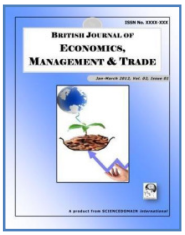

*British Journal of Economics, Management & Trade*
*5(4): 392-407, 2015, Article no.BJEMT.2015.033*
*ISSN: 2278-098X*

**SCIENCEDOMAIN** *international*
www.sciencedomain.org

# An Empirical Analysis of Monetary Policies on Stock Price Distortion in Nigeria: Implications on Real Sector

**Onafalujo Akinwunmi Kunle[1*] and Eke Patrick Omoruyi[1]**

[1]*Department of Accounting and Finance, Lagos State University, Ojo, Lagos State, Nigeria.*

***Authors' contributions***

*This work was carried out in collaboration between all authors. Author OAK designed the study and wrote the introduction and managed the literature searches. Author EPO performed the analyses and identified critical evidences for the results. All authors read and approved the final manuscript.*

***Article Information***

DOI: 10.9734/BJEMT/2015/13851
Editor(s):
(1) LI, Hui, School of Economics and Management, Zhejiang Normal University, China.
Reviewers:
(1) Anonymous, Pacific University, Oregon, USA.
(2) A. A. A. Bruce, Department of Business Administration, Gombe State University, Nigeria.
Complete Peer review History: http://www.sciencedomain.org/review-history.php?iid=810&id=20&aid=6820

***Original Research Article***

***Received 6th September 2014***
***Accepted 13th October 2014***
***Published 6th November 2014***

## ABSTRACT

A market economy functions through competitive model where pricing is the control and indirect agent of economic development. Imperfect markets however result from various influences that are dominant enough to creating information asymmetry thereby causing unsystematic disequilibrium in pricing. Distortions are constructs of deliberate and undesirable influences that militate against expected price and negatively impact real sector development. This paper examines the origin of distortions in stock prices as it relates to inflation rates, interest rates, foreign exchange and monetary policy initiatives and its implications on the real sector in Nigeria using Granger causality, co-integration tests, ECM, impulse response function and variance decomposition techniques, which has not been specifically tested by prior research in this area. The empirical techniques were applied to explain the predictive power of macro-economic variables distortion from somewhat mismanaged policy initiatives. It is found that share price distortion is influenced by monetary policy initiatives, interest rate, inflation rate and foreign exchange rate; which dove-tails into irreversible low commitment of investments in the real sector.

**Corresponding author: E-mail: onafalujo@yahoo.com;*

JEL Code: G14 E61 G12.

*Keywords: Efficient capital market; monetary policy initiative; stock price distortion.*

## 1. INTRODUCTION

Nigerian capital market regulators longed to understand the 2009 crash with an unending confounding issues hanging around price manipulation, without consideration for theoretical distortions. This may be the outcome of financial market reforms that produced implosive monetary policy initiatives. Price distortion is an extensive disequilibrium in a market economy, which means demand and supply disobeys the free will of the economic agents. It is sometimes an evidence of market or government failure or both. In whatever form it is exhibited, the perception and dealing behaviour is schemed to temporal faulty valuation and transfer of wealth from many market participants to a few ones [1]. The danger in this dealing is that decision making follows the herd instinct or human crowd effect that develops.

Price distortion is like a direct spur of energy to influence the market mechanism to a preferred outcome. For distortion exists like a phenomenon incidental to human activities and since it cannot be destroyed, it goes ahead to develop other effects anticipated and unanticipated in the economy. Price distortion is propagated as volatility, which is described by [2] as tax, because highly volatile relative prices discourage the irreversible investment commitments to the real sector. In short, extreme speculation and manipulation is suspected and long-term perspectives or investments are dissimulated. Manipulation is effecting of changes in security prices by means of artificial stimuli, as opposed to the normal changes that occur in the free market subject only to the interplay of supply and demand [1]. Manipulation generates market abuse and distortion. Even though, monetary policy initiative does not set out to promote manipulation but participants can latch on a regulatory slack to manipulate.

This study investigates how capital market distortion creates systemic distortions, which could be adverse to sectoral developments, and in particular the real sector in Nigeria. According to [3] the accurate evaluation of price distortion enhances the formulation of correct pricing mechanism.

The gap identified by this study is that the product and financial market are linked by various macroeconomic variables (interest rate, exchange rate and stock prices). When there is a direct influence that results in disequilibrium in demand and supply, an entropy is set up that must settle down naturally. This study contemplates that a sudden stock price jump that is not motivated by free market macroeconomic exchanges will develop into distortion in other markets, and in particular, the real sector. This is why sectoral underdevelopment may be traced to price distortions and its concomitant source – probably monetary policy initiative.

Accordingly, this study is undertaken to find answers to the following research questions: How does price distortion arise? What is the nature of pricing mechanism in the capital market? Why would price distortion arise from policy initiatives? Why is there significant impact of macroeconomic variables' distortions on the real sector GDP? Is there any link between global economic effects and stock prices in Nigeria? It is hypothesized thus: Stock price volatility in the Nigerian capital market does not follow Weiner's process; High share price volatility is not influenced by monetary policy initiative and macroeconomic variables; High share price volatility impacts negatively on the real sector growth.

The significance of this paper lies in the unveiling the mechanism of distortion and evaluating the seeding and mutation mechanism of price distortion of macro-economic variables- equity price, interest rate, foreign exchange rate and inflation rate and how it settles into lax sectoral development; and also unravelling the link between a weak real sector and a volatile capital market. The study would also deepen the literature on capital market theory accordingly.

## 2. LITERATURE REVIEW AND CONCEPTUAL ISSUES

The events of July, 2004-December,2005 in which Nigerian Banks were asked to recapitalise from N2billion to N25billion was more or less monetary policy initiatives to support a certain macroeconomic variable-capital formation-but may have led to stock price distortion because of the pressure or entropy created by the policy response. In line with these postulations, we

observe the following events on the timeline that the distortion occurred: Massive transfer of investible funds from the real and distributive sectors to the capital market from 2005-2007. In fact, some weak/fledging SMEs sold their warehouses and the capital funds transferred to the capital market. Subsequently, there could be expected decline in real GDP within the above period. Corroboratively, [4] says that "the Igbos fell to the ploy by banks which embarked on road shows and 'volcanic marketing strategies' in their bid to convince investors to invest in banks". He confirmed that people sold their warehouses and were assured of 'volcanic returns' which never came.

Price distortion is akin to a bubble that is excited by implicit and explicit factors that are either randomized or deterministic. For example, the housing bubble in the United States depicts a distortion period from 2000-2009 [5]. The origin in the housing price distortion in the United States was traced to systemic risk that was excited by opportunistic behaviour of speculators in the pricing mechanism which may have escaped the attention of regulators. Stock pricing is a more sophisticated procedure and this is why the capital market is much more regulated. Distortions in macro-economic variables can therefore give rise to high share price volatilities or mismanaged monetary policy initiatives which can be exploited leading to distortion. Incidentally, [6] pointed out, the control that the Central Bank of Nigeria (CBN) had over the credit system "was incomplete, lacking the firepower to subdue the flames of speculation".

Hence, we identify ontologically three auto orders in the distortion mechanism based on equity-trading experience. 1st Order Distortion in Stock Prices: the excitation of stock prices in a sector of the capital market and subsequent market bullishness 2nd Order Distortion: The human crowd effect based on herd instinct sets in and the real sector GDP declines. 3rd Order Distortion: bubble bursts, stock oversupplied and long trend downside volatility with capital formation disintermediation [6].

