

Original Research Article

EMPIRICAL ANALYSIS OF MONETARY POLICIES ON STOCK PRICE DISTORTION IN NIGERIA: IMPLICATIONS ON REAL SECTOR

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, inflation rates, interest rates and foreign exchange rates as it relates to monetary policy initiatives and its implications on the real sector in Nigeria using two stage regression model, which has not been specifically tested by prior research in this area. Empirical tests such as Granger causality, co-integration tests, and ECM 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.

Key words: Efficient capital market, Monetary policy initiative, Stock price distortion.

1.0 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

33 is sometimes an evidence of market or government failure or both. In whatever form it is
34 exhibited, the perception and dealing behaviour is schemed to temporal faulty valuation. The
35 danger in this dealing is that decision making follows the herd instinct or human crowd effect
36 that develops.

37 Price distortion is like a direct spur of energy to influence the market mechanism to a
38 preferred outcome. For distortion exists like a phenomenon incidental to human activities and
39 since it cannot be destroyed, it goes ahead to develop other effects anticipated and
40 unanticipated in the economy. Price distortion is propagated as volatility, which is described
41 by Wijnbergen and Edwards (1986) as tax, because highly volatile relative prices discourage
42 the irreversible investment commitments to the real sector. In short, speculation is
43 encouraged and long-term perspectives are dissimulated.

44 This study investigates how capital market distortion creates systemic distortions, which
45 could be adverse to sectoral developments, and in particular the real sector in Nigeria.
46 According to Xu (2005) the accurate evaluation of price distortion enhances the formulation
47 of correct pricing mechanism.

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

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

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

68 **2.0 Literature Review and Conceptual Issues**

69 The events of July, 2004-December,2005 in which Nigerian Banks were asked to recapitalise
70 from N2billion to N25billion was more or less monetary policy initiatives to support a certain
71 macroeconomic variable-capital formation-but may have led to stock price distortion because
72 of the pressure or entropy created by the policy response. In line with these postulations we
73 observe the following events on the timeline that the distortion occurred: Massive transfer of
74 investible funds from the real and distributive sectors to the capital market from 2005-2007.
75 In fact, some weak/fledging SMEs sold their warehouses and the capital funds transferred to
76 the capital market. Subsequently, there could be expected decline in real GDP within the
77 above period. Corroboratively, Ohakim (2010) says that “the Igbos fell to the ploy by banks
78 which embarked on road shows and ‘volcanic marketing strategies’ in their bid to convince
79 investors to invest in banks”. He confirmed that people sold their warehouses and were
80 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 (Real estate chart, 2010). 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, like Western (2005) 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”.

81 Hence, we identify ontologically three auto orders in the distortion mechanism based on
82 equity-trading experience. 1st Order Distortion in Stock Prices: the excitation of stock prices

83 in a sector of the capital market and subsequent market bullishness 2nd Order Distortion: The
 84 human crowd effect based on herd instinct sets in and the real sector GDP declines. 3rd Order
 85 Distortion: bubble bursts, stock oversupplied and long trend downside volatility with capital
 86 formation disintermediation (Western, 2005).

87 2.1 Factors Affecting Stock Price Volatility

88 Chandra (2008) recalls the arguments on ‘efficient’ capital market put forward by Fama in
 89 1960s (Fama, 1970) on the Efficient Market Hypothesis (EMH), saying that the intense
 90 competition in the capital market leads to fair pricing of debt and equity securities. Often, the
 91 line mostly advanced in the theory of exchange is the standard assumption that ‘markets are
 92 both complete and perfect’ (efficient market hypothesis), hence equilibrium is
 93 instantaneously and attained by costless means. This assumption has since led to one of
 94 Fisher’s theorem that productive optimisation of the firm can be separated from the
 95 consumptive optimisation of the individual-the present value rule. Indicating that within a
 96 successive time periods (t_0) and (t_1) from the present period (spot), it will be assumed that
 97 there exist in the market a unique price ratio $\varnothing_1/\varnothing_0$ and a corresponding discount factor $1/(1+$
 98 $r_t)$ which cannot be significantly influenced by the decisions of a single economic agent
 99 (Hirshleifer,1970:46).

