Analysis of the Effect of Monetary Policy Development on Equity Prices in Nigeria.

Abaenewe, Zeph C.,* and Ndugbu, Michael O.+

***Department of Banking and Finance, Abia State University, Uturu E-mail: abazephyr@yahoo.com**
+Department of Banking and Finance, Imo State University, Owerri

Abstract

This study investigated the effect of monetary policy development on equity prices in the Nigerian Stock Exchange Market using annual data from 1985 to 2010. The ordinary least square regression (OLS) was run using five monetary policy variables including minimum re-discount rate, treasury bill rate, interest rate, exchange rate and consumer price index (proxy for inflation) on the equity prices (proxied by all share price index). The first investigation of this study is that minimum rediscount rates and Treasury bill rates are highly correlated and cannot be applied simultaneously in monetary policy management. As a consequence, the Treasury bill rates were dropped in the course of further analysis. The general result of the analysis showed a weak correlation between monetary policy and equity prices. This reflected in the explanatory variables which accounted only 15.6% in the changes of equity prices in Nigeria. All the explanatory variables are negatively and insignificantly related to equity prices, except the consumer price index that has insignificant positive relationship with equity prices. The study has revealed that monetary policy has not made significant influence over the prices of ordinary equities in Nigeria. What this means is that the equities market has not significantly absorbed the monetary policy impulses and therefore cannot be taken as being a good transmission channel for monetary policy implementation in Nigeria until the distortion in the financial system caused by huge fiscal spending is corrected. This study therefore recommends that policy makers should be aware of these weak monetary policy impacts on equities market, and make their decisions in a more effective manner that can link monetary policy to the equities market to ensure price stability and encourage investors.

Key words: *Monetary Policy, Equity prices, transmission channels, Multi-collinearity test*

1.1 Introduction

The issue which has occupied the investment consciousness of investors in the Nigeria capital market is the effectiveness of the monetary policy changes in influencing equity prices. Questioning how the same monetary policy could influence macro economic variables, Udegbunam, [1] opined that despite the lack of consensus among economists on how it actually works, and on the magnitude of its effect on the economy, there is remarkable strong agreement that monetary policy has some measure of effects on the economy. According to Li et al,[2] stock markets are notoriously sensitive to changes in monetary policy. But this sensitivity may vary across different economies. On the other hand, Rigobon and sack [3] uphold that movements in the stock market can

have significant impact on macro economy and are therefore likely to be an important factor in the determination of monetary policy.

The above notwithstanding, the study on the link between the changes in monetary policy on equities performance of several economies have been examined by many financial economists. Among the recent empirical studies in this subject include Okpara,[4] Osuagwu,[5] Bordo et al, [6] Ioannidis and Kontonikas [7]. Those of similar studies carried out with evidence from Nigeria did not involve the periods of boom in the stock market and global economic crises.

Accordingly, monetary policy could be expressed as the process by which the monetary authority of a country controls the supply of money. The official goals usually include relatively stable prices and low unemployment level. In the words of Okpara [4], monetary policy is a measure designed to influence the availability, volume and direction of money and credits to achieve the desired economic objectives. Actually, monetary policy attempts to achieve a set of objectives that are expressed in terms of macroeconomic variables, such as inflation, real output and unemployment.

On its own, stock market encourages capital formation and generates liquidity for the expansion of industries, the impact which is seen in the real output of a country. According to Durham[8], financial economists have given reasons why changes in the discount rate affect stock returns. He posits that discrete policy rate changes influence forecasts of market determined interest rates and equity costs of capital. Waud [9] stressed that changes in the discount rate possibly affect expectations of corporate profitability.

However, the relationship between monetary policy and equity market has been linked to the transmission mechanisms of monetary policy. Similarly, Goodhart and Hofmann [10] see stock market as a transmission mechanism of monetary policy actions that affect stock prices which themselves are linked to real economy through their influences on consumption spending (wealth effect channel) and investment spending (balance sheet channel). Napolitano [11] posits that several proposed transmission mechanisms link changes in central bank policy to stock market which in turn affects output via consumer expenditure as well as investment spending. Bordo et al [6] expressed that policy markers and others often link the performance of the stock market to changes inflation and monetary policy, especially during extended periods of rapid appreciation or decline in real stock prices. All these scholars seem to believe that that the stock market is a real transmission mechanism for monetary policy.

In different economies of the world, monetary policy effect on stock market vary according to peculiarity and prevailing economic conditions as well as efficiency of the stock market in response to new policies and inflationary trend. As a result of the above, the transmission mechanism may differ. It is believed that the operations of the monetary transmission channels may vary systematically across countries due to differences in the extent of financial intermediations, i.e. the size, concentration and health of the banking system, the development of the capital market and structural economic conditions, the effect of the monetary policy tools on stock prices may vary equally across countries. Nigeria stock market being an emerging market exhibits its own behavior due to the changes in the structural economic conditions in Nigeria economy.

Just like high inflation level is the consequence of poor monetary management in an economy, it occurs when there is upward movement in the average level of prices of goods and services. There is a level tolerable in the

economy. The stock market therefore is expected to establish the prices of the Policies which include the monetary policy.

Furthermore, reasonable number of financial researchers has argued the possibility of distortion in equity prices with changes in monetary policy rates. Whether monetary policy influences the stock market performance has become an issue of continuous debate and controversy in financial literature.

Though, monetary policies are implemented through financial institutions of which the stock market is one. The high liquidity generated on daily basis at the stock exchange market has poised the central bank and monetary policy managers to believe that the capital market is an appropriate avenue for monetary policy implementation in order to bring stability in the economy. Whether this believe is correct, has also become a financial assets by adjusting too, to many economic conditions and government matter of concern to financial researchers and can only be supported by an empirical research finding to possibly establish how equity prices react to changes in monetary policy rates.

Similarly, it is arguable that monetary policy should exert significant influence on stock market. This, as a matter of fact should also manifest in the behavioral relationship of equity prices movement and monetary policy rate adjustment in the economy. Therefore the uncertainty in the adjustment of monetary policy rates affects investors' returns in financial asset investment. This uncertainty of the behavioural pattern, of course, has pushed this study to investigate their relationship jointly with a view to determining whether the changes in monetary policy rates significantly influence the equity prices in Nigeria.

