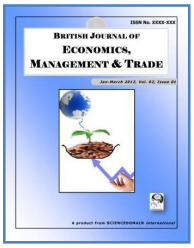

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Dynamic Effects of Capital Flow Shocks upon Stock Market Developments in Nigeria

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Authors' contributions

This work was carried out in collaboration between the both authors. Authors ARO and DBE designed the study, performed the econometric analysis, wrote the protocol, and wrote the first draft of the manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

Aims: To analyze the dependent relationship between capital flow and stock market development in Nigeria.
Study Design: case study (Nigeria)
Methodology: the study employed the use of Vector Auto-regression Model (Granger – Causality Wald Test, Impulse Response Test and Variance Decomposition Test), to enable us achieve our objectives.
Scope of the Study: 1986 – 2012.
Results: the granger causality result shows that Capital Account Balance (Deju), Foreign direct investment (FDIN), Net portfolio investment (NPI), Real gross domestic product

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(RGDP), Exchange Rate (EXCR), does not granger cause Market Capitalization (MC). There is bi-causality relationship between Market Capitalization and Trade Openness, that is, both Market Capitalization (MC) and Trade Openness(TROP) granger cause each other. Also, A uni-directional causality exist between Debt (DEBT) and Market Capitalization. Debt granger causes Market Capitalization but Market Capitalization does not granger cause Debt. For Impulse Response result indicates that Market Capitalization responded positively all through the year to the shock in Trade Openness, Real gross domestic product and Exchange Rate. While shocks in Dejure, NPI, and FDIN appears insignificant to Variations in Market Capitalization. Finally, the Variance decomposition analysis reveals that Market Capitalization contributes 40 percent of its own shock all through the year while the other variables accounts for the other 60 percent. Among all the selected variables, Trade Openness and Real gross domestic product seem to account for 45 percent of variation in Market Capitalization for the period under study.
Conclusion: based on our findings, market capitalization responded strongly to variations in trade openness and real gross domestic product. While shocks/changes in Deju, Net portfolio investment, Foreign direct investment and Debt appears insignificant to Variations in Market Capitalization. Showing that in all capital flow (liberalization) have not impacted on stock market development in Nigeria during the period under review.

Keywords: Market capitalization; trade openness; foreign direct investment; real gross domestic product; exchange rate; foreign direct investment; capital flow; liberalization.

1. INTRODUCTION

During the 1980s, developing countries enacted dramatic reforms to their financial systems through liberalization to make their economies more market-oriented (financial de-repression), making capital easier to move around the world. Since the inception of financial liberalization in mid 1980, there are significant arguments for a positive impact of integration with the international capital market, especially for developing countries. As Developing countries face a shortage of funds to meet their investment and development needs and the less than satisfactory economic growth registered by countries of sub-Saharan Africa can be attributed to low level of investment both human, capital and financial investment. This resource gap must be filled by capital inflows, composed of foreign direct investment (FDI), portfolio investment, net borrowing, and debt relief and these can only be achieved by opening-up the economy.

Again taking a stance from the standard Neoclassical growth theory which postulates that capital should flow from developed (North) to developing (South) countries due to the fact that the high marginal product of capital (MPK) in the South are caused by low capital-to-labor ratio or low household saving, thus predicting savings to flow from rich to poor countries. By tapping the pool of global savings, capital-poor countries could free themselves from a binding constraint on economic growth – lack of capital. Closer financial integration could also strengthen domestic financial systems leading to more investment, more efficient allocation of capital and higher growth [1].

Thus, it is useful to take stock of the benefits of further openness to capital flows as well as the risks. As countries develop, they require more advanced financial systems, which usually go hand in hand with greater cross-border capital flows. In addition, capital flows can facilitate the transfer of technology and management practices (particularly through FDI),

and financing of current account deficits for productive investment or smoothing consumption. They also have indirect benefits for intermediate objectives, such as financial sector development, macroeconomic policy discipline, and economic efficiency. For example, in Chile, Korea, and Mexico are some examples where liberalization has produced a positive result with the integrated approach [2].

In Chile, especially since the late 1990s, liberalization has been supported by strong macro-economic frameworks, including fiscal policy and exchange rate flexibility, carefully calibrated and sequenced liberalization measures to manage risks, financial market development, and improvements in the regulatory framework that addressed in particular the issue of related lending and exposures and has helped to build financial sector resilience. In Korea, also since the late 1990s liberalization has proceeded through a well-considered sequence of financial reforms in the context of sound macroeconomic policies and strong financial sector supervision. The experience also illustrates how long-term liberalization goals can be integrated with short-term use of Capital Flow Managements (CFMs). In recent years, Mexico's strong macroeconomic and prudential policy frameworks have allowed the country both to maintain an open capital account [2].

But capital flows can pose risks even for countries that have long been benefited from capital flows, and have highly developed financial markets as the experience in Latin America in the early 1980s and in Asia in the late 1990s have shown that capital flows can also bring serious problems. It is a fact that international capital flows on financial market can be very volatile. However, different countries experienced different degree of volatility of financial market and this may be systematically related to the quality of macroeconomic policies and domestic financial governance. In this context high volatility of capital flows has affected the macro economic variables such as exchange rate, interest rate, money stock (M3) and inflation negatively. Even in countries where conducive atmosphere is created for the free flow of capital and authorities don't operate with any current account deficit complicates the assessment of integration in financial market [3].

In addition, [4] argued on the long-standing puzzle in the pattern of international capital flows. He pondered why capital does not flow from North (developed countries) to South (developing countries) despite that it is scarcer and commends a higher rate of return (or marginal product) in the South as predicted by Neoclassical Theory. On this regard, [5], examined empirically the "Lucas Paradox" and gave a substantial explanation for lack of flows of capital from rich to poor countries to include differences in fundamentals across countries and capital market imperfections. He also affirmed that during 1970 – 2000 low institutional quality is the leading explanation. Now based on the Lucas Paradox of the reversal movement of financial capital and fixed capital, one will ponder if actually the financial liberalization (financial openness) has any impact on the economic/financial development in the developing world.

Empirical studies have attempted to examine whether financial openness contributes to growth using various methodology but in spite of these literatures; there is great dearth of study on the effect of different type of capital flow on stock market development. And the inter-reliant relationship between Capital flow and financial market cannot be ignored. According to [6], the capital market is a network of specialized financial institutions, series of mechanisms, processes and infrastructure that, in various ways, facilitate the bringing together of suppliers and users of medium to long term capital for investment in socio-economic developmental projects". Beside, [7] argues that the rapid implementation of financial sector reforms in some countries has not resulted in a priori expectation in the

developing countries. Upon the theoretical assertions that financial liberalization was embraced to produce positive changes in the financial market and again the degree of achievement in financial liberalization also depends on financial sector development [8]. And again considering Lucas paradox of reversal capital flow, it is in the interest of this study to find out (i) the relationship between different components of capital flow and stock market development (ii) secondly, to examine the growth impact of such flow on stock market development. (iii) Finally to indicate the variable that most impacted on stock market development.

To achieve these objectives, our hypotheses are developed as:

- H_{o1} there is no causal relationship among different component of capital flow and stock market development in Nigeria.
- H_{o2} stock market development has no significant growth responses with capital flow in Nigeria.
- H_{o3} there is no significant impact of capital flow, Trade Openness (TROP), Real gross domestic product (RGDP), Exchange rate (EXCR) on stock market development in Nigeria.

2. THEORETICAL AND EMPIRICAL LITERATURE

Capital flow arises through the transfer of ownership of a financial asset from one country to another. The assets involved in these transactions are typically equity and debt instruments. The transactions are recorded in the financial account of a country's balance of payments [9]. According to [10] "Capital flow liberalization" refers to the removal of Capital Flow Managements (CFMs). The concept includes the underlying capital transaction as well as the related payment or transfer, and it implies unrestricted convertibility of local currency in international financial transactions. Liberalization does not rule out the temporary re-imposition of such measures under certain circumstances, the maintenance of prudential measures that, while possibly CFMs, are needed for financial system stability.

