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DO MONETARY POLICY VARIABLES STIMULATE ACTIVITIES ON THE STOCK MARKET? EVIDENCE FROM THE NIGERIAN STOCK MARKET

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Abstract

This study examines whether or not monetary policy variables do stimulate activities in the stock market. To achieve this, linear combination of structural simultaneous systems of equations using market capitalization, stock price index, turnover ratio, real sector and monetary policy variables were estimated using ordinary least squares, generalized linear model and Vector Autoregressive (VAR) on the basis of direct and indirect effects to test the null hypothesis. The results show that changes in the monetary policy variables have a significant long-run dynamic relationship with the changes in stock prices movement on the Nigerian capital market. In other words, monetary policy variables do stimulate activities in the stock market through variable such as money supply and exchange rate as seen from the results. In the light of this therefore, it is recommended that, all institutional restrictions on trading of securities in the market should be eliminated.

Key Words: *Stock Market, VAR, GLS, OLS and Monetary Policy*

Introduction

Monetary policy comprises the rules and actions adopted by the Central Bank of any country to achieve its objectives. In most countries the primary goal of monetary policy is price stability. However, the mandate of many Central Banks also encompasses other objectives, including attainment of full employment, domestic financial stability and operation of foreign payments. The priority of price stability over

other policy goals tends to be politically accepted in most countries, if not actually enshrined in the laws governing the Central Bank. Changes in monetary policy are triggered by domestic and external shocks that can imperil the attainment of national policy objectives. Central Banks implement policy changes by resetting their policy instruments, usually short-term interest rate or bank credit aggregate. These instruments

affect the economy through various mechanisms of transmission to the ultimate policy goals. Monetary policy therefore, refers to the specific actions taken by the Central Bank of any nation to regulate the supply, value and cost of money in the economy with the view of achieving predetermine macroeconomic objective. While capital market, on the other hand is the long-term end of the financial market. It is made up of institutions, which facilitate the issuance and secondary trading of long-term financial instruments.

Unlike the money market, which functions basically to provide short term funds, the capital market provides funds to industries and governments to meet their long-term capital requirements, such as financing of fixed investments-buildings, plants and bridges, thereby, stimulating the real sector of the economy. Real sector therefore, refers to the sector in which there are productions of goods and services through combined utilisation of raw materials and other production factors such as labour force, land and capital. It is argued that, on account of high volume of savings and endogenous money creation by banks, more money is shifted from the real sector where Keynesian industrial circulation takes place, to the financial sector, in which Keynesian financial circulation occurs. This could lead to a financialisation of the economy, implying that the financial sector increasingly dominates the real sector or vice versa. The circle continues as long as the economy grows, given way to policy makers to take decision where necessary (Heinrich, 2010).

It is of great concern to policy makers that monetary policy permeates deeply into the real sector and capital market to engender economic growth. This can only be

achieved if monetary policy is properly transmitted into the macro-economy through the various channels notably interest rate channel, money supply, credit channel and the price level. An effective transmission mechanism will be one that will increase the return on investment. Investors can only benefit from returns on investment if earnings per stock are increasing adequately. Hence, the understanding of how policy actions affect the macro-economy deeply entails knowing how policy actions will affect key financial markets, as well as how changes in asset prices and returns in these markets affect the behaviour of households, firms and other stakeholders. Several factors have been identified in existing studies as affecting the demand and supply of stocks, which include company fundamentals such as a change in the Board of Directors, appointment of new management, creation of new assets, dividends, earnings and external factors such as government rules and regulations, inflation, and other economic conditions, investor behaviour, market conditions, money supply, competition, uncontrolled natural or environmental circumstances directly affecting the production of the company (Osuagwu, 2009). Among the different monetary policy regimes that have been adopted over the years in Nigeria: Exchange Rate Targeting Regime 1959-1973; Monetary Targeting Regime, 1974 to date; Direct Monetary Control 1974-1992; and Indirect Monetary Control, 1993 to date, the policy regimes that were on short-term basis (annual), ranged from 1959 to 2001. However, in 2002, the medium term preprogramming approach was adopted and implemented up to 2005 before reverting to annual programmes in 2006 (Central Bank of Nigeria, 2010).

According to Mordi, Englama and Adebuseyi (2010), monetary policy in Nigeria at the inception of the Central Bank prior to Nigeria's independence was influenced and predicated on the economic developments in Britain. One of the instruments of monetary policy at that time was the fixed exchange rate. The Nigerian pound was fixed to the British pound in line with the prevailing world economic scenario at that time. The fixing of the exchange rate provided a more effective mechanism for the maintenance of a viable balance of payments position and controlling inflation in Nigeria. The fixed parity lasted until 1967, when the British pound was devalued. This policy could not meet the desired objective and this led to the introduction of monetary targeting regime which involves the use of direct control or market based (indirect) instruments to achieve monetary targets. Consequently, the major focus of monetary policy was on controlling monetary aggregates, a policy based on the belief that inflation is essentially a monetary phenomenon. As the first policy, the next one could not stand the test of time too (Mordi et. al., 2010).

