Stock Market Development and Economic Growth in Nigeria: A Time Series Study for the period 1980-2007.

JOHN JIDEOFO CHIZEA

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ABSTRACT

This research empirically examines the relationship between stock market development and economic growth in the context of Nigeria. The question guiding this study is focused on whether the development of the stock market has had an impact on economic growth in Nigeria.

The thesis examines the long run causal relationship between the stock market and economic growth. It uses one bank and three measures of stock market development: the loans to deposit ratio of banks, Market capitalisation ratio, value traded to market capitalisation ratio as well as value traded to GDP ratio. Essentially the study uses the endogenous growth theory as a basis of its theoretical foundation.

The study exploits time series analysis techniques to test for the existence of a relationship and, where one is found to exist, the casual nature of that relationship. The study particularly applies Multivariate vector autoregressive models (VAR) and Vector Error Correction Models (VECM) in testing for the existence of a relationship.

The evidence obtained from the study shows the existence of co-integration between the stock market development and economic growth in the short as well as the long run. This suggests that stock market development has impacted on economic growth in Nigeria.

The Granger causality test findings indicate the presence of a bi-directional relationship between stock market development and economic growth. The findings of the study support the view that stock market development and economic growth in Nigeria are complementary and any improvements in the stock market would have a positive impact on economic growth in Nigeria.

The findings also support the hypothesis of endogenous growth models that financial development causes higher economic growth. The contribution of this study lies in the fact that it provides additional evidence on the ongoing debate of the impact stock markets on the economic growth process within a specific country.

List of Contents

LIST OF TABLES

LIST OF FIGURES

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DEDICATION

To the loving memory of my mother who taught me never to give up.

DECLARATION

I declare that the work contained in this thesis has not been submitted for any other award and that is all my own work.

Name: JOHN JIDEOFO CHIZEA

Signature:

Date:

CHAPTER 1: INTRODUCTION TO THE THESIS

1.1 Introduction

Achieving a sustainable high level of economic growth and development has been the goal of all countries, particularly since Smith (1776) published his famous book ‘an enquiry into the nature and causes of the wealth of nations’. The search for ways to improve the level of economic growth has encouraged the researcher to develop several models and theories in a bid to explain the phenomenon of economic growth. Economists traditionally have looked to factors such as capital, labour and technology as the only factors which matter to the process of economic growth.

But, since with recent developments in the economic growth theory, there has been a shift in the focus of growth literature from the traditional factors (capital, labour and technology) to other factors that might also contribute to the growth process. These other factors include financial development, the macroeconomic environment, political stability and foreign direct investment (FDI), among others. This study is interested in looking at one of these other factors, namely financial development and stock market development in particular, and how it impacts on economic growth.

The importance of financial development to economic growth was first

highlighted by Schumpeter (1911), who argues that credit markets are important to economic growth, as they make it possible for businesses to finance the acquisition of new technologies, which in turn lead to economic growth. The financial development role in economic growth has received much attention; however, the focus has been almost entirely on bank based financial institutions, while ignoring the possible impact of stock market development. The existence of a relationship between stock market development and economic growth is not generally accepted within the growth literature, owing in part to the inconsistencies in the results of the few available studies on the relationship.

The results obtained for empirical studies on developed countries point to the existences of a positive relationship between stock market and economic growth, while the few available studies for developing countries have not been clear on the exact relationship between stock market and economic growth. Enisan and Olufisayo (2009) suggest that this apparent difference in the results obtained for developed and developing countries may be due to factors like the level of efficiency of the developing countries' stock markets or their relatively small sizes, as opposed to stock markets in developed countries. The differences in the structure of the economies and the general macroeconomic environment could also be responsible for the differences in the results obtained and suggest a country specific analysis to overcome the problem of inconsistency. This study proposes to investigate this relationship between the stock market development and economic growth in Nigeria.

The Nigerian stock market was established in 1960 but commenced trading on 5 June 1961 with a total of eight securities, five of which were government and three were equities. The growth of the securities markets in Nigeria has increased gradually over the years. The present market security stands at 154 securities. The Nigerian stock exchange might have existed since 1961 but it only seriously started functioning when the Nigerian civilian government came into power in 1999. Until very recently, the Nigerian stock market has been characterised by little trading; consequently, the prices in the Nigerian stock market are very stable, as can be observed by examining the turnover ratio of Nigerian stock market within that period.

The bulk of the research on the Nigerian stock market has been on market efficiency. The various studies show that the Nigerian stock markets have tested the Fama efficient market hypothesis. A few of the studies show that the Nigeria stock market is a semi-strong efficient market but the majority of the studies reveal that the Nigerian stock market has weak form efficiency. Adelegan (2003) examined the Nigerian stock market, looking at the adjusted share prices to dividend announcements between 1991 and 1999. He found that, in the samples paying dividend for the announcement and after the announcement dates, the excess returns were negative and positive respectively. Adelegan (2003) also found that dividend and earnings were simultaneously announced in Nigeria, as opposed to in the developed stock markets, where they are announced independently.

In spite of this, there is limited empirical and theoretical research into the presumed link between stock markets and economic growth in Nigeria. The role of stock market development in economic growth has generated much interest from researchers of late and the debate has generated many but varied conclusions. This thesis seeks to contribute to this debate by examining the dynamic stock market development and economic growth link in Nigeria. The debate hinges on whether or not stock markets have an important influence in the economic growth process.

The contributory role of stock markets to economic growth can be theoretically postulated, particularly within the endogenous growth theory, and this view is increasingly supported by findings from empirical research. Empirical investigations on the possible relationship between stock market development and economic growth have been relatively limited, particularly regarding developing economies. Also, empirical research into this relationship for developing countries until recently has been dominated by cross-country studies, owing to the insufficient length of the available time series data (Adjasi and Biekpe 2006, Yartey and Adjasi 2007, Enisan and Olufisayo 2009). This presumed relationship has generated its fair share of controversy within economic literature and there is need for further investigation to improve understanding of this link, owing to the importance of the stock market to investors.

Academics hold different views on the importance of the role of stock market development in economic growth. These views on the stock market economic growth relationship can be categorised into four distinct schools of thought. The first school of thought believes that finance leads economic growth. Researchers such as Beck and Levine (2002) investigated the impact of stock market and banks on economic growth, using a data set from 1976 to1998. The panel data they used consisted of 40 countries and 146 observations; they also averaged the data over a five-year period. The focus of their research was on the long-running relationship between stock market, bank and economic growth. The generalised method of moment (GMM) technique was used and they found that stock market and banks positively affect economic growth. A possible limitation of this research is ignoring the short term relationship between stock market, banks and economic growth, which is lost or not captured by using the five-year averaged data. Similarly, Atje and Jovanovic (1993) reached the conclusion that the stock market leads economic growth when they examined the financial development economic growth relationship. They found that the stock market has a large effect on subsequent development of the economy. They, however, failed to detect a related effect for banking lending on subsequent development of the economy. These findings are, however, controversial, because normally bank lending and stock market tend to exert a similar effect on economic growth. It brings into question the fact that more countries are not developing their stock markets swiftly as a tool to facilitate economic growth.

In the second school of thought, the argument is that economic growth leads finance, according to researchers such as Chakraboty (2008), who examine the relationships between financial development and economic growth in India. He used the growth rate of GDP as a proxy for economic growth, while he used stock market capitalisation and bank credits as proxy for financial development. He found that the direction of the relationships was from real GDP to stock market development, indicating that growth leads financial development. Demetriades and Hussein (1996) similarly conducted a time series analysis on the relationship between stock market and economic growth; they used a panel of 16 countries over a period of 27 years. They had two proxies for financial development, which were ratio of bank claims in the private sector to nominal GDP and ratio of bank deposit liabilities to nominal GDP. They found that the relationship between stock market and economic growth was country specific, that is, it varied from country to country. The results reveal that six countries showed causation from growth to financial development, while only three of the countries examined showed causations from financial indicators to economic growth.

The academicians in the third school of thought argue that there is a dual causation or bi-causation (both finance and economic growth lead each other simultaneously); researchers such as Luintel and Khan (1999) argue that there is a two-way causal relationship between financial development and economic growth. This they demonstrated using data from 10 countries from 1951 to 1995. The countries in this study include Colombia, India, Costa Rica, Malaysia, Korea, South Africa, Sri Lanka, Philippines, Greece and Thailand. In their study,

they used total deposit liability as a proxy for financial development, while they used nominal GDP to proxy economic growth. In the same view, Bahadur and Neupane (2006) also identified the same relationship and argued that there is a two-way causality existing between stock market and economic growth. He posited that both variables enhance each other. He tested for causality relationship between stock market and economic growth in the Nepalese market using Grainger causality tests and the study found empirical evidence of long-running integration of macroeconomic variables and stock market indicators. The causality was observed only in real terms and not in nominal terms, thus concluding that the stock market plays significant roles in determining economic growth and vice versa in the Nepalese economy.

Finally, in the fourth school of thought, the argument is that stock market development has no impact and at bests a limited to role to play in the process of economic growth. Researchers such as Harris (1997) argue that there is no relationship between stock market and economic growth. He re-examined the Atje and Jovanovic (1993) empirical study on the relationship between financial development and economic growth and, in contrast with Atje and Jovanovic (1993), found no significant evidence to support the view that stock market activity explains economic growth. He re-estimated the same model, using current investment in place of lagged investment, and found that the stock market effect is weaker than Atje and Jovanovic (1993) found. They also applied two stages least square to cover for possible problems of correlation to current investments. The sample they employed in their analysis was divided

into less developed and developed countries. They found that, for the developed countries, stock market activities have some explanatory powers in growth in per capital output, while, for the less developed countries, the stock market effect is at best very weak. One of the basic criticisms of this research is that they used a two stage least square in their analysis and the efficiency of the two stage least square depends on the degree of correlation between the endogenous variables and their instruments. Also, the number of observations leaves questions as to the statistical significance of the result obtained because of the small size.

The rest of this chapter is organised as follows: Section 1.2 describes the motivation and rationale for the study; Section 1.3 presents the aims and objectives, research question as well as boundaries of the research; Section 1.4 discusses the contribution of the study to the literature and Section 1.5 explains the structure of the rest of the thesis.

1.2 The Motivation and Rationale for the Study

This study is motivated by two main issues in the empirical literature on the stock market development and economic growth relationship for developing countries. Firstly, the economic growth theory posits the existence of a consistent positive relationship between stock market and economic growth; however, in the empirical literature for developing countries, there seems to be a lack of clarity. The empirical literature reports mixed results on whether there is a relationship between stock market development and economic growth

(Osinubi and Amaghionyeodiwe 2003, Ang 2008, Enisan and Olufisayo 2009, Wang 2010). This is puzzling, as Singh (1997) argues that the effectiveness of a country's financial system in contributing to the growth process is dependent on not only how it is set up but also on the quality of the institutions (regulatory and supervisory) as well as the competence of government and the laws.

Secondly, empirical literature is not clear about the exact nature of the causal relationship between stock market development and economic growth for developed countries and there is even less clarity on the causal relationship for developing countries. The empirical literature reports mixed results on whether stock market development affects or is affected by economic growth (Osei 2005, Singh 2008, Soytas and Kucukkaya 2011). Nigeria is a developing country with an emerging stock market and provides a unique opportunity to investigate this interesting phenomenon.

Also, the various reforms that have been carried out in Nigeria have facilitated the availability of information on stock market activities. Similarly, various government agencies, like the Central Bank of Nigeria, have published data on various economic indicators available on their web pages. This improved access to economic data and made the possible to contemplate undertaking such research for Nigeria.

1.3 Aims and Objectives, Research Questions and Boundaries

The aim of this thesis is to examine the role of the stock market in economic growth in Nigeria. The main objective of this study is

• to examine the relationship between stock market and economic growth in Nigeria.

The other objectives the study proposes are:

• to examine the direction of causality between stock market development an economic growth in Nigeria.

• to highlight some policy implications for Nigeria in view of the findings from the research

• to contribute to existing literature.

In assessing the above objectives, the thesis will address the following two questions:

Research Question 1:

• What is the relationship between the stock market and economic growth in Nigeria?

As highlighted earlier within the literature, the relationship between stock market and economic growth is not clear and there is even less clarity of the impact of stock markets on economic growth in emerging markets, of which Nigeria is one (Osinubi and Amaghionyeodiwe 2003, Ang 2008, Wang 2010).

Research Question 2:

• What is the direction of the relationship between the stock market and economic growth in Nigeria? Does the stock market cause economic growth or does economic growth cause the development of the stock market?

Similarly, the literature points to the unresolved issue of the direction of causality of the relationship between stock market and economic growth, even for a developed country. Empirical studies report mixed results on the direction of the causal relationship between stock market and economic growth (Hondroyiannis et al 2004, Van Nieuwerburgh et al 2005, Enisan and Olufisayo 2009).

The first question is concerned with the impact of the stock market on economic growth in Nigeria. Examining whether the relationship between the Nigerian stock market and economic growth is positive or negative is important, as it provides a guide to policymakers in Nigeria as to whether or not to encourage the development of the stock market as a means of enhancing economic growth. The second question goes further, to determine the direction of causation between the stock market and economic growth, examining whether the relationship between the stock market and economic growth is driven by the stock market to economic growth or if the reverse is the case for Nigeria.

1.4 Contribution of the Study

The Nigerian stock market, for example, is witnessing rapid development. On the whole, the culture of equity holding is increasing among Nigerians. In spite of the rapid development in the Nigerian stock market, there seems to be notably few studies on the relationship between stock market development and economic growth in Nigeria. This study fills the knowledge gap by using data from Nigeria to empirically assess the relationship between stock market development and economic growth. This research also contributes by extending

the existing work on developing countries such as Nigeria. Secondly, this research contributes to the existing debate on the stock market and economic growth by providing additional evidence in support of the endogenous growth theories for a single developing country.

1.5 Structure of the Thesis

This study is divided into seven chapters. Following this chapter, the introductory chapter, Chapter Two provides the theoretical evidence for the relationship between the stock market and economic growth. Chapter Three builds on Chapter Two by reviewing the empirical literature on stock market and economic growth. Chapter Four provides an overview of the Nigerian economy, as well as its financial system. In Chapter Five, the research methodology is explained. Chapter Six presents a discussion of the model specified, with data sources as well as a discussion of the results. Finally, Chapter Seven concludes the study by providing the contributions, policy recommendations and limitations.

CHAPTER 2 THEORETICAL BACKGROUND

2.1 Introduction

Kuznets (1973) defines economic growth as a long-term increase in the ability of a country to provide a progressively more varied bundle of goods to its population. He specifies that the increase in the ability has to be based on either ideological and institutional adjustments or advances in technology. Drawing from Kuznets (1973), it can thus be inferred that economic growth is an increase in the rate of change of output or income of an economy over time and is calculated as the percentage speed of improvement in real gross domestic product (GDP). Thus, economic growth implies increases in per-capita real GDP or more efficient use of its economic resources to produce goods and services.

Economists have developed several growth theories over the years to explain economic growth. Economic growth theory is primarily based on a production function approach, which, in line with the microeconomic theory of the firm, assumes that economic growth on an aggregate level can be related to factor inputs and technology. In particular, changes in output are said to be caused by changes in the physical capital stock, labour, human capital and technology. The major growth theories, which include the Neo-Keynesian, Neoclassical and Endogenous growth theories, are discussed below.

The Neo-Keynesian theory of growth development is credited to the independent work of Roy Harrod (1939, 1948) and Evsey Domar (1947), hence the Harrod-Domar (HD) model. The HD model assumes an externally determined rate of technological change and also ascribes a major role to capital accumulation in the growth process. The model assumes that, for economic growth to take place, a net addition to the capital stock (K) is required. As Bhagwati (1984) points out, the model posits that the answer to underdevelopment is simply to increase the resources available to be devoted to investment.

The theory is criticised, as it assumes that capital and labour costs, as well as the proportions used, are fixed; thus, growth may be insufficient to sustain full employment.

The Neoclassical theory of growth can be traced to the work of Marshall (1898), Ramsey (1928), Solow (1956), Swan (1956), Cass (1965) and Koopmans (1965). This theory requires a diminishing return to every input, which includes a smooth elasticity of substitution between inputs; economic growth is dependent on technological progress, labour as well as the amounts of capital stock. Holding technological progress constant and the labour force growing at a steady rate means per capita production being dependent on the capital stock. Thus, the law of diminishing marginal returns would result in less output being produced as the use of the capital stock increases

It assumes that, in the long run, increases in per worker output can be maintained only by growth in productivity. This assumption is the source of one of the criticisms of the neoclassical growth model, as long-run growth is determined by elements that are entirely outside of the model, that is, they are exogenous to the model.

The Endogenous theory of growth can be traced to the work of Romer (1986), Lucas (1988), Rebelo (1991), Grossman and Helpman (1991) and Barro and Sala-i-Martin (1995), who over the years contributed to its growth and development. The endogenous growth models are models where long-running growth is treated as an endogenous variable and it is possible for output per-capita growth to occur without limits because the country in principle has an infinite capacity to create ideas. In an endogenous growth framework, however, government policy can affect rates of growth, since government policy actions, such as the provision of infrastructure, protection of intellectual property rights, regulations, taxation and the maintenance of law and order have the potential to influence the speed of creative activity. Governments, therefore, have great potential for either harm or good in these models. Thus, a country's entire policy organisation, as well as its financial structures, regulatory regimes, market, taxes and macroeconomic distortions, may affect investment distribution and savings decisions, such as whether to alter long-term growth.

While endogenous, neo-classical and neo-Keynesian growth models offer different explanations for the growth process, growth in total factor productivity

is an essential component of economic growth. However, the neo-Keynesian and neo-classical growth theories put more emphasis on the traditional factors (physical capital stock, labour, human capital) and totally ignore the role of institutions, such as government, banks and stock markets, as opposed to the endogenous growth theory.

The possible impact of stock market development on economic growth has generated much interest over the years. There has, however, been a relatively limited attempt at modelling the relationship, particularly for developing countries.

This chapter embarks on a review of the theoretical basis for any such relationship between the stock market and economic growth, so as to build up a theoretical framework for the analysis that will take place later in the work.

2.1.1 Aims and Objectives of the Chapter

The aim of this chapter is to present the main theoretical concepts of the thesis by establishing a theoretical link between the stock market and economic growth, with the objective of laying the foundation for the empirical analysis, essentially setting out the theoretical framework for the study of the relationship between stock market development and economic growth in Nigeria.

2.1.2 Chapter Question

The question that this chapter seeks to answer is: is there a theoretical basis for a relationship between the stock market and economic growth?

2.1.3 Chapter Structure

The rest of this chapter is structured as follows. In Section 2.2, the researcher looks at the theoretical literature on stock market development and economic growth. The origin of the relationship between stock market and economic growth is explored within the various economic growth theories. The researcher also specifically looks at how the stock market fits into the endogenous growth theory. Section 2.3 explores the various roles the stock market performs within an economy as it stimulates growth. Section 2.4 compares the relative benefits of stock markets, as opposed to banks based financing. Section 2.5 explores the implications of stock market efficiency on the process of economic growth. Lastly, section 2.6 presents a summary and conclusion of the issues discussed.

2.2. An Overview of Stock Market and Economic Growth Theoretical Literature

Hafer and Hein (2007) identify a stock as a source of income for the household and a source of financing for businesses within an economy. The availability of stocks and a developed financial system make it possible for growth in businesses and, consequently, economic growth. A stock market, therefore, is a market or place specifically set out for the exchange of stocks.

Drawing from the above definition, it can be said that a stock market is a financial institution set up with the aim of facilitating the mobilisation of capital for the growth of the economy. This definition hinges on the assumption that stock markets are related to real activities in the economy, since it is a financial market.

There is debate among economists about the degree of importance of stock market development to the economic growth process. These opinions range from ascribing an important role to stock market development to ascribing no contributory role to economic growth by stock markets. Authors such as Levine (1991), Diamond (1996), Greenwood and Smith (1997), and Enisan and Olufisayo (2009) ascribe a positively important role to stock market development on the economic growth process, while Devereux and Smith (1994) and Wang, (2010), on the other hand, view stock markets as having a negative or ineffectual impact at best on economic growth.

Levine (1991) is one of the early researchers who examined the stock market development economic growth relationship; he made a significant contribution in the modelling of the stock market development and economic growth. Economists usually view economic growth as a measurable quantitative increase in the level of output within an economy. This is conventionally measured by the rate of change of real GDP and it is viewed as a measure of wellbeing of the economy. Economic growth theory has over time tried to model the economic growth; these attempts were based on several assumptions, which are informed by the prevailing economic growth theory.

Economic growth theory historically credits classical economist Bagehot (1873) with identifying the possible link between financial development and economic growth. Schumpeter (1911) also contributed to the early development of the relationship. He argued that the functions performed by the financial sector within were vital in promoting economic growth. Although both Bagehot (1873) and Schumpeter (1911) were referring to the banks, the fundamental principle and functions of various components of the financial sector remain the same.

By the 1960s, interest in the role of financial development in general in promoting economic growth was completely ignored, owing most likely to the influence of the neo-classical growth theory, which was the dominant growth theory at that time. The neo-classical framework for modelling growth as determined by Solow (1956), Swan (1956), Koopmans (1965) and Cass (1965) assumes a diminishing return to every input, which includes a smooth elasticity of substitution between inputs. In this model, output per worker rises only when: (a) Total factor productivity increases; or (b) The ratio of capital per worker increases. This model fails to supply a practical structure to explain how policies and economic forces, such as financial development factors, interact. Within this model, financial development factors have no effect on the pace of economic growth but may have an impact on the capital stock per worker.

The intermediation function of financial development is completely ignored. Essentially, long-running growth is determined by outside elements to the model, hence the term exogenous models. Exogenous growths models require

improvements in technology, which is determined by factors outside the model as the main determinant for economic growth to occur (Solow, 1991).

By contrast, in the 1980s there was renewed interest in the role of financial development, in economic growth, spurred on to some extent by the development of the endogenous growth theory. Endogenous growth models are models in which the determinants variables of long-running growth are within the model (endogenous variable). These types of models offer a way to create a structure that demonstrates the growth effect of stock market development. Endogenous growth theory, however, by altering the rate of technological advancement or human capital accumulation and thereby investment in physical and human capital respectively, shows that it could influence long-term steady growth. Since there are externalities to human and physical capital in this theory, appropriate policies and choices help private agents internalise these externalities, which could accelerate long-term growth. Thus, a country's entire policy regime, as well as its level of financial development, financial structures, regulatory institutions, market, taxes, and macroeconomic distortions, may affect investment distribution and savings decisions, such as impact on long-term growth.

Before the development of the endogenous growth theory, the role of stock market development in economic growth was seen as nonexistent at worst and minimal at best. The growth model in use then did not explicitly model the role of the stock market. Romer (1986), Lucas (1988) and Rebelo (1991) developed

endogenous models where capital accumulation does not exhibit a diminishing return; this implies that growth can be self-sustaining.

With the introduction of the endogenous growth theory, there has been a shift from using the unknown neoclassical exogenous technical progress to using the new known endogenous growth model to explain economic growth. Different models specified such that the source of growth is either knowledge or human capital that accumulates over time. With this new approach, recent theoretical studies have attempted to explain the linkage between financial development and economic growth. However, the bulk of these studies focus almost entirely on banks with only a few looking at the impact of the stock market.

From the above, it can be seen that there has been a significant evolution in the economic growth theory with regard to the role of stock market development. This evolution in economic growth theory hinges on the view of whether or not economic growth is an exogenously or endogenous determined process. This research assumes the process of economic growth to be endogenously determined and thus tests the validity of the assumptions of the endogenous growth.

2.2.1 Endogenous Growth Theory and the Stock Market

The views of importance of the role of the stock market on economic growth have changed over time, particularly in line with the prevailing economic growth theory. Levine (1991), in his work, provides evidence in support of the role of

the stock market in economic growth. He created an endogenous growth model, where the stock market performed the function of risk allocation. He then examined how the markets alter incentives to invest in ways that alter the growth rate. Levine (1991) shows that stock markets enhance economic growth through providing a means for firms to change ownership and not disrupt the production process, as well as providing a means for agents to diversify their portfolio risk. In the absence of stock markets, lenders facing liquidity constraints would force firms to pay back loans, thus forcing the latter to liquidate (fully or partially) those assets which they own. Since such assets include capital assets, which embody a firm's technology, this would lower the firm's productivity.

Levine's model uses the Diamond and Dybvig (1983) structure of preference to create liquidity risk and also to include productivity shocks that create production risk. Liquidity risk and productivity risk create incentives for the formation of stock markets. Productivity risk lowers welfare and discourages agents from investing in firms. The stock market allows investors to invest in a large number of firms and to diversify away from idiosyncratic productivity shocks. This raises welfare, the portion of resources invested in firms and the economy's steady-state growth rate. In Levine’s model the economy is made up of an infinite sequence of three period-living agents and a countable infinity of agents are born in each period. Population growth is zero and young agents are identical with the following utility functions:

$$u(c_1, c_2, c_3) = -\frac{[c_2+\phi c_3]^{-\gamma}}{\gamma} \tag{2.1}$$

where ϕ is the coefficient of relative risk aversion and i is the age c is consumption. Since young agents have no value for age one consumption, the young period income is saved, hence the financial system and policy cannot affect agents' decisions about how much of their income to save. Furthermore, the variable specific to the agent, that captures the randomly observed effect cp, becomes known by the beginning of the second period and is defined by the probability distribution below:

$$\phi = \begin{bmatrix} 0 & with\ probability & 1-\pi \\ 1 & with\ probability & \pi \end{bmatrix} \tag{2.2}$$

The preference structure implies a ‘desire for liquidity’ because agents want to consume their wealth at age two if p=O. In the second stage of a firm's production, age three firm members with physical capital employ age one labour and manufacture goods:

$$y_{t+2} = \eta_{t+2}\, K_{t+2}\, L_{t+2}^{1-\theta} \qquad 0 < \theta < 1, \tag{2.3}$$

where Lt+2 is the number of age one labour employed by each entrepreneur in t+2 and eta is a productivity shock specific to the firm, which has one as an expected value. From a maximisation of the agent's problem, Levine (1991) derives the following steady-state growth rate:

$$G_y = K\pi^{-\delta}\,\rho q = K\pi^{-\delta}\,\rho\frac{\varepsilon\pi}{1-\pi+\,\varepsilon\pi} \qquad (2.4)$$

where G_y is the growth rate, K is the physical capital investment and q is stock market development. In Levine's model, the stock market raises the growth rate by increasing the productivity of firms or by improving the allocation of resources. Stock markets increase the efficiency of the firm, through K, because stock markets remove the need for the untimely liquidation of operating capital of firms. Instead of the liquidation of capital, agents that receive liquidity shocks sell their shares to agents that value period three consumption. Consequently, more capital is maintained in firms for two periods, which accelerates the rate of physical capital accumulation. Stock markets also enhance economic growth through facilitating increases in the portion of capital allocated to firms. If agents are sufficiently risk averse, the proportion of resources devoted to firms is higher with stock markets. By making it possible for firms to spread the risks of production, stock markets encourage an increase in investments in firms by risk-averse agents. In addition, stock markets reduce the liquidity risk associated with firm investment; agents that receive liquidity shocks can sell their shares for more than the liquidation value of the firm price. Finally, by increasing firm efficiency, stock markets raise the return on firm investment. Thus, the emergence of stock markets to manage productivity and liquidity risk accelerates growth by attracting resources to socially productive firms.

Similarly, Cho (1986) showed that the stock market can act positively on economic growth by developing a model where he demonstrated that the credit

markets were not efficient in the absence of a stock market. King and Levine (1993a) developed a growth model where innovative activity served as a source of growth. Thus, a high success rate of innovation would imply a high productivity growth rate and consequently growth. Financial markets appear in two different forms in this model. The first is where the intermediaries act as venture capital firms. They evaluate, finance and monitor risky and costly innovations. The second form is like the stock market. The present value of an innovation is revealed in the stock market and selling equity shares on the market can diversify the risk associated with it. Thus, according to King and Levine, development of the financial market can improve the prospect of successful innovations and economic growth.

Boyd and Smith (1998) proposed an endogenous growth model, which presents a framework in which capital formation is financed by issuing equity and debt. They examined an economy in which a group of agents' choice of external financing for investments decisions are determined by the quantity of information required to monitor management by the investors.

Boyd and Smith (1998) suggest that investors have only two options in the available technology. In the first option, the return is only freely discernible by the investor (debt) initiating it, while, with the second option, the returns are publicly discernible (equity). Their conclusion is that the comparative cost of capital will fall as a country experiences growth and capital is accumulated from this fall in the cost of capital; the cost of monitoring firms will rise with the country's growth. This trend will create a situation where the investors will show

a preference for the second technology option, which is publicly discernible. Hence, as the economy grows, there is a preference for equity financing at the expense of debt financing. Essentially, the Boyd and Smith (1998) model points to the existence of a bi-directional linkage between stock markets and economic growth and that banks and stock markets are complementary sources of finance in the long-term.

Following the same line of thought, Enisan and Olufisayo (2009) tested the relationship between stock market development and economic growth, using seven sub-Saharan African countries. They applied an endogenous type model and found that, among other things, the exact impact of stock market on economic growth may be subject not only to the effect of factors such as the relative efficiency, liquidity and size of the stock markets in question but also the general quality of the economic and social environment of the country in question.

2.3 The Role of the Stock Market in Economic Growth.

Clearly, from the discussions above, it can be seen that the endogenous growth theory provides a positive role for the stock market in economic growth. In theory, the stock market is expected to enhance economic growth through providing an avenue to increase domestic savings and also increasing investments in qualitative and quantitative terms (Singh 1997). The stock market is seen as a mechanism that enables the encouragement of domestic savings through the provision of individuals and businesses with some supplemental financial instruments that are capable of meeting their risk

preference and liquidity needs (Levine and Zervos 1998). Research in the financial development field in recent years has focused more on the role of the stock markets in promoting economic growth. This has become a prominent issue on the agenda of academic researchers and policy makers. A growing theoretical literature suggests that well-functioning stock markets can play an important role in economic growth by performing the following functions within an economy.

2.3.1 Liquidity

Stock markets, like all financial institutions, impact on economic growth through its ability to create liquidity. Liquidity in this sense refers to the degree of ease of agents easily to convert their investments into cash. Levine (1997) identifies those stock markets that are liquid as having the ability to provide certainty to investors about the settlement and timing of trades at a relatively cheap cost. Stock market liquidity impacts on economic growth by providing a means of facilitating the financing of high earning long term projects, while satisfying the short-term commitment requirements of investors. Essentially, as Boyd and Smith (1998) point out, the existence of a liquid stock market enables the employment of more long-term higher productive techniques of production, which allow greater economies of scale and consequently enhance economic growth.

The stock market function of providing liquidity in the economy has been recognised in much theoretical literature. Yartey and Adjasi (2007), among

others, argue that stock market liquidity is relevant to economic growth, since liquid stock markets can provide an increased motivation to acquire information about firms and help to improve corporate governance. Yartey et al (2007) also argue that stock markets create financial liquidity and that the creation of liquidity is important for economic growth. Stock market liquidity is expected to decrease the hazard of risk and help provide finance for projects which require a long time to mature. The investor maintains access to the initial investment at every stage of the project with a liquid stock market, as sale of their shares in the firm is possible at little or no cost to recoup their initial investments. In essence, a stock market with high liquidity may enhance investment in long-term projects which have a potentially higher rate of return and consequently impact on economic growth.

The liquidity provided by stock markets allows holders of equity to divest their holding at will without interrupting the capital available to the firm; that is, the capital is available permanently throughout the duration of the investment or firm. Essentially, liquid stock markets facilitate investment into potentially higher productive projects, which by their nature are long-term, as such enhancing capital productivity and consequently economic growth.

Senbet and Otchere (2008) highlight that the increasing liquidity of the stock market can be potentially harmful to corporate governance, as liquid stocks may encourage investor myopia. Consequently, the selling of more liquid stocks on the stock market has the potential to weaken the investor's commitment in matters of corporate control and has the potential to deter economic growth.

They argue that dissenting shareholders will simply sell their shares, rather than try to change management policies. Enhanced liquidity can potentially deter economic growth by diverting investment from new projects to acquiring shares of existing projects. Similarly, Jappelli and Pagano (1994) show that highly liquid stock markets can adversely affect economic growth by reducing uncertainty, which might in turn adversely affect the savings rate, with severe consequences for economic growth.

2.3.2 Facilitating Risk Diversification

The stock markets risk diversification function may mitigate the risks associated with investment by providing a means to pool the risk among various investors over several projects. Levine (1991) focused on two types of risk, liquidity and productivity risk, which he shows could impact on economic growth. Similarly, Baele et al (2007) argue that stock markets promote long-term economic growth by enhancing efficient risk sharing, which facilitates risk diversification, consequently optimising the savings rate and resources allocation within the economy. It can thus be inferred that, with a liquid stock market, savers can hold assets that may be sold easily and quickly, should the saver require immediate use of his/her savings.

In addition, stock markets can also reduce the risks to investors that are associated with investing in individual projects and firms by diversifying risk. Investing in a single project is riskier than investing in many projects in different, uncorrelated sectors. Moreover, risk diversification can also influence

innovation. An increase in productivity requires the introduction of innovation in the production process, which involves high risks because of uncertainty regarding the expected returns. By holding a diversified portfolio of innovative projects, stock markets finance innovation and hence generate real growth.

King and Levine (1993b) argue that, by making it possible to diversify, risk stock markets facilitate innovation and economic growth. In the same vein, recent theoretical research suggests that stock markets, by reducing risk, can facilitate a more liberal trade policy and consequently economic growth.

2.3.3 Information Production

The stock markets information production function provides a cheap means of evaluating, aggregating and disseminating information through a pricing process. This in turn facilitates the process of efficient allocation of resources to the firm in a number of ways. Essentially, a firm which requires capital has the option of doing so through the stock market.

As Yartey et al (2007) argue, there is direct allocation efficiency, as investors acquire information about the firm from the stock market and base their decision to invest or not on market valuation. Stock markets facilitate investments by making it cheaper for individual savers to acquire dependable information about the possible returns on projects, thereby driving productivity. It allows investors

the ease to invest without having to undertake the costly process of researching and evaluating individual firms.

Similarly, Enisan and Olufisayo (2009) argue that stock markets provide a source of motivation to investors for gathering information, which is reflected in stock prices, enabling the stock market to direct capital to the most efficient projects at reduced risk. This enables investors to gain knowledge from the stock market, generate information and implement it within their specific business, which in turn leads to growth in productivity. On the other side of the debate, Stiglitz (1985) argues that stock markets have the potential to create a free rider effect, since an efficient stock market has the ability rapidly to reveal information, thereby discouraging independent research by investors, as the price of the assets contains all available information about them.

2.3.4 Monitoring Managers and Exerting Corporate Control

Yeh et al (2008) argue that stock markets can exert control over managers through the voting and takeover mechanisms. Even small shareholders, by banding together with other shareholders, can influence managers. This occurs through proxy voting, where minority stockholders obtain other voting shareholders' permission to exercise their voting rights at meetings. The ability of individual shareholders to influence managers by their vote is, however, dependent on the ownership structure. Similarly, Yartey and Adjasi (2007) argue that the stock market, by making use of the takeover mechanism, ensures efficient use of past investments by managers.

In theory, takeover threat is a mechanism that provides an incentive to management to increase and maximise shareholder value. There is the assumption that, where management fails to increase and maximise shareholder value, some other economic agents may most likely seize control, restructure, change management and run the firm more efficiently. The stock market, in so doing, acts as a checking and balancing mechanism that keeps a tab on inefficient management and, at the same time, protects and maximises shareholder value.

The threat of takeovers provides a mechanism whereby stock markets can exert control over managers, since sales by dissatisfied shareholders have the potential to reduce the price of the shares, leaving the firm exposed to possible takeover bids; this could cost the managers their jobs.

Alternatively, when the threat of takeover is high, the stock market has the potential to place an additional cost on firms, since it encourages the managers to invest in short-term and quick-return projects. As Stulz (2000) points out, the short-term policy hampers the firm's ability to invest in much needed longer-term projects which have higher returns and greatly increase the firm's ability to perform efficiently and competitively and provide long-term growth for the economy.

