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STOCK MARKET PERFORMANCE AND ECONOMIC GROWTH IN NIGERIA; A CAUSALITY INVESTIGATION

H. B. RIMAN, I. E. ESSO AND E. EYO

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ABSTRACT

The paper addresses the question, "Is there really a link between stock market performance and economic growth in Nigeria, or is the stock market liquidity just highly correlated with some exogenous non-financial factors?" The paper utilises the Johansson's Vector Error Correction Model (VECM) in establishing if a long-run relationship does exist between stock market performance and economic growth in Nigeria using annual data from 1970-2004
The empirical results suggest that a long-run relationship does exist between stock market and economic growth as indicated by the significance of the Error Correction Model (ECM). The paper further establishes a uni-directional causality that runs from stock market to economic growth. The paper therefore reveals that the stock market is significant in determining economic growth in Nigeria. However, the paper further suggest that caution should be exercised in interpreting this uni-directional causality since other non-financial exogenous variables such as have been identified to influence the direction of stock market development in Nigeria.

INTRODUCTION

The Nigerian capital market has witnessed obvious transformation over the years, evident by the increased level of participation of the private and public investors at the floor of the stock exchange and in various public offers of quoted companies. The emerging market has also attracted and embraced the attention and the interest of international investors, thus increasing capital inflow. The explosive growth of the market has also contributed sizeably to the share of the global boom, particularly in Africa. For example, the overall market capitalisation had risen from 1,698.1m in 1980 to a high of 1,325,672.9 in 2003, thus signifying an increase within the period. Transaction at the floor of NSE has risen to a total of 263bn in 2005 from a previous value of 16.6m recorded in 1970. The number of deals from all market participants at the floor which recorded a mere 634 deals in 1970 had also witnessed a remarkable increase to 1,021,966.6 in 2005. The total number of listed companies had also increased from 91 as was listed in 1980 to 200 listed in 2003 (CBN Bulletin and Annual Report 2002-2003)

These rapid developments in the market are attributable to the stock market-growth linkages traceable through the mechanism of liquidity creation. According to Levine(1996) liquid equity market makes investment less risky and more attractive because they allow savers to sell their equity quickly and cheaply if they need access to their savings or if they want to alter the constitution of their portfolios. In other words investors will have confidence in markets that are assessable whenever the need arises. The more accessible the participants are to the market, the more liquid the market will become.

Dermirguc-kunt and Levine (1995) further expounded that large companies enjoy permanent access to capital raised through issues. That is to say that, through facilitating long term and profitable investment, liquid market improves the allocation of capital and enhances the prospect of long economic growth. Stock markets play key role in allocating capital to corporate sector, which in turn exerts real effect on the domestic growth of the economy. (Caporale, Howells and Soliman, 2004)

Empirical investigation on the link between financial development in general and stock market in particular have been relatively limited; particularly, regarding developing economies. Substantial economic literature dating back to Bernanke and Gertler (1990) and Schumpeter (1911) had emphasis positive contribution of the financial system to economic growth. The direction of causality between the increasing growth in the financial sector and a country's growth rate have been furiously debated and probably doubted (Robinson, 1952) and often considered as unimportant in developing economies (Lucas, 1998). However, current empirical research conducted on Ghana economy by Osei (2005) has proved the assertion of these researchers as untrue. Using the Granger-causality test to analyse the stock market performance in Ghana, Osei (2005) indicated that following uni-directional causality, stock markets caused economic growth in Ghana.

In the light of the above arguments, it has become very necessary to examine the importance which stock markets play in transitional market economies. Thus, this study intends to assess the contribution of NSE to economic growth in Nigeria. The study proposes to examine the direction of causality between market development and economic growth in Nigeria. In assessing the above objectives, the paper will address the following questions

(a) Is there an independent link between stock market development and economic growth, or is stock market liquidity only correlated with banking development?
(b) Is there a link between stock market liquidity

H. B. Riman, Department of Banking and Finance, University of Uyo, Akwa Ibom State-Nigeria.
I. E. Esso, Department of Banking and Finance, University of Calabar, Cross River State-Nigeria.
E. Eyo, Department of Agricultural Economics, University of Calabar, Cross River State-Nigeria.

and economic growth, or is stock market liquidity just highly correlated with some other non-financial factor?