100 Stock prices are assumed to follow a Markov process; that is, a stochastic process referred to
 101 as ‘volatility smile’ where only the present value of a variable is relevant for predicting the
 102 future (Hull, 2006). This aligns with weak form of EMH thinking that stock prices though are
 103 randomized; it is a probability distribution and a function of time. This means superior return
 104 is not achievable by financial analysis within a short time. Stock price is therefore based on
 105 rational anticipation that future events are the relevant price factors. The process exhibits
 106 mean of zero and variance of one. It implies that volatility of over 100% over a short period
 107 can be taken as distortions. Belsky and Gilovich (1999) refer to distortion as irrational or
 108 illogical possibilities. Barnejee (2008) identifies inflation, demographic, liquidity, market
 109 sentiment, and earning propensity as the main factors responsible for growth of stock prices.
 110 But growth in itself is different from volatility. The former evolves in a gradual order; the
 111 latter is like a revolution- a sudden disorder caused by some highly potent causal factors and
 112 hence creates uncertainty phenomenon (Hull, 2006).

EMH expects stock prices to reflect all public and insider information, hence Mayasami, Howe, and Hamzah (2004) 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 Nelson (1976), and Jaffe and Mandelker (1976), 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, Hirshleifer (1970:35) 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 (Hirshleifer, 1970:49, Fabozzi and Modigliani, 2003; Fabozzi, 2010).

The price of foreign exchange is expected to fluctuate based on the productivity of exportable goods and services (Eun and Wresinick 2007:106). 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 (Asika, 2006: 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 (Umar, 2010; Nnanna, 2002). 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.

Granger (1986) and Johanson and Juselius (1990) 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. Engle (1995), Engle and Rangel (2005) examined how heteroscedasticity occurs in time series context and suggested that there are deep relationship between stock prices return and macro economic variables.

3.1 Methodology and Data

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. Gross Domestic Product (GDP), money supply, interest rates, inflation rate and exchange rates were obtained from Central Bank of Nigeria (CBN) statistical bulletins. Globalization represents net export. Monetary policy initiatives representing macroeconomic factors that lagged the stock price movement were obtained using dummy variables operationalized from primary data (Kennedy, 2008: 232-240; Asteriou and Hall, 2007; Gujarati, 1999). Structured questions were circularised among senior stockbrokers, academician, investors and learned members of the public in Lagos State in Nigeria's commercial capital. The techniques of estimation include application of unit root, granger causality, cointegration, error correction tests and impulse response functions.

3.2. Model Specification

Three models were used for the study. The first model relates to the first hypothesis which tests the existence of Wiener's process in the Nigerian Stock market. The implicit form of wiener process is: $SPV = f(a dt)$(1)

The explicit model is thus:

$$SPV_t = a + b_t + e_t \dots\dots\dots(2)$$

Where: SPV = Share price volatility; t = time

172 For the $GARCH_{(1,1)}$ model which part of this study is based, the variance equation has the
173 form: $h_t = \gamma_0 + \delta_1 h_{t-1} + \gamma_1 \mu_{t-1}^2 \dots \dots \dots (3)$

174 Thus, the model specification for **hypothesis1** requires that three unknown
175 parameters $\gamma_0, \gamma_1, \sigma_1$ be estimated through the $GARCH_{(1,1)}$ model.

176 The next model's implicit function is of the form

$$177 \quad SPV_t = (MPI, FOREX, INTRT, INFLRT, GLOBAL, MS, CAPU) \dots \dots \dots (4)$$

178 It tests the second hypothesis that no significant relationship exists between share price
179 volatility and globalization and monetary policy initiatives, money supply, exchange rate,
180 manufacturing capacity utilization.

