Stock market performance and economic growth Empirical Evidence from Kenya using Causality Test Approach

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Abstract

This study investigates the causal relationship between stock market performance and economic growth in Kenya for the period 2001-2010, using quarterly secondary data. The objective was to empirically analyze using the Granger causality test and establish the link between stock market performance and economic growth (i.e. whether stock market performance causes economic growth or itself is a consequence of increased economic activity). Although there are numerous empirical researches conducted with regard to the correlation between financial market and economic growth, majority of them have focused on the implication of banks and the credit markets on economic growth. No single research had constituted an in-depth study of the causal relationship between stock market performance and economic growth in Kenya before. The investigation of the causal relationship was conducted using the popular Granger causality test based on the Vector Autoregressive (VAR) model. The statistical techniques used include the unit root Augmented Dickey Fuller test in order to fulfill the objective

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of stationarity for all the time series in their levels and first differences. The Johansen co-integration test was used to investigate whether the variables are cointegrated of the same order taking into account the trace statistics and the maximum eigen-value tests. The variables were found to be cointegrated with at least one co-integrating vector. Finally, a Granger causality test was used in order to find the direction of causality between stock market performance and economic growth within the estimated model. The findings imply that the causality between economic growth and stock market runs unilaterally or entirely in one direction from the NSE 20-share index to the GDP. From the results, it was inferred that the movement of stock prices in the Nairobi stock exchange reflect the macro-economic condition of the country and can therefore be used to predict the future path of economic growth.

1 Introduction

1.1 Background of the Study

The stock market plays a major role as an economic institution which enhances the efficiency in capital formation and allocation. It enables both corporations and the government to raise long-term capital which enables them to finance new projects and expand other operations. In this manner, Alile [3] observed that the performance of the economy is boosted when capital is supplied to productive economic units. Furthermore, as economies continue to develop; additional funds are therefore needed to meet the rapid expansion and the stock market therefore serves as an appropriate tool in the mobilization and allocation of

savings among competing uses which are critical to the growth and efficiency of the economy. It is in this light that the stock exchange market acts as a barometer for economic performance in the sense that, it assists to allocate the necessary capital needed for the consistent growth of an economy. In a later study, Alile [2] further argued that the determination of the overall growth of an economy depends on how efficiently the stock market performs in its allocative functions of capital. When the stock market mobilizes savings, it simultaneously allocates a larger portion of the same to firms with relatively high prospects as indicated by their returns and level of risk. The significance of this function is that capital resources are channeled by the mechanism of the forces of demand and supply to those firms with relatively high and increasing productivity thus enhancing economic expansion and growth.

Stock markets are a vital component for economic development as they provide listed companies with a platform to raise long-term capital and also provide investors with a forum for investing their surplus funds. Stock markets therefore encourage investors with surplus funds to invest them in additional financial instruments that better matches their liquidity preferences and risk appetite. Better savings mobilization may increase the savings rate, and which in turn spurs investments and earns investment income to the owners of those funds. As economies develop, more funds are needed to meet the rapid development and the stock markets serve as a veritable tool in the mobilization and allocation of savings among competing uses which are critical to the growth and efficiency of the economy, [3]. Stock market liquidity again helps to reduce the downside risk and cost of investing in projects that do not pay-off for a longtime. With a liquid market, the initial investors do not lose access to their savings for the duration of their investment project because they can quickly and easily sell their stake in a company as noted by Bencivenga and Smith [6].

Again, the stock market being a major component in the financial sector of most developing economies such as Kenya, serves a pivotal role in contributing

towards economic growth in these countries. Stock markets fuel economic growth through diversification, mobilizing and pooling of savings from different investors and availing them to companies for optimal utilization. As much as the stock markets are important in facilitating privatization channels and diversification of the financial sector services, they also provide the listed companies with a platform to raise long-term capital, and also offer the investors alternative investments to put their funds in. However, they face serious constraints if not properly monitored and adequate measures taken to curb any externalities. Most stock markets especially those in the developing countries face constraints which result in serious implications such as (1) liquidity issues; (2) absence of activities and; (3) absence of well developed investor base.

The causality relationship between financial development with particular emphasis on stock market performance and economic growth can well be described as a hen and egg problem. This issue has stirred debates in academic circles and the controversy has arisen from the fact that the relationship between the two variables is dynamic in nature. A majority of researches done with regard to this area are mostly centered on the role of financial development in stimulating economic growth, without taking into account of the stock market performance and development. For a well developed stock market, it is expected to theoretically increase savings by enhancing the set of financial securities available to savers to diversify their portfolios thus reducing risks and effectively allocating capital to the productive units in an efficient manner. The outcome from this will be an increase in the rate of economic growth. The presence of well-functioning stock markets greatly helps in reducing the principal-agent problem and reducing information asymmetry and consequently boosting an efficient allocation of resources and growth. Levine and Zervos [37] and Pagano [54] concurred that although some analysts view stock markets in the developing countries as "casinos" that have little positive impact on economic growth; recent evidence suggests that stock markets may give a big boost to economic development. In

fact, the focus on stock markets as an engine of economic growth is a new opening in financial literature. Going further, its benefits had been largely ignored in the past, but now there is consensus concerning the positive effects brought about by stock markets.

