

Modeling the Intermediation Behaviour of Institutional Investors (Theory and Practical Evidence): A Co-Integration and Causality Approach

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ABSTRACT

This study examines intermediation behaviour of institutional investors in Nigeria. The dramatic transformation in the financial markets has call for a provoking and ongoing theoretical and empirical debate to investigate the behaviour of institutional investors as it affects economic and financial development. These and other conflicting views on financial intermediation have promoted the intermediation behaviour hypothesis. The study uses the Johansen (1991) co-integration tests, the classical regression analysis, and granger-casualty test, unit root test and vector error correction (VEC) to establish the behaviour of institutional investors in Nigeria based on annual data spanning 1981 to 2013. Findings suggest that the behaviour of institutional investors is influenced or patterned significantly by the level of economic and financial development of an economy. Therefore it is our view that Nigeria being an emerging economy need to focus on economic development oriented policies and grow banks and non banks financial intermediaries as major player in order to stimulate a strong and vibrant financial sector development.

Keywords: Real-Per-Capital GDP, Institutional investors, Intermediation, Gross capital formation.

INTRODUCTION

The theory of financial intermediation is built on models of resource allocation based on perfect and complete markets, suggesting that it is frictions such as transaction costs and asymmetric information that are important in understanding intermediation. Gurley and Shaw (1960) argue that transactions costs such as costs of asset valuation mean that intermediaries have advantage over individuals because they allow costs to be shared or diversified. Frictions that relate more to investors information sets, numerous authors have argued the role of asymmetric information as an attractive rationalization for the importance of intermediaries in intermediaries' process. One of the earliest and most cited works, Leland and Pyle (1977) suggest that an intermediary can signal its informed status by investing its wealth in assets about which it has special knowledge.

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Financial system in many countries has witnessed a dramatic transformation in recent years. Financial markets such as stock and bonds markets have grown in size and activities, such as the value of the companies listed or any other conceivable measure of their importance. At the same time there has been extensive financial innovations acceleration in the 1970s and 1980s. This includes introduction of new financial products, such as mortgage backed securities and other securitized assets as well as derivative instruments such as swaps and options (Mabutho and Merle, 2014). These have a virtual explosion in volume. At the same time there are new exchanges for financial futures, options and other derivative securities. Interestingly, this increase in the breadth and depth of financial markets has resulted in increased use of these instruments by financial intermediaries and firms. These explosion regarded as financial development in these context is considered by many economists to be of paramount importance for output growth in any monetary economy. Also, many empirical studies have investigated the relationship between financial development and economic growth.

According to Arestis and Demetriades (1996), financial development is the level of development of financial markets, and economic growth. They have not been used by household to any significant extent. In fact, the increased size of the financial markets has resulted in a dramatic shift away from direct participation by individuals in the market towards participation through various kinds of institutional investors. Changes have been observed in the financial intermediation process in recent times which have been necessitated by increased surplus funds in the early 1970s and 80s, globalization and technological advances. These factors have led to changes in the financial system, in particular the banking and non-banking financial institutions (Mabutho and Merle, 2014). Arguments in favour of the behaviour of institutional investors in modern capital markets have been found in recent scholarly works.

Allen and Santomero (1997) argue that the current theory of financial intermediation has been too dependent on reducing market friction of costs and asymmetric information. These two fold role of intermediaries is more functional than institutional and leads to a new paradigms shift from the present (stylized) theory which suggests that there is now financial disintermediation in addition to dynamics of intermediation which emanate from new markets and products (Scholtens and Wensveen, 2000). Iris Claus and Arthur Grimes (2003) stress that financial intermediates exist because they can reduce information and transaction costs that arise from information asymmetric between borrowers and lenders.

Allen and Gorton (1993) hold that when there is asymmetric information between investors and portfolio managers, portfolio managers have an incentive to churn; their trade is not motivated by changes information, liquidity needs or risk sharing rather by a desire to profit at the expense of the investors that hire them. They therefore holds that one of the most significant changes in the structure of capital markets over the last four decades as been the growth of institutional investors. Allen and Gale (1994) hold that financial markets provide institutions and opportunities for individual to share risk efficiently. To this end, financial intermediaries function to assist the financial markets and any other factors that affect the amount of credit channeled. Intermediaries can have significance

macroeconomic effects as they provides liquidity and also their ability to transform the risk characteristics of assets hence, reducing costs of channeling funds between lenders and borrowers leading to a more efficient allocation of resources. The traditional view of financial intermediation is produced by the neoclassical economic theory, which holds that financial intermediaries are a means of allocating resources between the surplus and deficit economic units. These financial resources would then be used for productive investment of goods and services to support the real economy (Solow, 1956). Patrick (1966) sets out two propositions that financial intermediaries are ‘either demand following or supply-leading in the economy. The former proposition means that financial institutions develop in response to economic development while the latter imply that financial intermediaries influence economic development.

In light of structural changes, advent of innovative securities, surplus funds, increased technological advances and integration of global financial markets. There have been significant changes in the Nigerian financial system landscape over the past decades. As a result, arguments have been put forward pointing to changes in the structure of the financial system which is led by increasing activity of institutional investors or non-bank financial intermediaries. Generally, institutional investors are organizations which pool large sum of money and invest those sums in securities, real property and other investment assets. They include banks and non-bank financial institutions such as pension funds, insurance companies, collective investment schemes, investment companies among others.

In the same manner the Nigerian financial system has become complex and dynamic with growing stock markets and institutional investors which have remained elevated relative to banking assets. In response to these structural changes in the financial system, several studies have sought to establish the role of the financial sector in economic development and the consensus feeling that a sound financial system is capable of driving economic development especially a developing economy like Nigeria. Levine (1997), Levine and Zeros (1998), Levine and Zeros (1996) assert that economies that have a well-developed banking sector and stock market tend to grow faster than those of the contrary. However, few studies have attempted to disaggregate financial development in order to ascertain the role of institutional investor’s behaviour in economic and financial development. Financial development entails; banking sector, stock market, financial deepness and development of the non-bank financial sector.

