

**STOCK MARKET DEVELOPMENT AND ECONOMIC GROWTH  
NEXUS: EMPIRICAL EVIDENCE FROM KENYA**

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## DECLARATION

This paper is my original work and that no one has ever presented it for degree award in any other university.

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This research paper is dedicated to my loving family for its unwavering love and support.

## TABLE OF CONTENTS

<b>DECLARATION</b> .....	<b>ii</b>
<b>ACKNOWLEDGMENT</b> .....	<b>iii</b>
<b>DEDICATION</b> .....	<b>iv</b>
<b>LIST OF TABLES</b> .....	<b>vii</b>
<b>LIST OF ABBREVIATION/ACRONYMS</b> .....	<b>ix</b>
<b>ABSTRACT</b> .....	<b>x</b>
<b>CHAPTER ONE: INTRODUCTION</b> .....	<b>1</b>
1.1. Background to the Study .....	1
1.1.1 Stock Market Development .....	2
1.1.2 Economic Growth.....	3
1.1.3 Stock Market Development and Economic Growth.....	4
1.1.4 Stock Market Development and Economic Growth in Kenya .....	4
1.2 Research Problem.....	5
1.3 Research Objective .....	6
1.4 Value of the Study.....	7
<b>CHAPTER TWO: LITERATURE REVIEW</b> .....	<b>8</b>
2.1 Introduction .....	8
2.2 Theoretical Literature .....	8
2.2.1 Exogenous Growth Theory.....	8
2.2.2 Finance-Led Theory .....	9
2.2.3 Supply Lending Model .....	10
2.3 Determinants of Economic Growth .....	10
2.3.1 Stock Market Development .....	10
2.3.2 Capital.....	11
2.3.3 Human Capital .....	12
2.3.4 Foreign Direct Investment .....	12
2.3.5 Innovation, Research and Development .....	13
2.3.6 Macroeconomic Policies.....	14
2.4 Empirical Review .....	14
2.5 Conceptual Framework .....	17

2.6 Summary of Literature Review .....	19
<b>CHAPTER THREE: RESEARCH METHODOLOGY .....</b>	<b>20</b>
3.1 Introduction .....	20
3.2 Research Design .....	20
3.3 Data collection.....	20
3.4 Data Analysis .....	20
3.4.1 Variables.....	22
<b>CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION .....</b>	<b>23</b>
4.1 Introduction .....	23
4.2 Descriptive Statistics.....	23
4.3 Estimation of the Model.....	27
4.3.1 Unit root test.....	27
4.3.2 Cointegration test.....	29
4.3.3 Test for multicollinearity.....	30
4.3.4 Vector Autoregressive Model.....	30
4.3.5 Granger Causality Test.....	32
4.3.6 Discussion of results.....	33
<b>CHAPTER FIVE: SUMMARY, CONCLUSSION AND RECOMMENDATION .....</b>	<b>37</b>
5.1 Introduction .....	37
5.2 Summary .....	37
5.3 Conclusion.....	39
5.4 Recommendation.....	41
5.5 Limitations of the Study.....	42
5.6 Suggestion for Further Studies.....	43
<b>REFERENCES.....</b>	<b>44</b>
<b>APPENDIX I: VAR Regression.....</b>	<b>50</b>
<b>APPENDIX II: Granger Causality Test .....</b>	<b>52</b>

## **LIST OF TABLES**

Table 3.1: Description of Variables .....	22
Table 4.1: Variable Means, S.D, Min, and Max values (Billion Kshs) .....	26
Table 4.2: Unit root results .....	28
Table 4.3: Co-integration results.....	29
Table 4.4: Variable Inflation Factors (VIF) .....	30
Table 4.5: VAR Results .....	31
Table 4.6: Causality Test Results.....	33

## **LIST OF FIGURES**

Figure 2.1: Conceptual framework .....	18
Figure 4.1: Kenya's Gross Domestic Product Growth Rate for some selected years.....	24
Figure 4.2: NSE Market Capitalization over the years .....	25
Figure 4.3: NSE Volume of Transactions.....	26



## **LIST OF ABBREVIATION/ACRONYMS**

<b>ADF</b>	-	Augmented Dicky Fuller
<b>CBK</b>	-	Central Bank of Kenya
<b>CMA</b>	-	Capital Markets Authority
<b>ER</b>	-	Exchange Rate
<b>FDI</b>	-	Foreign Direct Investment
<b>GDP</b>	-	Gross Domestic Product
<b>INF</b>	-	Inflation
<b>KNBS</b>	-	Kenya National Bureau of Statistics
<b>MCR</b>	-	Market Capitalization Ratio
<b>NSE</b>	-	Nairobi Securities Exchange
<b>R&amp;D</b>	-	Research and Development
<b>RGDP</b>	-	Real Gross Domestic Product
<b>SMLR</b>	-	Stock Market Liquidity Ratio
<b>STR</b>	-	Stock Turnover Ratio
<b>UNCTAD</b>	-	United Nation Conference on Trade and Development
<b>VAR</b>	-	Vector Autoregressive
<b>VECM</b>	-	Vector Error Correction Model

## **ABSTRACT**

Studies reveal that stock market development is a very critical component of economic growth in both developing and developed economies across the world. This is because, these markets provide a platform for resource allocation. Various studies have been conducted on the relationship between stock market development and economic growth. However, literature remains inconclusive on the causality relationship between stock market development and economic growth. In addition, most of the studies have focused on the relationship between stock market development and economic growth and not causality link. The study had sought to answer a research question, what is the causality link between stock market development and the Kenya's gross domestic product. The objective for this study was; to investigate this link by applying time series methods on Kenyan data collected half annually for a period of 24 years (1993-2015). To achieve this, Vector Autoregressive Model granger causality technic was employed. First, the study performed stationarity test using Augmented Dicky Fuller to make sure that all variables were stationary before running the model. In addition, co-integration test was performed to predict whether there was either short-run or long-run relationship among the variables, a test which confirm the absence of co-integration, i.e. to existent of short-term causality relationship. Both descriptive and regression results were generated. Descriptive results were presented in tables and graphs. Results established a bidirectional causality relationship between economic growth and market capitalization, economic growth and stock turnover ratio, and economic growth and the transaction volume at the Nairobi Securities Exchange. This implies that collectively, all the measures of the stock market development, have a bidirectional link with the growth in the gross domestic product. In addition, findings reveal that there is a causality relationship between stock market development and control variables (Foreign Direct Investment, and Inflation). The study recommended the need by the government and development agencies to formulate and implement policies to promote stock market development and economic growth. In addition, the study recommended for the government and other development agencies to create conducive climate for investment, and stable macroeconomic factors to enhance economic growth.

# CHAPTER ONE: INTRODUCTION

## 1.1. Background to the Study

Resulting from seminal work undertaken by Schumpeter (1911) and subsequent works by Mckinnon and Shaw (1973), many researchers have studied nexus between stock market and the level of economic activities in different countries across the world. These studies have generated a lot of debate not just among the academicians, but policy makers as well. Even though the debate has been there for many decades, we do not have concrete agreement up to now on this relationship. Evidence indicate that among the key determinants of the economic growth and development, is the stock market because of its vital role for mobilization of idle finances and converting them into investment capital. On the other hand, the growth in an economy can generate surplus which in turn enhances the growth of financial sector.

Literature has discussed at length the linkage between economic growth and financial development over the last decades. Two schools of thoughts have emerged from this debate. The first school thought advanced arguments for the existence of positive correlation that between the two variables. Those who support this school argued that a well-functioning and developed market for stocks improves economic growth (Omoruyi & Izekor, 2015). The second school of thought proponents contradicted the assertion of the proponents of the first school stating that, the alleged positive link between stock market and economic progress was not only unclear but also unproven (ParamatI, 2011; Lei & Mishra, 2016). There are various ways of measuring developments in the stock market These includes: market capitalization to GDP, liquidity value, monthly stock market volatility and domestic market turnover.

### **1.1.1 Stock Market Development**

Stock market development entails the expansion of the market for stocks which brings about long-run increase in volume of investment (Sililo, 2010). Various factors determine stock market development. The factors are: market capitalization, volatility, liquidity of the stock market, international integration, market regulatory framework among others. Stock market development can also be understood as the ability of the stock market to list many firms and to increase the volume of active trading (Applegarth, 2004). The market stock development is therefore the capacity of the market to mobilize savings from many companies which may include equity markets, money and bond markets, allocate them effectively and provide available investment sources to those who invest. The market for stocks provides an opportunity for an individual or a company to diversify their financial sources as well as to diversify their financial securities.

Capitalization on the stock market refers is the summation of the market value of the outstanding shares of all companies trading in that market. This is among the key measure of the stock market growth. Liquidity in the stock market refers to how easy an economic agent can buy or sell their assets in the market for securities. Low costs of transaction in the stock markets are an indication of high stock turnover or liquidity. A major challenge of measure of liquidity is that it does not measure uncertainties and costs associated with buying and selling of securities at the going price. An increase in price will increase the value of traded securities and hence boosting the market value of transacted shares to GDP. This implies that liquidity may increase even with the falling number of transactions. Levine and Zervos (2003) argued that market capitalization to GDP ratio should be added to a regression to try and overcome the price effect.

Stock turnover is yet another measure of stock market development, which is computed as a percentage of transacted shares to capitalization of the market. In contrast to the market

capitalization to GDP ratio, this indicator (stock turnover) measures transactions relative to the market size (Levine and Zervos, 2003). Therefore, this indicator is instrumental in determining active and highly potential stock markets.