## 2.1 Factors Affecting Stock Price Volatility

[7] recalls the arguments on 'efficient' capital market put forward by Fama in 1960s [8] on the Efficient Market Hypothesis (EMH), saying that the intense competition in the capital market leads to fair pricing of debt and equity securities. Often, the line mostly advanced in the theory of exchange is the standard assumption that 'markets are both complete and perfect' (efficient market hypothesis), hence equilibrium is instantaneously and attained by costless means. This assumption has since led to one of Fisher's theorem that productive optimisation of the firm can be separated from the consumptive optimisation of the individual-the present value rule. Indicating that within a successive time periods ($t_0$) and ($t_1$) from the present period (spot), it will be assumed that there exist in the market a unique price ratio $Ø_1/Ø_0$ and a corresponding discount factor $1/(1+ r_t)$ which cannot be significantly influenced by the decisions of a single economic agent [9; 46].

Stock prices are assumed to follow a Markov process; that is, a stochastic process referred to as 'volatility smile' where only the present value of a variable is relevant for predicting the future [10]. This aligns with the weak form of EMH thinking that stock prices though are randomized; it is a probability distribution and a function of time. This means superior return is not achievable by financial analysis within a short time. Stock price is therefore based on rational anticipation that future events are the relevant price factors. The process exhibits mean of zero and variance of one. It implies that volatility of over 100% over a short period can be taken as distortions. [11] refer to distortion as irrational or illogical possibilities. [12] identifies inflation, demographic, liquidity, market sentiment, and earning propensity as the main factors responsible for growth of stock prices. But growth in itself is different from volatility. The former evolves in a gradual order; the latter is like a revolution- a sudden disorder caused by some highly potent causal factors and hence creates uncertainty phenomenon [10].

EMH expects stock prices to reflect all public and insider information; hence [13] explain that policy makers should have been able to take advantage of EMH to conduct national macroeconomic policies without being afraid of accusations of manipulating stock prices. Therefore, it means monetary policy initiatives should be very critical of dynamic interaction among macroeconomic variables- interest rate, inflation rate, foreign exchange rate and stock prices that could arise from policy pronouncement. Though the EMH theory was supported by the studies of [14], and [15], both establishing that macroeconomic variables influence stock prices.

### 2.2 Interest Rate, Inflation, Foreign Exchange Rate and Stock Price Distortion

The literature underscores that the market-determined interest rate or nominal rate are factored in the inflation rate. This implies direct relationship between inflation rate and interest rate. On the other hand, [9; 35] illustrates the centric nature of interest rate to the valuation of investment. He limited the term investment to 'real investment'-the physical sacrifice of current consumption by productive transformation (the intertemporal choice mechanism). The future cash flow generated is linked to the worth of such investment by interest rate in an inverse relationship (9; 49], [16,17].

The price of foreign exchange is expected to fluctuate based on the productivity of exportable goods and services [18]. Otherwise, distortions could arise from any of the macroeconomic variables. This implies that productivity could affect foreign exchange pricing. From Breton wood accord to International Monetary Fund and eventually World Trade organisation, the International community made efforts to harmonise foreign exchange system in a way that is deterministic [19; 86]. However, the politics behind foreign exchange price movement is such that a decline makes export cheaper and the reverse makes import cheaper. Nigeria through the financial liberalization of 1986 embraced the flexible exchange system. However, its price is sometime determined administratively based on economic exigencies and quest for financial sustainability [20,21]. Financial access which comprises: foreign exchange and capital market are exposed to arbitrage particularly where there is distortion. In this circumstance, monetary policy initiative should be a watchdog over the financial market to anticipate risk perceptions of speculators and to speedily respond with countermanding measures to smoothening distortions.

[22,23] adopt co-integrating set of time series analysis of macroeconomic variable in establishing that a set of time series variables are co- integrated if they are integrated of the same order and their linear combination is stationary. [24,25] examined how heteroscedasticity occurs in time series context and suggested that there are deep relationship between stock prices return and macro economic variables.

## 3. METHODOLOGY AND DATA

Unit Root: Using the ADF test (1979,1981), the order of integration (unit roots) of all the variables series were examined at level $\gamma_t$ ~I(0), that $\gamma_t$ ~I(n);n>0,while at first difference $\Delta\gamma_t = \gamma_t - \gamma_{t-1}$.If yes $\gamma_t$ ~I(1).

Secondary data was obtained by getting the soft copy of stock prices and market capitalization of quoted companies on the NSE for the period 1981-2009; a 29-year study using annual closing prices for the market capitalization. Gross Domestic Product (GDP), money supply, interest rates, inflation rate, capacity utilization and exchange rates were obtained from Central Bank of Nigeria (CBN) statistical bulletins. Net export is a proxy for Globalization. Monetary policy initiative data was obtained using dummy variables operationalized from primary data [26; 232-240], [27,28]. Structured questions were circularised among senior stockbrokers, academician, investors and learned members of the public in Lagos State in Nigeria's commercial capital. Lagos controls over 70% of the nation's economic activity with nearly all banks and financial institutions have their headquarters in Lagos [29] and 90% of the quoted companies have head offices in Lagos. The techniques of estimation include application of unit root, granger causality, cointegration, error correction tests and impulse response functions.

### 3.1 Model Specification

Three models were used for the study. The first model relates to the first hypothesis which tests the existence of Weiner process in the Nigerian Stock market. To [10], the Wiener process is a "particular type of Markov stochastic process with mean change of zero and variance rate of 1.0".
The implicit form of Wiener process is:

$$SPV = f(a\,dt) \quad \text{.....(1)}$$

Indicating a notation that ΔSPV= aΔt, in the limit as $\Delta t \rightarrow o$

The generalized form of Wiener process is:

$$SPV = f(adt, bdz) \quad \text{.....(1.1)}$$

The explicit model is thus:

$$d(SPV)_t = adt + bdz + e_i \quad \text{.....(2)}$$

Where: SPV = Share price volatility; t = time; $dz = \varepsilon\sqrt{\Delta t}$; $\varepsilon = \phi(o,1)$; a and b are constants.

For the $GARCH_{(1,1)}$ model which part of this study is based, the variance equation has the form:

$$h_t = \gamma_0 + \delta_1 h_{t-1} + \gamma_1 \mu_{t-1}^2 \quad \text{.....(3)}$$

Thus, the model specification for hypothesis one requires that three unknown parameters $\gamma_0$, $\gamma_1$, $\sigma_1$ be estimated through the $GARCH_{(1,1)}$ model.

GARCH Statistics (Model 1): To capture appropriately the possible effects associated with volatilities in financial and economic data. This study adopted the GARCH model for hypothesis one. The GARCH was developed by (5) as an extension of (9) ARCH formulation on conditional disturbance variance from studies of shocks referred to as "volatility clustering". Here, a big shock (residual) tends to be followed by shocks in either direction and small shocks tend to follow smaller shocks. In other words, the best way to model the pattern of the price movement in the NSE in the studied period is to allow the variance $\mu_t$ to depend upon its history.

