.65	0.00	39

Note: B1,P1, GRATE, IF, H2,H1 B2, S1, OP and S2 indicate credit to the private sector, gross capital formation, GDP growth rate, inflation rate, expenditure on health, expenditure on education, financial innovation, market capitalization, degree of openness and volume of stock traded respectively. All values are expressed as a share of GDP except GRATE that is growth rate of GDP measured as the percentage change in GDP and inflation rate that is measured as the percentage change in consumer price index

3.2. Unit Root Test

Table 2. Augmented Dickey-Fuller Unit Root Test of the Series

Series	Level				First Difference			Remark
		Constant	Trend and constant	None	Constant	Trend and constant	None	
GRATE	ADF	==	==	-4.158***	==	==	==	I(0)
	1%	==	==	-3.616	==	==	==	
	5%	==	==	-2.941	==	==	==	
B1	ADF	==	-4.097**	==	==	==	==	I(0)
	1%	==	-4.227	==	==	==	==	
	5%	==	-3.537	==	==	==	==	
B2	ADF	==	==	==	==	==	-4.884***	I(1)
	1%	==	==	==	==	==	-2.629	
	5%	==	==	==	==	==	-1.950	
S1	ADF	==	==	==	==	==	-7.094***	I(1)
	1%	==	==	==	==	==	-2.629	
	5%	==	==	==	==	==	-1.950	
S2	ADF	==	-2.219**	==	==	==	==	I(0)
	1%	==	-2.627	==	==	==	==	
	5%	==	-1.950	==	==	==	==	
BI*S1	ADF	==	==	==	-7.500***	==	==	I(1)
	1%	==	==	==	-3.621	==	==	
	5%	==	==	==	-2.943	==	==	
B1*S2	ADF	==	==	-2.358**	==	==	==	I(0)
	1%	==	==	-2.627	==	==	==	
	5%	==	==	-1.950	==	==	==	
B2*S1	ADF	==	-3.711**	==	==	==	==	I(0)
	1%	==	-4.219	==	==	==	==	
	5%	==	-3.533	==	==	==	==	

B2*S2	ADF	==	==	-2.273**	==	==	==	I(0)
	1%	==	==	-2.627	==	==	==	
	5%	==	==	-1.950	==	==	==	
OP	ADF	==	==	==	==	==	-7.547***	I(1)
	1%	==	==	==	==	==	-2.629	
	5%	==	==	==	==	==	-1.950	
IF	ADF	==	==	==	==	==	-5.754***	I(1)
	1%	==	==	==	==	==	-2.629	
	5%	==	==	==	==	==	-1.950	
H1	ADF	==	==	==	==	==	-10.039***	I(1)
	1%	==	==	==	==	==	-3.621	
	5%	==	==	==	==	==	-2.943	
P1	ADF	==	==	==	==	==	-7.625***	I(1)
	1%	==	==	==	==	==	-2.633	
	5%	==	==	==	==	==	-1.951	

Note: B1,P1, GRATE, IF, H2,H1 B2, S1, OP and S2 indicate credit to the private sector, gross capital formation, GDP growth rate, inflation rate, expenditure on health, expenditure on education, financial innovation, market capitalization, degree of openness and volume of stock traded respectively. All values are expressed as a share of GDP except GRATE that is growth rate of GDP measured as the percentage change in GDP and inflation rate that is measured as the percentage change in consumer price index

The unit root result presented in table 2 shows that all the variables are significant at different levels I(0) and I(I). As expected, GDP growth is significant at levels. We therefore proceed to check the co-integration relationship among variables using the Bounds Test embedded in the Auto-regressive Distributed Lag (ARDL) framework. The result is presented below.