2.3.5 Mobilising Capital Resources

Stulz (2000) highlights the fact that all financial institutions, including stock markets, participate in the process capital mobilisation; they combine the savings of various investors for their efficient use in projects of various scales by entrepreneurs. Levine (1997) identifies that the mobilisation of savings is the most important function performed by the stock market. An individual saver may not be able or willing completely to fund a borrower. However, he prefers storing his money in the form of deposits for security and profit reasons. Stock markets and intermediaries accumulate savings from individuals and make them available for lending to investors or enterprises to finance their projects, hence encouraging public and private investments and promoting growth.

Hicks (1969) argued that the financial markets' mobilising function was the driving force that enabled the adoption and implementation of methods that provided massive economies of scale. He further argued that the available options of production technologies are tied to the capital mobilisation function of financial markets.

Similarly, McKinnon (1973) illustrated this with an example of a farmer who cannot acquire particular equipment using his savings. He needs to access external financial recourses, provided by financial intermediaries, to buy it and increase his productivity. Therefore, the mobilisation of savings enables the farmer to introduce a new technology that results in an increase in his income. By mobilising savings and increasing the availability of funds for investors,

financial institutions encourage investment in new technologies across the economy, which increases overall productivity (Levine 1997).

Wargler (2000) shows that an important way through which the stock market capital mobilisation function can affect economic growth is by expanding the feasible option of investment projects; this it does by combining savings that make it possible to generate large capital to invest in large-scale projects. Also, as a result of mobilisation, instruments of small denomination may be created and this makes it possible to increase the liquidity of assets and improve investment efficiency, as well as diversify the household portfolio. Yartey and Adjasi (2007) note that the stock market provides avenues for small and medium scale businesses to source capital at lower costs, when compared to capital costs that banks and other financial intermediary charge.

Alternatively, Senbet and Otchere (2008) highlight the risk that increased liquidity of the stock market can be harmful to corporate governance, as highly liquid stock markets may encourage investor myopia. Essentially, the selling of highly liquid stocks on the stock market has the potential to weaken the investor's commitment in matters of corporate control.

2.3.6 Transmission Path for Monetary Policy

Monetary policy, among other factors, is concerned with controlling the rate of inflation. The most obvious link connecting monetary policy to the stock market is the impact of monetary policy on the rate of inflation.

The stock market is an often overlooked monetary policy transmission mechanism. Tobin (1969) demonstrates this in a model by showing how stock returns link the real and financial sectors of the economy. He also highlights how stock returns could react to possible change in the model of the monetary variables. Yartey and Adjasi (2007) show stock markets providing a transmission mechanism through the effect of inflation on household equity holding. Inflation impacts on the rate of expected return of shareholders and, as required rates of return change, it causes fluctuation in the share price. Firms act in response to these price changes by revising production and investment plans that in turn help to improve productivity and ultimately growth. In addition, the stock market provides a transmission mechanism when monetary policy lowers the returns for holding cash; by reducing the interest rate, the stock market provides an alternative investment option, which in turn stimulates higher economic growth.

2.4 Stock market versus Banks Financing and Economic Growth

The endogenous growth theory proposes that financial development can enhance economic growth. The question arises as to what kind of financial development is most appropriate, stock markets or a banking-oriented system. The bulk of the existing literature has used mainly banks as measures of financial development and has centred on developed countries. However, the existing debate as to which type of financial institution is optimal for economic growth is tied to two issues. Are stock markets superior to banks or can their functions be substituted by the other?

Modigliani and Miller (1958) first highlighted the connection between the value of a firm and its choice of financing. Ever since then it has been actively researched, even till today. Myers and Majluf (1984) argue that the choice of financing by firms is based on a scale of preference. The entire decision making process follows a hierarchical pecking order of choices, internal financing being first choice followed by banks and stock markets last in line.

Economists like Singh (1999), Stulz, (2000) and Scholtens, (2000) argue that banks are superior to stock markets as a means of enhancing economic growth. They questioned the usefulness of a stock market, even a well developed one. Evidence from the UK over a period of 30 years (1970-2000) showed that the stock market had not contributed positively to financing economic growth. Stulz (2000) points out that banks offer an alternative lower cost of capital to small firms, which might not be able to obtain finance from stock markets with their listing conditions.

Banks also reduce the associated agency costs and the problem of information asymmetry, as they build and maintain a close association with firms and consequently deal with them, based on the developed reputation. Cetorelli and Gamberra (2001) highlight the fact that bank borrowers are also depositors and the existing information in the banks' possession on the borrowers' credit worthiness provides a distinct advantage to the banks.

For competitive reasons also, enterprises may be unwilling to reveal to the general public the information which would be necessary in order to obtain

funds from the stock market but would agree to provide it to their bank. The greatest advantage of banks, however, lies mainly in their monitoring and controlling mechanisms. The significance of the governance role absolutely assumes that potential investors are aware of how to run a firm. Based on this assumption, a majority view of the firm's potentials to investors may easily be ascertained. Cameron (1997) concludes that a bank-based system of finance is a far better system for developing countries. Demirguc-Kunt and Haizinga (2000), however, argue that the stock market is better as a means of financing growth, as it provides a greater opportunity for competition, thereby encouraging entrepreneurship. Similarly, Arnold and Walz (2000) argue that stock markets are better as a means for finance than banks. They can extract a large share of the profit from firms, using inside information about them. Furthermore, stock markets perform a variety of functions that include helping investors to price and hedge risk more effectively.

An equity market allows a firm to diversify some of the risks it faces by allowing it to sell to other investors who are more willing bear these risks. Also, when firms belong to entirely new industries or their technologies are rapidly evolving, scarcity of information about the firms in the industry may exist.

In such cases, the function of governance performed by banks may become irrelevant or inefficient. The stock market, however, may play this role more efficiently, particularly as stock prices in an efficient market continuously collect all available information on the firm, thus making stock prices a source of information of the true worth of a firm. Moreover, Levine and Zervos (1998a)

find that the type of financial service provided by stock markets is different from the type of service provided by banks. Similarly, Levine (2002) argues that stock markets and banks provide financial services which are essential for the growth of a country and is of the opinion that the services provided by stock markets and banks may be complementary.

To conclude, Beck and Levine (2000) argue that stock markets and banks may complement each other in supplying financial services for economic growth rather than acting as substitutes. They support this with evidence from heavy external finance, using industries that show a faster rate of growth of firms in countries with a well developed financial system (both stock markets and banks).

2.5 Stock Market Efficiency and Economic Growth

Stock market efficiency is one of the most extensively covered areas in the financial literature. Although there are numerous studies about developed markets, few studies have examined informational efficiency in developing countries' markets. Studying the informational efficiency of stock prices is useful because theory suggests that these prices contain information about market expectations of future economic growth. Similarly, movements in equity prices can have direct effects on consumption and investment expenditures, via wealth and liquidity effects and consequently economic growth.

The extent to which the past price of a security can affect the present price of that security has been a source of great controversy and debate and the belief

before the efficient market hypothesis was that the past price of a security was rich in information and a pattern could be discerned from the price possibly to extrapolate into the future and as such make extraordinary profit from the market.

Fama (1965) is credited with developing the efficient market hypothesis (EMH) theory. The theory argues that the cost of traded securities on the stock market contains all the available information and immediately absorbs all new information. The general idea is that excessive returns cannot be earned from studying past prices. This is, however, based on the idea that the individual is rational and would act in his/her best interests.

Fama (1965) identified three forms of efficiency in his efficient market hypothesis, the weak-form efficiency, semi-strong-form efficiency and strong-form efficiency. A stock market is weak-form efficient when present prices reflect all information from past prices; thus, an investor cannot obtain extra profit form analysing past prices. A market is of semi-strong efficiency where the speed of adjustment to new information is instantaneous, without leaving room for profit to be made, owing to the delay in reflecting that information. A market has strong-form efficiency when it is not legally possible to earn abnormal profit from publicly available information.

When a stock market is efficient, it has the ability to price assets correctly and quickly. It is therefore expected that the more efficient the market, the lower its

volatility, since prices will adjust more quickly to news. If the stock market can price assets correctly, there will be an expectation of price stability.

Fama (1965) defines an efficient stock market as one where prices integrate with the available information, thereby removing the cost of gathering information and enhancing investment opportunities and economic growth. Efficiency, then, has implications for our first question of whether the Nigerian stock market has contributed to economic growth. Similarly, Subrahmanyam and Titman (1999) present models where the information produced by an efficient stock market helped guide management decisions through the markets resource allocation function further, highlighting the importance of the role of stock market efficiency in contributing to a country's economic growth.

2.5.1 Efficient Market Hypothesis (EMH)

Conclusions from empirical testing of the efficient market hypothesis with stock prices have not been consistent (Adelegan 2009). The overall conclusion from the empirical studies on developed stock markets shows that excess profit from using past records of price series is not possible, supporting the weak-form efficiency form of the EMH. However, developed stock markets have a different size and structure from the developing and less developed stock markets.

The general belief is that developing and less developed stock markets are not as efficient as the developed stock market. However, evidence from empirical studies has been inconclusive. The research findings on market efficiency

(WEMH) in developing and less developed stock markets are controversial and not as conclusive as those for the developed markets.

Mabhunu (2004) showed by using the South African stock market that developing stock markets can be efficient. The study revealed that the market was weak-form efficient, contrary to the common view. Also Ojah and Karemera (1999) tested the efficiency of four Latin-American countries stock markets and found them to be weak-form efficient.

Most of the studies that have tested the Nigerian stock market for efficiency have shown it as weak-form efficient; however, there are a few studies which have shown it as semi-strong efficient. Adelegan (2004) investigated the adjusted share prices to dividend announcements from 1991 to 1999. The results show negative and positive excess returns for the samples, paying dividend before and after announcement dates respectively. The results of the study also show the Nigerian stock market to be weak-form efficient. Similarly, Jefferis and Smith (2005), in their analysis, found the Nigerian stock market to be weak-form efficient. Emenuga (1998) is one of the few who have found the Nigerian stock market efficiency to be semi-strong form efficient. His study was, however, criticised as being based on questionable assumptions.

2.6 Summary and Conclusions

The purpose of this chapter has been to explore the theoretical evidence for the relationship between the stock market and economic growth, in order to provide a setting for the ensuing analysis. In this regard, this chapter traced the links

between stock market development and economic growth specifically that of the stock market within the endogenous growth theory.

The endogenous growth theory posits a positive role for the stock market in the economic growth process. Existing theoretical literature identifies various mechanisms to explain the positive influence of stock markets on the economic growth. The mechanisms emphasised by these studies rely on the premise that stock markets help to promote physical capital accumulation, improving capital mobilisation and increasing productivity growth through the facilitation of (risky) technological advances and inducing the real economic efficiency with which resources are utilised. Stock markets can do this by providing different functions, specialising in the provision of liquidity, projects evaluation, risks sharing, exerting corporate control, information collection and mobilising capital.

In conclusion, in the above theoretical studies, which link stock markets development with economic growth, the consensus is that stock markets and economic growth have a positive relationship within the endogenous growth theory. However, the relationship between stock market development and economic growth is not always positive as proposed by the endogenous growth theory. Speculation and the uncertain effect of some of the functions performed in the stock market suggest a possible negative link between stock market and economic growth. However, as has been shown, stock markets do have the ability to promote economic growth and many researchers have investigated the exact relationship between stock markets and economic growth, so as to

determine the validity and strength of this relationship. A review of some of the literature in this area is undertaken in the next chapter.

On the basis of this prior analysis of the literature conducted in this chapter, it is clear that there are a number of unresolved issues on the relationship between the stock market and economic growth. These issues include the impact of stock market development on economic growth, particularly in developing countries, taking into account the level of development of these countries' intuitions and the relatively small sizes of the stock market in these countries. Secondly, regarding the direction of the causal effect of a relationship which might exist between stock market and economic growth, this research aims to provide answers to these issues.

Given these above unresolved issues, it is clear that the following research questions are highly pertinent.

- What is the relationship between the stock market and economic growth in Nigeria?
- What is the direction of the relationship between the stock market and economic growth in Nigeria? Does the stock market cause economic growth or does economic growth cause the development of the stock market?

CHAPTER 3: EMPIRICAL RESEARCH ON STOCK MARKETS

3.1. Introduction

This chapter examines the existing empirical literature on stock market/economic growth relationship, specifically within the context of the endogenous growth theory. During recent years the relationship between stock market development and economic growth has been a source of significant attention in the economic growth literature. Endogenous growth theory accepts that there is a significant role for financial development, particularly for stock markets, in the economic growth process.

The chapter focuses on macroeconomic studies, while undertaking an extensive review of the key empirical research that has been carried out on the relationship between the stock market development and economic growth. The approaches followed by these studies may be categorised into two groups; cross-country and single country studies.

3.1.1 Aims and Objectives of the Chapter

The aim of this chapter is to provide a background to and justification for undertaking this research.

3.1.2 Chapter Question

The central question that this chapter seeks to answer is how the relationship between stock market development and economic growth can be examined.

Essentially, what is the best method to investigate the relationship, taking into account the literature, particularly in a developing country?

3.1.3 Chapter Structure

This chapter is structured as follows. In Section 3.2, the empirical evidence of the stock market development and economic growth relationship is introduced and the various types distinguished. Section 3.3 presents the evidence from developed countries and Section 3.4 presents the evidence for developing countries as well as Nigeria. Section 3.5 provides a general assessment of empirical literature and Section 3.6 presents a summary and conclusion of the issues discussed.

3.2. Empirical Evidence of the Stock Market Development and Economic Growth Relationship

Empirical literature on stock market development and economic growth relationship, as identified by Demirgüç-Kunt and Levine (2008), can be categorised into four different types of studies.

- Pure cross-country growth regressions.
- Panel techniques that make use of both time-series and cross-country type of data.
- Microeconomic studies that explore the various channels by which finance can affect economic growth.
- Single country studies.

Pure Cross-country Growth Regression Studies: The first type of approach in the study of the stock market economic growth relationship is the pure cross-

country growth regressions studies; this type of study forms the bulk of the available study and it usually involves the use of standard explanatory variables, like human and physical capital. Cross-countries studies allow for a large number of countries to be examined at the same time, providing a general idea of what the relationship between stock market and economic growth could be. They usually construct a series of observations for several countries by taking the average of the variables for the whole of the study period and examining how proxies for stock market development interact with growth. They are also easier to investigate because they require a shorter length of data. Examples of such studies include Atje and Jovanovic (1993) and Harris (1997), whose cross-sectional studies demonstrate that stock markets positively impact on economic growth for developed countries. Similarly, Rousseau and Wachtel (2000) and Beck and Levine (2002) within a cross-sectional study framework provide further evidence which indicates that stock market development can foster economic growth in the long run for developed counties. Also, they provide evidence in support of the endogenous growth theory, that stock markets which function well may enhance economic growth through their action on accumulation of capital, improvements in efficiency and the allocation of resources, thus providing a stimulus to economic growth. On the contrary, Adjasi, and Biekpe (2006), while investigating the effect of stock market development on economic growth in a group of 14 African countries, find that only some of the stock markets play a significant role in economic growth. They conclude that the income level of a country affects the level of impacts the stock market has on economic growth. Similarly, Enisan and Olufisayo (2009), while investigating the direction of the causality in the relationship between stock

market performance and economic growth from seven countries in sub-Saharan Africa, find conflicting results. Some of the developing countries (Egypt and South Africa) analysed showed strong evidence that stock market impacts on economic growth, while some showed weak evidence of this relationship.

However, cross-countries studies are not without their flaws and, as Ang (2008) points out, the standards of the econometric techniques employed in cross-country investigation of the stock market economic growth relationships are often subject to criticism. Owing to averaging, the degree of accuracy of the information is lost and the implication is that the reliability of the result is called into question. Secondly, many of these cross-country studies do not take into account specific information regarding the structure and conditions of the economies of individual countries. Gupta (1970) demonstrated this when he replicated Rahman's (1968) study with 50 countries, in place of the 31 originally chosen by Rahman (1968). Gupta's (1970) result showed a change in the sign of capital flow coefficient and capital flow losing significance.

Also, the assumption that the econometric models are static in cross-country studies is not valid, as it displays only a single period relative static structure, thus all assumptions that the results of cross-country studies mirror the long term economic properties of the countries are unfounded. Similarly, Ericsson et al. (2001) argue that cross-country study analyses neglect levels of relationships within the model specification. Hence, these studies examine only the short-run relationship, as opposed to the relationship in the long run.

Panel Techniques Studies: The second type of approach in the study of the stock market economic growth relationship is the panel studies techniques, that make use of both time-series and cross-country type of data. This approach tries to improve on the shortcomings observed in the econometric specification associated with studies that use the pure cross-sectional techniques by accounting for the impact of the time dimension through using the dynamic panel estimation techniques. Examples of such studies include Rousseau and Wachtel (2000), Rioja and Valev (2004) and Beck and Levine's (2004) panel-type study, which demonstrate that stock markets positively impact on economic growth for developed countries. Similarly, Christopoulos and Tsionas (2004), using a panel study technique, provide supporting evidence that the direction of causality of the relationship is running from financial development to economic growth. Also, Calderon and Liu (2003), within the panel estimation procedure, find evidence in support of a two-way causal relationship between financial development and economic growth, thus providing further evidence in support of the endogenous growth theory that a properly functioning stock market may enhance economic growth.

Although the dynamic panel techniques approach attempts to reduce some of the econometric problems associated with the pure cross-country approach, it is not without its own flaws. Panel techniques suffer from problems associated with heterogeneity (omitted variables) bias, particularly as the country-specific effects are not taken into account. Pesaran and Smith, (1995) observed that these omission can cause inconsistencies and bias in the parameter estimate of such studies and render the result unusable.

Secondly, many of these panel techniques studies hold the observable country-specific effects constantly and, as Wachtel (2003) demonstrates, any detected relationship between financial development and economic growth in this technique may be due to a falsely generated aggregate relationship, caused by differences between the countries rather than differences within the countries, making the results obtained from such broad comparative studies unreliable for policy decision- making purposes.

Microeconomic Level Studies: The third type of approach in the study of the stock market economic growth relationship is the microeconomic level studies technique that explores the various channels through which finance may affect economic growth. This approach makes use of industry and firm level data in examining the effect of stock market development on industry and firm performance. Microeconomic level studies techniques seek to avoid the identified flaws in cross-country and panel studies approaches by resolving issues with causality and providing a more detailed account of the effect and mechanism through which stock markets impact on economic growth. Examples of such studies include Rajan and Zingales (1998), who carried out a microeconomic study where they utilised industry level data to investigate causality issues as well as the mechanism of transmission of the relationship between financial development and economic growth. Their results demonstrate that financial development has a positive impact on firm growth as well as in the creation of new firms by helping the flow of external finance. The findings of the study show that industries with a high reliance on external finance do

well in countries that a have a well-developed financial sector. Similarly, Demirgüç-Kunt and Maksimovic (1998) utilised firm level data to investigate how much of an impact financial development has on a firm's decision to invest in expansion projects. They provide evidence in support of the positive effect of banks and stock market excess growth of firms. Beck and Levine (2002) confirm similar findings as Rajan and Zingales (1998), using different measures of financial development in a microeconomic study. Beck and Levine's (2002) study show that the stock market proxy (total capitalisation) had a significant positive impact on growth. The result thus supports the view that financial development boosts industry growth in industries with high external finance dependence.

While microeconomic level studies technique approaches help solve some of the problems specific to methods like pure cross-country and panel studies approaches, they also generate some issues of their own. Firstly, microeconomic level data have specific endogeneity problems, namely the fact that access variables cannot be considered to be determined exogenously. Secondly, there are problems with determining sample (both size and population), which can be constrained by cost, time and relevance to the study; these are decisions often subjective in nature.

Single Country Time Series Studies: The fourth type of approach in the study of the stock market economic growth relationship is the single country studies technique, that explores the finance growth relationship in a single individual country. This approach analyses the impact of a specific institution or policy

changes on economic growth within a country. The results generated from such studies are very effective for policy decisions, as they are tailored specifically to the country under analysis, which allows for careful in-depth examination of historical and institutional characteristics within the study. Earlier empirical studies, such as Patrick (1966), McKinnon (1988), Demetriades and Hussein (1996) and Arestis and Demetriades (1997), point to the superiority of the quality of time-series over the cross-sectional data. Their argument is that cross-sectional regressions studies are not in tune with the individual countries' situations, particularly in cases of policy regimes, effectiveness of governance and circumstances of financial institutions.

Also, it allows for a comprehensive explanation of the dynamic evolution of the economy, as data sets utilised in such studies are of the highest and most appropriate quality of the measures under analysis. Examples of such studies include Osei (2005), Van Nieuwerburgh et al (2005) and Bahadur & Neupane (2006), who carried out separate single country studies on Ghana and Belgium and found evidence in support of a positive relationship between stock market development and economic growth. Their respective results provide support for the assertion of the endogenous growth theory that stock markets enhance growth. Similarly, Brasoveanu et al (2008) and Shahbaz et al (2008), within a single country study framework, provide further evidence which supports the view that stock market development can foster economic growth in the long run for Romania and Pakistan respectively. Their study conforms to the general theoretical framework of this study, as it specifically tests the validity of the endogenous growth theory in a single country, using time series analysis. In

addition, their results provide support for the endogenous growth theory that a well functioning stock market may enhance economic growth. On the contrary, Asai & Shiba (1995), while investigating the effect of stock market on macro-economic variables in Japan, found that they could not detect a statistically significant causal relationship between the stock market and the macro-economic variables used in the study.

Although single country time-series studies technique approach has several advantages which make it superior to the other methods discussed above in the study of the stock market economic growth relationship, it is not without its challenges. The major challenge of the method is that most times the results of such studies cannot be generalised easily for other countries, as the exact structures of the economies may be different, thereby making the results of such studies difficult to use in policy decision processes for other countries than the initial country analysed.

In the light of the above flaws that have been discussed on the use of cross country, panel and microeconomic level techniques studies in examining the relationship between stock market development and economic growth, a country-specific approach is recommended. Levine & Zervos (1996) point to the adoption of single country studies as a way to circumvent the conceptual, statistical and measurement flaws in these other types of studies on the stock market development and economic growth relationship. The literature that follows below provides an overview of the single country time-series studies literature surrounding the relationship between financial development and

economic growth in general and the stock market specifically, in both developed and developing countries.

3.3. Empirical Studies on Developed Countries

This section focuses on time series and some of the empirical studies that relate to this study. Single country time-series studies of empirical literature on the stock market development and economic growth relationship in developed countries follow the time series change of economic growth and financial development within a certain country (to determine the existence of a relationship), test the direction of causality between financial development and economic growth (where it has been determined that a relationship exists) or test both. These studies adopt various time- series methods like correlation analysis, ordinary least square (OLS), least squares (GLS), vector auto-regressive (VAR), and autoregressive distributed lag (ARDL) modelling approaches have been used, with varying degrees of success. Each of these methods has certain weaknesses which influence their use but will be considered in greater detail later in this study in the methodology chapter.

Asai & Shiba (1995) employed a vector auto-regressions (VAR) model in their time- series study to determine the existence of a relationship between the stock market and macro-economic variables in Japan. The study utilised a multivariate specification using the variables inflation rate, interest rate, industrial production index and stock market development proxy. The result of the study indicates that there is a relationship between the stock market and the macro-economic variables. It, however, shows that the direction of the causal

relationship is from the macro-economic variables to the stock market, indicating that it is economic growth which drives the stock market for Japan. The causal effect found of the stock market on economic growth was, however, inconclusive. Similarly, Asteriou and Price (2000) employed a vector auto-regressions (VAR) model in their time-series study to determine the existence of a relationship between financial development and economic growth in the UK. They also utilised real GDP per capita as a measure of growth. They found evidence that supported the existence of a relationship between financial development and economic growth, with the direction being from financial development to economic growth. The result indicates that, contrary to what happens in the Japanese economy, financial development drives economic growth in the UK.

Herriott (2001) undertook a fascinating empirical investigation of the connection between financial development and economic growth in Switzerland, using quarterly time-series data from 1990 to 1999. He used a vector auto-regressive (VAR) estimation framework to specify the model. Herriott (2001) also used the variable real GDP as proxy for economic growth and three measures of stock market development (market capitalisation, stock market volume divided by market value and stock market volume divided by GDP) and one measure of banking sector development (M1). The results of the study showed that financial development positively impacts on economic growth in line with economic growth theory. However, the use of real GDP as proxy for growth in the study is criticised, as it is seen as a poor measure of economic growth.

Hondroyiannis et al (2004) employed a vector auto-regressions (VAR) model in their time series study to investigate the financial development/economic growth relationship for Greece and found the existence of a relationship. Their study utilised monthly time-series data from 1986 to 1999. Their results indicate the existence of a two-way causal relationship between the financial development proxies and growth in the long run. It, however, shows that the effect from the stock market measure was smaller than the effect from the bank measure on economic growth. Thangavelu and Ang (2004) obtain contrasting results after employing a vector auto-regressions (VAR) model in examining the financial development and economic growth relationship for Australia. Their results reveal that, while for the banking measures of financial development the causal relationship runs from economic growth to financial development, indicating that Australian banks do not drive economic growth, when stock market measures of financial development are utilised, the reverse is the case, that is the causal relationship runs from the stock market to economic growth, indicating that stock markets in Australia impact on economic growth positively. Similar results were obtained by Van Nieuwerburgh et al (2005) after an extensive empirical investigation of the long-term relationship between stock market development and economic growth in Belgium using annual time-series data for 1830 to 2000. The study used real per capita gross domestic product (GDP) to proxy growth and used five measures of stock market development, based on different groups of stocks. The results provide evidence that the stock market development caused economic growth in Belgium in the 1873 to 1935 period.

Yang and Yi (2008), using annual Korean data from 1971 to 2002, examined the financial development/economic growth relationship in the Korean economy. The findings of the study provide evidence that financial development causes economic growth and that is there is a one-directional relationship between the stock market and economic growth, running from the stock market to growth. Antonios (2010) also obtained similar results applying the Johansen co-integration and Granger causality tests within the Vector Error Correction Model (VECM), which examined the relationship between stock market development and economic growth for Germany. His analysis covered the period 1965 to 2007 using the variables stock market overall price index, gross domestic product (GDP) and bank lending rate. The results indicate that there is a one-directional relationship between the stock market and economic growth, running from the stock market to growth. The results are realistic, as theory tells us that, in the short run, the stock market takes the lead until the feedback mechanism take effect. However, his use of GDP as proxy for growth can be criticised, as GDP is not a good proxy for economic growth.

Fundamentally, the consensus from empirical studies conducted on the stock market development and economic growth relationship for developed countries provides evidence in support of the view that stock markets have a positive impact on economic growth. However, the key issue is--will the same results be obtained for developing countries like Nigeria, taking into account the specific economic environment of these countries?

3.4 Empirical Studies on Developing Countries

In this section, our empirical literature review briefly focuses on two areas. The first is the empirical literature that examines the effect of stock market development on economic growth. The second part focuses on the literature that accounts for the causal relationship between stock markets development and economic growth. While the first part is related to the first research question, the second part is related to the second research question of the study.

Azarmi et al (2005) employ ordinary least square (OLS) simple regression to examine the stock market development and economic growth relationship for India using annual time-series data from 1981 to 2001. The sample is divided into three groups, before and after market liberalisation as well as for the entire study period. The results of the study indicate a lack of association between stock market and economic growth over the entire study period. However, the results for the period before liberalisation indicate that the stock market was significant, while the period after liberalisation showed a negative relationship between stock market development and economic growth. There are, however, a few methodological issues with the study. Firstly, the study period of 21 years is not sufficient to conduct a meaningful statistically significant analysis using OLS regression, as the number of observations is less than 25. Secondly, division of the study into before and after liberalisation time periods further worsens the number of observation problems. This being the case, it would lead to too much of a loss in the degrees of freedom and consequently affect the reliability of the results of the study. Similarly, no unit root tests were conducted

to check if the dataset was stationary, thereby throwing further doubts on the validity of the results. Similarly, Ang (2008) found evidence of a relationship between financial development and economic growth for Malaysia. He applied an Autoregressive Distributed Lag (ARDL) model in testing the relationship and he concluded that there is a strong linkage between financial development and economic growth.

Nowbutsing & Odit (2009) investigated the impact of stock market on economic growth in Mauritius over the time period of 1989 to 2006. They measured stock market performance and development by its liquidity and size. The study used stock market capitalisation ratio and stock market turnover ratios as proxies of size and liquidity, which are capitalisation over GDP and volume of share traded over GDP respectively. Foreign Direct Investment (FDI) and human capital development were used as proxies for economic growth variables. Time-series econometric techniques were employed; specifically, the two-step Engle and Granger procedure was applied because of the small sample size. The findings showed that stock market growth impacted positively on economic growth, both in the short and long run, in Mauritius. Thus provides additional evidence to confirm the validity of the endogenous growth theory. However, the studies' use of human capital development and FDI as measures of economic growth is somewhat difficult to justify, as there are better measures of economic growth identified by the literature, such as GDP, GDP per capita or change in GDP per capita. More recently, Nazir et al (2010) investigated the stock market development and economic growth relationship in Pakistan from 1986 to 2008

using time series analysis. They used two measures of stock market development, namely market capitalisation and value traded ratios as proxies for market size and liquidity. The results show that both measures of stock market development impacted positively on economic growth in Pakistan for the period of study.

Oskooe (2010) also investigated the impact of stock market on economic growth in the Iranian economy using quarterly time series data from 1997 to 2008. He used Johansen's co-integration test as well as Vector Error Correction Model (VECM). The study result revealed that economic activity was the driving force in the movement of stock prices in the long run, while stock market played a leading role in economic growth in the short run. This work by Oskooe (2010) conforms to the general theoretical framework of this study. Also, the results seem compatible with economic theory.

Recent empirical works have tested for a causal relationship between stock markets and economic growth in developing countries, to ascertain whether stock markets drive economic growth or if the reverse is the case.

Osei (2005) examines the impact of stock market development on economic growth in Ghana using quarterly time-series data from 1991 to 2003. He used a Vector Auto-regressive (VAR) Model and applied Granger's (1969) definition of causality. The variables used in the analysis were the natural logarithm of Market capitalisation and market capitalisation ratio as proxy for stock market development and natural logarithm of Real GDP for growth. The empirical

evidence indicates that stock market development Granger causes economic growth in Ghana for the period of the study. The results are therefore consistent with the theoretical predictions.

Bahadur & Neupane (2006) investigated the direction of the causal relationship between stock market development and economic growth in Nepal using annual time series data from 1988 to 2005. The study used market capitalisation to GDP ratio, the annual market turnover to market capitalisation ratio and annual turnover to GDP ratio as proxies of stock market development and gross domestic product (GDP) for economic growth; it used the Granger causality test in the analysis. The results reveal the presence of a relationship between stock market and economic growth, also that stock market Granger causes economic growth in Nepal. The findings also support the assertion of the endogenous growth theory that the stock markets impacts positively on economic growth. Shahbaz et al (2008) also obtained similar results when investigating the stock market and economic growth relationships in Pakistan using annual time series data for 1971 to 2006. They applied the Johansen & Juselius co-integration and autoregressive distributed lag ARDL bounds, testing techniques to test for a relationship. While they used the Engle-Granger causality and ARDL tests to test for causality. The finding of the study indicates the presence of a strong relationship between the stock market and economic growth; also, a bidirectional relationship was observed between the variables in the long run. However, they found that the direction of causality ran from stock market to economic growth in the short run. This work by Shahbaz et al (2008) conforms to the general theoretical framework of this study, as it specifically tests the

validity of the endogenous growth theory in a single country using time-series analysis.

Kaplan (2008) assessed the stock market development and economic growth stock market performance and real economic activity and reactions of real economic activity to shocks in stock prices relationship in Turkey. He used the Johansen cointegration test and Granger causality test within the framework of a vector autoregressive (VAR) model on quarterly data for stock market indices and GDP from 1987 to 2006. The results of the study showed the existence of a long run cointegrating relationship between stock market and economic growth. In addition, the causality test showed the existence of one-way causation from the stock market to economic growth. This result conforms to theory and confirms the assertions of the endogenous growth theory. However, Wang (2010) obtained a contrasting result using monthly data from 1992 to 2008 to examine the relationship between the stock market and the Chinese economy. He used an Engle-generalised autoregressive conditional heteroscedasticity (EGARCH) model as well as a lag-augmented vector autoregressive (LA-VAR) model to investigate the volatility and causality respectively. The findings show no causality between stock market volatility and real GDP which measured economic activity; however, the study revealed the existence of a feedback mechanism, evidenced by a bidirectional relationship between stock market volatility and inflation volatility. The findings, however, do not conform to economic theory for the period under study. The study's findings are, however, open to criticism for its use of real GDP as proxy for economic growth, which is seen as a poor proxy for growth.

Odhiambo (2010) examined the causal relationship between stock market development and economic growth for the South African economy. The study used annual time-series data for the period 1971-2007 and autoregressive distributed lag (ARDL)-Bounds testing method was employed. The study employed the proxies' stock market capitalisation; stock market traded value and stock market turnover were used to represent stock market development, while the proxy real GDP per capita represented economic growth. The study's results showed that the direction of causality in the stock market development and economic growth relationship is influenced by the choice of proxy utilised to measure stock market development. Economic growth Granger caused stock market development when market capitalisation was used as a proxy for stock market development. The reverse was the case where the stock market development proxies' stock market traded value and stock market turnover were used. Overall, causality running from stock market development to economic growth was stronger. The results were valid both in the short-run and long-run.

Similar results were obtained by Tuchinda (2011), who examined the impact of stock market development on economic growth for Thailand in the agricultural sector as well as the non-agricultural sector, using quarterly time-series data from 1993 to 2010. He used the proxies' quarterly GDP at current market price, real GDP, GDP per capita and real GDP per capita for economic growth. Similarly, he used quarterly GDP of agricultural sector, real GDP of agricultural sector, GDP of non-agricultural sector and real GDP of non-agricultural sector proxy growth in agricultural and non-agricultural sector respectively. Stock

market development was measured by quarterly market capitalisation and also measured the turnover by volume. The study used Cointegration analysis and Granger causality and the results showed the existence of a long-running relationship between the stock market and economic growth in Thailand. The Granger causality tests show that causality is from the stock market to economic growth. In the analysis of the sectors, the study found that the stock market impacted positively on the non-agricultural sector and showed no noticeable impact on the agricultural sectors. The work conforms to the general theoretical framework of this study. These results have shown that the effect of the stock market on economic growth depends on each country's economic characteristics.

Essentially, there is no clear consensus from empirical studies on the relationship between stock markets development and economic growth for developing countries. The bulk of these studies establish a positive role for stock market development on economic growth, with a few finding negative role for stock markets, thus making the effect of stock markets on economic growth in developing countries a far from concluded matter.

3.4.1 Empirical Studies on Nigeria

In Nigeria, some researchers have examined the stock market development and economic growth relationship. For instance, Oke & Mokuolu, (2005) examined the degree of correlation of stock market development with economic growth in Nigeria. The study used annual time-series data from 1986 to 2002

and an independent partial correlation model was employed. Two measures of stock market development, namely stock market traded value and stock market turnover, were used with real GDP and stock market capitalisation for economic growth. The empirical results of the study provide evidence of positive correlation between stock market development and economic growth in Nigeria. The evidence essentially confirms the importance of stock market development (size and liquidity) to economic growth in Nigeria. The studies' use of real GDP as a proxy for economic growth is a source of criticism; also, the time span of the study draws into question the validity of the findings, as they could be spurious.

Riman et al (2008) examined the existence of a link between stock market development and economic growth for Nigeria using annual data from 1970 to 2004. Their study applied the Johansson's Vector Error Correction Model (VECM) and Granger causality tests in the analysis. They utilised real GDP as proxy for economic growth, market capitalisation as a measure of stock market development and a variable STRUC which represents that financial structure. The results provide evidence of the existence of a long-running relationship between the stock market and economic growth and it discovers a one-directional relationship running from stock market to economic growth, essentially confirming the relevance of the stock market development to economic growth in Nigeria. The study's use of real GDP as a measure of growth, which is a poor measure of economic growth, is a source of criticism. Also, that the study uses only one measure of stock market development and

does not control other factors within the economy which might impact on growth is another source of weakness of the study.