The interaction between monetary policy and Nigerian Capital Market is a critical issue to the economic growth. The continued interaction and deepening of Stock Market is a significant issue for policy makers, since the smooth functioning and performance of the Capital Market are crucial in ensuring a smooth transmission of monetary policy impulses to the economy. Against this back drop, this study is necessary to test how significant do monetary policy variables stimulate activities in the capital market in Nige.

Literature Review

According to Osuagwa (2009), Economists, generally agree that restrictive monetary policy leads to lower stock prices. On the other hand, expansionary monetary policy leads to higher stock prices. Some researchers also argue that changes in monetary policy influence forecasts of market determined interest rates, equity cost of capital, and expectations of corporate profitability (Waud, 1970). The fundamental approach is that an increase in interest rates due to a contractionary or restrictive monetary policy will leave investors with no other opportunity to raise funds except through the equity market. In a bid to boost the demand for their stocks, the price will fall to a level that will be attractive to an investor at least in the short run, perhaps through public offers.

The origin of the relationship between money supply, interest rates and stock prices point to Friedman's money demand function. Friedman (1956) attempted to integrate two distinct decisions to be made by agents; a decision on the quantity of savings (IS) and decision on how to allocate those savings among assets in a portfolio (LM), and in so doing transform the liquidity preference theory of the demand for money. He proposed that portfolio allocation decisions could have an impact on consumption – savings decisions determined by interest rate movements.

The interest rate channel of monetary policy transmission has become so prominent following the recommendation of the Radcliffe Report (1988) cited in Ricardo (2010) in the United States, that monetary authorities should regard the structure of interest rates rather than the supply of money as the center piece of monetary action. The interest rate channel is expounded in the marginal efficiency of capital function which posits an inverse relationship

between real interest rate and the present value of capital and consumer durable goods. This implies that a reduction in the real interest rate will lead to an increase in the present value of capital and durable consumer goods and increase the ratio of the market value to asset value (Mbutor, 2007).

Bodie (1976), Nelson (1976) and Fama and Schwert (1977) are some of the studies that have documented the inverse relationship between real common stock returns and various measures of both actual and expected inflation. However, the literature is divided over the reasons why equities might fail to maintain their value during periods of inflation. Ely and Robinson (1993) have examined two main arguments that have been advanced as possible explanations for this anomaly especially for the United States stock market. First, they examined the 'tax effect' hypothesis – which focuses on the treatment of depreciation and the valuation of inventories in periods of inflation, particularly that share prices fail to keep pace with inflation because inflation increases corporate tax liabilities and thus reduces after tax earnings. In this case, inflation can be said to "cause" movements in stock prices. Secondly, the 'proxy-effect' hypothesis is the alternative explanation for why real stock returns are negatively correlated with inflation. This hypothesis involves two main assumptions – one that cyclical variations in earnings and output growth are positively correlated, and the other that monetary policy is counter cyclical.

Consequently, in considering the impact of inflation on stock prices as proposed in this study, we shall ignore the tax effect hypothesis, this limitation is because we have set out to consider inflation as a

monetary phenomenon and its effect can only be adequately observed with the proxy-effect hypothesis mentioned above.

The proxy-effect hypothesis was first introduced by Fama (1981). Fama's explanation for the inverse relationship between expected economic activity and current inflation follows two main assumptions; that individuals are "rational" in the sense of making use of all available current information relevant to their money and financial decisions, and that individuals' current demand for money is related to future real economic activity and current interest rates. Assuming that the money supply, real economic activity, and interest rates are exogenous, the demand for money will become a means for the transmission of expected future inflation to current inflation.

Furthermore, the lowering in expected future output growth leads to a lowering in expected future dividends and has the direct and immediate effect of reducing current stock returns. But also the decline in expected future output growth leads to a decrease in money demand currently and excess supply of money. Following Fama's assumption that interest rates and the money supply are exogenous, the excess supply of money is accompanied by an increase in the price level to restore monetary equilibrium. Essentially, the forward looking nature of individuals' money demand generates an inverse relationship between current inflation and expected future growth in national output. This enables a decrease in future output growth to cause both a decline in current stock returns and an increase in current inflation.

Benderly and Zwick (1985) agree with Fama that the relationship between stock returns and inflation is spurious. Unlike Fama, et. al. (1985) who argues that the

relationship runs from inflation to expected output growth. They base their conclusion on a real balance model of output in which changes in aggregate demand are related to changes in real money balances.