### **1.1.2 Economic Growth**

Economic growth can be explained as an increase in the level of goods and services in monetary terms for a country, annually. Gross Domestic product (GDP) is the commonly used measure of economic growth (Quah, 2003). GDP can be determined in three ways namely expenditure, income or the product approach. GDP is regarded as the widest indicator of economic growth despite it not considering the inflation factor. GDP growth rate of a country is believed to be influenced by various factors including interest rates, exchange rates, inflation, unemployment, the level of financial development among other macroeconomic and regulatory factors.

In East Africa, Kenya is the most developed with Agriculture accounting for 22% of the GDP followed by the manufacturing sector at 11% (Deloitte, 2016). The GDP growth rate of Kenya has been fluctuating year-in-year-out for the last decade with maximum of 7% in the year 2007. For the last 10 years, the lowest ever recorded GDP growth rate was at 1.5% in the year 2008. This was largely attributed to the post-election violence which rocked the country after the 2007 disputed presidential results coupled with the World's financial crisis of 2008 (Deloitte, 2016).

There has been a general agreement that in developing economies, the link between stock markets and GDP is still unclear to a level that stock markets in these countries are called mere casinos. The reason behind this thinking is that stock markets in developing countries encounter many challenges like low transactions, liquidity problems as well as insufficient investor base (Owiti, 2013). Kenyan Stock market has an impact to the level of economic activities because market capitalization to GDP ratio tends to correlate with GDP.

### **1.1.3 Stock Market Development and Economic Growth**

The relationship between the stock market and economic growth has generated high level debate globally. Stock market has been theorized to hasten the pace of economic growth by enhancing the levels of domestic savings, providing various investment opportunities and improving the quality of investment activities in an economy. Economies that have advanced-stock markets are likely to experience low risk of credit crunch since they do not rely so much on financing by banks (Ngugi et al, 2009). Stock markets can thus have a positive influence on the economic growth by acting as conduits for firm financing as well as savings among individuals.

Efficient stock markets are expected to enhance corporate control through provision of financial discipline among the investors. The rationale behind this reasoning is that if a company that is listed on the stock market performs poorly and hence does not maximize on its value, another firm may take over it and reap its gains (Quah, 2003). In addition, well established sock markets can also reduce information costs by generating and disseminating of firm specific information which is revealed by efficient stock prices. Low costs of information in the stock market leads to easy access to information regarding investment opportunities and hence efficient allocation of resource. Furthermore, since stock prices are determined in exchanges, this may help potential investors to make rational decisions for better investment and thus, higher economic growth rates. Studies have shown that large security markets reduce the costs of marshalling savings, which facilitates investment in more efficient technologies (Adu et al., 2013). Others also argue that the capacity to transact more easily (market liquidity), is key to economic growth (Quah, 2003).

### **1.1.4 Stock Market Development and Economic Growth in Kenya**

Stock market transactions in Kenya commenced in 1920 (Ngugi et al, 2009). At this time, the stock market was very informal as there was no regulatory framework to govern the market.

Trading in stocks was simply based on the gentleman's agreement where a standard commission was charged, and clients were under obligation to their contracts for making perfect deliveries and settling relevant charges. The first professional stock broker company was started in 1951 by an Estate agent in the name of Francis Drummond (Ngugi et al, 2009). This was followed by establishment of other stockbrokerage companies. The Nairobi Securities Exchange which was then known as Nairobi Stock Exchange was established in 1954 when its transactions took place over a cup of tea at Stanley Hotel in Nairobi (Nyasha & Odhiambo, 2017). The NSE at this time was merely an association of individuals working as volunteer stockbrokers. This was registered under the society's Act Laws of Kenya. The association was then converted into a company limited by guarantee and without share capital in 1991. Since then, NSE has seen tremendous growth including an increase in the number of stockbrokers, introduction of investment banks, custodian institutions, credit firms, and an increase in the number of companies listed on the market. Among the securities traded on NSE include equities, bonds, and preference shares.

NSE market has undergone various reforms over the last two decades to make it more efficient. For instance, the government in 1998 extended the scope for foreign investors through introduction of incentives including tax free ventures. In addition, the trading hours were increased from 2 to 3 hours (10am-1pm) to 5 hours (10am-3pm) (Nyasha & Odhiambo, 2017).

## **1.2 Research Problem**

Studies have argued that the stock market is a very critical determinant of economic growth across the globe. This is due to its role of allocating investment capital as well as provision of a platform for acquiring best practices for running firms which results in expansion of investment. Most studies in this area have focused on financial intermediaries (bank-based) and GDP, and hence little focus on stock market development (Adu et al., 2013).

However, even from the available empirical evidence, it is not yet clear on the direction of linkage between stock market and GDP, whether unidirectional, bidirectional or no causality link especially in the emerging economies. While other studies indicate a positive link (Ngugi et al, 2009; Owiti, 2013; Nyamakanga, 2013); others have observed no relationship between stock market development and GDP (Sililo, 2010). In addition, no agreement has been reached on the causality direction. For example, (Nyamakanga, 2013) found a unidirectional link, (Ngugi et al, 2009; Owiti, 2013; Murayi, 2013) observed bidirectional.

Furthermore, studies in Kenya have also established varied results. For instance, Ndung'u (2009) using simple regression equation, observed a positive link between stock market and GDP. Similar findings were observed by Levine and Zervos (2003). Olweny and Kimani (2011) employed Vector Autoregressive Model. The study concluded that movement in stock prices reflected macroeconomic conditions of Kenya which could be used to determine future GDP trends. Moreover, while Owiti, (2013) in the most recent study reported bidirectional link between stock market development, Kimani & Olweny, 2011 and Nyamakanga, 2013 argued for unidirectional link. Besides the notion that stock markets may not affect economic growth are theoretical thoughts as other studies show that stock markets may adversely affect economic growth. For example, Quah (2003) indicated that these markets can hurt economy. The assertion is that liquidity in the stock market may harm growth since savings may decline because of externalities in capital accumulation. Based on this background, the research question for the study was, "What is the causal link between stock market development and Kenya's economic growth?"

### **1.3 Research Objective**

To investigate the causal link between stock market development and economic growth in Kenya.



#### **1.4 Value of the Study**

The study investigated causality relationship existing between stock market development and GDP in Kenya. This study therefore hoped to contribute to both empirical and theoretical nature of the two variables. This is particularly imperative due limited literature in this are in the Kenyan case.

In addition, better understanding of how stock market and GDP are linked provides valuable information in formulating effective strategies for stock market development, CMA, CBK, Ministry of Finance, among other stakeholders. The causality relationship is specifically going to enable investors to predict future stock market performance by observing GDP levels in the country. In real economic terms, investor may also benefit by being able to predict the performance of the stock market.

Furthermore, findings of this study are expected to generate academic debate which is anticipated to serve as a springboard for more studies in this area.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Introduction**

Several works undertaken by researchers on the connection between stock market and GDP were reviewed in this chapter. Literature is reviewed in terms of its approaches and applications. First, the chapter reviewed theories, followed by empirical literature. In addition, a summary of empirical literature is presented as well as the conceptual framework of the study.

### **2.2 Theoretical Literature**

Literature shows that there is no single theory which exhaustively explains the linkage between the stock market and GDP. Most of the theories of growth include elements such as capital and financial intermediaries in the economy. This study was guided by exogenous growth theory, finance-led and supply lending theories.

#### **2.2.1 Exogenous Growth Theory**

This theory is also called the Solow-Swan growth model which is based on neoclassical framework of long-term economic growth. In this theory, economic theory is explained using four key components namely; productivity, capital, technological progress and population growth (Aghion and Howitt, 1998). The model argues that the long-term growth in the economy is explained by factors outside the model specifications. The pillar of this model is the production function with constant labour and capital which are reproducible. This means that GDP (Y) is explained by capital and labour.

The theory assumes a diminishing returns of capital accumulation, meaning that if labour is given more capital goods in the absence of technology, there will be stagnation of new capital investment at some point. The other basic assumption of this model is that economic growth tends to converge

to steady state in the long-term depending on labour force growth rate and advancement in the technology in an economy. The theory argued that a country with high savings rate tends to grow faster than those with lower savings. In the long-term, the model states that capital accumulation plays a smaller role than technological progress. This model places more emphasis of the importance of technology on economic growth which offsets the effects diminishing returns which influences both labour increase and capital accumulation (Aghion and Howitt, 1998).

In summary, the theory emphasizes on capital accumulation as the key component for economic growth. Therefore, the study employed this theory to investigate how capital accumulation as facilitated by the stock market transactions (buying and selling of securities) was associated with economic growth, and the nature of such relationship.

### **2.2.2 Finance-Led Theory**

The Finance Led model was initially formulated by Schumpeter (1911) and it focuses on how financial institutions can mobilize domestic savings and investments via extremely open and liberalized system and enhancing productivity by coming up with efficient stock markets. This model posits that a well-performing financial sector will enhance technological innovations by allocating resources effectively from non-performing to performing sectors.

Several authors have expounded on this model. For example, Wadud (2005) while building on financial led growth model, postulated that evolution of domestic stock markets may improve and precede more capital accumulation which may ultimately lead to more economic activities. Hassan and Yu (2011) argued that the existence of an efficient financial sector in allocating financial resources from surplus sector and deficit ones, leads to expansion of the economy as well as stability of other macroeconomic variables. Just like, the exogenous growth theory, finance-led theories also underscore the role of the stock market in capital accumulation and how this affects economic

growth. This theory guided the study in investigating how the development at the stock market relate to economic growth through capital accumulation.

### **2.2.3 Supply Lending Model**

The theory of supply-lending was suggested by Mckinnon (1973) and Shaw (1973). The theory states that financial assets growth, enhances economic growth. Friedman and Schwartz (1963) in their demand-driven theory observed that growth in the economy leads to emergency of financial centers and thus, concluded that financial sector development is endogenously explained by real economic growth. In his contribution, Lucas (1988) found no causality link between financial sector development and GDP.