However, if the capital market was to be sustained, there is a need to address issues such as promoting the right political climate, improving macroeconomic stability, professionalization of asset management business and privatization of the management of public funds. The media and other stakeholders also have a role to play in helping to educate the public on the stock markets and benefits they bring about to the growth and development of a country's economy. The logic behind this study is thus motivated by the need to establish the causal linkage between the stock market performance and long-run economic growth in Kenya. This is in light of the reasoning that, for a proper stock market to thrive the prevailing economic conditions must be favorable; and again in order for the economic growth to prosper, there ought to be a vibrant and liquid stock market that ameliorates the allocation of capital and consequently enhancing the prospect for a long-term economic growth.

1.2 Statement of the Problem

Stock market growth and development has been a topic of intensive theoretical and empirical studies such as: Demirguc-Kunt and Levine [16]; Levine and Zervos [37, 38]; Chen *et al* [11]. For instance, in the 1970s, various studies including Shaw [61] and McKinnon [45] in each of their separate studies observed that the development of financial market and systems was significantly correlated with the level of per capital income. As such therefore, the financial markets are instrumental in the advancement of macroeconomic development. This is evident whereby with a well-developed financial market, investors and corporations are provided with the necessary finances to fund their projects. For that reason, a well-

developed stock market should increase saving and efficiently allocate capital to productive investments, which leads to an increase in the rate of economic growth. However, the theoretical literature on the contrary offers conflicting predictions about the role of stock markets in promoting economic growth.

Various researchers and policy makers alike have focused a lot of attention trying to understand the various ways in which economic growth can be enhanced. The relevance of policy implications cannot be overlooked due to the fact that, supposing the financial market development and with particular regard to the stock market can be an engine for growth; then the policy makers should focus their attention and energies towards establishing and sustaining a dynamic stock market in order to foster a sound and continued economic growth. Much of the literature has emphasized greatly on the role of the banking sector as the only organized capital market in most developing countries, and neglecting the potential impact of stock markets in efficient capital allocation and risk sharing in a liberalized financial market. In an effort therefore to better understand the relationship between stock market development and economic growth, more and more case studies might better identify the causal linkage between stock market trends and economic growth [37]. The present research study therefore followed this line of thinking and examined the causality between stock market performance and the economic growth in Kenya. It was an attempt to study the relationship between stock market performance and economic growth. The study therefore sought to examine the presence of causal linkage if any, between the stock market performance and economic growth in Kenya.

1.3 Research Objectives

The general objective of this study was to analyze the correlation between the stock market performance and economic growth in Kenya. From the above outlined general objective, the specific objectives were as follows:

   i.   To investigate the presence of causal relationship between stock market performance and economic growth.

  ii.   To examine the direction of causal relationship between and stock market performance and economic growth (i.e. is it uni-directional or bi-directional).

2 Theoretical Literature

Rogers [58] noted that the importance of economic growth is not arguable and spans across disciplines affecting all areas of society directly and indirectly. In addition, macroeconomic policies on factors like interest rates and inflation rates assist in promoting economic growth and also equally important, are vehicles of economic growth such as the stock market. However, a basic proposition of growth theory is that, in order to sustain a positive growth rate of output per capita in the long run, there must be constant advances in technological knowledge in the form of new goods, new markets, or new processes. This proposition can be demonstrated using the neoclassical growth model developed by Solow [65], which explains that if there were no technological progress, then the effects of diminishing returns would finally cause economic growth to die down. One of the biggest challenges facing growth economists though, is to identify the fundamental driving forces of growth and explain the great variation in cross-country economic performance over time. Neither the neoclassical growth models nor the endogenous growth models have the ability to address adequately the phenomena of uneven development and persistent international inequality. Understanding the process of economic growth has therefore been termed the ultimate objective of economics and taking on such a quest requires a lot of dedication as even small insights along the way can have major benefits to millions of people, and small mistakes can do the reverse. Therefore, economies

which achieve large increases in output over extended periods of time, not only enable rapid increases in standards of living, but also have serious changes in the economic, political and social landscape of a nation.

Within the endogenous growth literature, Caporale *et al* [8] argued that, a number of theoretical studies have focused on the links between endogenous growth and financial markets. However, Bencivenga and Smith [6] and Levine [36] were among the first to propose endogenous growth models to identify the channels through which financial markets affect long-run economic growth. The two papers emphasized that financial markets help diversify agents' liquidity and investment risk, attract more savings into productive investment and prevent the premature withdrawal of physical capital invested in the long-term projects. Consequently, the existence of financial markets means that more capital can be kept in productive investments, which in the end raises the rate of economic growth.

King and Levine suggested another approach to identifying the channel of transmission between finance and growth, and in their model they pointed at innovation as the engine of growth, [33]. In this aspect, financial markets evaluate the potential innovative projects, finance the most promising ones and monitor the carrying out of investment. This way financial markets help in the function of efficient resource allocation. Therefore, an economy with proper functioning financial markets will experience a higher growth rate of productivity [15]. The link between macroeconomic fundamentals and the equity market is naturally appealing given the importance of macroeconomic variables in determining company cash flows and overall systematic. The dividend discount model (DDM) and the arbitrage pricing theory (APT), on the other hand provide important theoretical frameworks that show the channel through which the behavior of macroeconomic variables are factored into stock prices. These models predict that any anticipated or unanticipated arrival of new information about GDP, production, inflation, interest rates, exchange rates, etc, will alter stock

prices/returns through the impact on expected dividends, the discount rate or both [10].

