

Behind the Crash: Analysis of the Roles of Macroeconomic Fundamentals and Market Bubbles in the Nigeria Stock Exchange

Chioma Chukwuma-Agu

Department of Banking and Finance

University of Nigeria, Enugu Campus, Enugu Nigeria

And

Chukwuma Agu

Investment and Trade Policy Centre

Department of Economics,

University of Pretoria

South Africa

**Paper for Presentation at the African Econometric Society Conference,
Sheraton Hotel, Abuja; 8 – 10 July, 2009**

JEL Classification : E44, G10, G12, 016

Abstract

Using three approaches with two data sources – one primary and the other secondary – this work aims to show the relationship between stock pricing and behaviour of the stock market on one hand and micro and macroeconomic fundamentals in the Nigerian economy on the other. The primary data was analyzed using charts and figures as well as estimates from a censored logistic model while the secondary data was modeled using an error correction approach. The long run value of the all share price index in the time series model was obtained using a single equation approach that relates the dependent variable to fundamental values of its core explanatory variables. Two equations were thereafter estimated, the first showing the relationship of this long run all share price index with major indicators in the economy and the second showing the relationship of the actual value of the all share price index with same set (or augmented sets) of indicators. The results from both the two sources largely corroborate the other. Data from the primary survey indicate that the key drivers of share prices, particularly for the boom period were neither broad macroeconomic indicators (though such factors as inflation rate and macro instability are noted to affect it) nor key indicators of the health of the firm. Prices were clearly shown to be much above levels that could have been determined by such indicators as posted profits of firms, amounts paid out as dividend and regularity of such dividend payout. In contrast, stakeholders see price setting behaviour as dominant in the market and largely driving stock prices for the boom period. Such price setting behaviour seems to be strongly aided by weak regulatory capacity of key institutions in charge of the market. Reframed as censored logit equations, these same results obtained. Secondary data analysis equally showed that the relationship between actual levels of the all share price index for the period 1990 through 2007 were not driven by “expected” variables. While its fundamental values are driven by such monetary and relative price variables, actual values are driven by external sector variables and prices. Output was largely insignificant either for fundamental or actual movements in the ASPI.

1. Introduction

A. Background to the Study

The occurrence and existence of bubbles have gained reasonable academic attention (examples include, Froot and Obstfeld, 1992; Allen and Gorton, 1993; Biswanger, 1999; Chen, 1999; Abreu and Brunnermeier, 2003). The existence of stock market bubbles and crashes dates back to the 1600s. The Dutch tulip mania of 1630's, the South Sea bubble of 1719 – 1720 and more recently, the internet bubble, which peaked in early 2000, are some notorious cases (Abreu and Brunnermeier, 2003). Time and again, both pundits and market makers have had difficulty correctly foreseeing the direction of the market even in the medium term. For example, when on March 10, 2000, the technology-heavy NASDAQ composite peaked at 5,048.62, very few expected what was to follow the next couple of months. Even though such high movements were quite contrary to the trends in the rest of the economy (particularly given that the Federal Reserve had raised interest rates six times over the same period and that the rest of the economy was already beginning to slow down), the fall still caught many analysts and stakeholders unprepared. The bubble burst that followed (generally known as the dot-com bubble crash) wiped out about \$5 trillion in market value of technology companies between March 2000 and October 2002. Many other (non-technology) stocks followed in the wave of weak confidence in the market and lost values. A number of reasons have been given for that particular market crash, but as in many other times, such reasons often relate to market-specific occurrences and are weakly related to the overall question of what causes stock market crash and how these can be prevented. Consequently, the question of what causes a particular market crash remains a context-specific one that must be answered for all dips in the market.

Investors sometimes, albeit temporarily, show excessive optimism and pessimism which end in pulling stock prices away from their long term trend levels to extreme points. Just before a major burst, experience has shown, the market will always look so promising and attract some late comers who are also somewhat new and inexperienced in the business. Unfortunately, they are the most vulnerable in crisis times. However, even for the more mature investors, there is evidence that following the market is a very demanding job and no one actually ever does a perfect job of correctly predicting its direction. In particular, the cause of bubbles remains a challenge to most analysts, particularly those who are convinced that asset prices ought not to deviate strongly from intrinsic values. While many explanations have been suggested, it has been recently shown that bubbles appear even without uncertainty, speculation, or bounded rationality. For instance, in their work, Froot and Obstfeld (1992) explained several puzzling aspects of the behavior of the United States stock prices by the presence of a specific type of bubble that they termed “intrinsic bubbles”. Bubbles are often identified only in retrospect, when a sudden drop in prices appears. Such drop is known as a *crash* or a *bubble burst*. To date, there is no widely accepted theory to explain the occurrence of bubbles or their bursts. Interestingly, bubbles occur even in highly predictable experimental markets, where uncertainty is eliminated and market participants should be able to calculate the intrinsic value of the assets simply by examining the expected stream of dividends. Clearly, the existence of stock market bubbles is at odds with the assumptions of Efficient Market Theory (EMT) which assumes rational investor behaviour. Often, when the phenomenon appears, pundits try to find a rationale. Literatures show that sometimes, people will dismiss concerns about overpriced markets by citing a new economy where the old stock valuation rules may no longer apply. This type of thinking helps to further propagate the bubble whereby everyone is investing.

Economic bubbles are generally considered to have a negative impact on the economy because they tend to cause misallocation of resources into non-optimal uses. In addition, while the crashes which usually follow bubbles are momentous financial events that are fascinating to academics and practitioners, they often destroy large amount of wealth and cause continuing economic malaise. For investors, the fear of a crash is a perpetual source of stress, and the onset of the event itself always ruins the lives of some. Foreign portfolio investments are withdrawn and/or withheld in order to service domestic financial problems; prospects of reduced foreign direct investment are bound to affect investor confidence and the economic health of countries with market crash. In addition, a general credit crunch from lending institutions for businesses requiring short-and-long-term money may also result and a protracted period of risk aversion can simply prolong the downturn in asset price deflation as was the case of the Great Depression in the 1930s for much of the world and the 1990s for Japan. Not only can the aftermath of a crash devastate the economy of a nation, but its effects can also reverberate beyond its borders and beyond the time of its occurrence. Market reversals and the damage they inflict tend to leave deep-seated memories and emotional scars that are not easily healed with the passage of time. Clearly, crashes (i.e. bubble burst) occur immediately after market tops. The problem now arises as to what perennial parameters should be used to measure the cutting edge of “boom harvest” to avoid unforeseen future market crash.

This study is about market bubbles and crash in the Nigerian capital market. Beginning in 2004, the market witnessed unprecedented boom. This boom lasted till the beginning of 2008 and a crash ensued – one which was sustained till the end of the year. The market crash was a strong reminder that the magic wand for understanding and solving the problem of bubbles and bursts in markets is yet to be found. It equally was a reminder that no market in the world is immune to crashes and the so-called rule of new markets that can grow indefinitely does not hold yet for any emerging market. As in some of the bubbles and crashes of earlier years and other climes, a number of reasons could be responsible. But which of these is the chief cause and what is the probable channel of impact is not known. This is partly what this work intends to research into.

B. Statement of the problem

Recent events seem to indicate that the Nigerian capital market is in no way exempted from the proven imperfections in financial markets throughout the world. While the market has been growing since the turn of the 21st Century, the banking consolidation seemingly led to a flurry of activities in the market that culminated in sharp increases in the values of a majority of stocks in the Nigerian stock exchange. Stock price movements were strong and investments in the stock market yielded superior returns relative to other channels of investment in the country. It became fashionable to join the investment train. With a growth of about 74.5 percent in 2007, the Nigerian stock market was acclaimed one of the World’s fastest growing markets and was an all-investors’ toast. Investor confidence was very high and market capitalization peaked at N12.6 trillion as at the first week of March, 2008. Multiple returns, particularly in capital appreciation were reaped by a number of investors and market awareness was at an all time high as at the end of 2007.

However, the trend changed significantly beginning in the second week of March 2008. The market began to slide in both capitalization and all share indices. For instance, market capitalization of the 303 listed equities, which had opened on January 1, 2008, at N10.180

trillion and later appreciated to N12.395 trillion as at March 2008, suffered its highest fall in the 48-year history of the Nigerian Stock Exchange, depreciating by N3.223tn or 32 per cent to N6.957tn by the year end. The all-share index (indexed in 1984 at 100) which had risen to 66,371 as at March 5, 2008, equally dropped drastically by the end of the year. Every indicator in the stock market has continued to slide down.

The Nigerian market crash came even before the rest of the world joined in what has now come to be accepted as a global economic recession. While the crash in the price of quoted shares on the Nigerian Stock Exchange started in March, those of the United States started in August and some other developed countries followed later in October. Even though the US real estate crisis had already set in, there was no clear evidence of strong relationship or that it could be the factor driving the fall of prices in the Nigerian stock market. This indicates that changes in the global economy may not be enough explanation for the challenges that faced the Nigerian capital market and calls for further enquiry into the causes. Nonetheless, the decline that was witnessed in the Nigerian capital market cannot be separated from the worldwide financial crisis that has continued to hit hard on global stocks. Needless to say, this development is worrisome. Investor confidence waned in the market and other economic activities like consumption and investment may have been seriously affected. Already, some structural changes in investment (portfolio readjustments, decrease in overall investments, etc) are already going on and many investors are channeling resources to the money market, real estate and other alternative investment destinations. Given these trends, some analysts, investors and other stakeholders are already predicting that the market may be headed for a complete crash.

As in many other stock markets under the same circumstances, there have been competing arguments as to the cause of this development since the start of the crash. Explanations as to its cause have ranged from the very plausible to the downright ridiculous. While some believe the market has always been over-valued and is undergoing self-correction indicating that the reduction in share prices will be permanent, others see the correction as temporary. This difference in perception also arises because of differences in understanding of what really is driving the fall in market value of shares. While it is believed in some quarters that share prices rose faster than both market and other economic fundamentals, some see the Nigerian stock market as not having even grown up to its fundamentals and so still having opportunities for further growth, indicating that the correction is very temporary.

But clearly, very little empirical analyses support most of these explanations. It is evident that there has been little research into the real causes of the challenges facing the Nigerian stock market. There seem to be more opinions than empirical evidence as to the cause of the market changes. On the whole, while the Nigerian stock market has received comparatively less critical research than some of its developed market counterparts, the current crisis in the market has received even far less critical evidence-based assessment. Many years down the line of market booms and bursts, critical assessment of what drives the Nigerian capital market and the range of roles macroeconomic policies can play to support the market is still weak. The danger in this is that policy positions may not adequately mirror the actual and/or fundamental causes of the problem. In addition, probability of future recurrences is higher if the underlying causes of the problems are not unearthed. This research work sets out to systematically study the market with a view to understanding the different roles of market fundamentals and bubbles in the

determination of stock pricing and market movements. The critical measure of market activity used in the study is the all share price index.