Augustine and Salami (2010) studied the stock market development economic growth relationship in Nigeria using ordinary least square (OLS) regression. They used time-series data from 1986 to 2006. Per capita gross domestic product (GDP) was the independent variable and proxy for economic growth. Total market capitalisation, turnover ratio, and total value of shares traded all represented stock market development. The result of the study show that stock market capitalisation and turnover ratios positively impact on economic growth, while stock market liquidity has a negative effect on long-running growth in Nigeria for the study period. The study, although useful, does not answer the issue of causality in the relationship between stock market and economic growth in Nigeria. Also, the number of observations in the data set is too small for a statistically significant study of the relationship. However, Nyong (1997) obtained contrasting results using market capitalisation to GDP ratio, total value of transaction to GDP ratio, value of transaction to GDP and stock market listings as measures of stock market development and finding evidence that the stock market has a negative impact on economic growth in Nigeria. The study used a simple regression model specification. Similarly, Osinubi and Amaghionyeodiwe's (2003) did an empirical investigation of the stock market development and economic growth relationship for Nigeria using a simple regression model. Their study finds no statistically significant effect of the stock market on economic growth for the period 1980 to 2000. These two studies are,

however, criticised, as the number of observations of their data points is insufficient to obtain a statistically significant result.

Essentially, there is no clear consensus from empirical studies on the relationship between stock markets development and economic growth for Nigeria. The results from the few available studies are inconsistent and, at best, weak, as a result either of the studies not being robust enough or being plagued by methodological problems, such as insufficient time series data, poor proxies and methods used in the studies, hence creating a need for a robust and reliable study, such as this one, of the relationship between stock market development and economic growth in Nigeria.

3.5 General Assessment of Empirical Literature

The selected empirical studies discussed in sections 3.2, 3.3 and 3.4 examined the stock market development economic growth relationship in both developed and developing countries. Some of the studies tried to find a link between stock market and economic growth, while some examined the direction of causality between stock market and economic growth.

The general trend in the literature for investigating the stock market and economic growth relationship is to use time-series VAR based on the superiority of the data. Several econometric time-series methods have been used in the analysis of the stock market economic growth relationship studies discussed in sections 3.2, 3.3 and 3.4 above. The methods include autoregressive distributed lag (ARDL) tests, lag-augmented vector autoregressive (LA-VAR),

ordinary least square (OLS), cointergration and VECM and the Granger causality test. Each of these methods has certain weaknesses which influence the choice of methods, so, depending on the available data and for what and how the results are intended to be used, methods are determined and selected. However, some methods are identified as being more reliable and less likely to produce spurious results. The Johansen cointergration and VECM is identified as one such method for the analysis of the stock market economic growth relationship. Similarly, the Granger causality tests are identified as the most suitable and reliable and least cumbersome for testing for a causal relationship between stock market and economic growth, hence their popularity in the literature and frequent use by most studies.

Also, the bulk of the studies which investigated the stock market and economic growth link used market capitalisation as a proxy of stock market development and real GDP for economic growth (Bahadur and Neupane 2006, Osei 2005, Oke and Mokuolu 2005, Nowbutsing and Odit 2009). These studies provide evidence that stock market is related to economic growth. In addition, other studies have used other variables as proxy of stock market development; these include stock market turnover ratio, stock market value traded ratio and stock market index (Oke and Mokuolu 2005, Nowbutsing and Odit 2009, Bahadur and Neupane 2006). These studies also provide evidence of the positive impact of the stock market on economic growth.

The use of real GDP as a measure of economic growth has been subject to criticism on the grounds that it does not adequately reflect rate or level of actual

growth. There have been instances where economies in recessions would report a rising real GDP and computation of the GDP growth rate showed a falling trend. Also, because real GDP does not take into account the population of a country and, lastly, as the study examines change over time, it is more appropriate that it looks at change in GDP. As an alternative to real GDP, the growth rate of per capita GDP is suggested as a measure of growth.

Evidence of the stock market development and economic growth relationship in Nigeria has been assessed by Augustine and Salami (2010), Riman et al (2008) and Oke and Mokuolu, (2005). Augustine and Salami (2010) considered total market capitalisation, total value of shares traded and turnover ratio against per capita GDP in their OLS regression. Riman et al (2008) used market capitalisation and a financial structure proxy against real GDP in their cointegration tests. Oke and Mokuolu (2005) used stock market turnover against real GDP, stock market capitalisation and stock and market traded value in their correlations analysis. The choice of measure of stock market development looking at the above empirical studies seems a somewhat subjective issue. Levine (2004) argues that the best solution to this problem would be to develop an indicator tied to theory and suited to the country being analysed, hence the difference.

At this juncture it is pertinent to explore briefly the predictive powers of lagged growth and financial markets particularly as it relates to Granger causality tests their purpose and limitations. Achieving the ability to predict the direction and magnitude of future growth has long been the goal of researchers particularly

of financial markets. The search for models that has sufficient power to effectively predict growth and financial markets has encouraged researcher to develop several models and theories in a bid to effectively predict these economic phenomenon.

Effective economic planning would be enhanced by the ability to accurately predict the consequences of policies as evaluating the effect of policy entails discerning the validity of future conditional sentences (If X is the case, thus Y will be the case). Similarly, discerning the validity of past practice or policy entails discerning the validity of counterfactual sentences (If X was the case, thus Y will have been the case). In line with the above the link between the validity of counterfactual sentences, future conditional as well as causal regularities emphasis a need for a better understanding of the causal structure and relationships within the context of economic planning and growth.

As Spirtes et al. (2000) point out any equation that attempts to link for example the automobile accidents fatality rate to the weight of the respective cars may be among other things sensitive to sample bias unless the sample is a true representation of the actual population. Thus making it ineffective in predicting the change to fatality rate caused by a change in car weight through legislation, hence further emphasising the need for a better knowledge of the existing causal structures existing between variables within relationships.

Causation in economics is generally understood to describe a relation between particular events where the occurrence of a particular event A initiates the occurrence of another event B. Thus each cause as well as effect is viewed as a separate and distinctive event and tests have been developed in a bid to capture this unique relationship. The Granger causality test is one such test developed to determine the direction of influence of one variable on another and the most widely adopted in several fields including econometrics (Kaminski et al. 2001).

Granger (1969) proposed a framework for identifying statistically causal relationships between stochastic processes, based on sequential prediction.
The framework proposed by Granger (1969) states that A is causing B if it is possible to predict B applying all available information than if the information apart from *A* were applied. The principle is based on the process through which causal side information exerts an influence on the process of sequential prediction.

The researcher used the Granger causality test in the analysis because it is the most suitable test available with sufficient power to answer the second research question which is what is the direction of the relationship between the stock market and economic growth in Nigeria?

The idea behind the Granger causality tests is to determine the causality or direction of influence of two or more variables on each other as regression

analysis (which is a more common analysis in econometrics) only answers the question of dependence between the variables. The Granger causality test is based on the assumption that all the information relevant to the prediction of the respective variables is contained only in the two variables (Gujarati, 2004). Since the future cannot be used to predict the past the test estimates lagged values of one variable against the present value of the other and in spite of its name the Granger Causality test is not sufficient to imply true causality.

It is however pertinent to note that the Granger causality tests as is applied within the thesis and in spite of its name is not a test of prediction in the conventional sense but rather a test of precedence between the variables being tested. As such the Granger causality tests is not a predictive test and cannot be used to determine future values of variables but rather can only tell the direction of the existing relationship between the variables. This is because one of the assumptions on which the test is based is that the two variables under investigation incorporate all the relevant information required for prediction of each other's values which is reality is not correct.

Thus the granger Causality tests is not a causality test as it is usually understood but rather a test of precedence between variables. Purpose of the granger causality tests is to test the order of precedence between two related variables. This led Jacobs et al (1979) to suggest that the term 'precedence' be used in place of the Granger causality term since all the test investigates is

whether a certain variable precedes another and not causality as it is usually understood.

3.6 Summary and Conclusion

The purpose of this chapter has been to explore the empirical evidence for the stock market development and economic growth relationship, in order to provide a setting for the ensuing analysis. In this regard, the chapter proceeded to conduct a review of the relevant empirical literature on the stock market development and economic growth relationship, considering the various approaches used in studies conducted on the relationship, as well as some of their weaknesses. It was identified from the literature that a single country time-series studies approach is the most appropriate way to study the relationship, as it allows the researcher to analyse the impact of a specific institution or policy changes on economic growth within a country and generates results tailored specifically for policy decisions to the country under analysis. Also, these single country time-series studies use mainly annual and quarterly and, rarely, monthly data, covering 'relatively longer periods of time when compared with cross-country data. The measures of stock market development used are more specific, as their choice is not based on cross-country availability.

In general, empirical studies on the stock market development and economic growth relationship for developed countries have all followed time series methodology as this allows the researcher to examine the variation between the variables over time. These studies have, however, used different techniques, their choice of techniques guided by their research questions. The studies that

are interested in investigating the existence of a relationship between the stock market and economic growth have used either simple regression (OLS) or some form of co-integration analysis, mainly the Johansen co-integration & VECM techniques (Antonios 2010). Similarly, the studies that are interested in investigating the direction of casualty have all used different variations of a vector autoregressive (VAR) models, the Granger causality test in particular; the results from these studies satisfy the requirements of their respective studies (Asteriou and Price 2000, Thangavelu and Ang 2004). The results of these previous empirical studies on developed countries all confirm that the stock markets development has a positive impact on economic growth. This implies that the endogenous growth theory is correct.

The empirical studies on the stock market development and economic growth relationship for developing countries have similarly followed time series methodology, as in developed countries. Similarly, the trend coming through is that the selection of techniques utilised by these studies is the same as for developed countries' studies, with studies investigating the existence of a relationship between the stock market and economic growth mainly using either simple regression (OLS) or some form of co-integration analysis, mainly the Johansen co-integration and for the causality studies the Granger causality test, just as in developing country studies.

However, there are two differences observed in the literature, one of which is the lack of consistency in the results of the studies of the stock market and economic growth for all the countries, as well as the variables used as proxies

in these studies. Secondly, the results of these studies on developing countries reveal a number of different conclusions. Some empirical studies provide evidence of a positive relationship; in others, the conclusion is that there is no relationship or even a negative relationship. Similarly, on the issue of the direction of causality, some researchers find a two-way relationship between stock market and economic growth, while others find a one-way causal relationship or even no causality. These conflicts in the results as have been discussed above still exist and are a source of debate.

For Nigeria, the literature review revealed that, although the few available studies on the stock market development and economic growth relationship have all followed time-series methodology, they are plagued by methodological weaknesses or lack robustness for the following reasons.

- The use of GDP as a measure of economic growth, disregarding its inability fully to capture and measure growth (Riman, et al 2008, Nurudeen 2009).
- Secondly, the number of observations used by these studies is too short and makes for statistically unreliable results (Nyong 1997, Osinubi and Amaghionyeodiwe 2003, Oke and Mokuolu, 2005, Augustine and Salami 2010).
- Also, the methods used for some of these studies are not very reliable for policy decision-making purposes, for example, Oke and Mokuolu's (2005) study, which utilised correlation analysis. Correlation measures

only the trend in the movement of one variable relative to another and does not measure the existence of a relation or its direction.

In the light of the above flaws that have been highlighted in the literature of the stock market economic growth relationship for Nigeria, there is a need for a single country time-series study on Nigeria, taking into account the issues identified in the literature, using a multivariate VAR framework, specifically Johansen co-integration & VECM and Granger causality test, as it has been shown to be the most reliable method at present to investigate this relation. The next chapter provides an overview of the Nigerian economy and its financial system.

CHAPTER 4: THE NIGERIAN ECONOMY AND ITS FINANCIAL SYSTEM

4.1 Introduction

The previous chapter provided an overview of the literature on stock market development and economic growth literature. The assumption maintained throughout the thesis is that the nature of the stock market's impact on economic growth, as has been shown in the literature review, is uncertain and varies, depending on the specific environment. Consequently, an understanding of the country-specific dynamic of the relationship between the stock market and economic growth within the context of Nigeria is required.

This chapter traces the historical narrative of the evolution of the Nigerian economy, showing its strengths, challenges and success so far. The performance of the Nigerian economy is highlighted, covering recent economic history. Thus, this chapter provides the background for the investigation of the relationship between the stock market and economic growth in Nigeria.

4.1.1 Aims and Objectives of the Chapter

This chapter aims to explore the dynamics of the Nigerian economy in the past and present, with the objective of understanding how the policy and the macroeconomic environment may have been shaped by the financial system in general and the stock market in particular.

4.1.2 Chapter Question

This chapter seeks to answer the question of what impact the country-specific environment in Nigeria has had on the stock market development.

4.1.3 Chapter Structure

The rest of the chapter is structured as follows. In section 4.2, the researcher undertakes a review of Nigeria's economic history, as well as its economic growth experiences. The period from independence in 1960 to the present is explored and looked at as five distinct periods in the history and the growth trend during this period is also looked at. Section 4.3 looks at the Nigerian financial system and discusses the trend in the banking sector development. Section 4.4 explores the Nigerian stock market, its structure and the various characteristics. Section 4.6 presents a summary and conclusion of the issues discussed in the chapter.

4.2 Review of Nigeria's Economic and Political History and its Growth

4.2.1 Experience since Independence

The territory called Nigeria was the creation of British colonial rule in 1914 but the histories of the peoples constituting the citizenry of Nigeria go back several centuries. Before delving into the specifics of Nigeria's economic environment, it is important to have a basic understanding of the socio-cultural environment of Nigeria and of some of the major issues that have affected the region over the past few decades.

Nigeria is a large country in the West African region. Covering 356,668 square miles, it is roughly twice the size of California and three times the size of the United Kingdom (Falola and Heaton 2008). Nigeria is blessed with a broad assortment of natural resources. Its mineral wealth includes commercial-sized deposits of tin, iron, columbite and coal, as well as zinc, lead, and copper, found in various parts of Nigeria. Small amounts of gold, silver and diamonds have also been discovered in various places. Nigeria is most famous, however, for its large petroleum reserves, located in the Niger delta. Since the 1970s petroleum has become the most important single commodity in the Nigerian economy and sales of petroleum make up about 90 per cent of the Nigeria's export earnings and makes up about 75 per cent of government revenues. This reliance on petroleum as the main source of the country's wealth has contributed greatly to economic instability since the late 1970s, as fluctuations in world petroleum prices and high levels of corruption among government officials have made sustainable development elusive and brought extreme poverty to the majority of Nigeria's citizens (Iyoha and Oriakhi 2002).

Nigeria is a middle-income country of about 150 million inhabitants, with an estimated annual per capita income of $2,400 in 2009 in terms of PPP (purchasing power parity). Nigeria's economic structure is dominated by industry and services, which account for 53.1% and 29.3% of GDP respectively, and agriculture accounts for the remaining 17.6% (CBN Statistical Bulletin 2004 and 2007). Historically the country has relied on exports of primary products to support the economy. Owing to a narrow production base, the country is highly dependent on exports of crude petroleum, although some of the imbalances in

the economy stem from socio-economic and political factors, such as military intervention, corruption, massive population growth and unpredictable fluctuations in crude oil prices. These issues have had major structural effects on the economy, contributing to a massive shortfall between income and expenditure and thereby having a negative effect on economic growth.

Ekpo and Egwakhide (2003) and Balogun (2007) emphasise that the growth and development of the Nigerian economy from independence to present times can be categorised into five different periods: the pre-oil boom decade (1960-70); the oil boom (1971-1977); stabilisation and structural adjustment (1986-1993); guided deregulation (1994-1998); and consolidation (1999–present). The next section describes each of these stages of the Nigerian economy.

4.2.1.1 Pre-oil boom era (1960-1970):

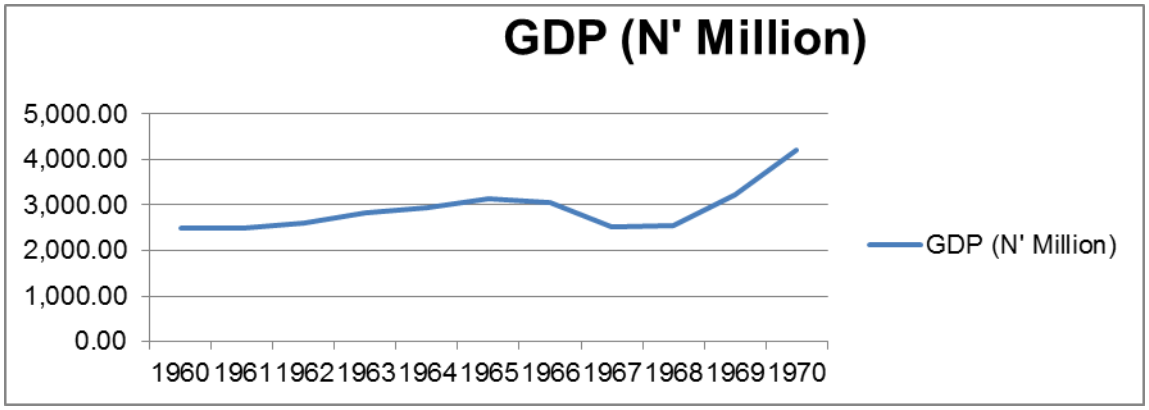
Balogun (2007b) argues that, prior to the oil boom, the Nigerian economy was heavily dependent on agriculture, which accounted for 65 per cent of its GDP and almost 70 per cent of total exports. The exportation of raw materials like agricultural produce to developed nations to earn foreign exchange to pay for capital and finished goods was the main thrust of the economy. In a bid to address the total reliance on agricultural production, the federal government designed policies to stimulate growth within the economy.

The 1962-1968 First National Development Plan (FNDP) favoured state direct and indirect participation in economic activities. It was argued that the government should provide the necessary and sufficient investment, so as to

improve the rate of growth of the economy. This was necessary as the savings and investment rates by the private sector were very poor at that time.

An import substitution industrialisation (ISI) strategy was also followed. Protective measures, such as tariffs and quotas, were adopted to allow domestic industries to grow and jobs were created in the short run. Throughout this period the inflation and unemployment rates remained relatively low, the increases in the level of productivity helped to maintain price stability and unemployment was also low at 1.5 per cent. Figure 4.1 shows the trend of GDP in this period.

Figure 4.1 Trend of GDP in Nigeria (millions of naira) from 1960-1970



Source: Compiled from Central Bank of Nigeria Statistical Bulletin, 2004 and 2007

4.2.1.2 Oil boom era (1971-77)

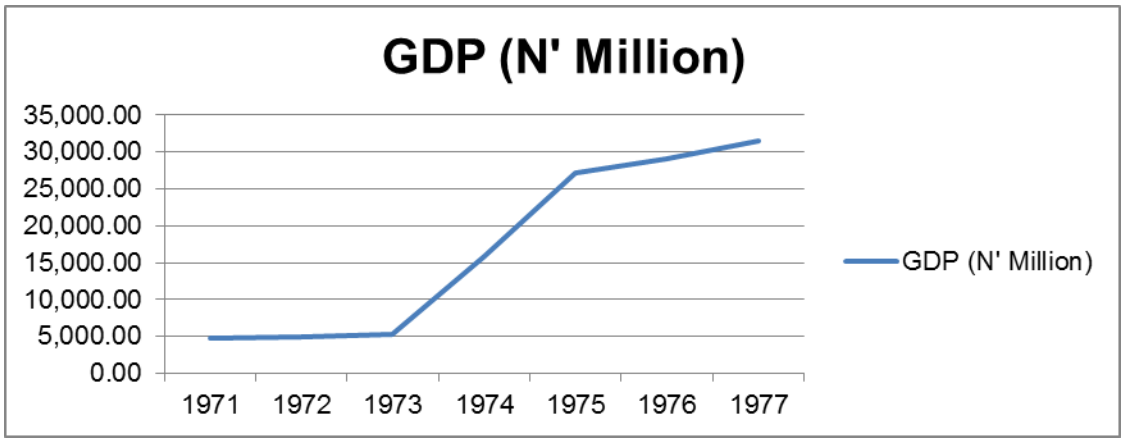
During the oil boom era the Nigerian economy was characterised by a heavy dependence on crude oil production. The contribution of agriculture to the GDP declined from 48.23 per cent in 1971 to 21 per cent in 1977, a fall of almost 30 percent in a space of 6 years. Also, in the same period the contribution to

exports of agricultural produce fell from 20.7 per cent to 5.71 per cent (Iyoha and Oriakhi, 2002).

The Arab Oil embargo of 1973 caused a shift from a high dependence on the agricultural sector to oil because of the sharp increase in the price of oil. The oil sector was now the dominant sector and now accounted for 85 per cent of total exports revenue (CBN 2006). By thus ensuring that foreign exchange inflows outweighed outflows, this encouraged a culture of import-oriented consumption and Nigeria became a net importer. When the revenue from oil declined, this led to a negative balance of trade situation. Also, the inflation rate and unemployment had increased; thus, by 1978 Nigeria was forced to borrow, to finance the shortfall from creditors in the European financial market.

The oil boom period had encouraged economic policies which were geared towards promoting consumption at the expenses of production. Also, there had been very little contribution by the private sector to the economy, so economic growth measured by GDP growth rate declined from 10.5 per cent to 5.7 per cent within the period 1976-8. Thus, the Nigerian economy started on a path of recession, necessitating additional stabilisation policies to reverse the trend. Figure 4.2 shows the trend of GDP in this period in Nigeria.

Figure 4.2 Trend of GDP in Nigeria (millions of naira) from 1971 - 1977



Source: Compiled from Central Bank of Nigeria Statistical Bulletin, 2004 and 2007

4.2.1.3 Stabilisation and structural adjustment (1978-1993)

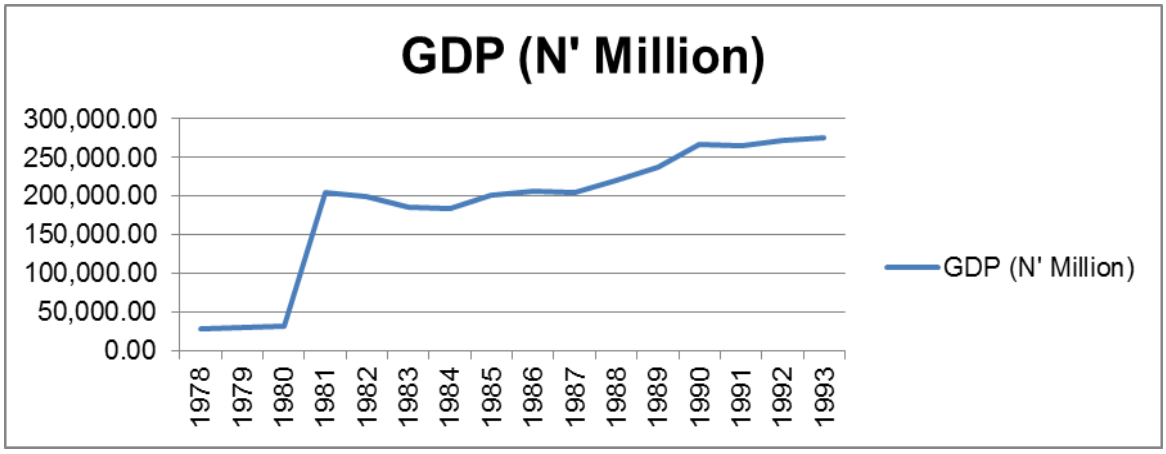
Ekpo and Egwakhide (2003) point to the fact that the oil boom era caused many distortions in the real sector of the Nigerian economy. The issues highlighted by Balogun (2007b) in the previous section caused the Nigerian economy to grind to a halt. With a weak productive base and the heavy reliance on oil, the Nigerian economy's "Dutch disease syndrome" was largely caused by misguided policies that saw it become heavily dependent on the oil sector, with a total neglect of the other sectors.

As Akpan (2009) points out, the bulk of Nigeria's external debt was acquired during this period, particularly as the debt increased substantially, from $4.3 billion to $11.2 billion. Also, most of this borrowing comprised short-term loans at floating interest rates. The terms of these loans made them expensive, as they required large amounts to continue to service them. Also, Nigeria fell into arrears on some of the loans and incurred penalties which further limited the country's access to credit on the global market. This contributed to Increases in

levels of unemployment and meant that many young people turned to crime to earn a living.

In a bid to address the multi-faceted socio-economic and structural problems facing the Nigerian economy, a structural adjustment programme (SAP) was adopted in 1986 as a means to correct and stabilise the imbalances within the Nigerian economy. Figure 4.3 below shows the trend of GDP in this period.

Figure 4.3 Trend of GDP in Nigeria (millions of naira) from 1978– 1993



Source: Compiled from Central Bank of Nigeria Statistical Bulletin, 2004 and 2007

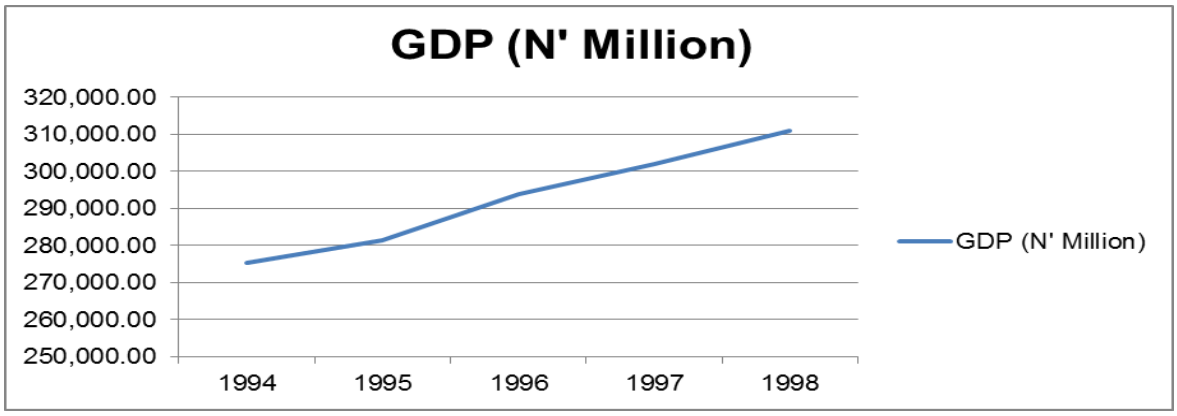
4.2.1.4 Guided deregulation (1994-1998)

Balogun (2007b) argues that the period of the Structural Adjustment Programme saw the economy making some gains and initially seemed to be achieving its intended objective; however, the associated sacrifices were perhaps worse than the initial problems. This situation led to problems with commitment to the policies in the long term. There was some growth in the value of the GDP over this period, from 1.3 per cent in 1994 to 2.4 per cent in 1998, but whatever little growth occurred was subsumed by the higher growth

rate of the population, which grew on average at the rate of 2.83 per cent (Osunubi et al 2003).

The faster rate of growth of the population in relation to the GDP in this period impacted negatively on the welfare of the population and contributed to increases in unemployment from 3.2 per cent to 14 per cent from 1994 to 1998. Beside the high unemployment rate, there was a very high level of inflation, which aggravated the price stability problem and generally reduced the standard of living of the average Nigerian. The private sector during this period experienced very little growth and the government policy to suppress demand to help control price fluctuation by paying poverty salaries and wages and generally cutting government spending further hampered the growth of the sector. These policies constricted economic growth and worsened the problems of low capacity utilisation, unemployment and inflation. Figure 4.4 shows the trend of GDP in the period.

Figure 4.4 Trend of GDP in Nigeria (millions of naira) from 1994-1998



Source: Compiled from Central Bank of Nigeria Statistical Bulletin, 2004 and 2007

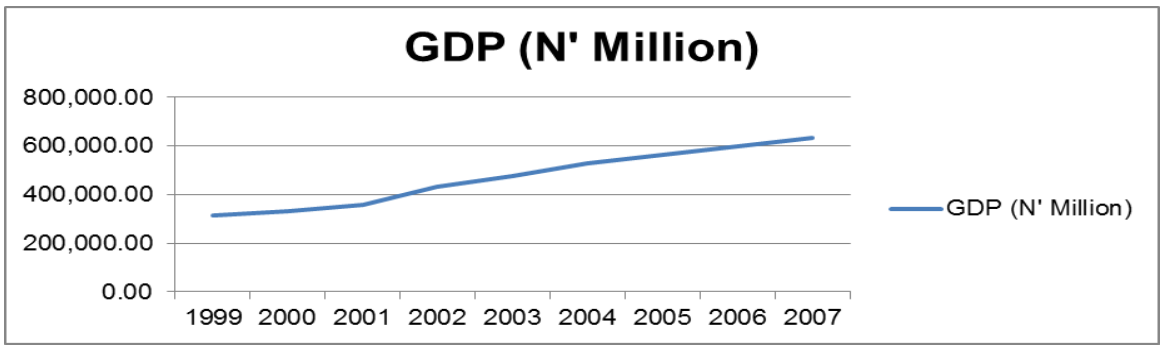
4.2.1.5 Consolidation (1999-2007)

The underlying philosophy of this period was that government should have a minimum role in the economy and the market forces should take the lead in development (National Planning Commission 2009). The government adopted the ten broad propositions of the Washington Consensus, which involved the imposition of fiscal discipline via a Fiscal Responsibility Bill. Tax reform to encourage private investments and interest rate liberalisation were implemented, to allow banks' and other financial institutions' operations to be governed by market forces. Free and market-determined exchange rates policies were practised within this period, which unfortunately caused recurrent currency devaluations, making foreign imports more expensive. Trade was liberalised and regulation abandoned; inflows of foreign direct investment (FDI) were encouraged. The government believed that FDI would act as an engine of growth for the economy (Nzotta and Okereke, 2009).

Thus far, the consolidation has seen a resurgence in private enterprise taking the initiative in addressing socio-economic problems. For example, the telecommunications industry has become one of the fastest growing sectors of the economy. The deregulation of this sector allowed an influx of foreign and local mobile telecommunications companies that have succeeded in creating employment and income However, not all privatisation exercises have been totally successful, such as that of the Nigerian Electric Power Company, where problems of erratic power supplies have yet to be resolved. While there have been significant gains during the consolidation era, there are still issues of unemployment and the low productive capacity of manufacturing sectors that

are yet to be addressed. Figure 4.5 shows the trend of GDP in Nigeria for the period discussed.

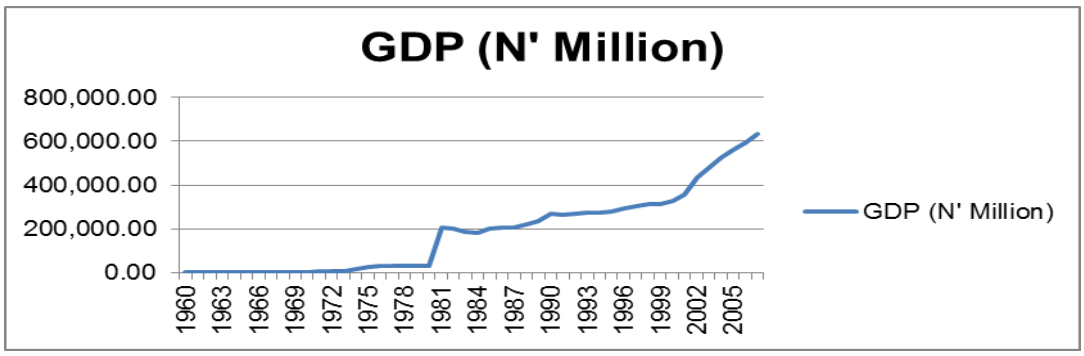
Figure 4.5 Trend of GDP in Nigeria (millions of naira) from 1999-2007



Source: Compiled from Central Bank of Nigeria Statistical Bulletin, 2004 and 2007

Overall, the trend of GDP in Nigeria has shown a steady upward movement; the first big jump coincided with the Arab oil embargo and the activities of OPEC, which saw an upsurge in the price of crude oil. The spike shown in figure 4.6 below at about the year 2000 may be explained by either of two events, the rise in crude oil prices as a result of the Gulf War or as a result of the return of the country to democracy in 1999, which saw an influx of foreign investments which boosted the GDP. This can be seen in Figure 4.6 below.

Figure 4.6 Trend of GDP for Nigeria (millions of Naira) from 1960-2007



Source: Compiled from Central Bank of Nigeria Statistical Bulletin, 2004 and 2007

4.3 The Nigerian Financial System

The financial system consists of various financial institutions, operators and instruments that give the system its character and uniqueness. According to the Central Bank of Nigeria Research Series (2009), the Nigerian financial system is viewed as consisting of a combination of financial arrangements, agents, institutions, rules and regulations which work together with each other and the entire world, with the aim of facilitating exchange and consequently economic growth of the country.

The financial system is a prime mover of economic growth, which it achieves through intermediation processes, which entail the provision of a medium of exchange necessary for specialisation and the mobilisation of savings from surplus units to deficit units. Through this process, an enhanced productive activity thus positively influences aggregate output and economic growth. The system ensures the efficient transfer of savings from those who generate them (savers) to those who ultimately use them (investors) for investment or consumption. Well-functioning financial markets are an essential part of healthy modern economies and through them excess funds offered by lenders/savers are purchased by borrowers/spenders who need those funds. The financial system also provides avenues for organising and managing the payments system and mechanisms for the collection and transfer of savings by banks and other depository institutions.

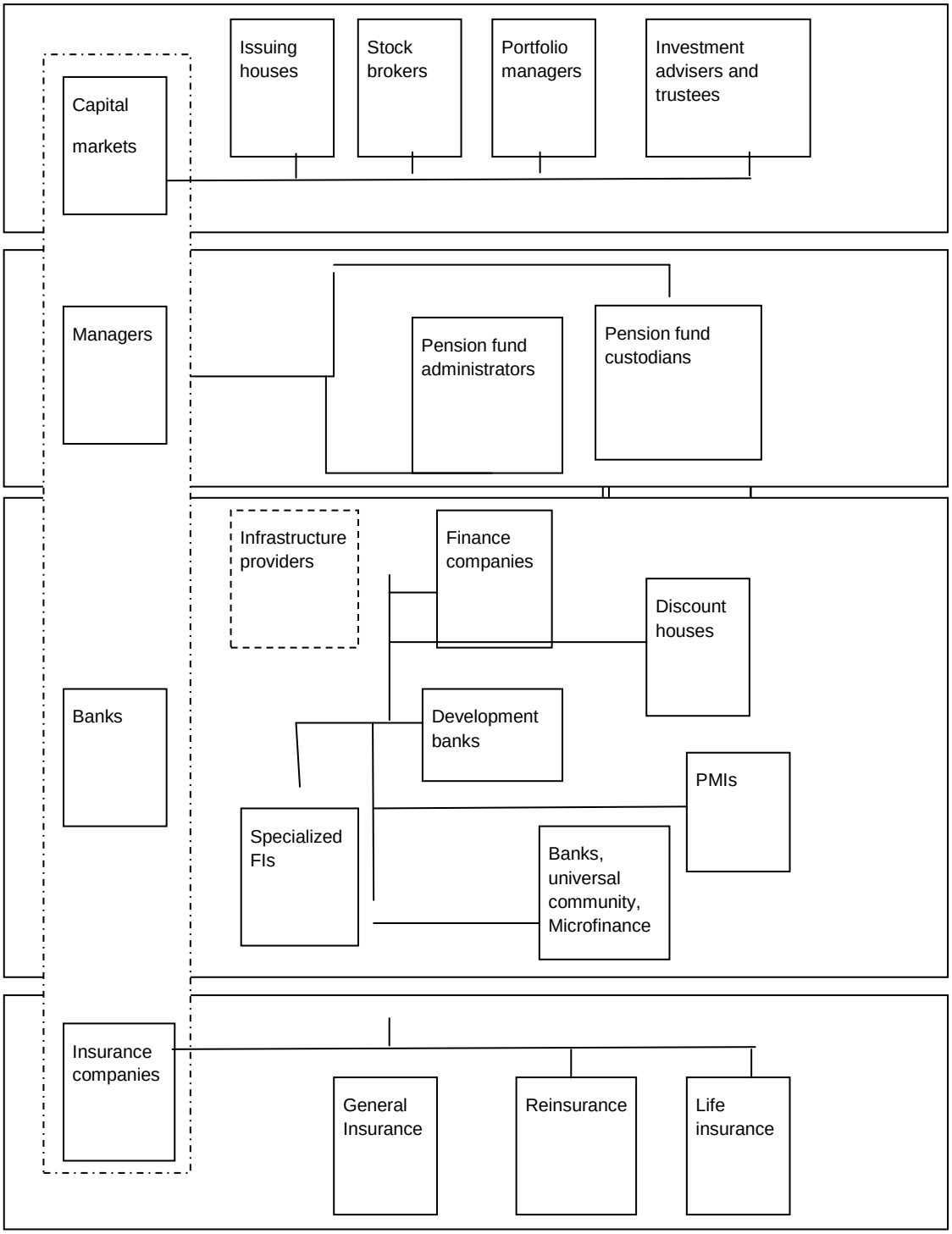
Arrangements are also made covering the activities of capital markets with respect to the issue and trading of long term securities, the workings of the

money market in respect of short-term financial instruments and the activities of financial markets complementary to the money and capital markets, for example in the foreign exchange market, risk insurance, and the futures market (Nzotta, 1999, Nzotta and Okereke 2009).