The next model's implicit function and the *a-priori* expectations is of the form

$$SPV_t = (MPI_t, FOREX_t, INTRT_t, INFLRT_t, GLOBAL_t, MS_t, CAPU_t)$$

$$SPV_t = (MPI, FOREX, INTRT, INFLRT, GLOBAL, MS, CAPU) \quad \text{.....(4)}$$

–/+ –/+ –/+ –/+ –/+ + –

It tests the second hypothesis that no significant relationship exists between share price volatility and globalization and monetary policy initiatives, money supply, exchange rate, manufacturing capacity utilization. The *a-priori* expectations are stated.

$$SPV_t = a_0 + \beta_1 MPI_t + \beta_2 FOREX_t + \beta_3 INTRT_t + \beta_4 INFLRT_t + \beta_5 GLOBAL_t + \beta_6 MS_t + \beta_7 CAPU_t + e_t \quad \text{.....(5)}$$

Where: MPI = Monetary policy initiatives, FOREX = Foreign exchange rate, INTRT = Interest rate INFLRT = Inflation rate, GLOBAL = Globalization, MS = Money supply, CAPU = Capacity utilization and $e_2$ = error term. The third model with the *a-priori* expectations is implicitly represented as

$$RGDP_t = (SPV_t, INFLRT_t, FOREX_t, MPI_t, INTRT_t) \quad \text{...(6)}$$

\+ – – + –

The model tests the third hypothesis on dependency of real sector growth on share price volatility and other macroeconomic variables including lag monetary policy initiatives as follows:

$$RGDP_t = a_0 + \alpha_1 SPV_t + \alpha_2 INFLRT_t + \alpha_3 FOREX_t + \alpha_4 MPI_t + \alpha_5 INTRT_t + e_{it} \quad \text{.....(7)}$$

The full explanatory variables are: Monetary policy Initiative index (MPI); annual average foreign exchange rate (Forex); prime lending rate (Intrt); annual rate of inflation (Inflrt); stock price volatility (SPV) while the explained variable is real Gross domestic product (RGDP). All the explanatory variables are on annual year-end data. Market capitalization ratio to GDP is greater than one in any economy where all the sectors represented in the stock market is experiencing an artificial bubble.

## 4. RESULTS

Using the Unit Root test, the study shows that all variables (CAPU, FOREX, GLOBAL, INFLRT, INTRT, M2, MPI, RGDP and SPV) were integrated of order 1 at both 1% and 5% [30] critical level (see Table 3). Therefore, all variable used were non-stationary in the respective level but stationary in their first difference (integrated of order one (1)) as was expected. By implication, following [31,32], these variables can be cointegrated as well following one or more Linear combinations among the variables that are stationary.

GARCH Statistics (Model 1): To capture appropriately the possible effects associated with volatilities in financial and economic data this study adopted the GARCH model for hypothesis 1. The GARCH was developed by [33] as an extension of [34] ARCH formulation on conditional disturbance variance from studies of shocks referred to as "volatility clustering". Here, a big shock (residual) tends to be followed by shocks in either direction and small shocks tend to follow smaller shocks. In other words, the best way to model the pattern of the price movement in the NSE in the studied period is to allow the variance $\mu_t$ to depend upon its history.

Table 1 depicts the descriptive statistics of the NSE market value changes. The average annual change in market value is 0.068%. The annual change in market value standard deviation is 95%, suggesting a high level of volatility in the market. The wide gap between the maximum (2.354234) and minimum (-1.472763) market value growth rates give support to the high variability of market value or stock prices in the NSE. Under the null hypothesis of normality distribution, Jarque-Bera (J-B) is 0. The J-B value of 0.989914 deviated from normal distribution. Similarly, skewness and kurtosis represent the nature of departure from normality. In a normally distributed series, skewness is 0 and kurtosis is 3. Positive or negative skewness indicate asymmetry in the series and less than or greater than 3 kurtosis coefficient suggest peakedness, respectively. The skewness coefficient is 0.430367 implies positive skewness. Positive skewness implies that the distribution has a long right tail and a deviation from normality and prices are concentrated towards large values. The empirical distribution of the kurtosis is clearly not normal but peaked. In summary, the NSE market value series do not conform to normal distribution but display a positive skewness and leptokurtic distribution. The results are however, based on the null hypothesis of normality and provide no information for the parametric distribution of the series. The alternate hypothesis of non-normality is suggested but subjected to further analysis.

Table 2 shows the result of volatility clustering using GARCH model developed by [33]. The model put variance as function of intercept (w), a shock from the prior period (α) and the variance from last period (β). Also, the theory expects parameter α and β to be higher than zero (0), and β to be positive to ensure that the conditional variance $\sigma^2$t is non-negative. The GARCH (1, 1) models results in Table 2 shows that α coefficient is insignificant but β coefficient is positive and significant at 5%.This implies that volatility is persistent. The result shows that stock price follows a random walk. Further analysis by adding α and β together i.e. (1.261355-0.330283) is 0.931072, which is closer to 1 thereby suggesting a high persistent of volatility clusters in the stock market. It implies that wide changes in stock prices tend to be followed by wide changes and mild changes tend to be followed by mild changes. The main economic implication of this finding for investors is that stock price volatility occurs in cluster and it is predictable (See Fig. 1).

Cointegrated Rank Test (Model 2): The key issue in cointegration is to investigate if really genuine long-run relationship exist that required a linear combination of variable and, even if the variable rises over time due to their trending, there will be a common trend that links them together in such a way that the stochastic trends cancel out later, that is, the difference between them is stationary [27].

Upon achieving stationary of the variables at I (1), we examine the presence or non-presence of co-integration among the variables. That is, a long run relationship between all the variables exist as suggested *a-priori*. With a Linear deterministic trend assumption Table (5) for trace statistics indicate five (5) cointegrating equations while maximum Eigen value statistics in Table (5) include three (3) cointegrating equations at 5% significance level, suggesting that there is co-movement in the variables in a long run equilibrium path. Similarly, the Normalized cointegrating coefficients are all significant given the rule of thumb method. See Figs. 2 and 3. In model 3, the Cointegration test realised two (2) cointegrating equations via the trace and eigen value respectively (see table 6), suggesting linear long run combination of the variables.

Granger Causality test: Granger Causality has been applied in the context of 'rationale expectation of super exogeneity', that every variable has a "precedence" [32]. When the past and present value of $Y_t$ provides useful information to predict $X_t+1$ at time, then it is said that $Y_t$ $\text{Granger causes} X_t$.

The two models estimated revealed unidirectional causality for some of the variables in line with our *a-priori* expectations at 10% significant level, and in support of the alternative hypothesis. The study reveals that causal relations run from share price volatility (SPV) to monetary policy initiative (MPI) directly linked to globalization to Forex; M2; Inflation; Interest rate; Capacity utilization; and impacting on Real GDP (See Table 4).

Vector Error Correction: The popular Granger representation theorem postulates that if a set of variables are cointegrated, then there exist a valid error-correction representation of the data series ([22]; [35]). Studies of cointegration and resulting error correction technique therefore are concerned with estimation that preserves the information about both form of co-variation. Implying that the variables thus possess some

adjustment mechanism which makes the error in the long run relationship to remain stable, hence achieve long run equilibrium [36,27]. The speed of adjustment of the model in the forwards long run equilibrium is a function of the adjustment coefficient presented in the general informative model of ECM.

The result of the VEC for the two models produced appropriate negative signs of -0.659258 and -0.498482 for models 2 and 3 respectively. Suggesting their significance and indicating that approximately 66% of any noticeable error in the short run dynamic path of the stock price volatility (SPV) adjust instantaneously in the long run to equilibrium. Similarly, 50% of any error in the short run RGDP distortion adjusts to long run equilibrium. It is important to stress that the high value of R-squared in model 3 indicates that the lagged explanatory variables identify largely and influences the RGDP (See Table 7).

Impulse Response Function: The impulse response function (IRF) tracks the impact of any variable shock (innovation) on others in the system overtime, often regarded as policy shock [26; 231]. It is on essential and categorical tool in empirical causal analysis and policy effectiveness.