C. Objectives and Relevance of the Study

Given the above, the primary objective of this research is to provide empirical evidence on the causes of the recent stock market crisis in Nigeria. Specifically, the study intends to

- ❖ Find out whether the movements in stock prices over the last couple of years (particularly since from 2004) follows fundamentals in the economy or merely reflect speculative (and other) bubbles. In other words, examine the relationship between stock market valuation and macroeconomic fundamentals in the country
- ❖ Assess the causes of the recent crisis in the Nigerian stock market
- ❖ Evaluate investor confidence in the market given these recent activities and occurrences
- ❖ Make recommendations on ways of avoiding or minimizing the negative consequences of such occurrences in the market in the future.

It is our conviction that this study has both academic and practical (policy) significance. The study will contribute to the literature particularly on the determination of developing countries' stock pricing and causes of stock market crises. Thus, it aims to add to the body of knowledge on the Nigerian stock market (which presently is relatively small) and point the way for more enquiry into the subject for future studies Besides, the issue under consideration in the work is one which is very current and relevant to investors, policymakers and other stakeholders in the Nigerian economy as it evaluates trends in the market and relate these to important economic goal posts in a meaningful, logical and empirical way. It particularly aims to influence policy on the stock market and inform on the relative roles of firm level fundamentals as well as market regulation and macroeconomic management in the determination of market movements.

II. Review of Related Literature

A Theoretical Review

1. Stock Valuation and the Theories of Investor Behaviour

According to Koller et al (2005), to examine the behavior of the stock market, one must first distinguish between what drives market valuation levels (such as market-value-to-capital ratios) and what drives total return to shareholders (TRS), which are primarily the market fundamentals. They state that market valuation levels are determined by the company's absolute level of long-term performance and growth, that is, expected revenue and earnings growth and return on invested capital (ROIC). TRS is measured by changes in the market valuation of a company over some specific time period and is driven by changes in investor expectations for long-term future returns on capital and growth. Their work showed that the relative market value of a company as measured by the market-value-to-capital ratio is determined by the company's growth and its spread of ROIC over the weighted average cost of capital (WACC).

Okafor (1983) classifies approaches to stock valuation under three broad headings: Fundamental Approach, Technical Approach and Efficient Market Approach/Efficient Market Hypothesis (EMT). The fundamentalists lay emphasis on real variables like dividends, earnings etc. They therefore conduct four major forms of analysis as follows - analysis of general economic

conditions, industry analysis, company analysis and financial analysis. The assumptions on which the fundamentalists operate are that every asset has an intrinsic value; the intrinsic value of every security is reflected by its market price and basic economic facts about a firm determine the intrinsic value of securities issued by it. The technicians reject the notion of intrinsic values on securities. Rather they study market conditions in general and price movements in particular. By implication, the technicians rely heavily on the market forces for determination of prices of securities. Dow Theory is perhaps the most popular tool of technical analysis. The theory upholds that all price actions comprise three contemporaneous movements – the primary movement, the secondary movement, and the minor movements. Charting techniques, which involves the use of graphs, and non-charting techniques, which involves other analytical procedures other than charts are other tools used in technical analysis.

The Efficient Market Hypothesis, on the other hand, is a modern development in security valuation. The theory holds that stocks are always in equilibrium and it is impossible for an investor to always “beat the market”. Consequently, the market is said to always be efficient implying that it adjusts to prices quickly and in an unbiased manner after the arrival of important news or surprises. Proponents of this theory are of the view that there are more pundits than there are stocks. There is parity to precision of their assessment as more analysts follow each stock in a given industry. Hence the price of stocks adjusts almost immediately to reflect any new developments.

Generally, there are three forms or levels of market efficiency.

- ❖ The weak form efficiency which holds that prices reflect all past information such as information in last year’s annual reports, previous earnings announcements, and other past news.
- ❖ The semi-strong form efficiency which holds that The semi-strong form of efficient market states that all public information, both past and present is reflected in asset prices and
- ❖ The strong form efficiency which holds that prices reflect all public and privately available knowledge including past and current information. Even corporate officers and other insiders cannot earn above average, risk-adjusted profits from buying and selling stock; even their detailed exclusive information already is reflected in current stock prices.

Two major theories dominate thinking on investor behaviour. These are the bandwagon theory and contrary opinion hypothesis. While the former asserts that errors of judgement in stock market transactions will be minimised by an investor who follows the lead market-makers, the latter is based on the assumption that small investors are usually wrong. Okafor (1983) asserts that “market-leads” which originate from odd-lot pressures are more likely to mislead than help the investor. There is an argument that in a discrete-time-finite horizon setting, stock prices cannot deviate from fundamentals unless traders are irrational or myopic. However, Allen and Gorton (1993) differed. They based their study on the assumption that investors hire portfolio managers to invest their wealth for them; the agency problem that arises between investors and managers because of asymmetric information between them means that asset prices can deviate from their fundamentals and bubbles can exist.

Koller et al (2005) assert that significant deviations from intrinsic value are rare, and markets revert to the economic fundamentals rapidly enough that managers should continue to base their decisions on such fundamental Discounted Cash Flow (DCF) analyses. But they also discovered three key conditions for market deviations from economic fundamentals which include irrational investor behavior, systematic patterns of behavior across different investors, and limits to arbitrage in financial markets the latter occurring where there are no barriers to arbitrage leading to the exploitation of systematic patterns of irrational behavior. When these conditions all apply, behavioral finance predicts that pricing biases in financial markets can be both significant and persistent.

2 Macroeconomic Fundamentals and the Stock Market

Beside the behaviours of micro private agents in the market, the broad macroeconomic conditions under which a market operates is definitely expected to impact on trends in that market. A number of key macroeconomic fundamentals like overall economic growth, inflation rates, exchange rates, monetary policy and interest rates, government fiscal policy, public indebtedness, taxation policies among others have significant influence on stock movements. Analysts and investors closely watch these variables and they impact on the pricing decisions of stocks. In this section, we review some of the issues in the relationship between such macroeconomic fundamentals and the stock market.

Several works have examined the relationship between stock market and economic growth and there are evidences that stock markets can give a boost to economic development and vice versa. The fact that capital, as generated from the stock market is needed for economic growth is not disputable (Soyode, 1990). The stock market is widely described as a leading indicator of any nation's economic direction. More generally, stock markets are seen as enhancing the operations of the domestic financial system in general and the capital market in particular (Kenny and Moss, 1998). When a nation's economy is doing well, its stock market usually mirrors this economic growth. An active stock market may be relied upon to measure changes in the general economic activities using the stock market index (Obadan, 1998). Savings mobilization and liquidity creation, foreign inflows, and risk diversification, are some of the contributions of stock markets to economic growth.

In principle, the stock market is expected to accelerate economic growth by providing a boost to domestic savings and increasing the quantity and the quality of investment (Singh, 1997). To achieve this, the stock market provides investors with facilities that may better meet their liquidity needs and risk preferences. Better savings mobilization may increase the savings rate (Levine and Zervos, 1998). Stock markets also provide an avenue for growing companies to raise capital at lower cost. In addition, companies in countries with developed stock markets are less dependent on bank financing, which can reduce the risk of a credit crunch. Stock markets therefore are able to positively influence economic growth through encouraging savings amongst individuals and providing avenues for firm financing. Costs of information are also reduced in an efficient stock market. Reducing the costs of acquiring information is expected to facilitate and improve the acquisition of information about investment opportunities and thereby improves resource allocation. Stock prices determined in exchanges and other publicly available information may help investor make better investment decisions and thereby ensure better allocation of funds among corporations and as a result a higher rate of economic growth.

Stock market liquidity is a reliable indicator of future long-term growth. It is expected to reduce the downside risk and costs of investing in projects that do not pay off for a long time. Investors are often reluctant to relinquish control of their savings for long periods except where such investments allow them to acquire an asset—equity—and to convert it to cash quickly and easily or alter their portfolios as they wish. Equally, firms enjoy unrestricted access to funds raised through equity issues. By facilitating longer-term, more profitable investments, liquid equity markets improve the allocation of capital and enhance prospects for long-term economic growth. Further, by making investment less risky and more profitable, stock market liquidity can also lead to more investment. Put succinctly, investors will come if they can leave.

However, there are alternative views about the effect of liquidity on long-term economic growth. Yartey and Adjasi (2007) pointed out the ambiguity of theories in explaining the exact impacts of greater stock market liquidity on economic growth. Some analysts argue that very liquid markets may negatively influence corporate governance thereby encouraging investor myopia. Since displeased investors can easily sell their shares, liquid markets may weaken investors' commitment and reduce incentives to exert corporate control by overseeing managers and monitoring firm performance and potential. In other words, instant stock market liquidity may discourage investors from having long-term commitment with firms whose shares they own and therefore create potential corporate governance problem with serious implications for economic growth (Bhide, 1993). According to this view, enhanced stock market liquidity may actually hurt economic growth.

Demirgüç-Kunt and Levine (1996) also observed that there are some channels through which liquidity can deter growth: Firstly, savings rate may be reduced, this happens when there are increasing returns on investment through income and substitution effect. As savings rate falls and with the existence of externality attached to capital accumulation, greater stock market liquidity could slow down economic growth. Secondly, reducing uncertainty associated with investment may impact on savings rate, but the extent and the direction remain ambiguous. This is because it is a function of the degree of risk-averseness of economic agents. Thirdly, effective corporate governance often touted as an advantage of liquidity of stock market may be adversely affected. The ease with which equity can be disposed off may weaken investors' commitment and serve as a disincentive to corporate control and vigilance on the part of investors thereby negating their role of monitoring firm's performance. This often culminates in stalling economic growth.

It is widely held that the stock market is a strong indicator of the level of economic activities within a country and that the direction of broad macroeconomic indicators like interest and exchange rates, savings rates and economic growth is picked up by the stock market. In the same vein, the stock market affects these indicators through multiple channels. Osinubi (2001) asserts that securities investment is a veritable medium of transforming savings into economic growth and development. Bencivenga, Smith and Starr (1996) equally insist that the level of economic activities is affected by the stock market through its liquidity-creating ability. It is understandable that profitable investment requires long-term funds. The easy transfer of capital ownership, which liquid equity market provides, facilitates firms' permanent access to capital raised through equity issues. Further to this, increased savings and investment tend to reduce the risk of investment facilitated by stock market and the prospect for long-term economic growth is

enhanced. In the same vein, stock markets can affect economic growth when they are internationally integrated through risk diversification. This enables greater economic risk sharing. Because high return projects also tend to be comparatively risky, stock markets that facilitate risk diversification which encourages a shift to higher-return projects (Obstfeld, 1994). This is to say that altering portfolio – a shift in a society's savings to higher-return investments – also accelerates growth.