4.3.1 Structure and Size of the Nigerian Financial System

According to the central bank of Nigeria the Nigerian financial system is made up of a mixture of banking and non-bank financial institutions. The sector is regulated by several hierarchical institutions which include Central Bank of Nigeria (CBN), Nigeria Deposit Insurance Corporation (NDIC), Securities and Exchange Commission (SEC), National Insurance Commission (NAICOM), and the National Board for Community Banks (NBCB). Figure 4.7 below gives an overview of the various elements of the Nigerian financial system.

Figure 4.7 Structure of the Nigerian Financial System



Source adapted from Soludo (2007)

From the figure 4.7 above, it can be seen that the Nigerian financial system has four interrelated sectors known as the Universal Banking Services as designated by the Governor of the Central Bank of Nigeria in 2009. Universal banking, as defined by the Central Bank of Nigeria, is banking where services related to savings and loans are combined with investment services. Under this concept, the banks have a choice of the exact type of financial activity (capital, money or insurance market activities or any combination) to participate in, as long as the specified guidelines for such activities are followed (CBN 2009). The four sectors of the Nigerian financial system are Insurance companies, banking, managers (pension fund managers) and capital markets and, as can be seen in figure 4.7, a further breakdown of these institutions is as follows; the Security and Exchange Commission deals with or regulates the capital markets, whose subsidiaries are the issuing houses, stockbrokers, portfolio managers and investment advisers trustees; The National Pension Commission has its primary responsibility, which is pension fund management, and it also regulates the pension fund administrators' and pension fund custodians' function; The Central Bank of Nigeria regulates the Banks. The banking sector has various branches, namely the Specialized Financial Institutions (Fls), under which are the Primary Mortgage Institutions (PMIs), the development banks, the finance companies and the banks' universal community microfinance. Finally, the fourth financial sector is the Nigerian Insurance Commission; it is in charge of the insurance companies. Insurance can be classed into three categories, general, reinsurance and life insurance. The Infrastructure providers include all organisations that enable message exchange and provide switching and settlement services for electronic or mobile payments. Securicor, Excel Cash

Services, Rating Agencies, Payments via Interswitch, Valucard, ATM etc. are examples of organisations that aid in the delivery of these financial services (CBN 2009).

4.3.2 The Nigerian Banks

The first bank to operate in Nigeria was the "African Banking Corporation in 1892, whose primary aim was to facilitate the transmission of funds from the colony (Nigeria) back to the home country (United Kingdom). This bank was taken over by the Bank for British West Africa in 1894 (now First Bank of Nigeria Ltd). Thereafter, many expatriate banking organisations were established" (Uzoaga, 1981, p. 66). In 1912, however, the West African Currency Board was established, to maintain parity between the West African Currency and the British Pound. The Currency Board was not a monetary authority (CBN 2007).

A review of the present structure of the Nigerian banking sector by the Central Bank of Nigeria as of September 2009 showed that there were 1014 community and 24 commercial banks in Nigeria and that they accounted for 93 percent of the value of private assets of the financial sector, indicating a large banking sector relative to the financial sector. According to the Central bank of Nigeria's draft Annual Report for the year ended 31 December 2008, the Nigerian banking sector is dominated by four banks, which account for 58 percent of the value of the assets and 65 percent of the total deposits held by the banking

sector. Only two of Nigeria's banks have some measure of control by foreign banks with only a 4% stake of total assets.

It is noted by the Central Bank of Nigeria that the significant growth and expansion noted above in the Nigerian banking sector is not without challenges. This is highlighted by the significant expansion from 41 banks before 1986 to 120 by 1994; the stiffness of the competition and other associated challenges facing the sector resulted in a fall from 120 banks to 89 banks by 2004 and then to 24 by 2009 (CBN 2010).

While some of these changes were market instigated and due to capitalisation, as noted by Soludo (2004), others were outcomes of the federal government's earlier proposals to introduce an indigenisation policy in the sector, allowing Nigerian citizens to have total control of the sector.

The financial sector boom, therefore, was, however, accompanied by financial disintermediation. "This tragic situation led to the continued foreclosure and technical insolvency of many banks and finance houses" (Eke 2003, p. 4) and "the latest assessment shows that while the overall health of the Nigerian banking system could be described as generally satisfactory, the state of some banks is less cheering" (Soludo 2004, p. 5). Access by the Nigerian banking sector to the stock market as a source of long term capital to finance its activities has been and may continue to be a major catalyst for any future growth of the banking sector (NSE 2009).

4.3.3 Monetary Policy

Prior to the establishment of the CBN in 1959, the West African Currency Board managed the currency and monetary affairs of Nigeria and was responsible for issuing and redeeming local currency in exchange for sterling and investing the currency cover in British government bonds and treasury bills, as well as exchange control operations and the licensing of commercial banks (CBN 2009).

In developed economies, a monetary policy is used as a means of steering the economy. According to the amended CBN Act of 2007, the aim of monetary policy in Nigeria is to strike a balance between the need to avoid recession, with the resultant unemployment problems, while at the same time preventing the heating of the economy, with its consequences for inflation. Monetary policy can also be used to compensate for fiscal policy laxity and, if there is excessive government spending which could be inflationary, a tight monetary stance would prevent this occurring.

In Nigeria, monetary policy has been used as a tool of economic management since the CBN was established. The conduct of monetary policy in Nigeria has gone through two distinct phases, starting with a pre-1986 phase, where the emphasis of monetary policy was in direct control through using monetary policy instruments, and continuing to the present phase, post-1986, where the emphasis is on more indirect measures, like controlling inflation, as mechanisms to achieve monetary policy aims.

4.4 The Nigerian Stock Market

Yartey et al (2007) argue that developmental functions performed by the Nigerian stock market have been of benefit to the process of economic growth. The functions performed by the exchange include aiding as an additional source of capital for financing projects for the private sector and being involved with a market capitalisation of over US $52 billion; it is a formidable instrument for mobilisation of resources.

Capital is a major factor highlighted by the economic growth literature as necessary for economic growth to take place. The establishment of the Nigerian stock exchange (NSE) was a major contribution towards improving the financial sector in Nigeria, in order to enable it to realise a better utilisation of financial resources by mobilising local and foreign savings and channelling such resources towards productive projects. The Nigerian stock exchange commenced operations in 1961, with 19 securities listed for trading. It currently has 275 listed securities, made up of 10 federal government development stocks, 57 industrial loans/bonds and preference shares and 209 equities. There are also 10 memorandum listings of unit trust equity funds. Listed companies looking to raise additional capital have several options open to them; they may issue new stock, issue corporate bonds or issue rights to existing shareholders.

These rights give shareholders the chance to buy additional stock at given prices. Rights are equally permitted for trading on the exchange since July 1998. There is also a market for derivative instruments and most of the

companies currently listed have multinational affiliations. The Nigerian stock exchange was formerly known as the Lagos stock exchange until 1977 when it assumed its present name. The establishment of the Nigerian stock exchange brought to an end the domination by banks of the Nigerian economy as the only formal form of channelling excess income.

The Nigerian stock exchange at present has 9 branches and each branch has a trading floor, with the first branch (Lagos) as the headquarters. Data on listed company performance are published daily, weekly, monthly, quarterly and annually. The Nigerian stock exchange All Share Index is the market's only index and includes all listings. The index is value-relative, with 1984 as its base year, and it is computed daily, including only common stock.

Demirgüç-Kunt and Levine (1996) propose three different sets of characteristics for evaluating the structure of a stock market, which are traditional, institutional and asset pricing characteristics. This utilises all three of these characteristics to evaluate the level of development of the Nigerian stock market, since it is of interest to this study.

The next sections explore the structure of the Nigerian stock market in the context of the characteristics identified above, in order to determine the level of development of the market and also to determine likely proxies for measuring the level of development of the Nigerian stock market. This section is also useful as a general background to the stock market in Nigeria.

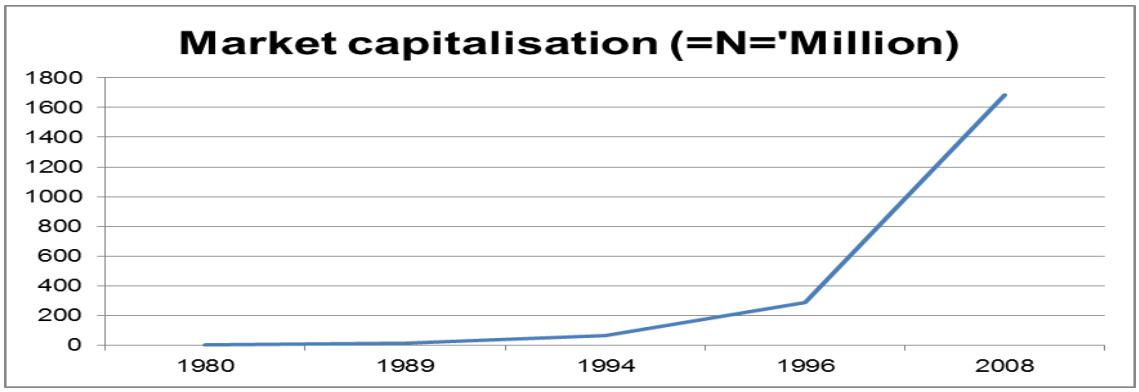
4.4.1 Traditional Characteristics of Nigerian Stock Market

The traditional characteristics of a stock market's development are concerned with basic measures of its growth, including the number of listed companies and market capitalisation. These are among the most commonly used measures of stock market development and will be discussed in some detail below, in providing a background for understanding the measures to be used in evaluating the level of stock market development and the variables selected in the empirical analysis chapter that is to follow.

Market Size: The size of the stock market is positively correlated with its ability to mobilise capital and diversify risk (Ologunde et al 2006); with 205 securities listed and a market capitalisation valued at approximately US$52billion, the Nigerian Stock Exchange may still be regarded as a small market relative to international standards. In Africa, Nigeria is ranked second after South Africa in terms of market size. However, an innovative move has been the creation of a second–tier securities market (SSM).

Stock market capitalisation in Nigeria has shown a fantastic increase over the last fifteen years. Figure 4.8 below shows the trend of the market capitalisation for Nigeria in domestic currency (Niara) from 1980 to 2007.

Figure 4.8 Market Capitalisation on the Nigerian stock exchange 1980-2008



Source: Compiled from Nigerian Stock Exchange data

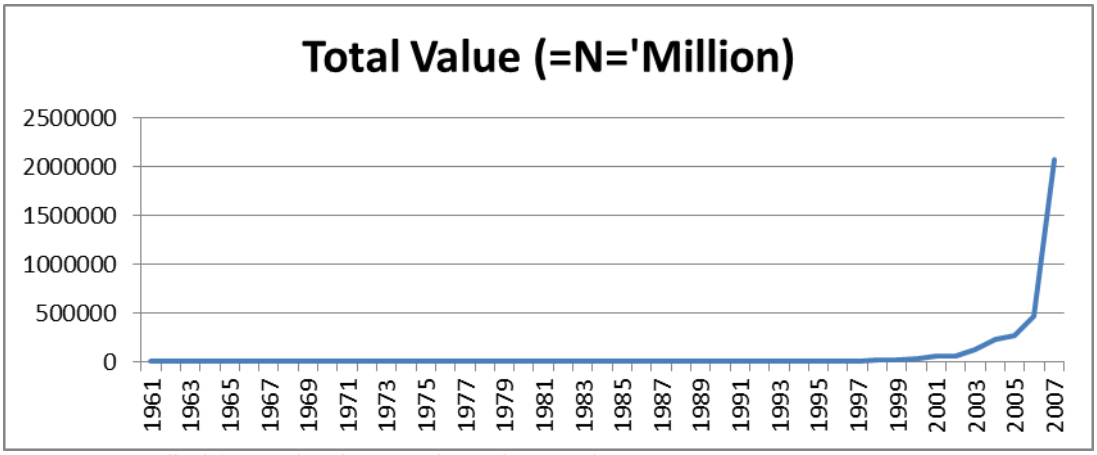
From figure 4.8, the stock market capitalisation for Nigeria showed a relatively stable upward trend, with little growth up until 1999, when the value rose sharply. The sharp rise in the value of market capitalisation can be explained mostly by the increase in the numbers of shares available, caused by the selling of government holdings in several companies and the sale of shares by several banks to boost their trading capital. The interest in the market since 1999 has increased the rate of growth of market capitalisation, as seen above.

Liquidity: This basically refers to the ease with which an asset can be converted into cash through an efficient market. Osinubi (2002) argues that the liquidity of the stock market facilitates profitable interactions between the equity and the money market, since, with a liquid stock market, shares are accepted as collateral by banks for lending purposes, consequently increasing access to credit for growth.

Oke and Mokuolu (2004) identify liquidity as an important characteristic of a stock market and point to its ability efficiently to allocate capital as well as

allowing investors to divest their assets easily. There are two main measures of stock market liquidity; total value traded ratio and turnover ratio. Figure 4.9 below shows the trend of the value traded on the Nigerian stock exchange since 1960 in millions of Naira.

Figure 4.9 Total value of trades in the Nigerian stock exchange from 1961-2007



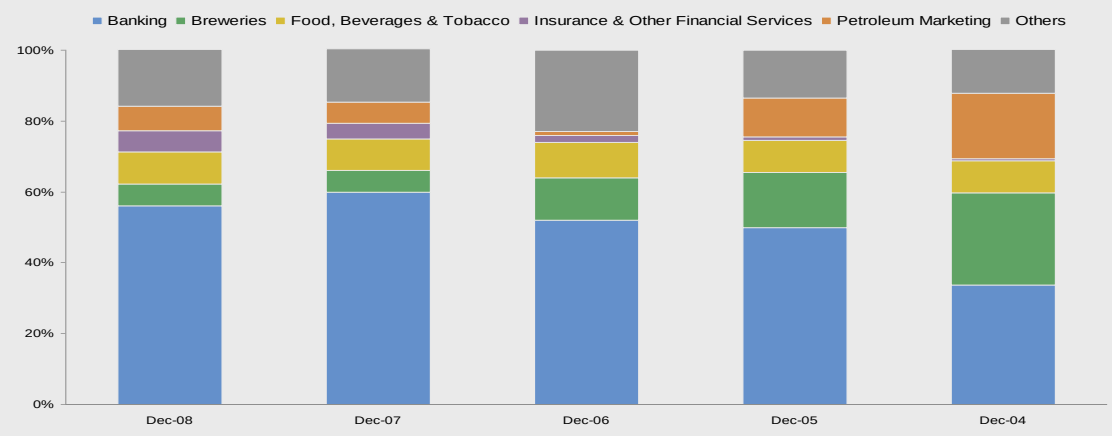
Source: Compiled from Nigerian Stock Exchange data

From figure 4.9 above, it can be observed from the total value of trades in the Nigerian stock exchange that very little trading seemed to be taking place up until 1999, when the value started to rise sharply. This can be explained by the fact that until 1999 the country's sucessive millary dictatorships created an environment that discouraged investment in the stock maket. From 1999 the democratically elected government stated its interest in encouraging a vibrant private sector and pursued policies to support this, which include the privatisation of government-owned businesses and rendering the acquisition of licences to operate certain businesses easier to obtain. This could arguably be taken as an indication that polical instability has been an important factor for stock market development in Nigeria.

The companies listed on the Nigerian stock market come from various sectors of the economy such as banking, breweries, petroleum marketing, insurance and the respective values of these sectors in terms of market capitalisation vary from one year to another so as such the contribution of the individual sectors to the value of the stock market and consequently the economy would level out over time.

The market capitalisation of the Nigerian stock market by sectors is shown below in figure 4.10

Figure 4.10: Market Capitalisation of the NSE by Sector (2004–2008)



Source: The Nigerian Securities and Exchange Commission

4.4.2 Institutional Characteristics of the Nigerian Stock Market

The second method of categorising the structure of stock markets is by the use of its institutional characteristics and they include the legal/transparency requirements, regulatory factors, trading costs and market barriers. These characteristics are discussed in some detail below for the Nigerian stock market. This provides a background for understanding and assessing the level of development of the institutional characteristics of the Nigerian stock market.

Regulatory Institutions: The Nigerian stock exchange itself is a self-regulating institution; however, the Securities and Exchange Commission and the Central Bank of Nigeria perform an oversight function in relation to the stock market (Inanga and Emenuga 1997, Ologunde et al 2006). The Federal Ministry of Finance also exerts some measure of influence on the stock market, although not directly.

Transaction Costs: A high transaction cost may serve as a form of deterrent in the use of the market for both investors and firms seeking capital on the stock market. The additional cost incurred by the investors or firms in the process of buying or selling of shares and expenses incurred in the bid to make public offers of equity respectively may affect the number of transactions or the willingness to seek finance from the stock market. For the Nigerian stock market it costs about 3.25 percent of the value (application, valuation, brokerage and vending fees are 0.5, 0.75, 1% and 1% respectively). This does not include the cost of paying for solicitors, advertising, administration and auditors (Ologunde et al 2006).

Openness and Market Barriers: On the inception of the Nigerian stock market in 1960 there were no restrictions as to who could invest in the market but this changed in 1972 with the promulgation of the Indigenisation Decree. This decree restricted the maximum amount of share holding of any business that can be acquired by a foreign national to 40 percent. This decree was amended in 1977 and 1989 but it was not until 1999 that any real change on the structure of ownership of Nigerian companies took place. The 1999 Investment and

Securities Act made it possible for the participation of foreign nationals and opened the way for the inflow of foreign direct investment. There is no longer a limit on the amount of shareholding by a foreign national and this prompted an increase in the average holding by foreign national in the Nigerian stock market from 3.96 percent to 15 percent from 2000 to 2009 (NSE 2009).

4.4.3 Asset Pricing Characteristics of the Nigerian Stock Market

The third and last category to describe stock market development is its asset pricing characteristics. This is an extremely important characteristic, as it is a measure of how efficiently the market is functioning. The speed of adjusting to new information is a good measure and this has been discussed earlier, in Chapter Two. The Nigerian stock market is regarded as weakly form efficient, as there have been recorded instances of delay in applying new information (Olowe 2002). Also, the bulk of the empirical research conduction on the Nigerian stock market has found it to be weak form efficient.

4.4.4 The Market Trading System

In principle, the securities traded on the NSE are divided into two groups, equities and debt instruments. The buying and selling of orders is handled by licensed brokers and executed on a continuous basis during trading hours. The trading of securities on the exchange is carried out by an automated trading system (ATS) and dealing members are connected to the trading engine, which executes orders in less than 2 seconds. The trading platform has facilities for remote trading, which is fully operational on the regional trading floors, allowing

brokers there to trade online in real time with their counterparts on the Lagos floor.

The stock exchange also has a website, www.nigerianstockexchange.com, which allows traders and investors to monitor daily trading in real time. Prices of shares are quoted in the local currency (Naira), changing increments of Naira 0.01, with a maximum change of 5 per cent on the previous day's close imposed on the daily movement of a share. This ceiling is applied to prevent large price fluctuations, and therefore eliminate unnecessary speculation, and to protect the interests of small investors. The only exception to this rule occurs when a stock dividend requires a price adjustment or when a company is initially listed, in which case its price is floated for 15 minutes and the base price is then set for that day. At present, the NSE keeps an up-to-date record of all transactions and all traded shares are registered (NSE 2009).

The clearing and settlement cycle on the Nigerian stock exchange is 3 trading days, otherwise known as T+3, that is, the trading day plus three days. This cycle is consistent with the standard set by the World Federation of Exchanges for mature markets. The functions of clearing and settlement are performed by the central securities clearing system (CSCS), which is a subsidiary of the stock exchange in Nigeria. The clearing and settlement process involves several institutions that complement each other in each transaction. Brokerage firms must first make purchases or carry out a sale of securities on the floor of the exchange. The NSE trading systems will then advise the CSCS of the

transaction. Based on this advice, the CSCS settles transactions on behalf of the firms, using the appointed settlement banks.

4.4.5 The Nigerian regulatory and stock market environment

The financial regulatory environment and in particular the stock market regulatory environment in Nigeria have undergone several changes since the inception of the stock market in 1960. Initial trading on the Nigerian stock market was predominantly in government securities due in part to the Nigerian Enterprises Promotion Decree of 1972 and 1977 which allowed for a high level of participation by public enterprises in the stock market. Also within this period pricing of new issues on the Nigerian stock market was not determined by the market but rather was determined by the Securities and Exchange Commission (SEC). Under this system the calculation of the pricing of the new issues was determined entirely subjectively by weighting the book value and the market value of the share. Thus allowing for potential distortion and manipulation of the market particularly in cases of private subscription where company directors with large block of shares may ask for lower valuation of new shares thereby allowing them to make a larger profit at the expense of the company to the determent of smaller shareholders.

4.4.5.1 Current stock market regulations

The Federal Government of Nigeria in 1995 started the process of liberalising the regulation of the market by the abrogation of laws which had been identified as obstacle to the participation of foreign investors in the market. These laws include: The Foreign Exchange (Monitoring and Miscellaneous Provision

Decree No: 17, 1995; Nigerian Investment Promotion Commission Decree No: 16, 1995; Companies and Allied Matters Decree of 1990 and Securities and Investment Act (ISA) 45 of 199910. The abrogation of these listed laws now allowed for the same rights, privileges and opportunities for investment in securities to all investors in the market whether they are Nigerians or foreigners and consequently boosting confidence in the market.

In addition the creation of a central depository for all the share certificates of quoted securities including new issues which was called “Central Security Clearing System (CSCS)” in April 1997 facilitated the introduction of an automated trading system (ATS). This system improved the speed of trading and also provided an electronic platform for investors to monitor any movements in their stock accounts similarly boosting confidence (NSE 2009).

Since 2007 when the national assembly enacted the Investment and Securities Act (ISA) 2007 which replaced the ISA 45 of 1999 has been the main act which governs the regulations of the stock market. It ‘establishes the Securities and Exchange Commission as the top regulatory authority for the Nigerian Capital market. It also provides guideline for the regulation of the market to ensure the protection of Investors, maintain fair, efficient and transparent market and reduction of systemic Risk; and for related matters’ (the Investments and Securities Act, 2007:9)

The act was enacted to create greater oversight on the market and also correct the inadequacies within the old system where the Nigerian stock market was

self regulatory and had no clear external organisation in charge of oversight over it. Also it provides legal backing for the creation and trading of new products and securities which include mortgage-backed securities and derivatives. It also imbues powers on SEC to be able to enter and seal up the premises of persons illegally carrying on capital market operations.

It also lays out the exact scope of the powers of the SEC as it relates to its over sight function and one of its key functions as laid out within the act is the protection of investors maintaining a fair and orderly markets in this regard SEC established an Investors Protection Fund (IPF) to compensate investors who due to bankruptcy or negligence of the Nigerian stock exchange dealing member firm suffer losses. In addition it set up a trust scheme to compensate investors whose losses are not covered under the investors' protection funds administered by securities exchanges to further boost confidence in the market and fulfil its mandate.

4.4.5.2 Dual listings on the Nigerian stock market

The Nigerian stock market encourages and facilitates dual listing by supporting companies listed on other markets to access the Nigerian market through either joint primary or secondary listing on the Nigerian stock market. Similarly it provides support for Nigerian companies seeking listing on other stock markets. This is in line with the view that dual listing has the ability to enhance a company's trading volume as well as its price to earnings ratio. However there are only a few companies that have taken advantage of this and they include Oando Plc a Nigerian company is listed on both the Nigerian stock exchange

and the Johannesburg Stock Exchange (South Africa). While the Pinnacle point group limited is an example of a company listed on other market (Johannesburg Stock Exchange) which is listed on the Nigerian stock market.

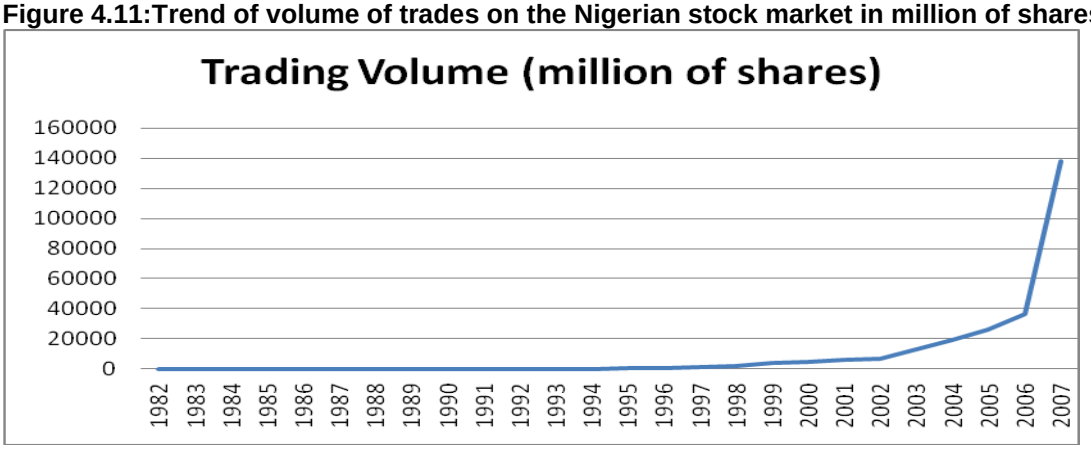
While Diamond bank Plc, Guaranty Trust Bank (GTB) Plc and Afren Plc are Nigerian companies already listed on the Nigerian stock exchange also listed on the London stock exchange (United Kingdom) With companies like Dangote cement Plc planning similar listing on the London stock exchange. The reasons proffered by the companies for seeking dual listing include increasing the exposure and profile of the company in the intended market as well as to provide access to a larger pool of capital through listings in other markets.

4.4.5.3 Trading volumes on the Nigerian stock market

At the commencement of operations, the NSE started trade with 0.3 million shares worth N1.5 m and the volume and value have continued to grow steadily to 138.07 billion share worth over N2086 billion by 2007 (NSE 2008). The volume of trade/ market activity has steadily increased over the course of the history of the market however there was a more significant increase in the volume of trades starting from 1998 up until 2007 owing in part to the improvements in the quality and quantity of securities available caused by the privatisation programme and increased awareness of the opportunities offered by the market. On analysis it can be seen that the percentage change in the volume of trade on the Nigerian stock market over the study period is over 59 percent although the bulk of the increase has occurred over the last few years. Figures 4.11 and 4.12 below provides a trend of the volume of trades and

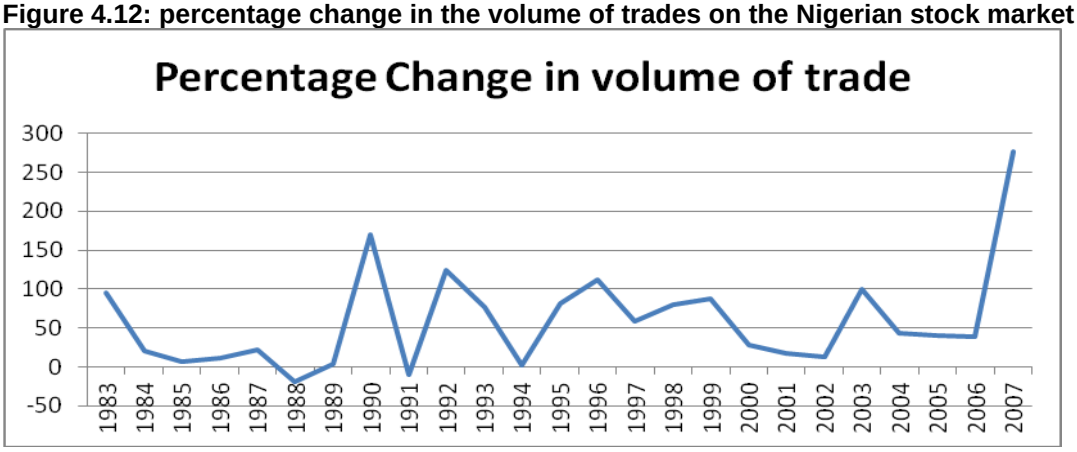
percentage change in the volume of trades on the Nigerian stock market over the study period.

Figure 4.11:Trend of volume of trades on the Nigerian stock market in million of shares



Source: Compiled from NSE data

Figure 4.12: percentage change in the volume of trades on the Nigerian stock market



Source: Compiled from NSE data

4.4.5.4 Market irregularities in the Nigerian stock market

The incidents of Known cases of market irregularities and other forms of illegalities within the Nigerian stock market have been extremely rear up till 2008 when the Nigerian stock market suffered the heaviest loss in its history and crashed. It is arguable that the crash could have been as a result of the global financial crisis however, on investigation it was discovered that there had been several cases of share manipulation, margin loans scandals as well as

other forms of market abuse by insiders which were more likely culprits of the crash.

The most common form of market abuse identified were cases where market operator through collusion deliberately underpriced the value of new issues of shares causing massive excess demand for the shares with poor chances of actually getting the shares. Due to this practice on the first day of trading of these shares there is normally a big jump in prices allowing the insiders who obtained shares from the initial allocation to make large capital gain.

The market insiders involved in this negative activity as well as other identified illegalities were arrested and have since been charged to court to be prosecuted in line with the provisions of the laws and market regulations as it relates to such activities. However their activities have affected the level of confidence in the market and the level of stock market's capitalisation has not returned to their earlier highs.

4.4.6 Available Market Information

In any particular area of investment, as is well known, it is imperative to have access to all available information on the market as a requirement for the market to be considered as efficient (Fama 1970). Indeed, to try and invest rationally, the investor will have to consider factors such as economic growth, company reports, government economic policies and many issues. In Nigeria, the sources of information available about investment in company shares can

be divided into three categories, company reports, stock market publications and brokers' research.

4.4.6.1 Company Reports

Perhaps the most factual and direct source of information is company reports. All listed companies are required by law to publish their annual reports during the first four months immediately following the financial year's end and the accounts are expected to include a record of all profits or loss, as well as a balance sheet (NSE 2009).

The main sections of annual reports include the notice of the annual general meeting, a list of directors, secretary and auditors, the director general's review, directors' report, the report of the auditors and the accounts. The balance sheet includes measures such as loans, overdrafts and details of share capital, current and other assets including listed and unlisted investments, loans to directors, details of valuation of certain assets, additions to and disposals of fixed assets, arrears of fixed cumulative investment and any changes in the company's assets.

The profit and loss account lists charges for depreciation, interest on loans and overdrafts, charges in corporate tax, investment income, proposed and paid dividends, pension and compensation, auditors' remuneration and turnover. One of the conditions of entry into the listed stock market is that the company must be prepared to provide shareholders with sufficient information for its appraisal. To achieve this, companies are required to enter into a general

agreement with the Stock Exchange for the provision of information. One of the provisions is to prepare a half-yearly report to be sent to the shareholders. In this report a six-month statement of profit and loss and comparative figures for the corresponding previous period are provided.

4.4.6.2 Stock Market Publications

According to information in the Nigerian stock exchange fact book (2007), the NSE in its various publications provides information about the listed companies. These publications include the following:

I. Monthly Statistical Bulletin: This contains valuable data and the financial ratios for the listed companies and includes cumulative market and sector by sector data, as well as individual company data.

2. Annual Report: This summarises the market's activities during the year. For example, the number of shares traded, their market value, the number of transactions made by companies which have offered new issues, companies' authorised capital and other similar information are included. The report also lists all the licensed brokers, the achievements of the market and the Director General's views regarding future plans.

3. Companies Guide: The NSE also publishes the Nigerian shareholding companies' guide on an annual basis, to provide interested parties with important information. The guide includes valuable data and the financial ratios of listed companies, in addition to information about numbers of shareholders, ownership ratios, the number of employees in each company and their balance sheets and profit and loss cost accounts for the past five years. In addition, the

rules and regulations of the Market, Companies Law, Banks Law, and Insurance Law are included.

4. Daily Official List: Prices of traded shares are quoted on a daily and weekly basis online and through newspapers, reporting the total number of traded shares, their market value and the number of transactions made, the closing price and the nominal value of the quoted shares. In addition, a short daily price quotation is broadcast on major Nigerian news stations.

4.4.6.3 Brokers' Research

Brokers in Nigeria have not been active in conducting research on the market or on listed companies in the past for several reasons, such as the small size of the market, but many have recently started doing so and several brokerage houses have commenced such activities in the market, as well as keeping a database on prices and company results. This information is usually supplied to major investors when required. Several international institutions also provide information about the market and companies in it. The IFC, for example, covers Nigeria in their emerging markets reports.

4.4.6.4 The Market Index of the Nigerian Stock Exchange

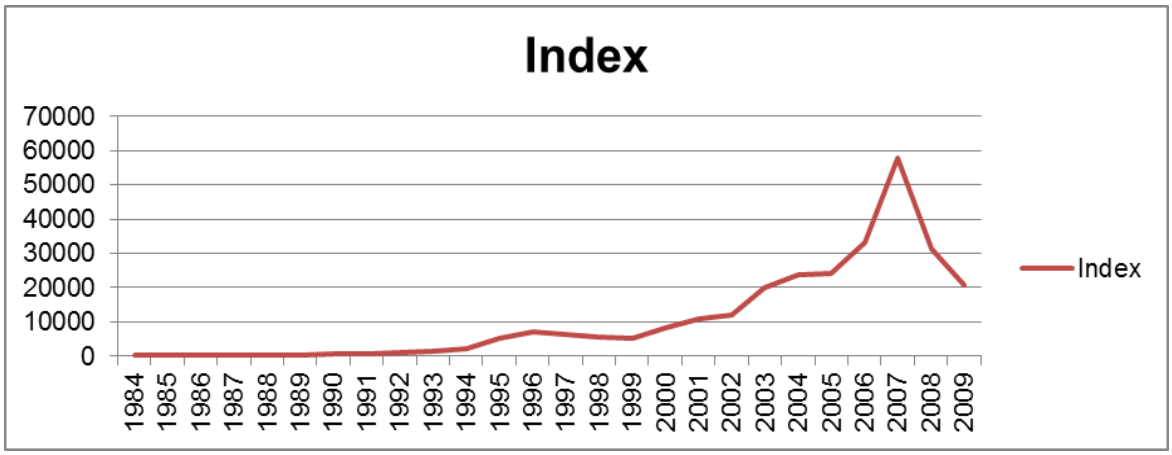
The Nigerian stock market all shares index, established by the exchange in 1985, helps to evaluate the atmosphere of the market. The base year used for the index is 1984, with a value of 100 (NSE Fact book 2007). The index grew astronomically, from 5,266.4 in 1999 to 20,827.2 in 2009; table 5.2 below shows the value of the index and the growth from 1984 to 2009. The trend is shown in figure 4.13 below.

Table 4.1: Nigerian Stock Exchange All-Share Index, Percentage Change (1984 –2009)

Year	Index	Change (%)
1984	100	--
1985	127.3	27.3
1986	163.8	28.7
1987	190.9	16.5
1988	233.6	22.4
1989	325.3	39.3
1990	513.8	57.9
1991	783.0	52.4
1992	1,107.6	41.5
1993	1,548.8	39.8
1994	2,205.0	42.4
1995	5,092.2	130.9
1996	6,992.1	37.3
1997	6,440.5	-7.9
1998	5,716.0	-11.9
1999	5,266.4	-7.2
2000	8111	54
2001	10963.1	35.2
2002	12137.7	10.7
2003	20128.9	65.8
2004	23844.5	18.5
2005	24085.8	1
2006	33189.3	37.8
2007	57990.2	74.7
2008	31450.8	-45.8
2009	20827.2	-33.8

Source: Nigerian Stock Exchange, Annual Reports and Accounts, Various years.