2.1 Benefits and Risks Associated with Capital Flows

There is general agreement among scholars and practitioners about the benefits and risks associated with cross-border capital flows for economic development in general and for financial sector stability in particular. The benefits include filling the saving–investment gap, allowing portfolio diversification directly and production diversification indirectly (through the more diversified domestic capital formation permitted by access to foreign finance in general and FDI in particular), lowering financing costs, setting and/or raising standards of business and corporate governance, raising the intensity of competition, and enhancing fiscal discipline through the restraining effect of the threat of capital flight. FDI is also supportive of structural reforms, which pay off in terms of a higher productivity growth regardless of the host country's initial conditions, [11].

However, capital inflows can also have less desirable side-effects. In the context of incomplete structural reforms, international capital flows carry considerable risks and may magnify underlying macroeconomic and structural weaknesses. If capital inflows are in excess of the recipient economy's ability to absorb them productively, they can have a potentially negative impact on the financial sector and, ultimately, on the real economy.

Large capital inflows have been associated with rapid credit expansion and riskier lending practices in many countries. Large inflows can also lead to real exchange rate appreciation, resulting in a loss of competitiveness and a deterioration in the debt servicing capacity of clients in the internationally exposed sectors and thus in the quality of banks' balance sheets, [10].

As the experience of the 1997–98 financial crises in South-East Asia and Russia in 1998 have shown, risks associated with capital inflows also include the sudden (unexpected and large-scale) reversal of some type of flows, particularly short-term inflows. Short-term inflows driven by speculative position-taking aimed at exploiting an interest rate differential or by views on the likely future direction of exchange rate movements can easily be reversed if fundamental or extraneous events cause expectations to change. While there is general agreement about the nature of the benefits and costs of capital account liberalization, the balance of costs and benefits remains an open issue. There is general agreement on the following two points. First, that the cost–benefit analysis of international financial integration is highly conditional on the nature and credibility of the exchange rate regime. A less than fully credible peg is a recipe for financial sector instability and economic dislocation. Secondly, the sequencing and coordination of capital account liberalization, macroeconomic stabilization and structural reforms aimed at strengthening the domestic financial sector. Capital account liberalization should follow domestic financial sector reform and macroeconomic stabilization. Liberalization of FDI should precede liberalization of portfolio investment and cross-border bank lending (for a recent analysis, see [11].

2.2 Theory of Capital Movements

This was propounded by the earliest theoreticians who assumed in the classical tradition, the existence of perfectly competitive market considered foreign investments as a form of factor movement to take advantage of the differential profit. The validity of this theory according to [12] is clear from the observation by a known economist Charles Kindleberger that under perfect competition, foreign direct investment would occur and that it would be unlikely to occur in a world where the conditions were even approximately competitive.

2.2.1 Monopolistic advantage theory

This theory also known as the Market Imperfection theory was expounded by Stephen Hymer in 1960. It is an important market imperfections approach to the explanation of foreign investments. The theory stated that foreign direct investment occurred largely in oligopolistic industries rather than in industries operating under near perfect competition. Hymer suggested that the decision of a firm to invest in foreign markets was based on certain advantages the firm possessed over the local firms (in the foreign country), such as economies of scale, superior technology, or skills in the fields of management, production, marketing and finance. [13] also argued that market imperfections were the basis for foreign investment.

2.2.2 Internalization theory

It was developed in the 1970s by British economists Peter Buckley and Mark Casson to explain the growth of multinational enterprises and the spread of foreign direct investment. This is an extension of the market imperfections theory. It states that foreign investment results from the decision of a firm to internalize its specific advantages like superior knowledge (ie keeping the knowledge within the firm to maintain the competitive edge).

Example, if a firm decides to externalize its knowhow by licensing a foreign firm, the firm (the authorizing firm) does not make any foreign investment in this respect but, if it decides to internalize, it may invest abroad in production facilities.

2.2.3 Location specific advantage theory

This suggests that foreign investment is pulled by certain location specific advantages.

Hood and Young postulate four factors that are pertinent to location specific theory. They are: Labour Costs, Marketing factors (market size, market growth, stage of development and local competition), Trade barriers and Government policy. Other factors include cultural factors. It is important to note that it is the total cost and not only labour cost that is important.

2.2.4 International product life cycle theory

This theory was developed by Raymond Vernon and Lewis T Wells in 1966. It describe how a firm tends to become Multinational at a certain stage in its growth. According to this theory, the production of a product shifts to different categories of countries through the different stages of the product life cycle.

The theory also shows that a new product is first manufactured and marketed in a developed country like the US (because of favourable factors like large domestic market entrepreneurship and ease of organizing production). The product is then exported to other developed markets. As competition increases in these markets manufacturing facilities are established there to cater for these markets and also to export to the developing countries. As the product becomes standardized and competition increases, more manufacturing facilities are established in developing countries to lower production costs and due to some other reasons. The developed markets may possibly be serviced by exports from the production units in the developing countries.

The product life cycle theory is useful because it explains the concentration of innovation in developed economies, and offers integrated theory of international trade and capital flows. It also provides explanation for the rapid growth in exports of manufactured goods by the newly industrialized countries.

2.2.5 The eclectic theory

John Dunning has attempted to formulate a general theory of international production by combining the postulates of some of the theories. According to Dunning foreign investment by MNCs result from three comparative advantages which they enjoy, these include; the firm specific advantage; internalisation advantage and location specific advantages.

The internalization advantage results from the ability of the firm to internalise its specific resources. Firm specific advantages result from the tangible and intangible resources held exclusively, at least temporarily, by the firm and which provide the firm comparative advantage over other firms. Even when a firm internalizes its exclusive resources, it may not be able to serve a foreign market without foreign investment. Therefore, for production to take place on the foreign country there should be some location specific advantages.

One important deficiency of the Eclectic theory is its inability to explain the foreign investment for acquisitions which have become a very important route to internalization.

2.3 Empirical Literature

The principal aims of financial liberalization were to stabilize the economy in the short run, induce the emergence of a market-oriented financial sector for effective mobilization of financial savings and efficient resources allocation to increase competition, strengthen the supervisory role of the regulatory authorities and stream-line public sector relationship with the financial sector [14,15] posits that financial liberalization entails the abolition of explicit controls on the pricing and allocation of credit. They said further that financial liberalization is only one component of a successful development strategy, which should lead to an increase in both the quality and quantity of financial intermediation by the banking system.

McKinnon Shaw hypothesis, according to many authors implies that a monetized economy reflects a highly developed capital market; hence a high degree of monetization should be positively related to growth performance. [16] emphasizes that financial markets channel funds from agents willing to save to those requiring funds and provide liquidity services.

[17] states that broad money (M2) is related to the ability of the financial system to provide liquidity, or a medium of exchange. [18] also focus on the liquid liabilities of financial system. According to [19] the extent of financial deepening (or financial depth) is an indicator of the overall size of the formal financial sector which can be measured by the ratio of liquid liabilities of financial institutions to GDP. [20] concludes that the ratio of broad money M2 to GDP reflects the extent to which a developing economy is monetized, and provides an indication of the extent to which the financial sector provides suitable instruments for payments and savings.

2.3.1 Studies on the relationship between capital flow and stock market development

[21] use dataset on financial development and structure. This is a unique database as it combines a wide variety of indicators that measure the size, activity and efficiency of financial intermediaries and markets across a large number of countries. Unfortunately the time-span of the data is until 1997 and the database has not been updated afterwards. He used indicators for stock and bond markets, as well as measures of efficiency of a banking system and foreign bank penetration. The correlations between these indicators for the sample of 32 developing countries show, in particular, that countries with more stock markets are also those that have more efficient banking sector, higher share of the broad money and of private bank credit in GDP but have fewer foreign banks. No significant correlation has been detected between the stock market efficiency and the size of both stock and bond markets. While the inefficiency of a banking sector is negatively correlated with stock and bond market development characteristics, the correlation coefficients of banking variables are much more significant with the variables of stock market as opposed to private bond market. Also, using GDP share of total investment in the economy taken from the Penn World, they found a significant positive correlation with all other measures of financial development. The results of this descriptive statistic analysis remain largely unchanged when the sample of developing countries is augmented with four 'cohesion' economies of the European Union or when the pre-1989 sample period starting from 1977 is also added, [22].