However, critics of the stock market argue that stock market prices do not accurately reflect the underlying fundamentals when speculative bubbles emerge in the market (Binswanger, 1999). Under such situations, prices of stock are no longer driven by macroeconomic fundamentals and they tend towards irrational behavior. This irrationality is expected to adversely affect the real sector of the economy as it is in danger of becoming the by-product of a casino. They also point out that the actual operation of the pricing and takeover mechanism in well functioning stock markets lead to short term perceptions and lower rates of long term investment. It also generates perverse incentives, rewarding managers for their success in financial engineering rather than creating new wealth through organic growth (Singh, 1997). This is because prices react very quickly to a variety of information influencing expectations on financial markets. Therefore, prices on the stock market tend to be highly volatile and enable profits within short periods. Moreover, because the stock market undervalues long-term investment, managers are not encouraged to undertake long-term investments since their activities are judged by the performance of a company's financial assets, which may harm long run prospects of companies (Binswanger, 1999).

Whatever the arguments on stock market relationship with economic activities though, history seems to indicate that stock markets emerge as economies grow, become more diversified, complex and interlinked. Emergence of the stock market signals a movement away from rudimentary resource allocation to improved signals for economic growth. In fact, low economic development levels seem to be a strong reason why stock markets are not strong in many African countries. It has been argued that stock markets might not perform efficiently in developing countries and that it may not be feasible for African markets to promote stock markets given the huge costs relative to their weak economic base and poor financial structures (Singh, 1999). Weak regulatory institutions and greater macroeconomic volatility further exacerbate the inefficiency of stock markets in developing countries especially sub-Saharan African economies. The higher degree of price volatility on stock markets in developing countries reduces the efficiency of the price signals in allocating investment resources. These serious limitations of the stock market have led many analysts to question the importance of the system in promoting economic growth in African countries.

B. Empirical Review

Empirical research into the relationship between firm fundamentals, macroeconomic indicators and stock pricing is a long one and several works have made significant inroads into trying to understand these links. This section reviews a few of these works and draws out the implications of their findings.

Tripathi (2008) examined the relationship between four company fundamental variables (viz. market capitalization, book equity to market equity ratio, price earnings ratio and debt equity ratio) and equity returns in the Indian stock market using monthly price data of a sample of 455

companies forming part of S&P CNX 500 Index over the period June 1997 to June 2007. The results was that market capitalization and price earnings ratio have statistically significant negative relationship with equity returns while book equity to market equity ratio and debt equity ratio have statistically significant positive relationship with equity returns in India. The study further investigated whether the inclusion of any one or more of these fundamental variables can better explain cross sectional variations in equity returns in India than the single factor CAPM. The author used a model stated as Davis Fama and French (2000) methodology and found that Fama-French three factor model (based on market risk premium, size premium and value premium) explains cross sectional variations in equity returns in India in a much better way than the single factor CAPM. These results have important implications for market efficiency, asset pricing and market microstructure issues in Indian stock market.

On the relationship between stock market and macroeconomic indicators, a number of studies have been conducted and with only minor variations in statistical significance and direction of influence, the outcomes have largely mirrored positive relationship. Claessens et.al (2006) use panel data to study how local stock market development and internationalization—listing, trading, and capital raising in international exchanges—are related to economic fundamentals. According to their findings, higher-income economies with sounder macro policies, more efficient legal systems, greater openness, and higher growth opportunities have more developed local markets. Importantly, these fundamentals also relate to internationalization, and actually more so, since the better the fundamentals, the higher the ratio of internationalization to local market activity. They also found that greater domestic stock market development is associated with subsequent higher internationalization. These findings are not consistent with firms internationalizing to escape poor domestic environments, but rather with better country fundamentals allowing firms to internationalize and with countries with more developed stock markets experiencing more internationalization. With liquidity agglomeration, better fundamentals might further accelerate internationalization, with potential negative effects on domestic markets, as others have already argued.

On the other hand, Koller et al (2005) try to verify that markets reflect economic fundamentals by estimating the intrinsic valuation level for the U.S. stock market as a whole as well as UK stock market based on economic fundamentals, using an equity DCF valuation model over a 40-year period. According to them, their two-stage model was to accommodate both the long-term economic fundamentals and short-term fluctuations in key value drivers. They agreed that markets can sometimes be off, but such situations do not last. Sooner or later the market will revert to fundamental levels. Three important conclusions can be adduced from their work as follows: the stock markets in the United States and the United Kingdom have been fairly priced and have oscillated around their intrinsic price-to-earnings ratios. The intrinsic P/E ratio was typically near 15, with the exception of the high inflation years of the late 1970s and early 1980s, when it was closer to 10. Second, the late 1970s and late 1990s did indeed produce significant deviations from intrinsic value. In the late 1970s, as investors were obsessed with high short-term inflation rates, the market was probably valued too conservatively. Based on long-term real GDP growth and returns on equity, the stock market should not have dropped to a P/E level of 7. The other obvious deviation occurred in the late 1990s, when the market valuation rose to a P/E ratio near 25. Such a level for the 12-month forward-looking P/E ratio could not be justified by a long-term real GDP growth of 3 percent and returns on equity of 12 to 15 percent. Finally, when

such deviations occurred, the stock market corrected itself within a few years to its intrinsic valuation level. Thus, although market valuations can apparently be wrong from time to time—even for the stock market as a whole—market valuations return to values justified by economic fundamentals.

More specifically on the relationship between stock market and economic growth, Muellbauer and Nunziata (2001) use econometric models to examine the influence of stock market price index among other variables on the US GDP for 1955 - 2000. In their work they found out that a sustained fall in share prices, leads to lower spending and lower income growth, which in turn, lowers growth expectations and further lowers share prices. According to them, the fall in the stock market at the end of 2000, higher oil prices, higher inflation, tighter loan standards, the rise in interest rates between 1999 and 2000, the high level of the trade deficit, the high level of the output gap and the high level of the real exchange rate all have negative implications for growth in 2001. Levine and Zervos (1998) find a positive and significant correlation between stock market development and long run growth. However, due to the seeming empirical limitations (their study relied on a cross-sectional approach and showed inability to sort country-specific effects), Mohtadi and Argawal (2001) re-examined the long-run impact of stock markets on economic growth using dynamic panel data. Their argument was that the Levine and Zervos use of a cross-sectional approach limits the potential robustness of their findings with respect to country specific effects and time related effects. However, with a time series cross section for 21 emerging countries from 1977-1997, the results of Mohtadi and Argawal did not differ from that of Levine and Zervos. The results still suggest a positive relationship between several indicators of the stock market development and long-run growth.

Likewise, within the context of a dynamic general equilibrium framework of information asymmetries, endogenous contract choice and capital accumulation, Capasso (2003) further studied the linkages between stock market development and economic growth. The analysis is based on a model of optimal capital structure, developed by Bolton and Freixas (2000), in which firms design optimal securities to finance risky investment projects. The empirical evidence shows clearly that stock market activity is closely related to real activity, with firms having a greater preference towards issuing equity (rather than debt) as capital accumulation proceeds. In other words, the optimal capital structure of firms depends fundamentally on the level of economic development. According to the author, to appreciate the link between financial markets and growth, it is necessary to depart from the fiction of a perfectly functioning representative agent paradigm and to move towards a framework based on market imperfections where the Modigliani-Miller theorem fails to hold.

Cochrane (1994) examined the cause of variation between GDP growth and stock returns using the conventional VAR identification approach. In his analysis, he showed that substantial amount of variation is due to transitory shocks. He defines the transitory shock from two perspectives - in relation to the consumption/GDP ratio and in relation to the dividend/price ratio. Transitory shock to consumption - GDP ratio is a shock to GDP holding consumption constant so that the shock does not affect consumption contemporaneously. The facts that the consumption/GDP ratio does not forecast consumption growth and that consumption is nearly a random walk drive this definition. Similarly, he defines transitory shocks to the dividend-price system as shocks to stock prices holding dividends constant so that the shock does not affect dividends

contemporaneously. The facts that the dividend/price ratio may not forecast dividend growth and that dividend is nearly a random walk can justify this definition. However, Gonzalo, et al. (2007) criticized the earlier work of Cochrane (1994). Following the common trend of King, et al. (1991) known as King, Plosser, Stock and Watson (KPSW), they showed that Cochrane's results depended on the assumption of weak exogeneity of one of the variables with respect to the cointegration vector. Given the assumption, both approaches agree otherwise Cochrane's transitory shocks would not totally be transitory. In addition Gonzalo et al (2007) find that shocks could also be permanent. Their results showed that the permanent components of GDP and stock prices are much larger than those estimates of Cochrane (1994) although substantial (but much smaller than in Cochrane, 1994) variations in GDP growth and stock returns are attributed to transitory shocks.

Closer home for research done on the African continent, evidence does not seem to point to the sort of very strong impacts and relationship between output growth and the stock market. For example, Yartey and Adjasi (2007) study the effect of stock markets on economic growth using three stock market indicators – market capitalization relative to GDP, value of shares traded relative to GDP, and the turnover ratio (value traded/market capitalization). Their work followed Levine and Zervos (1998) modeling and estimation framework and the Arellano and Bond (1991) Difference Generalized Method of Moments dynamic instrumental variable modeling approach. The ratio of market capitalization to GDP indicator showed stock market development does not have a significant effect on economic growth; the total value of shares relative to GDP indicator showed that stock market development plays a significantly positive role in economic growth alongside investment and past growth levels; value added/market capitalization indicator stock markets do not significantly affect economic growth even though a significant effect of turnover ratio on economic growth would also reaffirm the effect of stock markets in growth due to the absence of a price effect in this indicator. The authors used Sargan and serial correlation tests to check the robustness and validity of the Difference GMM estimation. From the empirical analysis, the significant stock market driver of economic growth in Africa is the ratio of value of shares traded to GDP. Nyong (1997) attempted to develop an aggregate index of capital market development and use it to determine its relationship with long-run economic growth in Nigeria. The study employed a time series data from 1970 to 1994. For measures of capital market development the ratio of market capitalization to GDP (in percentage), the ratio of total value of transactions on the main stock exchange to GDP (in percentage), the value of equities transaction relative to GDP and listings were used. The four measures were combined into one overall composite index of capital market development using principal component analysis. A measure of financial market depth (which is the ratio of broad money to stock of money to GDP) was also included as control. The result of the study was that capital market development is negatively and significantly correlated with long-run growth in Nigeria. The result also showed that there exists bi-directional causality between capital market development and economic growth. Osinubi and Amaghionyeodiwe (2003) equally assess the relationship between stock market development and long-run economic growth in Nigeria for the period 1980 to 2000. The study used secondary data while four models of multiple regressions were specified. The regression results, which were obtained using the Ordinary Least Square (OLS), show that measures of stock market development statistically have no significant effect on economic growth in Nigeria during the period 1980 to 2000. The major implication of the findings is that if the Nigerian Stock Market is to significantly contribute to rapid economic growth, policies must be fashioned out to eliminate those factors that blur the effectiveness of the vehicle or transmission mechanism through which stock market

activities influence economic growth. These findings seem to confirm the earlier point made under the theoretical review that weak economic base and institutions compromise the relationship between macroeconomic indicators and activities in the stock market.