Figure 4.13 Trend of the Nigerian stock market index 1984 -2009

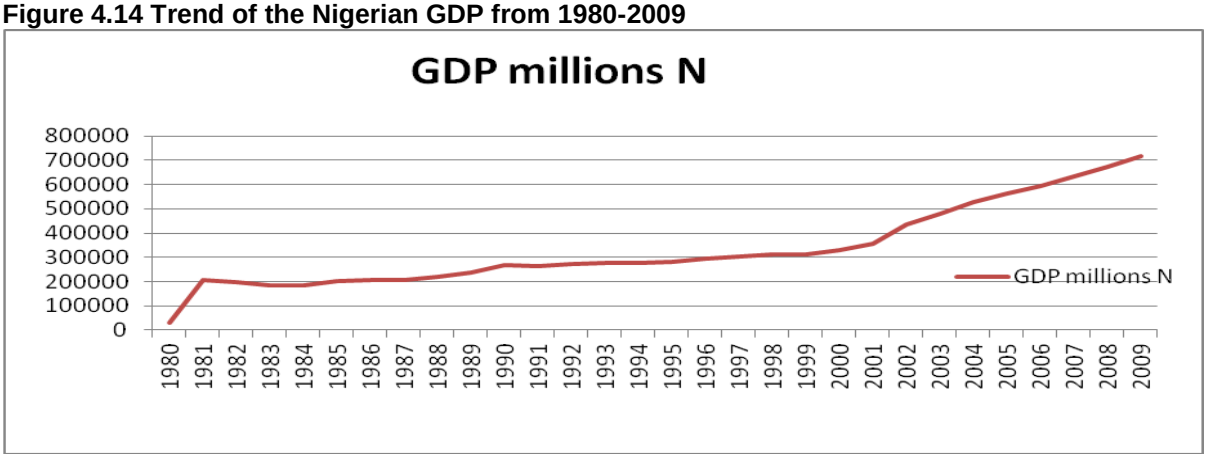


Source: Compiled from Nigerian Stock Exchange data

Overall the trend of the Nigerian stock market index has shown a steady upward movement up until it spiked in 2007 and started to exhibit a downward movement. However, on comparism with the trend of the GDP for Nigeria for the same period it can be observed that the GDP continues its upward trend even after 2007 where the stock market index starts to show a downward movement. The trend of GDP for the same period can be seen in Figure 4.14 below. This marked difference in the trends of GDP and the stock market index for Nigeria at about the year 2007 may be explained by high level of corruption in the stock market which seriously affect the level of confidence within the market and consequently its performance thus the downward spiral.

It is pertinent to note that even where the value of the stock market index is falling it may still be contributing towards economic growth.

Figure 4.14 Trend of the Nigerian GDP from 1980-2009



Source: Compiled from Central Bank of Nigeria (CBN) data

4.5 Summary and Conclusion

This chapter has undertaken to trace the evolution of the Nigerian economy from a historical and narrative perspective, with the aim of exploring the dynamics of the Nigerian economy. It has discussed the economic history and structural performance of the financial system, with special emphasis given to the stock market, providing the background for the subsequent investigation of the relationship between the stock market and economic growth in Nigeria.

The Nigerian economy has engaged in a series of reforms, in a bid to stimulate economic growth. Some were successful; others were not. Several reforms were targeted at the financial system in general and a few at the stock markets in particular, with a view to improving the functioning of the nation's financial system.

Nigeria has over the years experienced periods of rapid growth and decline as well as instability. Although its financial sector in general and its stock market in particular is better developed than those of most countries in Africa, it has also

had periods of instability, as was shown above. The various policies carried out by the government, which include the privatisation programme, have contributed positively to the development of the Nigerian stock market. Some of the policies include educating the population on the value and the use of the stock market and this has had some measure of success.

Many implications may be derived from discussion in this chapter. Privatisation helped to boost development of the Nigerian stock market by improving the liquidity and increasing the volume of stock available for trade. Privatisation also appears to have boosted interest in the stock market, thus confirming that government policy and the general macroeconomic environment are important for stock markets to perform optimally. The privatisation programme also contributed to the development of new financial instruments, particularly for unit trusts and insurance companies. In conclusion, with the right policy mix, a country may develop its stock market; however, the questions that remains is would the stock market impact on economic growth? And, if it impacted on economic growth, what is the direction of the causality?

CHAPTER 5: THE RESEARCH METHODOLOGY

5.1 Introduction

The previous chapter undertook to provide an overview of the Nigerian economy and the development of its financial system from a historical perspective, as well as the key strategic issues and events that have occurred in the political environment and the macroeconomic environments. It went on to explore origins and development of the Nigerian stock market itself.

This chapter focuses on explaining the epistemological philosophy underpinning this research and considers the methodological approach taken and the kind of data which can provide evidence on the relationship between the stock market and economic growth highlighted in the previous chapters. Therefore, giving an overview of the direction followed in the data collection and analysis in the research, the outcome is the identification of research findings that relate to the research aims and objectives.

It then proceeds to provide justification for the choice of research method and the selected research strategy as well as the research design and the research methodology and methods are described. Gray (2009) points out that the choice of research method is influenced by the research methodology chosen, which is itself influenced by the theoretical perspective adopted by the researcher. The theoretical perspective is influenced in turn by the researcher's epistemological stance. This is followed by an account of the methods and analysis techniques used. The model for the analysis is introduced and the choice of variables

explained. How the data are sourced, issues of data quality and how reliability were dealt with are explained. The specific methodologies of the two research questions are discussed and finally a summary of the chapter is provided.

5.1.1 Aims and Objectives

This chapter aims to provide an overview of the approach adopted in this research, particularly in the choice of method, data collection and justification for the variables selected. It also provides a justification for the time period of the study as well as the limitations of the methods used.

5.1.2 Chapter Question

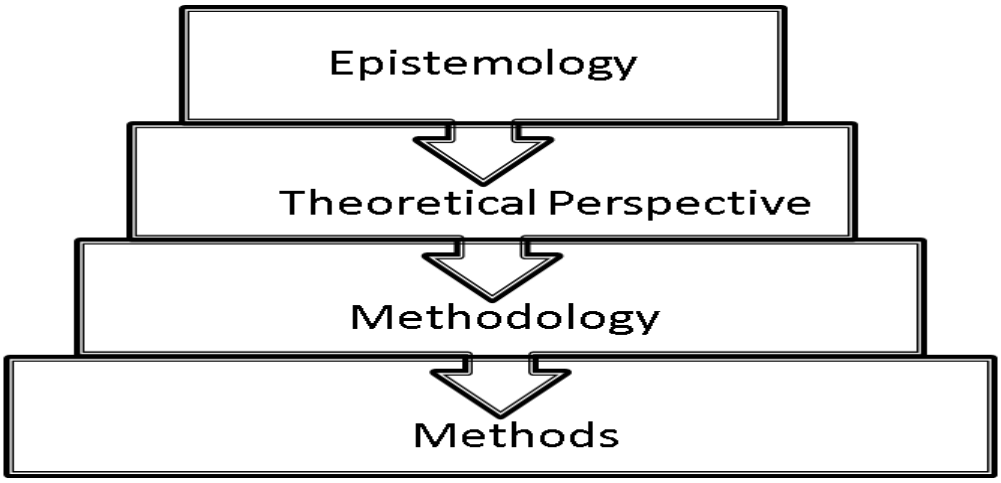
How does the researcher's philosophical stance affect the research and what is the most appropriate methodology for exploring the relationship between the stock market and economic growth? Is the selected methodology suitable and does it adequately answer the research questions.

5.2 Overview of Generic Research Theory

Trochim (2000) views research philosophies as theories that concern the best methods to perceive the world and carry out research into how we can better understand it, with the intention of producing the most effective way to comprehend the world to serve as a source of causal knowledge. Chia, (2002) views research philosophy as being mainly concerned with rigorously establishing, regulating and enhancing methods of knowledge creation in all fields of intellectual endeavour.

Creswell (2003) argued that a researcher's personality exerts an influence on epistemological and theoretical perspective, as well as predisposing the researcher to adopt a specific methodological viewpoint and a particular set of methods. This predisposing influence of personality makes it necessary to address the four key elements of research. As Crotty (1998) points out, these interrelated elements include the philosophical world view or epistemological stance, the theoretical perspective, the methodology and the research methods that will be used to answer the research questions posed (see figure 5.1).

Figure 5.1 Four Elements of the Research Process (source: Crotty 1998)



Epistemology is a branch of philosophy that asks such questions as: How can we know anything with certainty? How can we distinguish knowledge from beliefs or opinion? What methods are capable of producing reliable knowledge (Thomas 2004). Gray (2009) views epistemology as trying to understand what it means to know and he goes further, to say that it provides a framework for the classification of what kind of knowledge is accepted as adequate and legitimate.

Bryman (2007) considers epistemology to be about the question of what is or what should be regarded as acceptable knowledge in a discipline.

Cruz (2003) explains that epistemology attempts to understand the nature, limits and possibility of human achievement and intellect. He suggests that epistemology aims to investigate specific domains of knowledge or rational belief. It endeavours to characterise the kind of knowledge a given method of study might yield about a certain kind of subject matter and to what extent that kind of knowledge conforms to what is taken to be standard or genuine or true knowledge (Harre 1972).

The choice of epistemological stance adopted has serious implications for any research, since it defines and influences the theoretical perspective, methodologies and methods used in executing the research and has a significant impact on the reasoning and logic adopted in answering the research questions. Crotty (1998) discriminates between three possible epistemological stances: objectivism, constructivism and subjectivism. These three possible philosophical stances orientate the researcher's thinking and determine the theoretical perspective, which in turn informs the methodology used and determines the methods that are employed.

Theoretical perspectives are general frameworks that define points of view within a discipline, while taking into account basic assumptions that highlight a particular part of a phenomenon and, in the process, raise particular problems or issues. Various theoretical perspectives are applied in contemporary

research; however, the two most influential perspectives currently in use as identified by Gray (2009) are positivism and the various strands of interpretivism. Theoretical perspectives are best viewed as models, with each making assumptions about society, while attempting to provide significance to the things that the researcher experiences, and observes by combining different types of information.

Each model / perspective looks at various parts of society and, by adopting any particular perspective, implies that there will be certain consequences for the results obtained. The next section explores in more detail these two perspectives of positivism and interpretivism.

According to Delanty (2005), positivist knowledge is based on a foundation of certainty and can be characterised by five basic tenets which are discussed below. The postulation behind this is that there is a general unity underlying the human and natural worlds. Empiricism: the bedrock of science is observation. Positivistic science is based totally on that which is absolutely given to experience but expressed in a different manner – which means that, for it to be acceptable, it should be possible to observe and also verify it.

The progress from observation to verification for the positivist is operationalised through experimental methods; the scientist performs experiments with the purpose of uncovering objectively existing universal laws, based on which hypotheses may be made, which may subsequently be used for predictions as to what will happen.

Value freedom: one fundamental principle of science is that it is objective and does not make judgement but rather infers based on evidence obtained from the research. Also, it is does not transfer ethical or social values to the subject matter but rather remains neutral. Positivism is said to involve the search for scientific truth. That can be done only when the researcher detaches him/herself from all forms of experience or personal subjective elements and ethical self-reflection. This is because truth can be verified and is a statement in explanation of an objectively existing reality. In the light of the above, it can be said that scientific knowledge is a unique form of knowledge, as it is verifiable; thus it is held to be universally true.

Instrumental knowledge: the institution of science as an occupation in today's world has encouraged the quest of what is known as technically useful knowledge; this search has taken several forms, particularly three political forms, which comprise the following: (a) the classical positivistic ideology of scientific politics; (b) science as an instrumentally useful knowledge without political significance; (c) instrumental-bureaucratic social science.

Crotty (1998) views interpretivism as a stance which seeks for culturally originated and historically based explanation of the social world. Saunders et al (2007) advocate that interpretivist epistemology is relevant, as it creates a means to explore the role of the researcher as a social actor who cannot be divorced from his/her research. To Easterby-Smith et al (2008), the interpretive perspective views reality as determined by people, rather than as an objective external factor.

Unlike the positivists, interpretivists deny the existence of one real world that exists. They tend to believe differently about the concept of reality – reality in their opinion is mental and perceived (Hudson, and Ozanne 1988). According to Berger and Luckman (1967), reality is nothing more than a social construction and all human knowledge is advanced, disseminated and maintained in social situations.

The intention of the interpretivists is not to discover reality, since they perceive that multiple realities exists and are continuously changing. Rather, interpretivists are more concerned about the understanding of social realities and social actions, for example, friendship, marriage, wars, voting (Schwandt 2000). Invariably, this means that interpretivists are interested in developing an understanding of the cultural shared meanings, the perspectives and rationales, of those involved in making these social realities and the contexts in which these constructions happen (Hudson and Ozanne 1988). There are significant differences between positivist and interpretive paradigms. The ontological position of the positivist is that of representing an objective reality, while, in the case of the interpretivist, reality is subjective. Interpretivists believe that the world is represented more by the signs and symbols that people communicate (Allard-Poesi and Marechal 2001).

The positivist views knowledge as based on external objective facts that are waiting to be discovered, whereas the interpretivist is of the opinion that knowledge is based on the subjective experience of people and focuses on how, through experience, people give meaning to issues and events that affect

their lives. Table 5.1 draws the key distinctions between positivism and interpretivism.

Table 5. 1 : Contrasting Implications of Positivism and Interpretivism

	Positivist	Interpretivism
The observer	Must be independent	Is part of what is being observed
Human Interest	Should be irrelevant	Is the main drivers of science
Explanation	Must demonstrate causality	Aims to increase general understanding of the situation
Research progress through	Hypotheses and deductions	Gathers rich data from which ideas are induced
Concepts	Need to be operationalised, so that they can be measured	Should incorporate stakeholder perspectives
Units of analysis	Should be reduced to simplest terms	May include the complexity of 'whole' situations
Generalizations through	Statistical probabilities	Theoretical abstractions
Sampling requires	Large numbers selected randomly	Small number of cases chosen for specific reasons

Source: Easterby-Smith et al (2008)

Also, the roles the researcher plays when conducting research from a positivist or an interpretivist perspective vary. The role of the positivist researcher is largely independent of the subject matter under investigation but, in the case of intepretivism, the researcher is involved in the research, as his/her views shape the direction and outcome of the research. There are also differences in the areas of explanation, concepts and units of analysis and sampling requirements. However, it is pertinent to note that are no universally suitable perspectives but choice of perspective is best determined by the research question.

5.3 Research Philosophy

Crotty (1998) stated that the preference for a research philosophy is informed by the nature and type of study that one is conducting and also, where applicable, by the need to use research techniques that best support the theories and circumstances surrounding an individual study. This implies that, whatever the choice of research philosophies, research strategies should not be based on arguments about the merits of deduction against induction but rather on the understanding and application of the most appropriate philosophy for the research strategy and methods

The present researcher has chosen to conduct this research according to the positivist philosophy founded in the works of Auguste Comte (1853), who proposed that there can be no real knowledge but that based on observed facts. The research falls into this category, since it tests a theoretical object, and the underlying philosophy of positivism is the independence of the researcher, who does not affect the subject and is not affected by the subject. As Easterby-Smith et al (2002) point out, in this philosophy, social world is external and its existence is independent of the observer. Where its properties are measured, then it may be done objectively, using methods which are quantifiable and verifiable, as opposed to being studied through intuition, reflection or sensation.

Taking this into account, it is believed that the positivist approach is most suitable for use in studying the relationship between the Nigerian stock market and economic growth and if such a relationship exists, identifying the direction of causation within it. The researcher wishes to develop hypotheses, using

mathematical and statistical instruments, as well as remaining detached from the research process as much as possible. This will enable the relevant information to be analysed clearly, while an holistic view of events is maintained.

This study is driven by the ontological assumption that empirical reality is objective and is external to the subject. As Ahrens and Chapman (2006) emphasise, this ontological stance assumes the existence of an objective reality. This is in line with the study's epistemological assumption that phenomena "can be studied through objective categories and verified by empirical scientific methods" (Ahrens and Chapman 2006, p.822)). Thus, in this research, the aim is to test hypotheses and generate results that are applicable to the population of the study, and this ties in with the tenets of positivist science.

Hence, the aim is to test hypotheses and to generate results that are generalisable across the population which the study samples. This is the postulated aim of positivist science. Whereas this approach is nowadays often associated with narrow-mindedness and number crunching, Schweizer (1998) pointed out that "[t]here is considerable *diversity* within positivism" (p.45, emphasis in original). He went on to explain that positivist methodology requires methods to fulfil two standards, regardless of the research discipline. The first standard relates to the language, which has to be clear, so that definitions have to be provided to ensure that the concept is communicated consistently. Secondly, the validity of data should be tested, to ensure that any

researcher would come to similar findings when applying the method to the sample set. Schweizer (1998) referred to this process as the "validation of truth claims by rational means of logic and empirical enquiry" (p.45). These standards demonstrate the focus on method rather than on methodology within empirical research (Ahrens and Chapman 2006). The theoretical perspective of this study is informed by Comte's understanding of positivism, which reasons that "rather than proceeding via some kind of abstract reasoning process, positive science proceeds by a study of the 'given' (in Latin datum or, in the plural, data)" (Crotty 1998, p.28). It is important to note that Comte did not believe that all research had to follow strict mathematical rules but should provide evidence of thoroughness in method and analysis. The present study fulfils these requirements by describing in detail the development of the method used and providing clear procedures and rules under which the data was collected and analysed (Bergman and Coxon 2005).

The epistemological underpinnings of this study in a positivist approach do not follow the definition suggested by Burrell and Morgan (1979); this has been criticised by various authors (such as Lord 1953, Laughlin 1995) who presents different research philosophies as clearly separated entities that compete with each other, although Burrell and Morgan (1979) suggested that, with the conscious decision to follow one philosophy, the choice of method follows, since every philosophical stance provides its own specific method.

At the same time, positivist thinking is shown in the aim to satisfy the paradigm's requirements of objectivity when it comes to the development of a method, its

application and the analysis of results. Rather than relying on the previous definition, this study's epistemology was informed by the thinking of Heisenberg (1959), who pointed out that the then prominent positive paradigm was extremely restrictive and rigid, making it hard to accommodate several other concepts.

This has resulted, on the one hand, in a general reduction of certainty with which results were to be interpreted and Heisenberg suggested that the level of uncertainty should be expressed in the narrative explaining the results. On the other hand, it “opened the doors for the entrance of new concepts” (p.171) to complement existing research approaches. This opening towards new concepts is made possible through the knowledge and appreciation that epistemological paradigms are "precisely defined" "idealizations", through which they lose "their immediate connection with reality" (Heisenberg 1959, p.171).

Within the positivist perspective, the researcher is considered to be objective and disengaged from the study’s subject, so that data collection and analysis are clearly separate from the individual carrying out the study. Whereas this requirement might be achievable in scientific research, some researchers in the social sciences have argued that the process of data gathering can never be so objective, as the researcher encounters a constant stream of decisions that have to be made and decision-making will always involve subjective judgment.

In this context, Deegan and Unerman (2006) argued that "no research [...] is value free" (p.13). In relation to accounting research and objectivity, Morgan

(1988) suggested that "Accounting can never be truly objective, for, as George Berkely observed in the 17th century, objectivity is always as much a part of the observer as of the object observed." (p.482; see also Tinker et al 1982, Lodh and Gaffikin 1997, Tinker 2005). Bergman and Coxon (2005) agreed that “any observed fact has already been interpreted at least in the sense that meaning has been assigned to an empirical observation”.

Bryman and Bell (2004) emphasise that the epistemological position of positivism advocates the application of the methods of natural science to the study of social reality and beyond. In the perspective of the positivist, social reality is objective and external to the researcher and therefore there is only one reality (Collis and Hussey, 2009). The positivist conception of science considers things to exist only when they are directly observable and can be directly empirically tested (Lee and Lin 2008). Jankowicz (2005) states that the positivist approach assumes that, when engaging in any study, the best approach to arrive at the fact is to make use of what is known as the hypothetical-deductive method; this is made up of the following components.

A properly expressed broad statement with the possibility to clarify things is the theory. A deduction claims that, if the theory is true, then one would expect to find a relationship linking at least two variables, A and B. The hypothesis is a careful definition of what needs to be measured, in order to observe A and B varying.

Following the operational definition of these variables and the conducting of observations and measurements, conclusions are drawn about the hypothesis and implications are drawn out for the theory's verification. However, it must be mentioned that the positivist approach is not without flaws. Fisher et al (2004) suggest that there are some problems with the use of such research paradigms and methods. For example, they tend to predict only average behaviour, not the behaviour of individuals, and in many situations understanding particularities is what is required.

5.4 Research Methodology and Methods

The choice of research methodology for any kind of research is critical and, as Ghauri and Gronhaug (2005) highlighted, this refers to more than a set of methods, rather to the strategy or plan of action that underlies a particular study and enables the researcher to achieve the desired outcome. Similarly, Ismail (2005) points out that the relationship among the variables on which that the researcher focuses is important in deciding the type of research method that is adopted and he goes further by identifying two main types of relationship (cause and effect and non-cause and effect relationships). A cause and effect relationship would normally require an experiment (quantitative study) in one form or another, while a non-cause and effect relationship would most likely be descriptive (qualitative study). Since this focuses on a cause and effect relationship, the most appropriate research methodology, as identified by Ismail (2005), would be quantitative. It is, however, pertinent to distinguish between the two main types of methodology, quantitative and qualitative.

Quantitative research is simply research that involves the collection of research data in numerical form for the purpose of quantitative analysis. Numerical data could be counts of incidents, ratings of scales and scores (Jupp 2006). This is used in the organised systematic examination of the quantitative properties of phenomena and their interaction. Quantitative research is interested in classifying features, counting them and constructing statistical models in an attempt to explain what is observed. Qualitative research methods employ the use of a specific number of observations and endeavours to explain different aspects of a problem.

Qualitative research is associated with a variety of theoretical perspectives, such as interpretivism, constructionism and inductivism, and may make use of documentary analysis. The main distinctions between quantitative and qualitative methods can be seen in table 5.2 below.

Table 5. 2: Differences between Quantitative and Qualitative Methods

Quantitative Methods	Qualitative Methods
Emphasis on testing and verification	Emphasis on understanding
Focus on facts and research into social events	Focus on understanding respondents'/ informants' point of view
Controlled measurement	Observation in measurement in natural setting
Objective and distant from data	Subjective insider's view and closeness to data
Results oriented	Process oriented
Particularistic and analytical	Holistic perspective

Source: Saunders et al (2007)

5.4.1 Research Methodology Techniques – Quantitative Methods

Burns (2000) views the positivists approach to quantitative research as embedded in logical conclusions and dispassionate research-based results, which must be executed using scientifically tested facts, theories and hypotheses. Many methods have been used, including regression analysis, dispersion approaches, the analysis of coefficients of variation and time series analysis.

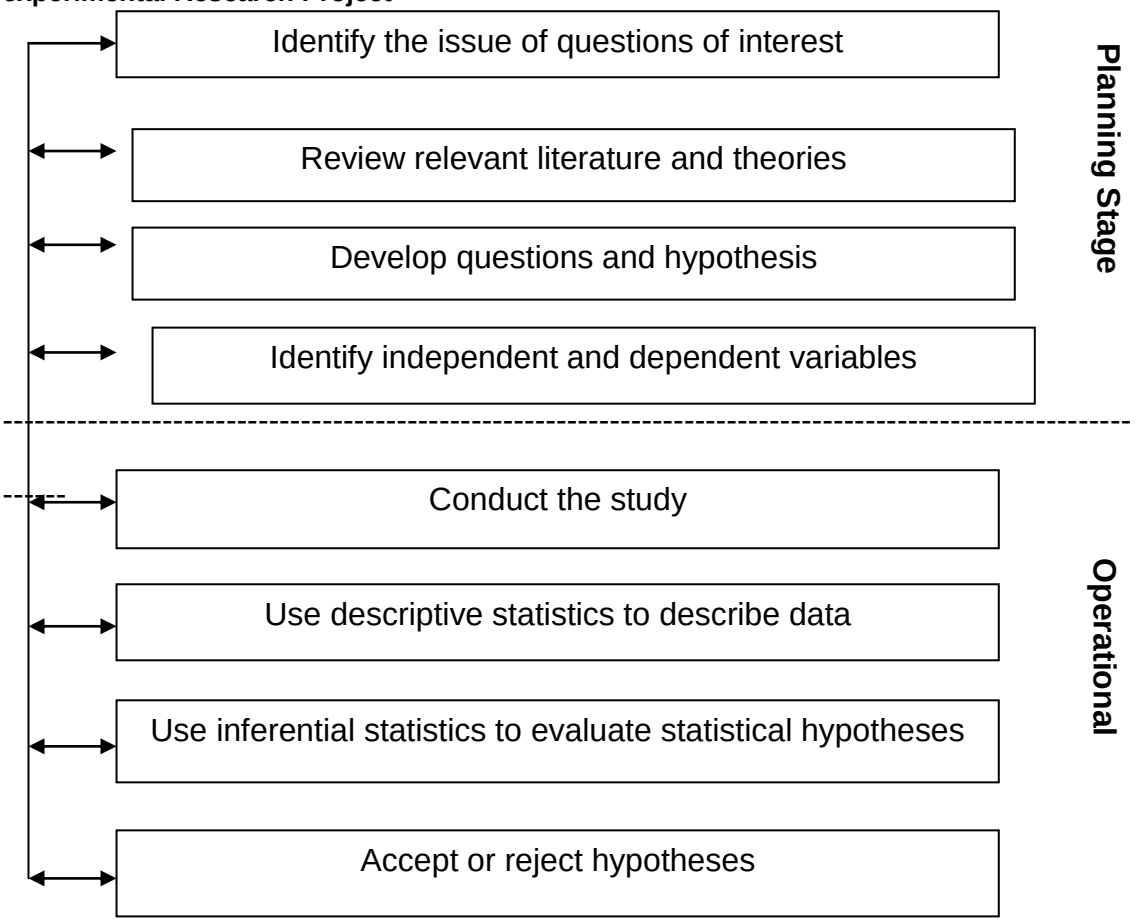
In the previous section it was identified that a quantitative methodology would be the most appropriate for this study, since the relationship under investigation is a cause and effect relationship. As such, the research design should follow an experimental or quasi-experimental design process following from the researcher's positivist philosophical stance. The experimental design process involves two distinct stages, the planning stage and the operational stage.

The planning stage involves the identification of the main issue of interest to the research. This was achieved in Chapter 1 and by exploring the relevant literature and theories relating to the issue to be investigated in Chapters 2 and 3. From there it should be possible (if it is possible to investigate the issue of interest) to formulate research hypotheses. The dependent variables (subject of the research) and the independent variables (variables that affect the subject of the research) are identified and made explicit, as was done in Chapters 2 and 3.

The operational stage involves conducting experimentation and it may involve the use of both descriptive and inferential statistics. From the analysis it then

becomes possible either to accept or reject the hypotheses. A formal document or presentation is then prepared to report the results and this is carried out in Chapter 5. Figure 5.2 shows in detail the two stages in an experimental research design.

Figure 5.2 Stages in the Planning and Operation of an Experimental or Quasi-experimental Research Project



(Adapted from Keppel et al.1992)

5.5 Methods Used in the Study of Stock Market Development and Economic Growth Relationship

The review of literature on stock market development and economic growth relationship in both developed and developing countries has shed some light on

the link between stock market and economic growth. This section, however, specifies the methodology applied to find the relationship between stock market and economic growth in Nigeria.

The bulk of the studies which investigated the stock market and economic growth relationship in a single country used some form of time-series study or other. This research examines the relationship between stock market development and economic growth over time for a single country (Nigeria), similar to the studies explored in the literature and as such will use time-series study, as it is a suitable tool to answer the research question. In addition, it is an accepted method within the literature for this kind of investigation. Authors such as Bahadur and Neupane (2006) as well as Tuchinda (2011) have also used this time series method in their studies of the stock market development and economic growth relationship in different single country studies, with a high degree of success and reliability in their result.

It is expected that this method will give insights into the relationships between the variables and how they behave as a system. In the present analysis, this method is particularly relevant because the research aims to investigate not only the strength but also the direction of any such relationships. In the past, there have been several time-series methods utilised within the literatures, as identified from the review of single country studies on stock market and economic growth relationship in Chapter 3. The methods include: correlation analysis (Oke and Mokuolu 2005), ordinary least square (OLS) test (Osinubi and Amaghionyeodiwe 2003, Azarmi et al 2005, Augustine and Salami 2010),

autoregressive distributed lag (ARDL) tests (Ang 2008, Odhiambo 2010), co-integration and VECM (Riman, et al 2008, Nowbutsing and Odit 2009, Oskooe 2010) and Granger causality test (Bahadur and Neupane 2006, Antonios 2010, Tuchinda 2011).

The correlation analysis method is a simple yet useful method of detecting the trend in any dataset and, as it was used by Oke and Mokuolu, (2005), it provides a rich source of information. However, it has several flaws which limit its use; correlation analysis detects the trend in the movement between two variables but it does not provide any information about a relationship other than the indication of a possible relationship. It simply shows if the trend of the direction of movement of the variable in relation to the other variable. Any inference drawn from any such co- movement as a possible association between the variables may in most cases be spurious (misleading).

In the same vein, the ordinary least square (OLS) test method, as was utilised by Osinubi and Amaghionyeodiwe (2003), Azarmi et al (2005) and Augustine and Salami (2010), is quite useful in detecting a relationship, as well as the magnitude of any detected relationship; however, it requires an apriori specification of the direction of the relationship and thus it is subject to misspecification errors. It is not able to capture the direction of the relationships, as it examines only the relationship in one direction. Also, it is not possible to use this method if the variables are not stationary, as is the case with most financial data.

The autoregressive distributed lag (ARDL) tests method, as utilised by Ang (2008) and Odhiambo (2010), is quite good for detecting the existence of a relationship and has very good small sample properties; however, its use becomes extremely complicated when the variables under analysis are integrated to order of 1 or above. Pesaran and Shin (1997) argue that, owing to this fundamental weakness in the traditional ARDL approach, it ceases to be applicable in the presence of integration in the data set of order 1 or higher. It is also not able to capture the direction of the relationships as it examines only the relationship in one direction. Consequently, the development of alternative estimation methods has been undertaken to mitigate against this problem; these include the Johansen (1991) method.

The Johansen and VECM method, like the ARDL method, is a type of co-integration analysis method. It was developed as an alternative estimation method. It avoids the flaws of the traditional ARDL method. According to Ang and McKibbin (2007), with the VAR it is easy to distinguish between short-run dynamics and long-run causality once the variables under analysis are co-integrated. The studies by Riman et al (2008), Nowbutsing and Odit (2009) as well as Oskooe (2010) utilised this method, with a good result in detecting the existence of a relationship between stock market and economic growth. This method has excellent small sample properties and it is possible to use it even where the variables are integrated of order 1. Also, where there is evidence of co-integration, it allows for the estimation of an error correction model.

While the studies that are interested in investigating the direction of casualty have all used different variations of a vector autoregressive (VAR) models, the Granger causality test in particular, the Granger causality test method as used by Bahadur and Neupane (2006), Antonios (2010) as well as Tuchinda (2011) allows the researcher to test for the actual direction of a relationship between stock market and economic growth without having a prior specification in his/her model. Enisan and Olufisayo (2009) explain the Granger causality tests as being based on prediction and add that the concept of causality is statistical; it tests to see if one time series can be useful in predicting another time series data. According to Granger (1969), causality exists when past values of X_1 can predict (Granger-causes) present values of $X_{2,}$ better than past values of X_2 and vice versa. A major weakness of the other methods discussed is that these methods are unable to capture the direction of the relationships that existed between variables and that they rely heavily on prior specification of the direction of the relationship.

The objective of this study is to examine the stock market economic growth relationship, in particular, to check for the existence of a relationship and, where one exists, the nature of the long-run causality between stock market development and economic growth. Given the debate on the impact of stock market on economic growth in developing countries as well as the unresolved conclusions on the nature of causality in the time-series studies, this study applies the Johansen and VECM method and also uses the Granger causality test to examine the causality.

Riman et al (2008) use a bivariate vector autoregression (VAR) to investigate the relationship between stock market development and economic growth for Nigeria. Their study does not control other factors within the economy that can impact on economic growth, leaving their study open to simultaneous bias (Gujarati (2004)). Although both studies are based on VAR models and examine the Nigerian economy, this study departs from this and other earlier works in Nigeria and thereby contributes to the knowledge by applying a multivariate VAR as such controls for other factors within the economy that might impact on economic growth, like the impact of government expenditure, openness of the economy, banking sector and capital stock. This approach minimises the omitted variable bias problem identified by Gujarati (2004) in VAR model specification.

This choice in method is similar to that of Tuchinda (2011), who examined the impact of stock market development on economic growth for Thailand. However, this study departs from their study by controlling a larger number of variables, as well as the longer time span of the data. The following hypothesis is tested in the co-integration analysis:

H_1: There is no relationship between the stock market and economic growth in Nigeria.

whereas the Granger causality analysis tests the two hypotheses

H_2: The stock market development does not Granger cause economic growth in Nigeria.

and

H_3: Economic growth does not Granger cause the stock market development in Nigeria.

5.6 Model Specification and Definition of Variables

The theoretical framework used to specify the model in the study stems from endogenous growth theory. To shed more light on how stock market development can influence economic growth, the researcher presents a simple framework based on an endogenous growth model (AK), as exemplified by Romer (1986), Lucas (1988), and Pagano (1993). Suppose the aggregate of output, $y_{t,}$ is produced according to the following constant-returns-to-scale production function:

$$y_t = AK_t \tag{5.1}$$

$$y_{t+1} = AK_{t+1} \tag{5.2a}$$

Or

$$[A = y_{t+1}/K_{t+1}] \tag{5.2b}$$

where K and t are the capital stock and time respectively and A is a variable which measures the social marginal productivity of capital or the level of total factor productivity, which has two components, economic efficiency and the level of technological progress.

It follows that, at steady states, the real economic growth rate is some composite of the social marginal productivity of capital, the proportion of total savings that are mobilised to investment and the savings ratio. This can be expressed in identity form as follows:

$$Y = \ln A + \ln B + \ln s \qquad (5.3)$$

The idea is that the identity in equation (5.3) represents a composite of the three main mechanisms by which financial development may induce endogenous economic growth:

I. It can raise β, the proportion of savings channels to investment (mobilisation and allocation of capital to more efficient use).
II. It can contribute to raising s, the savings rate, and thus physical capital accumulation, and,
III. It can increase A, the level of total factor productivity, by influencing economic efficiency or the level of technological progress.

To examine empirically the strength of the relationship between stock market development and economic growth in Nigeria, the endogenous growth model mentioned above is extended to incorporate the effect of stock market development. Incorporating the effect of financial market development on growth into the growth equation yields:

$$\mathrm{Y}_t = \alpha_0 + \alpha_1(\mathrm{K}_t/\mathrm{Y}_t) + \alpha_2\mathrm{H}_t + \alpha_3\mathrm{STOCK}_\mathrm{t} + \varepsilon_\mathrm{t} \qquad (5.4)$$

where ε_t is the error term / white-noise.

The argument in the above basic empirical model is that the savings and investment activities in the financial markets, such as in stock markets, induce economic growth endogenously.