[23] indicates that emergence of integrated financial markets and high capital mobility made possible by the increasing globalization of world economies predisposes economies, especially developing ones to the volatility of capital flows. Also, the nature and source of capital flows plays critical role in determining the impact of its surge or sudden outflow from an economy, whereas foreign portfolio investment is adjudged the most volatile. Notwithstanding, no matter the nature of capital flows (flows over a medium-to-long-term); they are expected to influence the monetary aggregates, especially the economy's net foreign assets (NFA), inflation, real effective exchange rate, aggregate output (GDP) and possibly the domestic interest rates. Developing countries are attracting great amount of capital flows, Nigeria inclusive. With increasing capital flows, especially the Net Portfolio Investment (NPI) into the Nigerian economy and coupled with its undeveloped nature, the economy may not be insulated from the ravaging impact of capital flows and/or sudden flight, if proactive policy measures were not designed and implemented to forestall them. The study underscores the relation between capital flows and financial crisis as well as policy issues and challenges for Nigeria. It points out that it is more desirable for the country to adopt and pursue vigorously, appropriate and coherent policies that would respond to the increasing capital flows or sudden capital flight rather than procrastinating, probably to be enmeshed in crisis that often requires very costly measures to solve. Consequently, it proffers policy measures that would forestall the impact of massive capital inflows and/or sudden capital flight from the Nigerian economy.

[24] empirically investigate how three types of private capital flows could promote economic growth in recipient developed and developing countries. Their focus is on the role of stock markets as a channel through which foreign capital flows could promote growth. The findings reveal that FDI exhibits a positive impact on growth, while both foreign debt and portfolio investment have a negative impact on growth in all sample countries. However, the results indicate that stock markets might be a significant channel or leading institutional factor through which capital flows affect economic growth. The findings provide clear implications that the negative impact of private capital flows can be transformed into a positive one if the stock market development has attained a certain threshold level, regardless of whether it is in developed or developing countries.

[25] use Ordinary Least Squares (OLS) methodology with a Parsimonious Error Correction Model Specification, after testing for the stationary status (unit root) and long run relationship (co-integration) of the variables, the result shows that foreign portfolio investment has a positive impact on capital market growth with the speed of adjustment from short run to long run as indicated by the ECM-1 having a relatively high value of 66% in absolute terms. The study thus recommends appropriate and quick measures to reverse the current trend of nationalization in the demand deposit banks, improvement in the market's legal framework to ensure safety of investment and the sincere pursuit of the privatization program for a private sector growth led economy.

2.3.2 Studies on the relationship between capital flow and other macroeconomic aggregates

[26] finds a positive effect of capital account liberalization on growth among industrial countries, but they do not find evidence that capital account liberalization promotes growth in non- industrial countries. This study follows a slightly different strategy than does other research in this area by first focusing on the role of capital account liberalization on financial development and then considering the effect of financial development on growth. They find a significant effect of capital account liberalization on the change in financial depth in the cross

section of 82 developed and developing nations. This significant result seems to be because of the presence of the OECD countries in the sample. Klein and Olivei show that capital account liberalization significantly affects the change in financial depth in a sample consisting of the 20 OECD countries but not in a sample of the non-OECD countries, nor in a narrower non-OECD sample of 18 Latin American countries, a group that had a relatively high incidence of capital account liberalizations.

[27] argues that the average growth rate among developing countries remained stable at a relatively low level during the 1990s in spite of the boom in capital flows. On the other hand faster rate of growth has been associated with high capital flows in more advanced middle income countries. This shows that the impact of capital inflows varies in countries and regions of the world depending on the prevailing economic conditions.

[28] critically appraised some of the theory and evidence on the relationship between growth and openness and concludes that the relationship between growth and openness is less than clear. He said that though some measures of openness are correlated with growth, that it may be related to geographical factors rather than the openness of policy.

[29] examine the impact of stock market liberalization on economic growth. As previous researchers have done, they begin their analysis by augmenting the standard set of growth model variables with their variable indicating stock market liberalization. To maximize the time-series content in their regression, they use a moving average panel data method. In general, BHL find that financial liberalization leads to a 1 percent increase in annual per capita GDP growth over a five-year period and that this effect is statistically significant. BHL investigate the robustness of this result with respect to alternative sets of liberalization dates, different country groupings, and different time horizons for measuring economic growth.

[30] suggests that the impact of open capital accounts may vary with the level of ethnic and linguistic heterogeneity in the society, a proxy for the number of interest groups. In particular, he finds that capital controls lead to greater inefficiencies and lower growth among countries with a high degree of ethnic and linguistic heterogeneity. While [31] argues that despite meagre direct evidence that developing countries gain from financial globalization, they should proceed cautiously, in an incremental manner. He maintains that there is strong evidence that domestic financial development spurs growth under the right conditions, and the conditions – plus domestic financial development itself are likely to make capital inflows from abroad more productive.

[32] also find little evidence of a relationship between capital account liberalization and growth. Using a variety of econometric techniques and a new data set focusing on quantitative measures rather than rule- based measures, they find that financial integration does not accelerate economic growth per se, even when controlling for particular economic, financial, institutional, and policy characteristics. They do, however, find that international financial integration is positively associated with real per capita GDP, educational attainment, banking sector development, stock market development, the law-and-order tradition of the country, and government integrity (low levels of government corruption.

[33] using time series data and OLS multiple regression analytical method and focusing on qualitative measure find a significant and negative relationship between financial sector liberalization and economic growth in Nigeria. The results of the empirical literature reviewed above indicate that there is a wide divergence in results across studies. This may reflect a number of differences in these studies.

One reason why empirical research on the financial openness-growth nexus is still inconclusive relates to the fact that different econometric techniques make it difficult to harmonize the results; and although the bulk of research papers take cross-country growth models as the starting point, visible dissimilarities remain vis-à-vis the sample of countries ,the sampling period, and the estimation techniques employed. For example, contemporaneous research has typically employed a neoclassical growth model where economists regress the growth rate of real GDP per capita on a proxy for financial openness, in addition to a set of control variables which stand-in for fundamental growth drivers. However, the econometric models employed differ in three important respects: (1) with regard to the measures for the degree of financial openness; (2) with regard to the model specification; and (3) with regard to the use of the investment rate versus the capital stock per worker. And [34] in a macro-study analyzed the impact of overall financial integration on TFP growth and using a cross-country data over the period 1975 -1999. He finds that financial integration has a positive direct effect on productivity growth.

[35] analyzed the relationship between financial openness and productivity growth using an extensive data set that includes various measures of productivity and financial openness for 67 countries -21 industrialised and 46 developing countries. They distinguished between de jure capital account openness- the absence of restrictions on capital account transactions and de facto financial integration- measured stocks of foreign assets and liabilities relative to GDP and they find that economies with more open capital accounts generally have higher TFP growth even after controlling for the standard determinants of growth. They further disaggregated the financial integration measure into stocks of liabilities attributable to different types of capital flows and they find strong evidence that FDI and Portfolio equity flows boost TFP growth while debt is negatively correlated with GDP growth.

Another strand of literature focuses on the impact of specific types of capital flows on economic growth. There is a strong presumption that FDI should yield productivity gains for domestic firms through several channels including imitation (adoption of new production methods), skill acquisition (education / training of labour force) and competition (efficient use of existing resources by domestic firms).

[36] finds no important effect of FDI on growth. There is also some work looking at the effects of equity market liberalization on growth. For example, Henry and Sasson (2008) find that equity market liberalizations are associated with an increase in the growth rate of labour productivity and economic growth in emerging economies (also see Mitton, 2006). Bosworth and Collins (1999) on the other hand, find a significant positive impact of portfolio flows on growth.