The Nigerian financial system is fast developing and ranked among the emerging economies. The individual segment of the financial markets shows that financial development varies considerably within the financial sector. The stock market development, non-bank financial services development, and deposit money bank assets. Demirguc-Kunt and Levine (1999) posits that the ratio for financial deepness or development as represented by banks’ total assets to GDP, stock market capitalization to GDP, and non-bank financial institutions assets to GDP significantly dominate financial system. Of interest is the growing institutional investors’ asset to GDP ratio, suggesting the importance of the institutional investors in financial development.

In this work, financial development is represented by financial deepness, broad money supply to GDP ratio, banking sector development (bank credit to private sector to GDP ratio), and stock market development (stock market capitalization to GDP). Institutional investors refer to the summation of assets of long-term and short-term insurance companies, mutual funds, public investment corporation, pension and provident funds. Institutional investors are important to financial market, because they bring huge amount of investment to the firm which is necessary for capitalization. The presence of institutional investors in the firm has profound positive implication on the financial health of the firm whether perceived or real and a positive influence on the price of the stock. In many ways institutional investors affect stock market liquidity and volatility and influence the management and operation of the firm. Keith Red Heal (2008) asserts that most investments by individuals are carried out through institutional investors which accounts for around 75% of the stock market investment. The investment behaviour of institutional investors therefore has considerable significant importance to financial market.

Luis Opazo, Claudid Radatz Seriol and Schmulkler (2014) hold that developing countries are trying to develop long-term financial market and institutional investors are expected to play a key role. The traditional theory of intermediaries is based on transaction costs and asymmetric information. They are designed to account for institutions which take deposits, issue insurance policies and channel funds to firms. New markets for financial futures and options are mainly markets for intermediaries rather than individuals or a firm who stresses the risk trading and participation costs. This patterned the observed behaviour of institutional investors in modern capital markets. Financial intermediaries earnestly play two different roles, facilitators of risk transfer and dealing with the increasingly complex maze of financial instruments and market (risk management).

Institutional investors are important sources of capital in the financial markets, by pooling constituent's investments, institutional investors arguably reduce the costs of capital for entrepreneurs while diversifying constituent portfolio. Their greater ability to influence corporate behaviour as well as to select investors profiles may help diminished any cost. Institutional investors horizons differ, but do not share the same life cycle as human beings unlike individuals, they do not have a phase of accumulation (active work life) followed by consumption (retirement) and they do not die. The influence that these investors have on financial and economic development call for an investigation of this sought in a view to determining the direction of causality among them, if any and whether any long run co-integration relationship exists. These established relationships will lead to the influence being drawn on their investment behaviour. This study therefore seeks to establish the influence of banks and non-bank financial institutions on both financial and economic development which are based on annual data spanning 1981 to 2013. The following hypotheses are formulated to guide the study.

H₀1: Institutional investors do not influence financial development.

H₀2: Institutional investors do not influence economic development.

H₀3: institutional investors do not influence gross capital formation.

Modeling the Intermediation Behaviour of Institutional Investors

The growth of financial intermediations has been widely researched. However, little has been done to establish the behaviour and role of institutional investors. This is particularly so in Nigeria being an emerging economy in Africa and is fast growing. Aziakpono (2004) postulates that economist should develop their financial sectors in order to realize regional integration benefits and, more importantly, drive economic growth in their countries. Diamond and Dybvig (1983) analyzed the provision of liquidity (transformation of liquid assets into liquid liabilities by banks. In Diamond and Dybvig's model, ex-ante identical investors (depositors) are risk averse and uncertain about the timing of their future consumption needs. Without an intermediary, all investors are locked into liquid long-term investments that yield high pay off only to those who consume late. Those who must consume early receive low pay off because early consumption requires premature liquidation of long-term investments. Banks can improve on a competitive market by providing better risk sharing among agents who need to consume at different times.

An intermediary promises investors a high pay off for early consumption and a lower pay off for late consumption relative to the non-intermediated case, hence, risk sharing and welfare. Leland and Pyle (1977) posit that banks can communicate information to investors about potential borrowers at a low cost than individual borrowers. He further maintained that financial intermediaries develop special skills in evaluating prospective borrowers and investment projects. Allen and Gale (1994) examine limited market participation and volatility of asset prices. In their study, they conclude that despite the traditional asset pricing theories which assume complete market participation, investors participates in a limited number of markets. They maintain that limited market participation can amplify the effect of liquidity trading relative to full participation under certain circumstances. Blume *et al* (1974) develop a measure of portfolio diversification which takes into account the proportion of each stock held by individuals' portfolio. Based on this measure, they find that the average amount of diversification is equivalent to having an equally weighted portfolio with two stocks.

Blume and Friends (1978) provide more detailed evidence of this lack of diversification. They find that large proportion of investors has only one or two stocks in their portfolios, and very few have more than ten. King and Leape (1984) analyse data from 1978 survey of 6010 U.S. households average wealth of almost \$250,000. When assets are categorized into 36 classes, they find that the median number owned was eight. Mankiv and Zeldes (1991) find that only a small proportion of investors own stock of those with liquid assets in excess of \$200,000, only 47.7% any stocks. Slobodan (2006) examines the role of institutional investors in financial development of European Union. The study finds out that the important type of market participants in modern capital markets is the institutional investors. Their study further revealed that when comparing large investors in terms of absolute size of total assets and also their relative importance in comparison with private or governmental and therefore concludes that the contribution to financial development is provided majorly, by institutional investors. According to Davis (2003), the growth of institutional funds has implications for the development of a robust financial