A number of studies have also worked on the relationship between stock markets and inflation. Numerous empirical studies such as Jaffe and Mandelker (1976), Nelson (1976), and Fama and Schwert (1977) establish that inflation has a negative short-run effect on stock returns but few studies report a positive, long-run Fisher effect for stock returns. Campbell and Vuolteenaho (2003) used the loglinear dynamic valuation framework of Campbell and Shiller (1988), since this framework, unlike the simple Gordon model, allows for time-varying discount rates and dividend growth rates. The Gordon model (1) has the limitation that the expected returns and expected growth must be constant. They found that high inflation is positively correlated with rationally expected long-run real dividend growth; inflation is almost uncorrelated with the subjective risk premium. However, inflation is highly correlated with mispricing, supporting the Modigliani-Cohn (1979) view that investors form subjective growth forecasts by extrapolating past nominal growth rates without adjusting for changes in inflation. Domian, Gilster, and Louton (1996) used the change in monthly Treasury bill rates and stock returns to show the relationship between stock prices and inflation. Their sample covers the United States from 1952 to 1992. Their findings supports popular results: Stock returns are significantly negatively related to changes in Treasury bill yields.

Related studies on the impact of inflation include Schwert (1981), which analyzes the reaction of stock prices to new information about inflation. Based on daily returns to the Standard and Poor's (S&P) composite portfolio from 1953-78, his work shows that the stock market reacts negatively to the announcement of unexpected inflation in the Consumer Price Index (C.P.I.), approximately one month after the price data are collected by the Bureau of Labour Statistics although the magnitude of the reaction is small. Using stock price and goods price data from six industrial countries, Kolari and Anari (2001) tried to show differential impacts of changes in price levels on equity prices in both the short and long run. Their findings show that long-run Fisher elasticity of stock prices with respect to goods prices exceed unity and are in the range of 1.04 to 1.65, which tend to support the Fisher effect. They also found that the time path of the response of stock prices to a shock in goods prices exhibits an initial negative response which turns positive over longer horizons. These results help to reconcile previous short-run and long-run empirical evidence on stock returns and inflation. Also, they reveal that stock prices have a long memory with respect to inflation shocks, such that investors should expect stocks to be a good inflation hedge over a long holding period.

A number of other studies have also worked on other macro indicators with mixed findings. For example, Das (2005) shows there are evidence that stock prices and interest rates possess a common trend in many of the countries he studied with the exception of India. However, there is strong evidence of common cycles for the other countries. These findings provide support to the view that although bond markets and stock markets in these countries are linked, this may not be through a common trend, but through a common cyclical pattern. From the policy point of view, being linked through a common cyclical pattern provides the advantage of better forecasting or decomposition of stock price change affected by bank interest rate change. Haastreht et al (2009) dealt with the pricing of stock, foreign exchange and inflation options under stochastic

interest rates and volatility. They considered a generic foreign exchange framework for the pricing of foreign exchange (FX), inflation and stock options. Moreover they allowed for a general correlation structure between the drivers of the volatility, the inflation index, the domestic (nominal) and the foreign (real) rates. Having the flexibility to correlate the underlying FX/Inflation/Stock index with both stochastic volatility and stochastic interest rates yields a realistic model, which is of practical importance for the pricing and hedging of options with a long-term exposure. They derive explicit option pricing formulas for various securities, like vanilla call/put options, forward starting options, inflation-indexed swaps and inflation caps/floors. Finally, they test the numerical quality of this approximation and consider a calibration example to FX market data.

Acknowledging the large body of evidence which indicates that macroeconomic and financial variables are dynamically interrelated, Hess (2003) tries to assess the extent of such interrelationship in the Swiss economy. The study analyzed the impacts of macroeconomic shocks on various sector indices of the Swiss Stock Market using a Vector error correction model (VECM). The VECM tried to disentangle local and foreign as well as macroeconomic and financial effects. He found that sector sub indices diverge to an important extent in their sensitivity to news about fundamental variables. On the other hand, Kent and Lowe (1997) build a model that assumes that asset-price bubbles arise exogenously, and that they “pop” with some exogenous probability. They then assume that there is some probability that an increase in interest rates might increase the chances of stock prices returning to their fundamental level. They also assume that inflation is directly related to the extent to which stock prices are above fundamental levels. Given these assumptions, and the objective of keeping inflation within targets, they derive optimal interest rate policies. These policies imply that a bubble will result in interest rates being set at a higher-than-neutral rate, and show that this rate will be lower the more efficient interest rates are in eliminating bubbles. The clear challenge presented by this work though is that of how to substantiate the very strong assumptions made by the authors.

Lastly, Billmeier and Massa (2009) assess the macroeconomic determinants of stock market capitalization in a panel of 17 emerging markets in the Middle East and Central Asia, including both oil-rich countries and economies without sizeable natural resource wealth. In addition to traditional variables, they included an institutional variable and remittances among the regressors. They found that (i) both institutions and remittances have a positive and significant impact on market capitalization; and (ii) both regressors matter, especially in countries without significant hydrocarbon sectors; whereas (iii) in resource-rich countries, stock market capitalization is mainly driven by the oil price.

A clear message from these reviewed works is that there is some relationship between the stock market and both firm-level and macroeconomic fundamentals. Arguments definitely exist as to the direction of such impacts, whether from the stock market to the rest of the economy, from the rest of the economy to the stock market or bi-directional. There are also arguments as to the size of the impacts whatever the direction assumed or observed. For countries with weak capital markets, low level of economic activity etc, the direction and size of impacts could be on the unclear. The fact that results from different works and on different countries differ in both size of estimates and broad policy implications makes a fundamental case for context-specific research on the subject matter on each country to be able to derive policy lessons. As can be seen from the review, there is a case about developing countries that hangs in the air i.e. that the relationship

could be weak for poor countries. But exactly how weak it can be depends on the level of development of the stock market. Since the early 1980s, the Nigerian stock market has been active and capitalization has continued to increase persistently. It has also suffered a major shock. But it is not known how these affect the broad macroeconomy or how various indicators in the economy contribute to its growth or to the shock and what implications these have for policies to manage the stock exchange. There is need for some empirical estimates in this respect.

III. Research Methodology

Given the overall aim of this work, it will be appropriate to employ both econometric analysis of both time series and survey data. The methodology shall therefore be a mix of primary and secondary data. A survey instrument which aims at eliciting information on the causes and impacts of the fall in key market indices was designed and administered on a select number of market operators, regulators, employees of quoted firms, investors and other stakeholders. For the secondary data, the publications of the Nigeria Stock Exchange, the Central Bank of Nigeria and other major institutions in the country will be used. For the time series estimation, a single equation regression model of the relationship between the all-share price index and related macro and micro indicators shall be specified and estimated. This section is expected to capture the impacts of the broad macroeconomic indicators with quarterly data from 1990 through 2007.

A. Survey Data Analysis

1. Instrument, Method and Coverage

A questionnaire has been designed and information elicited from stakeholders, particularly those working in stock-broking houses, the Nigerian stock exchange, investors, managers of quoted firms and other stakeholders. Most of the variables in the time series model are broad macroeconomic indicators. However, there are microeconomic issues relating to regulation and management of firms in the stock market that would doubtless have been important in affecting the recent trends in the market. The time series analysis is not able to fully capture these micro concerns. To therefore have a fuller picture, this study develops a survey instrument (structured questionnaire) to elicit the relevant information from stakeholders in the stock exchange. Responses obtained from the instrument shall be separately analyzed and the results compared to the ones obtained from the time series analysis to give a fuller picture of the factors affecting the stock exchange.

The questionnaire is structured to more effectively capture micro issues like balance sheet of the quoted firms, profitability and dividend sharing policies of the firms as well as selected aspects of the regulation of the stock market. The questionnaire is divided into three sections. Section one, with eight questions, deals with introductory issues and personal information of the respondent. Among other things, the first part aims to elicit information on the confidence level in the market among stakeholders given recent trends in stock prices. Section two, with ten questions, deals in greater details with micro issues of firm profitability, dividend policies, management capabilities and the balance sheet size of quoted firms, relating these to the pricing of stocks in the market. Section three, with twelve questions, covers issues of regulation and broad macroeconomic environment under which the stock market operates. Most of the questions aim to find out stakeholders' views on the contributions of both the regulatory

framework and the direction of the rest of the macro economy on the stock market. In all, there are 30 questions in the questionnaire

2 Analytical Techniques for the Survey Data

The principal objective here is to find out the extent to which each of the factors listed in the questionnaire determine prices and activities in the stock market. Consequently, the causative factors shall be grouped depending on the responses obtained and analyzed using standard statistical tools like tables, charts, as well as measures of central tendencies and dispersion. However, to effectively capture causality, a dichotomous binary estimator shall be used. Four variants of such dichotomous binary estimators generally come in handy in modeling vector qualitative variables – the Linear Probability Model [LPM], the Logit model, the Probit (Normit) model and the Tobit model. Among all four, the Logit model is known to be superior to the other three as an analytical technique. The LPM has structural deficiencies while the Tobit and Probit models are computationally unattractive (Gujarati, 1995; Holly and Weale, 2000). Therefore, analysis in this work shall be limited to the use of the Logit model. The probability function of a causality for price movements under the Logit model by any of the factors listed by respondents (represented here with an omnibus term (Pr) could be obtained as:

$$P(\text{Pr}) = E(\text{Pr} = 1/\{X_i\}) = 1/1 + e^{-\alpha_i}$$

Where p is probability of causality, Pr is the dependent variable (in this case price movement), E is expected value, Xi is a vector of explanatory variables and e is a binary operator. To ease interpretation and ensure consistency in the estimation, the original data obtained via likert scale responses will be converted to two groups of variables i.e. positive and negative. For responses where there are two sets of possible responses, they will be grouped as related. For example ‘strong’ and ‘very strong’ will be grouped as positive with a value of 1 while ‘weak’ and ‘very weak’ will be grouped as negative with a value of 0 and classified as not being strong enough to merit policy attention. A linear regression will then be used to estimate the relative impact of the different variables on stock prices.