For hypotheses 2, Fig. 4 reveals the responses of stock price volatility following a Choleskey's one standard deviation shock in other macroeconomic variable. The eight (8) variables in the model were tested given sixty four (64) responses following examined innovations in each variable. In Row 1, over the four quarter period, SPV responded positively to its own shock slightly to shock in interest rate and M2, more obviously to inflation rate and negatively to FOREX in the system while no relative response is noticeable of SPV to shocks in MPI, Global and CAPU rather maintaining stability around the equilibrium level. The result confirms our findings under the Granger test, except that CAPU innovation on SPV produce stable impact.

In the second row, MPI responded negatively to innovations in SPV and positively responded to its own lag and FOREX. It maintained stability around its equilibrium for one S.D innovation in the other macroeconomic variables- INTRT, INFLRT, GLOBAL, M2 and CAPU. The findings support the Granger test except that MPI bore no response to INFLRT. In the third row, the FOREX responded slightly positive in the first quarter maintaining same level through the entire observed period. It responded negatively, maintaining stability through the period; responded highly to its own shock and relative positive response to the innovations in other variables: INTRT, INFLRT, M2 but no visible response to innovations in CAPU, as in MPI. These results satisfy our expectation following the Granger test. In the fourth row, INTRT responds positively to SPV at the first quarter shock and remain relatively stable to long run. Similar results were obtained for MPI and the lagged INTRT. It responded to INFLRT by rising and falling around the equilibrium level to stability, in conformity to our Granger test and economic theory. It however reacted negatively to Global while maintaining stability around equilibrium to stimulus from FOREX, M2 and CAPU.

In the fifth row, INFLRT responded highly positive to shocks from SPV, MPI and upon its own lag. The MPI result confirms our earlier position through the Granger test while the SPV shock is against our earlier position that it is INFLRT that Granger cause SPV. The one S.D shocks from other variables: INTRT, GLOBAL, M2 and CAPU were contained around the INFLRT's equilibrium level. INFLRT had a minor negative response to shocks from FOREX in the period under study. The sixth row presents positive net GLOBAL response to shock in SPV, MPI, INTRT, and to its lagged value while its response to shock in FOREX and INFLRT are negative. It does not respond to shocks in M2 and CAPU. We observed mixed results here compared to initial position of the Granger test, as only M2 and MPI supports our Granger Test result.

In the seventh row, the M2 responded positively to shocks SPV, INTRT, GLOBAL and M2 but negative reaction to FOREX and INFLRT while achieving relative stable equilibrium from shocks in MPI and CAPU. These results confirm our Granger test position except for CAPU which Granger causes M2. In the eighth row, CAPU reacted positively to SPV and FOREX variable shocks but negative to INFLRT, maintaining relative stability with shocks in M2, and moving little above the equilibrium level for shocks in MPI, INTRT and its own lag but little below the equilibrium level for global shock variable. However, when compared with our postulation at the Granger test, SPV, MPI and Global did not Granger cause CAPU (See Fig. 4).

**Table 1. Descriptive Statistics of NSE market value**

| | | | | | |
|---|---|---|---|---|---|
| Mean | 0.006854 | Variance | 0.9072867 | Jarque-Bera | 0.989914 |
| Maximum | 2.354234 | Skewness | 0.430367 | Sig. of J-B | 0.609 |
| Minimum | -1.472763 | Kurtosis | 2.720044 | Std.Dev | 0.952516 |

*Sample: 1981 to 2009*

**Table 2. Random Walk and GARCH (1, 1): Model 1 Estimation**

| **Variance Equation** | | | | |
|---|---|---|---|---|
| **variable** | **Coefficients** | **Std. Error** | **z-Statistic** | **Prob** |
| W | 53.37684 | 104.9862 | 0.508418 | 0.6112 |
| A | -0.330283 | 0.301243 | -1.096400 | 0.2729 |
| B | 1.261355 | 0.198721 | 6.347335 | .00000 |

*Sample: 1981 to 2009*

Dependent Variable: SPV
Method: ML – ARCH
Date: 12/31/10 Time: 03:51
Sample: 1981 2009
Included observations: 29

Convergence not achieved after 100 iterations

| | **Coefficient** | **Std. Error** | **z-Statistic** | **Prob.** |
|---|---|---|---|---|
| C | 24.78306 | 8.075442 | 3.068941 | 0.0021 |
| | Variance Equation | | | |
| C | 53.37684 | 104.9862 | 0.508418 | 0.6112 |
| ARCH(1) | -0.330283 | 0.301243 | -1.096400 | 0.2729 |
| GARCH(1) | 1.261355 | 0.198721 | 6.347355 | 0.0000 |
| R-squared | -0.055869 | Mean dependent var | | 33.82072 |
| Adjusted R-squared | -0.182573 | S.D. dependent var | | 38.91277 |
| S.E. of regression | 42.31615 | Akaike info criterion | | 10.04808 |
| Sum squared resid | 44766.41 | Schwarz criterion | | 10.23667 |
| Log likelihood | -141.6971 | Durbin-Watson stat | | 1.154353 |

**Table 3. ADF unit root result**

| **Variable** | **Level**<br>**ADF (Intercept & Trend)** | **First Difference**<br>**ADF (Intercept & Trend)** |
|---|---|---|
| CAPU | -1.303527 | -4.329384 |
| FOREX | -1.221993 | -4.197102 |
| GLOBAL | -3.799222 | -8.726125 |
| INFLRT | -3.381685 | -4.970775 |
| INTRT | -2.943021 | -8.279210 |
| MS (M2) | -3.769176 | -6.395323 |
| MPI | -3.651013 | -6.283116 |
| RGDP | 2.412756 | -4.072174 |
| SPV | -3.036230 | -5.276832 |

*Source: Authors' Estimation using E-view 6.0; MacKinnon (1996) one-sided p-value*
*The Critical value for 1%, 5% and 10% levels are -4.339330; -3.587527; and -3.229230 respectively. All variables are significant at 1%, except for CAPU, FOREX and RGDP that are significance at 5%.*

For Hypothesis 3, Fig. 5 indicates the response of RGDP to shock / stimulus from other macroeconomic variables. In the first row, RGDP has major rise and fall (swing) responses around its equilibrium to its lagged value. While maintaining a low oscillation reaction for MPI shock, no visible reaction is noticeable from shocks in SPV, INFLRT, FOREX, MPI and INTRT. The responses of SPV, INFLRT, FOREX, MPI and INTRT to shocks in RGDP are also revealing. They all produced major swings around the equilibrium for SPV, FOREX and INTRT above it for INFLRT and below the equilibrium level for MPI. However, only INTRT and INFLRT did not conform with our proposition at the Granger test as they maintain no causality of RGDP to INFLRT and INTRT (See Fig. 5).