However, this hypothesis was only applicable under the neo-classical assumption of perfect information and no transaction costs (Amu et al., 2017). Lucas (1988) hypothesis has attracted many criticisms from economists because it is impossible to have a market without frictions and transaction costs. The theory was very instrumental in determining the causality relationship between the stock market development and economic growth in Kenya.

## **2.3 Determinants of Economic Growth**

Factors driving economic growth have been studied extensively in both developed and developing countries. Employing various methodologies, these studies have emphasized on variety of sets of variables and give numerous insights to the determinants of economic growth. Below are the key factors which determine economic growth rate.

### **2.3 1 Stock Market Development**

Sound banking system, conducive macroeconomic environment, existence of transparent and accountable institutions, and the protection of shareholders are considered among the key

determinants of effective stock markets (Adu et al., 2013). While stable macroeconomic surrounding is very important in the advancement of the stock market, fluctuations in the macroeconomic factors leads to a problem of asymmetric information in the market which is not good for investors because they are likely to make irrational investment decisions and hence leading to loses or reduced gains.

Inflation is very critical to the stock market development. For instance, investors (both domestic and foreign) will be very hesitant to invest in an environment where there is expectation of high inflation (Osamwonyi & Kasimu, 2013). The deepening of the banking sector is more of a complement to the banking sector as opposed to a substitute. Support services from the financial sector equally contribute to the stock market development (Arestis et al.,2001). In addition, a liquid-inter-bank a market enhances stock market development while weak-banking system is likely to hinder stock market development.

The quality of an institution can also occasion stock market development because, accountable and efficient institutions tend to display confidence in equity investment. The investment therefore becomes more attractive (Hondroyiannis et al.,2004). Countries with strong protection of shareholders also tend to have well-developed stock markets because there is no fear of expropriation among investors (Amu et al.,2017).

### **2.3.2 Capital**

Factor accumulation theory argues that higher inputs can translate into higher outputs. One of the most known determinant of GDP in the world is capital. This means that the more the capital accumulated by an economy, the faster the economic growth. However, during 1960's and part of 1970's, before liberation of the global economy, various developing countries such as India, China,

Russia, and Latin America, showed that investment without trade openness, or competition, would immediately produce growth but which will be detrimental for long-term growth.

In mid-1990's, it almost became apparently clear that East Asia's success was partially attributed to accumulation of capital (Olweny & Kimani, 2011). However, recent studies show that this assertion was not correct. There was heavy capital investment in these economies, though more vital was the fact that their trade openness, investment, and their competitive exchange rate ensured higher productivity growth.

### **2.3.3 Human Capital**

Lewis second principle of growth is human capital development. The conventional wisdom argues that private returns to education are high. In fact, no study has ever argued that human capital development is not necessary to sustainable growth. In early 1980's, more focus was placed on indirect and increasing social returns to education (Kemboi, 2012). Many production function models have established positive returns of education to the economic growth and development.

However, it has remained difficult to establish a significant externality effect of education on a smaller scale. Existing literature, observe that having too capital may not lead to more growth in certain instances. In addition, there are also moments when human capital development may not have significant contribution.

### **2.3. 4 Foreign Direct Investment**

Both neoclassical and endogenous theories of growth have cited investment to be the most fundamental determinant of economic growth. However, the neoclassical theory argues that investment impacts economic growth in transitional periods. On the other hand, endogenous theories suggest permanent effects. Due to the significance associated with investment as a

determinant of GDP, studies have examined the link between economic growth and investment (for example see Bond et al., 2001). Notwithstanding, the results of these studies are not conclusive.

Foreign Direct Investment (FDI) plays an important role in the global economic activities. It acts as a basis for technology transfer and GDP growth in that case. Many endogenous theories have stressed this role. Studies investigating the impact of FDI on economic growth have provided some-how inconsistent findings, confirming a strong positive relationship between the two variables (Bond et al., 2001).

### **2.3.5 Innovation, Research and Development**

Innovation, Research & Development (R&D) play a critical role in the economic growth. Wadud (2005) noted that innovation enable introduction of superior processes, goods and services which leads to an expansion of the economy. Several endogenous growth models have emphasized on this. In addition, this strong relationship has been confirmed further by various researches (Wadud, 2004). Based on these theories pioneered by Arestis (2001), technological innovations are created through research and development sectors with the help of human capital and the existing stock of knowledge. The innovations are then used in the in the production and thus, expansion of the output.

These models assume that endogenously determined innovations brings about sustainable economic growth, given that there are constant returns to innovation based on manpower employed in the research and development sectors. Aghion and Howitt (1998) observed a solid link between investment in R&D and the level of technology in the United States (US) economy. This positive link between a country's own R&D and total factor productivity was also confirmed by researches using international panel data (Hondroyannis et al.,2004).

### **2.3.6 Macroeconomic Policies**

Good macroeconomic policies are necessary for the growth of the economy. Most economies monetary and fiscal policies aim at maintaining balance of payment, job creation, expansion of output and sustainable development. For instance, an expansionary monetary policy meant to spur economic growth will reduce the rate of interest and this may lower the cost of credit and hence promote investment in the country. Equally, stability in the level of prices, exchange rates are likely to create a conducive business climate.

Studies have paid immense attention to the role of macroeconomic conditions on economic growth (Fischer, 1993). The policies can affect different aspects of the economy such as manpower, investment, infrastructure, legal frameworks as well as politics. Fischer (1993) argued that economic policies are necessary but not enough conditions for GDP growth. Largely, stability in the macroeconomic climate may increase production of goods and services through reduction of uncertainties such as unemployment, inflation, price fluctuations e.t.c.

### **2.4 Empirical Review**

The link between stock market development and economic growth can take various forms. Hassan and Yu (2011) argue that there are five of such forms namely; interdependence, supply-lending, demand-driven, no causal link and negative causality. A study of the impact of capital market development on economic growth in Nigeria using Granger causality test found that capital markets have a positive effect on the growth of the economy in Nigeria (Amu et al., 2017). However, applying regression analysis on annual data from 1981-2012, this study found insignificant impact of market capitalization on the Nigerian economic growth. These contradictions can be attributed to use of different methods of data analysis.



Liquidity of stock market was found to be closely associated with growth in the economy. Using VAR model, Arestis et al. (2001) argued that financial assets becomes less risky in a liquid stock market because the liquidity allows investors to sell very fast and change their financial position in case they find their value of stock to have decreased. This study further argued that less risky assets enhance allocation of capital which is an important channel of economic growth. However, Demirgüç-Kunt and Levine (1996) using ordinary least squares, argued that too much liquidity in the stock market is likely to increase returns on investment and then reduce the rate of savings and hence leading to a negative impact on economic growth. This will occasion a significant decrease in precautionary because of the uncertainty brought by more liquidity. In addition, the study observed that, stock market encourages investor myopia, which has a negative influence on corporate governance and this may hamper growth of the economy.

In study of the link between banking sector and stock market using VAR model, Hondroyannis et al. (2004) concluded that Greece's financial system development and stock market development significantly enhances growth in the economy. This study was carried out between 1986-1999. Similarly, Nzomoi (2013) observed the same results for the case of Fiji and Kenya respectively. On the contrary, a study in Northern Cyprus also using VAR model, revealed that banking sector and the market for securities has positive but, insignificant effect on GDP (Kemboi, 2012). The inconsistency in these findings could be attributed to changes in the economic climate.

Studies have also paid attention to the issue of the direction of causality link between stock market development and economic growth. Calderon and Liu (2002) using VAR investigated causality direction between stock market development and GDP and concluded that stock market deepening leads to GDP growth. In addition, the study adduced evidence that Granger causality from stock

market development to GDP growth and Granger causality from GDP growth to stock market development coexist.

In his study on the long-term link between stock market development and GDP growth in India, Pakistan and Bangladesh (Asian countries), Wadud (2005) argued that, the causality link runs from the stock market to GDP growth. A study from Latin America reveal that development in the financial systems leads to the GDP growth (Bittencourt, 2012). Studies in the African perspective on the Granger causality between financial development and growth of the economy have adduced mixed results. Esso (2010) for the case of Tunisia argued that the existence of a positive effect of financial sector development on economic growth is in doubt due to persistent high transaction and information costs coupled with uncompetitive financial sector in developing economies.

Applying VECM on data from Kenya, Ghana, Ivory Coast, Nigeria, Senegal, South Africa, Zambia and Togo to investigate the causal link between financial sector development and economic growth, Agbetsiafa (2004) found that development in the financial sector and GDP are related in the long-term. This study observed a unidirectional causality connection from financial sector deepening to GDP growth in several African countries such as Ghana, Nigeria, Senegal, South Africa, Togo and Zambia. On the other hand, the study concluded that under different measures of financial development, there is a bidirectional causality in Nigeria, Kenya, South Africa, Zambia, Ghana and Togo. In addition, the findings of the study appeared to indicate that growth in GDP leads to development in the financial sector in Kenya and Ivory Coast.

Esso (2010) examined the stock market-GDP growth nexus in Burkina Faso, Cape Verde, Cote d'Ivoire, Ghana, Liberia, and Sierra Leone. The study found that stock market development precedes GDP growth in Ghana, GDP growth precedes stock market development in Burkina Faso,

Cote d'Ivoire and Sierra Leone, and Granger causality relationship between stock market development and economic growth in Liberia and Cape Verde.