B. The Time Series Model

1 Model Specification and Justification of the Variables

A time series analysis of the determinants of stock prices employing selected macroeconomic fundamentals like exchange rate, interest rate, output growth and inflation rate shall be specified and estimated. Activities in the Nigerian stock exchange shall be proxied by the all-share price index (ASPI). The choice of the all-share price index as a proxy is based on two major considerations. First, it is a ratio and is therefore already in standard measurement that needs no further conversion. Secondly, more than any other variable, it has the capacity of capturing trends in all stock prices simultaneously. Given that each price movement that reflects in the ASPI is in ratio of the original price, the ASPI equally gives a weighted average of the prices and of other economic activities relating to trading in the market.

The relationship between output and stock market indices is well documented in the literature, both theoretical and empirical (as outlined in section 2). This relationship is obviously bidirectional. For example, growth translates to increased savings which makes resources available for investment in the stock market. It also leads to economic diversification and

therefore a deepening of the stock market. However, stock market deepening leads to more efficient resource mobilization which in turn makes available long term funds for increased investment and growth. However, the focus in this study is limited to the impact of growth on stock prices, which is conceptually transmitted through a number of ways – the most important being through increased savings. Increased income leads to increased availability of investible savings (at least in absolute terms) and availability of such investible resources determine demand and supply of stocks which in turn affects stock prices and other indices. Therefore, economic growth shall be brought in as one of the explanatory variables for all-share price index. The relationship is proposed to be positive.

Inflation, the persistent movement of prices upwards equally affects prices of stocks. In fact, being a price variable itself, stock price ought to be a component of the overall price levels in an economy. However, in some cases as in Nigeria, we do not have evidence that the calculation of the price index incorporates movements in stock prices. All the same, overall prices in the economy affect stock prices through a number of ways – co-movement and causality. In terms of co movement, it is common knowledge that prices tend to move in the same direction within an economy. However, attention here is paid to the causality. Upward movement in other prices in the economy will tend to put pressure on the prices of stocks. This partly will be the outcome of attempt by operatives in the stock market to effectively anchor stock prices to be a wedge against loss of value in assets on account of domestic inflation. However, inflation could be an instability factor leading to perception of risk in the stock market. Besides, when inflation lowers absolute purchasing power without commensurate rise in income, households are likely to put in places to make hard choices between present sustenance and investment in stocks, leading to possible crowding out of investment in stocks. In fact in the literature, evidence seems to point to potential negative short run relationship but positive long run relationship. Therefore the impact of inflation is proposed in this model to be either positive or negative.

Interest rate is the principal return on capital. In capital investment, there are short run (money market) and long run (capital market) options. These options imply potential trade off in the decisions to invest in either of the two. In Nigeria, high, assured interest rates on money market instruments have often meant less attention to the more unstable returns from investment in the capital market. Therefore increases in rewards to money market investment may reduce investment in the stock market and therefore depress the share price index. However, given that both are prices; there is the possibility of co-trending as well between stock prices and interest rates. Therefore, the relationship between interest rates and stock prices shall be assumed to either be positive or negative in this model. Viewed from the perspective of savings mobilization impact, the operational interest rate should be the average savings rate. However, given the experience of the country where margin facility has become increasingly significant in stock investment, the prime lending rate will also be experimented with.

Nigeria operates a fairly open capital account. Over the period 2004 through 2007, the consolidation of the banking sector came with a surge in public offers. It is believed in many quarters that a substantial part of the investments in these public offers came from remittances and portfolio flows from abroad. This proposition is yet to be empirically tested. However, it signals the possible impact of the external sector on the movements in stock prices over the period. As such, it will be helpful to bring in selected indicators of the external sector.

Theoretically, the principal influence should come from portfolio flows which follow interest rate differentials. The impact of remittances will also be tested here. Generally, higher portfolio flows and higher remittances should lead to increases in the all-share price index as demand exceeds supply in the stock exchange. The impact of the rest of the world shall be proxied using the index of OECD production, which shall also be interpolated.

In line with Tripathi (2008) and other key works in the area, a principal firm level fundamental that will be used in this study is market capitalization. However, the study shall use aggregate market capitalization and not individual firm capitalization. It is expected that the relationship between market capitalization and the price index will be positive.

Given the above, the final model can be mathematically represented as follows:

$$ASPI = ASPI(Y, INF, PLR, PF, REM, OECD, SMK)$$

Where ASPI is the all share price index, Y is income, INF is inflation rate, PLR is the prime lending rate, PF is short term portfolio flows, REM is remittances, OECD is the index of production in OECD countries and SMK is stock market capitalization.

Functionally, the model is given as:

$$ASPI = C + \alpha Y \pm \beta INF \pm \chi PLR + \delta PF + \phi REM + \eta OECD + \gamma SMK + \mu$$

All variables are as earlier defined; $\alpha, \beta, \chi, \delta, \phi, \eta, \gamma$ are coefficients while μ is a randomly distributed error term.

2 Analytical Techniques and Data Sources

The study shall use an error correction model to evaluate the nature and size of the long run relationship between the all-share price index and the selected fundamentals. The introduction of the error correction factor (ECF) is expected to show the rate of adjustment back to equilibrium given a shock to the relationship among the variables.

$$ASPI = C + \alpha Y \pm \beta INF \pm \chi PLR + \delta PF + \phi REM + \eta OECD + \gamma SMK - ECF + \mu$$

All variables are as earlier defined. ECF is the error correction factor. Lags of the dependent variable shall be incorporated as explanatory variables to track the autonomous movements of the all-share price index irrespective of trends in the movements of the explanatory variables. In fact, this study shall experiment with an extreme case of such autoregressive model where the all-share price index is made to be a function of just its own lags in order to test the random walk hypothesis and therefore efficiency of the market. The result from this second model will be compared with the one specified above. This will help in making judgments about the relationship between the market and the rest of the economy and in determining what really drives prices and therefore the fall in prices in the market. Equilibrium levels of the fundamentals shall be determined using Williamson (1994) ex-ante methodology which uses a single equation to decompose times series data into permanent and transitory components.

Data for the secondary analysis shall be sourced from published materials of the Central Bank of Nigeria and the Nigeria Stock Exchange. However, data on real sector variables like output (and its growth rate) which are not available on higher frequency shall be obtained using any of the regular interpolation techniques.

IV. Findings

A. Findings from Primary Survey

1. Some Statistics on Reactions from the Field

As much as possible, attempts were made to have a representative sample from key operators in the capital market. In all, 71 responses were elicited, 28 percent of which consists of bankers, 15 percent each of stockbrokers and employees of quoted firms, another 21 percent from government officials and market regulators, 10 percent directly from investors and 11 percent from others. Experience of most of the respondents on the market was considered very appreciable with 18 percent of them being employers of labour in these sectors, 28 percent being senior management employees, 51 percent being mid-level management staff and only 3 percent being others. About 79 percent of these have investments in the stock market and only 21 percent notify their investments were mainly in other sectors and many of these are very closely familiar with the Lagos trading floor of the Nigeria Stock Exchange.

One of the first questions that was asked them was whether they suffered any losses in the market during the fall in prices. The aim was to ascertain that though they might be insiders, they did not wield enough powers to manipulate prices themselves in a way that could bias their responses. 76 percent of the respondents notified that they had substantial losses from the market crash. Figure 1 captures how such losses affected their confidence in the market. Evidently, confidence in the market has drastically been dampened. In fact, about 71 percent of the entire respondents were either not very sure or were certain they were not going to invest in the market again. Though we believe that still has to be seen as future price increases may still attract many of them back into the market, the responses reflect impact of the fall in prices on sentiments in the market as well as the level of care investors may apply in future dealings on the market.

We followed up to ascertain to what extent the fall in the market was viewed (or is known) by operators and stakeholders as temporary adjustment to previous stock price overvaluation as opposed to the outcome of specific inconsistencies in both regulatory and management structures in the market. The responses are shown in figure 2. Interestingly, only 1 percent of the respondents believe it is just about price adjustment. Many were emphatic that it had nothing to do with adjustment while about 74 percent think it goes beyond mere price adjustment.

Fig 1: Is your confidence in the market dampened?