2.1 Monetary Policies and the Stock Market.

According to Ioannidis and Kontonnikas [7] the present value or discounted cash flow model offers useful insight on the stock market effects of monetary policy changes. As expressed in the widely used model, the stock price (St) is the present value of expected future dividends (D_{t+j}). Under the assumption of constant discount rate (R), it can be shown as thus :

$$S_t = E_t\left[\sum_{j=1}^{K}\left(\frac{1}{1+R}\right)^j D_{t+j}\right] + E_t\left[\left(\frac{1}{1+R}\right)^K S_{t+K}\right] \qquad (1)$$

where E_t is the conditional expectations operator based on information available to market participants at time t, R is the rate of return used by market participants to discount future dividends, and K is the investor's time horizon (stock holding period). The standard transversality condition implies that as the horizon K increases the second term in the right hand side Eq. (I) vanishes to zero (no rational stock price bubbles) Ioannidis and Kontonikas [7]:

$$\lim_{K\to\infty} E_t\left[\left(\frac{1}{1+R}\right)^K S_{t+K}\right] = 0 \qquad (2)$$

Thus, we obtain the familiar version of present value model

$$S_t = E_t\left[\sum_{j=1}^{K}\left(\frac{1}{1+R}\right)^j D_{t+j}\right] \quad (3)$$

Equation 3 indicates that a change in monetary policy can affect stock returns in a dual manner. First, there, is a direct effect on stock returns by altering the discount rate used by market participants. Tighter monetary policy leads to an increase in the rate at which firms' future cash flows are capitalized causing stock prices to decline. The underlying assumptions are that, first, the discount factors used by market participants are generally linked to market rates of interest and second, the central bank is able to influence market interest rates.

Second, monetary policy changes exert an indirect effect on the firm's stock value by altering expected future cash flows. Monetary policy easing is expected to increase the overall level of economic activity and the stock price responds in a positive manner (expecting higher cash flows in the future). Patelis [12] advanced that stocks are claims on future economic output, so if monetary policy has real economic effects then stock markets should be influenced by monetary conditions.

In the above equation 1, there is an assumption that an investor has two alternative investment opportunities over a one period of time: either a stock with expected gross returns $E_t (S_{t+1} + D_{t+1}] / S_t$, or a risk-free bond with constant nominal gross return 1+R. Arbitrage opportunities imply that, for the investor to be indifferent between the two alternatives, they must yield the same expected return.

Monetary policy is a forward looking economic reform tool especially applied to expand or contract money supply or liquidity in the economy with the aim of achieving price stability. In the other hand, stock market is a market for equities and financial assets. Corporate organizations raise capital in the stock market to finance their businesses.

As a matter of fact, the relationship between stock prices and monetary policy has received attention in different countries. Because no economy is static, a study of this nature should be carried out from time to time in order to follow up the changing behavior of these variables. This is very important because of the implications the recent findings on the effect of monetary policy may have on investors' portfolio formation. Central banks and stock market participants should be aware of the relationship between monetary policy and stock market performance in order to have a good understanding of the effects of policy shifts. Napolitano [11] posits that the empirical relationship between central bank policy and stock market returns can be relevant under two critical conditions.

According to Loannidis and Kontonikas [7], monetary authorities in particular face the dilemma of whether to react to stock price movements, above and beyond the standard response to inflation and output developments. This is the reason while studying monetary policy and stock market performance the issue of inflation should be taking care of because of its responds to their actions, if left behind will not augur well.

Prior researches have found out that the impact of monetary policy actions on stock returns have varied over time with changes in market conditions. Osuagwu [5] observed in his study that a change in stock market index is largely influenced by monetary policy variables both in the long run and short run. Waud [9], Smirlock and Yawitz [13], Cook and Hahn [14], Rigobon

and Sack [3] posit that changes in monetary policy affect short run stock returns in the United States. Chen[15] in his study while observing bear and bull markets conditions find out that monetary policy shocks have a large impact on market returns especially in bear market and that contractionary monetary policy increases the chances of the market moving to a bear market state.

Bordo,[6] used the hybrid Qual-Var/dynamic factor model to estimate the effects of output, inflation and other shocks on real stock prices and reported that unanticipated changes in inflation and interest rates have played important roles in major movements in the United States stock market since world war 11. Specific findings include that inflation and interest rate shocks have large negative impacts on stock market conditions, apart from their effects on real stock prices. Geske and Roll [16] explain the negative linkage among stock returns and inflation. Using post-war data for the US, Canada, Germany and the UK, Kaul [17] explains the relationship between stock returns and unanticipated changes in expected inflation under alternative monetary policy regimes. He finds that in countries where there is no change in the policy regime, there exists a negative relation between stock returns and changes in expected inflation.

Furthermore, Jensen and Johnson [18] while studying the long run monthly as well as quarterly performance of monetary policy using U.S. data find out that expected stock returns are significantly greater during expansive monetary periods than restrictive periods. In all, they posit that monetary policy developments are associated with patterns of stock returns. Ioannidis and Kontonikas,[7] in a similar study expressed that in a majority of They showed that long term stock returns following discount rate decreases are higher and less volatile than returns following rate increases.

countries sampled; the results suggest that stock returns are generally higher in an expansive monetary environment than they are in restrictive environment. The implication of the above is there is an association that exists between monetary policy development and stock returns. In his own study, Thorbecke [19] used alternative methodologies to examine the relationship between monetary policy and stock prices in the United States. Applying VAR system, he finds that monetary policy shocks measured by orthogonalized innovations in the federal funds rate have a greater impact on smaller capitalized stocks. Thorbecke [19] supported the finding that expansionary monetary policy exerts a large statistically significant positive effect on monthly stock returns. Okpara [4] posits that monetary policy is a significant determinant of long run stock market returns in Nigeria. In his words, long run behavior of stock market returns is influenced largely by monetary variables.