sector if their asset allocation varied from those of individual' investors. Davis (2003) found a two way relationship which shows that despite the general notion that as the institutional investors grows, there is an emergence of new securities in the market or whether institutional investors emerge first then promote capital market development. However, this relationship has not been tested using econometric methodology. It may be argued that institutional investors are fast becoming more important in global financial markets, with their assets under management rapidly catching up with those of banking industry (Committee on the Global Financial System, 2007). Davis (2003) suggests that institutional investors are key financial innovation in recent years, causing a shift from traditional bank intermediation and necessitating a re-evaluation of financial market structure and behaviour. Mabutho and Merle (2014) assert that since 1990s, assets of institutional investors have remained elevated in comparison to those of deposit-taking financial institutions in South Africa. This paradigm shift in the financial markets has provoked the ongoing theoretical and empirical debate, which, on the one hand, pits institutional investors as causing financial 'disintermediation' against, on the other hand, deposit taking financial institutions in promoting economic development. These and other conflicting views on financial intermediation have promoted the 'finance-growth nexus' hypothesis, which draws lessons from the Patrick (1966) 'demand-following' and 'supply-leading' propositions (Patrick, 1966). The study uses the Johansen (1990) co-integration tests, the vector error correction and the Granger causality approaches to establish the role played by institutional investors in the finance-growth nexus in South Africa based on quarterly data spanning 1994 to 2009. Findings suggest that a 'demand-following' phenomenon exists in South Africa in which the growth in the institutional investors' industry is dependent upon the level of economic development and banking sector development.

METHOD

This study uses annual data obtained from the central bank of Nigeria (CBN) statistical bulletin spanning 1981 to 2013. The key variables in this study are described on table 1. Real Gross Domestic Product (RGDP) per capital at constant prices is selected for this study to represent a measure of economic development in line with King and Levine (1993).

Bank Credit to Private Sector (BCP): Domestic bank credit to private sector (BCP) to GDP ratio measures the extent to which financial intermediaries channel savings to investors in the economy. Particularly, this ratio is a proxy of the banking industry development and the larger the ratio the more developed the banking industry. The value of BCP is divided by the country's GDP ratio.

Institutional Investor's Assets (IIA): This variable has been used in the estimation of the impact of non-banking financial intermediaries on economic growth in Nigeria. Harichandra and Thangavelu (2004) also suggest the use of the ratio of total assets of institutional investors to GDP to capture the role of institutional investors in economic development.

Broad Money Supply to GDP Ratio (M2): Real broad money is used as the proxy for financial development or financial deepness and is calculated as a percentage of real GDP as suggested by Liu *et al* (1997).

Stock Market Capitalization to GDP Ratio (MC): Several studies have used this ratio in the analysis of long-run relationship between stock market development and other economic and financial variables such as GDP growth, real GDP per capital and M2 to GDP ratios. Stock market capitalization ratio is widely regarded as a proxy measures of capital market development of a country, the larger the ratio, the more the development.

Gross Fixed Capital Formation to GDP Ratio (GCF): The GCF variable represents other non-financial factors that affect economic growth and is suggested by Islam and Osman (2007). This variable in the model is to account for gross fixed capital formation in the economy to capture broad spectrum of factors that influence economic development.

Theoretical and Empirical Models: The underpinning theoretical model for this study is shown in equation 1 below:

$$RGDP = f(BCP, IIA, M2, MC, GCF) \dots\dots\dots 1$$

Where GDP is real GDP per capital, BCP is bank credit to private sector to Real GDP ratio, IIA Institutional Investor's Asset Size ratio, M2 is Broad Money Supply to GDP ratio, MC is Stock Market to GDP ratio, and GCF is Gross Capital Formation to GDP ratio. Real GDP per capital is the dependent variable regressed against the explanatory variables specified in equation 2 below:

$$RGDP_t = a + \hat{a}_1 BCP_t + \hat{a}_2 IIA_t + \hat{a}_3 M2_t + \hat{a}_4 MC_t + \hat{a}_5 GCF_t + \hat{\epsilon} \dots\dots\dots 2$$

RESULTS AND DISCUSSION

The results of the correlation analysis in Table 1 clearly show that there is a high positive significant relationship ($p < 0.01$) with correlation coefficient in each pair at least greater than 0.600 among all the variables under consideration. The result of the regression of others variables on Institutional investors (IIAS) indicates a significant coefficient ($p < 0.01$). This suggests that Institutional Investor has a significant effect on all other variables under study. The value (Constant) in each case indicates the value of the variable when there is no Institutional Investors while the coefficient of the IIAS in each case in the table 2 above indicates that a unit change in Institutional Investor (IIAS) will produces such coefficient values change in the variable (Dependent) under study. On table 3, the coefficient of regression model of Institutional Investors (IIAS) on Financial Development (BCP, M2, and MC) are 0.001, 0.001 and 0.022 respectively for BCP, M2 and MC. This indicates that a unit change in IIAS will bring about 0.001, 0.001 and 0.022 increase in BCP, M2 and MC respectively. Therefore, since each of the coefficients is significant ($p < 0.01$), the null hypothesis which states that institutional investors do not influence financial development is rejected. The high Adjusted R^2 of the Regression model as indicated on table 4 is an indication of a goodness of fit of the model and a high F-ration indicates a significant



overall fit of the variable of the model. However, only the coefficient of IIAS and GCF is significant ($p < 0.05$). The result of the regression model of Institutional Investor (IIAS) on Economic Development (RGDP) as shown on table 2 is given by:

$$RGDP = 623.424 + 0.227 (IIAS); t = (4.609)(11.197); R^2 = 0.802; F = 125.375$$

The coefficient of 0.227 implies that a unit change in Institutional Investor will bring about an increase in RGDP by about 0.227. Since the above coefficient is significant ($p < 0.01$), we reject the null hypothesis that institutional investors do not influence economic development and then affirm that institutional investor has a significant influence on economic development. The result of the regression model of Institutional Investor (IIAS) on Gross Capital Formation (GCF) as shown on table 2 is given by:

$$GCF = 26.578 + 0.003 (IIAS); t = (6.411)(5.236); R^2 = 0.469; F = 27.411$$

The coefficient 0.003 implies that a unit change in Institutional Investor will bring about an increase in GCF by about 0.003. Since the above coefficient is significant ($p < 0.01$), we reject the null hypothesis that Institutional investors do not influence gross capital formation and then posit that Institutional Investor has a significant influence on gross capital formation. Unit Root Test is a statistical test that seeks to investigate the stationarity of a time series variable. The most popular of unit root (stationarity) tests are the Dickey-Fuller (ADF) test and the Phillips-Perron (PP) test.

The ADF and PP tests differ mainly in how they treat serial correlation in the test of regression. One of the most popular unit root tests is Augmented Dickey-Fuller (ADF) test (Erik and Par 2007). The null hypothesis that the variable has no unit root that is, the variable is stationary against the alternative that the series is non stationary is being examined. The unit root test for the variables under study is as shown in the Table 5. Granger Causality Test is used to measure 'cause and effect' between two variables. Granger causality could be Unidirectional (if X granger cause Y but Y do not granger cause X) or Bidirectional (if X granger cause Y and Y granger cause X).

The Summary of the Granger Causality test of the variables under study is tabulated in Table 6. Co-integration is the regression of variables with unit root (Non stationary) after which the residual of the regression shows stationarity. It means that despite being individually non-stationary, a linear combination of two or more time series can be stationary. It is an indication of long-run, or equilibrium, relationship between non stationary variables. The co-intergration test for the non-stationary variables under this study is as presented on table 7.

Table 1: Description of Key Variables used in this study

Percap	Real GDP per Capital in Nigeria
BCP	(Domestic Credit provided by Banking Sector GDP)
IIAS	Institutional Investors Asset Size
M2	Broad money supply (M2/GDP)
MC	Market capitalization/GDP
GCF	Gross capital formation/GDP



Table 2: Correlations Analysis

		RDGP	BCPS% (GDP)	IIAS	M2% (GDP)	MC% (GDP)	GCF% (GDP)
BCPS% (GDP)	Pearson Correlation	.700**					
	Sig. (2-tailed)	.000					
	N	33					
IIAS	Pearson Correlation	.895**	.686**				
	Sig. (2-tailed)	.000	.000				
	N	33	33				
M2% (GDP)	Pearson Correlation	.602**	.932**	.539**			
	Sig. (2-tailed)	.000	.000	.001			
	N	33	33	33			
MC% (GDP)	Pearson Correlation	.872**	.716**	.908**	.600**		
	Sig. (2-tailed)	.000	.000	.000	.000		
	N	33	33	33	33		
GCF% (GDP)	Pearson Correlation	.742**	.665**	.685**	.599**	.613**	
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	33	33	33	33	33	

** . Correlation is significant at the 0.01 level (2-tailed).

Source: Own computation using E-View

Table 3: Classical Regression Analysis

Dependent Variables	BCPS	M2	MC	RDGP	GCF
Constant	9.492*** [9.419]	14.963*** [13.921]	14.176 [1.187]	623.424*** [4.609]	26.578*** [6.411]
IIAS	0.001*** [5.248]	0.001*** [3.562]	0.022*** [12.040]	0.227*** [11.197]	0.003*** [5.236]
R ²	0.47	0.29	0.824	0.802	0.469
F-ratio	27.545***	12.688***	144.971***	125.375***	27.411***

[] – t-value, ***- (p<0.01)- significant coefficient.

Source: Own computation using E-View

Table 4: Regression Model

RGDP = f (BCP, IIAS, M2, MC, GCF)

RGDP = -21.733 – 34.508(BCP) + 0.116(IIAS) + 39.605(M2) + 3.502(MC) + 12.425(GCF)

t (-0.056) (-0.623) (2.301) (0.757) (1.769) (2.127)

Adjusted R² = 0.831, F ratio = 32.473.

Table 5: Stationarity (Unit Root) Test

Variable	ADF Test Statistic	P-value	Remark
BCPS	-2.617894	0.2754	Non Stationary
M2	-2.415890	0.3650	Non Stationary
MC	-1.486751	0.8133	Non Stationary
RDGP	-2.033530	0.5608	Non Stationary
GCF	-2.947700	0.1628	Non Stationary
IIAS	-1.749930	0.7050	Non Stationary

Source: Own computation, 2016

Table 6: Pair wise Granger Causality Tests

Sample: 1981 2013

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
GCF does not Granger Cause BCPS	31	4.51617	0.0207
BCPS does not Granger Cause GCF		5.12622	0.0133
IIAS does not Granger Cause BCPS	31	4.84235	0.0163
BCPS does not Granger Cause IIAS		9.96018	0.0006
M2 does not Granger Cause BCPS	31	1.07209	0.3569
BCPS does not Granger Cause M2		1.33976	0.2794
MC does not Granger Cause BCPS	31	26.6018	5.E-07
BCPS does not Granger Cause MC		0.96338	0.3948
RDGP does not Granger Cause BCPS	31	5.88100	0.0078
BCPS does not Granger Cause RDGP		1.00727	0.3790
IIAS does not Granger Cause GCF	31	0.24207	0.7868
GCF does not Granger Cause IIAS		10.9587	0.0004
M2 does not Granger Cause GCF	31	8.07509	0.0019
GCF does not Granger Cause M2		0.83255	0.4462
MC does not Granger Cause GCF	31	3.82639	0.0349
GCF does not Granger Cause MC		2.12905	0.1392
RDGP does not Granger Cause GCF	31	1.61990	0.2173
GCF does not Granger Cause RDGP		0.93256	0.4063
M2 does not Granger Cause IIAS	31	8.68226	0.0013
IIAS does not Granger Cause M2		1.32473	0.2832
MC does not Granger Cause IIAS	31	1.02741	0.3720
IIAS does not Granger Cause MC		36.0836	3.E-08
RDGP does not Granger Cause IIAS	31	6.30196	0.0059
IIAS does not Granger Cause RDGP		3.33404	0.0514
MC does not Granger Cause M2	31	5.29424	0.0118
M2 does not Granger Cause MC		0.35835	0.7022
RDGP does not Granger Cause M2	31	4.26568	0.0250
M2 does not Granger Cause RDGP		1.11489	0.3431
RDGP does not Granger Cause MC	31	5.52461	0.0100
MC does not Granger Cause RDGP		0.77982	0.4689