Geske and Roll (1983), relaxes the assumption of an exogenous money supply, and suggested an extension of Fama et. al. (1985), argument. They posit that a “reverse causality” actually drives the inverse relationship between stock returns and inflation. Their model involves the Central Bank when deficit begins to grow because of a decrease in output, outstanding government debt increases. The Central Bank chooses to monetize a portion of this debt, thus leading to inflation. Since this debt monetization is anticipated by rational individuals, a decline in the stock market will cause an increase in expected future inflation. Therefore, stock returns are inversely correlated with expected future inflation.

The Fama model excluded any response by the monetary authority while Geske and Roll (1983) stress a policy response of debt monetization. This argument is further developed by Kaul (1987) who agrees that the relationship between stock returns and inflation is spurious. Following Fama, Kaul (1987) stresses the importance of the money demand linkage in his analysis but is also willing to incorporate a response of the monetary authorities. Unlike Geske and Roll, (1983) however, this response does not hinge exclusively on debt monetization. Rather, Kaul (1987) presumes that the Central Bank follows a countercyclical money supply process.

The sequence of events as viewed by Kaul (1987) occurred as follows. First, expected future output decline is signaled by a fall in stock prices. The Central Bank then responds with a countercyclical policy which results in an increase in the money

supply. This causes both an increase in current inflation and an upward revision in inflation expectations. As a result, there is an observed inverse relationship between stock returns and both actual and expected inflation.

Kaul’s version of the proxy effect hypothesis thus incorporates two commonly accepted effects of a perceived reduction in future national output growth. For one, the anticipated shows lower current stock returns. For another, the anticipated shows causes of current monetary expansion and thus inflation. These two conditions are however sufficient to generate the inverse relationship often found between stock returns and inflation. The inverse relationship between expected future national output growth and current inflation is the result of the equilibrium process in the monetary sector.

Zhao (1999) examined the relationship between inflation, output and stock prices in the Chinese economy. The study employs monthly data for the period January 1993 to March 1998. The results show a significant but negative relationship between stock prices and inflation. Similarly, the study found a negative but significant relationship between output and stock prices.

Udegbumam and Eriki (2001), in their study on the Nigerian Stock Market, examining the relationship between stock prices and inflation found a strong evidence to support the proposition that inflation exerts a significant negative influence on the behaviour of stock prices. The study further revealed that stock prices are also strongly driven by the level of economic activity measured by Gross Domestic Product (GDP), interest rate, money stock and financial deregulation. This study is therefore set to test whether monetary policy variables have any significant relationship or can

adequately be used to effect positive changes on stock prices in Nigeria. Using the available data, we have set out to observe the correlation between monetary policy variables and stock prices and the particular effect of inflation on stock prices. From the literature reviewed above, we have observed that according to Uchendu (1996), monetary policy in Nigeria is adequately transmitted through the liquidity, credit and exchange rate channels and Udegbuma and Eriki (2001) have also demonstrated that there exists a relationship between stock prices and the level of economic activity, interest rate, money stock and policy shift to deregulation. Hence we shall draw our analogy based on this known premise.

The modern literature dedicates numerous studies to the relationship between monetary policy and capital market, especially capital market, whose general conclusion is that the markets are sensitive to unexpected changes in the monetary policy and the sensitivity depends on the economy's particularities. Bjorland and Leitemo (2009), analyze the interdependence between U.S. monetary policy and the development of S&P500 stock market index, finding a great interdependence between the interest rate setting and stock prices. In contrast, Bohl *et. al.* (2009), highlight a generally low relationship between German market index return and interest rates on short term, over 1985-1998 period. Işcan and Xu (2010), emphasize that in Canada, the immediate response of stock prices to an internal contradictory monetary policy shock is low and on short time, while in the United States, the immediate response to a similar shock in stock Models and Methods in Applied Sciences prices is more significant and its dynamic response is relatively long. These differences are caused, among others,

by different degree of openness of the two financial markets included in the model. Jansen and Tsai (2010) show that the unexpected impact of monetary policy in a bear market for many industries is significantly higher compared to the unexpected impact of monetary policy in a bull market. Also, Ioannidis and Kontonikas (2008) investigate the impact of monetary policy on index returns in 13 countries of the Organisation for Economic Co-operation and Development (OECD) during the 1972-2002 periods, and the results indicate that a change in monetary policy significantly affects index returns. Going further with the analysis, Pennings *et. al.* (2011) demonstrate that, on average an increase in official interest rates determines an appreciation on exchange rate and a decrease of stock market indices.