Mishkin [20] suggests that lower interest rates increase stock prices and therefore decrease the likelihood of financial distress, leading to increased consumer durable expenditure as consumer liquidity concerns abate. Bosworth,[21] posits that high stock prices lower the yield on stocks and reduce the cost of financing investment spending through equity issuance.

Durham [8] expressed that several purported monetary transmission mechanism link changes in central bank policy to the stock market, which in turn affects aggregate output through consumer expenditure as well as investment spending. Jensen and Johnson [18] also find that monetary policy developments are associated with patterns in stock returns.

However, the choice of discount rate as proxy for the stance of monetary policy follows from the view that the discount rate is typically regarded as a signal of monetary and possibly economic

developments. This argument is based on Waud's [9] suggestion that discount rate changes affect market participants' expectation about monetary policy since rate changes are made only at substantial intervals; they represent a somewhat discontinuous instrument of monetary policy.

In another study, Jensen et al [22] extended the Fama and French [23] analysis by expressing that monetary environment affects investors' required returns. Jensen et al find out that predictable variation in stock returns depends on monetary as well as business conditions, with expected stock returns being higher in tighter money periods than in easy money periods. Booth and Booth [24] using federal funds rate and discount rate have confirmed that expansionary monetary policy increases stock returns. They concluded that monetary policy has expansionary powers in forecasting stock returns

In a different study, Ogbulu [25], whose study looks at the dynamic long run relationship between stock returns, inflation and interest rates in Nigeria, found that there is positive long run dynamic significant relationship between Inflation and stock returns, and negative long relationship between significant relationship between inflation and stock returns and a negative long run relationship between interest rates and stock returns in Nigeria. The reason for reference to this study is that the study uses monetary policy variables against the stock market index which this study extended in a broad manner..

.

2.2 Monetary Policy Design in Nigeria

The direct approach of monetary policy management was the main technique of monetary policy implementation in Nigeria before the introduction of the structural adjustment programme (SAP). Between 1986 and 1993, the CBN made efforts to create a new environment for the introduction of indirect approach to monetary management.

A major action taken as part of the monetary reforms programme was the initial rationalization and eventual elimination of credit ceilings for selected banks that were adjusted to be sound. After the initial test run of the indirect monetary management approach, monetary management shifted to the indirect approach in which open market operations (OMO) was the principal instrument of liquidity management.

Since the introduction of the indirect approach, the primary and secondary markets for treasury securities have been developed to take advantage of liberalization introduced through the reforms. Discount houses, banks and recently some selected stockbrokers are now very active in primary market for treasury bills.

According to Allen, [26] indirect methods of monetary control in their most idealized form, allow the state no role at all in the relationship between commercial banks and their customers. In the idealized model, the state in the guise of the central bank, deals only with commercial banks and perhaps some principal institutions. The role of the central bank is purely to supply central bank money to the financial system in such a way as to enable the objectives of monetary policy to be achieved (Allen)[26].

Therefore, the decisions about how much credit to extend to non bank borrowers, and at what interest rate, and about what interest to pay to depositors, are all left entirely to the private sector.

2.3 Monetary Policy Transmission Mechanism and Impact on the General Economy

Monetary policy is deemed to have a far reaching impact on the financing

conditions of an economy. This is among the reason why monetary authorities embark on the policy. The impact is not only on costs but also the availability of credit or banks' willingness to assume specific risks and its influence on expectation about activity and inflation [47]. In general, monetary policy can affect the prices of goods, asset prices, exchange rates as well as consumption and investment. Therefore, the process through which monetary policy decisions impact on an economy in general, and the price level in particular, is known as the monetary policy transmission mechanism. But the individual links through which monetary policy impulses proceed are known as transmission channels. Every monetary policy impulse (e.g. Interest rate by central bank, change in the monetary base resulting from changes in the minimum reserve rate) has a lagged impact on the economy [47]. This bank posits that it is uncertain how exactly monetary impulses are transmitted to the price or how real variables develop in the short and medium term. However, Chami et al [27] in their study which examined the possibility of the stock market to be one of the monetary policy transmission channels in addition to money and credit channels concluded that the stock market is a channel for transmitting monetary policy.

Monetary policy transmission mechanism varies in details between economies because it depends partly upon the institutional structures. However, these differences are small and involve the relative importance of different channels rather than the existence of the channels themselves (AJayi) [28].

Now, it could be believed that the individual transmission channels of monetary policy can include the interest rate channel, credit channel, exchange rate channel and wealth channels.

The interest rate channel expands and reduces money supply. The expansion of money supply by the central bank feeds through a reduction of short term market interest rate. As a result the real interest rate and capital costs decline thereby raising investment.

The credit channel in effect breaks down into two different channels. i.e. the banking lending channel and the balance sheet channel. With the banking lending channel, the central banks' monetary policy decision influences commercial banks refinancing costs; banks are inclined to pass the charges on to their customers. If financing costs diminish, investment and consumer spending rise, contributing to an acceleration of growth and inflation. However, following an increase in interest rates, the risk that some borrowers cannot pay back their loans in due course may increase so much that banks will not grant loans to these borrowers. As a result, borrowers would be forced to cut back on planned expenditure.

In the balance sheet channel, monetary policy effect can be seen in corporate balance sheet. This is because monetary policy may have a direct impact on corporate policy. Companies may borrow to improve return on equity as long as the returns on debt – in effect the lending rate – are lower than the return on assets. Hence, the return on assets is weighted arithmetic mean of the return on equity and the lending rate, which are respectively weighted by the share of equity and debt in total assets. Consequently, lower interest rates improve the return on equity. For this reason, non profitable enterprises may show a profitable return on equity. However, this may re-enforce the influence of interest rates on investment behavior, which is referred to as the financial acceleration effect [47].

Also, expansionary monetary policy affects exchange rate because deposits denominated in domestic currency become less attractive than deposits denominated in foreign currencies when interest rates are cut. As a consequence, the value of

deposits denominated in domestic currency declines relative to that foreign currency denominated deposits and the currency depreciates. This depreciation makes domestic goods cheaper than imported goods causing demand for domestic goods to expand and aggregate output to augment. This channel does not operate if a country has a fixed exchange rate; conversely, the more open an economy is, the stronger this channel is.