The fact that expected dividends (or cash flow) and expected discount rate affect current stock prices/returns, it should be logical that the conditional variance of current returns will be a function of conditional variance of expected future cash flow and future discount rate [47, 39]. Chinzara [10] further argued that, since future corporate earnings and thus cash flows are related to the health of the macroeconomy, it is unsurprising that changes in uncertainty about the future behavior of macroeconomic fundamentals trigger proportional reaction in current volatility of stock returns, assuming a constant discount rate.

2.1 The Effects of Stock Market Performance on Economic Growth

One of the most important service institutions with a crucial importance in a modern economy is the stock exchange market. It is one of the hallmarks and facilitators of entrepreneurial progress. With the development and progress of the economy, the sizes of industrial enterprises tend to grow. This means that it is no longer possible to confine the forms of industrial organizations to proprietorships or even partnerships. The primary role that is played by the stock exchange market in Kenya as well as many more economies of the different countries of the world is fostering a thrift culture and saving. People have the incentive to save more and consume less due to the fact that there are credible institution(s) where these people can safely invest their money and earn a return. As such, the stock market assists in the transfer of savings to investment in productive enterprises as an alternative to keeping the savings idle. The outcome of this is that the investor can earn investment income from the savings converted into investments.

Levine and Zervos [38] argue in their work that well-developed stock

markets may be able to offer different kinds of financial services than banking systems and may, therefore, provide a different kind of impetus to investment and growth than the development of other sectors of the financial system such as the banking system. Specifically, they pointed out that an increase in the stock market capitalization, as measured either by the ratio of the stock market value to GDP or by the number of listed companies, may improve an economy's ability to mobilize capital and diversify risks. Again, Majid [42] contends that any well functioning financial sector channels limited resources from surplus units to deficit units and in so doing providing an efficient allocation of resources, thereby resulting in economic growth. In some of the earliest researches on the impact of the stock market performance on the overall macroeconomy, researchers such as Bagehot [4]; Hicks [27] asserted that the development of the financial sector helped to trigger industrialization in England by increasing the access of the people to funds, which in turn they used to finance and execute capital projects.

Much later studies have concluded that stock market performance and the financial market in general influences the rate of growth of the economy. Levine [36] argued that developed stock market reduces both liquidity shock and productivity shock of businesses. Likewise, Levine and Zervos [37], Khan and Senhadji [32] emphasized that the establishment of stock market has played a significant role in the development of banking institutions, particularly in emerging market economies. Accordingly, the authors believe that the development of the financial sector (and stock market in particular) contributes meaningfully to economic growth. Adjasi and Biekpe [1] concluded that stock exchanges enable firms to acquire capital quickly, due to the ease with which securities are traded. The stock exchange activity was noted to play an important role in helping to determine the effects of macroeconomic outcomes. Liquidity is another important indicator of stock market development in that it may be inversely related to transactions costs, which impede the efficient functioning of the stock markets. Liquidity may, as Levine and Zervos [38] observed,

demonstrate that various measures of equity market activity are positively correlated with measures of real activity, across different countries, and that the association is particularly strong for developing countries.

The provision of liquidity is another very important role played by any thriving stock market in a country's economy. In this way, the stock market provides investors with an efficient mechanism to liquidate their investments in securities as and when they want. The eventual benefit is that more people commit their funds into investment projects instead of holding the money idle and as a result boost the growth of the economy. Levine [36], Bencivenga and Smith [6] conformed to this in their studies that, market liquidity as the ability to trade equity easily plays a key role in economic growth. They asserted that the stock market provides assets to individuals with surplus with an opportunity to easily and readily liquidate these assets whenever they desired and at the same time granting firms a permanent access to capital. Mauro [43] demonstrates that stock market is a stable predetermining factor of economic growth in emerging economies. Hence, a robust stock market should therefore channel capital to competing users so that in general the economy gains the maximum output at the very least cost. Other empirical works as well continue to show largely some degree of positive relationship between stock markets and economic growth. For instance, in a study done by Rousseau and Wachtel using Granger causality techniques examined the link between financial markets and growth, analyzed 47 economies and reported that greater financial sector development leads to increased economic activity [59]. Other opinions held by many other researchers with regard as to the role played by stock market activity on economic growth include; Dailami and Aktin who concluded that any thriving, well developed and active stock market has the potential to alter the pattern of demand for money since booming stock markets create liquidity consequently spurring economic performance [13]. The effects of public policies on economic growth as observed by Mehr [46], one angle can be measured by the increase or decrease in stock

exchange market prices.