The study provides relevant insight into the direction of causality between stock market development and economic growth in Nigeria. The issue of direction of causality will be addressed using the framework introduced by Granger (1969)

Introduction

The role of stock market development has assumed a developmental role in global economies following the observable impact the market has exerted in corporate finance and economic activity. Given the growing interest in the impact of stock market on economic development several researchers have posited reasons for this growing interest.

For instance, Rouseau and Wachtel (2000) advanced four reasons for the importance of stock market on financial institutions even when equity issuance is a relatively minor source of funds. First, an equity market provides investors and entrepreneurs with a potential exit mechanism. According to them, venture capital investments will be more attractive in countries where an equity market exists than one without an adequately functioning public equity market. When the market exists, the venture capital investor knows that it is possible to realize the gains from a successful project when the company makes an initial public offering. The option to exit through a liquid market mechanism makes venture capital investments more attractive and might well increase entrepreneurial activity generally. The impact of the market will be felt well beyond the firms that actually do use the market for raising capital (Benchivenga and Smith, 1991)

Secondly, capital inflows – both foreign direct investment and portfolio investments – are potentially important sources of investment funds for emerging market and transition economies. International portfolio investments have grown rapidly in recent years as portfolio managers around the world have begun to understand the importance of international diversification. Portfolio flows tend to be larger to countries with organized and liquid markets. Thus, the existence of equity markets facilitates capital inflow and the ability to finance current account deficits.

Thirdly, the provision of liquidity through organized exchanges encourages both international and domestic investors to transfer their surpluses from short-term assets to the long-term capital market, where the funds can provide access to permanent capital for firms to finance large, indivisible projects that enjoy substantive scale economies. Thus, given this scenario the importance of domestic resource mobilization cannot be underestimated.

Finally, the existence of a stock market provides important information that improves the efficiency of financial intermediation generally. For traded companies, the stock market improves the flow of information from management to owners and quickly produces a market evaluation of company developments. As firms increasingly link the compensation of their managers to stock price performance, a deep equity market may also provide managers with incentives to exert more effort in monitoring risky, high-return projects. Furthermore, the valuation of company assets by the stock market provides benchmarks for the value of business assets, which can be helpful to other businesses and investors, thereby improving the depth and efficiency of company assets generally.

However the role of the stock market in improving economic growth has also faced criticism overtime. Stiglitz (1985) had argued that stock markets had the tendency to reveal information through frequent instability and changes in equity prices. This situation according to him results in a free-rider problem that had the tendency to reduce investor's incentives, increases uncertainty and further exposes market participants to the tendency of conducting costly research in attempt to predict future market behaviour.

Demirguc-Kunt and Levine (1996) also questioned the contribution of stock market liquidity to long-term economic growth. They pointed out that stock liquidity deter growth via three channels. Firstly, stock market reduces savings rate through income and substitution effects, secondly, by reducing the uncertainty associated with investment, greater stock market liquidity may reduce savings rate because of the ambiguous effect of uncertainty on savings, and thirdly, stock market liquidity encourages investor's myopia, adversely affecting corporate governance, thereby reducing the cross benefit from economic growth.

However, further researches conducted by Greenwood and Smith (1996) emphasised that stock market were relevant in mobilising savings thus facilitating investment into most productive technologies. Companies take advantage of their market efficiency to explore the market for profit over their savings. Such savings are distributed across investors as dividend benefits and are often reinvested into the company for further capital appreciation. This interplay between the markets and market participants promote economic growth through redistribution of income.

Bencivenga et al (1996) and Levine (1991) have also argued that market liquidity, the ability to trade equity easily play a key role in economic growth. They affirmed that stock market provide assets to savers who would easily and readily liquidate them whenever they desire, while simultaneously allowing firms permanent access to capital raised through equity issue. Studies by Rousseau and Wachtel (2000), Beck and Levine (2003), Atje and Jovanovc (1993) has further shown that in a well developed stock market, share ownership provides individual with a relatively liquid means of sharing risk when investing in promising project. They also showed that investors are able to cope with liquidity risk by allowing those who are hit by liquidity shock to sell their shares to other investors who do not suffer from such shocks. The result of this risk transfer is that capital is not prematurely removed from firms who desire to meet short term needs. Dailami and Aktin (1990) also hold the opinion that a well developed and active market has the capacity to alter the pattern of demand for money since booming stock markets create liquidity thereby spurring economic.