Through the wealth channel, monetary policy impulses are also transmitted through the prices of assets such as stock and real estate. Fluctuation in the stock or real estate markets that influenced by monetary policy impulses have important impacts on the aggregate economy. Expansionary monetary policy effects of lower interest rates make bonds less attractive than stocks and result in increased demand for stocks, which bids up stock prices. Conversely, interest rates reductions make it cheaper to finance housing, causing real estate prices to go up. There are three types of transmission mechanism involving asset prices. This includes investment effects, wealth effects and balance sheet effects.

Having looked at the existing literature so far, the inference that could be drawn is that studies centered on monetary policy and stock returns or its performance have different objectives as specified in their models. Even, the variables for the measurement differ from scholar to scholar. Furthermore, previous researches support the view that various monetary policy actions on equity prices have varied over time with changes in market or economic conditions. However, what should be discussed is whether proactive measures or reactionary measures should be adopted by monetary policy managers. And to investors in equities, how they should be bothered with adjustment to policy changes in order to maximize their investment. Although, Ioannidis and kontonikas [7] have expressed that despite the difference in the timing of the reaction, both approaches effectively assume that the monetary authorities can affect stock market value. It is this assumption that we are investigating for good monetary policy formulation with a view to bringing stability in the Nigerian economy.

3.1 Research Methodology

Here, we extended the literature to empirical examination to ascertain the relationship between monetary policy and equity prices by utilizing a more up-to-date data set by checking the robustness of the empirical findings and analyze the shift in the changes in monetary policy rates proxied by minimum rediscount rate, Treasury bill rates, interest rates, exchange rate and inflation. The contemporaneous relationship is examined using the regression model below in a context of multiple regressions and correlation coefficient.

3.2 Sources of Data and Data Collection

To achieve the set objectives of this research, secondary were data sourced and extracted from the central bank of Nigeria (CBN) statistical bulletin, Nigerian stock market fact book and the annual bulletin of the National Bureau for Statistics for the period 1985-2010. The period of the study covers periods of shocks in the economy including structural adjustment programme (SAP) and economic meltdown and boom in stock prices.

To estimate the effect of monetary policy on equities market performance some monetary variables have been identified to capture the impact of the various transmission channels. These include the minimum rediscount rate, the Treasury bill rate, the interest rate the exchange rate and the consumer price index. For the exchange rate transmission channel, the official exchange rate of the naira against the US dollar is used. Also the consumer price index is adopted to estimate the impact of on inflation. To

capture the impact of monetary transmission through the interest rate, the minimum rediscount rate was chosen. The treasury bills rate is also chosen in addition to represent the interest rate for the money market which serves as an opportunity cost for capital market investment. Nevertheless, the quarterly interest rate is also used to capture the cost of borrowing from banks for investment.

3.3 Data Analytical Technique and Procedure

The data for this study is time series data. The study applied annual-rate-of-change analysis to find out the rate of change of the variables for the relevant years. For Example; data 1986 = (1986-1985)/1985 etc. This was done in order to improve on the data quality in order to reduce the incidence of spurious regressions and also make the test result more meaningful for acceptance.

The Pearson correlation coefficient and multiple regressions analytical methods were adopted for the analysis on the converted data. These variables are denoted as X and Y variables. The rate of change in share prices captured in the all share index is the dependent variable, while the rates of change in monetary policy variables are the independent variables i.e. Minimum rediscount rate (MRR), the Treasury bill rates, interest rates, exchange rates and Inflation proxied by consumer price index (CPI).

3.4 Model Specification

The model/equation specified below is based the assumption that the all share index as earlier and briefly introduced can be explained by the linear combination of values of monetary policy and related variables. The models are estimated as thus:

$$\Delta ASI = f\{\Delta MRR, \Delta TBR, \Delta INTRATE, \Delta EXR, \Delta CPI, \mu_t) \quad (4)$$

Eqn. 1 could be expressed more explicitly as

$$\Delta ASI = a_0 + \beta_1\Delta MRR_t + \beta_2\Delta TBR_t + \beta_3\Delta INTRATE_t + \beta_4\Delta EXR_t + \beta_5\Delta CPI_t + \mu_t) \quad (5)$$

where:

ΔASI = Change in Annual All Share Index

ΔTBR = Change in annual Treasury bill rate

ΔMRR = Change in annual minimum rediscount rate

$\Delta INTR$ = Change in annual interest rate

$\Delta EXCHR$ = Change in annual Foreign Exchange rate

ΔMS = Change in annual consumer price index

μ_t = Stochastic or Error term

Pearson Correlation CoefficientE

$$r = \frac{\sum XY - \frac{(\sum X)(\sum Y)}{n}}{\sqrt{\left(\sum X^2 - \frac{(\sum X)^2}{n}\right)\left(\sum Y^2 - \frac{(\sum Y)^2}{n}\right)}} \quad (6)$$

In a nutshell, what the models above intend to achieve is to verify whether changes in equity prices can be associated with changes in monetary phenomenal variables. As stated by Okpara [4] (2010), a change in the CBN rediscount rate can trigger off a chain of events that will affect other short term interest rates, long term interest rates, foreign exchange, and stock prices. But this study looks from the other way round and contend that changes in the stock prices are triggered off mostly by CBN controlled monetary variables such as Minimum rediscount rate, Treasury bill rate, , interest rate, exchange rate and inflation.