$$181 \quad SPV_t = a_0 + \beta_1 MPI_t + \beta_2 FOREX_t + \beta_3 INTRT_t + \beta_4 INFLRT_t + \beta_5 GLOBAL_t + \beta_6 MS_t + \beta_7 CAPU_t + e_t$$

$$182 \quad i \dots \dots \dots (5)$$

183 Where: MPI = Monetary policy initiatives, FOREX = **Foreign exchange rate**, INTRT =
184 **Interest rate**, INFLRT = **Inflation rate**, GLOBAL = Globalization, MS = Money supply,
185 CAPU = Capacity utilization and e_2 = error term. The third model is implicitly represented as

$$186 \quad RGDP_t = (SPV, INFLRT, FOREX, MPI, INTRT) \dots \dots \dots (6)$$

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

$$190 \quad RGDP_t = a_0 + \alpha_1 SPV_t + \alpha_2 INFLRT_t + \alpha_3 FOREX_t + \alpha_4 MPI_t + \alpha_5 INTRT_t + e_{it} \dots \dots \dots (7)$$

191 The full explanatory variables are: Monetary policy Initiative index (MPI); **annual average**
192 **foreign exchange rate** (Forex); **prime lending rate** (Intrt); **annual rate of inflation** (Inflrt) while
193 the explained **variable is year on year change in market capitalisation of the Nigerian Stock**
194 **Exchange (SP). Market capitalization ratio to GDP is greater than one in any economy where**
195 **all the sectors represented in the stock market is experiencing an artificial bubble.**

196 4.1 **Estimation Techniques** and Results

197 **Unit** Root: Using the ADF test(1979,1981), the order of integration (unit roots) of all the
 198 variables series were examined at level $\gamma_t \sim I(0)$, that $\gamma_t \sim I(n); n > 0$, while at first difference $\Delta \gamma_t$
 199 $\gamma_t - \gamma_{t-1}$. If yes $\gamma_t \sim I(1)$. We discovered that all variables (CAPU, FOREX, GLOBAL,
 200 INFLRT, INTRT, M2, MPI, RGDP and SPV) were integrated of order 1 at both 1% and 5%
 201 Mackinnon (1996) critical level (see table 1). Therefore, all variable used were non-stationary
 202 in the respective level but stationary in their first difference (integrated of order one (1)) as
 203 was expected. By implication, following Dritsakis and Adamopoulons (2004), Maddala and
 204 Kim (1998), these variables can be cointegrated as well following one or more Linear
 205 combinations among the variables that are stationary.

206 **GARCH** Statistics (Model 1): To capture appropriately the possible effects associated with
 207 volatilities in financial and economic data this study adopted the GARCH model for
 208 **hypothesis** 1. The GARCH was developed by Bollerslev (1986) as an extension of Engle's
 209 (1982) ARCH formulation on conditional disturbance variance from studies of shocks
 210 referred to as "volatility clustering". Here, a big shock (residual) tends to be followed by
 211 shocks in either direction and small shocks tend to follow smaller shocks. In other words, the
 212 best way to model the pattern of the price movement in the NSE in the studied period is to
 213 **allow** the variance μ_t to depend upon its history.

214 Table 1 depicts the descriptive statistics of the NSE market value series. The average yearly
 215 market value is 0.068%. The yearly market value standard deviation is 95%, reflecting a high
 216 level of volatility in the market. The wide gap between the maximum (2.354234) and
 217 minimum (-1.472763) market value growth rates, give support to the high variability of
 218 market value or stock prices in the NSE. Under the null hypothesis of normality distribution,
 219 Jarque-Bera (J-B) is 0. The J-B value of 0.989914 deviated from normal distribution.
 220 Similarly, skewness and kurtosis represent the nature of departure from normality. In a
 221 normally distributed series, skewness is 0 and kurtosis is 3. Positive or negative skewness
 222 indicate asymmetry in the series and less than or greater 3 kurtosis coefficient suggest
 223 flatness and peakedness, respectively. The skewness coefficient is 0.430367 is positively
 224 skewed. Positive skewness implies that the distribution has a long right tail and a deviation
 225 from normality. The empirical distribution of the kurtosis is clearly not normal but peaked. In
 226 summary, the NSE market value series do not conform to normal distribution but display a
 227 positive skewness and leptokurtic distribution. The results are, however, based on the null

228 hypothesis of normality and provide no information for the parametric distribution of the
229 series.