Stock markets have also been hailed with acting as absolute predictors for economic performance in a country. In this way, movements in share prices have been observed to play a significant role in directing economic activities in both the medium-term and long-term. For example, studies by Nasseh and Strauss [49]; and Adjasi and Biekpe [1] agree on that stock prices reflect the expectations of the public towards the future economic activity, and if for instance, a recession is expected, the stock prices will reflect this by decreasing in value whereas an increase in value may reflect the expectations towards future prospects in economic growth. However, not all researchers into the nature of relationship between economic performance and economic growth have cited a positive correlation between the two variables. For instance, Shleifer and Summers [62] pointed out strongly that the development of stock exchange markets can be detrimental to economic growth by encouraging counterproductive corporate takeovers. Other authors such as Mayer [44] and Stiglitz [66] postulated that stock markets only promote short-term profits and that they do not accord to the corporate managers a chance to focus on the long-term prospects, which is on investment – a key factor to economic growth and development.

2.2   The Impact of Economic Growth on Stock Market Performance

Financial development has been observed to follow economic growth in numerous other studies. For instance, Ibrahim [29] found that macroeconomic forces have systematic influences on the prices of stocks through their influences on expected future cash flows. The relationship between stock prices and macroeconomic variables therefore, has been predominantly investigated assuming that macroeconomic fluctuations are influential on stock prices through

their effect on future cash flows and the rate at which they are discounted [11, 22]. For instance, Singh suggested that stock markets do not in any way lead to long-run economic growth due to macroeconomic instability, volatility and arbitrariness of pricing process; and that instead the macroeconomic activities have an upper hand in the interaction between the two variables [64]. The nature of the economy therefore plays a prominent role in determination of stock prices and a complex set of factors are seen to influence the movement of prices at the stock market. However, even if an economic report is negative, the outcome of the stock market and the financial markets in general may occasionally rise making the stock market perhaps one of the most dynamic components of the world market, alongside other components such as Foreign Exchange market. Charkavarty also noted that stock exchange prices are highly sensitive to some fundamental macroeconomic indicators [9]. It is also noted that as the economy expands, the demand for certain financial instruments increases, leading to the growth of these services and the end result is that the developments in macroeconomic activity influences the stock market performance. An example of such work is [50], in which the authors studied the relationship in Belgium and established that growth in GDP caused stock market development.

The stock market can be vibrant especially with regard to any prospects for potentially positive returns, but generally stock prices and the stock market in general are very volatile. However, it would be wrong to attribute the causes to stock market movements to just the macroeconomic forces, because the financial markets are undisputedly known to be very prone to "noisy" and irrational behavior. The prices of stocks may also move up and down due to other factors such as investors' perception about the prospects of an individual company, the industry in which it operates. The movement in the price of stocks is also directly affected by the mechanisms of demand and supply in the market. For instance, when more consumers purchase a particular type of stock, its price will consequently increase; and when more traders sell off a stock, its price will tend to

fall. This shows the dynamic effects that the forces of demand and supply have on the performance of the stock exchange market.

Dynamic linkages exist between stock markets and macroeconomic variables, but such linkages have been investigated extensively only for the developed markets by authors such as Lee [34]. This leaves the dynamic linkages in the emerging markets and the less developed countries much more ignored, with only a few exceptions. Reason cited by authors such as Bekaert and Harvey [5] and Muradoglu *et al* [48] for the lack of extensive literature for the developing economies includes the overwhelming influence of governments in economic activity, and that most of the stock markets are at their infancy stages therefore the volume of trade is low, and company-specific information is not always timely or of high quality. This therefore leaves the stock markets more prone to influences from economic policy, but the relationship is assumed to be unidirectional from macroeconomic variables to stock returns.

In their book, Howells and Keith [26] argue that, equity prices just like the price of all assets will respond to changes in interest rates. That is to mean, if the Central Bank raises the interest rates, for instance, the rate available on the risk-free assets goes up and if more can be earned on risk-free assets, then the holders of risky shares will want a higher return as well. The share prices will also fall if the equity market as a whole becomes more risk averse and demand a higher premium for any level of risk. Ehrmann and Fratzscher pointed out that, more research is needed to understand why individual stocks react so differently to some macroeconomic factors such as monetary policy shocks which are cited as being a driving force behind their reaction with stock market prices [19]. In another study, Bernanke and Kuttner concluded that very little of the market's reaction can be attributed to the effect of monetary policy on the real rates of interest [7]. Robinson argued that the financial system does not spur economic growth [57]; and that, instead financial development simply responds to developments in the real sector. Thus, many influential economists give a very

minor role, if any, to the role of financial system, particularly the stock market in economic growth.

2.3 The Feedback Effect between Stock Performance and Economic Growth

In a study involving 10 developing countries, Luintel and Khan reported to have found a bi-directional causality/feedback effect between financial development and economic growth in all the countries they studied [40]. Hongbin [28] in his study concluded that there exists a two-way causality between China's stock market development and economic growth, that is, economic growth can not only promote the development of the stock market, but also the stock market development similarly pushes economic growth. He cited that, although the impact of stock market is more limited in the short-term, it tends to be significant in the long-term. The study proposed that since the stock market plays the function of national economy 'barometer' it needed to be further strengthened. In a much more recent study, Dawson contends that there exists a bi-directional causality, from finance and economic development, and from economic development to finance [14]. Therefore, a country with a well developed financial system can promote high economic expansion through technological changes, products and services innovation. This would in turn create a high demand for the financial institutions, and as the financial institutions effectively respond to this demand, these changes will stimulate higher economic achievement. Both financial and economic developments are therefore positively interdependent and their relationship could lead to bi-directional causality according to Majid [42].