3.3. Co-integration Analysis

As contained in table 3, the result shows that in all the models, the F-staistics is greater than the upper critical bound for both I(0) and I(I) at 1%, 2.5%, 3% and 5% levels of significance. The null hypothesis of no co-integration is therefore rejected. The implication is that there is a long run causal relationship among the variables in all the models. Before we estimate the long run relationship, we first check the short run dynamics in the relationship of the variables for all the models. The result is presented in table 4. Both the short run and long run relationship are estimated using the ARDL.

Table 3. Bounds Co-integration Tests Results of the Models

	Test Statistic	Value	Signif.	I(0)	I(1)
B2 model	F-statistic	9.67	5%	2.04	3.24
	k	6	3%	2.32	3.59
			1%	2.66	4.05
S1 model	F-statistic	6.57	5%	1.97	3.18
	k	7	2.50%	2.22	3.49
			1%	2.54	3.91
B2*S1 model	F-statistic	5.298	5%	1.91	3.11
	k	8	2.50%	2.15	3.4
			1%	2.45	3.79
S2 model	F-statistic	21.176	5%	1.97	3.18
	k	7	2.50%	2.22	3.49
			1%	2.54	3.91
B2*S2 model	F-statistic	5.022	5%	1.91	3.11
	k	8	2.50%	2.15	3.4
B1 model	F-statistic	5.078	5%	2.04	3.24
	k	6	2.50%	2.32	3.59
			1%	2.66	4.05
B1*S1 model	F-statistic	6.054	2.50%	2.22	3.49
	K	7	1%	2.54	3.91
B1*S2 model	F-statistic	19.138	5%	1.91	3.11
	K	8	2.50%	2.15	3.4
			1%	2.45	3.79

Note: B1, B2, S1 and S2 indicate credit to the private sector, financial innovation, market capitalization, and volume of stock traded respectively. All values are expressed as a share of GDP

3.4. Regression Results

The interaction of bank and stock market variables in the short run and long run are presented in tables 4-7 below. Bank development is said to precede stock market development (Dermitriades & Rousseau, 2016; Soultanaeva, 2010; Arestis, Demetriades & Luintel, 2001; Stiglitz, 1985). Therefore, we interact bank development variables; B_1 and B_2 separately with stock market variables; S_1 and S_2. Recall that market capitalization ratio is a measure of stock market sustainability, while value of stock traded ratio is a measure of stock market liquidity. Credit to private sector ratio captures the depth of financial services, while money supply ratio reveals the depth of financial innovations. The short and long run regression result has five models presented in separate columns. Each of the bank and stock market variables is used in a separate equation. This was done to avoid the tendency for multi-collinearity amongst the financial variables. Subsequently, we

interpret the complimentary and substitution relationship in addition to the linear effects observed within the separate growth models.

Table 4. Short Run Dynamics Showing the Nature of Effects of Markets and Banks on Economic Growth