At each point on the test that $p < 0.05$, H_0 is rejected.**Source:** Own computation using E-View.**Table 7:** Trend assumption: Linear deterministic trend (restricted)

Series: BCPS GCF IIAS M2 MC RDGP

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None*	0.925992	207.8987	117.7082	0.0000
At most 1*	0.884283	127.1875	88.80380	0.0000
At most 2	0.560401	60.33268	63.87610	0.0958
At most 3	0.371177	34.85401	42.91525	0.2511
At most 4	0.319210	20.47295	25.87211	0.2029
At most 5	0.241123	8.553401	12.51798	0.2097

Trace test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized	Max-Eigen	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.925992	80.71116	44.49720	0.0000
At most 1 *	0.884283	66.85486	38.33101	0.0000
At most 2	0.560401	25.47866	32.11832	0.2594
At most 3	0.371177	14.38107	25.82321	0.6895
At most 4	0.319210	11.91954	19.38704	0.4227
At most 5	0.241123	8.553401	12.51798	0.2097

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values



Unrestricted Cointegrating Coefficients (normalized by b*S11*b=I):

BCPS	GCF	IIAS	M2	MC	RDGP	@TREND(82)
0.393533	0.008054	0.000490	-0.183666	-0.035122	1.35E-05	-0.026692
-0.483404	-0.004194	0.000428	0.162915	-0.005539	0.001005	-0.168179
-0.090540	0.042153	0.000342	-0.196068	0.002928	0.000944	-0.225492
-0.436869	0.089774	-3.27E-05	0.128395	-0.022314	0.003877	-0.313758
0.496006	-0.028624	-0.000610	-0.320696	0.004855	0.003185	-0.380543
0.686604	-0.036763	-0.000600	-0.723221	0.012235	0.001383	-0.022382

The result shows a cointegration both with trace test and max-eigenvalue test at most 1. This is a clear evidence of long run relationship among the non stationary series at most one.

Vector Auto Regression

Vector Auto regression Estimates

Standard errors in (e) & t-statistics in [t]

	BCPS	GCF	IIAS	M2	MC	RDGP
BCPS(-1)	-0.522506 (0.35677) [-1.46455] [0.47592]	1.085505 (2.28084)	-181.9544 (258.163) [-0.70481]	-0.836576 (0.51415) [-1.62712]	6.612384 (3.48664) [1.89649]	60.28773 (36.3381) [1.65908]
BCPS(-2)	-0.386085 (0.27806) [-1.38851] [1.20786]	2.147114 (1.77762)	322.5488 (201.204) [1.60309]	-0.439977 (0.40071) [-1.09799]	2.115106 (2.71738) [0.77836]	-25.68583 (28.3209) [-0.90696]
GCF(-1)	0.014626 (0.04633) [0.31568]	0.633998 (0.29620) [2.14041]	-34.69097 (33.5266) [-1.03473]	-0.001185 (0.06677) [-0.01775]	0.950644 (0.45280) [2.09949]	-0.570007 (4.71910) [-0.12079]
GCF(-2)	-0.042337 (0.04030) [-1.05061]	-0.101063 (0.25762) [-0.39229]	66.80878 (29.1597) [2.29113]	-0.040260 (0.05807) [-0.69326]	-1.266861 (0.39382) [-3.21686]	2.896694 (4.10442) [0.70575]
IIAS(-1)	1.77E-05 (0.00026) [0.06729]	-0.001347 (0.00168) [-0.79944]	0.469750 (0.19064) [2.46402]	-6.65E-05 (0.00038) [-0.17503]	0.035544 (0.00257) [13.8049]	-0.021668 (0.02683) [-0.80749]
IIAS(-2)	-0.000639 (0.00053) [-1.19627]	-0.007500 (0.00342) [-2.19505]	-0.545390 (0.38673) [-1.41027]	-0.000552 (0.00077) [-0.71611]	-0.024559 (0.00522) [-4.70208]	-0.002667 (0.05443) [-0.04900]
M2(-1)	0.411597 (0.27243) [1.51086]	1.431760 (1.74163) [0.82208]	-59.28015 (197.131) [-0.30071]	0.970794 (0.39260) [2.47274]	1.720654 (2.66237) [0.64629]	-10.46144 (27.7475) [-0.37702]
M2(-2)	0.332685 (0.30002) [1.10889]	-2.031082 (1.91802) [-1.05895]	34.68231 (217.095) [0.15976]	0.283277 (0.43236) [0.65519]	-3.333158 (2.93200) [-1.13682]	8.508162 (30.5576) [0.27843]
MC(-1)	0.042737 (0.01460) [2.92685]	0.136940 (0.09335) [1.46696]	16.93612 (10.5660) [1.60289]	0.039595 (0.02104) [1.88165]	0.703170 (0.14270) [4.92761]	-0.032673 (1.48724) [-0.02197]
MC(-2)	0.062343 (0.01281) [4.86517]	0.038044 (0.08192) [0.46440]	0.670965 (9.27245) [0.07236]	0.041861 (0.01847) [2.26682]	-0.687453 (0.12523) [-5.48953]	-3.015753 (1.30516) [-2.31064]
RDGP(-1)	-0.002301 (0.00268) [-0.85867]	-0.000945 (0.01713) [-0.05514]	-0.415319 (1.93933) [-0.21416]	0.001406 (0.00386) [0.36406]	0.105803 (0.02619) [4.03958]	1.036975 (0.27297) [3.79882]
RDGP(-2)	0.001598 (0.00294) [0.54311]	0.011194 (0.01882) [0.59491]	2.128753 (2.12973) [0.99954]	-0.001371 (0.00424) [-0.32326]	-0.105691 (0.02876) [-3.67451]	0.133732 (0.29977) [0.44611]
C	6.727891 (1.87607) [3.58617]	-13.51727 (11.9938) [-1.12702]	-2169.130 (1357.54) [-1.59784]	8.037373 (2.70363) [2.97281]	-46.44878 (18.3344) [-2.53342]	-280.5588 (191.083) [-1.46825]
R-squared	0.955126	0.892433	0.968021	0.890973	0.989685	0.989768
Adj. R-squared	0.925210	0.820722	0.946702	0.818289	0.982808	0.982946
Sum sq. resids	60.24792	2462.387	31546550	125.1233	5754.122	625015.4
S.E. equation	1.829510	11.69612	1323.853	2.636531	17.87941	186.3413
F-statistic	31.92685	12.44485	45.40632	12.25811	143.9127	145.0958
Log likelihood	-54.28655	-111.7980	-258.3984	-65.61444	-124.9542	-197.6160
Akaike AIC	4.341068	8.051486	17.50957	5.071899	8.900271	13.58813
Schwarz SC	4.942417	8.652835	18.11092	5.673249	9.501621	14.18948
Mean dependent	12.59355	38.82258	3939.087	17.20000	99.37097	1555.270
S.D. dependent	6.689790	27.62350	5734.366	6.185036	136.3592	1426.921
Determinant resid covariance (dof adj.)		3.74E+15				
Determinant resid covariance		1.43E+14				
Log likelihood		-769.1777				
Akaike information criterion		54.65663				
Schwarz criterion		58.26472				