**Table 4. Granger causality test**

Pairwise Granger Causality Tests
Date: 12/24/10 Time: 10:41
Sample: 1981 2009
Lags: 2

| | | | |
|---|---|---|---|
| GLOBAL does not Granger Cause FOREX | 27 | 2.57886 | 0.0986 |
| FOREX does not Granger Cause GLOBAL | | 0.53243 | 0.5946 |
| M2 does not Granger Cause FOREX | 27 | 2.81003 | 0.0819 |
| FOREX does not Granger Cause M2 | | 0.71201 | 0.5016 |
| INFLRT does not Granger Cause INTRT | 27 | 3.86612 | 0.0364 |
| INTRT does not Granger Cause INFLRT | | 0.46653 | 0.6332 |
| M2 does not Granger Cause INTRT | 27 | 2.24589 | 0.1295 |
| INTRT does not Granger Cause M2 | | 3.51575 | 0.0473 |
| CAPU does not Granger Cause INFLRT | 27 | 1.23875 | 0.3092 |
| INFLRT does not Granger Cause CAPU | | 2.58298 | 0.0983 |
| RGDP does not Granger Cause M2 | 27 | 2.98738 | 0.0712 |
| M2 does not Granger Cause RGDP | | 0.64736 | 0.5331 |

**Table 5. Cointegration test: hypothesis 2**

Date: 12/24/10 Time: 10:37
Sample (adjusted): 1983 2009
Included observations: 27 after adjustments
Trend assumption: Linear deterministic trend
Series: SPV MPI FOREX INTRT INFLRT GLOBAL M2 CAPU
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

| **Hypothesized No. of CE(s)** | **Eigenvalue** | **Trace Statistic** | **0.05 Critical Value** | **Prob.**** |
|---|---|---|---|---|
| None * | 0.983942 | 301.8255 | 159.5297 | 0.0000 |
| At most 1 * | 0.884064 | 190.2743 | 125.6154 | 0.0000 |
| At most 2 * | 0.836560 | 132.0969 | 95.75366 | 0.0000 |
| At most 3 * | 0.665963 | 83.19157 | 69.81889 | 0.0030 |
| At most 4 * | 0.606875 | 53.58594 | 47.85613 | 0.0132 |
| At most 5 | 0.519301 | 28.37796 | 29.79707 | 0.0722 |
| At most 6 | 0.272673 | 8.600102 | 15.49471 | 0.4037 |
| At most 7 | 0.000144 | 0.003876 | 3.841466 | 0.9491 |

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

| **Hypothesized No. of CE(s)** | **Eigenvalue** | **Max-Eigen Statistic** | **0.05 Critical Value** | **Prob.**** |
|---|---|---|---|---|
| None * | 0.983942 | 111.5512 | 52.36261 | 0.0000 |
| At most 1 * | 0.884064 | 58.17736 | 46.23142 | 0.0018 |
| At most 2 * | 0.836560 | 48.90535 | 40.07757 | 0.0040 |
| At most 3 | 0.665963 | 29.60563 | 33.87687 | 0.1488 |
| At most 4 | 0.606875 | 25.20798 | 27.58434 | 0.0977 |
| At most 5 | 0.519301 | 19.77786 | 21.13162 | 0.0764 |
| At most 6 | 0.272673 | 8.596226 | 14.26460 | 0.3213 |
| At most 7 | 0.000144 | 0.003876 | 3.841466 | 0.9491 |

*Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level*
** denotes rejection of the hypothesis at the 0.05 level*
***MacKinnon-Haug-Michelis (1999) p-values*

**Table 6. Cointegration test: hypothesis 3**

Date: 12/24/10 Time: 10:54
Sample (adjusted): 1983 2009
Included observations: 27 after adjustments
Trend assumption: Linear deterministic trend
Series: RGDP SPV INFLRT FOREX MPI INTRT
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

| Hypothesized | | Trace | 0.05 | |
|---|---|---|---|---|
| **No. of CE(s)** | **Eigenvalue** | **Statistic** | **Critical Value** | **Prob.**** |
| None * | 0.853698 | 126.1126 | 95.75366 | 0.0001 |
| At most 1 * | 0.751041 | 74.21633 | 69.81889 | 0.0213 |
| At most 2 | 0.462756 | 36.67377 | 47.85613 | 0.3631 |
| At most 3 | 0.395829 | 19.89860 | 29.79707 | 0.4297 |
| At most 4 | 0.204205 | 6.293354 | 15.49471 | 0.6609 |
| At most 5 | 0.004663 | 0.126187 | 3.841466 | 0.7224 |

*Trace test indicates 2 cointegrating eqn(s) at the 0.05 level*
** denotes rejection of the hypothesis at the 0.05 level*
***MacKinnon-Haug-Michelis (1999) p-values*

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

| Hypothesized | | Max-eigen | 0.05 | |
|---|---|---|---|---|
| **No. of CE(s)** | **Eigenvalue** | **Statistic** | **Critical value** | **Prob.**** |
| None * | 0.853698 | 51.89628 | 40.07757 | 0.0015 |
| At most 1 * | 0.751041 | 37.54256 | 33.87687 | 0.0174 |
| At most 2 | 0.462756 | 16.77517 | 27.58434 | 0.5993 |
| At most 3 | 0.395829 | 13.60525 | 21.13162 | 0.3983 |
| At most 4 | 0.204205 | 6.167167 | 14.26460 | 0.5919 |
| At most 5 | 0.004663 | 0.126187 | 3.841466 | 0.7224 |

*Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level*
** denotes rejection of the hypothesis at the 0.05 level*
***MacKinnon-Haug-Michelis (1999) p-values*

**Table 7(i). Error correction test: model 2**

| Variable | Coefficient | Stat-error | t-statistics | Prob. |
|---|---|---|---|---|
| C | -4.928184 | 9.50665 | -0.51839 | 0.619 |
| D (SPV (-1) | 0.151402 | 0.23083 | 0.65589 | 0.413 |
| D(CAPU (-1)) | 2.341250 | 3.03003 | 0.77268 | 0.784 |
| D(FOREX -1) | -0.377012 | 0.47049 | -0.80132 | 0.836 |
| D(GLOBAL -1) | 34.00447 | 28.9662 | 0.17394 | 0.513 |
| D(INFLRT (-1) | -0.307239 | 0.52023 | -0.59059 | 0.491 |
| D(INTRIT (-1) | -0.709474 | 2.41177 | -0.29417 | 0.317 |
| D(M2 (-1) | -0.867605 | 0.69816 | -1.24270 | 0.782 |
| D(MPI (-1) | 1.820452 | 3.48518 | 0.52234 | 0.913 |
| ECM | -0.659258 | 0.28149 | -2.34205 | 0.031 |
| R-SQUARED | 0.402846 | Mean dependent variance | | -1.828889 |
| ADJUS. R-SQUARED | 0.086705 | S.D. dependent Var. | | 44.52238 |
| SUM.SQ.RESIDES | 30776.33 | Akaike Infor. Criterion | | 10.61728 |
| S.E EQU. | 42.54847 | Schwairz sc | | 11.09722 |
| LOG.LIKELIHOOD | -133.3333 | | | |
| F.STATISTICS | 1.274261 | | | |

*Source: Authors Estimation using E-view 6.0*

**Table 7(ii). Error correction test: model 3**

| Variable | Coefficient | Std Error | t-statistics | Prob. |
|---|---|---|---|---|
| C | 137415.7 | 93561.3 | 1.46872 | 0.4653 |
| D(RGDP(-1)) | -0.937525 | 0.28003 | -3.34791 | 0.0357 |
| D(SPV(-1)) | 3789.839 | 2510.41 | 1.50965 | 0.3762 |
| D(INFLRT(-1)) | -3906.619 | 5158.62 | -0.75930 | 0.4371 |
| D(FOREX(-1)) | -3623.895 | 5709.67 | -0.63469 | 0.4153 |
| D(MPI(-1)) | -600.2566 | 38911.2 | -0.01543 | 0.7531 |
| D(INTRT(-1)) | -9391.897 | 20926.3 | -0.44881 | 0.4753 |
| ECM | -0.498482 | 0.30235 | -1.64870 | 0.1265 |

| | | | |
|---|---|---|---|
| R-Squared | 0.758156 | Mean dependent Variance | 128469.0 |
| Adj. R-Squared | 0.069055 | S.D. dependent Variance | 815802.3 |
| Sum Sq. Residual | 4.18E+12 | Akaike infor. Criterion | 29.19712 |
| S.E. equ. | 469312.9 | Schwarz Sc. | 29.58107 |
| F-Statistics | 8.509001 | | |
| Log Likelihood | -386.1611 | | |