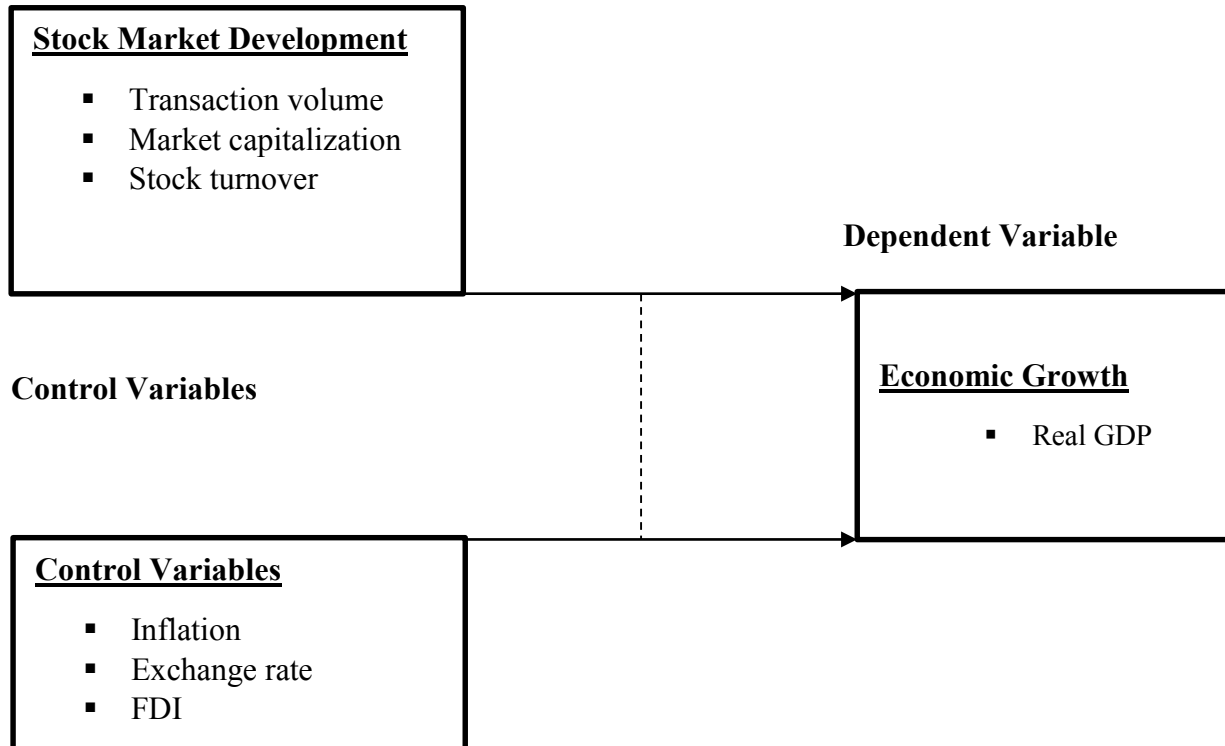
Adusei (2013) in employing simple regression equations, found a unidirectional link for the case of Ghana and South Africa. Odhiambo (2012) examined the causality link between financial sector and economic growth by investigating the effects of inflation on the connection of the two variables. This study concluded that GDP growth leads to financial deepening in Kenya, in addition, this study argued that to a greater extent, financial deepening relies on the demand for, and not supply of financial services.

Using linear regression, Bransoveanu et al. (2008) observed that a strong correlation between market capitalization and GDP growth in Romania. Employing multivariate regression, Kemboi (2012) noted that government stock, interest rate and market capitalization are significant stock market factors which are capable of impacting GDP growth. Similarly, Mwaura, Ngugi and Njega (2002) argued that stock return levels influence the amount of trading activities and thus effecting economic growth rate.

## **2.5 Conceptual Framework**

The conceptual framework of this study as shown in Figure 2.1, presents the dependent variable which is economic growth and an independent variable as stock market development.

## Independent Variables



**Figure 2.1: Conceptual framework**

**Source: Researcher (2017)**

Figure 2.1 indicates real GDP as a dependent variable and stock market development as independent variable on the other side. Both theory and empirical studies have established that liquidity in the stock market, market capitalization, stock turnover and stock market volatility are indicators of development in the stock market. The study had sought to investigate how each of these indicators correlates with the real GDP. The study also included control variables which were believed to influence economic growth as well as the development in the stock market. Variables included were: inflation, exchange rate and foreign direct investment (FDI).

## **2.6 Summary of Literature Review**

There is more literature on the causality link between stock market development and economic growth for both developed and developing countries. However, these studies differ in terms of the direction of the relationship and whether there is any impact of the two variables on each other or not. For example, while studies find bi-directional link between stock market development and economic growth (Agbetsiafa,2004; Nzomoi and Ikikii,2013), others observed a unidirectional relationship (Esso,2010; Odhiambo, 2012).

In addition, there was limited literature on the nexus between stock market growth and GDP in the Kenyan perspective. It was therefore imperative to investigate this link to fill these gaps.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Introduction**

This chapter describes the procedures and processes that will be applied to achieve the objectives of the study. It comprises of research design, study population, data type, collection and data analysis approach.

### **3.2 Research Design**

A research design as defined by Orodho (2009) refers to an outline or plan that is used to generate answers to research problem. The study employed causality test to examine stock market development and GDP nexus in Kenya. The reason behind this method is that causes, and effect links are often vague and hence the need to better understand this link. The purpose here was to help all stakeholders in making rational decisions on policies.

### **3.3 Data collection**

Secondary data which was collected half annually for a period of 24 years (1993- 2016). These data comprised of market capitalization, volume and value of traded shares for all listed companies at NSE. The data was obtained from World Bank database, NSE, Kenya National Bureau of Statistics (KNBS) and UNCTAD annual reports.

### **3.4 Data Analysis**

The study used VAR Model to investigate the link between stock market development and GDP. This model has been employed successfully by various studies such as Kemboi and Tarus (2012), Osamwonyi and Kasimu (2013). Based on the theory, empirical and the conceptual framework, the study estimated the following model:

$$(GDPGR)_t = \alpha_0 + \beta_1(STR)_t + \beta_2(\ln MC)_t + \beta_3(\ln TV)_t + \beta_4(\ln FDI)_t + \beta_5(INF)_t + \beta_6(ER)_t + \varepsilon_t \dots \dots \dots (1)$$

Where,

$\alpha_0$  – y intercept (constant)

$\beta$ 's =Coefficients to be estimated

lnFDI= natural log Foreign Direct

GDPGR= Gross Domestic Product Growth

Investment

Rate

INF=Inflation

STR= Stock Turnover Ratio

ER=Exchange Rate

lnMC= Natural log of Market Capitalization

$\varepsilon_t$  =Error term

lnTV= natural log of Transaction Volume

t= time (<sup>1</sup>/<sub>2</sub>) year

Granger (1969) stated that when two variables are related, they can be employed to forecast each other. He suggested that given two variables like, Y & X, one can argue that X explains Y if Y can best have forecasted by employing X & Y and not just values for Y alone. In the study, the value of GDPGR was used to measure economic growth while stock market development was measured by STR, SMC and TV. Therefore, Granger test for causality model was expressed as follows:

$$(GDPGR)_t = \alpha_0 + \sum a_i(GDPGR)_{t-i} + \sum b_i(STOCK)_{t-i} + \varepsilon_t \dots \dots \dots (2)$$

$$(STOCK)_t = \alpha_0 + \sum c_i(STOCK)_{t-i} + \sum d_i(GDPGR)_{t-i} + \mu_t \dots \dots \dots (3)$$

Where STOCK refers to the four measures of stock market development (STR, TV, SMC and TV).

The study employed some tests to ensure that the results are not biased. Unit root test was conducted using ADF to ensure no spurious outcome.

### 3.4.1 Variables

**Table 3.1: Description of Variables**

Variable	Proxy/measurement)	Source
Gross Domestic Product Growth Rate	Gross Domestic Product Growth rate was given	KNBS
Stock Turnover Ratio	Stock Turnover Ratio = $\frac{\text{Value of transactions at NSE}}{\text{Market capitalization}}$	Richard (1996)
Stock Market Capitalization	Natural log of Stock Market Capitalization was computed	Levine and Zervos (2003)
Transaction volume (TV)	TV = value of transaction at the NSE -natural log be was taken	Richard (1996)
Foreign Direct Investment	Natural log of Foreign Direct Investment was computed.	KNBS, UNCTAD
Inflation	Inflation = This is a yearly-end change in the CPI index monthly.	KNBS
Exchange Rate	Exchange Rate = the study considered the exchange rate of Kenya shilling against United States Dollar	NSE, KNBS