VARIABLES	B1	S1	B1*S1	S2	B1*S2
ΔGRATE(-1)	-0.52***	-0.91***	-0.20***	-0.83***	-0.36***
	(-4.82)	(-5.97)	(-9.90)	(-7.10)	(-9.16)
D(IF)	-0.02	-0.03	-0.09	-0.01	-0.04
	(-0.16)	(-0.76)	((-1.73)	(-0.25)	(-0.88)
D(IF(-1))	0.25	0.18***	0.26***	0.15	0.20***
	(1.53)	(3.04)	(3.88)	(0.17)	(5.86)
D(IF(-2))	0.31***	0.23***	0.34***	0.17***	0.16***
	(4.25)	(3.38)	(5.79)	(4.50)	(4.42)
D(LNH2)	-0.83	-0.41	-0.85**	-0.10	0.52**
	(-0.54)	(-0.22)	(-2.25)	(-0.06)	(2.91)
D(LNH2(-1))	-1.87	-0.35	-3.53***	-2.20***	-0.75***
	(-0.40)	(-0.12)	(-1.25)	(-3.09)	(-5.60)
D(LNH2(-2))	0.80	0.89*	085		0.30
	(1.23)	(1.98)	(1.04)		(1.64)
D(LNH2(-3))	0.63				-0.30***
	(1.05)				(-3.98)
D(LNH1)	-0.22	-0.91**	-0.57	-0.64**	0.89***
	(-0.33)	(-2.18)	(-0.99)	(-2.39)	(4.09)
D(LNH1(-2))	-0.56	-0.36***	-0.44**		
	(-1.73)	(-2.19)	(-2.13)		
D(GFC)	0.83	0.78	-0.33	-0.69	0.71
	(0.50)	(0.28)	(-3.66)	(-0.19)	(0.07)
D(GFC(-1))	-0.16	-0.75**	2.52**	-0.80***	-0.28***
	(-0.28)	(-2.16)	(0.14)	(-3.46)	(-3.64)
D(GFC(-2))	-0.98		-0.53**		-0.65***
	(-0.68)		(-2.19)		(-5.09)
D(OP)	-0.03		-0.03	-0.07	-0.11**
	(-0.35)		(-0.41)	(-1.34)	(-2.53)
D(OP(-1))	-0.28		-0.19***		-0.31***
	(-1.58)		(-3.47)		(-3.25)
D(OP(-2))	-0.05		-0.06		-0.23***
	(-0.56)		(-1.45)		(-3.30)
D(B1)	0.33		0.86	-0.57*	0.32
	(0.63)		(1.34)	(-1.81)	(0.90)
D(B1(-1))	-0.22		-0.77***		0.47
	(-0.28)		(-3.57)		(0.82)
D(B1(-2))	-0.25		0.44		0.76**
	-0.35		1.01		(2.12)
D(S2)					-0.69
					(-0.26)

D(S2(-1))					0.81*** (5.12)
D(S2(-2))					0.37*** (5.19)
D(B1*S1)			0.02 (0.79)		
D(B1*S1(-1))			0.09*** 3.15)		
D(B1*S1(-2))			-0.07** (-2.18)		
D(B1*S2)					0.30 (1.61)
D(B1*S2(-1))					-0.42 (-5.24)
D(B1*S2(-2))					-0.93*** (-4.93)
CointEq(-1)	-0.52*** (-9.43)	-0.91*** (-8.34)	-0.20*** (-4.96)	-0.83*** (-11.30)	-0.36** (-2.73)

*Note: B1, S1, S2, ΔGRATE, GFC, IF, LNH2, LNH1 AND OP indicate; credit to the private sector, market capitalization, volume of stock traded, growth rate, gross capital formation, inflation rate, log of expenditure on health, log of expenditure on education and degree of openness respectively. B1*S1, B1*S2 are the interaction variables of B1 with S1, S2 respectively. ***,**,* indicate significant level at 1%, 5% and 10% respectively. Figures in the brackets are t-values.*

Table 5. Long Run (Levels Equation) Results of the Effects of Banks and Markets on Economic Growth

VARIABLES	B1	S1	B1*S1	S2	B1*S2
IF	-0.17 (-1.74)	-0.23*** (-3.22)	-0.16*** (-3.04)	-0.19*** (-4.09)	-0.29*** (-8.76)
LNH2	0.51 (1.03)	0.51 (1.13)	0.66 (1.33)	0.13*** (3.13)	0.37*** (6.56)
LNH1	-0.34 (-1.35)	-0.38 (-1.50)	-0.70** (-2.31)	-0.66*** (-3.62)	-0.04*** (-7.98)
GFC	-0.53 (-1.06)	-0.34 (-1.31)	-0.02*** (-6.43)	0.21*** (3.79)	-0.52** (-5.53)
OP	0.32*** (3.77)	0.31*** (4.03)	0.34*** (7.60)	0.19 (0.67)	0.26*** (8.14)
B1	0.51 (0.63)	0.25 (0.93)	0.45*** (4.07)		-0.12 (-0.31)
S1		0.05 (0.36)	-0.03 (-0.11)		