230 Table 2 shows the result of volatility clustering using GARCH model developed by
231 Bollerslev (1986). The model put variance as function of intercept (w), a shock from the prior
232 period (α) and the variance from last period (β). Also, the theory expects parameter α and β to
233 be higher than zero (0), and β to be positive to ensure that the conditional variance σ_t^2 is non-
234 negative. The GARCH (1, 1) models results in table 2 shows that α coefficient is insignificant
235 but β coefficient is positive and significant at 5%. This implies that volatility is persistent. The
236 result shows that stock price follows a random walk. Further analysis by adding α and β
237 together i.e. (1.261355-0.330283) is 0.931072, which is closer to 1 thereby suggesting a high
238 persistent of volatility clusters in the stock market. It implies that wide changes in stock
239 prices tend to be followed by wide changes and mild changes tend to be followed by mild
240 changes. The main economic implication of this finding for investors is that stock price
241 volatility occurs in cluster and it is predictable.

242 Cointegrated Rank Test (Model 2): The key issue in cointegration is to investigate if really
243 genuine long-run relationship exist that required a linear combination of variable Y_t and X_t ,
244 even if the variable rises over time due to their trending, there will be a common trend that
245 links them together in such a way that the stochastic trends cancel out later, that is, the
246 difference between them is stationary (Asteriou and Hall, 2007).

247 Upon achieving stationary of the variables at $I(1)$, we examine the presence or non-presence
248 of co-integration among the variables. That is, a long run relationship between all the
249 variables exist as suggested a-priori. With a Linear deterministic trend assumption table (2)
250 for trace statistics indicate five (5) cointegrating equations while maximum Eigen value
251 statistics in table (3) include three (3) cointegrating equations at 5% significance level,
252 suggesting that there is co-movement in the variables in a long run equilibrium path.
253 Similarity the Normalized cointegrating coefficients are all significant given the rule of
254 thumb method. See table (4).

255 Granger Causality test: Granger Causality has been applied in the context of ‘rationale
256 expectation of super exogeneity’, that every variable has a “precedence” (Maddala and Kim,

1998). When the past and present value of Y_t provides useful information to predict X_{t+1} at time t , then it is said that Y_t 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. Our test reveal 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

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 (Granger 1983; Engle and Granger 1987). 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 (Hamilton, 1994, Asteriou and Hall, 2007). The spread 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.

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 (Kennedy, 2008: 231). It is on essential and categorical tool in empirical causal analysis and policy effectiveness.

For hypothesis 2, figure 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

287 innovations in each variable. In Row 1, over the four quarter period, SPV responded
288 positively to its own shock slightly to shock in interest rate and M2, more obviously to
289 inflation rate and negatively to FOREX in the system while no relative response is noticeable
290 of SPV to shocks in MPI, Global and CAPU rather maintaining stability around the
291 equilibrium level. The result confirms our findings under the Granger test, except that CAPU
292 innovation on SPV produce stable impact.

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

307 In the fifth row, INFLRT responded highly positive to shocks from SPV, MPI and upon its
308 own lag. The MPI result confirms our earlier position through the Granger test while the
309 SPV shock is against our earlier position that it is INFLRT that Granger cause SPV. The one
310 S.D shocks from other variables: INTRT, GLOBAL, M2 and CAPU were contained around
311 the INFLRT's equilibrium level. INFLRT had a minor negative response to shocks from
312 FOREX in the period under study. The sixth row presents positive net GLOBAL response to
313 shock in SPV, MPI, INTRT, and to its lagged value while its response to shock in FOREX
314 and INFLRT are negative. It does not respond to shocks in M2 and CAPU. We observed
315 mixed results here compared to initial position of the Granger test, as only M2 and MPI
316 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.

For Hypothesis 3, [figure 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.

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 (Pindyck and Rubinfeld, 1998: 433). 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.

347 **4.2 Discussion of Result**

348 The study set out to investigate price distortion's impact on the real sectoral development.
 349 The literature made the point that distortion just like inflation may be a natural path to market
 350 activities but must be controlled in order not to influence negative growth in other sectors.
 351 Research on EMH show that capital market efficiency is contestable, hence, regulators need
 352 to be watchful of insider dealings and rent seekers. The findings revealed that there is an
 353 unusual price jump 2006-2008, coinciding with the implementation period of monetary
 354 policy initiatives on financial reforms going on in the economy. This induced corporate
 355 activities that resulted in sudden price jumps, induced appetite for rent seeking, with an
 356 outcome of relatively high market capitalization to GDP ratio. The model specified by the
 357 study conjectured that high share price volatility is influenced by macro-economic monetary
 358 policy initiatives, which co-integrate with other macroeconomic variables -interest rate,
 359 exchange rate, and inflation rate - with resultant maladapted investors' interests in business
 360 continuity in the real sector.