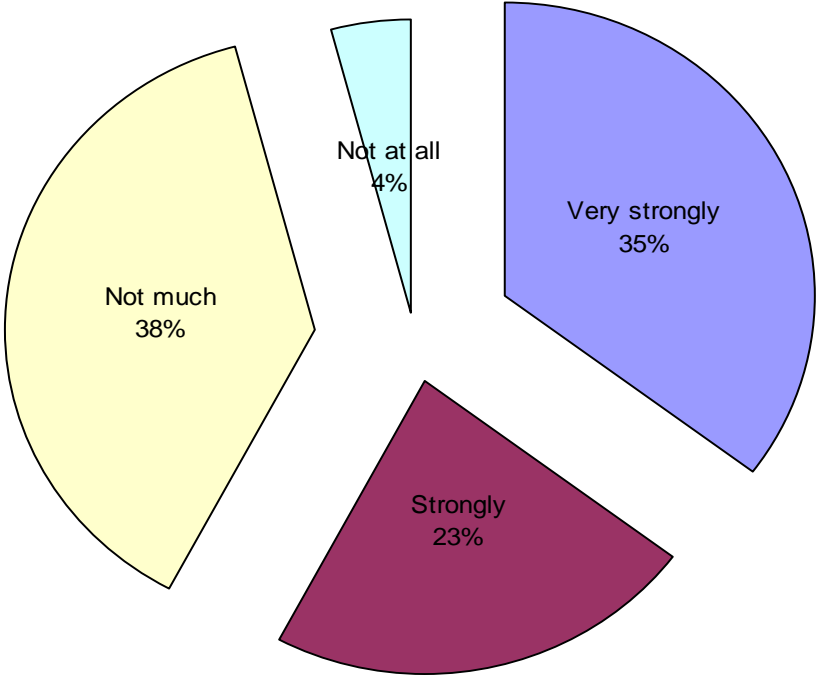
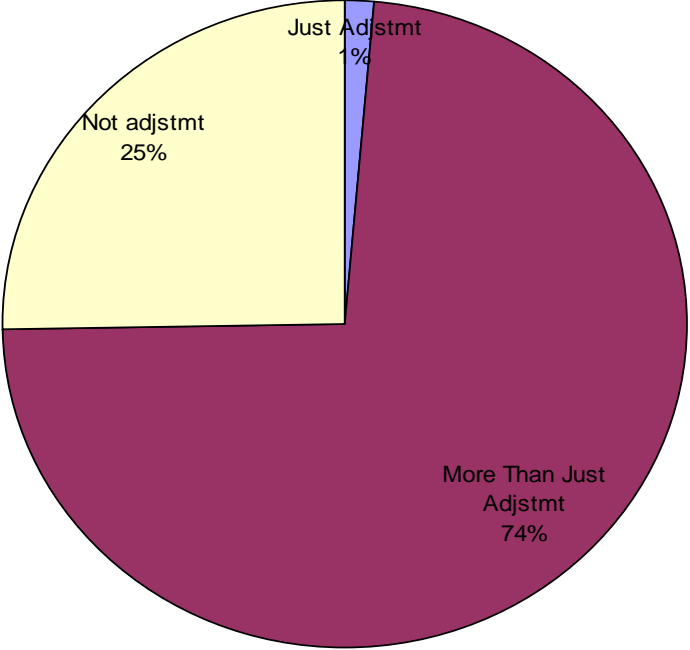
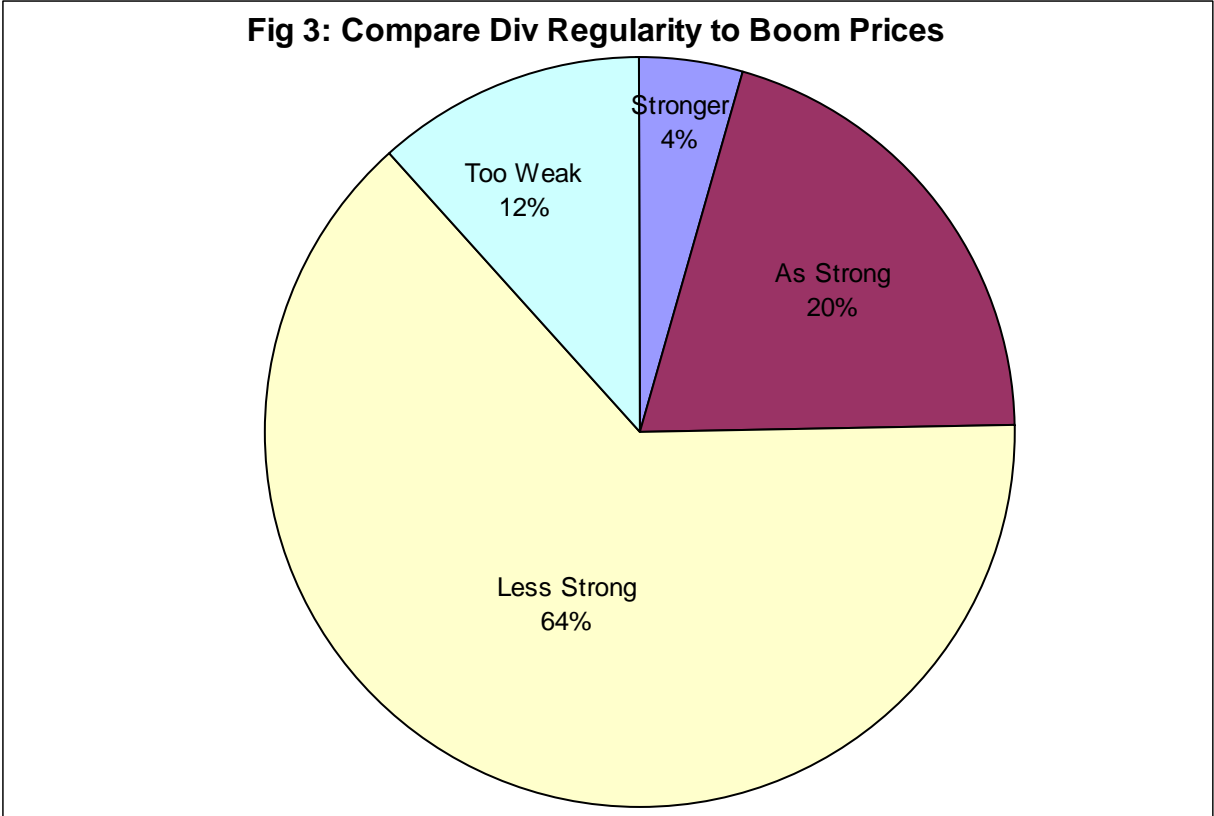


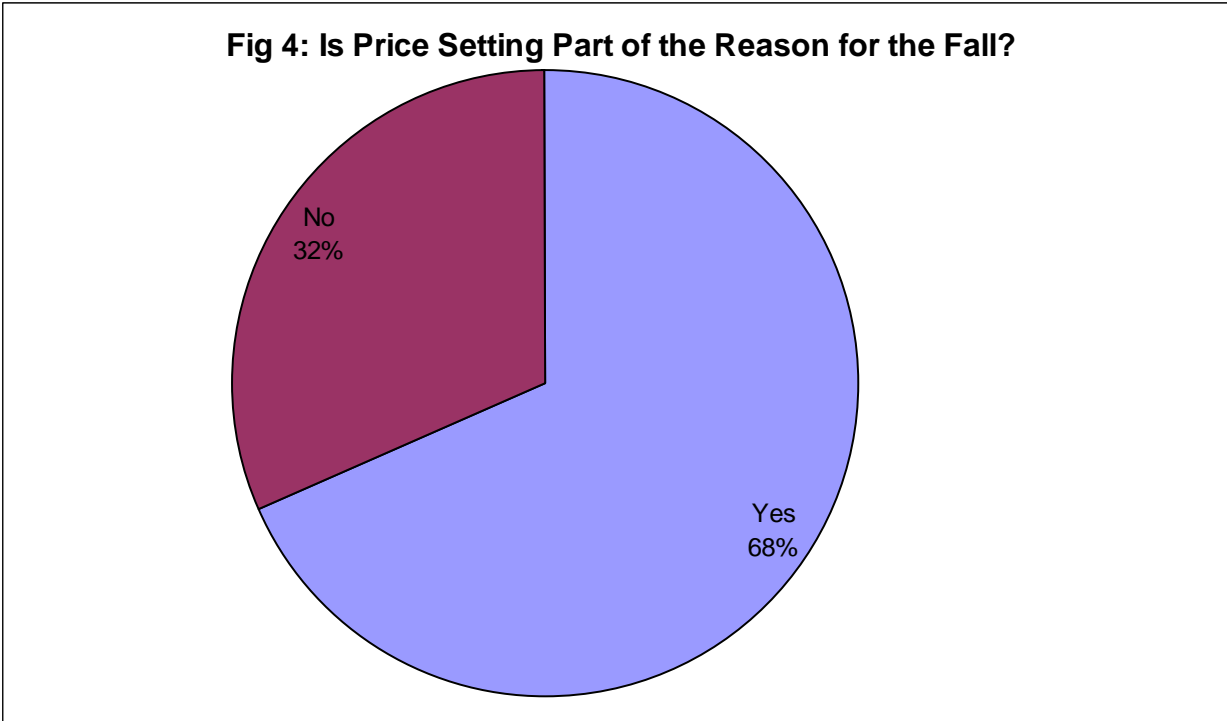
Fig 2: Does the Fall in Prices Reflect Adjustment or more...?



Following this, a number of micro/firm level fundamentals were selected and respondents were requested to relate them to share prices between 2004 and early 2008. Five indicators chosen include management standards and practices in the quoted firms, size of posted profits of the firms, regularity of dividend payouts by the firms, the size of dividend paid to investors in the firms and structure and size of balance sheet of quoted firms. Figure 3 shows the responses on regularity of dividend payout, which mirrors the responses on the other indicators. From the figure, clearly the majority figures that prices were not matched by regularity of dividend payout by quoted firms. A combined 78 percent of the respondents believed regularity of dividend payout was much weaker than the quoted prices of the firms. In fact, only less than 10 percent of the entire array of quoted firms had any consistent dividend payout policy and/or stick to any such policy where they exist. There are a number of quoted firms that were yet to pay any dividend whatsoever since they were listed. Others have paid once or twice and stopped since. Only a number of the firms in the banking sector and food/confectionaries consistently paid dividends and/or had script issues on a regular basis. The response on dividend regularity largely mirrors responses on the other micro variables. For example, a combined 68 percent believe that posted profits were weaker than stock prices as opposed to 32 percent who either think posted profits matched prices or were stronger. While 73 percent believed that amounts paid out as dividend were too small compared to stock prices, 53 percent strongly indicated that even management standards and practices in these firms were much weaker than comparable prices of the firms on the exchange. It was only on the balance sheet of quoted companies that sentiments were a bit favourable as up to 56 percent believed firm balance sheets were healthy enough to warrant the stock prices.

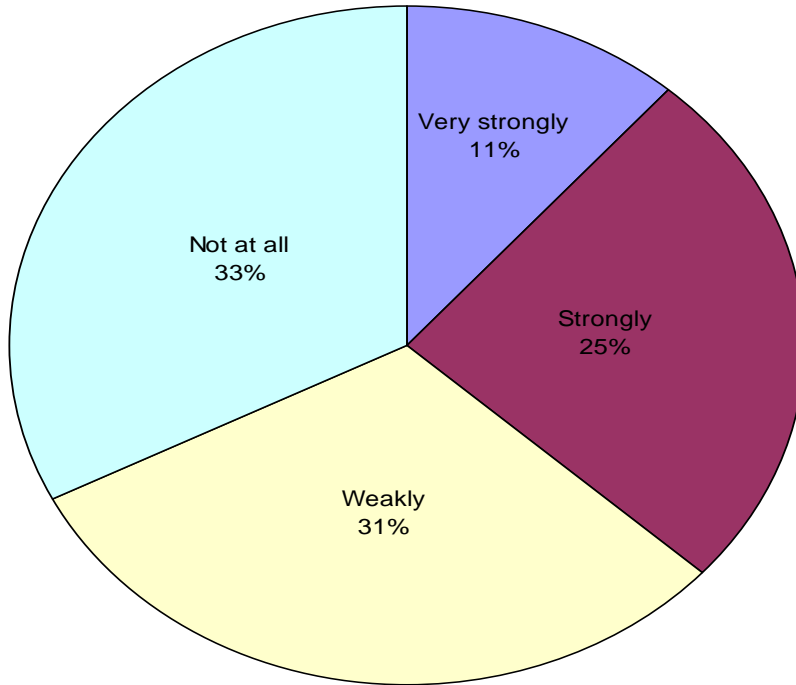


So the questionnaire narrowed further down to get information on specific factors, including regulatory and management irregularities in the market that could be part of the reason for the price movements. The finding as reflected in figure 4 shows that price setting by key players and firms in the exchange is the central factor to blame. Such price setting involved the manipulation of prices in order to achieve such short term goals as increased investment in the firm, higher returns for a small proportion of shareholders who may control majority shares in the firms, etc. Though we could not immediately confirm the extent to which the use of margin facilities was responsible for this, indications are that a number of reform changes and diversification requirements of regulation contributed to the irregularities. For example, given the structure of share holding in a majority of banks prior to the consolidation exercise, some powerful shareholders worked seriously to increase the value of their shares before selling to the rest of the public in either through public offers or the secondary market.