Var Model:

$$\begin{aligned} \text{BCPS} &= C(1,1)*\text{BCPS}(-1) + C(1,2)*\text{BCPS}(-2) + C(1,3)*\text{GCF}(-1) + C(1,4)*\text{GCF}(-2) + C(1,5)*\text{IIAS}(-1) + \\ &C(1,6)*\text{IIAS}(-2) + C(1,7)*\text{M2}(-1) + C(1,8)*\text{M2}(-2) + C(1,9)*\text{MC}(-1) + C(1,10)*\text{MC}(-2) + \\ &C(1,11)*\text{RDGP}(-1) + C(1,12)*\text{RDGP}(-2) + C(1,13) \\ \text{GCF} &= C(2,1)*\text{BCPS}(-1) + C(2,2)*\text{BCPS}(-2) + C(2,3)*\text{GCF}(-1) + C(2,4)*\text{GCF}(-2) + C(2,5)*\text{IIAS}(-1) + \\ &C(2,6)*\text{IIAS}(-2) + C(2,7)*\text{M2}(-1) + C(2,8)*\text{M2}(-2) + C(2,9)*\text{MC}(-1) + C(2,10)*\text{MC}(-2) + \\ &C(2,11)*\text{RDGP}(-1) + C(2,12)*\text{RDGP}(-2) + C(2,13) \\ \text{IIAS} &= C(3,1)*\text{BCPS}(-1) + C(3,2)*\text{BCPS}(-2) + C(3,3)*\text{GCF}(-1) + C(3,4)*\text{GCF}(-2) + C(3,5)*\text{IIAS}(-1) + \\ &C(3,6)*\text{IIAS}(-2) + C(3,7)*\text{M2}(-1) + C(3,8)*\text{M2}(-2) + C(3,9)*\text{MC}(-1) + C(3,10)*\text{MC}(-2) + \\ &C(3,11)*\text{RDGP}(-1) + C(3,12)*\text{RDGP}(-2) + C(3,13) \\ \text{M2} &= C(4,1)*\text{BCPS}(-1) + C(4,2)*\text{BCPS}(-2) + C(4,3)*\text{GCF}(-1) + C(4,4)*\text{GCF}(-2) + C(4,5)*\text{IIAS}(-1) + \\ &C(4,6)*\text{IIAS}(-2) + C(4,7)*\text{M2}(-1) + C(4,8)*\text{M2}(-2) + C(4,9)*\text{MC}(-1) + C(4,10)*\text{MC}(-2) + \\ &C(4,11)*\text{RDGP}(-1) + C(4,12)*\text{RDGP}(-2) + C(4,13) \\ \text{MC} &= C(5,1)*\text{BCPS}(-1) + C(5,2)*\text{BCPS}(-2) + C(5,3)*\text{GCF}(-1) + C(5,4)*\text{GCF}(-2) + C(5,5)*\text{IIAS}(-1) + \\ &C(5,6)*\text{IIAS}(-2) + C(5,7)*\text{M2}(-1) + C(5,8)*\text{M2}(-2) + C(5,9)*\text{MC}(-1) + C(5,10)*\text{MC}(-2) + \\ &C(5,11)*\text{RDGP}(-1) + C(5,12)*\text{RDGP}(-2) + C(5,13) \\ \text{RDGP} &= C(6,1)*\text{BCPS}(-1) + C(6,2)*\text{BCPS}(-2) + C(6,3)*\text{GCF}(-1) + C(6,4)*\text{GCF}(-2) + C(6,5)*\text{IIAS}(-1) + \\ &C(6,6)*\text{IIAS}(-2) + C(6,7)*\text{M2}(-1) + C(6,8)*\text{M2}(-2) + C(6,9)*\text{MC}(-1) + C(6,10)*\text{MC}(-2) + \\ &C(6,11)*\text{RDGP}(-1) + C(6,12)*\text{RDGP}(-2) + C(6,13) \end{aligned}$$