361 **5.0 Conclusion and Recommendations**

362 This paper traced the origin of direct stock price distortion to a more or less business response
 363 to regulatory directives and policies; akin to how United States economy instantiated
 364 volatility in the housing market in 1987 and the Asian crises of 1997 in which "monetary
 365 policy was deliberately loosened" (Western, 2005). Stock Price distortion co-integrates with
 366 macro-economic variables – interest rates, inflation rate, foreign exchange rate, and
 367 empirically found to have more causal link to monetary policy initiative, with a negative
 368 effect on real sector development, aligning with the suggestions of Wijnbergen (1986). We
 369 posit that there was high share price volatility 2005-2008, which more or less market
 370 response to the macro-economic policy initiative subsisting as the banking and insurance
 371 sectors reforms declared by CBN and NAICOM respectively rather than the natural market
 372 reaction of price manipulation.

373 We therefore recommend that fiscal and monetary policies should structurally be multi-
 374 dimensional and not focused on narrow targets. Nature is paradoxical; the atmosphere has a
 375 gaseous balance of oxygen and carbon monoxide that is maintained by both the needs of men
 376 and plants. It is suggested that regulators should constantly assess strategic emerging risk that
 377 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 like fire; the policy reforms should simulate long term framework and impact, hence requiring all stakeholders input.

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Appendix

457 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

458 **Sample:** 1981 to 2009

459 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

460 **Sample:** 1981 to 2009

Dependent Variable: SPV

Method: ML – ARCH

Date: 12/31/10 Time: 03:51

Sample: 1981 2009

Included observations: 29

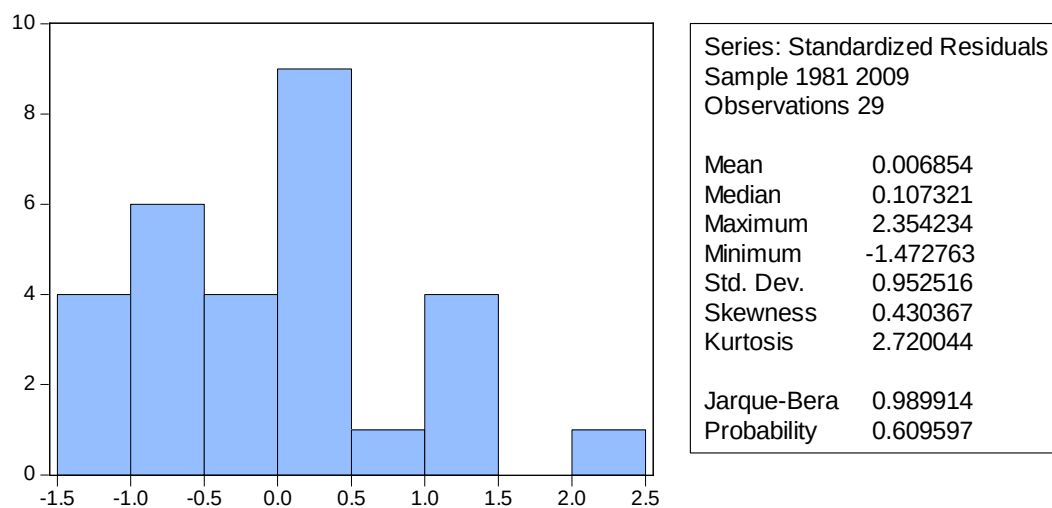
Convergence not achieved after 100 iterations

	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	

461

462 Fig.1 The GARCH Result graph

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466 Table3: ADF Unit Root Result

Variable	Level	First Difference
	ADF (Intercept & Trend)	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

467 **Source:** Authors' Estimation using E-view 6.0; MacKinnon (1996) one-sided p-value

