Shaky Pillars: Are Micro and Macroeconomic Fundamentals Enough to Explain the Strength of the Nigeria Stock Exchange?

Chukwuma Agu

Investment and Trade Policy Centre Department of Economics
University of Pretoria, South Africa
E-mail: shookslife@yahoo.com
Tel: +27 73 9411 952

Chioma Chukwuma-Agu

Department of Banking and Finance, University of Nigeria, Enugu Campus
E-mail: thefavouredglad@yahoo.com
Tel: +234 803 2622 305

Abstract

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 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. 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 firm fundamentals. In contrast, stakeholders see price setting behaviour as dominant in the market aided by weak regulatory capacity of key institutions in charge of the market. From the secondary data, we find that while fundamental values of the ASPI are driven by 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.

Keywords: All share price index, Nigerian economy, macroeconomic fundamentals
JEL Classification Codes: E44, G10, G12, 016

1. Introduction

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 US 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 optimisms 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.

The Nigeria Stock Exchange which has been the toast of investors for nearly a decade started a steep decline in early 2008 even before the rest of the world joined. Market capitalization which peaked at N12.6 trillion as at the first week of March, 2008 quickly nosedived beginning in the second week of March 2008 losing nearly half its value by the end of the same year. Every indicator in the stock market has continued to slide down. As in many other stock markets under the same circumstances, there have been competing arguments as to the cause of the crash. But many of these arguments are not underpinned by strong empirical analyses. Besides, despite its growth and strategic positioning in the African market, the Nigerian capital market has received comparatively little assessment. Consequently, it is not clear that policies for the market are driven by strong understanding of the links between the market and the rest of the economy or more specifically between the market and broad macroeconomic fundamentals as opposed to firm level and institutional variables and/or regulatory loopholes. This research work therefore 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.

The primary objective of the paper is to provide empirical evidence on the causes of the recent stock market crisis in Nigeria. In doing so, it tries to find out whether 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. 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 enquiries into the subject for future studies. The rest of the paper is organized as follows: section II reviews some work in related area and provides the basis for this one; section III outlines the methodology; section IV discusses the findings while section V concludes.

II. Review of Related Literature

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 (Koller et al, 2005). According to the Koller team, 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). These discussions are generally captured under three approaches to stock valuation given as Fundamental, Technical and Efficient Market Approaches (Okafor, 1983).

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.

But besides 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.

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. 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.

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.

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. Haastrecht and Pelsser (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.

A clear message from these reviewed works is that there is some relationship between the stock market and both firm-level and macroeconomic fundamentals. 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. 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. Analytical Techniques for the Survey Data
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 are 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.

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:

$$P(\text{Pr}) = E(\text{Pr} = 1/\{Xi\} = 1/1 + e^{-(a_{\bar{i}'})}$$

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 – Specification and Analytical Techniques

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 maximum 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:

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

Where ASPI is the all share price index, Y is income, INF is inflation rate, MLR is the maximum 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:

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

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

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.

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

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.

IV. Findings
A. Findings from Primary Survey

A censored logit model was used to analyze the responses from the field. However, given that there was no independent question asked on stock pricing in the questionnaire, 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	1.498225
	(1.85)	(2.48)
NER	-0.20283	-0.63842
	(-2.37)	(-1.66)
RER		-1.11737
		(-1.84)
NOS	1.553487	9.148427
	(1.43)	(1.86)
YN	1.04379	
	(1.28)	
TBR	-0.08642	
	(-1.14)	
REM	Lag 1 0.173315 0.130422 (2.06) (1.68) Lag 4 0.076146 (1.09)	
RESID	-8.48E-05	-0.00088
	(-3.77)	(-4.21)
R^2	0.314	0.607
DW	2.6	2.3

V. Summary of Findings and Policy Matters Arising

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. Primary data was analyzed using a censored logistic model while 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

[1] Allen, F and G Gorton (1993) "Churning Bubbles", <u>Review of Economic Studies</u> 60, 813-836

[2] Cochrane, J. H. (1994), "Permanent and Transitory Components of GNP and Stock Prices", <u>Quarterly Journal of Economics</u> 107, 241-265.

[3] 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.*

[4] Fama, E. and Schwert G (1977) "Asset Returns and Inflation", <u>Journal of Financial Economics</u> 5 (November): 115–46.

[5] Froot, K. and M. Obstfeld (1992), "Intrinsic Bubbles: the Case of Stock Prices", NBER Working Paper Series, w3091: SSRN: http://ssrn.com/abstract=304858

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

[7] 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

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

[9] King, R. G., C. I. Plosser, J.H. Stock, and M. W. Watson, 1991, "Stochastic Trends and Economic Fluctuations", <u>American Economic Review</u> 81, 819-840.

[10] 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

[11] Levine, R. and S. Zervos (1998), "Stock Markets, Banks and Economic Growth", <u>American Economic Review</u>, 88, 537-557.

[12] 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.

[13] Okafor F. O (1983) "Investment Decisions: Evaluation of projects and securities" Cassell:London

[14] Singh, Ajit, 1997, "Financial Liberalization, Stock Markets, and Economic Development," <u>The Economic Journal</u>, 107: 771-782.

[15] Soyode, A. (1990): "The Role of capital in Economic Development," <u>Security Market Journal Nigeria</u>, volume 6

[16] Tripathi Vanita (2008) "Company fundamentals and Equity returns in India", 21st Australasian Finance and Banking Conference 2008 Paper Available at SSRN: http://ssrn.com/abstract=1247717