B1*S1			0.01 (0.08)		
S2				0.74** (2.81)	-0.84*** (-5.92)
B1*S2					0.32*** (6.26)
R-squared	0.77	0.87	0.70	0.70	0.79
Adjusted R-squared	0.70	0.81	0.64	0.66	0.68
Durbin-Watson stat	2.06	2.03	2.08	2.09	2.07
JarqueBera	1.76	1.39	2.35	0.44	0.07
Probability	0.42	0.49	0.10	0.80	0.72
B-G Serial Corr. LM Test (F.Stat)	0.67	3.72	4.53	9.52	4.03
Probability	0.60	0.05	0.32	0.02	0.20
B-P-G Hetero Test	0.50	1.01	0.20	0.69	0.59
Probability	0.87	0.50	0.99	0.77	0.81

*Note: B1, S1, S2, ΔGRATE, GFC, IF, LNH2, LNH1 AND OP indicate; credit to the private sector, market capitalization, volume of stock traded, growth rate, gross capital formation, inflation rate, log of expenditure on health, log of expenditure on education and degree of openness respectively. B1*S1, B1*S2 are the interaction variables of B1 with S1 and S2 respectively. ***,**,* indicate significant level at 1%, 5% and 10% respectively. Figures in the brackets are t-values.*

Table 6. Short Run Dynamics Showing the Nature of Effects of Banks and Market on Economic Growth

VARIABLES	B2	S1	B2*S1	S2	B2*S2
ΔGRATE(-1)	-0.80*** (-4.29)	-0.70*** (-4.58)	-0.41 (-1.56)	-0.94*** (-10.24)	-0.91** (-2.59)
D(IF)	0.21*** (3.12)	0.05 (1.01)	0.11 (1.38)	0.06 (1.53)	0.12*** (9.84)
D(IF(-1))	0.05 (0.77)	0.17** (2.67)	0.12 (0.70)	0.13*** (4.03)	0.10*** (7.14)
D(IF(-2))	0.36*** (4.42)	0.20*** (3.42)	0.39*** (3.19)	0.22*** (6.91)	0.23*** (9.70)
D(LNH2)	0.72 (0.27)	0.37** (2.26)	0.60 (0.11)	0.32** (2.17)	0.13*** (6.52)
D(LNH2(-1))	-0.40 (-0.19)	-0.52** (-2.77)	-0.96** (-2.85)	-0.83*** (-4.03)	-0.37*** (-6.35)
D(LNH2(-2))	0.23* (1.91)		-0.80** (-2.01)		-0.11*** (-7.02)
D(LNH1)	-0.53 (-0.21)		-0.06 (-1.59)	-0.42*** (-4.41)	-0.21** (-2.92)
D(LNH1(-1))	-0.43 -0.21		0.41 (1.69)	0.41** (2.58)	0.25*** (9.91)

D(LNH1(-2))	-0.12				3.19
	-2.04				
		-			
D(GFC(-1))	-0.89	0.64***	-0.27**	-0.46***	-0.26**
	-0.03	(-3.04)	(-2.19)	(-5.12)	(-2.94)
D(GFC(-2))	-0.45	0.36			-0.78***
	-0.02	(1.57)			(-3.54)
D(OP)	0.02	-0.09	-0.08	-0.15	-0.24
	(0.27)	(-1.51)	(-1.19)	(-3.11)	(-0.60)
D(OP(-1))	0.24**	0.21**	0.21**	0.10**	0.16***
	(2.33)	(2.82)	(2.05)	(2.28)	(7.66)
D(OP(-2))	0.12	0.07	-0.10		0.08***
	(1.41)	(1.07)	(-0.79)		(5.28)
D(B2)		-			
	-0.88**	0.10***	-0.10	-0.98***	-0.25***
	(-2.04)	(-3.15)	(-2.59)	(-4.92)	(-6.97)
D(B2(-1))	0.64***	0.35	-0.39		0.10
	(3.09)	(1.41)	(-0.71)		(1.07)
D(B2(-2))	0.76**	0.32	0.43		0.36***
	(2.84)	(1.21)	(0.95)		(4.28)
D(S2)				0.15**	0.03***
				(2.99)	(3.90)
D(S2(-1))				-0.33***	-0.03
				(-3.25)	(-1.22)
D(S1(-1))		0.15	-1.18		
		(1.36)	(-1.47)		
D(B2*S1)			0.07		
			(1.39)		
D(B2*S1(-1))			0.06		
			(1.49)		
D(B2*S2(-1))					-0.11**
					(-2.05)
D(B2*S2(-2))					-0.22
					-5.16
		-			
CointEq(-1)	-0.80***	0.41***	-0.41***	-0.94***	-0.91***
	(-3.01)	(-5.13)	(-4.13)	(-6.14)	(-7.75)