[37] finds that capital fosters higher economic growth, above and beyond any effect on the investment rate, but only in economies where the banking sector has reached a certain level of development. This suggests that the level of financial development plays a pivotal role in the determination of the impact of capital inflows especially in developing countries.

Lastly, the impact of capital inflows on growth is influenced by the components of such flows. For example, [38] finds that there are large positive benefits from FD1 and portfolio equity flows, while bank (debt) flows have damaging effect on countries with fragile financial systems.

3. METHODS

There are various empirical models that have been developed to explain the different ways in which capital flow can affect the macro economy at large. Some strand of study have developed model to test the different impact of capital flow on economic growth. While very few have tried to find the impact of capital flow on stock market development.

3.1 Unit-Root Test

There often exists the problem of non-stationarity in empirical research involving time series data and this renders the traditional tools of econometrics (like OLS and 2SLS) inappropriate. To overcome this unit-root problem, we test for stationarity of the series in use. The Augmented Dickey-Fuller test (ADF) is of choice in this study because of its efficiency in detecting unit root. It is specified as follows:

$$\Delta Y_t = \theta_o + \theta_1 Y_{t-1} + \sum_{i=1}^{k} b_i \Delta Y_{t-i} + \mu_t \quad (1)$$

where, Y_t is a vector of all variables in the model $\theta_i$and b_i are parameters of the model, $\mu_t$is the white noise at time while k and Δ remain as defined in equation (6) above. This we will achieve, conducting the test by first or second level difference if the series are integrated of order one or order two (i.e. I(1) or I(2)). The null hypothesis here is that Y_t has a unit root (that is, non-stationary) and the alternative is that there is no unit root (that is, stationary). If the variables turn out to contain unit roots, we will therefore, conclude that they are non-stationary.

3.1.1 Granger causality test for objective (1)

To solve the first research objective of checking if there exists a causal relationship between Nigeria's privatization proceeds and macro-economic variables within the period under review, we employ the Granger causality test. Accordingly, we specified the general form as follows:

$$Y_t = \beta_o + \sum_{k=1}^{m} \beta_k Y_{t-K} + \sum_{P=1}^{n} \alpha_P X_{t-P} + \mu_t \quad (1)$$

$$X_t = \gamma_o + \sum_{k=1}^{m} \lambda_k Y_{t-K} + \sum_{P=1}^{n} \gamma_P X_{t-P} + V_t \quad (2)$$

where; Y_t and X_t are the variables μ_t and V_t are the mutual uncorrelated error terms, t denotes time and K and P are the number of lags. The null hypothesis is $\alpha p = 0$ for all *P's* and $\lambda k = 0$ for all *K's* versus the alternative hypothesis that $\alpha p \neq 0$ and $\lambda k \neq 0$ for at least some *P's* and *K's*. If the coefficient $\alpha p's$ are statistically significant while, λk 's are not, then X is said to cause Y. On the other hand, if λk 's are statistically significant while

$\alpha p's$ are not, then *Y* is said to cause *X* (uni-directional causality). However, if both αp and λk are statistically significant, then causality is said to run both sides which is known as bilateral or bi-directional causality. We adopt a Granger causality Wald test for this purpose. In this case, if the probability of the computed Chi^2-value is sufficiently low (less than 0.05) we reject the null hypothesis, and accept if otherwise.

3.1.2 Causality impulse response function of VAR for objective 2

To achieve the second objective, we examined the impulse response function (IRF) of the vector Auto regressive model. The impulse response functions are responses all variable on the model to a one unit structural shock to one variable in the model. The impulse responses are plotted on the y-axis with the period from the initial shock on the x-axis.

3.1.3 Variance decomposition for objective 3

In econometrics and other applications of multivariate time series analysis, a **variance decomposition** or **forecast error variance decomposition** (FEVD) is used to aid in the interpretation of a vector autoregression (VAR) model once it has been fitted [1]. The variance decomposition indicates the amount of information each variable contributes to the other variables in the autoregression. It determines how much of the forecast error variance of each of the variables can be explained by exogenous shocks to the other variables.
For the VAR (p) of form

$$y_t = \nu + A_1 y_{t-1} + \ldots + A_p y_{t-p} + u_t \quad (3)$$

3.1.4 Empirical model

3.1.4.1 Functional specification

$$MC = f(DEJU, FDIN, NPI, DEBT, TROP, RGDP, EXCR) \quad (4)$$

Equation (1) describes stock market development proxied by market capitalization (MC), as a function of DEJU, FDIN, NPI, DEBT, TROP, RGDP and EXCR where, DEJU = Capital Account Balance, FDIN = Foreign Direct Investment, NPI = Net Portfolio Investment, DEBT = External Debt, TROP = Trade Openness, RGDP = Real Gross Domestic Product EXCR = Exchange Rate, while f = functional notation.

3.1.4.2 Econometric form of the model

In order to take care of the presence of white noise, we introduce the error term in the model which transforms the mathematical model to an econometric model as specified in equation (5) below:

$$MC_t = b_o + b_1 DEJU_t + b_2 FDIN_t + b_3 NPI_t + b_4 DEBT_t + b_5 TROP_t + b_6 RGDP_t + b_7 EXCR_t + \mu \quad (5)$$

where, Exchange Rate (EXCR) is introduced in the model as a control variable. $b_{i's}$ are the model parameters, t is current year while t-1denotes the previous year. Other variables remain as defined in equation (1) above. The model expresses Market Capitalization as dependent on the explanatory variables and their previous values where, $\boldsymbol{\mu}$ =the white noise.

3.1.4.3 Source of data

Annual time series data is sourced from World Bank Indicators 2010 and 2011 edition of the CBN statistical bulletin while 2012 series are extrapolated using the popular Moving Average Method.

3.1.4.4 Software packages

E-View 5 is used to run the regression while Microsoft Excel 2013 is used to enter the data.

3.2 Variable Description

3.2.1 De jure measures

The IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER) provides the most readily available, standardized source of information.

[39], attempts to capture the intensity of enforcement of controls on both the capital account and the current account through a careful reading of the narrative descriptions in the AREAER. He scores the intensity of controls for capital account receipts and capital account payments separately. For each of these two categories, a score of 0 indicates payments are forbidden, 0.5 indicates that there are quantitative or other regulatory restrictions, 1 indicates that transactions are subject to heavy taxes, 1.5 indicates that there are less severe taxes, and 2 indicates that transactions are free of restrictions or taxes. The sum of the values for the two categories is an indicator of over- all capital account openness that ranges between 0 and 4. A glance at Quinn's data set indicates that the overall trend toward liberalization is mostly driven by the OECD countries.

3.2.2 De facto (quantitative) measures

Recently, efforts have been made to gauge the extent of capital mobility through the use of actual capital inflows and outflows, either as a percentage of GDP (as in [39]), by using an annual measure of portfolio and direct investment assets and liabilities as a percentage of GDP as a long-run indicator of financial openness .

3.2.3 Market capitalization

Also known as market value, is the share price times the number of shares outstanding. Listed domestic companies are the domestically incorporated companies listed on the country's stock exchanges at the end of the year. As outstanding stock is bought and sold in public markets, capitalization could be used as aproxy for the public opinion of a company's net worth and is a determining factor in some forms of stock valuation.

3.2.4 Trade openness

The Openness Index is an economic metric calculated as the ratio of country's total trade, the sum of exports plus imports, to the country's gross domestic product. The interpretation of the Openness Index is the higher the index the larger the influence of trade on domestic activities

4. RESULTS

As indicated in the literature, most time series variables are non-stationary and using non-stationary variables in the model might lead to spurious regressions. The first or second differenced terms of the most variables will usually be stationary. Hence some of the variables were found significant at level while all are significant at first differences. See appendix below.
The first step is VAR estimation to select the suitable lag order for the unrestricted VAR. In this respect, lag length criteria test computes various criteria to select the lag order of an unrestricted VAR. In selecting the appropriate lag number, the VAR lag order selection criteria test was employed and lag of 4 is selected for subsequent test based on the minimum Final Prediction Error (FPE) and Akaike information Criteria (AIC) as shown in Table 1 below.