As previously highlighted, the main objective of this chapter is to test the hypothesis that stock market development in Nigeria is linked with real economic growth. Thus, the research follows in the footsteps of previous researchers in this area, such as Riman et al (2008), who has employed the endogenous growth model framework. Riman et al (2008) use a univariate vector autoregression model to examine the relationship between stock market and economic growth. Their work uses only one measure of stock market development and does not control other factors within the economy which might impact on growth. Although both studies are based on VAR, this study departs from this and other earlier works in Nigeria by using a higher order multivariate VAR specification and thereby contributes to the knowledge. The other variables incorporated into the multivariate VAR model selected are guided by economic growth theory as well as other recent empirical studies identified from the literature review as having an impact on the economic growth process. These variables include a banking sector development variable (BL) (Levine et al 2000, Kar and Pentecost 2000), a measure of the impact of the government sector (GE) (Ghimire and Giorgioni 2009, Levine and Zervos 1996), a measure of the openness of the economy captured by the sum of import and export divided by GDP (XM) (Enisan and Olufisayo 2009, Ghimire and Giorgioni 2009),

gross capital formation (GC) (Ang 2009) and a dummy variable as a measure of political instability (POL) (Levine and Zervos 1996). The inclusion of these variables in the model is guided by economic theory as well as their common use in recent empirical studies. This study uses the model specified thus:

$$\mathrm{Y} = f(\mathrm{SM}, \mathrm{BL}, \mathrm{GE}, \mathrm{XM}, \mathrm{GC}, \mathrm{POL}) \tag{5.5}$$

The model is represented in a log-linear econometric format to obtain the coefficients of the elasticity on these variables, while reducing the possible impact that any outlier may have thus:

$$\ln \mathrm{Y}_t = \alpha_0 + \alpha_1 \ln \mathrm{SM}_t + \alpha_2 \ln \mathrm{GE}_t + \alpha_3 \ln \mathrm{XM}_t + \alpha_4 \ln \mathrm{BL}_t + \alpha_5 \ln \mathrm{GC}_t + \alpha_6 \ln \mathrm{POL}_t + \varepsilon_t \tag{5.6}$$

Three measures of stock market development are used in the analysis. In order to avoid issues of multi-collinearity in the specified model each of the measures of stock market development are tested separately as shown below.

$$\ln \mathrm{Y}_t = \alpha_0 + \alpha_1 \ln \mathrm{MC}_t + \alpha_2 \ln \mathrm{GE}_t + \alpha_3 \ln \mathrm{XM}_t + \alpha_4 \ln \mathrm{BL}_t + \alpha_5 \ln \mathrm{GC}_t + \alpha_6 \ln \mathrm{POL}_t + \varepsilon_{1t} \tag{5.7}$$

$$\ln \mathrm{Y}_t = \beta_0 + \beta_1 \ln \mathrm{VTG}_t + \beta_2 \ln \mathrm{GE}_t + \beta_3 \ln \mathrm{XM}_t + \beta_4 \ln \mathrm{BL}_t + \beta_5 \ln \mathrm{GC}_t + \beta_6 \ln \mathrm{POL}_t + \varepsilon_{2t} \tag{5.8}$$

$$\ln \mathrm{Y}_t = \delta_0 + \delta_1 \ln \mathrm{VTM}_t + \delta_2 \ln \mathrm{GE}_t + \delta_3 \ln \mathrm{XM}_t + \delta_4 \ln \mathrm{BL}_t + \delta_5 \ln \mathrm{GC}_t + \delta_6 \ln \mathrm{POL}_t + \varepsilon_{3t} \tag{5.9}$$

Where:

Y is economic growth: This variable measures economic growth, which for this research is measured by the proxy growth rate of per capita gross domestic product (GDP); this choice is guided by theory. This variable proxy captures the actual change in GDP from the previous year to the current and, thus, if the economy has grown it is positive and, if it has not, then it will be negative. Also, this measure takes the effect of population on GDP into account. Researchers such as Levine et al (2000) and Beck and Levine (2002) have similarly used the growth rate of per capita real gross domestic product (Y) as proxy for economic growth. The variable was collected in the local currency (the Naira) and was not converted, since this study is interested only in the trend over time in the individual country (Nigeria).

SM is the stock market development variable: stock market development covers a variety of factors, such as the market's ability to mobilise saving and risk management. These entire functions cannot be captured by a single measurement. The literature review on stock market and economic growth identifies the size of the stock market, as well as the liquidity, as important factors in its ability to stimulate economic growth. The literature is, however, divided as to the most appropriate measure and several measures of stock market development are proposed.

Therefore, the purpose of using three stock market development indicators is to allow for the testing to be robust. The variables measuring stock market development that were selected in this study are associated with the size and

liquidity of the stock market, The selected indicators are expected to measure how well it performs the function of stimulating economic growth. Furthermore, by using several indicators, it is expected that the exact manner in which the stock market impacts on economic growth can also be identified. This study uses three proxies for stock market development, one for size and two for liquidity.

I. **MC is the market capitalization ratio**: This variable measures the size of the stock market relative to the economy (market capitalisation divided by GDP). The idea behind the selection of this variable is that it provides a measure of the amount of finance the market is capable of providing, as well as the market's ability to mobilise capital, diversify risk and allocate resource (Shahbaz et al 2008). This variable is carefully deflated, using the method suggested by Beck and Levine (2004), as stock market capitalisation is a variable measured at the end of a year, while GDP is a flow variable measured relative to or over the year; simply using the stock market capitalisation by the GDP can produce misleading measures of stock market development, especially in highly inflationary environments.

II. **VTG is the value of stock traded to GDP ratio**: The first measure of liquidity (value-traded ratio) of the stock market measures the value traded, adjusted relative to the size of the economy. A higher value traded corresponds to greater liquidity in the market and greater attractiveness for investors (Enisan and Olufisayo 2009). The ratio of organised equity trading as a share of GDP positively reflects liquidity on an economy-wide basis.

This ratio also complements the market capitalisation ratio, since the market size measured by market capitalisation may be large but can be relatively inactive as measured by trading activity. Since both the numerator and denominator of the ratio are flow variables that have been measured within the same period of time, there is no need to deflate the variables in this case.

III. **VTM is the value of stock traded to market capitalisation**: The second measure of liquidity (turnover ratio) of the stock market measures the value traded adjusted relative to the size of the market. This ratio is equal to the total value traded divided by market capitalisation and measures the size of equity transactions in relation to the size of the stock market. A high turnover ratio may often be an indication of low cost of transaction and a higher ratio may represent greater liquidity and market efficiency. Thus, illiquid stocks react to market information more slowly than do liquid stocks. However, an excessively high turnover ratio may represent inefficiency or excessive speculative trading. Since this indicator is the ratio of a stock and a flow variable, the deflating procedure is applied.

BL is banking sector development: This variable measures the impact of the banking sector development on the economy, which is included to avoid omitted variable bias in the specification of the model (see Gujarati 2004). Since banks and stock markets fulfil similar functions in the economy, not including a measure of banking sector development could mean that any relationship

detected may be due to the influence of the banks disguised as stock market effect. The research measures the impact of the banking sector, using the loan-to deposit ratio of banks, as it not only provides an indication of the credit provided by the banking sector but also equates this to the level of saving within the economy. Also, Levine et al (2000) highlights this proxy as most appropriate to measure the impact of the banking sectors credit generations ability.

GE is the ratio of government expenditure to GDP: This variable measures the impact of the government on economic growth and acts as a proxy for the level of macroeconomic stability. This variable is particularly important to include in this research as the government sector is the largest sector in Nigeria, which is measured using the ratio of government expenditure to GDP. Also, researchers, such as Levine and Zervos, (1996), Ghimire and Giorgioni (2009) have used government expenditure to GDP as a proxy for the government sector and to measure the level of macroeconomic stability. However, other researchers, such as Barro and Sala-I-Martin (1995) have also used this variable to proxy political corruption. This research uses it as a proxy for macroeconomic stability.

XM is the ratio of total trade (import plus export) to GDP: This variable measures the degree of openness of the economy, which the researcher measured by the level of total trade as a fraction of GDP. The degree of openness to international trade of any economy has been highlighted in the endogenous growth literature as an important factor for growth to occur. Several

studies, including Edwards (1993), have highlighted the impact of openness on international trade as important for growth and that economies which are open may grow more rapidly by virtue of their larger markets and ability to improve on efficient gains. This variable is also included as a control variable.

GC is the gross capital formation. The amount of capital stock available within any economy impacts on the level of production. Economists recognise capital, labour and land as factors of production; however, the capital stock captures the relative contribution of the man-made resources including buildings, plant, equipment and inventories created by all three factors, which all contribute to the growth process. The level of available capital stock thus impacts on economic growth and the measure of capital stock utilised in this analysis is the value of the gross capital formation, which includes both private and public capital.

POL is political instability: This is a dummy variable included to account for the high level of political instability which the researcher measured by the years under military and civilian rule. The reason for the inclusion of this variable is drawn from the theoretical hypothesis that uncertain socio-political conditions affect economic growth negatively. The impact of political instability on the process of economic growth has been highlighted in various studies and, to capture this effect, a dummy variable (POL) is utilised in this study. This is guided by theory, as political stability affects the prospects of an economy's growth. Also, researchers such as Ang (2009) have utilised dummy variables to

account for the effects of distortions to the economies that they are investigating.

α_0, β_0 and δ_0 are constant terms, ε is a random error/disturbance term and t is the time trend; these are normally included in standard time-series specifications to account for the omitted variables as well as unexplained random effects within the model.

To avoid problems of misinterpretations of the empirical results, this section provided a description of all variables appearing in the specified equation. All the variables are converted to logarithms, in order to minimise the outlier effect and to also obtain coefficients of elasticity of the variables.

5.6.1 Data Sources, Time Span and Expected Signs of Variables

According to Remenyi et al (2005), within business and management studies, secondary data are mainly used in case study and survey-type research. In line with this, the present researcher collected secondary data to achieve the research goals. The research utilised secondary annual time series for the variables identified above. The data set was from the following sources.

- Central Bank of Nigeria (CBN) statistical bulletins
- Nigerian Stock Exchange (NSE)
- Capital Market of Nigeria database
- Organisation of Petroleum Exporting Countries (OPEC)

Some of the data set utilised in this study was not directly available and had to be derived/represented by proxies, utilising techniques proposed in the literature and standard conversion procedures. For example, the data set in some cases had to be deflated to remove the effect of inflation and, to address this problem, the procedure defined by Levine et al (2000) was used and is illustrated, using as an example the stock market capitalisation ratio below.

When computing the average real stock market capitalisation (MCAP) in year t and t+1, this average was divided by real GDP measured in year t, with the end-of-year CPI the value for December. The formula is the following:

$$0.5 \times \frac{(\mathrm{MCt}\ /\ \mathrm{CP}\boldsymbol{I}\mathrm{e,t}) + (\mathrm{MCt}-1\ /\ \mathrm{CP}\boldsymbol{I}\mathrm{e,t}-1)}{\mathrm{GDPt}\ /\ \mathrm{CP}\boldsymbol{I}\mathrm{a,t}} \qquad (5.10)$$

Advantages and Disadvantages of Using Secondary Data

Compared with the limitations of primary data, using secondary data can not only save on the resources (and, in particular, time) needed for collecting data but also achieve a longer time span (Ghauri et al 1995). In addition, secondary data are likely to be of higher quality, especially when collected by surveys from governments or institutions (Stewart and Kamins 1993).

Secondary data can generally be divided into three main types: documentary, survey and compiled data (Saunders et al 2003). There are a number of disadvantages of using secondary data. One of these is the suitability of the data, since primary data are new data collected with a specific research

purpose in mind and can usually answer the research question and/or objective straightforwardly. Secondary data, however, have always been organised and collected for some other purpose beforehand. Therefore, they can seldom be used to answer the research question(s) directly but can still provide useful sources for investigation and analysis (Denscombe 1998).

Stewart and Kamins (1993) argue that an advantage of using secondary data is that the data already exists. Therefore, it merely needs to be evaluated for suitability prior to use. Investigating the suitability of secondary data is worthwhile in these circumstances, since this important step will save time, especially when there are several different data sources (Saunders et al 2003). Apart from concerns of the data's suitability, their accessibility and availability is also worth considering. It is difficult and costly to gain access to data collected for commercial reasons and issues of confidentiality may also restrict access to data. The research was fortunate that the available secondary data were suitable for answering the research question.

Reliability and Validity of Data:

Saunders et al (2007) pointed out that there are two major threats to the credibility of research: data reliability and validity. The main issue of reliability in the context of this research will arise when information is obtained from an undependable or untrustworthy source. To control the incidence of unreliability of data, the data set used in this analysis was obtained from the Central Bank of Nigeria (CBN) and the Nigeria Stock Exchange (NSE). Both of these organisations are the primary institutions which generate the data required for

the research and any other source receives information on these variables from these institutions. The researcher is aware that, as in most developing countries, Nigerian data are still subject to some sources of error, which it can be argued exists in some degree in any data collected.

Data validity and reliability are a crucial determinant of the credibility of research. Where research is conducted at a national or regional level, secondary data are the most appropriate sources. Threats to validity in the context of this research would include the soundness of the specifications of the models and the methods, as well as the nature of the data used in the analysis. These problems can be solved to some extent by undertaking diagnostic tests, as outlined later in this chapter, and to verify that the suitable models and methods are chosen to suit the nature of the data and to avoid potential threats to the validity of the research findings. This has been demonstrated in the literature review, as well as in the discussions of research philosophy and methods.

The Time Span of the Study

The Nigerian stock market came into existence in 1960 and, during most the first two decades of its existence, it was under military rule, where the government adopted a series of nationalist policies which were not conducive to private sector growth. Although foreigners were allowed to invest in the country, the level of participation as well as capital repatriation was restricted. With the advent of democracy in 1978, there was a change in government from military to civilian regime. The 1980s marked an attempt to shift from an overreliance on

the government because the government just did not have the funds to finance these projects and the few existing government businesses were badly run.

Since then, the Nigerian economy has undergone a series of reforms by the civilian government, with a view to making the economy more market friendly. The different liberalisation policies, which include the structural adjustment programme (SAP) recommended by the international monetary fund (IMF), have been implemented by successive governments in the countries since then, to stimulate economic growth and encourage the stock market in Nigeria, making this an interesting time period to study the development of the Nigerian stock market and its impact on economic growth.

The year 1999 was another defining moment for Nigeria, with the return of a civilian regime, after over ten years of military rule, intent on returning the Nigeria to a market economy. The policies implemented include a privatisation programme of government owned companies, thereby improving and increasing the quality and quantity of securities available on the market. This sparked renewed interest in the stock market and increased activity on the market. This is a great time period to examine, as it provides insight into the contribution of the stock market to growth before, during and after the recent privatisation programme.

Also, the traditional time-series approach to studying this relationship between the stock market and economic growth, as identified in the literature review, is dependent on at least 25 observations for the analysis to be statistically

significant. The period 1980 to 2007, which is the period of this study, has more than this and allows for the analysis to be credible, while maintaining a reasonably good degree of freedom in the model. The available number of observations of data, however, did not allow for a statistically significant two-period study (before and after privatisation). The summary of the variables used in the analysis, what they proxy, the expected signs and the researchers that have used them in the past are outlined in table 5.3.

Table 5.3: Description of the variables in the model and their expected signs

Symbol	Variable	What it proxies	Expected signs	Authors who have used them
Y	Growth rate of per capita GDP	Economic growth	NA	Enisan and Olufisayo (2009)
MC	Market capitalization to GDP	size of stock market	+	Enisan and Olufisayo (2009); Bahadur and Neupane (2006); Herriott (2001)
VTG	Value traded to GDP	Liquidity of the stock market relative to the whole economy	+	Enisan and Olufisayo (2009); Bahadur and Neupane (2006); Herriott (2001)
VTM	value traded to Market capitalization	liquidity of the stock market relative to stock market size	+	Bahadur and Neupane (2006); Herriott (2001).
GC	Gross capital formation (GFCF) GDP	Total capital stock	+	Ang (2009)
GE	Government expenditure to GDP ratio	Government sector impact/ macroeconomic stability	+	Ghimire and Giorgioni (2009); Levine and Zervos (1996)
BL	Loan-to-deposit ratio of banks	Banking sector credit activities	+	Levine et. Al. (2000); Kar and Pentecost (2000)
POL	Dummy variable for political instability	Political instability	-	Levine and Zervos (1996)
XM	Total export and import to GDP	Degree of openness	+	Enisan and Olufisayo (2009); Ghimire and Giorgioni (2009)

5.7 Methodology for the First Research Question

This research investigates two research questions, using a similar data set, with a view to analysing the relationship between the stock markets and economic growth in Nigeria. This section outlines the methodology used to answer the first research question, “Is there a relationship between the stock market development and economic growth in Nigeria?”. This question requires checking for evidence of the presence of a relationship between the variables of interest over time and, from the literature, the most appropriate method of doing this is an econometric framework, specifically a time-series analysis.

Econometric Framework

This section describes the econometric methods used to assess the stock market development/economic growth relationship in this study. First, a brief description of the time series analysis method of co-integration process is given and the procedures used for co-integration analysis are explained. Co-integration is a form of time series study that is commonly used by empirical researchers within the literature, to identify the persistent patterns of co-movement among variables, as well as to estimate long- run equilibrium. However, where it is discovered that the variables have unit roots, the testing process becomes more difficult. The examination of unit root is a pre-requisite for co-integration analysis, which cannot be valid unless variables are non-stationary. Engle and Granger (1987) show that, for certain groups of non-stationary variables, a linear combination of these variables may be stationary. The basic idea behind this is that, where two or more series move closely together in the long run, the difference between the series is constant; even if

the series are trended, then it may be said that the variables exhibit the existence of a co-integration relationship.

Since time-series data tend to be non-stationary, determining the order of integration or co-integration of the variables becomes important. The order of integration of a time series implies the number of times a time series must be differenced to make it stationary. Many economic time-series appear to be integrated of order one, I(1), needing to be differenced once to make them stationary. They are then said to exhibit a unit root. However, it may be the case that equilibrium or arbitrage conditions imply that particular combinations of the variables under consideration are stationary, I(0). If this is the case, the variables are said to be co-integrated.

Recent developments in non-stationarity and co-integration theory have contributed to a better understanding of the short-run and long-run dynamics in economics and the equilibrium behaviour of economic variables. Co-integration testing provides evidence in support of the existence of a linear relationship, connecting the variables under consideration that is steady long-run. The existence of relationships which attain equilibrium in the long-run have important implications for the short-run behaviour of the underlying variables, given that there must be a mechanism that drives the variables to their long-run relationship. This adjustment process is modelled by an error-correction mechanism, which leads to the specification of an error-correction model (ECM).

To sum up, the three important aspects to consider while estimating relationships between variables are unit root (integration) properties, the multivariate aspects and the dynamics. An ideal econometric estimation technique should be able to: (1) incorporate all prior knowledge about the presence of unit roots; (2) account for the simultaneous determination of several variables (so as to avoid endogeneity bias); and (3) capture both short and long run dynamics adequately.

5.7.1 Stationarity and Unit Roots

A series is said to be stationary if

a) it has finite variance which does not depend on time,

b) the effect of a particular random innovation is transitory,

c) it tends to fluctuate around its mean, and

d) it has autocorrelations that decline rapidly as the lag increases (Granger 1986, Engle and Granger 1987).

A strictly stationary process is one where, for any t_1, t_2,..., $t_T \epsilon$ Z, any k ϵ Z and T=1,2,...

$$Fy_{t_1}, y_{t_2}, \dots, y_{t_T}(y_1, \dots, y_T) = Fy_{t_{1+k}}, y_{t_{2+k}}, \dots, y_{t_{T+k}}(y_1, \dots, y_T) \qquad (5.1)$$

where F denotes the joint distribution function of the set of random variables (Tong 1990 p.3). Also, Brooks (2008) notes that “It can also be stated that the probability measure for the sequence $\{y_t\}$ is the same as that for $\{y_{t+k}\}\forall k$ (where $'\forall k'$ means ‘for all values of k’)”. Consequently, a series is strictly stationary if the probability distribution of its values remains constant as time

progresses, implying that the probability that y falls within a particular interval is the same now as at any time in the past or the future. However, this strict evidence of stationarity is not always viable and therefore weak stationarity is commonly used. Weak stationarity requires the mean, variance, and covariance of a series to remain constant over time (Gujarati 2004). By differencing the data, non-stationary data could become stationary.

Prior to the 1980s, econometricians tended to formulate a traditional regression model to represent the behaviour of time series data, assuming that the trend component is a deterministic function of time and that cyclical components represent stationary movements around this trend. This assumption of stationarity was, however, found to be false and the results of the regression found to be spurious. The presence of nonstationarity in economic time series has posed a serious problem of estimation and testing. It was observed that running an OLS regression on nonstationary data could produce misleading or spurious results. Changes in mean and often in variance resulting from the first two moments being irregular rather than constant can be ascribed to a nonstationary series. In contrast to a stationary series which contains a stationary trend, a nonstationary time series contains a stochastic trend. A series may drift slowly upwards or downwards simply as a result of the effects of stochastic or random shocks (Enders 1995).

Since almost all economic time series contain trends, it follows that these series have to lose any trends before a sensitive regression analysis can be performed. Therefore, a way of dropping a trend in a time series is by using first

differentials rather than the levels of the variables. Here, the concept of the integrated series is used. This is because, in the stochastic process, stochastic shocks have permanent effects. These become built into the future levels of the series, so that they are integrated into the series and hence such series are referred to as integrated series *(*Perron 1989*)*. If time series data are shown to be nonstationary, this may be purged by differencing and estimating, using only differentiated variables. Regressions where variables of different orders of integration are involved can often lead to spurious results.

Granger and Newbold (1974) and Engel and Granger (1987) asserted that many of the variables that appear in time-series econometric models are non-stationary or are integrated variables. Therefore, in this research unit root tests were performed on the univariate time series to ascertain the stationarity or otherwise of the series. The next section outlines the process used in the ADF unit root test.

The Augmented Dickey-Fuller (ADF) test is a test used to confirm whether or not a set of time-series samples is stationary or not. It essentially tests for a unit root in the data and it is an improved version of the Dickey–Fuller test. The term ‘augmented’ implies that this version has been improved and is more suitable than the plain Dickey–Fuller test for more complicated and large data sets. The ADF test is commonly used. It fits an autoregressive AR(k) model, examining the null hypothesis of an autoregressive integrated moving average (ARIMA) process against the stationary ARIMA alternative (Dickey and Fuller 1979). This involves running the following univariate regression:

$$y_t = \alpha + \beta y_{t-1} + \sum_{i=1}^{p} y\,\Delta y_{t-1} + u_t \qquad (5.2)$$

where α is a deterministic component, y_t is the series and y_{t-1} is a one period lag of the series, while u_t is the unobserved errors.

The above specification can be appended with a deterministic trend term if appropriate. The null hypothesis is that $\beta = 0$ (there is a unit root) against the alternative hypothesis (Haldrup and Jansson 2006).

$\beta \neq 0$ (stationary). The test statistic is given as:

$$DF = \frac{\hat{\beta}}{\widehat{\sigma_{\beta}}} \qquad (5.3)$$

where DF is the Dickey-Fuller distribution and $\widehat{\sigma_{\beta}}$ is the least squares standard error of β. However, given that the distribution of ADF does not follow the standard student's t-distribution, the computed t-statistic is compared with the critical values provided by MacKinnon (1996). Highly negative test statistics reject the null hypothesis.

5.7.2 Traditional Co-integration Tests and Their Limitations.

Two series are co-integrated when they share a common stochastic trend, suggesting that there might be a long-run relationship between the two series (Gujarati 2004). In this study, the task is to investigate the co-movement by

testing respectively for stationarity and co-integration. The notion of co-integration refers to the case where two or more variables move together over time and the difference between them is stable over time. The two most widely adopted co-integration techniques are the two-step residual procedure of Engle and Granger (1987) and the system-based reduced rank approach of Johansen (1991, 1995). The latter has several advantages over the Engle and Granger methodology, of which the main one is that it can estimate the number of co-integrating vectors in the system. The former assumes that there is only one unique co-integrating vector, whereas the latter allows for the estimation of multiple co-integration vectors when the tests involve more than two variables. Therefore, the present analysis utilises the Johansen methodology.

Although the two-step Engle and Granger (1987) residual-based approach can be implemented easily, its application is subject to some limitations. Firstly, the estimation of the long-run equilibrium relationship involves a simple OLS regression on levels of the variables. This method is appealing because of computational convenience. However, as pointed out by Hendry et al (1986), the omission of dynamics can generate substantial bias in finite samples and this severely undermines the performance of the estimator. Also, endogeneity bias can affect small sample estimates, even though endogeneity has negligible effects asymptotically.

Secondly, the two-step procedure uses the residual generated in the first step to form a new regression model in the second stage. Hence, any errors introduced in the first step are carried into the second step (Enders 2004).

Thirdly, Park and Philips (1988) have pointed out that the OLS estimator in the first step has a non-normal asymptotic distribution that depends on nuisance parameters. Hence, the reported t-statistics on the long-run parameters may be misleading. The Johansen (1995) approach is discussed in greater detail in the next section.

The Johansen Methodology

The Johansen (1995) methodology is rather complicated and is by now well-known in academic literature. As such, only a brief overview of it is necessary here. It begins with the construction of a multivariate autoregressive model of the form:

$$z_t = A_1 z_{t-1} + A_2 z_{t-2} + \dots + A_k z_{t-k} + u_t, \qquad u_t \sim IN(0, \Sigma) \tag{5.4}$$

where z_t is a (n x 1) matrix of n potentially endogenous variables and each of the A_1 is a (n x n) matrix of parameters. The equation can be reformulated into a vector error correction form:

$$\Delta z_t = \Gamma_I \Delta z_{t-I} + \Gamma_{k-I} \Delta z_{t-k-I} + \dots + \prod z_{t-k} + u_t, \qquad u_t \sim IN\left(0, \sum \right) \tag{5.5}$$

where Γ_I =-(I-A_1 -... -A_i), (i= 1,... ,k- 1) and P=- (I - A, -... -Ak), with I being the identity matrix. The vector error correction form gives us information about the

short and long runs via the estimates of Γ_1 and $\prod$ respectively. It can be shown that $\prod = \alpha\beta'$, where α is the speed of adjustment to disequilibrium and β is a vector of long run coefficients. Johansen proposed that Δz_t and z_{t-k} should be regressed on a constant and the z_t lagged differences to obtain the residual vectors R_a and R_{kt} respectively. These residual vectors are then used to form residual matrices (Lutkepohl 2006):

$$S_{ij} = T^{1} \sum_{i=1}^{T} R_{it} R'_{jt} \qquad i, j = 0, k \tag{5.6}$$

The eigenvectors which correspond to the r largest eigenvalues are derived by solving the equation:

$$|\lambda S_{kk} - S_{k0} S_{00}^{-1} S_{0k}| = 0 \tag{5.7}$$

are the maximum likelihood estimate of P. This procedure gives n eigenvalues $\lambda_1 > \lambda_2 > \cdots > \lambda_n$, and the corresponding eigenvectors V= (v, ..., v). The r elements in V are the co-integrating vectors. Furthermore, Johansen shows that ä= $S_{\alpha k}\beta$ from which we obtain estimates of α. Once we have estimates of α and β and test for restrictions, we then estimate the equation by OLS to obtain the full model. One of the most important implications of cointegration is the Granger representation theorem (Granger 1983, Engle and Granger 1987). The

theorem posits that, if two or more variables are co-integrated of order 1, then the data can be represented by an error correction model, which is discussed in greater detail in the next section.

The Johansen approach is not free from criticism; the process of inclusion of lags to remove the omitted variable bias affects the degrees of freedom and choosing the optimal number of lags appears to be the most serious drawback of Johansen's method (Pesaran et al 2001). The small sample properties of these approaches are also unknown; however, in this study the sample is not small. Also, the test results may be sensitive to the inclusion of intercepts and trends in the specification.

Another potential drawback concerns the number of co-integrating vectors found. When more than one co-intergrating vector is found, it is often hard to interpret each implied economic relationship; however, this research is interested only in one. In addition, when the variables are not stationary in level 1(0) or first difference 1 (1), the implementation of this technique becomes more complicated and somewhat burdensome.

Constructing the Vector Error Correction Models (VECM)

A vector error correction (VEC) model is a restricted VAR designed for use with non-stationary series that are known to be co-integrated (Lutkepohl, 2006). A simple example would be to consider a model with two variable and one co-integrating vector and no lags. The co-integrating equation is:

$$y_{2,t} = \beta y_{1,t} \tag{5.8}$$

Where $y_{2,t}$ and $y_{1,t}$ are the variables and β is the coefficient

The corresponding VEC model is:

$$\Delta y_{1,t} = \alpha_1 (y_{2,t-1} - \beta y_{1,t-1}) + \epsilon_{1,t}$$
$$\Delta y_{2,t} = \alpha_2 (y_{2,t-1} - \beta y_{1,t-1}) + \epsilon_{2,t} \quad (5.9)$$

The right-hand side of the model shows the error correction term, which in the long run (equilibrium) is equal to zero. Where the $y_1$and $y_2$deviate from the equilibrium, the value of the error correction term is found to be nonzero; thus, the $y_1$and y_2 's continually adjust in a bid to return the relationship to equilibrium. The α_2 captures the rate at which the *i* th variables in the model revert to their equilibrium state.

As the VEC model specification can be relevant for application only in series which are co-integrated, the first step is to run the Johansen co-integration test as described above and determine the number of co-integrating relations. This information is needed as part of the estimation of the vector error correction model (Lutkepohl 2006).

5.8 Second Research Questions Methodology

This section outlines the methodology used to answer the second research question: “What is the direction of causation in the relationship between the stock market and economic growth in Nigeria?” Enisan and Olufisayo (2009)

explain that the Granger causality tests involve a statistical concept of causality that is based on prediction, testing to see if one time series can be useful in predicting another set of time series data. According to Granger (1969), causality is said to exist between two variables when a variable (X_1) predicts (Granger-causes) another variable (X_2) better than that variable can predict itself. Thus, the information contained within past values of the variable X_1 is better at predicting the variable X2 than previous values of X_2 can predict itself.

$$SM = \alpha_1 + \sum_{i=1} \beta_1 SM_{t-1} + \sum_{j=1} GDP_{t-j} + U_{1t} \qquad (5.10)$$

$$GDP_t = \alpha_2 + \sum_{i=1} \beta_2 GDP_{t-1} + \sum_{j=1} SM_{t-j} + U_{2t} \qquad (5.11)$$

where economic growth is represented by GDP and SM is stock market development represented by three different development variables.

To test the hypothesis of no causality between the variables, the restricted F-test is applied and is given by:

$$F = \left[\left[(RSS_R - RSS_{UR})/m \right] \Big/ \left[RSS_{UR}/(n-k) \right] \right] \qquad (5.12)$$

where, k represents the number of parameters estimated, m is the length of lagged terms and RSS_R and RSS_{UR} are residual sums of squares of restricted and unrestricted models respectively (Perron 2006).

A major limitation associated with the Granger causality test is the fact that the predictor is not always based on all possible information but rather on only part of the information. This is due to the nature of the test, which utilises a bi-variate system and this often leads to misspecifications of the model, which could cause incorrect inferences (Lutkepohl 1982). However, this limitation can usually be overcome by running diagnostics tests to detect misspecification in the model, owing to potentially excluded variables. Another solution to this problem would be to construct a trivariate VAR for systems of higher dimensions. This is, however, not necessary for this study, as it is interested only in the relationship between two variables (stock market and economic growth).

Also, Gujarati (2004) argues that F-test procedure ceases to be valid when the variable are not stationary, as is the case with time-series data, and may lead to spurious results, thereby making the traditional Granger causality test invalid. However, Enders (2004) proved that the F-test procedure is still valid, provided that the variables are first differentiated, thus enabling the valid use of the traditional Granger causality test. However, this study will utilise the improved Granger-Causality procedure instead.

5.9 Summary and Conclusion

This chapter has presented and justified the epistemological stance underpinning the research, as well as detailing issues associated with the methodology and data used in examining the link between the stock market and economic growth. The methodologies adopted aim to overcome some of the

problems and issues identified as weaknesses involved in other research in the area.

Taking a positivist stance, the researcher consequently applied a quantitative methodology in the study, using a time series analysis to examine the relationship between the stock market and economic growth. The chapter then examined the issues associated with time-series analysis, such as the stationary of the data set, before detailing the methodology used to answer the two research questions examined in this study.

The chapter introduced the model for the estimation in the study variable, as well as the justification for the methodology, as well as the variables used in the analysis.

For the first research question. the Johansen cointegration methodology was adopted because it can (i) account for the long-running relationships between the variables of interest: (ii) account for different relationships among the variables in the form of separate cointegrating vectors; and (iii) provide statistical evidence as to which variables are endogenous.

For the second research question, the Granger causality framework was adopted to test the direction of Granger causality between stock market variables and economic growth in Nigeria.

This chapter has also looked at the issue of stationarity in some detail, given the impact of time series not being stationary, as well as methods to make them stationary.

CHAPTER 6: DISCUSSION OF THE RELATIONSHIP BETWEEN STOCK MARKET AND ECONOMIC GROWTH IN NIGERIA

6.1 Introduction

This chapter provides a detailed report on the outcomes from the analysis of the relationship between stock market and economic growth conducted for the Nigerian economy. The findings from the study are highlighted and discussed in terms of their significance in understanding the relationship between the stock market and economic growth in Nigeria. The findings are related to the literature, studying the role of financial development in economic growth and particularly those strands investigating stock markets and economic growth.

6.1.1 Objectives of the Chapter

The materials in this chapter aim to establish empirically whether or not there is a relationship between the stock market and economic growth in Nigeria and to establish the nature of causality in any such relationship.

6.1.2 Research Questions

In order to achieve the objectives of this chapter, the following two questions were examined.

1. What is the relationship between the stock market and economic growth in Nigeria?
2. What is the direction of the relationship between the stock market and economic growth in Nigeria?

The first question refers to the effect of the stock market on the economic growth of a developing country, in this case Nigeria. The study examined whether or not there is a positive relationship between the stock market and the economy.

The second question draws from the first, examining if there is a relationship, what is the direction of this relationship, is it in two directions or one direction and which of the factors investigated drives the other? This is particularly important because it provides insight into the dynamics of the relationship within the Nigerian economy.

6.1.3 Research Hypothesis

The study investigates the validity of the assertions of the endogenous growth theory regarding the role of stock market development on economic growth particularly the positive role for the stock market on economic growth posited by the endogenous growth theory. It examines the endogenous growth theory which posits that stock market development causes higher growth through its influence on the level of investment in the economy. To achieve this, the study seeks to answer the two questions drawn from unresolved issues within the endogenous growth theory. Which are the question of the existence a relationship between stock market and economic growth and the causal direction of any such relationship?

Three research hypotheses are formulated and the first one (Hypothesis 1) tests for the existence of a relationship between stock market and economic growth a major assertion of the endogenous growth theory and is stated thus below:

The second and third hypotheses (Hypothesis 2 and Hypothesis 3) both examine another unresolved issue within the endogenous growth theory particularly in time series studies which is the direction of causality. They test if stock market leads economic growth (supply leading) or if the reverse is the case (demand leading) respectively. Statistical and econometric time series methods outlined in the previous chapter are utilised in examining the following research hypotheses:

Hypothesis 1: Ho: There is no relationship between the stock market and economic growth in Nigeria

Hypothesis 2: Ho: The stock market does not Granger cause economic growth in Nigeria.

Hypothesis 3: Ho: Economic Growth does not Granger cause the stock market in Nigeria.

The research hypotheses are tested in this research by conducting two sets of empirical tests. The first aims to establish if there is a relationship between the stock market and economic growth in Nigeria and the second investigates the direction of Granger causality between the variables in any relationship found in

the first study. However, some preliminary tests need to be carried out and these tests include correlation tests, which are discussed below.

6.2 Correlation Analysis Results and Discussion

Econometrics theory does not have any single clear method for the detection and elimination of multicolinearity in a model but rather proposes several methods to detect and mitigate against its impact. A possible method to avoid this is conducting a prior correlation analysis of the variables intended for the model and eliminating any variable found to have a high correlation coefficient from the model. Some researchers have offered rules of thumb for interpreting the meaning of correlation coefficients, and by extension determining the degree of multicollinearity within a model but these rules of thumb are domain specific.

Some researchers suggest that a high pair-wise or zero-order correlation coefficient value of 0.8 or above indicates the existence of serious multicolinearity. However Gujarati (2004) argues that a high pair-wise correlation coefficient on its own is a sufficient condition for the existence of collinearity, but it is not a necessary condition for its existence within any given model. He points to cases where multicolinearity has been detected in model with correlation coefficients of less than 0.5. These findings support the view that the distinction in multicollinearity is a matter of degree and not of kind.

Since multicollinearity is a sample feature and the degree of its existence within any sample can be measured.

Taking this into account the researcher set the following guidelines for interpreting the correlation coefficient to determine the possibility of the existence of multicollinearity and acceptability of the variables for inclusion in the final models. Values between 0 and 0.4 (0 and -0.4) indicate a weak positive (negative) linear correlation and the possibility of the existence of a very weak multicollinearity thus a high acceptability of the variables to be included within the same model.

Values between 0.4 and 0.7 (-0.4 and -0.7) indicate a moderate positive (negative) linear correlation and the possibility of the existence of a moderate multicollinearity thus a poor acceptability of the variables to be included within the same model although if the variables in question has been identified within theory as very essential to the estimation it could still be included. While Values between 0.7 and 1.0 (-0.7 and -1.0) indicate a strong positive (negative) linear correlation and by extension the possibility of the existence of a very strong multicollinearity thus a very poor acceptability of the variables to be included within the same model.

The researcher choose to set the cut off at 0.4 for this study as it is quite rigorous and allows for only the possibility of the existence of very weak multicollinearity as this is below the threshold of 0.5 highlighted by Gujarati (2004) thus maintaining an acceptable level of multicollinearity also the objective of the model is not for predictive purposes.