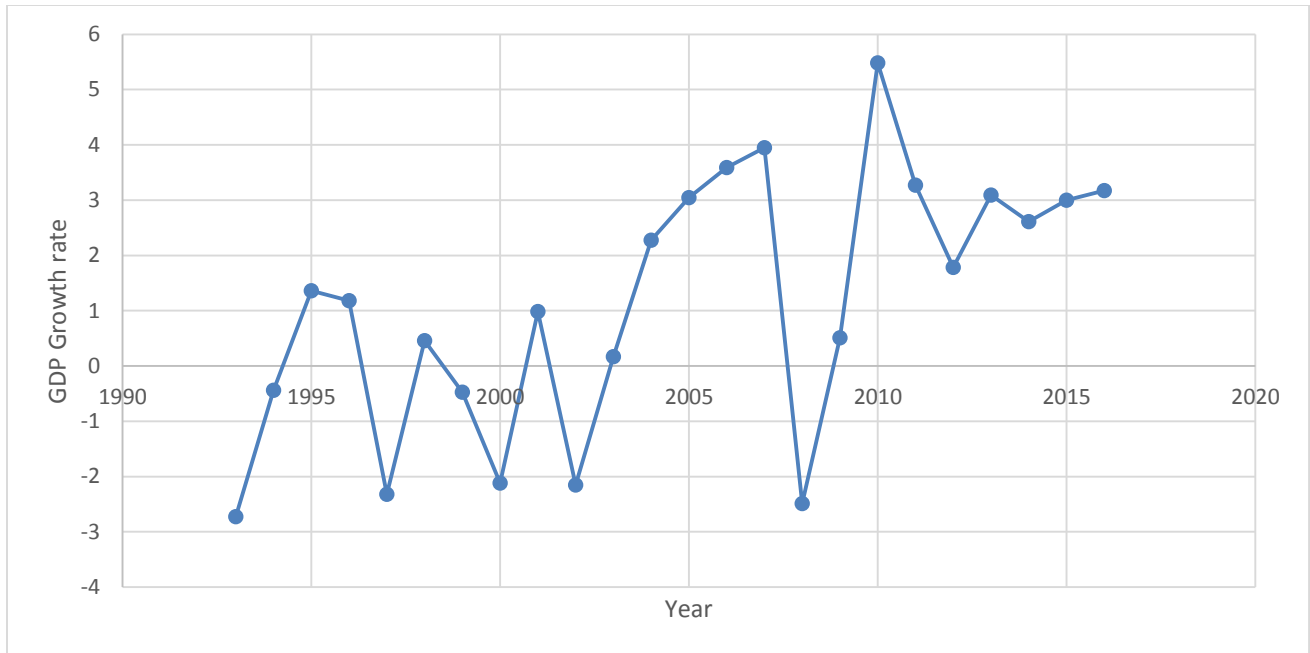
## **CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION**

### **4.1 Introduction**

The role of the stock market towards economic growth and development cannot be gainsaid. While some studies argue that stock market development causes economic growth, other studies have found that economic growth explain stock market development. Arising from these inconsistencies in literature, this study had sought to investigate the causality link between these two variables using Granger-Causality test. This chapter presents results and discussions in two sections: section one presents descriptive statistics, while section two presents results from analytical model.

### **4.2 Descriptive Statistics**

The descriptive statistics considered by the study are trends in GDP growth rate (GDPGR) as a proxy for economic development, Market Capitalization (MC) and Volume of Transactions at the stock market (proxy for stock market development). In addition, the mean, standard deviation, maximum and minimum values of both the dependent and independent variables were considered. The study begins by describing the trend in GDPGR as shown in Figure 4.1.

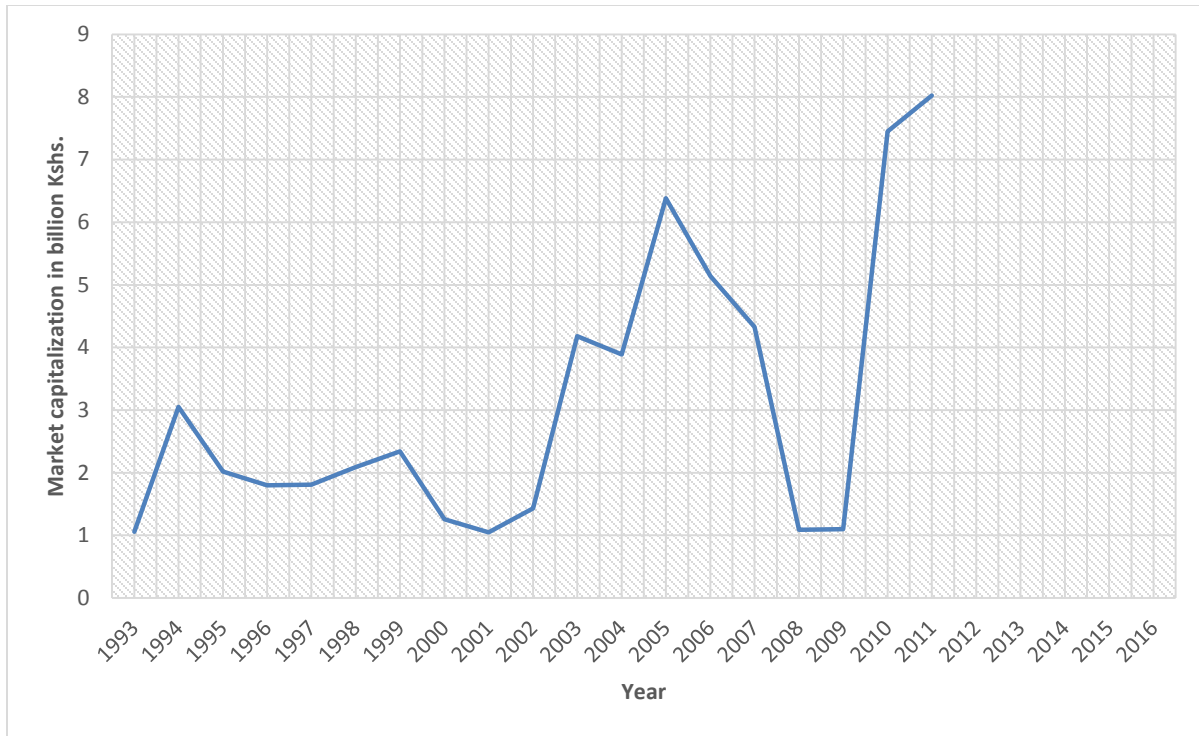


**Figure 4.1: Kenya’s Gross Domestic Product Growth Rate for some selected years**

Source: Own Computation from Research data

Figure 4.1 shows that the GDP growth rate (GDPGR for Kenya has been fluctuating over time. This behavior can be attributed to the dynamic nature of the factors affecting the growth of Kenya economy such as exchange rate, stock market activities, inflation, political instability as well as external shocks like the world economic crisis of 2008.

The study has also analysed how the stock market has been performing over time in Kenya. Stock Market Capitalization, and Volume of transaction at the NSE are proxies for the performance of the stock market. Summary results on this issue are shown in Figures 4.2 and 4.3.

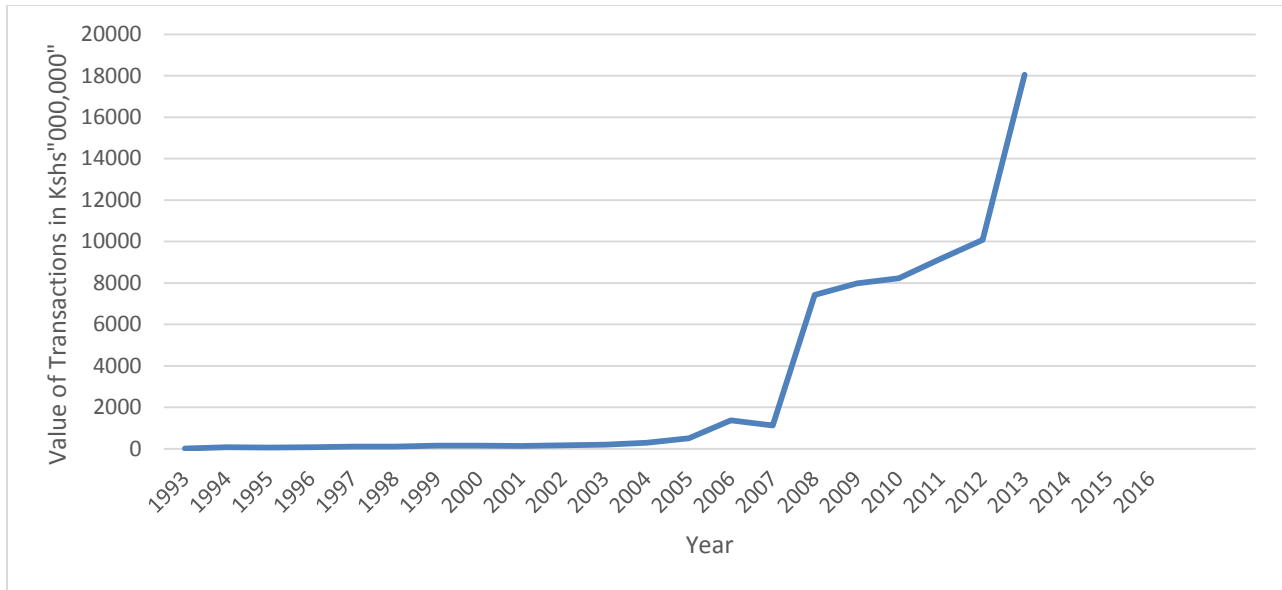


**Figure 4.2: NSE Market Capitalization over the years**

Source: Own Computation from Research data

According to Figure 4.2, NSE performed dismally between 1993 to 2002 and thereafter the started experiencing remarkable growth. However, there was again poor performance between 2006 and 2009 from where the market is showing again an upward trend.

Volume of transactions at NSE shows an increasing trend, implying that the market for stocks has been expanding over time (see Figure 4.3).



**Figure 4.3: NSE Volume of Transactions**

Source: Own Computation from Research data

Next, Table 4.1 presents a summary of the means, standard deviation (S.D), minimum (Min) and maximum (Max) values of all variables included in the study.