Lately, researchers have begun questioning the direction of causality between stock market and economic growth. Further questions have been rift about the long-term effect of stock market on growth. Atje and Jovanic (1993) while using cross sectional regression

concludes that stock market have long-run impact on economic growth. They also found out that stock market influences growth through a number of channels, liquidity, and risk diversification, acquisition of information about firms, corporate governance and saving mobilisation (Levine and Zervos, 1996)

Luintel and Khan (1999) studied 10 developing economies and observed a bi-directional causality between financial development and economic growth in all samples. Surya and Neupane (2006) also examined the existence of causality between stock market and economic growth in a small economy of Napal. The study revealed a long-run integration and causality between stock market indicators and macroeconomic variables. Ahmed et al (2008) in a study of Pakistan economy found bi-directional causality relationship and a long-run relationship between stock market development and economic growth.

A study of the GSE (Ghana Stock Exchange) carried out by Osei (2005) interestingly revealed that stock market performance granger-causes economic growth in Ghana economy. Quite interestingly, the study did not find a reverse causality, but rather a uni-directional relationship. This upheld the fact that economic growth does not predict stock market development in Ghana. However, the researcher attributed this inu-directional causality to the low level of income as evidenced in most developing economies.

Similar to the result obtained by Osei (2005), NZue (2006) also attempted to investigate the relationship between the development of the Ivorian stock market and the country's economic performance. His empirical results suggested that gross domestic product and stock market development were cointegrated when the control variables were included in the analysis. That is, there is a long-run relationship between these variables taken together. The result also indicated a uni-directional causality running from stock market development to economic growth.

From the afore discourse it would be recalled that various researchers has posited that bi-directional causation is evident in developed economies while uni-directional causation exist in developing economies. It therefore becomes necessary to examine the directional effect of causation between stock market and economic development regarding the Nigerian economy.

METHODOLOGY

This study attempts to employ the methodology adopted by Surya and Neupane (2006) while testing for the direction of causation between stock market and economic growth in Napal. The data set for the study consist of 34 annual observation Spanning 1970-2004. Annual data was used because quarterly data could not be accessed for some of the variables.

As a measure for economic performance, the real GDP was employed, while market capitalization was used to depict the level of stock market performance measured by the ability of investors to raise funds from the market. Financial structure variable measured by ratio of total asset of all deposit money bank to GDP was employed as a control variable to x-ray the soundness of the Nigerian financial system.

Methodology and Data

The research proposes to test the long-run relationship between real GDP, Stock Market Performance and Financial structure. To determine the long run relationship between real GDP, Stock market performance and financial structure the study will implement the Johansen and Juselius (1990) and Johansen (1991) cointegration procedure. The cointegration test is based on the following vector error correction model (VECM

$$\Delta Y_t = \delta o + \sum_{i=1}^{p} \delta_i \Delta Y_{t-1} + \alpha\beta\, {}^{\prime}Y_{t-p} + \mu_t \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where, Δ is the first difference operator, *Yt* represents (MCAPt, RGDPt, STRUCt), $\delta 0$ represents the intercept, and μ represents the vector of white noise process. The matrix β consists of r ($r \leq 1$) cointegrating vectors. Matrix α contains the error parameters. The Johansen and Juselius cointegration procedure yields two statistics (i.e. maximum eigenvalue and the trace statistics).

The study estimates the following VECM to determine the long and short run dynamics between stock performance, economic growth, and financial structure

$$\Delta RGDP_t = \alpha + \sum_{i=1}^{a} \Phi_i \Delta RGDP_{t-1} + \sum_{i=1}^{b} \varphi_i MCAP_{t-1} + \sum_{i=1}^{c} \varphi_i \Delta STRUC_{t-1} + \varphi R_{t-1} \quad (2)$$

$$\Delta MCAP_t = \alpha + \sum_{i=1}^{a} \Phi_i \Delta RGDP_{t-1} + \sum_{i=1}^{b} \varphi_i MCAP_{t-1} + \sum_{i=1}^{c} \varphi_i \Delta STRUC_{t-1} + \varphi R_{t-1} \quad (3)$$