468 The Critical value for 1%, 5% and 10% levels are -4.339330; -3.587527; and -3.229230 respectively.

469 All variables are significant at 1%, except for CAPU, FOREX and RGDP that are significance at 5%.

470 **Table 4: GRANGER CAUSALITY TEST**

471

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

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475 **Table5. COINTEGRATION TEST: HYPOTHESIS 2**

476

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		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	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		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	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

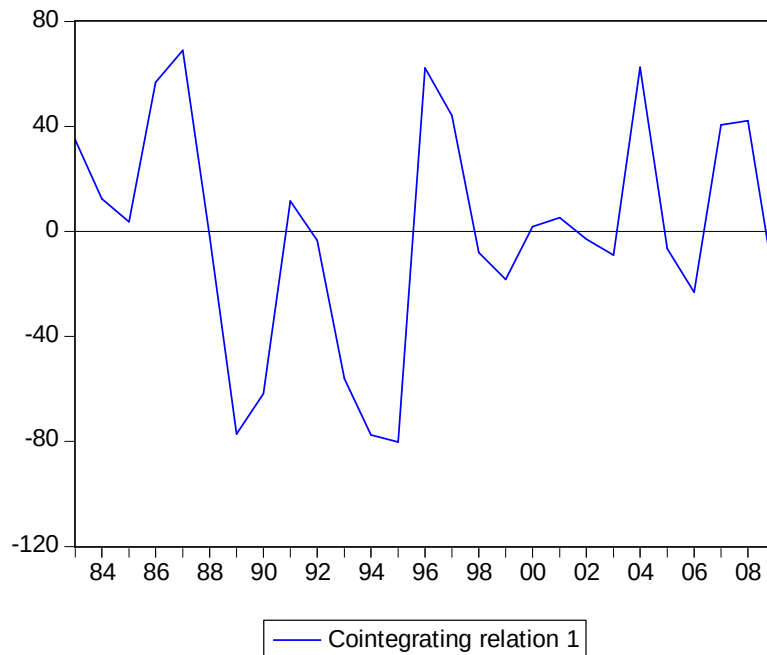
* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

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479 **Fig.2. COINTEGRATION GRAPH: HYPOTHESIS 2**



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481 **Table 6: COINTEGRATION TEST: HYPOTHESIS 3**

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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

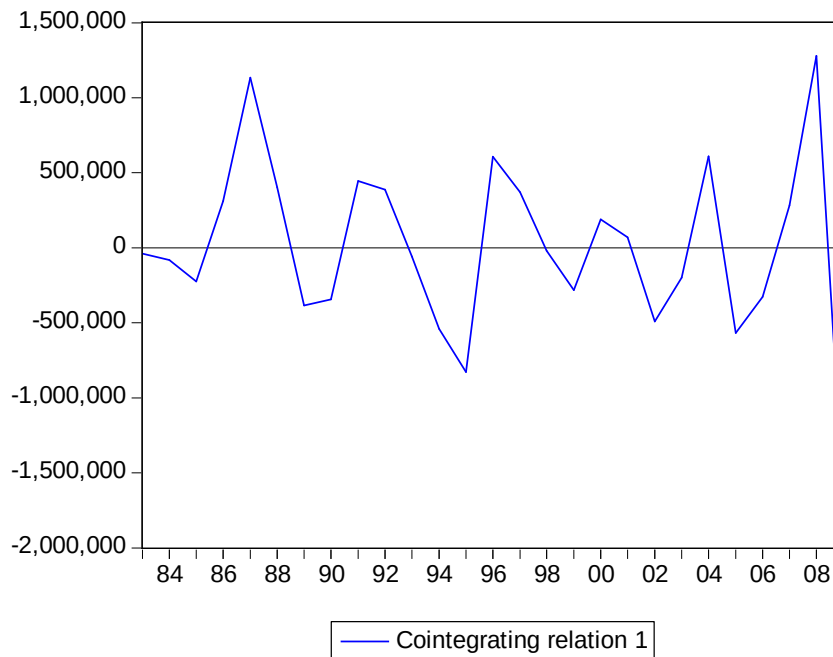
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