The recent financial crisis has demonstrated that the potential economic and social costs of financial instability can be devastating. The existing consensus before triggering the crisis in accordance, to which the monetary policy should take asset prices into account only if these affect inflation, is challenged. In the modern literature, we find few studies regarding the role of stock markets in Central Bank's policy in non-crisis periods, particularly for the Central Bank of Nigeria (CBN). A representative study is realized by Botzen and Marey (2010), who analyze the influence of stock price developments upon the Europe Central Bank's (ECB) monetary policy over the period 1999-2005. The authors find that the evolution of stock prices has exerted influence on the key ECB interest rates before the crisis. In addition, the second pillar of the ECB's monetary policy strategy ensures an institutional framework to meet stock market developments. Cassola and Morana (2004) analyze stock market's role in the transmission mechanism of monetary

policy in the euro area and highlights that stock prices seem to hold an important role in the transmission mechanism in the euro area and that a monetary policy focused on long-term price stability ensures the stability of the stock market. A number of authors argue that Central Bank should not take into consideration asset prices developments. Among them, are found Assenmacher-Wesche and Gerlach (2008), who show that setting the monetary policy's response to asset price movements can generate higher losses than those resulting from a possible explosion of asset bubbles. The same position is adopted by Illing (2006), who argues that a possible Central Bank intervention on asset markets, by injecting liquidities, may increase financial instability. In addition, Hunter et. al. (2005), argue that monetary authorities are unable to identify financial imbalances early enough and with the necessary degree of comfort to take remedial measures, because trying to respond to financial imbalances may increase the volatility of the economy. Icard (2006) shows that the solvency of credit institutions is influenced by the evolution of asset prices. However, the active involvement of Central Bank is justified by the necessity to reduce their volatility, with positive impact on credit risk. The potential costs of instability are large enough to justify a proactive attitude of monetary policy.

The most recent study by Ovidiu et. al. (2012) investigate the impact of monetary policy on stock prices in Eastern European markets. The study considers short term interest rate as a proxy for the monetary policy and stock price index for stock market. They employed Vector Autoregression (VAR) model over period 2000-2011. Their results highlight that only on the more developed stock markets, the

monetary policy has a significant impact. On the emerging markets such as Nigerian capital market this linkage is not significant because of the specific characteristics of economic and financial environment. Their study therefore, supports the hypothesis of uncertainty in monetary growth which is found to have no influence on stock prices (Boyle, 1990).

Methodology

The model of analysis will follow a linear combination of explanatory time series variables and the dependant variable which is an estimate of stock market performance. The All Share Index has been chosen as the appropriate measure of stock market performance because it gives an estimate of price movement at the stock exchange. Although the all share index is calculated based on the movement of the prices of 93 of 175 companies listed on the exchange, it is still the most appropriate measure of stock price movement in Nigeria, (Osugwu, 2009). The market capitalization measures the monetary value of the entire capital market, whereas the All Share Index captures the daily price movements of equity which is of interest in this study.

Nigeria has an emergency capital market which commenced operation in 1980. The data for the all share index are obtained from the CBN Statistical Bulletin. The computation of all share index of the Nigeria stock exchange took effect from January, 1984; hence the data set for this study is for the period 1984:1 2009:4

Money supply as one of the variables is obtained from the Centre Bank of Nigeria, Statistical Bulletin too. To capture the exchange rate transmission we have included the data of official exchange rate of the Nigeria Vis – a – Vis the United States dollar. To capture the

impact of monetary transmission through the interest rate channel we have chosen the minimum rate rediscount rate recently christened monetary policy rate in Nigeria. The rate at which the Central Bank in Nigeria lends money to banks to meet their immediate cash calls, it is a penalty rate and most times it is the anchor of the bank lending rate. We have selected the Treasury bill rate as a proxy for the interest rate of money market instruments that is an alternative to stocks and can possibly capture the opportunity cost of investing in the capital market. The central bank uses treasury bills to effect open market operations a major market determined by monetary instrument for regulating the

quantity of money in circulation. It is generally seen as an alternative to investing in the capital market.

Linear regression models are specified for all the real sector, capital market and monetary policy variables. Savings (SV), investment (INV), income (INC), inflation (INF), market capitalisation (MC), stock price index (SPI) and turnover ratio (TOR) on one hand, are treated as a function of monetary policy variables – interest rate (IR), money supply (MS), exchange rate (EXR), minimum re-discount rate (MRR), and the Treasury Bill (TB). The proxies for capital market performance are treated as endogenous variables while the monetary variables as the exogenous variables. Thus, the simultaneous models:

$$MC_t = \alpha_0 + \alpha_1 IR_t + \alpha_2 MS_t + \alpha_3 EXR_t + \alpha_4 MRR_t + \alpha_5 TB_t + \mu_t \dots\dots\dots(1)$$

$$SPI_t = b_0 + b_1 IR_t + b_2 MS_t + b_3 EXR_t + b_4 MRR_t + b_5 TB_t + \mu_t \dots\dots\dots(2)$$

$$TOR_t = \lambda_0 + \lambda_1 IR_t + \lambda_2 MS_t + \lambda_3 EXR_t + \lambda_4 MRR_t + \lambda_5 TB_t + \mu_t \dots\dots\dots(3)$$