Garcia and Liu [23] observed that a reciprocal relationship between financial system development and economic growth exists whereby economic growth makes the development of financial intermediation system profitable, and the

establishment of an efficient financial system permits faster economic growth. The researchers stressed that the financial and real sectors interact during all stages of development and that there is; at no stage, only a one-way relationship between financial development and economic growth prevails. Chen *et al* [11] made an observation that no satisfactory theory would argue that the relation between financial markets and the macroeconomy is entirely in one direction. Furthermore, stock prices are usually considered as responding to external forces (even though they may have a feedback on the other variables). They further stated that all economic variables are endogenous in some ultimate sense and only natural forces such as supernovas, earthquakes etc are truly exogenous to the world economy, and that to base an asset pricing model on these systematic physical factors was beyond human capabilities. More and more authors therefore, prefer describing the relationship as a two-way causation or uni-directional relationship or the feedback effect, and in these studies, they do not always establish the direction of the causality between these two variables, and those that do seek to identify the direction of the causality often lead to ambiguous conclusions.

2.4 Related Empirical Literature

Various studies have tried to study the nature of relationship that exists between stock market development and the economic trends persisting in a country. Such studies include Demirguc-Kunt and Levine [16]; Levine and Zervos [38]. These researchers investigated: (1) the consistency of stock market development with economic growth, and (2) the harmonious nature of stock market development with financial intermediaries, with some empirical demonstration. Their main findings and outcomes were as follows: (i) they carried out cross-country growth regressions that suggested that the predetermined component of stock market development was positively and robustly associated with long-run growth. (ii) From the cross-country analysis, they found out that the

level of stock market development is positively correlated with the development of financial intermediaries and consequently economic growth. (iii) While stock market development induces the substitution of equity finance for debt finance in developed countries, it facilitates more debt finance in least developed countries. Hence, their hypothesis deserves an investigation in the Kenyan context, which this study intends to carry out in order to fill the knowledge gap.

In a study on emerging stock markets performance and economic growth, Seyyed [60] presented a systematic investigation of the relationship between the two variables within the Vector Autoregressive (VAR) model and deduced that macroeconomic activity was a main cause for the movement of stock prices in the long run and that the stock market also plays a role as a leading economic indicator of future economic growth in Iran in the short run i.e. a two-way causality running between share prices and economic growth in the short run. Seyyed [60], for example, attempted to study the important role played by the Karachi Stock market in the economic development of Pakistan, and they used the Granger's causality test and arrived at the conclusion that no causal relationship existed between macro-economic indicators and stock exchange prices in Pakistan. They stated that the performance of macro-economic indicators cannot be used to predict stock prices; and again the stock prices in Pakistan do not reflect the macro-economic condition of the country.
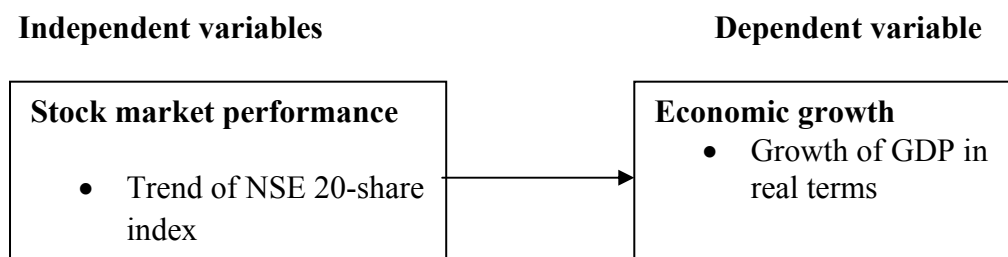
From closer home, Nurudeen [53] carried out a research on whether stock market development raises economic growth in Nigeria, by employing the error correction approach and the results indicated that stock market development (market capitalization-GDP ratio) increased economic growth in Nigeria. The study also made recommendations such as the removal of impediments to stock market development which include tax, legal, and regulatory barriers; and the employment of policies that would increase the productivity and efficiency of firms as well encourage them to access capital on the stock market and also enhance the capacity of the Nigeria Security and Exchange Commission so as to

facilitate the growth of the stock market, restore the confidence of stock market participants and safeguard the interest of shareholders by checking sharp practices of market operators (particularly speculators). Vazakidis [67] carried out a study on stock market development and economic growth in France with an attempt to investigate the causal relationship between stock market development and economic growth for the period 1965-2007, using a VAR framework. The results of the study confirmed that economic growth causes stock market development in France, and consequently therefore economic growth has a positive effect on stock market.

Levine and Zervos [37], examined the nature of links between stock markets, banks and income growth, on a cross-country study consisting of 47 countries and the results showed that the size of both stock markets and banks were correlated with the future economic growth. The study identified and stated that the problems with endogeneity of the variables were perhaps even more severe with stock market variables: where the market capitalization represents the present value of future earnings, and so there is most likely a positive correlation between market capitalization and expected economic performance.

2.5 Conceptual Framework

The conceptual framework as brought out from the literature review in this study is illustrated in the figure below.