*Source: Authors' Estimation using E-View 6.0*

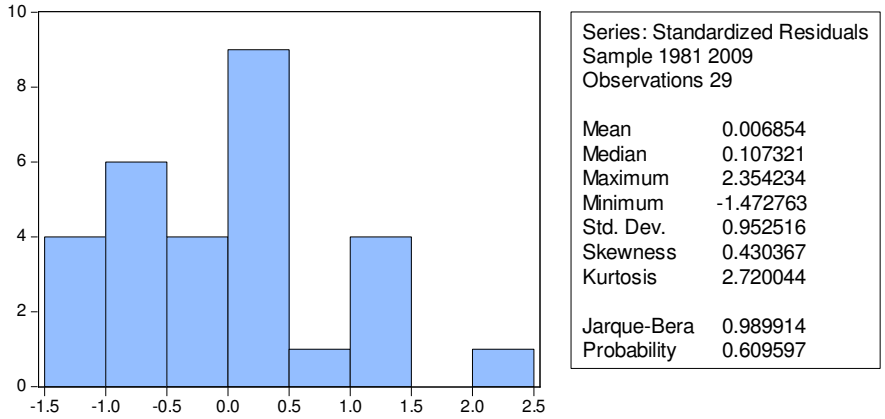


**Fig. 1. The GARCH Result graph**

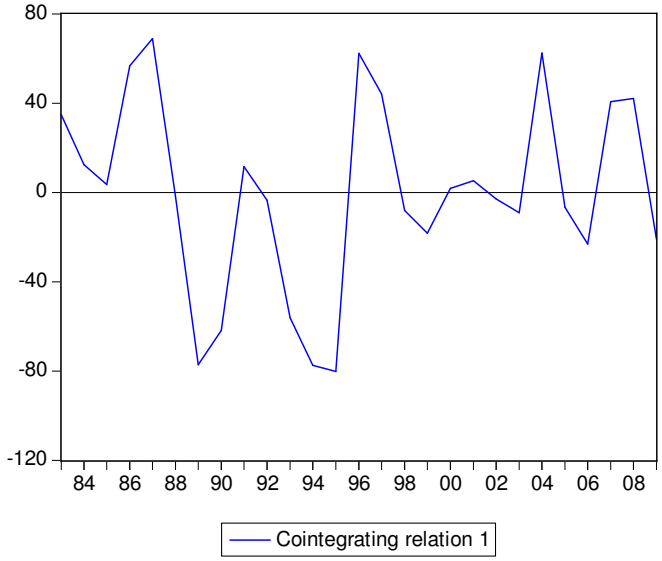


**Fig. 2. Cointegration graph: hypothesis 2**

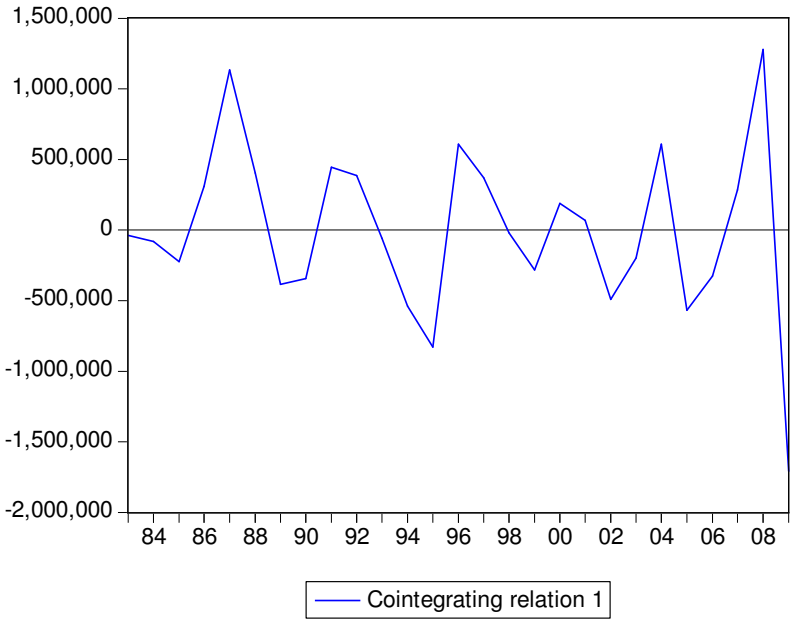


**Fig. 3. Cointegration graph: hypothesis 3**


**Fig. 4. Impulse response graph hypothesis 2**

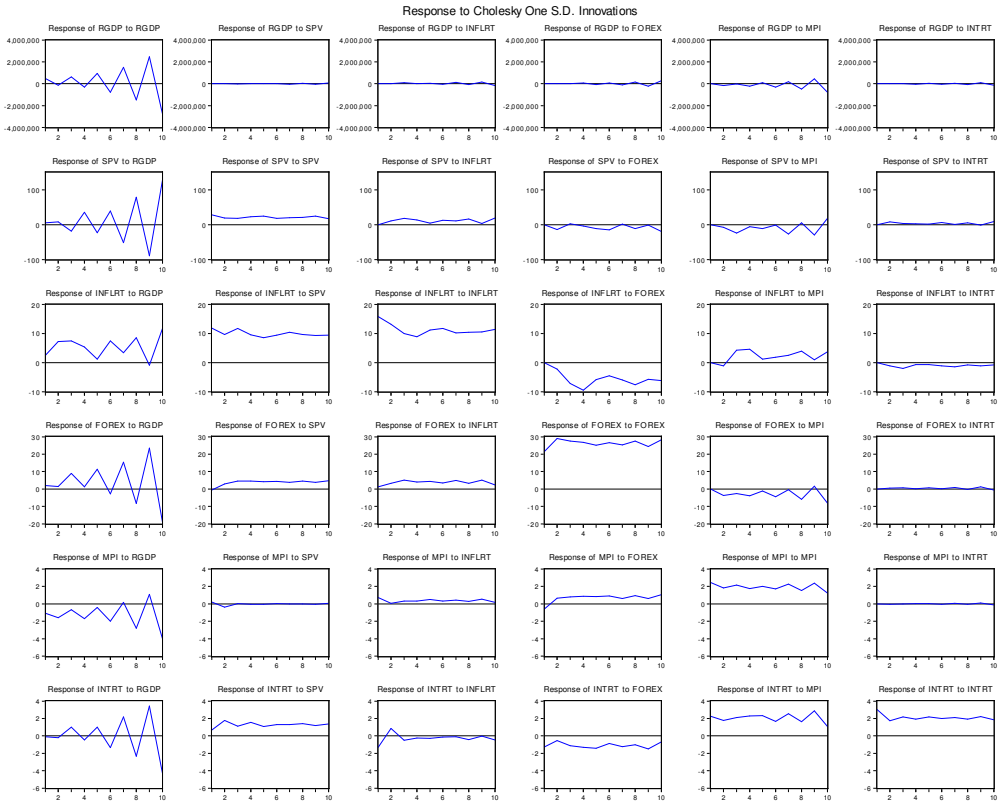


**Fig. 5. Impulse response graph: hypothesis 3**

Variance Decomposition (VD): This technique "break down the variance of the forecast error for each variable into component parts" attributable to each of the endogenous variables [37]. The study examined the dynamics of the standard errors in model 2 and 3. Tables 8 and 9 show the variance decompositions for the SPV, MPI and RGDP. On the standard error of SPV variance (Table 8), the error is absorbed thus: in period 1, SPV absorbed 100%; in period 2 SPV absorbed 93.3%, MPI absorbed 1.47%, etc. For model 3 (Table 9), the RGDP variance is absorbed thus: in period 1, 100% by itself. In period 2, 90% by itself, 18% by forex and 9% by MPI etc; On SPV variance, the standard error is absorbed as follows: 97% by itself, 2.8 % by RGDP. In period 2 SPV absorbed 69%, 5.4% by RGDP, 6.4% by inflation, 11% by forex, 3.4% by MPI and 4% by interest rate and so forth.