$$\Delta STRUC_t = \alpha + \sum_{i=1}^{a} \Phi_i \Delta RGDP_{t-1} + \sum_{i=1}^{b} \varphi_i MCAP_{t-1} + \sum_{i=1}^{c} \varphi_i \Delta STRUC_{t-1} + \varphi R_{t-1} \quad (4)$$

where Δ stands for difference operator; *RGDP* and MCAP represent economic growth and stock market performance, respectively; STRUC the variable of financial structure. The maximum lags determined by the modified AIC are represented by *a*, *b*, and *c*. *Rt*-1 is the error-correction term lagged by one period. The error correction term assesses the deviations of the variables from the long run equilibrium association. Under the VECM, the null hypothesis of non-causality is rejected if the sum of the regression coefficients on the independent variable is significantly different from zero and/or the error correction term is statistically significant. For instance, in equation (3), the null hypothesis that stock market performance do not Granger-cause economic growth is rejected if the set of estimated coefficients on the lagged values of *ΔMCAP* and/or the lagged error correction term (*Rt*-1) is statistically significant.

ESTIMATION TECHNIQUE

Estimating the VECM proceeds in the following manner:

Pre-test for stationary, lag-length, and test for cointegration.

This is to ensure that the variables are stationary and that shocks are only temporary and will dissipate and revert to their long-run mean. The tests for stationarity or unit roots employed for this study will be the augmented Dickey-Fuller (ADF) test performed on the variables in levels and first differences. Cointegration requires that all the variables be integrated of the same order. To test for unit roots, we will use the ADF which tests the null hypothesis of

H 0 : $\gamma = 0$ in

$$\Delta y_t = a_0 + \gamma y_{t-1} + \sum \beta_i \Delta y_{t-i+1} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

to examine whether a unit root exists. The ADF test assumes the asymptotic normality of the idiosyncratic error term, ε_t, in (3).

The choice of lag-lengths may be decided using Sims likelihood ratio test. The appropriate lag length is important as too many lags reduce the power of the test due to the estimation of additional parameters and a loss of degrees of freedom. In contrast, too few lags may not capture the dynamics of the actual error correction process, resulting in poor estimates of g and its standard errors. This paper employs the multivariate forms of the Akaike information criterion (AIC) and the Schwarz Bayesian Criterion (SBC) to determine lag lengths.

The choice of the number of maximum cointegrating relationships will be based on the λ_{trace} test to examine the specific hypotheses. We will reject models where π has full rank as in such a situation, z_t is stationary and has no unit root and so there is no error correction.

Having determined the order of cointegration, we will select and analyse the relevant cointegrating vector and speed of adjustment coefficients. Assuming π does not have full rank and there are multiple cointegrating vectors, we will choose the first eigenvector based on the largest eigenvalue, which is regarded as the most useful.

RESULTS AND DISCUSSION

UNIT ROOT TESTS

Time series data are often assumed to be non-stationary and thus it is necessary to perform a pretest to ensure there is a stationary cointegrating relationship among variables to avoid the problem of spurious regression. Based on the error correction mechanism as indicated by Johansen (1988), it is necessary for the variables to be of the same order of integration. For the testing of unit roots, the Augmented Dickey-Fuller (ADF) DF will be used. The result of the ADF to determine the presence of unit roots is reported in Table 1. Interestingly, it can be observed that on application of the ADF test on the level series only MCAP was not stationary (that is, it contains a unit root) as indicated by the fact that its respective critical value is larger (in absolute terms) than the calculated ADF statistics, thus the null hypothesis of the presence of a unit root could be rejected, as it is integrated of the order one. The remaining variables, STRUC and RGDP were stationary at their levels. The null hypothesis of the presence of unit root in the series was rejected as indicated by the values of their calculated ADF (in absolute terms) statistics which were higher than their critical values. In this direction, we say that their series are integrated of the order zero that is 1(0).

Consequently, the ADF test was applied on the log of the differenced series (MCAP) to make them stationary, except STRUC and RGDP which had been originally stationary at their levels.

Based on the foregoing, it became necessary to test for cointegration. By using the log-level form of the series, a multivariate cointegration relationship was estimated to establish the existence of a long-run equilibrium.

Co-integration Test:

Table 2 shows the summary result of the Johanson's Maximum Likelihood cointegration test. The test relations were estimated with intercept and linear deterministic trend in a Vector Auto Regression (VAR) model of order one (1) with a lag length of one (1), which was found to be most parsimonious for the data series. The Johansen cointegration test is based on the Maximum Eigenvalue of the stochastic matrix as well as the Trace of the stochastic matrix.