*Note: B2, S1, S2, ∆GRATE, GFC, IF LNH2, LNH1 and OP indicate; broad money supply, market capitalization, volume of stock traded, growth rate, gross capital formation, inflation rate, log of expenditure on health, log of expenditure on education and degree of openness respectively. B2*S1, B2*S2 are the interaction variables of B2 with S1 and S2 respectively. ***,**,* indicate significant level at 1%, 5% and 10% respectively. Figures in the brackets are t-values.*

Table 7. Long Run (Levels Equation) Results of the Effects of Banks and Markets on Economic Growth

VARIABLES	B2	S1	B2*S1	S2	B2*S2
IF	-0.13*	-0.34***	-0.11	-0.20***	-0.16***
	(-1.82)	(-3.41)	(-0.40)	(-6.61)	(-4.501)
LNH2	0.20	0.37**	0.39	9.86***	0.69**
	(0.83)	(2.80)	(1.26)	(5.45)	(2.58)
LNH1	0.56	-0.86***	-0.43	-0.44***	-0.88**
	(0.18)	(-3.01)	(-1.30)	(-6.05)	(-3.82)
GFC	0.95	0.33*	-0.41	-0.74	-0.30
	(1.69)	(1.95)	(-0.69)	(-0.12)	(-0.84)
OP	0.13	0.05	0.19	0.11**	-0.04
	(1.11)	(0.43)	(0.92)	(2.15)	(-1.65)
B2	-0.60**	-0.23**	-1.19	-0.33	-0.62***
	(-2.69)	(-2.28)	(-0.72)	(-1.50)	(-5.26)
S1		0.16	-0.62		
		(0.72)	(-0.40)		
B2*S1			0.12		
			(0.91)		
S2				0.812***	0.57
				(5.525)	(0.33)
B2*S2					0.18**
					(2.13)
R-squared		0.851	0.834	0.871	0.865	0.841
Adjusted R-squared		0.755	0.865	0.822	0.839	0.766
Durbin-Watson stat		2.123	2.022	2.726	2.177	3.124
JarqueBera		1.490	0.751	1.490	0.053	17.003
Probability		0.482	0.697	0.472	0.974	2.042
B-G Serial Corr. LM Test (F.Stat)		0.091	0.951	2.411	2.394	0.706
Probability		0.244	0.200	0.244	0.162	0.742
B-P-G Hetero Test		0.380	1.493	1.822	1.587	1.847
Probability		0.931	0.252	0.376	0.145	0.4615

*Note: B2, B1, S2, ∆GRATE, GFC, IF, LNH2, LNH1 AND OP indicate; Broad money supply, market capitalization, volume of stock traded, growth rate, gross capital formation, inflation rate, log of expenditure on health, log of expenditure on education and degree of openness respectively. B2*S1 and B2*S2 are the interaction variables of B2 with S1 and S2 respectively. ***,**,* indicate significant level at 1%, 5% and 10% respectively. Figures in the brackets are t-values.*