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484 Fig.3 COINTEGRATION GRAPH: HYPOTHESIS 3



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487 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	Schwarz sc		11.09722
LOG.LIKELIHOOD	-133.3333			
F.STATISTICS	1.274261			

488 Source: Authors Estimation using E-view 6.0

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492 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 Criterion		30.58107
F-Statistics	8.509001			
Log Likelihood	-386.1611			

Source: Authors' Estimation using E-View 6.0

503 Fig.4 IMPULSE RESPONSE GRAPH HYPOTHESIS 2



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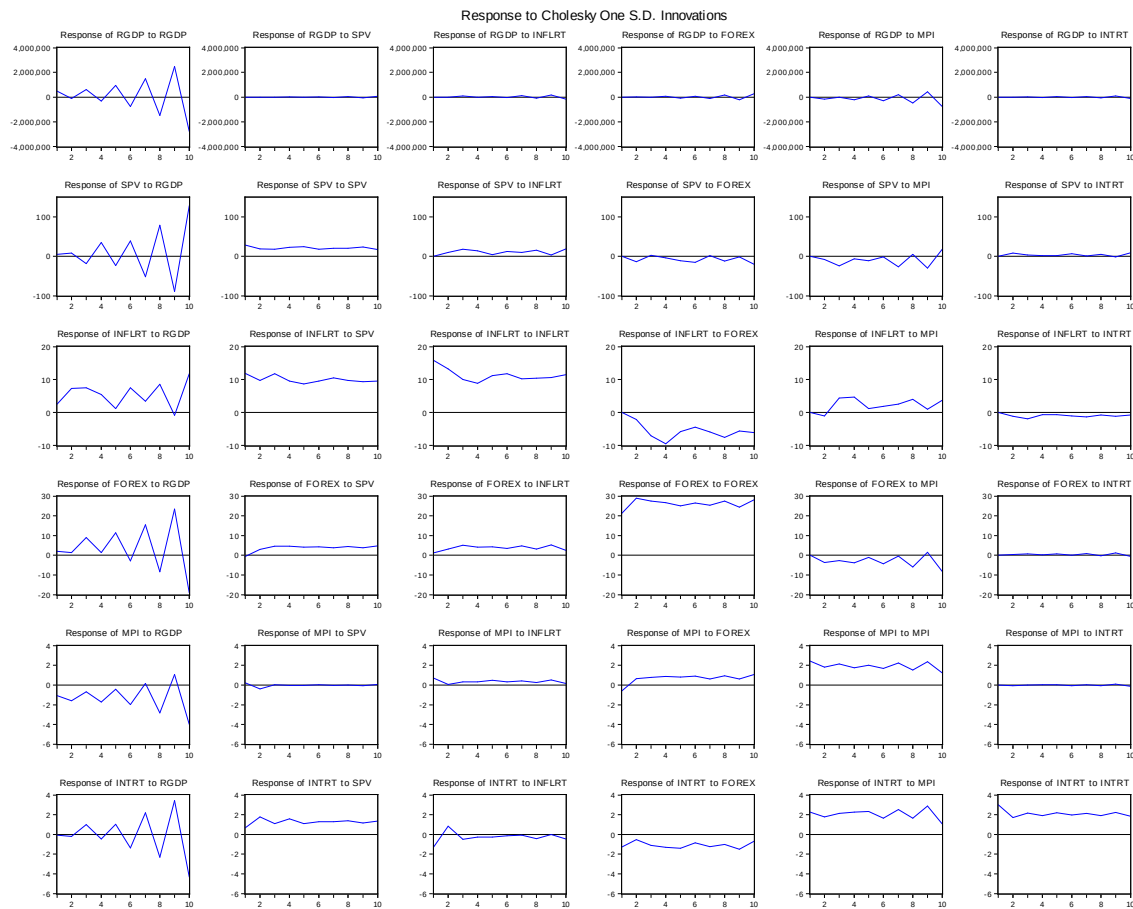
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Fig.5 IMPULSE RESPONSE GRAPH: HYPOTHESIS 3



523 Table 8

524 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

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528 Table 9

529 VARIANCE DECOMPOSITION TABLE HYPOTHESIS 3

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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

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