From the result it is evident that both the trace test and the maximum eigenvalue test indicate one cointegrating equation as the null hypothesis of r = 0 is rejected. Thus, it is infered that there was a unique long-run equilibrium relationship between market capitalisation (MCAP), financial structure (STRUC) and real gross domestic product (RGDP). The Johansen model is a form of Vector Error Correcting Model (VECM) where only one integrating relationship exists between the variables concerned (Hallam and Zanoli; 1993). The result of the integrating coefficient normalised on market capitalisation is presented as long-run estimates (see Table 3)

Vector Error Correcting Estimates

Table 3 shows the result of the VECM estimates for market capitalisation. Both the long and short-run estimates cum diagnostics are presented in Table 3. From the results, it can be seen that the model could not fit the observed data fairly well as indicated by the adjusted R^2 (0.1689) and F-statistic (2.6263) of the relevant error correction equation. The reason for this may be ascribed to the various anomalies experienced within the Nigerian financial system. This may imply that market capitalisation was not necessarily dependent on economic growth and the financial structure, but rather there may have existed some other exogenous variables that influenced the market.

In both the short and long-run, the financial structure STRUC is inelastic as indicated by the coefficients 0.1637 and -0.1177 respectively. This clearly suggests that a 10 percent increase in STRUC will increase MCAP by 1.637 percent in the shot-run and will as well decrease MCAP by 1.177 percent in the long-run. Similarly, a 10 percent increase in RGDP will decrease MCAP by 0.17 percent in the short-run with a reciprocal increase of 1.293 percent in the long-run. This result implies that in Nigeria market capitalisation is strengthened and robust only in the long-run. In the

short-run the market participants may be hedging against risk of losing their assets. But in the long-run as the discrepancies associated with price variation dissipates the market faces some rebounds and positive growth due to improved capital accumulation and total factor of productivity.

The error correction coefficient (-0.6195) which measures the speed of adjustment towards long-run equilibrium carries the expected negative sign and significant at 5 percent level. The coefficient of Vector Error Correction (VEC) indicates a feed back of about 61.95 percent of the previous year's disequilibrium from the long-run elasticity of market capitalisation. This also implies the speed with which STRUC and RGDP adjust from short-run disequilibrium to changes in MCAP in order to attain long-run equilibrium is 61.95 percent within one year.

Test for Causality:

Table 4 show the result for the test of causality. Granger Causality test was adopted in testing the direction of causality between economic growth and stock market performance in Nigeria. The Granger causality test determines the predictive content of one variable beyond that inherent in the explanatory variables itself. Thus the variables used for this causality test are assumed to be stationary and well integrating.

Table 4 reveals that the direction of causality is from market capitalisation to economic growth. The result which depicts uni-directional causality however did not reveal a bilateral or feed back causality between market capitalisation and economic growth as was reported by the research in Napal, Surya and Neupane (2006)

Further interpretation of this result indicates that market capitalisation catalyses economic development in Nigeria. The result shows that there is a positive link between market capitalization (normalized for the level of GDP) and future economic growth. This link, however, is likely to be because efficient markets incorporate anticipated future growth into current period prices and, therefore, exert an increase in market capitalization. The link exists even more strongly within higher income countries. Therefore, it is not surprising that countries with more developed financial markets are more efficient and, better able to incorporate anticipated future growth into current prices.

Another interesting and even more impressive result is that where financial structure is observed to granger, it caused an improvement in market capitalization. With a well functional financial and banking sector stock market can positively give a big boost to economic development as was noted in the work of Rousseau and Wachtel (2000), Beck and Levine (2005) and Ahmed and Ali (2008). Levine and Zervos had demonstrated that stock market liquidity and development of the banking sector both positively predict growth, due to improved capital accumulation and total factor productivity.

A well managed stock market has the ability to stimulate investment opportunities by organizing and financing productive projects that will diversify entrepreneur portfolio risk and exchange of goods and services, thus leading to higher economic activities through mobilizing domestic savings from public and private investors.