Table 1. VAR estimation lag length

LAG	LOGL	LR	FPE	AIC	SC	HQ
O	-677.7763	NA	9.26E+13	54.86210	55.25214	54.97028
1	-577.1586	128.7906*	6.48E+12	51.93269	55.44305	52.90631
2	-458.0244	76.24587	6.53E+11*	47.52195*	54.15264*	49.36102*

** indicates lag order selected by the criterion*
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final Prediction Error
AIC: Akaike Information Criterion
SC: Schwarz Information Criterion
HQ: Hannan-Quinn Information Criterion
The optimal lag length is 2. The selected lag length is based on different criteria.

Since the individual coefficients in the VAR models are very difficult to be interpreted, we use the Granger causality test, Impulse Response Function analysis and variance decomposition which are contained in VAR to interpret the VAR result. The granger causality test is usually employed in VAR to check for causality among the selected variables. Impulse Response Function analysis is an important one in the VAR model. Analysis of Impulse Response Function traces the response of endogenous variables in the VAR system due to shocks or changes in the error term.

4.1 Granger Causality Wald Test for Objective I

To achieve objective I, Granger Causality Wald Test was used to examine the causal relationship between stock market developments (proxied by Stock market capitalization) and disaggregated De-jure and De -facto measures of financial openness (Capital account balance, Net foreign direct investment, foreign debt, and Net Portfolio Investment) plus other growth indicators (Trade Openness, Real GDP, and Exchange Rate).

The result is presented in the Table 2 below;

The granger causality result shows that Deju, FDIN, NPI, RGDP, EXCR does not granger cause MC. While there is bi-causality between MC and TROP, that is, both MC and TROP granger cause each other. Also, A uni-directional causality exist between DEBT and MC. DEBT granger causes MC but Mc does not granger cause DEBT.

Table 2. Summary of granger causality wald test

	LAGS: 2		
Null hypothesis	**OBS**	**F-statistic**	**Probability**
DEJU does not granger cause MC	25	0.78270	0.47068
MC does not granger cause DEJU		0.34214	0.71432
FDIN does not granger cause MC	25	0.19262	0.55104
MC does not granger cause FDIN		0.61407	0.82631
NPI does not granger cause MC	25	0.14147	0.86894
MC does not granger cause NPI		1.87996	0.17859
DEBT does not granger cause MC	25	6.05287	0.00880
MC does not granger cause DEBT		0.36065	0.70167
TROP does not granger cause MC	25	18.5724	2.8E-05
MC does not granger cause TROP		8.06669	0.00270
RGDP does not granger cause MC	25	0.67868	0.51859
MC does not granger cause RGDP		0.23398	0.79351
EXCR does not granger cause MC	25	4.17034	0.03063
MC does not granger cause EXCR		1.90554	0.17479

4.2 Impulse Response Results (IRF) for Objective II

The graph below shows the impulse response of stock market capitalization, capital flows and growth variables.

The Fig. 1 below reveals that the response of MC to shock in DEJU and NPI appears insignificant throughout the period under review. For the response to shock in FDIN, MC responded positive in the first quarter, and between 7^{th} and 8^{th} month. However, the response was negative towards the end of the year. The response to a shock in DEBT is negative at the beginning and towards the end of the time horizon. MC responded positively all through the period to the shocks in TROP and RGDP. It also responded slightly positive to shocks in EXCR.

4.3 Variance Decomposition for Objective III

In applications of multivariate time series analysis, variance decomposition is used to aid in the interpretation of a vector autoregressive (VAR) model once it has been fitted. The variance decomposition indicates the amount of information each variable contributes to the other variables in the autoregression. It determines how much of the forecast error variance of each of the variables can be explained by exogenous shocks to the other variables. This decomposition refers to the contribution of each innovation to the variance of the forecast error associated with the forecast of each variable in the VAR.

4.4 Summary of the Variance Decomposition

The variance decomposition result presented in the appendix below, shows that MC accounts for an average of 40 percent of its own shock all through the year while the other variables accounts for the other 60 percent. Among all the selected variables, TROP and RGDP seem to account for 45 percent of variation in MC for the period under study.

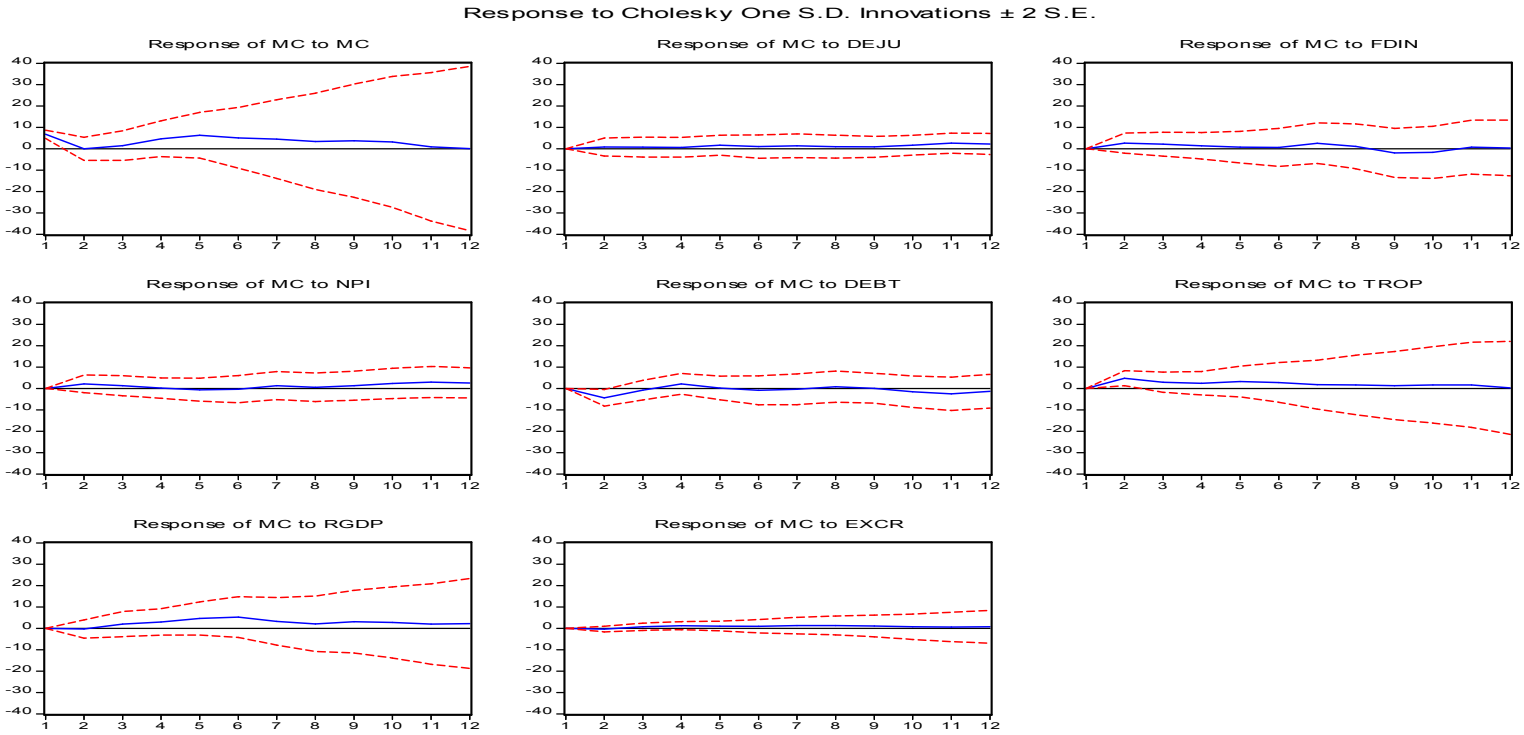

Fig. 1. Impulse response graph

Source: Graph by IRF, impulse variable and response variable

5. DISCUSSION

5.1 Policy Implication of the Granger Causality Wald Test for objective I

The Causality Wald test shows that there is no causal relationship between stock market development and capital account balance, net foreign direct investment, net portfolio investment, real gross domestic product, and exchange rate. And this is against our a priori expectation, it is expected from already existing literature that stock market development is highly influenced by capital mobility and macroeconomic factors like (Exchange rate, inflation, interest rate, real GDP among others), the result is line with some studies negating the existence of any significant relationship between stock market performance and macroeconomic variables [40]. [41] perceives that stock market has previously generated 'false signals' about the economy and should not be relied on as an economic indicator. The stock market crash could be an example in which stock prices falsely predicted the direction of the economy: instead of entering into the recession which many were expecting, the economy continued to grow for several years [42].