Independent variables   **Dependent variable**

Stock market performance • Trend of NSE 20-share index	→	**Economic growth** • Growth of GDP in real terms

3 Research design

This study adopted a causal relationship research design to investigate the causal relationship between the stock market performance and economic growth in Kenya. This enabled the researcher to understand how one variable under study affected, or was responsible for changes in another variable. Causal research design was chosen because in business research, the cause-effect relationship is less explicit. Cooper and Pamela [12] pointed out that, use of a causal research design eases the understanding, explanation, prediction and control of any relationship between variables under study.

3.1 Target Population

The population of this study was all quoted companies at the Nairobi stock exchange. On the other hand, the performance of the overall economy was targeted and measured by the growth in GDP, a leading indicator about the health of our economy.

3.2 Sampling and Sample Design

This study utilized a purposive sampling by employing the most recent data series on the variables under investigation to meet the objectives of the study.

3.3 Data collection

In order to fulfill the objectives of this study, a data collection guide was used to capture the required data. The study wholly depended on the use of quarterly secondary data from the first quarter of 2001 to the last quarter of 2010

due to non-availability of reliable data on the stock market before 2001. The NSE 20-share index was chosen as a proxy for the stock market because it is able to measure price movements in selected, relatively stable and best performing 20 listed companies at the bourse. Another benefit of the index was that it is based on a geometric mean of average prices of the constituent companies which are equally weighted, and that it is reviewed periodically to ensure that it reflects an accurate picture of market performance. GDP was picked as the preferred macroeconomic indicator because it's widely used by economists and policy makers alike to gauge the health of an economy, and on this account its variations are also relatively and quickly identified. The GDP and consumer price index (CPI) rates were collected from published economic reports, the annual Statistical abstracts published by the Kenya National Bureau of Statistics. On the other hand, the NSE 20-share index was obtained from the Nairobi stock exchange.

3.4 Data Processing and Pre-estimation Diagnostics

The data used in this study was in logged form, and hence changed in to natural logarithms in order to improve its interpretability, and consequently the statistical analysis.

3.4.1 Test for Stationarity

In order to avoid the possibility of biased results emanating from a likely existence of unit roots in the variables under study, the researcher performed stationarity using the ADF (Augmented Dickey Fuller) test procedure.

3.4.2 Testing for Cointegration

To perform this, the Johansen-Juselius test procedure was used to test for the possibility of a long-run equilibrium relationship among the variables under

examination. This way, the researcher was able to analyze whether the time series under study share a common stochastic drift or not.

3.4.3 Testing for the Causality

The Granger-causality test was also used to investigate direction of causation between stock market performance and economic growth. The outcome from the Granger-causality test was used to determine whether the variables under study can be used to predict each other or not. At the same time, the variables used in the granger-causality test were all assumed to be stationary i.e. *I(0)* process.

3.5 Model Specification

The study employed a vector autoregressive (VAR) model to estimate and provide empirical evidence on the nature of causal relationship between the NSE 20-share index and growth in GDP. The VAR model provided a systematic way to capture rich dynamics between the variables under study. Sims [63] argued that VAR held out the promise of providing a coherent and credible approach to data description, forecasting, structural inference and policy analysis. VARs have proven to be powerful and reliable tools because VARs involve current and lagged values of multiple time series, and their ability to capture co-movements that cannot be detected in univariate or bivariate models. Furthermore, standard VAR summary statistics like Granger-causality test and variance decompositions are well-accepted and widely used methods for portraying these co-movements.

The final form VAR specification model was therefore be given as:

GDP = f(INDEX, CPI)

$$LGDP_t = \beta_i \, LGDP_{t-i} + \beta_j \, LINDEX_{t-j} + \beta_k \, LCPI_{t-k} + \varepsilon_t \tag{1}$$

whereby:

L – logarithm

INDEX – stock market index (NSE 20-share index)

GDP – rate of growth in real GDP

CPI – Consumer price index

ε – error term

3.6 Data analysis Methods

In the study, the VAR model for analyzing the causal linkage between stock market performance and economic growth used by Mahdavi and Sohrabian [41] was adopted in the empirical analysis so as to estimate the variable in the model using the VAR model. In order to estimate the parameters of the model using the VAR model, the equation was linearized by taking the logarithms of the variables in the model. Even though the study adopted the model used by Mahdavi and Sohrabian [41], this study differed from their study in some dimensions. First, this study used data of since 2001 - 2010. Second, the perspective of this study was limited to Kenya while the other study was carried out in the United States. Finally, this study considered stationarity of a time series data. The hypotheses of the study were tested by determining the significance of the regression coefficients of the VAR equations that was estimated and by determining whether the relevant regression coefficients are equal to one. In order to determine whether the coefficient was statistically different from one and thus reject the null hypotheses, the p-value was used. Again, Cooper and Pamela [12], pointed that the p-value is the probability of observing a sample value as extreme as, or more extreme than, the value actually observed, given that the null hypothesis is true. The p-value is compared to the significance level (α), and hence on this basis the null hypothesis is either rejected or not rejected. If the p-value is less than the significance level, the null hypothesis is rejected (if p-value α, reject the null). If p-value is greater than or equal to the significance level, the null hypothesis is not rejected (if p-

value $\geq \alpha$, don't reject the null).