Where:

MC_t = Market Capitalisation at time t

SPI_t = Stock Price Index at time t

TOR_t = Turnover Ratio at time t

IR_t = Interest Rate at time t

MS_t = Money Supply at time t

Consider the structural simultaneous econometric models are first to be transformed to a stationary model:

$$D^{k_0} LNM C = \alpha_0 + \alpha_1 D^{k_1} L N I R + \alpha_2 D^{k_2} L N M S + \alpha_3 D^{k_3} L N E X R + \alpha_4 D^{k_4} L N M R R + \alpha_5 D^{k_5} L N T B R + \mu_t \dots\dots\dots(4)$$

$$D^{k_0} L N S P I = b_0 + b_1 D^{k_1} L N I R + b_2 D^{k_2} L N M S + b_3 D^{k_3} L N E X R + b_4 D^{k_4} L N M R R + b_5 D^{k_5} L N T B R + \mu_t \dots\dots\dots(5)$$

$$D^{k_0} L N T O R = \lambda_0 + \lambda_1 D^{k_1} L N I R + \lambda_2 D^{k_2} L N M S + \lambda_3 D^{k_3} L N E X R + \lambda_4 D^{k_4} L N M R R + \lambda_5 D^{k_5} L N T B R + \mu_t \dots\dots\dots(6)$$

To check for the order of integration we follow the Dickey-Fuller (DF) (1979) test for unit roots stated thus:

Where D is differencing, LN is the natural logarithm to base 10.

$k_0, k_1, \dots, k_6, k_7$ are the orders of integration for $k_0 \neq k_1, k_2, k_3, k_4, k_5, k_6$

μ_t is the random error term, and α 's, b 's and λ 's, are the intercepts and the slope coefficients respectively.

$$\Delta Y_t = \alpha_0 + \alpha_1 t + \alpha_2 Y_{t-1} + \mu_t \dots\dots\dots(6)$$

Or the Augmented Dickey-Fuller (ADF) (1981) tests;

$$\Delta Y_t = \alpha_0 + \alpha_1 t + \alpha_2 Y_{t-1} + \sum_{i=1}^k \alpha_i \Delta Y_{t-i} + \mu_t \dots\dots\dots (7)$$

In order to estimate the models, a statistical package, Eviews 4.0 econometric software is used.

Table 1: A Priori Expectations

Dependent Variables	Independent Variables								
	IR	MS	EXR	MRR	TB	SV	INC	INV	INF
SPI	-	+	+	-	-	-	+	+	-
MC	-	+	+	-	-	-	+	+	-
TOR	-	+	+	-	-	-	+	+	-

Source: Author's Findings (2012)

Discussion of Results

For ease discussion, the relevant portions have been extracted from the reported results of VAR output. We therefore concentrate on interpreting only relevant results for SPI, MC and TOR models. The abridged summary results are shown in Table2 and3.

Except for interest rate, minimum rediscount rate and inflation, independent variables included in the SPI equation carried their correct signs. As for the MC equation, interest rate, exchange rate and savings came out with unexpected signs. Interestingly, TOR equation variables exhibited the correct signs except for interest rate and minimum rediscount rate. From Table 2, with an average R-squared of 0.9952, it can be seen that fit for all the equations have been very good, while the F-statistic is also very robust with the exception of treasury bill with a value of 1.83.

The results further revealed that stock price index and market capitalisation, as a proxy for capital market performance, were not significantly responsive to their lagged values. The opposite was the case for turnover ratio. The results also showed that money supply, minimum rediscount rate

and investment were significantly responsive to the stock price index in the positive direction while treasury bill and savings are negatively significant with respect to stock price index. The lagged values of SPI, interest rate, exchange rate and inflation rate are not significant. In the other models of MC and TOR, similar results are observed. As the result of this, implies that money supply, minimum rediscount rate and investment are said to have a positive significant influence on capital market performance while treasury bill, interest rate and exchange are said to have a negative impact on the performance of capital market.

Furthermore, the results revealed that on turnover ratio amongst the dependent variable that is significantly responsive to it lagged value, all the independent variables are significantly responsive to their lagged values except interest rate and inflation rate. However, interest is significantly responsive to the level of constant only in the SPI model.