Data and Analysis

The tables (1-3) below present the data and analysis of this study

TABLE 1: Time Series Data

Year	ASI	MRR (%)	TBR (%)	INTR (%)	EXCHR(₦)	CPI
1985	127.3	10.00	8.50	9.25	0.8938	1.9
1986	163.8	10,00	8.50	9.25	2.0060	2.1
1987	190.9	12.75	11.75	14.90	4.0179	2.4
1988	233.6	12.75	11.75	13.40	4.5367	3.8
1989	325.3	18.50	17.50	18.90	7.3916	5.5
1990	513.8	18.50	17.50	19.60	8.0378	5.7
1991	783.0	14.50	15.00	15.71	9.9095	7.0
1992	1107.6	17.50	21.60	20.80	17.2984	10.4
1993	1548.8	26.00	26.90	23.60	22.0511	16.8
1994	2205.0	13.50	12.50	15.00	21.8861	29.7
1995	5092.2	13.50	12.50	13.62	21.8861	45.0
1996	6992.1	13.50	12.25	12.94	21.8861	51.5
1997	6472.1	13.50	12.00	7.04	21.8861	56.7
1998	5889.9	14.31	12.95	10.20	21.8861	63.5
1999	5397.9	18.00	17.00	12.68	92.6934	63.6
2000	8111.0	13.50	12.00	10.60	102.1052	72.9
2001	10963.0	14.31	12.95	10.20	111.9433	84.9
2002	11740.8	19.00	18.88	16.31	120.9702	95.9
2003	21222.8	15.75	15.02	14.31	129.3565	95.2
2004	23844.5	15.00	14.21	13.69	133.5004	117.9
2005	24085.8	13.00	7.00	10.53	132.1470	129.7
2006	33189.3	12.25	8.80	9.75	128.6516	144.7
2007	57990.2	8.75	6.91	10.29	125.8331	157.1
2008	31450.8	9.81	9.55	11.95	118.5669	167.4
2009	20827.2	7.44	6.13	13.30	148.9017	192.6
2010	24910.5	6.25	7.47	4.63	150.2983	161.43

Source: CBN Statistical Bulletin, the Stock Market fact-book, and Bureau on Statistical bulletin (various issues covering 1985-2010).[29]

Table 2: The Converted Data (i.e.) Using Rate oF Change in Annual Figures of Variables

YEAR	ASI	MRR	TBR	INTR	EXCHR	CPI
1985	0	0	0	0	0	0
1986	0.286724	0	0	0	1.244766	0.105263
1987	0.165446	0.375	0.382353	0.610811	0.950437	0.142857
1988	0.223677	0	0	0.100671	0.129173	0.583333
1989	0.392551	0.45098	0.489362	0.410448	0.629218	0.447368
1990	0.579465	0	0.50739	0.237083	0.087424	0.036364
1991	0.523929	-0.21622	0.142857	-0.19847	0.232862	0.22807
1992	0.414558	0.206897	0.44	0.323987	0.745638	0.485714
1993	0.398239	0.485714	0.245367	0.134615	0.274748	0.615385
1994	0.423683	-0.48077	-0.53532	0.136447	0.200348	0.767857
1995	1.309288	0	0	-0.092	0	0.515152
1996	0.3731	0	-0.02	-0.04993	0	0.144444

Source: Derived from table 1 above

Using the data on table 1 above, ordinary direct least square (OLS) regressions were run. Durbin Watson statistics result of 1.40 was observed showing presence of auto regression. The DW statistics suggests that the result will have to be taken with caution because of auto regression.

As the first regression result showed presence of auto regression, this necessitated the application of trend analysis to compute the rate of change in the annual time series data as can be seen above on table 2. The essence of this computation is to improve on the data quality before repeating the OLS multiple regressions analysis. This reflected in the OLS result accepted by this research

.

Table3: Correction Matrix Result

Correlations matrix

		ASI	**MRR**	TBR	INTR	EXCHR	CPI
Pearson Correlation	ASI	1.000	-.173	-.159	-.186	-.170	.320
	MRR	-.173	1.000	**.841**	.678	.384	.115
	TBR	-.159	**.841**	1.000	.580	.337	-.056
	INTR	-.186	.678	.580	1.000	.340	-.068
	EXCHR	-.170	.384	.337	.340	1.000	-.095
	CPI	.320	.115	-.056	-.068	-.095	1.000

From table 3 above, it was found out the minimum rediscount rate (MRR) and is strongly correlated with Treasury bill rate (TBR) as highlighted on the table. The implication is that they exhibit substitutability behavior. TBR was thereafter dropped in the final Linear multiple regressions.

.

Table 4: Multiple Regression Results are presented in Appendix A.

4.1 Result and Findings:

The result of the multiple regressions shows that all the independent variables are negative and insignificantly related to stock market prices; except the consumer price index that is positively and insignificantly related to stock market prices.

In the OLS multiple regressions model summary result shown in table 5, results revealed that only 15.7% of the variation in stock prices in this model can be explained by the independent variables – MRR, INTR, EXCHR and CPI. This could be said that the monetary policy variables have low explanatory power on equity prices.

The Durbin Watson statistic value of 1.989 revealed that there is no auto regression with the data hence the Durbin Watson statistic is approximately 2.0.

However, the Pearson correlation result similarly, shows that all the explanatory variables i.e. MRR, TBR, INTR, EXCHR are negatively correlated with ASI except the consumer price index (CPI) that is positively correlated with ASI. In fact, the "R" value in the model summary reveals that there is weak correlation between the

all share index and monetary policy variables.

From the result therefore we can empirically state that there is no significant effect of monetary policy variables on equity Prices in Nigeria. This is proved by the monetary policy variables used in this study. As part of the findings, it is worthwhile to mention the substitutability behavior exhibited by minimum rediscount rate (MRR) and Treasury bill rate (TBR) variables during the analysis.

This research finding confirms Osuagwu [5] that negative relationship exists between minimum rediscount rates, interest rates, exchange rates (Exchr) and stock prices. Furthermore, the study confirms the *apriori* expectation that consumer price index has a positive relationship with stock prices. In the study of Ogbulu [25] using Nigerian data, found out that inflation is positively related to stock prices. This is contrary to the earlier finding of Liu and Shrestha [30] who found a positive relationship between inflation and stock prices in China.

Furthermore Tanggaard [31] finds a moderately positive relationship between expected stock returns and expected inflation for the US and a strong positive relationship for Denmark. Other studies such as Choudhry [32] find a positive relationship between stock returns and inflation in four high inflation countries. Similarly, Boudoukh and Richardson [33], Solnik and Solnik [34], Engsted and Tanggaar [31] and Kim and In [35] examined the relationship between stock returns and inflation over long-horizons and their results support the Fisher Hypothesis as the horizon widens. Samarakoon[36] finds that nominal stock returns are positively related to expected inflation in a one-to-one correspondence in Sri Lanka.