4 Causal Relationship between Stock Market and Economic Growth

This chapter presents the trends of the variables adopted in the study in chart form. It also contains time series results for model estimation. N'Zue [51] argues that, time series or panel data are more suited to addressing the relationship between economic growth and stock market performance because their regression is able to capture the specificity of an individual country. Further usefulness is that it allows us to capture the unique characteristics and point out specific indicators in a given country that impact strongly on economic growth, thereby boosting economic policy.

The tool used to determine the causal relationship between stock market performance and economic growth includes descriptive statistics, the unit root Augmented Dickey Fuller (ADF) test proposed by Dickey and Fuller [17, 18]; Johansen's [30] cointegration test and Granger-causality test proposed by Granger [25]; Engle and Granger [20]. However, in order to produce dynamic results, after the researcher finds the variables under study to be cointegrated, we shall conduct a Vector Error Correction Model which is marginally superior to an unrestricted VAR and much better in predicting the short-run as well as the long-run dynamics between stock market performance and economic growth.

Statistical characteristics of all the variables are shown as Table 1. These variables are the real gross domestic product (GDP), the Nairobi stock market 20-share index (Index) and the consumer price index (CPI). Statistically, this study employed the Jarque-Bera test to test for normality in the time series data variables used. The researcher set the hypothesis below:

H_0: JB=0   (normally distributed)

H_1: JB$\neq$0   (not normally distributed)

The Jarque-Bera (JB) test statistic is used to test whether stock market performance and economic growth individually follow the normal probability distribution. The JB test of normality is an asymptotic, or large-sample, test that computes the skewness and kurtosis measures and uses the following test statistic:

$$JB = n [S^2 /6 + (K-3)^2 /24]$$

Where n = sample size, S = skewness coefficient, and K = kurtosis coefficient. For a normally distributed variable, S = 0 and K = 3. Therefore, the JB test of normality is a test of the joint hypothesis that S and K are 0 and 3 respectively. We conclude that all the variables are normally distributed i.e. No evidence against the null hypothesis and the data appears to be consistent with the null hypothesis.

Table 1: Descriptive Statistics

	LN_REALGDP	LN_INDEX	LN_CPI
Mean	12.61847	8.001449	4.826779
Median	12.61353	8.092825	4.786024
Maximum	12.86456	8.638641	5.167472
Minimum	12.40843	6.950240	4.586605
Std. Dev.	0.13771	0.497673	0.195770
Skewness	0.03699	-0.693701	0.465458
Kurtosis	1.70523	2.297308	1.818593
Jarque-Bera	2.80316*	4.031105*	3.770542*
Probability	0.24621	0.133247	0.151788
Observations	40	40	40

*insignificant at 5% level

4.1 Test for Stationarity

An important concern in data analysis is to know whether a series is stationary (do not contain a unit root) or not stationary (contains a unit root). This concern is important because you want both the left hand side and right-hand side variables of your regressions to balance. Time series data are often assumed to be non-stationary and thus it is necessary to perform a pretest to ensure there is a stationary co-integrating relationship among the variables in order to avoid the problem of spurious regression.

Spurious regression is cited in [55], to exist where the test statistics show a significant relationship between variables in the regression model even though no such relationship exists between them. Therefore, in order to address the issue of non-stationarity and avoid the problem of spurious regression, we employ a quantitative analysis. For the testing of unit roots, the Augmented Dickey-Fuller test (ADF) was used.

Augmented Dickey-Fuller (ADF) test has been carried out which is the modified version of Dickey-Fuller (DF) test. ADF makes a parametric correction in the original DF test for higher-order correlation by assuming that the series follows an AR (p) process. The ADF approach controls for higher-order correlation by adding lagged difference terms of the dependent variable to the right-hand side of the regression. The Augmented Dickey-Fuller (ADF) test is specified here as follows:

$$\Delta Y_t = b_0 + \beta Y_{t-1} + \mu_1 Y_{t-1} + \mu_2 Y_{t-2} + \ldots\ldots + \mu_p Y_{t-p} + \varepsilon_t \qquad (2)$$

where, Yt represents time series to be tested, b_0 is the intercept term, β is the coefficient of interest in the unit root test, μ_i is the parameter of the augmented lagged first difference of Y_t to represent the pth-order autoregressive process, and ε_t is the white noise error term. In carrying out the unit root test, we seek to test the following hypothesis:

H_0: α=0   (non stationary)

H_1: $\alpha \neq 0$ (stationary)

If the null hypothesis is rejected, this means that the time series data is stationary. The decision criteria involve comparing the computed Tau values with the MacKinnon critical values for the rejection of a hypothesis for a unit root. If the computed tau (ADF) statistic is less negative (i.e. lies to the right of the MacKinnon critical values) relative to the critical values, we do not reject the null hypothesis of non-stationarity in time series variables.