## 4.1 Discussion of Result

The study set out to investigate price distortion's impact on the real sectoral development. The literature made the point that distortion just like inflation may be a natural path to market activities but must be controlled in order not to influence negative growth in other sectors. Distortion is related to a market abuse influenced by artificial stimuli [6], [3]. The findings revealed that there is an unusual price jump 2006-2008, coinciding with the implementation period of monetary policy initiatives on financial reforms going on in the economy. This induced corporate activities that resulted in sudden price jumps, induced risk appetite for rent seeking, with an outcome of relatively high market capitalization to GDP ratio. The model specified by the study conjectured that high share price volatility or distortion is influenced by macroeconomic monetary policy initiatives unintended consequence, which co-integrates with other macroeconomic variables - interest rate, exchange rate, and inflation rate - with resultant maladapted investors' interests in business continuity in the real sector. Researches on EMH also show that capital market efficiency is contestable; hence regulators need to be watchful of insider dealings and rent seekers.

**Table 8. Variance decomposition hypothesis 2**

| Variance decomposition of SPV: | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Period** | **S.E.** | **SPV** | **MPI** | **FOREX** | **INTRT** | **INFLRT** | **GLOBAL** | **M2** | **CAPU** |
| 1 | 42.54847 | 100.0000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 53.12539 | 93.35813 | 1.470104 | 3.318141 | 1.138864 | 0.024811 | 0.166637 | 0.455693 | 0.067619 |
| 3 | 63.25756 | 80.82421 | 1.255681 | 6.266554 | 1.380487 | 7.108333 | 2.023529 | 1.047852 | 0.093351 |
| 4 | 75.32145 | 70.30968 | 1.146813 | 7.961412 | 2.657540 | 14.75717 | 1.427449 | 1.668676 | 0.071258 |
| 5 | 84.86012 | 70.94796 | 1.100987 | 9.630173 | 2.270671 | 13.37798 | 1.290256 | 1.324680 | 0.057289 |
| 6 | 91.61700 | 72.03488 | 1.065751 | 10.40419 | 2.115379 | 11.96495 | 1.214566 | 1.143039 | 0.057241 |
| 7 | 97.50185 | 72.02235 | 0.970016 | 10.91131 | 2.158622 | 11.54054 | 1.298698 | 1.040868 | 0.057602 |
| 8 | 103.6619 | 71.40465 | 0.859241 | 11.26826 | 2.177820 | 11.96529 | 1.270120 | 1.001021 | 0.053595 |
| 9 | 109.7168 | 70.95791 | 0.769501 | 11.64419 | 2.207590 | 12.18258 | 1.213141 | 0.975906 | 0.049169 |
| 10 | 115.3630 | 70.98123 | 0.720608 | 11.97459 | 2.185475 | 11.99758 | 1.181345 | 0.912831 | 0.046331 |
| **Variance decomposition of MPI:** | | | | | | | | | |
| **Period** | **S.E.** | **SPV** | **MPI** | **FOREX** | **INTRT** | **INFLRT** | **GLOBAL** | **M2** | **CAPU** |
| 1 | 3.101171 | 2.427360 | 97.57264 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 4.220276 | 11.45535 | 80.07987 | 5.195087 | 0.006541 | 1.393246 | 1.769214 | 0.093731 | 0.006965 |
| 3 | 5.006040 | 11.35274 | 75.83647 | 10.45266 | 0.012034 | 0.994428 | 1.257514 | 0.082386 | 0.011774 |
| 4 | 5.658464 | 11.66468 | 73.45152 | 12.82596 | 0.011051 | 0.804786 | 1.082930 | 0.149822 | 0.009244 |
| 5 | 6.248788 | 12.25017 | 71.60700 | 14.26825 | 0.069241 | 0.668069 | 0.924583 | 0.203481 | 0.009201 |
| 6 | 6.778773 | 12.28367 | 70.81025 | 15.19745 | 0.063346 | 0.573184 | 0.840960 | 0.222540 | 0.008601 |
| 7 | 7.268847 | 12.41319 | 70.07540 | 15.92638 | 0.072367 | 0.498787 | 0.751931 | 0.253467 | 0.008480 |
| 8 | 7.738601 | 12.43804 | 69.65042 | 16.43495 | 0.072791 | 0.441539 | 0.701646 | 0.252577 | 0.008033 |
| 9 | 8.177265 | 12.49908 | 69.21522 | 16.89438 | 0.071502 | 0.395602 | 0.656369 | 0.260240 | 0.007610 |
| 10 | 8.592032 | 12.58889 | 68.81626 | 17.26030 | 0.076093 | 0.358541 | 0.619711 | 0.272786 | 0.007424 |

**Table 9. Variance decomposition table hypothesis 3**

| Variance decomposition of RGDP: | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Period** | **S.E.** | **RGDP** | **SPV** | **INFLRT** | **FOREX** | **MPI** | **INTRT** |
| 1 | 469312.9 | 100.0000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 512224.8 | 90.42977 | 0.003844 | 0.010170 | 0.186013 | 9.358918 | 0.011288 |
| 3 | 806703.2 | 94.89193 | 0.036170 | 1.085006 | 0.076305 | 3.837474 | 0.073117 |
| 4 | 891105.1 | 89.74295 | 0.106428 | 0.896357 | 0.582850 | 8.508817 | 0.162599 |
| 5 | 1312043. | 93.92008 | 0.050791 | 0.616266 | 0.699715 | 4.570859 | 0.142290 |
| 6 | 1554291. | 91.49528 | 0.046631 | 0.496579 | 0.745940 | 7.059895 | 0.155677 |
| 7 | 2168962. | 94.18900 | 0.045661 | 0.551328 | 0.590546 | 4.466320 | 0.157144 |
| 8 | 2672847. | 92.53070 | 0.058937 | 0.455534 | 0.745999 | 6.024281 | 0.184550 |
| 9 | 3678781. | 94.00672 | 0.046640 | 0.444600 | 0.712869 | 4.612683 | 0.176485 |
| 10 | 4689671. | 93.10929 | 0.049227 | 0.397753 | 0.757917 | 5.500461 | 0.185355 |
| **Variance decomposition of SPV:** | | | | | | | |
| **Period** | **S.E.** | **RGDP** | **SPV** | **INFLRT** | **FOREX** | **MPI** | **INTRT** |
| 1 | 28.96557 | 2.888445 | 97.11155 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 41.24386 | 5.494947 | 69.65421 | 6.377527 | 11.01247 | 3.420342 | 4.040505 |
| 3 | 57.48928 | 12.80241 | 45.62858 | 13.50469 | 5.903158 | 19.81306 | 2.348100 |
| 4 | 72.89007 | 31.14143 | 38.53119 | 11.81453 | 3.985399 | 12.97287 | 1.554579 |
| 5 | 81.97207 | 32.49416 | 39.52613 | 9.659100 | 4.925456 | 12.13726 | 1.257902 |
| 6 | 95.05010 | 41.64395 | 32.94193 | 8.937898 | 6.051849 | 9.037560 | 1.386819 |
| 7 | 113.7270 | 49.75230 | 26.25334 | 7.044857 | 4.242689 | 11.72990 | 0.976917 |
| 8 | 141.4497 | 63.13020 | 19.10627 | 5.833065 | 3.394684 | 7.742569 | 0.793208 |
| 9 | 171.7644 | 69.91432 | 14.94612 | 3.993483 | 2.306881 | 8.297053 | 0.542149 |
| 10 | 217.6794 | 78.17511 | 9.942026 | 3.228718 | 2.266223 | 5.866424 | 0.521504 |