Contrary to the findings above, are Fama [37], Fama and Schwert [38] Gallagher and Taylor [39], Geske and Roll [16] who empirically find that stock returns are negatively affected by both expected and unexpected inflation. Others who supported the negative relationship include Chatrath et al,[40] -India, Najandand and Noronhal[41] -Japan, Crosby [42] -Australia. Based on the money demand and the quantity theory of money, Fama [37] and Marshal [43] find that negative effect of inflation on stock return is generated by real economic fluctuations, by monetary fluctuations or changes in both real and monetary variables.

With regard to exchange rate and stock prices, Kim [44] posits that S &P common stock prices is negatively related to the exchange rate and therefore supports this result. The negative and positive effects of monetary policy variables on stock prices found in this study have several practical implications.

High exchange rates discourage investment especially for import depended firms performance. In Nigeria, foreign exchange rate has been in linear progression affecting the value of local currency.

Also, research evidence here provides that stock prices appear to react mainly negatively to rising interest rates. One reason suggested for this relationship is the expected returns on stocks in which the higher interest rate has a direct bearing. Thus, the higher interest rates would directly affect the returns on stocks causing prices to fall consistent with the theory. Whenever the interest rate on treasury securities increases, the investors tend to switch out of stocks causing fall of stock prices. Therefore, this implies that a certain level of predictability is present in stock prices that can be explained through the behaviour of the three month Treasury bill rate as shared with Menike [45].

4.3 Discussions

From the result and findings of this study, it can be suggested that the monetary policy variables used in this study could not justify the assumption that monetary policy in Nigeria significantly

influence the stock market prices. However, the study did not loose sight of Conversely, high interest rates reduce stock returns.

For now, the Nigerian stock market has not been a good transmission channel of monetary policy implementation hence the weak relationship discovered in this study. Ordinary stock markets where efficient, should reflect the position of monetary policy in any country if the stock market absorbs monetary policy impulses. Whenever, there are financial crises, investors avoid borrowing from financial institutions to invest in stocks, thereby avoiding high interest attached funds but rather switch their investment towards high Treasury bill rates which poses to be a better and choose alternatives. Perhaps, it seems that investors in the stock market in Nigeria probably may largely be government contractors who use their earnings to invest in the stock market and government appointee who receive much gratification from huge government fiscal expenditure.

Looking at the monetary policy management in Nigeria, it appears that the policy makers do not align the monetary policy rate with the increasing government expenditure. This might account for the reason why most central banks in Africa are admonishing their governments on their spending plans so that their increasing spending will not subvert the monetary policy power and quicken inflation. (Martinez) [46].

Therefore, this study has shown that monetary policy has not made significant influence over the prices of stocks in Nigeria. There appears to be a disconnection between the monetary policy and the stock market. The disconnection found here might be attributed to continuous high and

.

suggestion by Mishkin [20] that lower interest rate reduces stock returns.

increasing government Fiscal expenditure in the last decades which supplies more liquidity in the economy.

5.2 Conclusion:

This study robustly assessed the effect of monetary policy development on equity prices by selecting the relevant monetary policy variables. From our appraisal through an empirical research conduct and analysis, the study found a weak correlation of the equity prices and monetary policy variables. The study further revealed that monetary policy has not made significant influence over the prices of ordinary equities in Nigeria. What this means is that the equities market has not significantly absorbs the monetary policy impulses and cannot be taken as being a good transmission channel for monetary policy implementation in Nigeria. The dominance of insignificant negative relationship between equity prices and monetary policy has a lot of implications on the monetary policy managers in Nigeria. From the analysis, there appears to be a disconnection between monetary policy design and its alignment with the fiscal policy. Until this distortion is corrected, the equities market will not significantly feel the impulse of monetary policy in Nigeria.

Furthermore, relating the result to previous studies, the achievement of one directional insignificant relationship between monetary policy and equity market performance in Nigeria could be attributed to the level of the economy, monetary policy design and implementation as well as other economic reforms prevalent in Nigerian economy

References

[1] Udegbunam, R.I. (2003) "monetary and Financial Policy in Iyoha, M.A. and C.O. Itsede (ed.) Nigerian Economy: Structure, Growth and Development, Benin City; Mindex Publishing pp.253-279

[2] Li,Y.D., Iscan,T. B. and Xu, K. (2007) "The Impact of Monetary Policy shocks on Stock Prices" Evidence from Canada and United States.JEL Classification: E440, E520, G100, C300. Kuan.xu@Dal.Ca

[3] Rigobon, R. and Sack, B. (2001), "Measuring the Reaction of Monetary Policy to the Stock Market," Finance and Economics Discussion Series, Board of Governors of the Federal Reserve System, No. 14 (April).

[4] Okpara, G.C. (2010) "Monetary Policy and Stock Market Returns: Evidence from Nigeria" Journal of Economics 1(1) 13 – 21

[5] Osuagwu, E. S. (2009) "The effect monetary policy on stock market performance in Nigeria" Nigeria Journal of Securities and Finance (NSE) Vol. 14(2) September.

[6] Bordo, M.D., Ducker M.J. and Wheellock D.C. (2008) "Inflation, Monetary Policy and Stock market Conditions" Working Paper 14019 National Bureau of Economic Research http://www.nber.org /paper /w14019.

[7] Ioannidis C. and Kontonnikas, A. (2006) "The Impact of Monetary Policy on Stock Prices" JEL Classification E44: E52: E60 email: a.kontonikas@Ibss.gla.ac.uk

[8] Durham, J.B. (2001) "The Effect of Monetary Policy on Monthly and Quarterly Stock Market Returns: Cross Country Evidence and Sensitivity Analyses" j.benson.durham@frb.gov Federal Reserve System Washington D.C.

[9] Waud, R. (1970)"Public Interpretation of Federal Reserve Discount Rate changes: Evidence on the Announcement Effect" Econometrica, Vol.3, 231 -250

[10] Goodhart C., and Hofmann, B. (2000) "Financial Variables and the Conduct of Monetary Policy" Sveriges Riskbank working Paper NO. 12

[11] Napolitano, O. (2006) "Is the impact ECB monetary policy on EMU stock market Returns asymmetric?" JEL Classification: E52, E32, G10

[12] Patelis, A. D., (1997), "Stock Return Predictability and the Role of Monetary Policy," *Journal of Finance*, vol. 52, no. 5 (December), 1951-1972.