Table 2: Summary of Results

Variable	Symbol	R ²	SE of equation	Sum of squares resid	Akaike info criterion	Schwarz info criterion	Log-likelihood
LINEAR							
<i>Ordinary Least Squares Model (OLS)</i>							
Direct Impact (Monetary sector to Capital Market)							
Stock Price Index	<i>SPI</i>	0.628	9248.73	1.88E+09	21.27	21.51	-282.12
Market Capitalization	<i>MC</i>	0.675	2207.7	1.07E+08	18.40	18.64	-243.43
Turnover Ratio	<i>TOR</i>	0.807	2746	165.84	5.023	5.263	-62.82
Indirect Impact (Monetary sector to Real sector)							
Savings	<i>SAV</i>	0.9213	556881.6	6.68E+12	29.442	29.682	-392.47
Investment	<i>INV</i>	0.9269	412661.4	3.75E+12	28.864	29.104	-384.67
Real Income	<i>INC</i>	0.9549	8631605	1.64E+15	34.945	35.185	-466.76
Indirect Impact (Real sector to Capital Market)							
Stock Price Index	<i>SPI</i>	0.91165	4665.46	5.01E+08	19.869	20.062	-264.24
Market Capitalization	<i>MC</i>	0.87471	1340.01	41299108	17.375	17.567	-230.56
Turnover Ratio	<i>TOR</i>	0.91914	1.738	69.53	4.0801	4.2721	-51.082
Average		0.84651	1069046	1.83E+14	19.919	20.143	-264.24
NON-LINEAR							
<i>Generalized Linear Model (GLM)</i>							
Direct Impact (Monetary sector to Capital Market)							
Stock Price Index	<i>SPI</i>	-	-	1.88E+09	21.288	21.527	-282.38
Market Capitalization	<i>MC</i>	-	-	1.07E+08	18.42	18.66	-243.70
Turnover Ratio	<i>TOR</i>	-	-	165.84	5.04	5.28	-63.08
Indirect Impact (Monetary sector to Real sector)							
Savings	<i>SAV</i>	-	-	6.68E+12	29.46	29.70	-392.73
Investment	<i>INV</i>	-	-	3.75E+12	28.88	29.12	-384.93
Real Income	<i>INC</i>	-	-	1.64E+15	34.96	35.20	-467.02
Indirect Impact (Real sector to Capital Market)							
Stock Price Index	<i>SPI</i>	-	-	69.53	4.092	4.284	-51.25
Market Capitalization	<i>MC</i>	-	-	41.30	17.387	17.58	-230.72
Turnover Ratio	<i>TOR</i>	-	-	69.55	4.42	5.32	-62.38
Average		-	-	1.83E+14	18.216	18.519	-242.02

MULTIPLE-EQUATION SYSTEM							
<i>Vector Auto-Regressive Model (VAR)</i>							
Stock Price Index	<i>SPI</i>	0.99008	2807.72	1.18E+08	159.51	164.83	-1963.59
Market Capitalization	<i>MC</i>	0.99796	404.82	6.6E+05	159.51	164.83	-162.653
Turnover Ratio	<i>TOR</i>	0.99769	404.82	15.716	14.69	15.72	-162.653
Average		0.9952	1205.79	3.96E+07	111.24	115.13	-762.97
Source: Author's computation from estimation results							

The hypothesis states that variations in monetary policy variables do not stimulate capital market activity in Nigeria. The question is, does evidence from above analysis support this position or otherwise? The proxies used in this study to represent variations in monetary variables include interest rate, money supply, exchange rate minimum rediscount rate and treasury bill. Out of all these variables, only money supply had shown to be not only statistically

significant but consistent. Since money supply is very critical in the monetary toolkit of the monetary authorities and has shown to have been active in the statistical relationship between capital market performance and monetary policy variables, it suggests that the null hypothesis was rejected and the conclusion be drawn that indeed, variations in monetary variables seem to stimulate capital market activities in Nigeria.

Table 3:Abridged Summary Results and Test of Statistical Significance

PERFORMANCE INDICATORS	PROXIMATE FACTORS										
STOCK MARKET INDEX	Past Performance of Stock Price Index	Interest Rate	Money Supply	Exchange Rate	Minimum Rediscount Rate	Treasury Bill	Savings	Real Income	Investment	Inflation	Constant
	[0.205080] (0.1399)	[211.33] (0.2743)	[0.004]* (0.001)	[45.6303] (0.0764)	[1312.79]* (0.0166)	[-1298.6]* (0.0057)	[-0.022]* (0.0033)	[9.17E-5] (0.2912)	[0.01745]* (0.0367)	[14.839] (0.3372)	[-5585.3]* (0.0329)
STOCK MARKET CAPITALIZATION	Past performance of Stock Market Capitalization	Interest Rate	Money Supply	Exchange Rate	Minimum Rediscount Rate	Treasury Bill	Savings	Real Income	Investment	Inflation	Constant
	[-0.363760] (0.3897)	[76.703] (0.2389)	[0.002]* (0.0014)	[-1.1415] (0.4522)	[29.57024] (0.4443)	[-65.6443] (0.3192)	[0.00111] (0.3669)	[7.60E-05] (0.0749)	[0.000854] (0.3983)	[-0.3371] (0.4840)	[-349.40] (0.3897)
CAPITAL MARKET TURNOVER	Past performance of Capital Market Turnover Ratio	Interest Rate	Money Supply	Exchange Rate	Minimum Rediscount Rate	Treasury Bill	Savings	Real Income	Investment	Inflation	Constant
	[0.581039]* (0.0207)	[0.0724] (0.3015)	[9.6E-7]* (0.001)	[0.0219]* (0.0436)	[0.14093] (0.2810)	[-0.23068] (0.1131)	[-3.8E-06] (0.0594)	[2.68E-08] (0.3264)	[2.26E-06] (0.3015)	[-0.0096] (0.2327)	[0.26897] (0.4052)