3.4.1. Short Run Effects

Table 4 consists of five models showing the linear effects of bank and stock market variables in the short-run where B1 (credit to private sector) is the only bank variable used. In the first model of the bank variable B1 (credit to private sector), it is observed that generally, B1 has insignificant effects on economic growth. This implies that bank credit on its own cannot enhance economic growth. The third

model which is B1*S1 (interaction of credit to private sector and market capitalization), it is observed that the first and second lag of the interaction show positive relationship. This implies that the interaction between the two in the short-run has complimentary effect on economic growth. The fifth model, which is B1*S2 (interaction of credit to private sector and value of stock traded), it is observed that both the first and second lag show a negative relationship which is significant in the second lag. This implies that the interaction of the two in the short-run has a substitution effect on economic growth.

Table 6 consists of five models showing the linear effects of bank and stock market variables in the short-run where B2 (Financial innovations) is the only bank variable used. In the first model which is the B2 model, B2 has a negative and significant relationship with economic growth. The first and second lag of B2 have positive and significant effects on economic growth. We observe that unlike B1 (credit to private sector), B2 (financial innovatons) on its own has significant effects on economic growth. The third model which is B2*S1 (interaction of financial innovation and market capitalization), shows a non-significant relationship between the two. This implies that the interaction of financial innovation and market capitalization does not affect economic growth in the short run. The fifth model which is B2*S2 (interaction of financial innovation and value of stock traded), shows a negative and significant relationship in the first lag. This implies that the interaction of financial innovation and value of stock traded has substitution effect on economic growth in the short-run.

3.4.2. Long Run Effects

Table 5 consists of five models showing the linear effects of bank and stock market variables in the long run where B1 (credit to private sector) has been used as the only bank variable. In the first model, it is observed that B1 has no significant effect on economic growth. The third model which is B1*S1 (interaction of credit to private sector and market capitalization) shows that there is no significant relationship between the two hence, the interaction has no effect on economic growth in the long run. The fifth model which is B1*S2 (interaction of credit to private sector and value of stock traded) shows a positive and significant relationship between the two (Oluwatosin et. al., 2013). This implies that the interaction of credit to private sector and value of stock traded has a complimentary effect on economic growth in the long run.

Table 7 consists of five models showing the linear effects of bank and stock market variables in the long run where B2 (financial innovations) has been used as the only bank variable. In the first model, it is observed that B2 on its own has a positive and significant effect on economic growth. The third model which is B2*S1 (financial innovation and market capitalization) shows that there is no significant relationship between the two, hence, their interaction has no effect on economic growth in the

long run (Oluwatosin et. al., 2013). The fourth model shows that S2 (value of stock traded) on its own has positive and significant effect on economic growth in the long run. The fifth model which is B2*S2 (interaction of financial innovation and value of stock traded) shows a positive and significant relationship between the two. This implies that the interaction of financial innovation and value of stock traded has complimentary effect on economic growth in the long run.

It is observed that there is consistency in the interaction relationship of S2 (value of stock traded) with B1 (CPS) and B2 (Financial innovations) both in the short run and long run. The interaction of S2 with B1 and B2 in the short run has substitution effect on economic growth, while its interaction with B1 and B2 in the long run has complimentary effect on economic growth. This suggest that the value of stock traded has the strongest interaction with bank development in Nigeria.

Our findings align with the position of Dermitriades and Rousseau (2016) that stock market and bank variables would have effects that varies at different stages of development. However, we couldn't establish that stock market activities complement bank activities at the early stage and only become substitutes at the later stage. Value of stock traded, a prominent and active stock market variable in Nigeria, interacting with bank variables, has substitution effects in the short run and complementary effects in the long run. The leptokurtic behavior of VST in the descriptive statistics gives credence to this finding. The position of (Ayadi et. al., 2015; Mhadhbi, 2014; Narayan & Narayan, 2013; Singh, 1997; Garcia, 1986), on the overbearing influence of the Central Bank on the financial system which usually is in favour of money supply and credit creation provides an explanation for the situation observed for Nigeria.