[13] Smirlock, M. and Yawitz, J. (1985), "Asset Returns, Discount Rate Changes, and Market Efficiency," *Journal of Finance*, vol. 40 no. 4 (September), 1141-1158.

[14] Cook, T. and Hahn, T. (1989). "The Effect of Changes in the Federal Funds Rate Target on Market Interest Rates in the 1970s". *Journal of Monetary Economics* 24: 331-351.

[15] Chen, S-S. (2007) "Does Monetary Policy Have Asymmetric Effects on Stock Returns?" Journal of Money, Credit and Banking 39 (2-3), March-April, pp. 667-88.

[16] Geske, R., & Roll, R. (1983) "The Monetary and Fiscal Linkage Between Stock Returns and Inflation". Journal of Finance, 38, 1–33.

[17]. Kaul, G. (1990). "Monetary Regimes and the Relation Between Stock Returns an Inflationary Expectations". Journal of Financial and Qualitative Analysis, 25, 307–321.

[18]. Jensen G. and Johnson R. (1995) Discount Rate Changes and Security Returns in the U.S. 1962-1991" Journal of Banking and Finance 19, 79-95

[19]. Thorbecke, W., (1997). "On Stock Market Returns and Monetary Policy" Journal of Finance 52, 635-654.

[20]. Mishkin, F.S. (1997) The Economics of Money, Banking, and Financial Markets 5th ed. M.A. Addison-Wesley.
[21]. Bosworth, B (1975), "The stock market and the economy" Working papers on Economic Activity, 2, 257-290
[22]. Jensen G, Mercer J. and Johnson R. (1996) "Business Conditions, Monetary Policy Monetary Policy, and Expected Security Returns," Journal of Financial Economics, Vol.40, 213-237.
[23]. Fama, E., and French, K., (1989) "Business Conditions and Expected Returns on Stocks and Bonds." Journal of Financial Economics 25, 23-49.
[24]. Booth, J., and Booth, L., (1997). "Economic Factors, Monetary Policy, and Expected Returns on Stocks and Bonds". Federal Reserve Bank of San Francisco 2.
[25]. Ogbulu, O.M. (2010), "The Interaction Between Inflation, Interest Rates and Stock Returns in Nigeria: test of Fisher's Hypothesis. Abia State University Uturu maxwellogbulu@hotmail.com
[26]. Allen, W.A. (2004) "Implementation monetary policy" issued by the Centre for Central Banking Studies Bank of England, London EC2R8AH ccbsinfo@bankofengland .co.uk
[27]. Chami, R., T. Cosimano and C. Fullenkamp (1999)" The stock market channel of Monetary Policy" International Monetary Fund Working Paper.
[28]. Ajayi, M. (2007) "Monetary policy Transmission mechanism in Nigeria"Economic and Financial Review, (CBN) vol.45 (4)December. Napolitano, O. (2006) "Is the Impact ECB Monetary Policy on EMU Stock Market Returns Asymmetric?" JEL Classification: E52, E32, G10
[29]. Central Bank of Nigeria Statistical Bulletin Various Issues (1985-2010)
[30]. Liu, M.H. and Shrestha, K.M. (2008) "Analysis of Long-Term Relationship between Macro-Economic Variables and Chinese Stock, a Heteroscedatatic Cointegration" Journal of Management Finance, Vol. 34 No.11PP744-755
[31]. Engsted, T., Tanggaard, C., (2002) "The Relation Between Asset Returns and Inflation at Short and Long Horizons". Journal of International Financial Markets, Institutions & Money 12, 101–118.
[32]. Choudhry, T. (2000) "Inflation and Rates of Return on Stocks: Evidence from High Inflation Countries". Journal of International Financial Markets, Institutions, and Money, 11, 75–96.
[33]. Boudoukh, J., Richardson, M., (1993) "Stock Returns and Inflation. A Long-horizon Perspective, American Economic Review 83, 1346-1355.
[34].Solnik, B. and Solnik, V., (1997) "A Multi-Country Test of the Fisher Model for Stock Returns". Journal of International Financial Markets, Institutions & Money 7, 289–301.
[35]. Kim, S. and In, F., 2005. The Relationship Between Stock Returns and Inflation: New Evidence from Wavelet Analysis. Journal of Empirical Finance 12 (2005) 435- 444.
[36]. Samarakoon, L.P. (1996b) Stock Market Returns and Inflation: Sri Lankan Evidence. Sri Lankan Journal of Management 1, 293 - 311.
[37] Fama E., (1981)." Stock Returns, Real Activity, Inflation and Money". American Economic Review 71, 545-65.
[38]. Fama, E., and Schwert, G., (1977) "Asset Returns and Inflation". Journal of Financial Economics 5, 115-146.
[39]. Gallagher, L. A., & Taylor, M. P. (2002) "The Stock Return–Inflation Puzzle

Revisited". Economics Letters, 75, 147–156.
[40]. Chatrath, A., Ramchander, S., & Song, F. (1997) "Stock prices, Inflation and Output: Evidence from India". Applied Financial Economics, 7, 439–445.
[41]. Najand, M. and Noronha, G. (1998) Causal Relations Among Stock Returns, Inflation, Real Activity and Interest Rates: Evidence from Japan. Global Finance Journal, 1, 71–80.
[42]. Crosby, M. (2000). "Stock returns and inflation. Australian Economic Papers." 40 156-165.
[43]. Marshall, D.A. (1992) "Inflation and Asset Returns in a Monetary Economy" Journal of Finance Vol. 47 No.4 PP1315-42
[44]. Kim, K. (2003) "Dollar Exchange Rate and Stock Price: Evidence from Multivariate Cointegration and Error Correction Model". Review of Financial Economics 12, 301-313
[45]. Menike, L.M.C.S. (2006) "The Effect of Macroeconomic Variables on Stock Prices in Emerging Sri Lankan Stock Market" Sabaragamuwa University Journal, Vol. 1 pp 50-67
[46]. Martinez, A.R. (2012) "African Top Central Banks Turn on Governments to Curb Prices"February 03, Bloomberg. Andrew J. Barden at arden@bloomberg.net
[47]. Oesterreichische National bank (2011) "How does monetary policy impact on the Economy?" www.oenb.at/en/geldp_volksw_ retrieved December 2011