**Table 4.1: Variable Means, S.D, Min, and Max values (Billion Kshs)**

Variable	Obs	Mean	S. D	Min	Max
GDP Growth rate	48	1.13	2.33	-2.73	5.48
Market Capitalization	48	5.62	4.81	1.21	1.45
Transaction Volume	48	4.52	5.29	1.21	1.81
Exchange Rate	48	73.34	12.14	51.43	98.18
Inflation	48	11.29	9.75	1.55	45.97
Foreign Direct Investment	48	2.16	3.52	530	1.44
Stock turnover ratio	48	0.05	0.03	0.01	0.12

Source: Own Computation from Research data

Statistics from Table 4.1 indicate that the average GDP growth rate between 1993 to 2016 was 1.13 billion Kshs and it ranged between a minimum of -2.73 billion Kshs and a maximum of 5.48 billion Kshs with the standard deviation of 2.33. The maximum Market Capitalization was 1.45 billion Kshs while the minimum was 1.21 billion Kshs during the study period. The same results indicate that the mean transaction volume was 4.52 billion Kshs with a standard deviation of 5.29 and ranging between 1.21 billion Kshs and 1.81 billion Kshs. During this period (1993-2016), the mean exchange rate of Kenya shilling against USD was 73.34 with a standard deviation of 12.13. The same results show that inflation ranged 45.97 between 1.55 with the mean of 11.29. During this period, Kenya maintained an average Foreign Direct Investment inflow of 2.16 billion Kshs with the maximum reaching 1.44 billion Kshs. The average Stock turnover was 0.05 and ranged between a maximum of 0.12 and a minimum of 0.01 points.

### **4.3 Estimation of the Model**

The study employed VAR model to estimate granger causality between NSE stock market development and Kenya's economic growth using Stata version 14. Granger causality tests are based on VAR estimates and hence VAR precedes the test. VAR model is based on time series data, and therefore, to run it, the study had to conduct unit root test to confirm stationarity of all variables.

#### **4.3.1 Unit root test**

Unit root tests for non-stationarity of time series which is a critical problem in empirical analysis. Variables non-stationary leads to statistical inference which can mislead further give meaningless finding and wrong conclusions. The test assumes that logical interpretation of time series data results will only occur when the series is stationary otherwise it leads into spurious regression problems.

Augmented Dickey Fuller (ADF) was used to determine stationarity of the series. Null hypothesis in ADF test is that  $p=0$  (i.e, there is unit root) and the alternative hypothesis,  $p<0$  (unit root is not present). In this test, if the t value is greater than the DF critical value in absolute values at 1%, 5% and 10% significance levels, then the  $H_0$  hypothesis is rejected hence the series is stationary and vice versa is also true.

The ADF test has three models; the intercept only model, the intercept and trend model and the suppressed intercept and trend model. For the variable to be termed as stationary, the t value must be greater than the critical values consistently in the three models. The L value has also to be negative consistently in the three models. Table 4.2 presents the results of the ADF test

**Table 4.2: Unit root results**

Variable	No. of lags	No. of diff	Intercept only	Intercept and trend	Suppressed intercept and trend
GDP Growth rate	0	1	-6.006	-5.847	-6.113
Stock turnover ratio	0	1	-5.283	-5.307	-5.408
Market Capitalization	0	1	-6.320	-6.295	-6.336
Transaction volume	0	1	-4.763	-5.103	-4.721
Foreign Direct Investment	0	1	-6.874	-6.681	-6.814
Inflation	0	0	-5.593	-5.154	-3.817
Exchange rate	0	4	-5.998	-6.035	-6.035

Source: Own Computation from Research data

Based on the results displayed in Table 4.2, the first ADF test on confirmed that all the variables except inflation (INF) had their t statistical values in all the models less than the t critical values in all the three significant levels. Therefore, the study could not reject the null hypothesis which states that there is unit root for variables GDP growth rate (GDPGR), Stock turnover ratio (STR),

Market Capitalization (MC), Transaction Volume, Foreign Direct Investment (FDI) and Exchange rate (ER). To correct this, the study differenced these variables to a level where all the variables were stationary in all the models. Table 4.2 indicates that all variables apart from the ER and Inflation (INF) were differenced only once. This then implied that stationarity variables occurred at different levels of differencing. From the table, it is now a fact that all variables are stationary. This is because the t values in all the models are greater than the t critical values at 1%, 5%, and 10%. Due to the presence of unit roots as indicated by the first ADF test before differencing, the study considered a co-integration test as necessary.

#### 4.3.2 Co-integration test

Two or more variables are said to be co-integrated if they have a long run equilibrium or relationship between them (Hassan et al., 2011). Differencing of variables to achieve stationarity status leads to loss of long term characteristics.

Engel-Granger 2 step procedure was used to carry out this test. First, an OLS regression equation was estimated followed by prediction of residuals from non-stationary variables. Secondly, ADF test was applied to residuals and the results of this test are summarized in Table 4.3.

**Table 4.3: Co-integration results**

	test statistic	1% critical value	5%critical value	10%critical value
Z(t)	-2.972	-3.750	-2.997	-2.630

P value Z (t) =0.0000

From the table, the absolute test statistic value was less than the absolute critical values in 1% and 5% levels of significance but was greater than the critical value at 10% level of insignificance. The study therefore had to accept null hypothesis which states that there is no co integration. The study hence concluded that the variables were not co-integrated, i.e, they have a short-term relationship.

This implied the use of Vector Autoregressive Model (VAR). Before running the model, multicollinearity test was conducted.

### 4.3.3 Test for Multicollinearity

Multicollinearity test was undertaken using Variance Inflation Factors (VIF). For this test, VIF values greater than 10 and 1/VIF values which are less than 0.10 is an indication of the presence of multicollinearity. The results of this test are shown in Table 4.4.

**Table 4.4: Variable Inflation Factors (VIF)**

Variable	VIF	1/VIF
Stock turnover ratio (STR)	1.93	0.517214
Market Capitalization (MC)	1.80	0.557009
Exchange rate (ER)	1.23	0.811567
Foreign Direct investment (FDI)	1.18	0.845293
Inflation (INF)	1.17	0.857684
Transaction volume (TV)	1.11	0.897451
Mean VIF	1.40	

Source: Computed from research data

Findings from Table 4.4 indicates the absence of multicollinearity because the variance inflation factors are all less than 10 and the tolerance values (1/VIF) are all greater than 0.1. the absence of multicollinearity implies that estimated coefficients are stable and unbiased.

### 4.3.4 Vector Autoregressive Model

The test for co-integration has confirmed that there is no long run association among all the variables. Based on this, the study runs unrestricted VAR as opposed to Vector Error Correction Model (VECM). Summary results for VAR regression equations are displayed in Table 4.5



**Table 4.5: VAR Results**

	<i>Coef.</i>	<i>Std. Err.</i>	<i>z</i>	<i>P&gt; z </i>	<i>[95% Conf. Interval]</i>	
GDPGRD1						
ERD4						
L1.	-.1261092	.0340255	-3.71	0.000	-.192798	-.0594204
L2.	.0387691	.0338288	1.15	0.252	-.0275342	.1050724
lnMCD1						
L1.	.0153743	.056233	0.27	0.785	-.0948404	.125589
L2.	.1528251	.0586732	2.60	0.009	.0378278	.2678224
lnTVD1						
L1.	.1695822	.0479385	3.54	0.000	.0756244	.2635399
L2.	4.217067	.8381784	5.03	0.000	2.574268	5.859867
INF						
L1.	.2749972	.132579	2.07	0.038	.0151472	.5348472
L2.	-.2907601	.1227152	-2.37	0.018	-.5312774	-.0502427
lnFDIInfD1						
L1.	-.9758568	.2071963	-4.71	0.000	-1.381954	-.5697595
L2.	-2.288487	.3357756	-6.82	0.000	-2.946595	-1.630379
STRD1						
L1.	24.83753	27.8985	0.89	0.373	-29.84251	79.51758
L2.	-117.2527	19.89712	-5.89	0.000	-156.2504	-78.25509
lnMCD1						
GDPGRD1						
L1.	-4.814461	2.274216	-2.12	0.034	-9.271842	-.3570797
L2.	-2.346031	1.123758	-2.09	0.037	-4.548557	-.1435045
lnTVD1						
GDPGRD1						
L1.	2.028419	.7576692	2.68	0.007	.5434152	3.513424
L2.	.5215596	.3743871	1.39	0.164	-.2122257	1.255345
INF						
GDPGRD1						
L1.	2.725341	.7277922	3.74	0.000	1.298895	4.151788
L2.	2.407558	.359624	6.69	0.000	1.702708	3.112408
lnFDIInfD1						
GDPGRD1						
L1.	-.4638202	.1634691	-2.84	0.005	-.7842137	-.1434267
L2.	-.230269	.080775	-2.85	0.004	-.3885851	-.0719529
STRD1						
GDPGRD1						
L1.	.0055598	.0040646	1.37	0.171	-.0024067	.0135263
L2.	-.0016785	.0020084	-0.84	0.403	-.005615	.002258
AIC	= -155.1543					
HQIC	= -154.6427					
SBIC	= -150.0079					

Source: Computed from research data

Based on the VAR results as presented in Table 4.5, all coefficients of variables indicate short run causality. Taking Gross Domestic Product Growth Rate (GDPGR) as dependent variable for the first equation, the two lagged variables (L1 and L2) of ER show a short-term causality running from GDPGR to Exchange Rate (ER). While L1 is negatively and significantly ( $p$ -value=0.000) associated with GDPGR, L2 indicates a positive and not significant association because its  $p$ -value (0.252) is more than 5% associated with GDPGR. The rate of inflation (INF) indicates similar results, but for the case of INF, both L1 and L2 are significant at 95% confidence interval. On the other hand, the coefficients of FDI indicate a negative and significant relationship with GDPGR. While the result indicates that Market Capitalization (MC) is positively related to GDPGR, L1 is not significant but L2 is significant with the probability value of 0.009. The coefficients of stock market Transaction Volume (TV) indicate that, TV positively and significantly explains GDPGR. Further, the results on Stock Turnover Ratio (STR) indicate that L1 is positive and insignificantly associated with GDPGR while L2 shows the opposite (significant and positive correlation).

These interpretations show that from VAR, it is impossible to determine the effect of independent variables on dependent variable and vice versa. This is because, in most instances, L1 and L2 of explanatory variables show opposite results (negative and positive correlation, significant and insignificant). This begs the question, “what is the short run causality link as a whole? To answer this question, the study had to run Granger Causality Test.