Var Model - Substituted Coefficients:

$$\begin{aligned} \text{BCPS} &= - 0.522505909521*\text{BCPS}(-1) - 0.386084744229*\text{BCPS}(-2) + 0.01462631251*\text{GCF}(-1) - \\ &0.0423371347523*\text{GCF}(-2) + 1.77282200697\text{e-}05*\text{IIAS}(-1) - 0.000639339792989*\text{IIAS}(-2) + \\ &0.411597244659*\text{M2}(-1) + 0.332684979181*\text{M2}(-2) + 0.0427371859462*\text{MC}(-1) + \\ &0.0623430189903*\text{MC}(-2) - 0.00230129506259*\text{RDGP}(-1) + 0.00159847067198*\text{RDGP}(-2) + \\ &6.72789146087 \\ \text{GCF} &= 1.08550489388*\text{BCPS}(-1) + 2.14711363505*\text{BCPS}(-2) + 0.633998337824*\text{GCF}(-1) - \\ &0.101063494801*\text{GCF}(-2) - 0.00134651330108*\text{IIAS}(-1) - 0.0074998551546*\text{IIAS}(-2) + \\ &1.43176015977*\text{M2}(-1) - 2.03108156982*\text{M2}(-2) + 0.136940358157*\text{MC}(-1) + \\ &0.0380444519898*\text{MC}(-2) - 0.000944798579316*\text{RDGP}(-1) + 0.0111938104791*\text{RDGP}(-2) - \\ &13.5172726078 \\ \text{IIAS} &= - 181.954376052*\text{BCPS}(-1) + 322.548827071*\text{BCPS}(-2) - 34.6909671371*\text{GCF}(-1) + \\ &66.80877582*\text{GCF}(-2) + 0.469749997138*\text{IIAS}(-1) - 0.545389785017*\text{IIAS}(-2) - \\ &59.2801524334*\text{M2}(-1) + 34.6823061632*\text{M2}(-2) + 16.9361166865*\text{MC}(-1) + \\ &0.670964640288*\text{MC}(-2) - 0.415318760558*\text{RDGP}(-1) + 2.1287525753*\text{RDGP}(-2) - 2169.12968958 \\ \text{M2} &= - 0.836576197626*\text{BCPS}(-1) - 0.439976789058*\text{BCPS}(-2) - 0.00118529944737*\text{GCF}(-1) - \\ &0.0402595770929*\text{GCF}(-2) - 6.64560021344\text{e-}05*\text{IIAS}(-1) - 0.000551540651473*\text{IIAS}(-2) + \\ &0.970793505287*\text{M2}(-1) + 0.283276575666*\text{M2}(-2) + 0.039595269659*\text{MC}(-1) + \\ &0.041860575039*\text{MC}(-2) + 0.00140608625462*\text{RDGP}(-1) - 0.00137109560673*\text{RDGP}(-2) + \\ &8.03737279417 \\ \text{MC} &= 6.61238376312*\text{BCPS}(-1) + 2.11510635363*\text{BCPS}(-2) + 0.95064370257*\text{GCF}(-1) - \\ &1.26686086248*\text{GCF}(-2) + 0.0355441518204*\text{IIAS}(-1) - 0.0245589224781*\text{IIAS}(-2) + \\ &1.72065399244*\text{M2}(-1) - 3.33315812648*\text{M2}(-2) + 0.703170301307*\text{MC}(-1) - \\ &0.687452908084*\text{MC}(-2) + 0.105803495908*\text{RDGP}(-1) - 0.105690584478*\text{RDGP}(-2) - \\ &46.4487810206 \\ \text{RDGP} &= 60.2877312287*\text{BCPS}(-1) - 25.6858319698*\text{BCPS}(-2) - 0.570006984824*\text{GCF}(-1) + \\ &2.89669386717*\text{GCF}(-2) - 0.0216684316711*\text{IIAS}(-1) - 0.00266709521414*\text{IIAS}(-2) - \\ &10.4614351587*\text{M2}(-1) + 8.50816198857*\text{M2}(-2) - 0.0326731465023*\text{MC}(-1) - \\ &3.01575303345*\text{MC}(-2) + 1.03697543512*\text{RDGP}(-1) + 0.133732431859*\text{RDGP}(-2) - 280.558776416 \end{aligned}$$

Vector Error Correction Estimates

Vector Error Correction Estimates

Standard errors in (e) & t-statistics in [t]