Source: Author's computation from estimation results

[] –Coefficient

() – prob-value

* Statistically Significant at 5 per cent

Conclusion

Therefore, the objective of this study was to determine whether or not monetary policy variables stimulate activities on the Nigerian capital market. In line with objective, the hypothesis has shown that monetary policy variables exert significant influence on the capital market in Nigeria. Money supply as one of the major toolkits exerts significant influence on the capital market (Table 3). On the other hand, the trend analysis revealed that capital market indicator shows an upward trend from the beginning of the study period to its peak in middle 2007, when stock price index rose to over 60,000 points while market capitalisation rose to over 12 trillion Naira and turnover ratio rose to 20 per cent. The stock prices decline sharply from the beginning of 2008 to its present state of low activities. Similarly, money supply and exchange rate have the same pattern. This implies that increase in money supply and exchange rate stimulates the demand and supply in the capital market. In the real sector, national income savings and investment also follow the same trend. This finding supports the findings of Kibuthu (2005) and Asea (2003), of instability in African capital markets. Though the effect of financial meltdown had a negative impact on stock price, leading to

the near total collapse of Nigerian capital market in 2008 and 2009.

Recommendations

Based on the findings of this study, the following are recommended:

- i. Monetary authorities should exercise restraint in the use of policy instruments because it is clearly evident that the use of monetary policy instruments affects the performance of the stock market to a very large extent in the long-run. This is important because of the significant impact monetary policy variables have on capital market such as money supply and exchange rate.
- ii. The Nigerian Capital Market and Security and Exchange Commission (SEC) also need to strengthen their regulatory capacities to enhance market discipline and investor confidence. This will involve training personnel to enforce financial regulations, perform market surveillance including, analytical and investigative assignments. All institutional restrictions such as doctoring and the use of information manipulation on trading of securities in the market should be eliminated.

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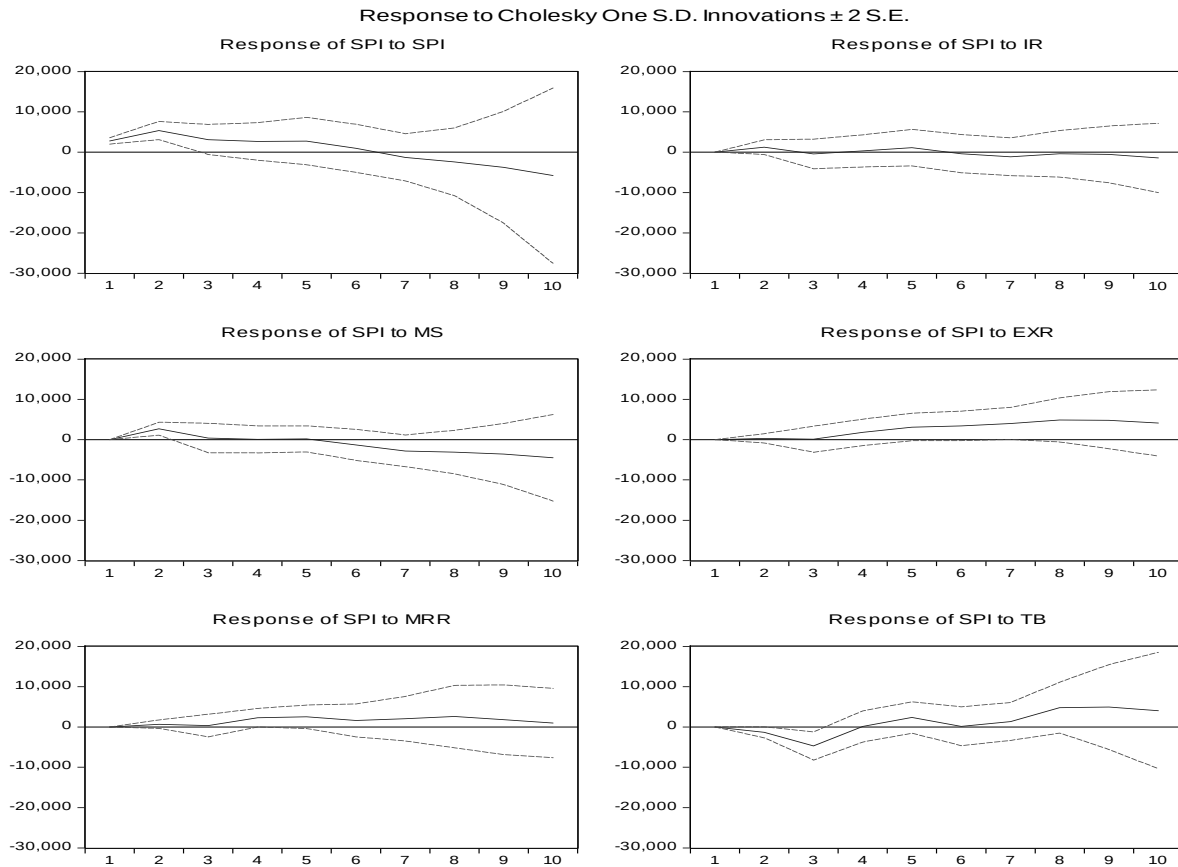
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Appendix