#### **4.3.5 Granger Causality Test**

This is a post-estimation test for VAR which determines the causality relationship between the dependent and explanatory variables. Granger (1969) stated the null hypothesis for Granger causality is that there is no causality relationship between dependent and independent variables or that all the coefficients of the lagged variables are equal to zero. Therefore, when the  $p$ -values of

the estimates are greater than 10% confidence level, we accept the null hypothesis and on the other hand, when the p-values of the estimates are less than 10% confidence level, we reject the null hypothesis and conclude that there is causality relationship. The result for the causality test on GDPGR, ER, TV, MC, STR, FDI and INF are Summarized in Table 4.6.

**Table 4.6: Causality Test Results**

Null Hypothesis:	Chi2	Prob > chi2
GDPGR does not Granger cause ER	94.398	0.000
GDPGR does not Granger cause MC	6.8718	0.032
GDPGR does not Granger cause TV	28.419	0.000
GDPGR does not Granger cause INF	5.6161	0.060
GDPGR does not Granger cause FDIInf	59.126	0.000
GDPGR does not Granger cause STR	41.584	0.000
STR does no Granger cause GDPGR	11.873	0.003
MC does not Granger cause GDPGR	4.9289	0.000
TV does not Granger cause GDPGR	8.622	0.013
ER does not Granger cause GDPGR	18.171	0.000
INF does not Granger cause GDPGR	51.509	0.000
FDI does not Granger cause GDPGR	9.0171	0.011

Source: Computed from research data

#### **4.3.6 Discussion of results**

The main objective of the study was to investigate causality relationship between economic growth as a dependent variable and stock market development as explanatory variables. Stock market development was measured by two variables which are MC, TV, and STR. Granger causality

hypotheses are divided into two sections. The first section comprises of those hypotheses testing on whether there is granger causality running from explanatory variables (MC, TV, STR, ER, INF, and FDI) to the dependent variable GDPGR, while section two includes those hypotheses testing whether there is granger causality running from GDPGR to the explanatory variables. The study presents the discussion of findings beginning with section 1.

According to the results presented in Table 4.6, there is a short run granger causality running from Market Capitalization(MC) to the Gross Domestic Product Growth Rate (GDPGR). This is because, the p-value (0.032) for this equation is less than 5% which leads to the rejection of null hypothesis. This finding indicates that in the short-run, MC explains the rate of economic growth in Kenya. Findings as to whether GDPGR does not granger cause Transaction volume (TV) at NSE indicate the rejection of null hypothesis. With a probability value of 0.000, this equation shows that there is short term granger running from TV to GDPGR and hence implying that the amount of transactions at the NSE can determine the size of economic growth rate.

Regarding Stock Turnover Ratio (STR)-another proxy for stock market development, the p-value (0.000) of the GDPGR-STR equation indicates that there is granger causality running from STR to GDPGR. Again, this finding shows that, stock market turnover ratio explains the gross domestic product growth rate. Additionally, the hypothesis on whether GDPGR does not granger cause Inflation (INF) was accepted on the account of the of its p-value (0.06) which was found to be greater than 5%. This meant that there is no granger causality running from INFI. However, since there are three acceptable levels of significance, i.e. 1%, 5%, and 10%, this study accepted alternative hypothesis at 10% significant level and hence implying that there is granger causality running from INF to GDPGR. Similarly, the study rejected the hypothesis that GDPGR does not granger cause Foreign Direct Investment. The reason is that the p-value (0.000) for this hypothesis

was discovered to be less than 5%. This therefore, implies that there is short-run granger causality running from FDI to GDPGR. Further, the granger causality test running from Exchange Rate to GDPGR implies the rejection of the null hypothesis on the account of its p-value (0.000) which is less than 5%. This is inferred to mean that there is short-run causality running from Exchange Rate to GDPGR.

Turning to the question whether there is granger causality running from GDPGR to explanatory variables, the hypothesis on whether MC does not granger cause GDPGR was rejected on the grounds that its p-value (0.000) is less than 5%. This confirms that there is granger causality running from GDPGR to MC. Similarly, p-value (0.003) for STR-GDPGR hypothesis indicates that there is granger causality running from GDPGR to STR, implying that GDPGR explains stock return ratio at NSE. On the hypothesis on whether TV doesn't granger cause GDPGR, the p-value of this hypothesis is 0.013 and is less than 5%. This is a confirmation that GDPGR granger causes transaction volume in the short-run.

The test for whether ER does not granger cause GDPGR was also rejected because its p-value (0.000) is less than 5%. This is an indication that there is a short-run causality running from GDPGR to ER. Similarly, the p-value of 0.000 on the hypothesis for INF-GDPGR granger causality reveals that there is short-run causality running from GDPGR to INF. Finally, the hypothesis on whether FDIInf does not granger cause GDPGR was rejected because its p-value (0.011) is less than 5%. This implies that GDPGR explains FDIInf in the short-run.

In summary, results on causality tests as presented in Table 4.6, indicate that there is a bidirectional causality relationship between GDPGR and all explanatory variables included in the model. This is because, the probability values for all causality equations are less than the three levels of significance. This implies that there is a short-term two-way causality link between

GDPGR and all explanatory variables. Similar results were observed by Calderon and Liu (2002); Agbetsiafa,2004; Nzomoi and Ikikii,2013). Contrastingly, Contrary Wadud (2005); Adusei (2013) found a unidirectional link between stock market development and economic growth.

## **CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION**

### **5.1 Introduction**

The aim of this study was to investigate the causality relationship between stock market development and economic growth rate focusing on the Kenyan economy. This chapter presents summary of the findings, conclusion and key recommendation.

### **5.2 Summary**

This study sought to examine causality link between stock market relationship and economic growth. Stock market development was measured by market capitalization at the Nairobi Securities Exchange, transaction volume (traded at NSE), and Stock market return ratio, while economic growth was measured by the Gross Domestic Product Growth Rate. There are also other variables which according to the existing literature, explain or control the relationship between stock market development and economic growth. In view of this, the study incorporated Exchange rate, Foreign Direct Investment and Inflation as control variables.

The study used secondary time used half-yearly data for 24 years, i.e. from 1993-2016. Hence, total observations for this study was 48. Data was collected from the Nairobi Securities Exchange, UNCTAD reports and the Kenya National Bureau of Statistics (KNBS) annual reports. The study employed VAR methodology of granger causality. Granger causality test is preceded by VAR regression. To make sure that the estimated coefficients are valid and that generates meaningful results, several diagnostic tests were carried out. Unit root test as well as test for multicollinearity which ensured that variables were stationary and that they were free of multicollinearity. While unit root test by Augmented Dicky Fuller confirmed that all variables were stationary, the test for

multicollinearity using Variance Inflation Factors on the other hand, found that multicollinearity was absent from the model. These implies that the estimated coefficients are valid at 95% confidence intervals and that inferences drawn from these findings can be relied on.

Granger causality test whose results are presented in Table 4.6, indicate that there is short-run granger causality running from stock return ratio to real GDP, and from real GDP to stock return ratio. This means that an increase in the stock turnover at NSE generates additional income for the economy. This income might be in the form of corporate tax, and income tax coming from an expanded work force due to increased activities both at NSE and at the firm level. On the other hand, an increase in economic activities as measured by GDP are likely to increase stock turnover ratio at the NSE. In addition, the test for real GDP and Market capitalization, shows that short run granger causality runs from Market capitalization to real GDP and from GDP to market capitalization. This bidirectional causality between GDPGR and MC means that increased MC translates into more income for the economy, and this is likely to affect gross domestic product growth rate. Similarly, growth in the national income is likely to increase incomes of the firms trading at the NSE which in turn translates into higher market capitalization.

The study also confirms the existence of a bidirectional relation between transaction volume- another proxy for stock market development and GDPGR. This can also be inferred to mean that increased trading activities at the NSE leads to generation of more income at national level. In the same way, an increase in gross domestic product may generate more transactions at NSE either directly or indirectly. These findings mean that both stock market development and economic growth have a bidirectional relationship. They therefore imply that an increase in real gross domestic product leads to stock market development. On the other hand, a more developed stock



market increases its activities (trade) which ultimately leads to generation of more income for the economy.

These findings are also supported by other studies. For example, Calderon and Liu (2002), Wadud (2005), and Bittencourt (2012) for the case of United States established a bidirectional causality relationship between stock market development and the gross domestic product growth rate. Contrastingly, Agbetsiafia (2004) for the case of Kenya, Ghana, Nigeria, Senegal, South Africa and Togo found a unidirectional relationship between stock market development and gross domestic product.

Furthermore, granger causality test for control variables: Inflation, foreign direct investment and exchange rate and real GDP confirmed short run causality running from either side. This equally implies that exchange rate, inflation and FDI can explain both the stock market deepening and GDPGR and on the other hand, GDPGR can also explain exchange rate, inflation, and foreign direct investment.

### **5.3 Conclusion**

The aim of this study was to investigate the causality relationship between stock market development and real gross domestic product using half-yearly data for 24 years (1993-2016). Based on the discussion of findings and summary, this study makes several conclusions: first, the study concludes that there is a bidirectional causality link between market capitalization and gross domestic product growth rate. This indicates that market capitalization at the Kenya's stock market plays a role towards economic growth. On the other hand, the growth rate at the national level can determine the development at the stock market.

secondly, the study concludes that the turnover ratio at the stock market explains the level of economic growth on one hand, while on the other hand, economic growth rate determines stock turnover ratio at the NSE. Assuming that stock turnover ratio at NSE is the best measure of stock market development, then, this study infers that STR is very instrumental towards economic growth. Third, the level of transaction at the NSE determines the size of GDPGR on one hand, and GDPGR explains transaction volume at the NSE. The implication here is that transaction volume at NSE contributes to economic growth rate of the Kenya's economy. On the other hand, growth in the economy means increased trading activities at the Nairobi Securities Exchange.