Also there is a uni-lateral relationship between debt and stock market development showing that the level of debt incurred can deter growth in Stock market. While on the other hand, bi-causality relationship exists between stock exchange development and trade openness, this is in line with our theoretical literature, trade openness (in theory) has been often referred to as an engine of growth, since it enables a country to specialize using its comparative advantage and benefit from the international exchange of goods.

This result has to be interpreted with caution since trade flows and FDI can be linked, the FDI was equally included in the measure of trade openness. FDI is an important source of stock market Development. Studies have shown that FDI plays roles in raising domestic savings in the country through creation of jobs and enhancement of technology transfer [43]. Other authors posited that without FDI, it would be difficult to obtain such a large capital through the country's own domestic savings [44].

5.2 Policy Implication of Impulse Response Results (IRF) for Objective II

Looking closely at the result, there exists a strong growth relationship between shocks in market capitalization and trade openness, real gross domestic product, and exchange rate.

In the wake of financial liberalization worldwide and increasing trade and capital movements, exchange rates have been identified as one of the major determinants of business profitability and equity prices. The instability of exchange rate can cause speculation in foreign exchange market, disrupt international credit operations and international stock market operations. The instability can also lead to crisis of confidence that could cause capital flight, or a large-scale withdrawal of short term credit facilities. If there is high exchange rate, it would encourage round tripping and discourages stock market investment. It will cause operating cost upward movement and lower corporate profit in the real sector; the higher the operating cost, the lower the profit. When the value of the currency is dropping, the incentive to invest by foreign investors in the domestic economy is lost. This can affect the stock market and price [45].

Also in addition, It is important to note that if there is an upward movement in GDP, equity prices may possibly rise due to the potential for higher profits arising from a healthy business

climate. It has been said that one of the best tools for measuring or estimating the aggregate economic performance is the Gross Domestic Product (GDP). This is so because if there is an upward movement in GDP, equity prices may possibly rise due to the potential for higher profits arising from a stable business and institutional quality. On the other hand, when the GDP is on the downward trend, there is likelihood of equity price to drop showing that the business climate is not healthy for further investments, [32].

5.3 Policy Implication of Variance Decomposition for Objective III

Relaying on the variance decomposition result it is very obvious that the result agrees with [33], who affirmed that stock market produces its own shocks. And against the a priori expectation that capital flow have significant impact on stock market development, they are among the least of variables that have impacted on market capitalization. On the other hand, Trade openness and real gross domestic product did contributed 45 percent of shocks in Market capitalization. This could as a result of corruption, lack of transparency, and instability in the political and economic environment in Nigeria. Though, this results need to be interpreted with caution

5.4 Policy Suggestion

- Financial liberalization can never an end but a means to an end, therefore it must be combined with appropriate fiscal and monetary policy if we will achieve positive result.
- For Nigeria to reap the benefit associated with capital flow, she must build a stable and strong macro-economic, political and institutional environment that is devoid of constant crisis.
- Corruption has been remarked as the hallmark of problem confronting developing country, thus it is a strong factor against growth of any sector. This can be checked by understanding the composition of capital flow.
- Lack of transparency, accountability and prudential supervision will reduce the benefits Nigeria will enjoy considering liberalization. Therefore, measures should be put in place.
- For countries that choose to liberalize capital flows, there should emphasis on a systematic process and pace consistent with the country's institutional and financial development.

6. CONCLUSION

A central debate in international economics is on the supposed impact of trade/ financial openness; whether it has significant impact on the macro-economy. Also, there has been arguments by scholars on the risk posed be liberalizing capital flow. But one important issue is that as country grows, they require more advanced financial systems which usually go hand in hand with greater cross border capital flows.

This paper have successfully, analyzed the impact of capital flow on stock market development in Nigeria, and it is clear from our regression result that Trade openness and real gross domestic product have been strong factors that are consistent in affecting stock market development in Nigeria. As proposed by theoretical evidence, that a country seeks both economic and financial integration with the rest of the world, in order to achieve speedy economic growth and develop its financial sector.

It is very obvious that opening to trade will affect demand for external finance, and thus financial depth, in the trading countries. In addition, foreign investment/investors require strong stock exchange market and stable macro-economic/ institutional environment to operate.

Thus, it is very important to put into consideration the inter- reliant relationship between stock market development, economic growth and capital flows/ openness. Though foreign Direct Investment (FDI) and portfolio investment are major components of capital flow, but based on our regression results we found that they are not strong factors for stock market development.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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APPENDIX

Unit root test at levels

Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.094589	0.2483
Test critical values:	1% level	-3.737853	
	5% level	-2.991878	
	10% level	-2.635542	

Null Hypothesis**: DEJU** has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic based on SIC, MAXLAG=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.957744	0.7504
Test critical values:	1% level	-3.752946	
	5% level	-2.998064	
	10% level	-2.638752	

Null Hypothesis: **FDIN** has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.647906	0.0122
Test critical values:	1% level	-3.737853	
	5% level	-2.991878	
	10% level	-2.635542	

Null Hypothesis: **NPI** has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.070860	0.0004
Test critical values:	1% level	-3.737853	
	5% level	-2.991878	
	10% level	-2.635542	

Null Hypothesis: **DEBT** has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic based on SIC, MAXLAG=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.054829	0.9546
Test critical values:	1% level	-3.752946	
	5% level	-2.998064	
	10% level	-2.638752	

Null Hypothesis: **TROP** has a unit root
Exogenous: Constant
Lag Length: 2 (Automatic based on SIC, MAXLAG=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.870524	0.9930
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

Null Hypothesis: **RGDP** has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.756022	0.0797
Test critical values:	1% level	-3.737853	
	5% level	-2.991878	
	10% level	-2.635542	

Null Hypothesis: EXCR has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-0.294737	0.9120
Test critical values:	1% level	-3.737853	
	5% level	-2.991878	
	10% level	-2.635542	

Unit root test at first difference

Null Hypothesis: **D(MCFD)** has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic based on SIC, MAXLAG=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.305971	0.0003
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

Null Hypothesis: **D(DEJU)** has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.783755	0.0001
Test critical values:	1% level	-3.752946	
	5% level	-2.998064	
	10% level	-2.638752	

**MacKinnon (1996) one-sided p-values*

Null Hypothesis**: D(DEBT,2)** has a unit root
Exogenous: Constant
Lag Length: 4 (Automatic based on SIC, MAXLAG=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.808037	0.0015
Test critical values:	1% level	-3.857386	
	5% level	-3.040391	
	10% level	-2.660551	

Exogenous: Constant
Lag Length: 1 (Automatic based on SIC, MAXLAG=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.204982	0.0000
Test critical values:	1% level	-3.769597	
	5% level	-3.004861	
	10% level	-2.642242	

Null Hypothesis**: D(RGDP)** has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.285354	0.0003
Test critical values:	1% level	-3.752946	
	5% level	-2.998064	
	10% level	-2.638752	

Null Hypothesis**: D(EXCR)** has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=5)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.634811	0.0013
Test critical values:	1% level	-3.752946	
	5% level	-2.998064	
	10% level	-2.638752	