CONCLUSION AND RECOMMENDATION

We had examined the dynamic relationship that exists between stock market development and economic growth in Nigeria using annual data from 1970-2004. To establish a long-run relationship between the variables, the study had to initially establish that the variables are stationary. To establish co-integration, further test was conducted using both DF and ADF co-integration test. The study established a long-run relationship between economic growth and stock market development. The study further revealed that a market-based financial structure also had the tendency to effectively mobilize investible funds from the private and public sector, efficiency in financial intermediation, increasing social marginal productivity of capital and influencing private savings.

Research work by some authors had established a bi-directional causality between market performance and economic growth in some developing economies, but this bi-directional causality was not evident in Nigerian economy. The uni-lateral causal relationship could be attributed to the low income level of the economy, the poor savings culture of the investing public, and the insufficient number of companies listed on the floor of the market. The research also reveals that apart from the market capitalization, Nigeria market may be correlating with some other non-financial variables, exogenous to the market and capable of affecting the liquidity of the market.

Therefore, to invigorate and strengthen the financial market, more companies should be encouraged to get listed in the floor of the market. Small and medium entrepreneurs should be allowed to access the market for investible funds given their close affinity with the grass root funds mobilization ability.

Table 1: Result of Augmented Dickey Fuller (ADF) unit root tests

Variable Level	ADF Statistics	Critical Value (1%)
MCAP	2.135	-3.724
STRUC	-4.789	-3.639
RGDP	-6.473	-3.646

(2) Variable First Differenced

Variable first difference	ADF statistics	Critical Value (1%)	Order of Integration
ΔMCAP	-8.648	-3.724	1(1)
-	-	-	0
-	-	-	0

Critical values of ADF test are based on Mackinnon (1996) one-sided P-Values. Lag length selection was automatic based on EViews Schwarz information criteria

Table 2: Results of Multivariate Cointegration tests

Null Hypothesis	Eigen Values	Trace Statistics	Critical Value at 5%	Null Hypothesis	Max-Eigen Value statistics	Critical Values at 5%
r = 0**	0.5121	41.5940	29.68	r = 0**	23.6880	20.97)
r ≤ 1	0.2993	17.9060	15.41	r ≤ 1	11.7389	14.07
r ≤ 2	0.1704	2.1670	3.76	r ≤ 2	2.1670	3.76

** Denotes rejection of the null hypothesis at the 5% level

Table 3: Short and Long-run VECM estimate

(a) Long-Run Estimates

Regressor	Long-run estimates	Standard Error	t-value
LNMCAP	1.0000		
LNSTRUC (-1)	-0.1177	(0.0465)*	-2.5286
LNRGDP (-1)	0.1293	(0.1293)	0.5863
Constant	-6287.5890		

(b) Short-Run Estimates

Error Correction	ΔLnMCAP	LnSTRUC	LnRGDP
Coint EQ 1[ECM (-1)]	-0.6195	1.7136	-0.2362
	(0.2202)	(0.5550)	(0.2342)
ΔLnMCAP	0.2232	-1.2083	-0.0112
	(0.2027)	(0.5110)	(0.2157)
LnSTRUC	0.1637	0.0307	-0.5126
	(0.1539)	(0.3880)	(0.1637)
LnRDGP	-0.0170	-0.0425	-0.0344
	(0.0644)	(0.1624)	(0.0685)
Constant	113.9150	809.4828	174.9542
	(961.3190)	2422.95)	(1022.47)
Diagnostics			
R^2	0.2728		
Adj R^2	0.1689		
S E Equation	5515.476		
F-Statistics	2.6263		
Log likelihood	-328.4193		
Akaike Criterion	20.2072		
Schwarz Criterion	20.4339		

** Figures in parenthesis are standard errors

Table 4: Result of Pairwise Granger-Causality Test (1970-2004)
Number of Lag = 1

Null Hypothesis	Obs	F-stat	Prob
LNMCAP does not Granger cause LNRGDP	34	2.1136	0.1560**
LNRGDP Granger causes LNMCAP		0.1395	0.711
LNFINSTRUC does not Granger cause LNMCAP	34	2.5710	0.1189**
LNMCAP Granger causes LNFINSTRUC		0.6552	0.4244
LNFINSTRUC does not Granger cause LNRGDP	34	1.8E-05	0.9966**
LNRGDP Granger causes LNFINSTRUC		0.0163	0.899

** Denotes that figures are significant at 5%

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