Figure 6.1 presents the values of correlation among the variables measured in this study. As can be seen, all the variables are correlated with growth (real per capita GDP growth). Stock market capitalisation and both liquidity measures (value traded and turnover ratios) are positively and significantly correlated with growth. The correlations among the stock market development indicators show two important points. Firstly, the two measures of market liquidity, the value traded and turnover ratios, are significantly and positively correlated, with a correlation coefficient greater than 70 per cent. This implies that the two measures are substitutes for each other and may reveal similar aspects of stock market development. Secondly, the stock market size indicator of market capitalisation ratio is positively correlated with the liquidity indicators. This leads to the conclusion that, when the size of the stock market increases, the stock market becomes more liquid and efficient. Therefore, the inclusion of both variables in the same model could lead to a severe problem of multi-collinearity. Multi-collinearity is a statistical phenomenon that is said to occur when two or more independent variables within a specified model are shown to exhibit a high level of correlation with each other. Where it occurs it

may cause the estimated coefficient of the variables in the model to vary erratically when there are changes to the model or the data.

As can also be seen from figure 6.1 below, there are positive correlations between the banking sector indicator (ratio of banks loan-to-deposit) and the stock market indicators. A possible explanation of this correlation is that the stock market transmits information that is useful to creditors.

Figure 6.1 Correlation matrix of variables used in the analysis.

	Y	MC	VTG	VTM	GC	GE	BL	POL	XM
Y	1.000								
MC	0.402	1.000							
VTG	0.332	0.706	1.000						
VTM	0.234	0.814	0.72	1.000					
GC	0.596	0.494	0.543	0.431	1.000				
GE	-0.577	-0.154	-0.238	-0.323	-0.506	1.000			
BL	-0.150	0.088	0.119	0.215	-0.076	0.045	1.000		
POL	-0.6	-0.221	-0.393	-0.438	-0.489	0.424	0.063	1.000	
XM	-0.177	0.088	-0.124	-0.35	-0.133	0.56	-0.04	0.296	1.000

6.3 Unit Root Test – Results and Discussion

The assumption of stationarity in the data used is essential in the analysis of time series data. The significance of the stationarity of data in time series analysis lies in the fact that conditions of constant covariance, variance and mean need to be satisfied to ensure the accuracy of the estimated models and

parameters. Therefore, it is important to consider whether or not the data are stationary prior to estimating the relationship between the economic growth and its determinants. Phillips and Perron(1986) showed that conducting regressions which employ non-stationary variables may lead to misleading results, showing apparently significant relationships, even where the variables are generated independently.

These cases are known as 'spurious regression' (Patterson 2000) and are frequently encountered while dealing with time series data. A unit root test can be applied to determine whether or not the variables of interest are stationary and this test is also necessary here, as the Granger causality test is based on the assumption that the time series data are stationary. The Augmented Dikey-Fuller (ADF) unit root tests was applied in this study and a summary of the results obtained can be found in tables 6.1 and 6.2 below (full results are attached in the appendix). The Augmented Dickey-Fuller t-statistic (ADF) tests the null hypothesis that the natural logarithm of the variable of interest has a unit root. The tests were conducted using the econometric software Eviews.

Table 6. 1: ADF unit root test result at level

Variables	Augmented Dikey-Fuller (ADF) tests Level	Critical t-statistic value at 1%	Critical t-statistic value at 5%	Meaning
lnY	0.201977	-3.699871	-2.976263	Not stationary
lnMC	-2.662418	-3.699871	-2.976263	Not stationary
lnVTG	-0.913488	-3.699871	-2.976263	Not stationary
lnVTM	-2.437374	-3.699871	-2.976263	Not stationary
lnGC	-1.455468	-3.699871	-2.976263	Not stationary
lnGE	-0.746365	-3.699871	-2.976263	Not stationary
lnBL	-2.793724	-3.699871	-2.976263	Not stationary
POL	-1.423737	-3.699871	-2.976263	Not stationary
lnXM	-2.450764	-3.699871	-2.976263	Not stationary

The conventional hypothesis test and confidence intervals process were followed in investigating the stationarity of the variables of interest by performing unit root tests for all the variables, first at level and then at first difference.

The hypothesis tested in the unit root test is as follows;

Ho; the series does have a unit root

The selection criterion applied is that, when the value of the ADF test statistic is greater than the critical value at the 1%, and 5% levels of statistical significance, the null hypothesis Ho cannot be rejected, thus indicating the presence of a unit root. Hence, the variable is stationary. Alternatively, when the ADF test statistic value is less than the critical value at the 1% and 5% levels, the null hypothesis is rejected, indicating the absence of a unit root and hence the variable is not stationary.

As can be seen in table 6.1, the ADF test statistics for all the variables were less than the critical values at 1% and 5% levels. As such, the null hypothesis is rejected and hence the variables are not stationary. This result was expected, as most time series are non-stationary, owing to the nature of their data generation process. Therefore, it was necessary to conduct the tests using the first difference, in the hope that they would now be stationary. The results from the subsequent Augmented Dickey-Fuller (ADF) tests conducted using the first differences are presented in the table 6.2 below.

Table 6. 2. ADF unit root test result at first difference

Variables	Augmented Dikey-Fuller (ADF) tests first diff	Critical t-statistic value at 1%	Critical t-statistic value at 5%	Meaning
lnY	-4.385611	-3.724070	-2.986225	stationary
lnMC	-7.259693	-3.711457	-2.981038	stationary
lnVTG	-4.777834	-3.711457	-2.981038	stationary
lnVTM	-6.824371	-3.711457	-2.981038	stationary
lnGC	-6.409584	-3.711457	-2.981038	stationary
lnGE	-5.499007	-3.711457	-2.981038	stationary
lnBL	-3.823408	-3.752946	-2.998064	stationary
POL	-4.898979	-3.711457	-2.981038	stationary
lnXM	-6.802617	-3.711457	-2.981038	stationary

From the results of these ADF tests in table 6.2, the null hypothesis of a unit root for each series at first differences could not be rejected. Hence, all of the variables are found to be stationary at their first differences at the 1% level of significance. In other words, the tests indicate that the variables are stationary

at first difference. The results of the ADF test thus indicate that the variables are integrated of order 1 expressed as $I(1)$. Since the data set is found to be stationary at first difference, it was therefore necessary, before estimating the regressions, to transform the variables of interest by taking their first differences operator in order to achieve stationarity. As discussed in the previous chapter, despite the fact that the data are not stationary at level, it is still possible to carry out further analysis. Based on the order of integration of the variable, it is possible to apply the Johansen cointegration methodology.

6.4 Discussion of the Results of the First Research Question - Cointegration Analysis

Having established from the unit root tests that the variables are stationary at their first difference [$I(1)$], the co-integration test was carried out using the Johansen (1992) and Johansen and Juselius (1992) frameworks. Owing to the sensitivity of the co-integration test to lag lengths, VAR lag order selection tests were performed, to choose the optimal lag length for the period under consideration in this study. The order for the VAR using the Akaike Information Criterion reported by Eviews was selected. The results indicated a lag length of 3 which, however, is not practical because of the insufficient number of observations. Given that the models with lag 1 are more parsimonious than those with lag 2, analysis was carried out using a lag length of 1 in this study. The next step in the analysis is to estimate the equation and find the number of co-integration vectors. Three different but similar equations were estimated, using a different measure of stock market development for each equation.

This was done firstly to test the sensitivity of the model to the measure of stock market development used and secondly to avoid issues of multiple collinearity, where variables were highly correlated with each other. In the latter case, the inclusion of more than one of the stock market variables in the same equation would almost certainly lead to problems for the model. The methodology discussed previously was followed and the results are reported in the appendix and discussed for each regression separately. The results obtained for the co-integration estimations for trace statistic and maximum eigenvalue are summarised in Table 6.3a, 6.3b and 6.3c.

Table 6.3 a: Unrestricted Co-integration Rank Test for Model 1

Hypothesis	Trace statistics	Critical value at 5%	Maximum Eigenvalue	Critical value at 5%
R=0	242.9419	125.6154	118.2612	46.23142
R ≤ 1	124.6807	95.75366	42.42014	40.07757
R ≤ 2	82.26054	69.81889	31.47689	33.87687
R ≤ 3	50.78365	47.85613	26.05423	27.58434
R ≤ 4	24.72941	29.79707	16.06296	21.13162
R ≤ 5	8.666454	15.49471	8.666052	14.26460
R ≤ 6	0.000402	3.841466	0.000402	3.841466

Table 6.3 b: Unrestricted Co-integrated Rank Test for model 2

Hypothesis	Trace statistics	Critical value at 5%	Maximum Eigenvalue	Critical value at 5%
R=0	210.9072	125.6154	76.20857	46.23142
R ≤ 1	134.6987	95.75366	41.25396	40.07757
R ≤ 2	93.44471	69.81889	34.41924	33.87687
R ≤ 3	59.02547	47.85613	28.81328	27.58434
R ≤ 4	30.21219	29.79707	21.50314	21.13162
R ≤ 5	8.709049	15.49471	7.310968	14.26460
R ≤ 6	1.398081	3.841466	1.398081	3.841466

Table 6.3 c: Unrestricted Co-integration Rank Test for model 3

Hypothesis	Trace statistics	Critical value at 5%	Maximum Eigenvalue	Critical value at 5%
R=0	212.4326	125.6154	74.04419	46.23142
R ≤ 1	138.3884	95.75366	47.87619	40.07757
R ≤ 2	90.51223	69.81889	30.05488	33.87687
R ≤ 3	60.45735	47.85613	27.50620	27.58434
R ≤ 4	32.95115	29.79707	22.99479	21.13162
R ≤ 5	9.956358	15.49471	9.866464	14.26460
R ≤ 6	0.089894	3.841466	0.089894	3.841466

The result of the co-integration tests as shown in table 6.3a indicates the presence of co-integration vectors. This means that there are dynamic long-run

relationships, involving the indicators of economic growth and the other variables in the analysis. The trace statistic and maximum eigenvalue results from the co-integration estimations shown above in the first model show that there is not enough evidence to accept the null hypothesis of no co-integration at the 5% level of significance. The trace statistics indicate that there are over 4 co-integrating vector equations in the model at the 5% level of significance. The Maximum eigenvalues, however, indicate over 2 co-integrating vector equations at the 5% level. The results for the maximum eigenvalues are chosen as they are known to be more reliable and robust. This result is contrary to the findings of Enisan and Olufisayo (2009) for seven sub-Saharan African countries (including Nigeria), who found no relationship between the stock market and economic growth for Nigeria.

The presence of co-integration suggests that there exists a long-running relationship between these variables and the measure of stock market development used, which is in this case the stock market capitalisation ratio. Also, by extension, this result implies that causality must exist by definition in at least one direction (Engle and Granger 1987) between economic growth and market capitalisation ratio as a measure of stock market development.

For the second model, the results of the co-integration tests are shown in table 6.3b above, also indicating the presence of co-integration vectors. This again means that there are dynamic long-running relationships involving the indicators of economic growth and the other variables in the analysis. The trace statistic and maximum eigenvalue results from the co-integration estimations shown for

the second model again mean that there is not enough evidence to accept the null hypothesis of no co-integration at the 5% level of significance. The trace statistics and the maximum eigenvalues both indicate that there are over 4 co-integrating vector equations in the model at the 5% level of significance. This result is also contrary to the findings from Enisan and Olufisayo's (2009) cross-country analysis that there is no relationship between economic growth and the stock market in Nigeria.

The presence of co-integration suggests that there exists a long-running relationship between these variables and the measure of stock market development used, which in this case is the value of traded stock to GDP ratio. By extension, this result once again implies that causality must exist by definition in at least one direction (Engle and Granger 1987) between economic growth and the value of traded stock to GDP ratio as a measure of stock market development.

For the third model, the results of the co-integration tests shown in the table 6.3c above also indicate the presence of co-integration vectors, suggesting dynamic long-running relationships involving the indicators of economic growth and other variables. The null hypothesis of no co-integration at the 5% level of significance cannot be accepted, with both the trace statistics and maximum eigenvalues indicating over 4 co-integrating vector equations in the model at the 5% level of significance. The findings of Enisan and Olufisayo (2009) that there is no relationship between economic growth and the stock market for Nigeria are once again contradicted.

The presence of co-integration suggests here that there exists a long-running relationship between these variables and the measure of stock market development used, which in this case is the value of traded stock to stock market capitalisation ratio. Also, by extension, this result again implies that causality must exist by definition in at least one direction (Engle and Granger 1987) between economic growth and the value of traded stock to stock market capitalisation ratio as a measure of stock market development. In summary, the results of the Johansen co-integration tests for the three models using the various measures of stock market development all show the presence of a long-running relationship between the stock market and economic growth.

The next step is to formulate the short-run dynamics or an error correction model (ECM). Engle and Granger (1987) showed that, where evidence of co-integration is found in any model, an error correction representation that relates to that same model may be also found, thus indicating that all variations within the dependent variables in the model are as a result of the co-integrating vectors attempting to return to equilibrium and the error correction term (ECT) that captures these variations. In line with this, error correction models are estimated in the next section, in order to derive the short-run dynamics.

6.5 Discussion of the results of the ECM.

The error correction mechanism (ECM) was first used by Sargan (1962) and later popularised by Engle and Granger (1987) to correct for disequilibrium in a co-integrating relationship. The error correction terms within the ECM model

and its effect and interpretation contain significant important information about the equilibrium of the system. They capture the short-run dynamics and serve as a way to reconcile the behaviour of an economic variable in the short run with its performance in the long run. The results of the vector error correction models and the short run parameters as estimated in the present research are presented in tables 6.4a, 6.4b and 6.4c below.

Table 6.4 a: Error Correction Model (MODEL 1)

Dependent Variable: GDP PER CAPITA (LNY)

Variables	Coefficient	Std. Error	t-Statistic
C	0.224533	0.14209	1.58025
D(LNY(-1))	0.003040	0.58994	0.00515
D(lnMC **(-1))**	-0.003462	(0.19333)	-0.01791
D(lnGC **(-1))**	-0.000937	0.17978	-0.00521
D(lnGE **(-1))**	0.027895	0.07151	0.39007
D(lnBL **(-1))**	0.625220	0.76845	0.81361
D(lnXM **(-1))**	-0.000473	0.34218	-0.00138
POL(-1)	-0.407191	0.65765	-0.61916
ECM (-1)	0.102440	0.42922	0.23867

The estimates presented in table 6.4a above reveal that the error correction term (ECT) or the speed of adjustment coefficient for the equation is wrongly signed with positive ECT. This implies that any error generated in each period has a tendency to explode or wander further away from the equilibrium path

over time. The equation also indicates that 10 per cent of the errors generated in the last period are corrected in the current period. However, based on the value of the associated t-statistics, the error term's coefficient is not statistically significant.

Table 6.4 b: The Error Correction Model (MODEL 2)

Dependent Variable GDP PER CAPITA (LNY)

Variables	Coefficient	Std. Error	t-Statistic
C	0.317468	0.11783	2.69423
D(LNY(-1))	-0.366431	0.48791	-0.75102
D(lnVTG**(-1))**	-0.292079	0.19607	-1.48964
D(lnGC **(-1))**	-0.039298	0.17784	-0.22097
D(lnGE **(-1))**	0.001949	0.08001	0.02436
D(lnBL **(-1))**	2.001971	0.87775	2.28080
D(lnXM **(-1))**	0.306909	0.31953	0.96050
POL(-1)	-0.479408	0.61557	-0.77880
ECM (-1)	0.376267	0.41891	0.89821

The error correction estimates presented in table 6.4b above reveal that this error correction term or speed of adjustment coefficient for the equation is also wrongly signed with positive ECT, again implying that any error generated in each period may diverge from the equilibrium path over time. Here, the equation indicates that 37 per cent of the error generated in the last period is corrected in

the current period but, from the value of the t-statistics, the error term coefficient is still not statistically significant.

Table 6.4 c: The Error Correction Model (MODEL 3) Dependent Variable: GDP PER CAPITA (LNY)

Variables	Coefficient	Std. Error	t-Statistic
C	0.172790	0.11586	1.49135
D(LNY(-1))	0.393948	0.41534	0.94851
D(lnVTM**(-1))**	-0.257453	0.15148	-1.69960
D(lnGC **(-1))**	-0.174158	0.16156	-1.07797
D(lnGE **(-1))**	-0.020805	0.07375	-0.28211
D(lnBL **(-1))**	0.957290	0.64764	1.47812
D(lnXM **(-1))**	0.130361	0.29263	0.44548
POL(-1)	0.412620	0.54517	0.75687
ECM (-1)	-0.069467	0.23095	-0.30079

Conversely, the error correction estimates presented in table 6.4c above reveal that the error correction term or speed of adjustment coefficient for the equation is correctly signed with the expected negative sign, meaning that there is a tendency by the model to correct and move towards the equilibrium path following disequilibrium in each period. This implies that meaningful error correction is taking place. This equation, however, accounts for the correction of only 6 per cent of the error generated in the last period and, from the value of the t-statistic, the error term's coefficient is again not statistically significant.

The statistical significance of both the error-correction terms and the lag dynamics terms, as mentioned above, implies that the short-term changes found in the level of each of the indicators of stock market development are somewhat tied to the future changes in real per capita GDP growth. Therefore in each short-term period, economic growth is adjusted by taking into account the previous time period's difference between these indicators of stock market development and per capita real GDP growth.

6.6 Discussion of the Results of the Second Research Question - Granger Causality Test.

The result of the co-integration tests discussed above indicates that causality exists by definition in at least one direction, since the tests discovered the existence of co-integration (Engle and Granger (1987) between the various measures of stock market development and economic growth. Of course, the confirmation of a relationship between stock market development and economic growth is insufficient, on its own, to establish the direction of the causal relationship between stock market development and economic growth. With this in mind, the Granger causality tests were designed to conduct further analysis.

The Granger causality test simply can be used to show that, if the stock market development variables can predict economic growth better than economic growth can predict itself, then stock market development ‘Granger causes’ economic growth or vice versa. The technique can further suggest that, if the

coefficient of economic growth is significant, then economic growth causes stock market development and vice versa.

The technique also suggests that, if the coefficient of financial development is significant and the coefficient of economic growth is not, then there is a unidirectional causality between stock market development and economic growth and vice versa. If both coefficients are insignificant, then no Granger causality is found between the variables. Bidirectional relationships exist where the coefficients for stock market development and economic growth are both significant. A summary of the results of the Granger causality tests is displayed in table 6.5, with SM representing stock market development and Y economic growth. Full results are attached in the appendix.

Table 6.5: Granger Causality Tests

Variables (SM)	SM does not Granger Cause Y			Y does not Granger Cause SM	
	F-statistics	p-values		F- statistics	p-values
MC	5.67575	0.0107		4.75308	0.0198
VTG	2.81870	0.04546		5.88993	0.0093
VTM	4.51105	0.0243		4.44701	0.0245

Table 6.5 contains the results of the Granger causality tests based on the Engle-Granger causality test technique. For the first group of results testing for Granger causality running from the individual measures of stock market

development to per capita real GDP (economic growth), the null hypothesis that stock market development does not Granger cause economic growth can be rejected for all the individual measures of stock market development. Therefore, the presence of Granger causality is indicated from stock market development to economic growth (Y) for all the variables in the Nigerian economy at the 5% level of significance. This result is supported by the findings from other studies on developing countries, which also found Granger causality from the stock market to economic growth, such as Bahadur and Neupane (2006).

The second group of results tested for Granger causality, running from the measures of economic growth (per capita real GDP) to the individual measures of stock market development. Here, the null hypothesis that economic growth does not Granger cause stock market development can again be rejected for all the individual measures of stock market development, thus indicating the presence of Granger causality from economic growth (Y) to stock market development for all the variables in the Nigerian economy at the 5% level of significance.

In summary, the results of the Granger causality test have shown that the direction of causation between the Nigerian stock market and economic growth variable is bi-directional, running from stock market development to economic growth and also from economic growth to stock market development. Consequently, the results indicate the presence of a symbiotic relationship between the stock market and economic growth in Nigeria.

6.7 General Assessment of Empirical Findings

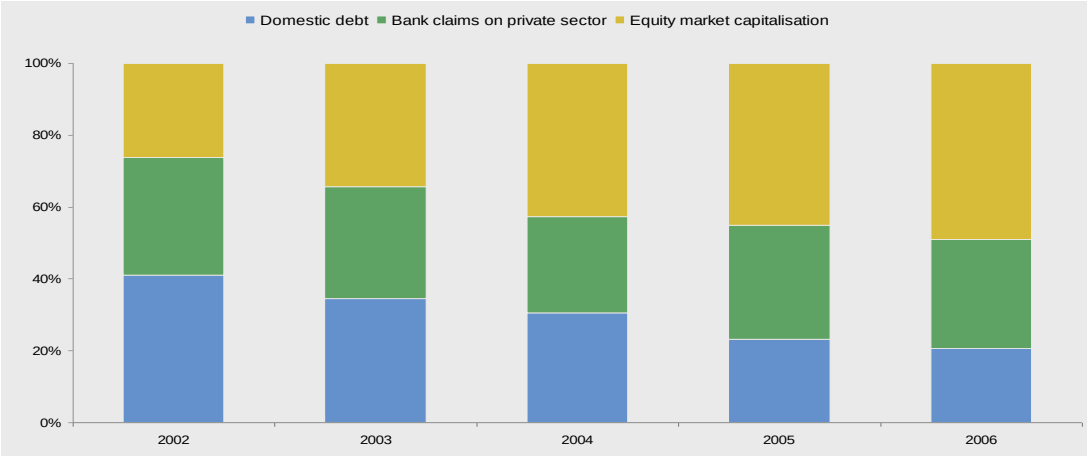
After the above analysis and findings the next question is how relevant to the Nigerian economy are the results of the study in determining this the first point to be considered is the size of the Nigerian stock market in relation to the economy particularly in terms of market capitalisation.

On examination it is found that the size of Nigerian stock market in terms of market capitalisation has historically ranged from between 6% to 28% of the GDP for the period between 1980 and 2007. Thus indicating a reasonable size in relation to the GDP inferring that size wise the Nigerian stock market provides a reasonable sample size for the Nigerian economy.

In addition firms which have generated funds from the Nigerian stock market cut across various sectors of the Nigerian economy thus, highlighting the relevance of the stock market to the growth of the economy. Which is in line with the empirical findings of this study and this has been discussed in some detail earlier in chapter four.

Similarly, independent statistics from both the SEC and the CBN point to the significance of the stock market in capital generation for funding the economy in Nigeria. Looking over the period 2002 to 2007 it can be seen that the share of equity market capitalisation to funding the economy has progressively increased for about 12% to over 40% showing an increasing role for the stock market. This can be seen in figure 6.2 below.

Figure 6.2: Sources of Funding for the Nigerian Economy



Source: The Nigerian Securities and Exchange Commission

Lastly the findings are significant as it highlights the stock market's ability to generate funds for certain firms within the economy which arguably might be big firms. However what this implies is that the stock market reduces competition for fund from other sources thereby making it easier for the smaller firms to generate capital for growth.

6.7 Summary and Conclusion

This chapter has provided a simple theoretical framework that links together endogenous growth theory on the functions of financial markets and institutions, in order to investigate empirically the relationship between stock market development and economic growth in Nigeria. In particular, the following questions were examined: Is there a relationship between the stock market and economic growth in Nigeria? Is the stock market a leading sector in the process of economic growth in Nigeria? Or is causation two-way? The causality issue was investigated using Granger causality techniques and utilising three measures of stock market development that are most commonly used by academics and practitioners. The evidence presented form the Johansen co-

integration tests supports the view that there are both short- and long-run relationships between stock market development and economic growth in Nigeria. These findings are consistent with the theoretical predictions of both the finance growth and endogenous growth literature. Also, the study provides evidence to support the view that the stock market in Nigeria has the potential to support the process of the country's economic growth. In particular, the evidence favours the conclusion that the relationship between economic growth and the stock market is bi-directional. This implies that there is a feedback effect between stock market development and economic growth in Nigeria.

This finding is not consistent with those obtained by Enisan and Olufisayo (2009), who, in a cross-country study with a sample including Nigeria, found the direction of Granger causality to be only from economic growth to the stock market. However, the results are consistent with the views of Patrick (1966), as well as a number of endogenous growth models, such as those of Greenwood and Smith (1997) and Boyd and Smith (1998), which provide evidence in support of a bidirectional causal relationship between financial development and economic growth.

Overall, the findings in this chapter have important policy implications for Nigeria and other developing countries with similar economic structures. The evidence indicates that the stock market and economic growth play an important role in encouraging each other's development. Thus, the development of the stock market would be beneficial for economic growth in the Nigerian economy.

CHAPTER 7: SUMMARY AND CONCLUSION

This chapter provides a summary and conclusion to the study and its main findings. Also, it highlights the main contribution of the thesis, presents some policy implications and proffers some recommendations on ways to improve the contributions of the stock market to economic growth. It then finishes by presenting the limitations of the study and proffers some suggestions on areas for further research into the stock market and economic growth relationship.

7.1 Summary and Conclusion

This thesis investigated the link between the stock market development and economic growth in Nigeria, using time series data. In this study, the endogenous growth theory and the supply-leading and demand-following hypothesis are re-examined. It applied the VAR and vector error correction model (VECM) to evaluate the stock market development and economic growth long-run and causal relationship. In this study, two questions were addressed: What is the relationship between the stock market and economic growth in Nigeria? And if there is a relationship what is the direction of the relationship between the stock market and economic growth in Nigeria? Does the stock market cause economic growth or does economic growth cause the development of the stock market?

To allow for robustness the study utilised three measures of stock market development, market capitalisation ratio (MC), value of stock traded to GDP ratio (VTG) and value of stock traded to market capitalisation (VTM). The study

established the existence of co-integration for all the stock market development measures. Thus, the results obtained for all three measures of stock market development measures used in this research point to the existence of a positive relationship between stock market development and economic growth. The findings from the Granger causality tests suggest the existence of a bi-directional relationship between the stock market and economic growth in Nigeria. The findings in the thesis provide additional evidence in support of the endogenous growth theory that states that there is a positive relationship between the stock market and economic growth.

From the above summary of findings, it can be concluded that in Nigeria the stock market impact on economic growth is positive and statistically significant and that the direction of the causal relationship is a bi-directional between the stock market and economic growth for Nigeria, thus re-confirming the assertions of the endogenous growths theory that a positive relationship exists between stock markets and economic growth.

This thesis investigated the link between the stock market development and economic growth in Nigeria, using time series data. This thesis re-examines the endogenous growth theory particularly the posited positive role of stock on economic growth as well as the direction of the causal relationship. This study utilised three hypothesis in the investigation, It applied the VAR and vector error correction model (VECM) to evaluate the stock market development and economic growth long-run and causal relationship. In this study, two questions were addressed: What is the relationship between the stock market and

economic growth in Nigeria? And if there is a relationship what is the direction of the relationship between the stock market and economic growth in Nigeria? Does the stock market cause economic growth or does economic growth cause the development of the stock market?

To allow for robustness and the study utilised three measures of stock market development, market capitalisation ratio (MC), value of stock traded to GDP ratio (VTG) and value of stock traded to market capitalisation (VTM). On the issue of potential multicolinearity between the dependent variables the study utilised three different models because of the high level of correlation between some of the dependent variables detected.

The study established the existence of co-integration for all the stock market development measures. Thus, the results obtained for all three measures of stock market development measures used in this research point to the existence of a positive relationship between stock market development and economic growth. The findings from the Granger causality tests suggest the existence of a bi-directional relationship between the stock market and economic growth in Nigeria. The findings in the thesis provide additional evidence in support of the endogenous growth theory that states that there is a positive relationship between the stock market and economic growth.

From the above summary of findings, it can be concluded that in Nigeria the stock market impact on economic growth is positive and statistically significant and that the direction of the causal relationship is a bi-directional between the

stock market and economic growth for Nigeria, thus re-confirming the assertions of the endogenous growths theory that a positive relationship exists between stock markets and economic growth.

7.2 Main Contributions of the Study

This thesis makes a contribution by providing time series evidence for a developing country on the stock market economic growth relationship, using a multivariate VAR approach, as opposed to the bivariate VAR models approach used by Bahadur and Neupane (2006) and Osei (2005) and in most of the studies on developing countries. Only a few studies, like that of Enisan and Olufisayo (2009), have utilised the multivariate VAR approach and they utilise only trade openness, financial development and growth variables on seven sub-Saharan African countries. This study departs from their study and other studies by using a higher dimension system (using seven variables, stock market development, banking sector development, government expenditure, trade openness variable, per capita GDP growth rate, gross capital formation and a political stability dummy variable) to improve robustness and avoid simultaneous bias, as highlighted by Gujarati (2004). This approach in this thesis is unique in the study of the stock market development and economic growth relationship in Nigeria. To my knowledge, this is a new approach in the study of the stock market development and economic growth relationship.

Another contribution of this thesis is its use of three different stock market development variables as well as a banking development variable in the examination of the stock market development and economic growth causal

relationship for a single country (Nigeria). Previous studies on Nigeria have used less than three different stock market development variables and have been based on cross-country estimation techniques, like the study of Enisan and Olufisayo (2009), that examine the stock market and economic growth causal relationship for seven African countries, including Nigeria. This study improves on their work by looking at a single country and using three stock market measures instead of the two utilised by Enisan and Olufisayo (2009).

Also, this study addresses the stock and flow variable problems by utilising the technique proposed by Beck and Levine (2004) to deflate the variables where necessary to avoid bias in the results. Similarly, the study uses the change in per capita GDP as a proxy for economic growth as opposed to GDP or per capita GDP, as this is more appropriate, since economic growth is viewed the actual change that occurs from one time period to another in the economy and change in per capita GDP better reflects economic growth.

As was shown in chapter 3, the results obtained for any particular country cannot be generalised readily for another country and, as Stulz (2000) highlights, issues relating to the relationship are country specific. Thus, this study makes a contribution by providing insight into the stock market economic growth relationship for a specific country (Nigeria). The findings from this study can thus be readily utilised as a reference for policy formulation for the Nigerian economy.

7.3 Policy Implications and Recommendations

The empirical findings from this study highlight various policy implications issues relating to the role of the stock market in economic growth in Nigeria. A major policy implication from the results is that there is a positive relationship between stock market development and economic growth. To tap into the growth enhancing capacity of the stock market, it is essential to adopt measures favourable to stock market development. The Nigerian government can do so, by creating an enabling environment that would involve, amongst other things, putting in place key legislation to cover investment, taxation and guarantee property rights, so as to stimulate investments.

In addition, policies to enhance the supply of securities should be encouraged. This could include continued implementation of the privatisation programme, to increase both the quality and quantity of the securities available on the market, consequently improving liquidity. Also, similar policies should be pursued to support the demand of securities; this could include using the stock market as a source of finance for projects and programmes by all levels of governments. This would help increase the volume of transactions on the stock market and also help in its development.

Furthermore, the establishment of specialised financial institutions, like mutual funds and pension funds, should be encouraged by the government, as these institutions can increase the demand for securities and the ability of the stock market to generate capital, hence playing a potential role in increasing depth and liquidity in the stock market. Also, proper regulation of the stock market

through the setting up of regulatory institutions, particularly to guard against the use of insider information and protect minority shareholders rights, as well as covering various conflict of interest issues relating to the market, should be carried out. The cost of raising funds on the Nigerian stock market should also be reviewed, with a view to lowering it, to make it more competitive and attractive as a source of raising financing.

It is arguable that the size of the Nigerian stock market relative to the economy is relatively small particularly when compared to other stock markets internationally but on review it can be seen from chapter four that with the spread of it market capitalisation across various sectors of the economy that as an institution it has contributed to the development of the economy across various sectors.

In conclusion, in order to strengthen the role of the stock market in enhancing economic growth in Nigeria, the government has to implement some, if not all, of the policy recommendations outlined above, through either direct action or legislation.

7.4 Limitations of the Study and Suggestions for Further Research

The study's result may be improved by removing some of the restrictions to it. This study's restrictions include the unavailability of sufficiently long time-series data for variables that are included in the theoretical models. The researcher

could collect annual data for only 30 years, which was sufficient in statistical terms but less than was originally intended.

In addition, the stock market indicators which the researcher used in the empirical analysis were constructed proxies, which might not perfectly replicate the functions of a stock market; however, in practice perfect measures do not exist.

This study uses annual time-series data to examine the stock market economic growth relationship for Nigeria. The following areas are suggested for further research. This study is a single-country study, with the applications of the study limited to the country studied (Nigeria). A further extension of this research could be to conduct a similar study for other countries, particularly other developing countries.

Also, Kar and Pentecost (2000) highlighted in their study that the direction of causality appeared to be sensitive to the proxy measure of financial development used, so a possible extension to this study could be to investigate the other types of financial intermediaries, such as the insurance institution and pension funds on economic growth.

Endogenous growth theory posits that there are multiple channels through which stock markets may impact on economic growth and in this study they were not examined, so further studies could concentrate on the possible channel of influence of stock markets on economic growth in Nigeria.

Further research should advance this study by extending the data sampling period; also, firm level (microeconomic) analysis into the relationship between stock market development and economic growth would be desirable to supplement the findings of this research. Also, this analysis was conducted using annual time-series data but the analysis could be conducted using higher frequency data, possibly quarterly and monthly, to confirm that the findings of this study are not as a result of aggregations and could prove to be quite informative.

Appendix A: Macroeconomic Indicators of Nigerian Economy.