CointegratingEq:	CointEq1					
BCPS(-1)	1.000000					
GCF(-1)	0.068599					
	(0.00786)					
	[8.72898]					
IIAS(-1)	-0.001477					
	(0.00014)					
	[-10.3195]					
M2(-1)	-0.448758					
	(0.02140)					
	[-20.9682]					
MC(-1)	-0.008624					
	(0.00476)					
	[-1.81132]					
RDGP(-1)	0.001486					
	(0.00014)					
	[10.9991]					
C	-3.584657					
Error Correction:	D(BCPS)	D(GCF)	D(IIAS)	D(M2)	D(MC)	D(RDGP)
CointEq1	-1.312995	-1.689498	1782.325	-0.703868	-8.460065	155.5078
	(0.60739)	(5.01758)	(498.961)	(1.05496)	(6.43642)	(60.2934)
	[-2.16169]	[-0.33672]	[3.57208]	[-0.66720]	[-1.31441]	[2.57919]
D(BCPS(-1))	0.447404	0.386241	-1283.332	0.389621	8.397968	-72.47049
	(0.44600)	(3.68431)	(366.376)	(0.77463)	(4.72613)	(44.2722)
	[1.00315]	[0.10483]	[-3.50277]	[0.50298]	[1.77692]	[-1.63693]
D(BCPS(-2))	0.047291	1.324363	-552.5143	-0.267776	6.631015	-72.46522
	(0.37883)	(3.12945)	(311.200)	(0.65797)	(4.01438)	(37.6048)
	[0.12484]	[0.42319]	[-1.77543]	[-0.40697]	[1.65182]	[-1.92702]
D(GCF(-1))	0.081099	-0.199225	-45.42058	0.044768	0.334007	-6.977735
	(0.03782)	(0.31242)	(31.0676)	(0.06569)	(0.40076)	(3.75415)
	[2.14437]	[-0.63769]	[-1.46199]	[0.68154]	[0.83343]	[-1.85867]
D(GCF(-2))	-0.004547	0.137099	-31.31874	-0.041629	-0.844518	-5.182333
	(0.04569)	(0.37748)	(37.5373)	(0.07937)	(0.48422)	(4.53593)
	[-0.09950]	[0.36320]	[-0.83434]	[-0.52452]	[-1.74409]	[-1.14251]
D(IIAS(-1))	-0.001680	-0.003723	1.789051	-0.001175	0.023475	0.180528
	(0.00074)	(0.00609)	(0.60610)	(0.00128)	(0.00782)	(0.07324)
	[-2.27708]	[-0.61081]	[2.95175]	[-0.91693]	[3.00256]	[2.46489]
D(IIAS(-2))	-0.002076	-0.005485	1.784734	-0.001696	-0.023284	0.182914
	(0.00078)	(0.00641)	(0.63738)	(0.00135)	(0.00822)	(0.07702)
	[-2.67512]	[-0.85571]	[2.80012]	[-1.25862]	[-2.83191]	[2.37491]
D(M2(-1))	-0.397865	1.229705	730.8253	-0.198452	-1.354256	70.77416
	(0.36547)	(3.01912)	(300.229)	(0.63478)	(3.87284)	(36.2790)
	[-1.08863]	[0.40731]	[2.43423]	[-0.31263]	[-0.34968]	[1.95083]
D(M2(-2))	0.011955	1.272824	197.7626	0.011677	-4.060249	60.87569
	(0.26995)	(2.23005)	(221.761)	(0.46887)	(2.86064)	(26.7972)
	[0.04429]	[0.57076]	[0.89178]	[0.02490]	[-1.41935]	[2.27172]
D(MC(-1))	0.028831	-0.043131	21.16031	0.040515	0.275788	1.199338
	(0.01778)	(0.14686)	(14.6045)	(0.03088)	(0.18839)	(1.76477)
	[1.62171]	[-0.29368]	[1.44889]	[1.31209]	[1.46390]	[0.67960]
D(MC(-2))	0.036621	-0.036426	43.23798	0.028249	-0.833538	1.387602
	(0.01482)	(0.12245)	(12.1766)	(0.02575)	(0.15707)	(1.47140)
	[2.47056]	[-0.29748]	[3.55091]	[1.09724]	[-5.30666]	[0.94305]
D(RDGP(-1))	0.001543	-0.000532	0.326767	0.006171	0.102973	0.073185
	(0.00259)	(0.02138)	(2.12641)	(0.00450)	(0.02743)	(0.25695)
	[0.59593]	[-0.02488]	[0.15367]	[1.37257]	[3.75402]	[0.28482]
D(RDGP(-2))	0.005392	0.044752	-0.134464	0.000525	-0.042101	0.074311
	(0.00277)	(0.02287)	(2.27382)	(0.00481)	(0.02933)	(0.27476)
	[1.94817]	[1.95718]	[-0.05914]	[0.10924]	[-1.43534]	[0.27046]
C	0.832673	-0.099714	-1760.366	0.209440	4.917153	-91.19337
	(0.79069)	(6.53177)	(649.535)	(1.37332)	(8.37878)	(78.4885)
	[1.05309]	[-0.01527]	[-2.71019]	[0.15251]	[0.58686]	[-1.16187]



R-squared	0.933629	0.691228	0.812231	0.773896	0.960630	0.703995
Adj. R-squared	0.879702	0.440350	0.659669	0.590187	0.928641	0.463491
Sum sq. resids	41.57692	2837.269	28057148	125.4239	4668.742	409685.2
S.E. equation	1.612004	13.31650	1324.225	2.799821	17.08205	160.0166
F-statistic	17.31294	2.755242	5.323934	4.212615	30.03051	2.927162
Log likelihood	-47.46337	-110.8092	-248.7965	-64.02569	-118.2799	-185.3974
Akaike AIC	4.097558	8.320610	17.51977	5.201713	8.818658	13.29316
Schwarz SC	4.751450	8.974502	18.17366	5.855605	9.472550	13.94705
Mean dependent	0.303333	-0.186667	528.5867	0.093333	15.36000	133.2460
S.D. dependent	4.647690	17.80050	2269.922	4.373583	63.94638	218.4623
Determinant resid covariance (dof adj.)		1.83E+15				
Determinant resid covariance		4.20E+13				
Log likelihood		-725.9488				
Akaike information criterion		54.39658				
Schwarz criterion		58.60018				

Source: Own computation using E-View

CONCLUSION

It can be deduced therefore, that institutional investors depend heavily on macroeconomic factors such as economic and financial development for growth and this pattern their behaviours. Institutional investor's behaviour was found to be influenced by economic and financial development. Nigeria being an emerging economy need to focus on economic development oriented policies and grow their banks and non-banks financial intermediaries in order to stimulate a strong and vibrant financial development of the financial sector.

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