3.4.3. Absorptive Capacity of Stock Market

The issue of absorptive capacity was first raised by Ndebbio (2006) who argued that electricity supply in Nigeria is expected to drive the growth of the manufacturing sector in Nigeria. He went further to establish that there is a low absorptive capacity of the manufacturing sector from the power sector. The concept has since been applied to other areas of the economy particularly the financial market. While studying the effect of stock market efficiency in Nigeria, Ewah et al. (2006) were the first to raise the issue of low absorptive capacity of the Nigerian stock market. The low absorptive capacity is described as the inability of the stock market to absolve the impulses of bank development in order to have a positive effect on economic growth. Therefore, the level of absorption of the stock market is measured by the significance and direction of effect of market capitalization on economic growth in the long run (Oluwatosin et. al. 2013; Yadichukwu & Chigbu, 2014). Our result confirms the low absorptive capacity of the Nigerian stock market that has persisted up to the current period. Claims that the over- subscription of the N150 billion Sukuk bond in 2020 is a proof of the high absorptive capacity of the Nigerian Market (Oji,

2020), cannot be empirically established yet. Under the M_2 category, market capitalization has a negative but insignificant interaction with money supply and more importantly, has insignificant effect on economic growth. Under the CPS category, market capitalization has a positive but insignificant interaction with credit to private sector and more importantly, has insignificant effects on economic growth. The insignificant effect of market capitalization on economic growth is a further attestation to the fact that Nigeria falls within the category of low middle income economy with less capitalized markets (Hewartz & Walle, 2014; Adjaski & Biekpe, 2008).

4. Conclusion

We sought to examine the interaction that exist between stock market and bank development as they both affect economic growth in Nigeria. We also aimed at resolving issues that may be connected with the stock market, bank development and economic growth relationship. Based on our analysis and findings, we come to the following conclusions; first, value of stock traded has the strongest interaction with bank development in Nigeria. Second, variations in the short run and long run complimentary and substitution effects are observed for stock market and bank development variables. Third, contrary to previous studies which establish that effects can vary from stage to stage, with complimentary effect preceding the substitution effect, substitution effect precedes complimentary effect of stock market and bank development interaction in Nigeria. Fourth, in line with the findings of previous studies, market capitalization still predicts economic growth insignificantly. This supports the issue of low absorptive capacity which has become persistent. Fifth, again, in line with previous studies, value of stock traded in has positively and significantly affected economic growth.

In terms of liquidity and sustainability of markets and institutions, developments in Nigeria's stock market and banks have not measured up significantly. More importantly, this may deprive the Nigerian economy from partaking of the benefits of financialization which is inevitable for the global economy. The bank based view (restrict focus) emphasizes the positive role of banks in development and growth. Similarly, the market based view (structure focus) highlights the advantages of well-functioning markets. Under the financial services view, neither banks nor stock markets has a greater influence on growth, rather the financial services provided by both are a by far more important for economic growth. Therefore there is no need for banks and stock markets to compete as they both perform the basic functions of cost reduction on transactions and allocate resources (Mader, 2017). Analysis of the bank and stock market development and their collective and separate influence on economic growth, reveals the two could have significant effects in the positive or

negative direction overtime. The two have their strengths in the Nigerian financial system, therefore financial policies adopted should recognize the two.

In recent times, some authors in the finance growth literature have come up with a more holistic and dynamic focus which derive from the previous three, it is called the 'institutional-centric theory' (Arestis, Nissanke & Stein, 2003) This view holds that financial system need to be development oriented and this can be achieved through the institutionalization of its activities and processes. Institutions that support the development of markets should also be established. Particularly for a developing economy like that of Nigeria, institutional structure need to be strengthened in the area of norms, incentives, regulations, capacities and organizations (Arestis et. al. 2003). All of these should be embedded in the circuits of social and economic production.

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