Table A1: Government Recurrent Expenditure

Year	RECURRENT EXPENDITURE				
	Administration	Economic Services	Social Community	Transfer	**TOTAL**
1980	1917.4	468.6	807.7	1611.5	**4805.2**
1981	2175.1	499.4	856	1316.2	**4846.7**
1982	2082.1	345	723.9	1734.7	**4885.7**
1983	2567.9	380	904.4	1426.5	**5278.8**
1984	2677.3	326.9	768	2055.3	**5827.5**
1985	2638.2	315.4	1132.2	3490.4	**7576.2**
1986	2675.7	513.7	862	3645.5	**7696.9**
1987	6046.3	1092.9	469	8038	**15646.2**
1988	5777.8	1221.2	2114.2	10296.2	**19409.4**
1989	6270.5	1419	4230.1	14074.6	**25994.2**
1990	6540.2	1613.7	3396	24669.7	**36219.6**
1991	6953.8	1303.4	2676.9	27309.4	**38243.5**
1992	8854.5	3140.4	1362.3	40715	**54072.2**
1993	18366.1	4656	8807.4	50314.1	**82143.6**
1994	20534.8	3909.9	10085.5	51388.7	**85918.9**
1995	28757.9	5917.9	13820.8	84403.1	**132899.7**
1996	47122.8	5841.1	17687.2	53640.2	**124291.3**
1997	61333.1	7794	21330.6	68105.8	**158563.5**
1998	54673.5	11862.1	22777.6	88784.6	**178097.8**
1999	97224.1	20451.2	37748.3	294238.8	**449662.4**
2000	121299.1	29816.3	58802.4	251690.7	**461608.5**
2001	180810	53011.1	79634.4	265873.6	**579329.1**
2002	331736	65910.9	189431.6	280258	**867336.5**
2003	307848.5	96031.8	102565.9	477821.9	**984268.1**
2004	306842.8	58781.7	134390.7	532726.1	**1032741**
2005	434671.8	64308.5	151646.6	573103.1	**1223730**
2006	522198.2	79687.2	194169.1	594147.5	**1390202**
2007	323028.42	41973.77	196944.89	744294.48	**1306241.5**
2008	369600	196900	332900	739700	**1639100**

Source: CBN Statistical bulletin 2010

Table A2: Government Capital Expenditure

Year	Administration	Economic Services	Social Community	Transfer	**TOTAL**
1980	1501.1	5981.1	2456.7	224.5	**10163.4**
1981	720.1	3629.4	1299	918.5	**6567**
1982	385.4	2542.5	968.3	2521	**6417.2**
1983	1098.2	2290.7	1026.5	470.3	**4885.7**
1984	262.7	656.3	237.6	2943.5	**4100.1**
1985	459.6	892.7	1154	298.4	**5464.7**
1986	264.8	1099.9	655.4	6506.7	**8526.8**
1987	1816.2	2159.7	619.1	1777.5	**6372.5**
1988	1898.6	2128.7	1726	2586.8	**8340.1**
1989	2617.5	3926.3	1844.8	6645.5	**15034.1**
1990	2919.9	3485.7	2096	15547	**24048.6**
1991	3345	3145	1491.7	20359.2	**28340.9**
1992	5118.5	2336.7	2132.6	30175.5	**39763.3**
1993	8081.7	18344.7	3575.3	24500.1	**54501.8**
1994	8785.1	27102.8	4994.4	30036	**70918.3**
1995	13337.8	43149.2	9215.6	55435.7	**121138.3**
1996	14863.6	63581.1	8656.2	71577.4	**158678.3**
1997	49549	169613.1	6902	43587.6	**269651.7**
1998	35270.4	200861.9	23356.6	49.517.7	**309015.6**
1999	42737.2	323580.8	17253.5	114456.1	**498027.6**
2000	53279.5	111508.6	27965.2	46697.6	**239450.9**
2001	49254.9	259757.8	53336	76347.8	**438696.5**
2002	73577.4	21533.4	32467.3	0	**321378.1**
2003	87958.9	97982.1	55736.3	11.3	**241688.6**
2004	137775.8	167721.8	30032.5	15729.8	**351259.9**
2005	171614.1	265034.7	71361.2	11500	**519510**
2006	185224.3	262207.3	78681.3	26272.9	**552385.8**
2007	220900	367900	131100	39423	**759323**
2008	287100	504400	152100	**17300**	**960900**

Source: CBN Statistical bulletin 2010

Table A3: Nigeria's Economic growth Variables as well as Stock Market Development Indicators

Year	GDP millions (N)	GDP per capita (N)	market capitalisation N='M	Total Value (=N='Million)
1980	28545.04	466.3951453	4,464.20	512.1
1981	33144.371	526.7819759	4,976.80	332.1
1982	38508.816	483.0917536	4,025.70	214.8
1983	36297.582	342.3807254	5,768.00	397.9
1984	26431.792	255.9437877	5,514.90	418.2
1985	20307.092	284.4874139	6,670.70	319.6
1986	23213.604	429.7374876	6,794.80	494
1987	36088.065	1017.724794	8,297.60	348
1988	87998.592	1238.54929	10,020.80	137.6
1989	110299.01	1885.935272	12,848.60	521.6
1990	172981.76	2678.936202	16,358.40	265.5
1991	253036.24	2887.40355	23,125.00	136.2
1992	280791.33	4410.252999	31,272.60	313.5
1993	441479.56	3381.994894	47,436.10	402.3
1994	348406.35	3753.44054	66,368.00	569.7
1995	397819.66	7420.518989	180,305.10	1838.8
1996	808910.78	8985.6412	285,815.80	7062.7
1997	1007101.7	6723.134184	281,887.20	11072
1998	774458	6056.246105	262,517.30	13572.4
1999	716744.61	27306.64901	300,041.10	14027.4
2000	3318904.7	37605.06028	472,290.00	28154.6
2001	4692096.2	38091.09456	662,561.30	57637.2
2002	4877145.7	53552.98866	764,975.80	60088.7
2003	7033435.3	64110.55612	1,359,274.20	120703
2004	8633063.4	83727.49989	2,112,549.60	225820.5
2005	11554479	104242.0835	29,000,621.10	262929.6
2006	14735244	130580.1799	5,120,943.30	470253.8
2007	18897564	141613.3379	13,294,584.90	2068543

Source: NSE Fact book 2009

Table A4: Other Variables

Year	Import million N	Exports Millions of N	TOTAL TRADE in millions of N
1980	9095.6	14186.7	23282.3
1981	12839.6	11023.3	23862.9
1982	10770.5	8206.4	18976.9
1983	8903.7	7502.5	16406.2
1984	7178.3	9088	16266.3
1985	7062.6	11720.8	18783.4
1986	5983.6	8920.6	14904.2
1987	17861.7	30360.6	48222.3
1988	21445.7	31192.8	52638.5
1989	30860.2	57971.2	88831.4
1990	45717.9	109886.1	155604
1991	87020.2	121535.4	208555.6
1992	145911.4	207266	353177.4
1993	166100.4	218770.1	384870.5
1994	162788.8	206059.2	368848
1995	755127.7	950661.4	1705789
1996	562626.6	1309543	1872170
1997	845716.3	1241663	2087379
1998	837418.7	751856.7	1589275
1999	862515.7	1188970	2051486
2000	985022.4	1945723	2930746
2001	1358180	1867954	3226134
2002	1512695	1744178	3256873
2003	2080235	3087886	5168122
2004	1987045	4602782	6589827
2005	3792821	6372052	10164874
2006	4296716	5752748	10049464
2007	8126001	5289824	13415825

Source: CBN Statistical bulletin 2010

Appendix B: Unit Root Test Conducted on Eview

Null Hypothesis: LNY has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.052297	0.1374
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNY)

Method: Least Squares

Date: 06/03/10 Time: 05:23

Sample (adjusted): 1981-2007

Included observations: 27 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
LNY(-1)	-0.443414	0.145272	-3.052297	0.0055
C	2.310207	0.735611	3.140528	0.0044
@TREND(1980)	0.116796	0.036637	3.187980	0.0040

R-squared	0.298635	Mean dependent var	0.211697
Adjusted R-squared	0.240187	S.D. dependent var	0.384161
S.E. of regression	0.334862	Akaike info criterion	0.754244
Sum squared resid	2.691185	Schwarz criterion	0.898226
Log likelihood	-7.182294	Hannan-Quinn criter.	0.797057
F-statistic	5.109483	Durbin-Watson stat	1.727383
Prob(F-statistic)	0.014169		

Null Hypothesis: D(LNY) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 1 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-4.394171	0.0096
Test critical values:	1% level	-4.374307	
	5% level	-3.603202	
	10% level	-3.238054	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNY,2)

Method: Least Squares

Date: 06/03/10 Time: 05:24

Sample (adjusted): 1983-2007

Included observations: 25 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
D(LNY(-1))	-1.250560	0.284595	-4.394171	0.0003
D(LNY(-1),2)	0.329709	0.206855	1.593915	0.1259
C	0.148809	0.183099	0.812724	0.4255
@TREND(1980)	0.008820	0.011376	0.775354	0.4468

R-squared	0.526952	Mean dependent var	0.006708
Adjusted R-squared	0.459373	S.D. dependent var	0.537275
S.E. of regression	0.395044	Akaike info criterion	1.126007
Sum squared resid	3.277255	Schwarz criterion	1.321028
Log likelihood	-10.07509	Hannan-Quinn criter.	1.180098
F-statistic	7.797639	Durbin-Watson stat	1.972457
Prob(F-statistic)	0.001100		

Null Hypothesis: D(LNY) has a unit root

Exogenous: None

Lag Length: 0 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.641945	0.0008
Test critical values:	1% level	-2.656915	
	5% level	-1.954414	
	10% level	-1.609329	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNY,2)

Method: Least Squares

Date: 06/03/10 Time: 05:25

Sample (adjusted): 1982-2007

Included observations: 26 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
D(LNY(-1))	-0.692462	0.190135	-3.641945	0.0012

R-squared	0.346634	Mean dependent var	-0.001563
Adjusted R-squared	0.346634	S.D. dependent var	0.528106
S.E. of regression	0.426874	Akaike info criterion	1.173046
Sum squared resid	4.555534	Schwarz criterion	1.221435
Log likelihood	-14.24960	Hannan-Quinn criter.	1.186981
Durbin-Watson stat	1.943215		

Null Hypothesis: LNMC has a unit root

Exogenous: None

Lag Length: 0 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.362359	0.1565
Test critical values:	1% level	-2.653401	
	5% level	-1.953858	
	10% level	-1.609571	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNMC)

Method: Least Squares

Date: 06/03/10 Time: 05:26

Sample (adjusted): 1981-2007

Included observations: 27 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
LNMC(-1)	-0.107143	0.078645	-1.362359	0.1848

R-squared	0.060853	Mean dependent var	0.055693
Adjusted R-squared	0.060853	S.D. dependent var	0.721444
S.E. of regression	0.699148	Akaike info criterion	2.158426
Sum squared resid	12.70902	Schwarz criterion	2.206420
Log likelihood	-28.13875	Hannan-Quinn criter.	2.172697
Durbin-Watson stat	2.605743		

Null Hypothesis: D(LNMC) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.144018	0.0000
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	10% level	-3.233456	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNMC,2)

Method: Least Squares

Date: 06/03/10 Time: 05:27

Sample (adjusted): 1982-2007

Included observations: 26 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
D(LNMC(-1))	-1.392268	0.194886	-7.144018	0.0000
C	-0.045036	0.300965	-0.149638	0.8824
@TREND(1980)	0.008033	0.018441	0.435633	0.6672

R-squared	0.689666	Mean dependent var	0.028689
Adjusted R-squared	0.662680	S.D. dependent var	1.213933
S.E. of regression	0.705043	Akaike info criterion	2.247051
Sum squared resid	11.43297	Schwarz criterion	2.392216
Log likelihood	-26.21167	Hannan-Quinn criter.	2.288853
F-statistic	25.55685	Durbin-Watson stat	2.036955
Prob(F-statistic)	0.000001		

Null Hypothesis: LNVTG has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 3 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.886890	0.6299
Test critical values:	1% level	-4.394309	
	5% level	-3.612199	
	10% level	-3.243079	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNVTG)

Method: Least Squares

Date: 06/03/10 Time: 05:29

Sample (adjusted): 1984-2007

Included observations: 24 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
LNVTG(-1)	-0.285561	0.151339	-1.886890	0.0754
D(LNVTG(-1))	0.137156	0.223534	0.613581	0.5472
D(LNVTG(-2))	0.069936	0.214860	0.325494	0.7486
D(LNVTG(-3))	0.454420	0.211727	2.146253	0.0457
C	-1.871818	0.911864	-2.052739	0.0549
@TREND(1980)	0.034767	0.022327	1.557121	0.1368

R-squared	0.335106	Mean dependent var	0.095880
Adjusted R-squared	0.150413	S.D. dependent var	0.751488
S.E. of regression	0.692669	Akaike info criterion	2.315790
Sum squared resid	8.636234	Schwarz criterion	2.610303
Log likelihood	-21.78948	Hannan-Quinn criter.	2.393924
F-statistic	1.814395	Durbin-Watson stat	1.790367
Prob(F-statistic)	0.160735		

Null Hypothesis: D(LNVTG) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.065362	0.0020
Test critical values:	1% level	-4.356068	
	5% level	-3.595026	
	10% level	-3.233456	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNVTG,2)
Method: Least Squares
Date: 06/03/10 Time: 05:30
Sample (adjusted): 1982-2007
Included observations: 26 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
D(LNVTG(-1))	-1.080344	0.213281	-5.065362	0.0000
C	-0.312476	0.323178	-0.966882	0.3437
@TREND(1980)	0.028015	0.019966	1.403145	0.1739

R-squared	0.527895	Mean dependent var	0.069808
Adjusted R-squared	0.486843	S.D. dependent var	1.037334
S.E. of regression	0.743094	Akaike info criterion	2.352178
Sum squared resid	12.70034	Schwarz criterion	2.497343
Log likelihood	-27.57832	Hannan-Quinn criter.	2.393981
F-statistic	12.85900	Durbin-Watson stat	1.974736
Prob(F-statistic)	0.000178		

Null Hypothesis: LNVTM has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.424491	0.3598
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNVTM)

Method: Least Squares

Date: 06/03/10 Time: 05:32

Sample (adjusted): 1981-2007

Included observations: 27 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
LNVTM(-1)	-0.397696	0.164033	-2.424491	0.0232
C	-1.602380	0.622238	-2.575189	0.0166
@TREND(1980)	0.020711	0.019203	1.078533	0.2915

R-squared	0.229357	Mean dependent var	0.011289
Adjusted R-squared	0.165136	S.D. dependent var	0.850445
S.E. of regression	0.777059	Akaike info criterion	2.437838
Sum squared resid	14.49169	Schwarz criterion	2.581820
Log likelihood	-29.91081	Hannan-Quinn criter.	2.480651
F-statistic	3.571408	Durbin-Watson stat	2.230923
Prob(F-statistic)	0.043877		

Null Hypothesis: D(LNVTM) has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 1 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.054000	0.0022
Test critical values:	1% level	-4.374307	
	5% level	-3.603202	
	10% level	-3.238054	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNVTM,2)

Method: Least Squares

Date: 06/03/10 Time: 05:33

Sample (adjusted): 1983-2007

Included observations: 25 after adjustments

	Coefficient	Std. Error	t-Statistic	Prob.
D(LNVTM(-1))	-2.013636	0.398424	-5.054000	0.0001
D(LNVTM(-1),2)	0.467682	0.251326	1.860856	0.0768
C	-0.406666	0.374128	-1.086971	0.2894
@TREND(1980)	0.027265	0.022422	1.215995	0.2375

R-squared	0.724838	Mean dependent var	0.030038
Adjusted R-squared	0.685529	S.D. dependent var	1.425167
S.E. of regression	0.799201	Akaike info criterion	2.535237
Sum squared resid	13.41316	Schwarz criterion	2.730258
Log likelihood	-27.69047	Hannan-Quinn criter.	2.589328
F-statistic	18.43956	Durbin-Watson stat	1.823080
Prob(F-statistic)	0.000004		

Null Hypothesis: LNGC has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.455468	0.5403
Test critical values:	1% level	-3.699871	
	5% level	-2.976263	
	10% level	-2.627420	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNGC)

Method: Least Squares

Date: 06/03/10 Time: 05:33

Sample (adjusted): 1981-2007

Included observations: 27 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
LNGC(-1)	-0.090060	0.061877	-1.455468	0.1580
C	1.297663	0.703052	1.845757	0.0768

R-squared	0.078116	Mean dependent var	0.288352
Adjusted R-squared	0.041241	S.D. dependent var	0.614136
S.E. of regression	0.601339	Akaike info criterion	1.891872
Sum squared resid	9.040219	Schwarz criterion	1.987860
Log likelihood	-23.54027	Hannan-Quinn criter.	1.920414
F-statistic	2.118387	Durbin-Watson stat	1.356320
Prob(F-statistic)	0.157983		

Null Hypothesis: D(LNGC) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.409584	0.0000
Test critical values:	1% level	-3.711457	
	5% level	-2.981038	
	10% level	-2.629906	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNGC,2)

Method: Least Squares

Date: 06/03/10 Time: 05:35

Sample (adjusted): 1982-2007

Included observations: 26 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
D(LNGC(-1))	-0.941708	0.146922	-6.409584	0.0000
C	0.189912	0.099502	1.908616	0.0683

R-squared	0.631239	Mean dependent var	-0.079219
Adjusted R-squared	0.615874	S.D. dependent var	0.742163
S.E. of regression	0.459977	Akaike info criterion	1.358523
Sum squared resid	5.077890	Schwarz criterion	1.455299
Log likelihood	-15.66079	Hannan-Quinn criter.	1.386391
F-statistic	41.08277	Durbin-Watson stat	2.276640
Prob(F-statistic)	0.000001		

Null Hypothesis: LNGE has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-1.960409	0.5957
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNGE)

Method: Least Squares

Date: 06/03/10 Time: 05:37

Sample (adjusted): 1981-2007

Included observations: 27 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
LNGE(-1)	-0.264715	0.135031	-1.960409	0.0617
C	0.565657	0.689054	0.820917	0.4198
@TREND(1980)	-0.115979	0.059756	-1.940872	0.0641

R-squared	0.154504	Mean dependent var	-0.307585
Adjusted R-squared	0.084046	S.D. dependent var	1.712177
S.E. of regression	1.638647	Akaike info criterion	3.930059
Sum squared resid	64.44397	Schwarz criterion	4.074040
Log likelihood	-50.05579	Hannan-Quinn criter.	3.972872
F-statistic	2.192851	Durbin-Watson stat	2.022824
Prob(F-statistic)	0.133456		

Null Hypothesis: D(LNGE) has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-5.499007	0.0001
Test critical values:	1% level	-3.711457	
	5% level	-2.981038	
	10% level	-2.629906	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNGE,2)

Method: Least Squares

Date: 06/03/10 Time: 05:37

Sample (adjusted): 1982-2007

Included observations: 26 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
D(LNGE(-1))	-1.115530	0.202860	-5.499007	0.0000
C	-0.340081	0.353104	-0.963118	0.3451

R-squared	0.557515	Mean dependent var	0.015636
Adjusted R-squared	0.539078	S.D. dependent var	2.607133
S.E. of regression	1.770016	Akaike info criterion	4.053657
Sum squared resid	75.19093	Schwarz criterion	4.150434
Log likelihood	-50.69754	Hannan-Quinn criter.	4.081525
F-statistic	30.23908	Durbin-Watson stat	2.019028
Prob(F-statistic)	0.000012		

Null Hypothesis: LNBL has a unit root

Exogenous: Constant, Linear Trend

Lag Length: 0 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.010750	0.1477
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNBL)

Method: Least Squares

Date: 06/03/10 Time: 05:39

Sample (adjusted): 1981-2007

Included observations: 27 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
LNBL(-1)	-0.556145	0.184720	-3.010750	0.0060
C	2.402314	0.800399	3.001395	0.0062
@TREND(1980)	-0.004117	0.003754	-1.096774	0.2836

R-squared	0.274292	Mean dependent var	0.002209
Adjusted R-squared	0.213816	S.D. dependent var	0.157860
S.E. of regression	0.139970	Akaike info criterion	-0.990345
Sum squared resid	0.470195	Schwarz criterion	-0.846363
Log likelihood	16.36965	Hannan-Quinn criter.	-0.947531
F-statistic	4.535578	Durbin-Watson stat	1.769229
Prob(F-statistic)	0.021337		

Null Hypothesis: D(LNBL) has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-3.823408	0.0085
Test critical values:	1% level	-3.752946	
	5% level	-2.998064	
	10% level	-2.638752	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNBL,2)
Method: Least Squares
Date: 06/03/10 Time: 05:40
Sample (adjusted): 1985-2007
Included observations: 23 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
D(LNBL(-1))	-1.944699	0.508630	-3.823408	0.0012
D(LNBL(-1),2)	0.811441	0.427785	1.896843	0.0740
D(LNBL(-2),2)	0.429472	0.312841	1.372810	0.1867
D(LNBL(-3),2)	0.456431	0.206849	2.206589	0.0406
C	-0.012183	0.032622	-0.373449	0.7132

R-squared	0.691940	Mean dependent var	0.004982
Adjusted R-squared	0.623482	S.D. dependent var	0.253457
S.E. of regression	0.155524	Akaike info criterion	-0.694378
Sum squared resid	0.435377	Schwarz criterion	-0.447531
Log likelihood	12.98535	Hannan-Quinn criter.	-0.632297
F-statistic	10.10755	Durbin-Watson stat	2.170682
Prob(F-statistic)	0.000181		

Null Hypothesis: LNXM has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.450764	0.1382
Test critical values:	1% level	-3.699871	
	5% level	-2.976263	
	10% level	-2.627420	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation

Dependent Variable: D(LNXM)

Method: Least Squares

Date: 06/03/10 Time: 05:42

Sample (adjusted): 1981-2007

Included observations: 27 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
LNXM(-1)	-0.391625	0.159797	-2.450764	0.0216
C	-0.017162	0.086241	-0.199004	0.8439

R-squared	0.193711	Mean dependent var	-0.005141
Adjusted R-squared	0.161459	S.D. dependent var	0.488572
S.E. of regression	0.447394	Akaike info criterion	1.300433
Sum squared resid	5.004038	Schwarz criterion	1.396421
Log likelihood	-15.55585	Hannan-Quinn criter.	1.328976
F-statistic	6.006242	Durbin-Watson stat	2.172860
Prob(F-statistic)	0.021594		

Null Hypothesis: LNXM has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 0 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-2.401200	0.3707
Test critical values:	1% level	-4.339330	
	5% level	-3.587527	
	10% level	-3.229230	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNXM)
Method: Least Squares
Date: 06/03/10 Time: 05:42
Sample (adjusted): 1981-2007
Included observations: 27 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
LNXM(-1)	-0.406121	0.169133	-2.401200	0.0244
C	-0.069224	0.187113	-0.369956	0.7147
@TREND(1980)	0.003687	0.011700	0.315114	0.7554

R-squared	0.197033	Mean dependent var	-0.005141
Adjusted R-squared	0.130119	S.D. dependent var	0.488572
S.E. of regression	0.455678	Akaike info criterion	1.370379
Sum squared resid	4.983420	Schwarz criterion	1.514361
Log likelihood	-15.50011	Hannan-Quinn criter.	1.413192
F-statistic	2.944572	Durbin-Watson stat	2.148679
Prob(F-statistic)	0.071841		

Null Hypothesis: D(LNXM) has a unit root
Exogenous: Constant
Lag Length: 0 (Automatic based on SIC, MAXLAG=6)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-6.802617	0.0000
Test critical values:	1% level	-3.711457	
	5% level	-2.981038	
	10% level	-2.629906	

*MacKinnon (1996) one-sided p-values.

Augmented Dickey-Fuller Test Equation
Dependent Variable: D(LNXM,2)
Method: Least Squares
Date: 06/03/10 Time: 05:43
Sample (adjusted): 1982-2007
Included observations: 26 after adjustments

Coefficient		Std. Error	t-Statistic	Prob.
D(LNXM(-1))	-1.315948	0.193447	-6.802617	0.0000
C	-0.002715	0.094506	-0.028726	0.9773

R-squared	0.658487	Mean dependent var	0.006342
Adjusted R-squared	0.644258	S.D. dependent var	0.807859
S.E. of regression	0.481840	Akaike info criterion	1.451395
Sum squared resid	5.572082	Schwarz criterion	1.548172
Log likelihood	-16.86814	Hannan-Quinn criter.	1.479264
F-statistic	46.27560	Durbin-Watson stat	2.087176
Prob(F-statistic)	0.000000		

Appendix C: Cointegration and Error Correction.

Model 1 lnY = f (lnMC, lnGE, POL, lnXM, lnBL, lnGC)

Date: 06/03/10 Time: 05:50
Sample (adjusted): 1982-2007
Included observations: 26 after adjustments
Trend assumption: Linear deterministic trend
Series: LNY LNMC LNGE POL LNXM LNBL LNGC
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.989417	242.9419	125.6154	0.0000
At most 1 *	0.804373	124.6807	95.75366	0.0001
At most 2 *	0.701996	82.26054	69.81889	0.0037
At most 3 *	0.632887	50.78365	47.85613	0.0259
At most 4	0.460874	24.72941	29.79707	0.1713
At most 5	0.283452	8.666454	15.49471	0.3971
At most 6	1.55E-05	0.000402	3.841466	0.9859

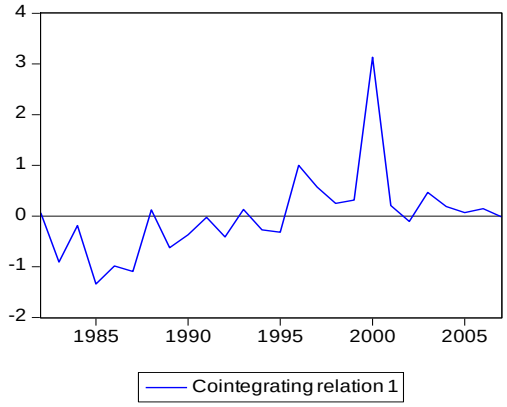
Trace test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

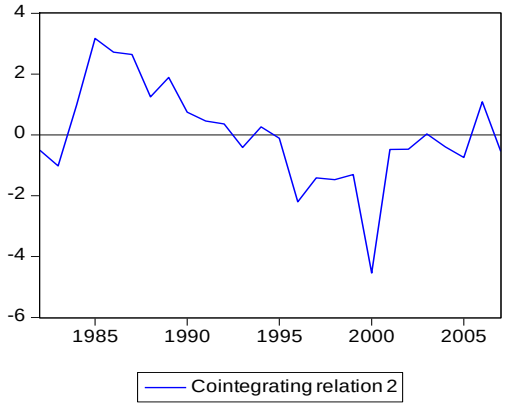
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.989417	118.2612	46.23142	0.0000
At most 1 *	0.804373	42.42014	40.07757	0.0267
At most 2	0.701996	31.47689	33.87687	0.0942
At most 3	0.632887	26.05423	27.58434	0.0774
At most 4	0.460874	16.06296	21.13162	0.2212
At most 5	0.283452	8.666052	14.26460	0.3150
At most 6	1.55E-05	0.000402	3.841466	0.9859

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

Cointegration graph for Model 1.





Model 2 Y = f (VTG, GE, POL, XM, BL, GC)

Date: 06/03/10 Time: 06:01
Sample (adjusted): 1982-2007
Included observations: 26 after adjustments
Trend assumption: Linear deterministic trend
Series: LNY LNGE POL LNXM LNBL LNGC LNVTG
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.946662	210.9072	125.6154	0.0000
At most 1 *	0.795398	134.6987	95.75366	0.0000
At most 2 *	0.733882	93.44471	69.81889	0.0002
At most 3 *	0.669848	59.02547	47.85613	0.0032
At most 4 *	0.562660	30.21219	29.79707	0.0448
At most 5	0.245116	8.709049	15.49471	0.3930
At most 6	0.052352	1.398081	3.841466	0.2370

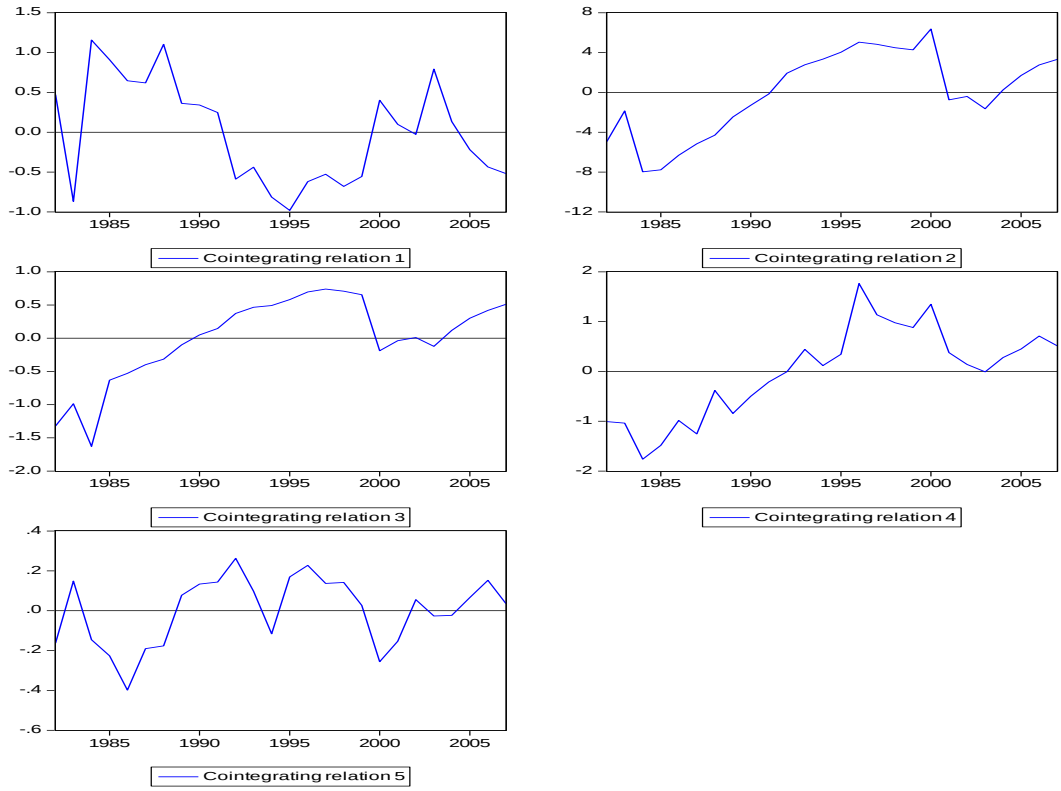
Trace test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

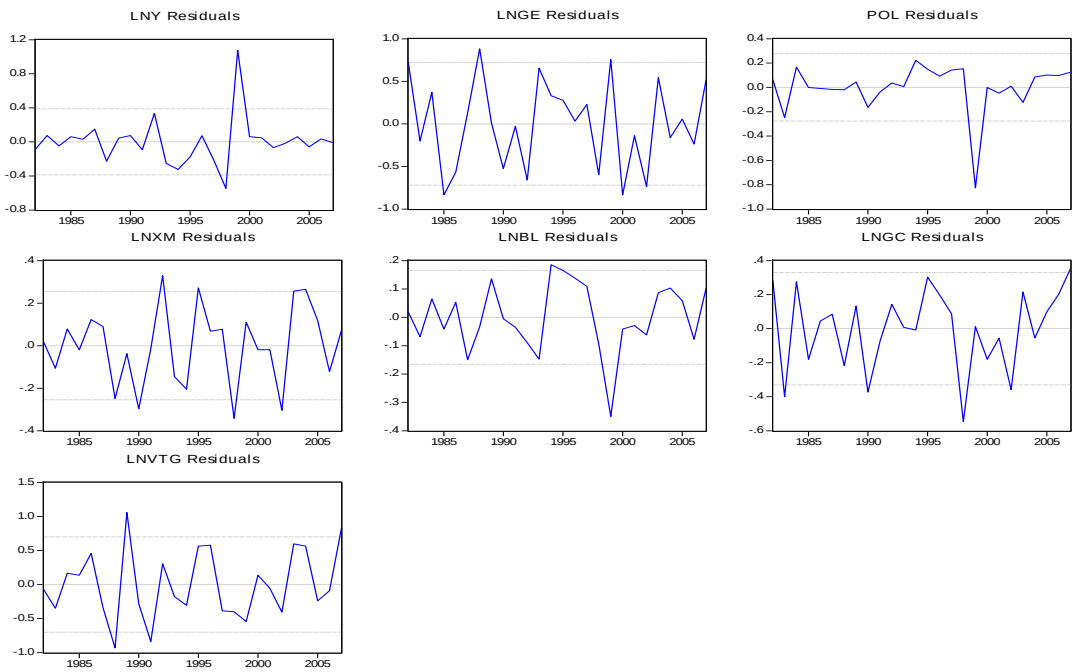
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.946662	76.20857	46.23142	0.0000
At most 1 *	0.795398	41.25396	40.07757	0.0367
At most 2 *	0.733882	34.41924	33.87687	0.0431
At most 3 *	0.669848	28.81328	27.58434	0.0346
At most 4 *	0.562660	21.50314	21.13162	0.0443
At most 5	0.245116	7.310968	14.26460	0.4530
At most 6	0.052352	1.398081	3.841466	0.2370

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

Cointegration graph for Model 2



Error Correction Residual graphs for Model 2.



Model 3 Y = f (VTM, GE, POL, XM, BL, GC)

Date: 06/03/10 Time: 06:10
Sample (adjusted): 1982-2007
Included observations: 26 after adjustments
Trend assumption: Linear deterministic trend
Series: LNY LNGE POL LNXM LNBL LNGC LNVTM
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.942031	212.4326	125.6154	0.0000
At most 1 *	0.841404	138.3884	95.75366	0.0000
At most 2 *	0.685244	90.51223	69.81889	0.0005
At most 3 *	0.652827	60.45735	47.85613	0.0021
At most 4 *	0.587044	32.95115	29.79707	0.0210
At most 5	0.315782	9.956358	15.49471	0.2841
At most 6	0.003451	0.089894	3.841466	0.7643

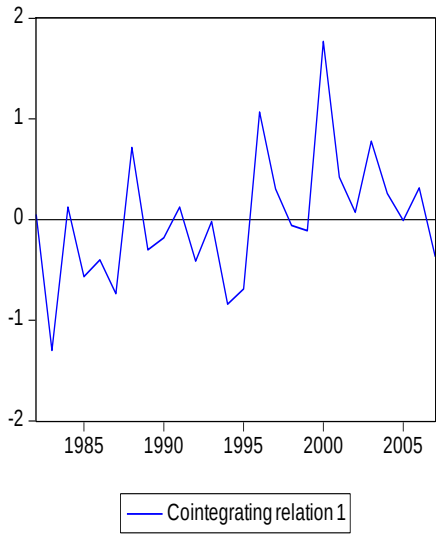
Trace test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

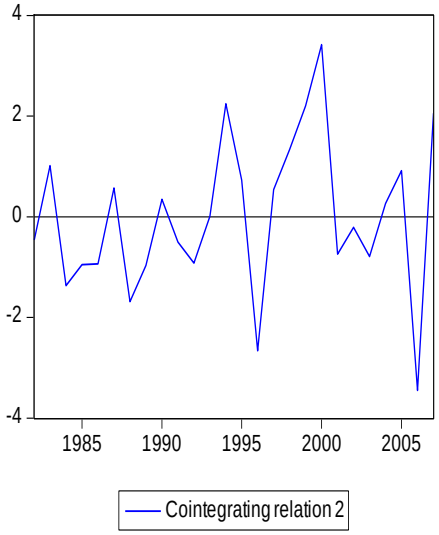
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.942031	74.04419	46.23142	0.0000
At most 1 *	0.841404	47.87619	40.07757	0.0055
At most 2	0.685244	30.05488	33.87687	0.1337
At most 3	0.652827	27.50620	27.58434	0.0512
At most 4 *	0.587044	22.99479	21.13162	0.0270
At most 5	0.315782	9.866464	14.26460	0.2208
At most 6	0.003451	0.089894	3.841466	0.7643

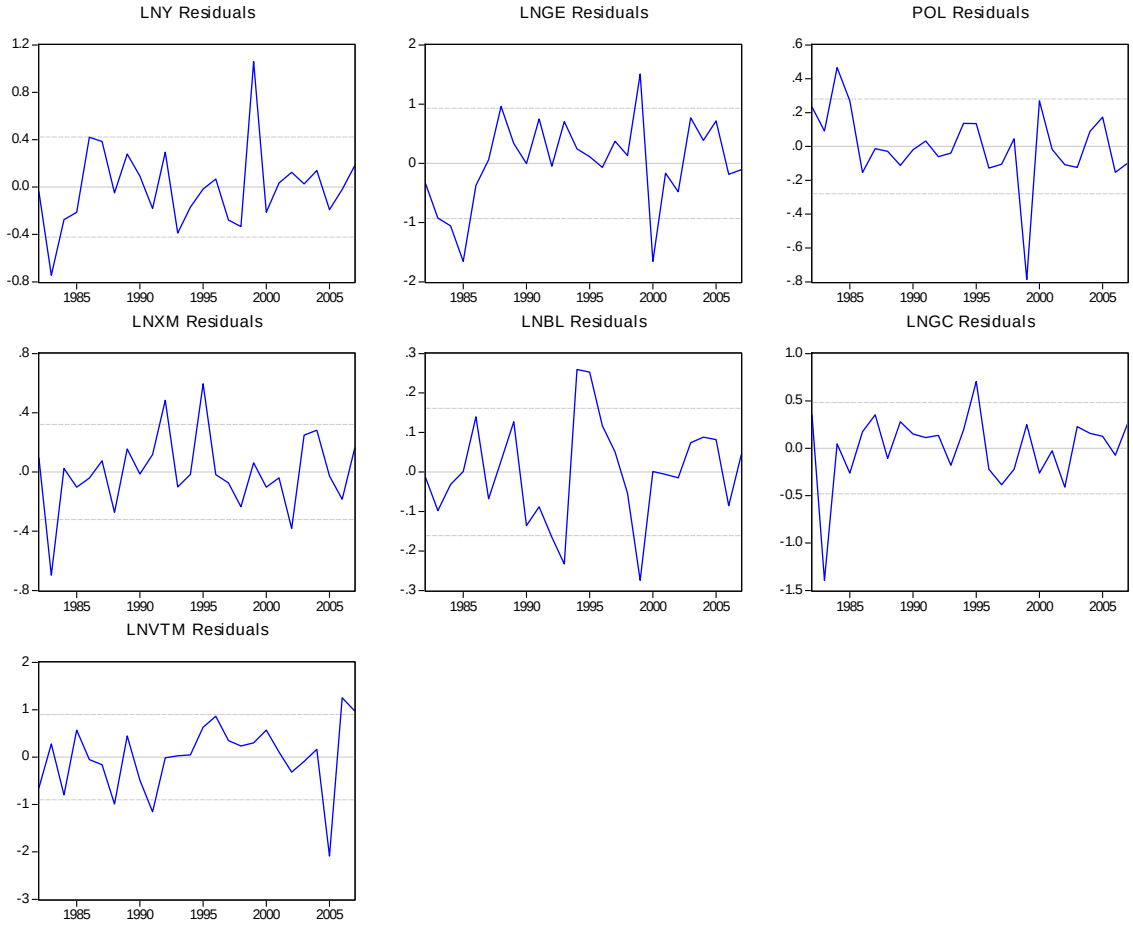
Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Cointegration graph for Model 3





Error Correction Residual graphs for Model 3.



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