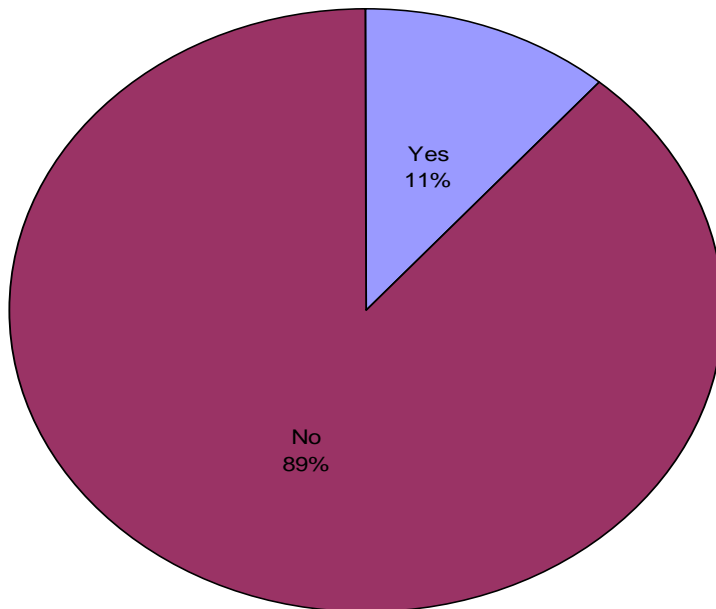
Respondents did not altogether exonerate the macroeconomic environment from the happenings in the stock market. For example, nearly 86 percent believe that stock prices equally tried to reflect inflationary trends in the economy and that macroeconomic instability arising from fluctuations in prices were partly responsible for the price rise and subsequent collapse. Another 70 percent linked the surge in stock prices between 2004 and 2008 to the relatively high growth of the economy within the same period in some way. However, when it comes to whether such big events as the change in government (which occurred just about 9 months before the beginning of the collapse in prices) had impact on the market, many thought otherwise. Figure 5 indicates that only about 36 percent could make the link. The rest believe the negative movements in the market had little or nothing to do with the change in government.

Fig 5: Do You Think the Change in Govt Had Impact on the Market?



The survey also tried to elicit information on broad perception of respondents on the governance structure in the market. It specifically asked whether respondents thought there were enough safeguards in the market to regulate the system. Figure 6 summarizes the responses on this. About 89 percent of the respondents made it clear there are not enough safeguards in the system to regulate it – another way of saying market regulation is extremely weak in the NSE.

Fig 6: Are There Enough Safeguards to Regulate the System?



2. Censored-Logistic Analyses

Using standard regression techniques, attempts were made to confirm the results obtained and give probability representations of the responses. To do so, a censored logit model was applied as earlier specified. However, given that there was no independent question asked on stock pricing, the dependent variable had to be slightly adjusted and availability of safeguards in the system, on which responses largely mirrored the reality of stock price fall was used. For this first equation, dependent variables were deliberately chosen to include only the critical firm level and stock market regulatory factors. These include existence or otherwise of price setting behaviour, extent to which such price setting affected the market, management standards and practices, size of posted profits of the firms, regularity of dividend payment and amounts paid out as dividend, balance sheet of the quoted companies and extent to which regulation capacity of both the Nigeria Stock Exchange and the Securities and Exchange Commission meet minimum standards. As shown in table 1, four factors more than others were critically associated with the view on lack of safeguards in the market. These include price setting behaviour of firms, poor management standards and practices in the quoted firms, irregularity of dividend payment and weakness in the regulatory capacity of both the Nigeria Stock Exchange and Securities and Exchange Commission. Other factors like amount shared as dividend, posted profits and balance sheet of the firms were less important, again confirming the trends observed in the statistical analyses. A similar regression on macroeconomic indicators (not displayed here) identifies macroeconomic instability, policies on margin facility, growth and the change in government as significant determinants. In effect, these latter macroeconomic variables provided the environment for specific regulatory weaknesses of key regulators (NSE and SEC) to be exploited by price setting tendencies and weak management standards of the quoted firms to provide overall weakness in the safeguard system and lead to market instability and general overvaluation of prices on the market which collapsed when it could bear no more.

Interestingly, similar equations run on factors that could contribute to a rebound in the market seem to indicate little faith by stakeholders in the resolution of these micro challenges and direct market regulation issues within the short period in which they expect the market to at least moderately rebound. Two of such equations were again estimated, the first using predominantly the same micro variables used in the equation in table 1 and the second using predominantly macro variables, including growth, macroeconomic instability, and change in government. The factors identified by respondents in both equations as potential redemptive measures to be taken include more effective management of inflation and macroeconomic instability measures, effective policies on the use of margin facilities for stock purchase and upturn in the global economic condition. Changes in government once again showed up as not being of any importance one way or another. Stakeholders are obviously not concerned about the impact of government in power, probably indicating that they are not expecting any major shift in policies on account of the change. Economic growth is also not expected to have much impact (maybe not much change in the growth rate is expected over the time horizon for which a rebound is possible by respondents either). Firm profitability, management, and improved regulation are also not expected very soon as to lead to market rebound. Nor do stakeholders expect that changes in broad credit policy and other governance indicators were going to make significant impacts in terms of leading to a turnaround in the market.

Table 1: A Censored Logit Model of Availability of Safeguard in the Market

Dependent Variable: SAFGUAD				
Method: ML - Censored Logistic (Quadratic hill climbing)				
Date: 06/25/09 Time: 06:54				
Sample: 1 71				
Included observations: 55				
Left censoring (value) at zero				
Convergence achieved after 5 iterations				
Covariance matrix computed using second derivatives				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
PRICESET	-0.278458	0.154629	-1.800817	0.0717
PRICING	0.325267	0.105670	3.078152	0.0021
MGTSP	0.238693	0.076329	3.127153	0.0018
POSPRFIT	-0.055053	0.078129	-0.704649	0.4810
REGDIV	0.255620	0.077805	3.285374	0.0010
DIVAMT	0.082132	0.060035	1.368073	0.1713
BSHT	-0.027629	0.062402	-0.442763	0.6579
NSEREQ	0.188753	0.056225	3.357127	0.0008
	Error Distribution			
SCALE:C(9)	0.193212	0.022484	8.593357	0.0000
Mean dependent var	1.890909	S.D. dependent var		0.314627
S.E. of regression	0.425980	Akaike info criterion		1.115112
Sum squared resid	8.528582	Schwarz criterion		1.443585
Log likelihood	-21.66559	Hannan-Quinn criter.		1.242135
Avg. log likelihood	-0.393920			
Left censored obs	0	Right censored obs		0
Uncensored obs	55	Total obs		55

B. Evidence from Secondary Data

The last part of the analysis examines the relationship between stock pricing, here proxied by the all share price index and broad macroeconomic indicators to complement the views from the survey. Chosen indicators include interest rate which is expected to serve either of two purposes – indicate alternative investment opportunities in the money market as well as show access to funds from the money market which agents can invest to make short term gains in the capital market. Others are income, money supply, government expenditure, credit to the private sector,

nominal exchange rate, number of listed securities and remittances. Two equations were estimated. The first equation uses a derived value of the all share price index obtained by estimating a single equation of the relationship of the index with broad macroeconomic fundamentals of the economy, indicated as ASPIGEN. The value of the all share price index that is consistent with the long term value of these determinants is taken as its fundamental value. Deviations from this value were thereafter regarded as bubbles or irregular movements in the real value of the all share price index. Identified fundamentals include output, money supply, inflation and interest rates. The fundamental value of the all share price index (ASPIGEN) were then ploughed back into an equation of a broader set of determinants and the results compared to a regular error correction function of the deflated all share price index using identified indicators. Factors that affect the “normal all share price index” but do not affected the fundamental all share price index are considered to have temporary impacts and so may not matter in the long run determination of ASPI. For both equations, the estimation technique is general-to-specific in order to capture economy-specific relevant factors that may ordinarily not appear in a theory-constrained model. The results from the two are compared.

Unit root and cointegration tests were conducted on both the derived and actual all share price indices. The unit root test results interestingly indicated that while the actual all share price index (in real terms) is stationary at order 2, the derived variable is stationary at order 1 indicating more stability in the real value of the derived (fundamental) value. Both sets of variables were cointegrated with the specified determinants. The estimation results for the equations are shown in the table below. And here, we have very interesting results. The long-run, real value of the all-share price index (shown by the results of the ASPIGEN equation (row 2 in the table) are determined by almost a different set of variables from the actual values. For the long run values (ASPIGEN), key determinants include the lending rate, money supply and credit to the private sector. The real exchange rate and number of listed securities were marginally significant at 7 percent each. This implies that key determinants of the long run value of the all share price index are mainly absolute price and monetary variables with the exception of the real exchange rate, which is a relative price and the number of listed securities.

However, moving one step further and analyzing the factors that determine actual values of the dependent variable shows up such indicators as remittances and nominal exchange rate. Most of the variables identified in the long run equation disappear in significance with many of them not even able to enter the model at more than 20 percent probability. Credit to the private sector is the only variable that remained fairly significant, though not as important as remittances and nominal exchange rate. In effect, uncertain flows in remittances and changes in the nominal exchange rate have been part of the factors causing shifts of the market prices of stocks away from their fundamentals. Most of the other major variables in the economy are very weakly related to the ASPI. These findings fairly corroborate the view obtained from stakeholders in the survey about the weak relationship between stock pricing and macroeconomic fundamentals. Because however the micro variables could not be picked up in the macro estimate, it becomes difficult to directly compare the coefficients for the more micro factors. But at least the message from the macro factors seems to be fairly consistent.

Table 2: Modelling Fundamental and Actual Values of the All Share Price Index

Model	Actual ASPI		Fundamental ASPI
MLR			-1.95373 (-3.27)
M2			2.127017 (4.74)
GEXP			0.839622 (1.03)
CPS	0.242951 (1.85)		1.498225 (2.48)
NER	-0.20283 (-2.37)		-0.63842 (-1.66)
RER			-1.11737 (-1.84)
NOS	1.553487 (1.43)		9.148427 (1.86)
YN	1.04379 (1.28)		
TBR	-0.08642 (-1.14)		
REM	0.173315 (2.06) Lag 1 0.130422 (1.68) Lag 4 0.076146 (1.09)		
RESID	-8.48E-05 (-3.77)		-0.00088 (-4.21)
R ²	0.314		0.607
DW	2.6		2.3

V. Summary of Findings and Policy Matters Arising

Using three approaches with two data sources – one primary and the other secondary – this work aims to show the relationship between stock pricing and behaviour of the stock market on one hand and micro and macroeconomic fundamentals in the Nigerian economy on the other. The primary data was analyzed using charts and figures as well as estimates from a censored logistic model while the secondary data was modeled using an error correction approach. The long run value of the all share price index in the time series model was obtained using a single equation approach that relates the dependent variable to fundamental values of its core explanatory variables. Two equations were thereafter estimated, the first showing the relationship of this long run all share price index with major indicators in the economy and the second showing the relationship of the actual value of the all share price index with same set (or augmented values) of indicators. The results from both the primary and secondary analyses were fairly consistent and largely corroborate the other. Data from the primary survey largely indicate that the key drivers of share prices, particularly for the boom period were neither broad macroeconomic indicators (though such factors as inflation rate and macro instability are noted to affect it) nor key indicators of the health of the firm. Prices were clearly shown to be much above levels that could have been determined by such indicators as posted profits of firms, amounts paid out as dividend and regularity of such dividend payout. In contrast, stakeholders see price setting behaviour as dominant in the market and largely driving stock prices for the boom period. Such price setting behaviour seems to be strongly aided by weak regulatory capacity of key institutions in charge of the market. Reframed as censored logit equations, these same results obtained. Secondary data analysis equally showed that the relationship between actual levels of the all share price index for the period 1990 through 2007 were not driven by “expected” variables. While its fundamental values are driven by such monetary and relative price variables as the real exchange rate, money supply and credit to the private sector, its actual values are driven by nominal exchange rate, remittances and credit to the private sector. Such long term important variables as output did not seem to be significant in dictating trends in the market.