Appendix A: SPSS Multiple Regression Results

Correlations

		ASI	MRR	TBR	INTR	EXCHR	CPI
ASI	Pearson Correlation	1	-.173	-.159	-.186	-.170	.320
	Sig. (1-tailed)		.199	.219	.181	.203	.056
	N	26	26	26	26	26	26
MRR	Pearson Correlation	-.173	1	.841**	.678**	.384*	.115
	Sig. (1-tailed)	.199		.000	.000	.026	.289
	N	26	26	26	26	26	26
TBR	Pearson Correlation	-.159	.841**	1	.580**	.337*	-.056
	Sig. (1-tailed)	.219	.000		.001	.046	.394
	N	26	26	26	26	26	26
INTR	Pearson Correlation	-.186	.678**	.580**	1	.340*	.068
	Sig. (1-tailed)	.181	.000	.001		.044	.372
	N	26	26	26	26	26	26
EXCHR	Pearson Correlation	-.170	.384*	.337*	.340*	1	-.095
	Sig. (1-tailed)	.203	.026	.046	.044		.322
	N	26	26	26	26	26	26
CPI	Pearson Correlation	.320	.115	-.056	.068	-.095	1
	Sig. (1-tailed)	.056	.289	.394	.372	.322	
	N	26	26	26	26	26	26

**. Correlation is significant at the 0.01 level (1-tailed).

*. Correlation is significant at the 0.05 level (1-tailed).

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.404[a]	.163	-.046	.37760	.163	.779	5	20	.576	2.014

a. Predictors: (Constant), CPI, TBR, EXCHR, INTR, MRR

b. Dependent Variable: ASI

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.555	5	.111	.779	.576[a]
	Residual	2.852	20	.143		
	Total	3.407	25			

a. Predictors: (Constant), CPI, TBR, EXCHR, INTR, MRR

b. Dependent Variable: ASI

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.166	.118		1.409	.174	-.080	.411		
	MRR	-.383	.713	-.238	-.537	.597	-1.872	1.105	.214	4.679
	TBR	.189	.509	.146	.371	.715	-.872	1.250	.268	3.725
	INTR	-.142	.345	-.116	-.413	.684	-.863	.578	.533	1.877
	EXCHR	-.029	.122	-.054	-.241	.812	-.283	.225	.821	1.218
	CPI	.589	.358	.358	1.647	.115	-.157	1.335	.887	1.127

a. Dependent Variable: ASI

Correlations

		ASI	MRR	TBR	INTR	EXCHR	CPI
ASI	Pearson Correlation	1	-.173	-.159	-.186	-.170	.320
	Sig. (1-tailed)		.199	.219	.181	.203	.056
	N	26	26	26	26	26	26
MRR	Pearson Correlation	-.173	1	.841**	.678**	.384*	.115
	Sig. (1-tailed)	.199		.000	.000	.026	.289
	N	26	26	26	26	26	26
TBR	Pearson Correlation	-.159	.841**	1	.580**	.337*	-.056
	Sig. (1-tailed)	.219	.000		.001	.046	.394
	N	26	26	26	26	26	26
INTR	Pearson Correlation	-.186	.678**	.580**	1	.340*	.068
	Sig. (1-tailed)	.181	.000	.001		.044	.372
	N	26	26	26	26	26	26
EXCHR	Pearson Correlation	-.170	.384*	.337*	.340*	1	-.095
	Sig. (1-tailed)	.203	.026	.046	.044		.322
	N	26	26	26	26	26	26
CPI	Pearson Correlation	.320	.115	-.056	.068	-.095	1
	Sig. (1-tailed)	.056	.289	.394	.372	.322	
	N	26	26	26	26	26	26

**. Correlation is significant at the 0.01 level (1-tailed).

*. Correlation is significant at the 0.05 level (1-tailed).

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.404[a]	.163	-.046	.37760	.163	.779	5	20	.576	2.014

a. Predictors: (Constant), CPI, TBR, EXCHR, INTR, MRR

b. Dependent Variable: ASI

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.555	5	.111	.779	.576[a]
	Residual	2.852	20	.143		
	Total	3.407	25			

a. Predictors: (Constant), CPI, TBR, EXCHR, INTR, MRR

b. Dependent Variable: ASI

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.166	.118		1.409	.174	-.080	.411		
	MRR	-.383	.713	-.238	-.537	.597	-1.872	1.105	.214	4.679
	TBR	.189	.509	.146	.371	.715	-.872	1.250	.268	3.725
	INTR	-.142	.345	-.116	-.413	.684	-.863	.578	.533	1.877
	EXCHR	-.029	.122	-.054	-.241	.812	-.283	.225	.821	1.218
	CPI	.589	.358	.358	1.647	.115	-.157	1.335	.887	1.127

a. Dependent Variable: ASI

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.397[a]	.157	-.003	.36977	.157	.979	4	21	.440	1.9

a. Predictors: (Constant), CPI, INTR, EXCHR, MRR

b. Dependent Variable: ASI

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.536	4	.134	.979	.440[a]
	Residual	2.871	21	.137		
	Total	3.407	25			

a. Predictors: (Constant), CPI, INTR, EXCHR, MRR

b. Dependent Variable: ASI

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.179	.109		1.637	.116	-.048	.407		
	MRR	-.182	.454	-.113	-.402	.692	-1.127	.762	.506	1.977
	INTR	-.139	.338	-.113	-.412	.684	-.842	.564	.533	1.876
	EXCHR	-.030	.119	-.056	-.254	.802	-.278	.218	.821	1.217
	CPI	.551	.336	.335	1.642	.115	-.147	1.250	.964	1.037

a. Dependent Variable: ASI