VAR Lag Order Selection Criteria
Endogenous variables: MC DEJU FDIN NPI DEBT TROP RGDP EXCR
Exogenous variables: C
Date: 04/27/14 Time: 00:39
Sample: 1986 2012
Included observations: 25

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-677.7763	NA	9.26e+13	54.86210	55.25214	54.97028
1	-577.1586	128.7906*	6.48e+12	51.93269	55.44305	52.90631
2	-458.0244	76.24587	6.53e+11*	47.52195*	54.15264*	49.36102*

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

Vector Autoregression Estimates
Date: 04/27/14 Time: 07:46
Sample (adjusted): 1988 2012
Included observations: 25 after adjustments
Standard errors in ( ) & t-statistics in [ ]

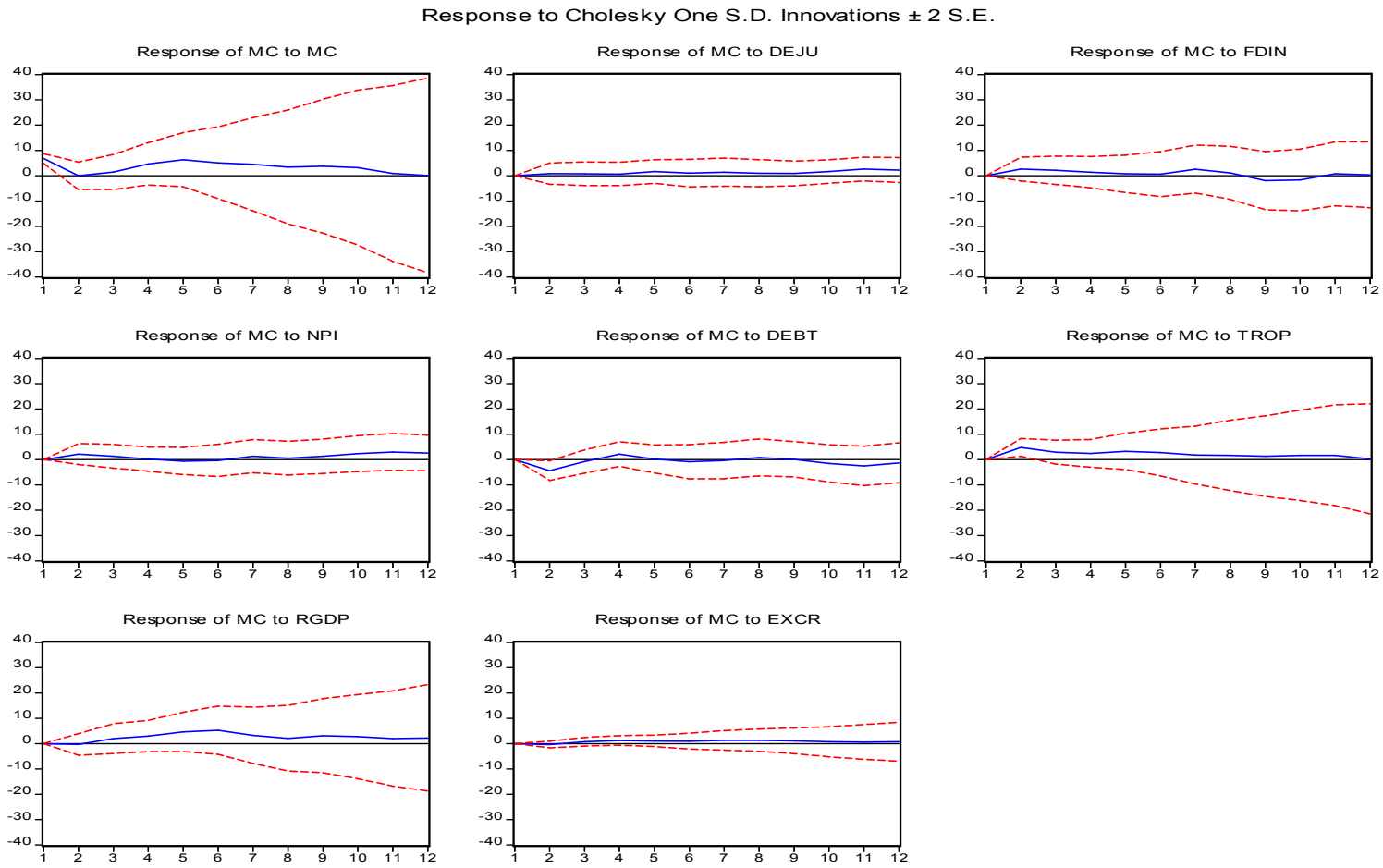
	MC	DEJU	FDIN	NPI	DEBT	TROP	RGDP	EXCR
MC(-1)	0.668199	-0.017684	1.161768	8.820679	0.210054	0.026724	-0.325895	-0.529312
	(0.31259)	(0.01166)	(1.05612)	(5.27875)	(0.92224)	(0.00888)	(0.25240)	(0.52701)
	[2.13761]	[-1.51707]	[1.10004]	[1.67098]	[0.22776]	[3.01118]	[-1.29117]	[-1.00437]
MC(-2)	-1.188201	-0.001854	0.857462	-5.773977	-0.418029	0.021070	0.139881	1.210550
	(0.36707)	(0.01369)	(1.24018)	(6.19872)	(1.08297)	(0.01042)	(0.29639)	(0.61885)
	[-3.23700]	[-0.13547]	[0.69140]	[-0.93148]	[-0.38600]	[2.02174]	[0.47195]	[1.95611]
DEJU(-1)	-1.698372	0.190490	-12.21969	219.8141	10.10219	0.168322	-4.821297	37.66215
	(6.10862)	(0.22779)	(20.6386)	(103.157)	(18.0224)	(0.17344)	(4.93242)	(10.2988)
	[-0.27803]	[0.83624]	[-0.59208]	[2.13087]	[0.56054]	[0.97052]	[-0.97747]	[3.65696]
DEJU(-2)	4.458683	0.338038	-4.889721	76.97501	1.867493	-0.174079	-1.399914	-21.15045
	(8.51138)	(0.31739)	(28.7565)	(143.732)	(25.1113)	(0.24165)	(6.87254)	(14.3497)
	[0.52385]	[1.06504]	[-0.17004]	[0.53554]	[0.07437]	[-0.72037]	[-0.20370]	[-1.47393]
FDIN(-1)	-0.029677	-0.009909	0.260276	-1.512664	0.437541	0.004896	-0.042473	-0.107930
	(0.08686)	(0.00324)	(0.29345)	(1.46675)	(0.25625)	(0.00247)	(0.07013)	(0.14643)
	[-0.34168]	[-3.05943]	[0.88695]	[-1.03130]	[1.70746]	[1.98549]	[-0.60561]	[-0.73706]
FDIN(-2)	-0.016395	0.007595	-0.678505	-0.832229	0.262678	0.003762	0.080983	0.123664
	(0.09214)	(0.00344)	(0.31129)	(1.55590)	(0.27183)	(0.00262)	(0.07440)	(0.15533)
	[-0.17794]	[2.21052]	[-2.17966]	[-0.53489]	[0.96634]	[1.43832]	[1.08855]	[0.79611]
NPI(-1)	-0.001992	0.000317	-0.045261	-0.294425	-0.009517	0.000192	0.000339	0.025146
	(0.01219)	(0.00045)	(0.04119)	(0.20589)	(0.03597)	(0.00035)	(0.00984)	(0.02055)
	[-0.16341]	[0.69762]	[-1.09878]	[-1.43003]	[-0.26459]	[0.55468]	[0.03443]	[1.22338]
NPI(-2)	-0.005357	-3.41E-05	0.004140	-0.173619	-0.040600	3.52E-05	-0.006392	-0.015353
	(0.01240)	(0.00046)	(0.04189)	(0.20937)	(0.03658)	(0.00035)	(0.01001)	(0.02090)
	[-0.43207]	[-0.07385]	[0.09884]	[-0.82922]	[-1.10992]	[0.09986]	[-0.63847]	[-0.73450]
DEBT(-1)	-0.135200	-0.011048	0.268531	2.052726	0.122443	0.003945	-0.074112	0.040807
	(0.11220)	(0.00418)	(0.37908)	(1.89472)	(0.33102)	(0.00319)	(0.09060)	(0.18916)
	[-1.20500]	[-2.64046]	[0.70838]	[1.08339]	[0.36989]	[1.23846]	[-0.81805]	[0.21572]
DEBT(-2)	0.002112	-0.010306	0.354036	2.947682	0.616712	0.007469	-0.025990	0.044096
	(0.12406)	(0.00463)	(0.41913)	(2.09493)	(0.36600)	(0.00352)	(0.10017)	(0.20915)
	[0.01703]	[-2.22783]	[0.84469]	[1.40705]	[1.68499]	[2.12057]	[-0.25946]	[0.21084]
TROP(-1)	39.55815	-0.576738	40.47393	462.1080	-11.67006	-0.290374	-13.81839	-12.04745
	(11.5125)	(0.42931)	(38.8961)	(194.413)	(33.9655)	(0.32686)	(9.29580)	(19.4094)
	[3.43610]	[-1.34341]	[1.04056]	[2.37694]	[-0.34359]	[-0.88837]	[-1.48652]	[-0.62070]
TROP(-2)	3.406751	-0.309609	28.73828	210.4457	-23.87168	0.076539	-5.720420	2.118107
	(8.59128)	(0.32037)	(29.0265)	(145.082)	(25.3470)	(0.24392)	(6.93705)	(14.4844)
	[0.39654]	[-0.96640]	[0.99007]	[1.45053]	[-0.94180]	[0.31378]	[-0.82462]	[0.14623]
RGDP(-1)	0.086082	0.002200	0.730085	6.119560	-0.147690	0.013391	0.067415	0.216340
	(0.45161)	(0.01684)	(1.52581)	(7.62637)	(1.33239)	(0.01282)	(0.36465)	(0.76139)
	[0.19061]	[0.13063]	[0.47849]	[0.80242]	[-0.11085]	[1.04439]	[0.18487]	[0.28414]
RGDP(-2)	-0.464131	0.024860	0.318285	17.13560	-0.247009	0.001028	-0.229931	0.066457
	(0.35346)	(0.01318)	(1.19421)	(5.96899)	(1.04283)	(0.01004)	(0.28541)	(0.59592)
	[-1.31309]	[1.88607]	[0.26652]	[2.87077]	[-0.23686]	[0.10244]	[-0.80563]	[0.11152]
EXCR(-1)	-0.111089	-0.004683	0.042588	-3.072843	0.093136	0.011200	0.111640	0.908010
	(0.19890)	(0.00742)	(0.67199)	(3.35880)	(0.58681)	(0.00565)	(0.16060)	(0.33533)
	[-0.55852]	[-0.63133]	[0.06338]	[-0.91486]	[0.15872]	[1.98336]	[0.69514]	[2.70782]
EXCR(-2)	-0.052717	-0.001173	-0.236433	-3.433743	-0.150627	-0.000370	0.089177	-0.026929
	(0.13238)	(0.00494)	(0.44726)	(2.23550)	(0.39056)	(0.00376)	(0.10689)	(0.22318)
	[-0.39823]	[-0.23768]	[-0.52863]	[-1.53601]	[-0.38567]	[-0.09834]	[0.83429]	[-0.12066]
C	13.03768	2.513990	-90.49385	-43.03801	44.82220	-1.598347	11.92540	22.93835
	(30.4320)	(1.13483)	(102.818)	(513.908)	(89.7840)	(0.86402)	(24.5724)	(51.3065)
	[0.42842]	[2.21530]	[-0.88014]	[-0.08375]	[0.49922]	[-1.84989]	[0.48532]	[0.44708]