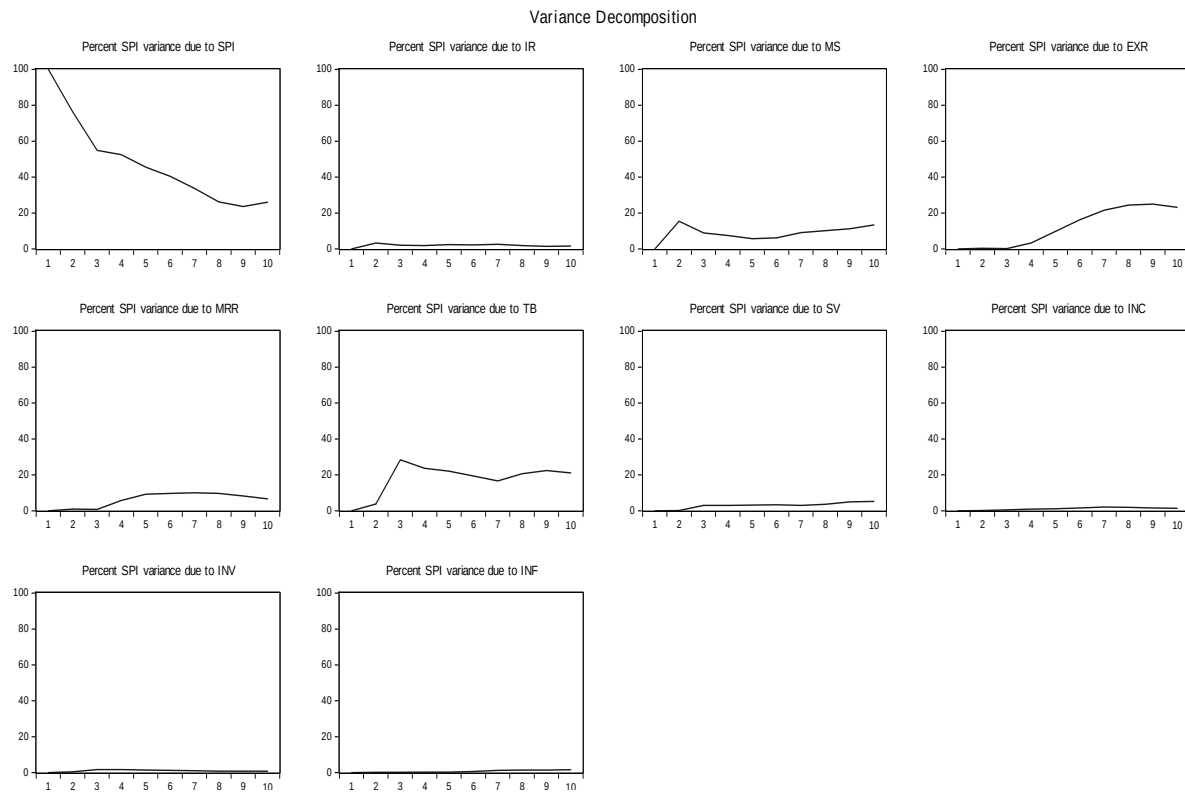
Impulse Response and Variance Decomposition of Stock Price Index to Monetary Policy Variables

Figure 1: Impulse Response of Stock Price Index to Monetary Policy Variables



Source: E-views Output

Figure2: Variance Decomposition for SPI to Monetary Policy Variable



Source: E-views Output