Fourth, given that stock market development was measured by market capitalization, transaction volume, and stock return ratio, the study concludes that there is a bidirectional link between stock market development and economic growth. This shows that on one hand, stock market development plays a very important role regarding economic growth, while on the other hand, economic growth is very critical when it comes to stock market development. Therefore, the level of economic activities in the economy can be forecasted by the performance of the stock market development and vice versa. In addition, all the indicators of stock market development, i.e. Market capitalization, stock return ratio and stock market transaction, were found to be positively related to gross domestic product. This means that the development of stock market translates into higher GDP growth rates, and on the other hand, higher GDP is likely to attract more investment at NSE and hence the development of the stock market.

Higher economic growth rate reflects conducive investment climate, most likely to attract more investment in the economy, encourage firms at NSE to seek funding for business expansion through floating of their shares. This enhances stock market development. Similar findings were

reported by Ngugi et al., 2009; Owiti, 2013; Murayi, 2013; Ifuero and Abudu, 2013). On the other hand, Nyamakanga (2013) found a unidirectional causality link.

Finally, in view of the prevailing discussions on the causality link between stock market development and the level of economic activities as measured by gross domestic product, findings of this study should not be taken as conclusive evidence, but they should be viewed as an added motivation for more studies in this area of study.

#### **5.4 Recommendation**

The importance of the stock market development regarding economic growth cannot be re-emphasized. Results, discussion, summary and conclusion show that there exists a bidirectional causality relationship between stock market development and economic growth. This implies that economic growth rate and stock market development are interlink. Therefore, study recommends to the government through CMA to formulate and implement policies that are aimed at stabilizing the stock market to promote capital formation, enhance investment and strengthen economic growth. Measures such as tax incentives to investors can increase savings by investors and facilitate purchase of securities such as stocks, treasury bills and bonds. In addition, CMA should introduce stringent measures in terms of supervision to promote investor confidence.

Secondly, Kenyan government has mainly paid more attention on the developing of the banking sector, such like reducing the involvement of credit allocation, reduction of taxation for financial intermediaries. Therefore, the government need to also focus on the stock markets. The government should particularly scrutinize regulatory framework and policies under which the stock market operates with the aim of removing unnecessary entry barriers if any. For instance, the government, through Capital Markets Authority should lift barriers to the stock market e.g.

taxes, legal, and other regulatory impediments to make it easy for firms to get listed and trade at the stock market exchange.

Since economic growth contributes to stock market development, the government and other development agencies should promote conducive climate for investment, and stable macroeconomic factors to expand economic growth. This will go a long way in encouraging more firms to get listed on the stock market. For instance, the government should enact policies enhance ease and smooth operation of business entities. Such may include, inflation, reduce corporate tax and lessen the processes for registering corporate bodies in Kenya.

### **5.5 Limitations of the Study**

In this study a time series data for a 24-year period from 1993-2016 was used. This was because the study could not get data on the NSE statistics such as market capitalization and transaction volume before 1993. In addition, this data was only for a single country, that is, Kenya. According to Oya & Damar (2007), cross country evidence is usually necessary for time series methodologies. Cross-country time series overcomes country specific variants, and this helps to enhance the validity of the findings.

In addition, this study used Market capitalization, stock turnover ratio, and transaction volumes at NSE to measure stock market development mainly because, these are the most commonly used indicators in literature. This study did not include other measures like integration, market concentration, institutional and regulatory indicators as well as capital markets fluctuations due to the limitation of data. The inclusion of these variables could may be have changed the findings.

Furthermore, the regression did not consider unobserved characteristics such as management at NSE. Therefore, this model did not sufficiently represent the causality relationship between stock

market development and the GDP. This also means that the inclusion of these variables (management style at NSE, regulatory framework), would have altered these findings and therefore, maybe lead to different inferences.

### **5.6 Suggestion for Further Studies**

This study has established a bidirectional causality relationship between stock market development and real GDP. However, there is need to investigate other aspects of the stock market e.g. international integration, market concentration, institutional and regulatory indicators, to find out if they will generate similar results. In addition, inclusion of cross-country perspectives will be quite instrumental. This call for further study in this area.

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## APPENDIX I: VAR Regression

var GDPGRD1 ERD4 lnMCD1 lnTVD1 INF lnFDIInfD1 STRD1

Vector autoregression

Sample: 2459q4 - 2463q4      Number of    obs    =48

Log likelihood = 1423.811    AIC    =    -155.1543

FPE            = 1.13e-73    HQIC =    -154.6427

Det(Sigma\_ml) = 4.22e-82    SBIC =    -150.0079

Equation	Parms	RMSE	R-sq	chi2	P>chi2
GDPGRD1	15	1.7717	0.9468	302.3078	0.000 0
ERD4	15	5.33683	0.9912	1921.9	0.0000
lnMCD1	15	13.743	0.7313	46.2583	0.0000
lnTVD1	15	4.57855	0.9055	162.9122	0.0000
INF	15	4.39801	0.9188	192.3216	0.0000
lnFDIInfD1	15	.987835	0.9307	228.4853	0.0000
STRD1	15	.024562	0.9391	262.0204	0.0000

Coef.	Std. Err.	z	P>z	[95% Conf.	Interval]
GDPGRD1					
GDPGRD1					
L1.	-.2161938	.2931853	-0.74	0.461	.7908264    .3584388
L2.	-.8233069	.1448717	-5.68	0.000	-1.10725    -.5393636
ERD4					
L1.	-.1261092	.0340255	-3.71	0.000	-.192798    -.0594204
L2.	.0387691	.0338288	1.15	0.252	.0275342    .1050724
lnMCD1					
L1.	.0153743	.056233	0.27	0.785	.0948404    .125589

L2.	.1528251	.0586732	2.60	0.009	.0378278	.2678224
lnTVD1						
L1.	.1695822	.0479385	3.54	0.000	.0756244	.2635399
L2.	4.217067	.8381784	5.03	0.000	2.574268	5.859867
INF						
L1.	.2749972	.132579	2.07	0.038	.0151472	.5348472
L2.	-.2907601	.1227152	-2.37	0.018	.5312774	-.0502427
lnFDIInfD1						
L1.	-.9758568	.2071963	-4.71	0.000	1.381954	-.5697595
L2.	-2.288487	.3357756	-6.82	0.000	2.946595	-1.630379
STRD1						
L1.	24.83753	27.8985	0.89	0.373	29.84251	79.51758
L2.	-117.2527	19.89712	-5.89	0.000	156.2504	-78.25509
_cons	.3001582	.6055619	0.50	0.620	.8867214	1.487038

## APPENDIX II: Granger Causality Test

vargranger

Granger causality Wald tests

Equation	Excluded	chi2	df	Prob > chi2
GDPGRD1	ERD4	94.398	2	0.000
GDPGRD1	lnMCD1	6.8718	2	0.032
GDPGRD1	lnTVD1	28.419	2	0.000
GDPGRD1	INF	5.6161	2	0.060
GDPGRD1	lnFDIInfD1	59.126	2	0.000
GDPGRD1	STRD1	41.584	2	0.000
GDPGRD1	ALL	204.17	12	0.000
ERD4	GDPGRD1	18.171	2	0.000
ERD4	lnMCD1	58.46	2	0.000
ERD4	lnTVD1	86.938	2	0.000
ERD4	INF	85.82	2	0.000
ERD4	lnFDIInfD1	152.98	2	0.000
ERD4	STRD1	29.343	2	0.000
ERD4	ALL	348.99	12	0.000
lnMCD1	GDPGRD1	4.9289	2	0.085
lnMCD1	ERD4	16.989	2	0.000
lnMCD1	lnTVD1	10.903	2	0.004
lnMCD1	INF	5.0742	2	0.079
lnMCD1	lnFDIInfD1	3.0415	2	0.219
lnMCD1	STRD1	11.123	2	0.004
lnMCD1	ALL	37.866	12	0.000

lnTVD1	GDPGRD1	8.622	2	0.013
lnTVD1	ERD4	15.627	2	0.000
lnTVD1	lnMCD1	5.4758	2	0.065
lnTVD1	INF	14.694	2	0.001
lnTVD1	lnFDIInfD1	11.064	2	0.004
lnTVD1	STRD1	7.4155	2	0.025
lnTVD1	ALL	161.91	12	0.000
INF	GDPGRD1	51.509	2	0.000
INF	ERD4	.87649	2	0.645
INF	lnMCD1	21.573	2	0.000
INF	lnTVD1	4.1655	2	0.125
INF	lnFDIInfD1	44.028	2	0.000
INF	STRD1	19.608	2	0.000
INF	ALL	190.79	12	0.000
lnFDIInfD1	GDPGRD1	9.0171	2	0.011
lnFDIInfD1	ERD4	29.578	2	0.000
lnFDIInfD1	lnMCD1	47.281	2	0.000
lnFDIInfD1	lnTVD1	34.728	2	0.000
lnFDIInfD1	INF	1.5875	2	0.452
lnFDIInfD1	STRD1	14.972	2	0.001
lnFDIInfD1	ALL	134.11	12	0.000
STRD1	GDPGRD1	11.873	2	0.003
STRD1	ERD4	111.38	2	0.000
STRD1	lnMCD1	11.266	2	0.004
STRD1	lnTVD1	45.383	2	0.000
STRD1	INF	15.739	2	0.000
STRD1	lnFDIInfD1	12.302	2	0.002
STRD1	ALL	226.53	12	0.000