## 5. CONCLUSION AND RECOMMENDATIONS

This paper traced the origin of direct stock price distortion to a more or less business response to regulatory directives and policies; akin to how United States economy instantiated volatility in the housing market in 1987 and the Asian crises of 1997 in which "monetary policy was deliberately loosened" [6]. Stock Price distortion co-integrates with macro-economic variables – interest rates, inflation rate, foreign exchange rate, and empirically found to have more causal link to monetary policy initiative, with a negative effect on real sector development, aligning with the suggestions of [2]. We posit that there was high share price volatility 2005-2008, which more or less market response to the macro-economic policy initiative subsisting as the banking and insurance sectors reforms declared by CBN and NAICOM respectively rather than the natural market reaction of price manipulation.

We therefore recommend that fiscal and monetary policies should structurally be multi-dimensional and not focused on narrow targets. The unintended consequence of monetary policy initiative can stimulate a regulatory risk that causes loss of confidence in the market. Nature is paradoxical; the atmosphere has a gaseous balance of oxygen and carbon dioxide that is maintained by both the needs of men and plants. It is suggested that regulators should constantly assess strategic emerging risk that is most likely to attend policy initiatives in planning financial market development. Thus, policy responses must be carefully monitored to achieve delicate balanced growth for all sectors of the economy. Since the financial system seems more prone to originate distortions because of the ease of propagation by speculators; the policy reforms should always simulate long term framework implications, hence require all stakeholders input.

## COMPETING INTERESTS

Authors declare that there are no competing interests.

## REFERENCES


1. Söderström R. Regulating market manipulation: an approach to designing regulatory principles. Uppsala Faculty of Law, Working Paper; 2011.
2. Wijnbergen VS, Edwards S. The welfare effect of trade & capital market liberation. International Economic Review. 1986;27(1):141-48.
3. Xu P. Price distortion in the transition process: a CGE analysis of China's case. Journal of Economic Planning, Netherlands, Springer; 2005.
4. Ohakim I. Why Ndigbo are into bank robbery, kidnapping. The Business Day, Lagos. 2010;23-25, pg 5.
5. Real estate chart; 2010. Available:http://www.jparsons.net/housingbubble/ accessed on July 25, 2010
6. Western D. Booms, bubbles and busts in US stock markets, Routledge, London and New York; 2005.
7. Chandra P. Investment analysis and portfolio management, 3rd Edition, New Delhi: Tata Mc Graw- Hill Publishing Co. Ltd. 2008;276-294.
8. Fama EF. Efficient capital markets: a review of theory and empirical work. Journal of Finance. 1970;25(2):383-417.
9. Hirshleifer J. Investment, interest and capital, United State of America, Prentice-Hall, INC. 1970;31-98.
10. Hull JC. Option, futures, and other derivatives, Prentice Hall, Upper Saddle River, New Jersey 07458. 2006;263-270.
11. Belsky G, Gilovich T. Why smart people make big money mistake-And how to correct them. New York Simon and Schuster. 1999;2-41. Available: http://book google.com/books id=belsky+and+gilovich
12. Barnejee B. Fundamental of financial management, New Delhi: PHI Learning Private Limited. 2008;491-521.
13. Mayasami RC, Howe LC, Hamzah MA. Relationship between macroeconomic variables and stock market indices: cointegration evidence from stock exchange of Singapore's all s-sector indices. Journal Pengurusan, 2004;24:47-77
14. Nelson CR. Inflation and rates of return on common stocks. Journal of Finance. 1976;31(2):471-483.
15. Jaffe J, Mandelkar G. The Fisher effect for risky assets: an empirical investigation. Journal of Finance. 1976;31:447-456.
16. Fabozzi FJ, Modigliani F. Capital market institutions and instruments 3rd ed, prentice-Hall of India Private Ltd. 2003;107-161.

17. Fabozzi FJ. Bond markets, analysis and strategies. 7th edition, prentice Hall. 2010;92-122.
18. Eun CS, Wresnick BG. International financial management. McGraw-Hill Irwin. 2007;106-132.
19. Asika N. Introduction to International Business, Rothmed Int. Ltd. 2006;86-99.
20. Umar A. GARCH and ARDL model of exchange rate: evidence from Nigeria's retail Dutch auction system. International Research Journal of Finance and Economics, Issue 49, Euro Journals Publishing. 2010;7-14.
21. Nnanna OJ. Towards exchange rate stability in Nigeria in monetary policy and exchange rate stability, NES Proceedings of a one day Seminal Held on 23 May 2002.
22. Granger CWJ. Developments in the study of co-integrated economic variables. Oxford Bulletin of Economics and Statistics. 1986;48:213-228.
23. Johansen S, Juselius K. Maximum Likelihood estimation and inference on co-integration with application to the demand of money. Oxford Bulletin of Economics and Statistics. 1990;52:169-210.
24. Engle RF. ARCH: selected readings, (Advanced Texts in Econometrics). Oxford University Press; 1995.
25. Engle RF, Rangel JG. The spine GARCH model for unconditional volatility and its global macroeconomic causes. Working papers Series, 2005/13, Czech National Bank, Research Department; 2005.
26. Kennedy P. A guide to econometrics, sixth edition. Blackwell Publishing. 2008;232-240, 276-330.
27. Asteriou D, Hall SG. Applied econometrics, second edition. Macmillan. 2011;287-411.
28. Gujarati D. Essentials of econometrics, 2nd edition, McGRAW-Hill International Editions. 1999;275-309.
29. Lagos State Investor Handbook. A Guide to Business and Investment in Lagos State; 2012.
Available: www.lagosstate.gov.ng
30. Mackinnon JG. Numerical distribution function for unit root and cointegration test. Journal of Applied Econometrics. 1996;601-618.
31. Dritsakis N, Adamopouous A. Financial development and economic growth in Greece, an empirical investigation with Granger causality analysis. International Economic Journal. 2004;18:547-559
32. Maddala GS, Kim In-Moo. Unit roots, co-integration and structural change. Cambridge University Press. 1998;47-258.
33. Bollerslev T. Generalized autoregressive conditional heteroskedasticity. Journal of Econometrics. 1986;31:307-327.
34. Engle RF. autoregressive conditional heteroskedasticity with estimate of the variance of United Kingdom inflation. Econometrica. 1982;50:391-1007.
35. Engle RF, Granger CW. Cointegration and error correction: representation, estimation and testing. Econometrica. 1987;35:143-159.
36. Hamilton J. Time series analysis, Princeton: Princeton University Press. 1994;582
37. Pindyck RS, Rubinfeld DL. Econometric models and economic forecasts; 1998.




*Peer-review history:*
*The peer review history for this paper can be accessed here:*
*http://www.sciencedomain.org/review-history.php?iid=810&id=20&aid=6820*