These findings have profound implications for potential trends in the Nigerian Stock Exchange. First, being out of sync with the real sector does not portend good for the long term relationship between the market and growth of the other sectors. It seems that the same factors that have made the money market largely non-responsive and non-responsible to the real sector equally impact the capital market currently. Being driven by financial indicators and players in the financial sector seem to show that regulation and policies to relate growth in these monetary sector with the real sector are still weak where they exist. It portends even bleaker future for the already weak real sector over the short to medium term at least.

But equally, the implications of stock prices not necessarily being driven by firm level fundamentals are not miniscule. That stock prices cannot be related to such basic indicators as profitability and dividend policy imply that sick firms can hide behind bloated stock prices to wreck havoc on corporate Nigeria. But more importantly, such trends remove the most important leverage available to genuine investors for evaluating alternative investments in quoted firms. Besides raising the stakes for genuine investors, it creates room for arbitrageurs and other rent-seekers to manipulate prices and reap bumper benefits that end up hurting all genuine participants in the market.

It is interesting and in a way comforting that changes in government do not seem to affect the stock market. But this equally implies that government actions or inactions become nearly irrelevant in the stock market. This is a measure of insulation from activities in the rest of the economy that could be considered unhealthy. This might also be no more than an indicator that the market is not expecting much from the government of the day – a possibility that itself does not give much reason for cheer.

One message that is clear from the work is that regulation of the market falls short of the 'desirable'. Key regulators (particularly the Nigeria Stock Exchange and the Securities and Exchange Commission) were clearly depicted as lacking the capacity (or maybe the will) to effectively run the market. Such weaknesses, the sources of which could not be obtained in the course of the survey, seem to be so obvious that key players in the market exploit them. They equally interact with macroeconomic instability factors and other regulatory loopholes to create room for market manipulation by key players. Obviously then, instituting additional measures to boost the capacity of the regulators to moderate activities will be an important step towards restoring confidence in the market. But it might equally be important to research further into what specifically may be wrong with the 'safeguard mechanisms' in the market and how such can be corrected.

Whether it is money market or capital market, the overall aim of the financial sector is to provide funds for real sector growth. The financial sector in a country does not exist for its own sake. But it seems this is consistently the trend in both money and capital markets in Nigeria. Relationship of the capital market with such important indicators as output is so weak that both at the long run fundamental or short run actual determination, the impact of output on the stock market is nearly non-existent. One implication of this is that one grows without the other. Plainly, this is not healthy for long term growth as the real sector is likely to remain stunted for far longer than is warranted given the boom in the financial sectors. The situation is equally not the best even for investors in the stock market as the probability of market crashes continues to soar given increased differences between the performance of the real sector and the financial sector. When price increases are not supported by real activities, the market is driven by bubbles which ultimately will disappear.

References

- Abreu, D and M. K Brunnermeier (2003) “Bubbles and Crashes”, *Econometrica*, 71(1): 173 - 204
- Allen, F and G Gorton (1993) “Churning Bubbles”, *Review of Economic Studies* 60, 813 – 836
- Anyanwaokoro M (1999) “Theory and Policy of Money and Banking” Enugu: Hossana publications
- Arellano, M and S. Bond (1991), “Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations,” *Review of Economic Studies*, 58: 277-97.
- Atje, R. and B. Jovanovic (1993), “Stock Markets and Development”, *European Economic Review*, 37, 632-640.
- Bencivenga, V. R., B. D. Smith, and R. M. Starr (1996): “Equity Markets, Transaction Costs, and Capital Accumulations: An Illustration”. *The World Bank Review* 10(2):241-265.
- Bhide, A (1993): “The Hidden Costs of Stock Market Liquidity”, *Journal of Financial Economics*, 34: 31-51.
- Billmeier, A and I. Massa (2009) “What drives stock market development in emerging markets – institutions, remittances or natural resources?”, *Emerging markets review* Volume 10 issue 1 March 2009, Pages 23-35
- Binswanger, M (1999) “Stock Markets, Speculative Bubbles and Economic Growth”, Cheltenham: Edward Elgar Publishing
- Bolton, P. and X. Freixas (2000), “Equity, Bonds and Bank Debt: Capital Structure and Financial Market Equilibrium under Asymmetric Information”, *Journal of Political Economy*, 2, 208,324-351.
- Campbell, J. Y. and R. J. Shiller (1988), “The dividend-price ratio and expectations of future dividends and discount factors”, *Review of Financial Studies* 1, 195—228.
- Campbell J.Y and T. Vuolteenaho (2003) “Inflation Illusion and Stock Prices” *American Economic Review*, 94
- Capasso S (2003) “Stock Market Development and Economic Growth: A matter of informational problems” The University of Manchester *Discussion paper Series* Centre for Growth and Business Cycle Research, School of Economic Studies <http://www.ses.man.ac.uk/cgbcr/dicussi.htm>

Chen J. (1999) “When the bubble is going to burst...”, *International Journal of Theoretical and Applied Finance*, 2(3): 285 -292: World Scientific Publishing Company

Claessens, S., and Glen, J. (1995), “Stock Price Behaviour in emerging Stock Markets.” Paper presented at the World Bank Conference on Portfolio Flows to Developing countries, Washington, D.C. The World Bank, September 9-10.

Claessens S, Klingebiel D, and Schmukler S. L (2006) “Stock market development and internationalization: Do economic fundamentals spur both similarly?” Journal of empirical finance, 13 (3) June: 316-350

Cochrane, J. H. (1994), “Permanent and Transitory Components of GNP and Stock Prices”, Quarterly Journal of Economics 107, 241-265.

Das A (2005) “Do stock prices and interest rates possess a common trend?”, Louvain Economic Review 71(4) *Public Policy Institute Georgetown University, Washington, D.C.*

Demirgüç-Kunt, A. and R. Levine (1996), “Stock Market Development and Financial Intermediaries: Stylized Facts”, World Bank Economic Review, 10 (2): 291-321.

Domian, D., Gilster J, and Louton D. (1996) “Expected Inflation, Interest Rates, and Stock Returns.” The Financial Review 31 (November): 809–30.

Emenuga, C., (1998), “The Nigerian Capital Market and Nigeria’s Economic Performance,” Paper presented at the seminar organized by the Nigerian Economic Society, at Nigerian Institute of International Affairs, Lagos. 21st January.

Fama, E. and Schwert G (1977) “Asset Returns and Inflation”, Journal of Financial Economics 5 (November): 115–46.

Froot, K. and M. Obstfeld (1992), “Intrinsic Bubbles: the Case of Stock Prices”, NBER Working Paper Series, w3091: SSRN: <http://ssrn.com/abstract=304858>

Garcia, F. Valeriano and Lin Liu, 1999, “Macroeconomic Determinants of Stock Market Development,” Journal of Applied Economics, 2 (1): 29-59.

Gonzalo J., Lee T., and Yang W. (2007) “Permanent and Transitory Components of GDP and Stock Prices: Further Analysis”, Macroeconomics and Finance in Emerging Market Economies, 1(1) March: 155 -120: Available at www.informaworld.com/smpp/content

Haastrecht A and Pelsser A (2009) “Generic pricing of FX, inflation and stock options under stochastic interest rates and stochastic volatility” a.vanhaastrecht@uva.nl

Hess, Martin (2003) “Sector-Specific Impacts of Macroeconomic Fundamentals on the Swiss Stock Market” Financial Markets and Portfolio Management, 17 (2): 234-245, ITAM, Mexico

Jaffe, J. and G. Mandelker, (1976) “The ‘Fisher Effect’ for Risky Assets: An Empirical Investigation.” The Journal of Finance 31 (May): 447–58.

Kent, C. and P. Lowe (1997): “Asset-Price Bubbles and Monetary Policy”, Reserve Bank of Australia Working Paper, 9709 December.

Kenny, Charles, and Todd D. Moss, 1998, “Stock Markets in Africa: Emerging Lions or White Elephants?” *World Development*, 26: 829-43.

King, R. G., C. I. Plosser, J.H. Stock, and M. W. Watson, 1991, “Stochastic Trends and Economic Fluctuations”, American Economic Review 81, 819-840.

Kolari J.W and Anari A (2001) “Stock Prices and Inflation”, Journal of Financial Research, xxiv (4)

Koller, Tim, Marc Goedhart, David Wessels, Thomas E. Copeland, McKinsey and Company (2005) “Valuation – Measuring and Managing the Value of Companies” 4th edition, John: Willey and sons Inc

La Porta, Rafael, Florencio Lopez-de-Silanes, and Andrei Shleifer, 2003, “What Works in Securities Laws?” NBER Working Paper No. 9882, Boston: National Bureau of Economic Research

Levine, R. and S. Zervos (1998), “Stock Markets, Banks and Economic Growth”, American Economic Review, 88, 537-557.

Modigliani, F and R.Cohn (1979): “Inflation, rational valuation, and the Market”, Financial Analysts’ Journal.

Mohtadi H and Agarwal S (2001) “Stock Market Development and Economic Growth: Evidence from Developing Countries”

Muellbauer John and Nunziata, (2001) “Credit, the Stock Market and Oil: Forecasting U.S. GDP”, Nuffield College, University of Oxford, England, Research supported by the Economic and Social Research Council, under grant number R000237500

Nelson, C. (1976) “Inflation and Rates of Return on Common Stock” The Journal of Finance 31 (May): 471–83

Nyong, Michael O. (1997): “Capital Market Development and Long-run Economic Growth: Theory, Evidence and Analysis” First Bank Review, December: 13-38.

Obadan, M. I. (1998): Presidential Address presented on the “ Capital Market and Nigeria’s Economic Development” at one day seminar organized by Nigeria Economic Society at the Institute of International Affairs, Lagos 21st January.