R-squared	0.912347	0.947120	0.660769	0.821748	0.946650	0.947023	0.699088	0.987244
Adj. R-squared	0.737041	0.841360	-0.017693	0.465244	0.839950	0.841068	0.097265	0.961733
Sum sq. resids	368.2919	0.512143	4204.021	105027.1	3205.743	0.296879	240.1186	1046.827
S.E. equation	6.785019	0.253018	22.92384	114.5792	20.01794	0.192639	5.478579	11.43912
F-statistic	5.204303	8.955359	0.973922	2.305018	8.872097	8.938028	1.161617	38.69801
Log likelihood	-69.09846	13.12688	-99.53497	-139.7622	-96.14625	19.94287	-63.75168	-82.15651
Akaike AIC	6.887877	0.309850	9.322798	12.54098	9.051700	-0.235430	6.460134	7.932520
Schwarz SC	7.716712	1.138686	10.15163	13.36981	9.880536	0.593406	7.288970	8.761356
Mean dependent	15.75800	-1.054888	34.22988	139.5088	68.08480	0.927200	5.501200	78.90360
S.D. dependent	13.23143	0.635249	22.72370	156.6852	50.03710	0.483214	5.766174	58.47617
Determinant resid covariance (dof adj.)		1.03E+10						
Determinant resid covariance		1131365.						
Log likelihood		-458.0244						
Akaike information criterion		47.52195						
Schwarz criterion		54.15264						

Pairwise Granger Causality Tests
Date: 04/27/14 Time: 00:58
Sample: 1986 2012
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Probability
DEJU does not Granger Cause MC	25	0.78270	0.47068
MC does not Granger Cause DEJU		0.34214	0.71432
FDIN does not Granger Cause MC	25	0.19262	0.82631
MC does not Granger Cause FDIN		0.61407	0.55104
NPI does not Granger Cause MC	25	0.14147	0.86894
MC does not Granger Cause NPI		1.87996	0.17859
DEBT does not Granger Cause MC	25	6.05287	**0.00880**
MC does not Granger Cause DEBT		0.36065	0.70167
TROP does not Granger Cause MC	25	18.5724	**2.8E-05**
MC does not Granger Cause TROP		8.06669	**0.00270**
RGDP does not Granger Cause MC	25	0.67868	0.51859
MC does not Granger Cause RGDP		0.23398	0.79351
EXCR does not Granger Cause MC	25	4.17034	**0.03063**
MC does not Granger Cause EXCR		1.90554	0.17479

Impulse response of MC to the selected variables



The Variance Decomposition

Period	S.E.	MC	DEJU	FDIN	NPI	DEBT	TROP	RGDP	EXCR
1	6.785019	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	10.04026	45.66820	0.662419	6.770456	4.742840	18.85584	23.07419	0.094214	0.131840
3	11.11489	39.00906	1.046681	9.198899	5.213074	15.82842	25.87901	3.275688	0.549174
4	12.99870	41.50302	1.010215	7.882916	3.833880	14.35125	22.39520	7.699872	1.323652
5	15.66449	44.73266	1.783529	5.645533	2.795125	9.902183	19.71596	14.05795	1.367052
6	17.61470	43.75268	1.749749	4.592935	2.242210	8.067122	18.13631	20.07207	1.386931
7	18.89527	43.77888	2.046228	5.874258	2.459738	7.048895	16.66026	20.44499	1.686755
8	19.51889	44.12492	2.161001	5.826136	2.387858	6.796822	16.32166	20.33000	2.051600
9	20.34758	44.00154	2.180238	6.305754	2.597832	6.256949	15.44786	21.03289	2.176938
10	21.18470	42.89700	2.623671	6.460586	3.659646	6.289572	14.84998	21.08832	2.131227
11	21.90104	40.31137	3.879804	6.156981	5.329456	7.166757	14.49700	20.58301	2.075622
12	22.33806	38.75128	4.742234	5.945568	6.478386	7.224811	13.94913	20.80320	2.105388

Cholesky Ordering: MC DEJU FDIN NPI DEBT TROP RGDP EXCR

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