Table 2: Results of Augmented Dickey Fuller (ADF) stationarity test at level
          ADF Test at Level (Trend and Intercept)

Variable	ADF Statistic	Critical value	DW	Lag	Inference
LReal GDP	-2.953285	-3.548490	2.127005	5	I(1)
LIndex	-2.095760	-3.536601	2.008872	2	I(1)
LCPI	-2.246757	-3.533083	1.988510	1	I(1)

On application of the ADF test, on the level series none of the three variables understudy: namely log of real GDP, log of Index and the log of CPI, is stationary (they all contain a unit root) as indicated by the fact that their respective critical values are all smaller (in absolute terms) than the calculated ADF statistics and hence we do not reject the null hypothesis: that the time series data variables are non-stationary.

In Table 3 above and after the application of the ADF test on the first difference series, the computed Tau (ADF) Statistics are more negative than the MacKinnon critical Tau values; we therefore reject the null hypothesis that the time series data variables are non-stationary (have a unit root). The time series exhibit difference stationarity (i.e. stationary at first difference).

Table 3: Results of Augmented Dickey Fuller (ADF) stationarity test at level
ADF Test at First difference (Trend and Intercept)

Variable	ADF Statistic	Critical value	DW	Lag	Inference
ΔLReal GDP	-6.710937	-3.533083	2.128751	0	I(0)
ΔLIndex	-4.267994	-3.533083	2.165274	0	I(0)
ΔLCPI	-5.293770	-3.533083	1.954954	0	I(0)

"**Δ**" denotes the first difference.

4.2 Testing for Cointegration

Once a unit root has been confirmed for a data series, there arises a question whether there is any possibility for the existence of a long-run equilibrium relationship among a given set of variables. Granger [25], states that a test for cointegration can be thought of as a pre-test to avoid spurious regression situations. In this study and in order to test for the co-integrating relationship between the variables under study, the general to specific approach was taken to search for a suitable lag length. Vazakidis [67] stated that it is well known that Johansen's cointegration tests are very sensitive to the choice of lag length. Since it has been determined in the unit root test that the variables under examination are integrated of order 1, the cointegration test is performed. Cointegration analysis is therefore used to investigate the long-term relationship between stock market performance and economic growth. Enders (2004) noted that, any equilibrium relationship among a set of variables implies that their stochastic trends must be linked. The testing hypothesis is the null of non-cointegration against the alternative that is the existence of cointegration relationship.

To conduct cointegration test, this study uses the method developed by Johansen and Juselius [31]. The Johansen-Juselius test gives better results and test cointegration by applying maximum likelihood estimation procedure. Furthermore, the test procedure is based on the VAR model. However, prior to the

application of the VAR model the selection lag is important as the Johansen's co-integration tests are very sensitive to the choice of lag an optimal lag length. The Akaike information criteria (AIC) and the Schwartz information criteria (SIC) are used to select the number of lags required in the cointegration test. Using individual significance, a lag length of $k = 1$ is suggested based on these criteria's.

Table 4: Johansen co-integration tests (LrealGDP, LIndex, LCPI)

Johansen test statics				
Testing Hypothesis	Trace value	Critical value [prob]**	Max-Eigen value	Critical value [prob]**
None*	49.87299	29.79707 [0.0001]	42.83322	21.13162 [0.0000]
At most 1	7.039773	15.49471 [0.5730]	6.953404	14.26460 [0.4947]
At most 2	0.086370	3.841466 [0.7688]	0.086370	3.841466 [0.7688]

* Denotes rejection of the null hypothesis at the 5% level. Figures in parentheses are the
   MacKinnon-Haug-Michelis p-values, [45].

The results of the Johansen's cointegration test as shown in the Table 4, above uses two test statistics namely the trace statistics and the maximum eigen-value proposed by Johansen and Juselius [31]. Firstly, the trace statistic tests the null hypothesis that the number of characteristic roots (i.e. the testing hypothesis) is less than or equal to r, (where r is 0, 1 or 2) against the general alternative hypothesis. From the table, the trace statistic is small when the values of the characteristic roots are closer to zero (and its value will be large in relation to the values of the characteristic roots which are further from zero). The other test, the maximum eigen-value is an alternative test statistic which tests the null hypothesis that the number of r co-integrated vectors is r against the alternative of (r+1) co-integrated vectors. (i.e. the null hypothesis r = 0 is tested against the alternative that r = 1; r = 1 against the alternative r = 2 etc). If the estimated value of the

characteristic root is found to be close to zero, then the maximum eigen-value will be small.

The cointegration results in Table 4 above suggest the existence of one co-integrating vector as the trace statistics rejects the null hypothesis of no co-integrating vector at 5 percent significant level and accept the alternate hypothesis of more than zero co-integrating vectors. Similarly, the maximum eigenvalue rejects the null hypothesis of r = 0 co-integrating vector at 5 percent significant level and accepts the alternate hypothesis of one co-integrating vector. Therefore, since both test statistics suggest the presence of one co-integrating vector, we can conclude that the variables are cointegrated and follow long-run equilibrium relationship. Engle and Granger [20] stated that the evidence of cointegration rules out spurious correlation and suggests the presence of at least one direction(s) of Granger causality.

4.3 Testing for the Causality

Granger [25] proposed that if causal relationship exists between variables, these variables can be used to predict each other. The author pointed out that in causality approach, a variable say Y, is caused by X if Y can be predicted better from past values of Y and X than from past values of Y alone. The causality test helps to ascertain whether a uni-directional or bi-directional (feedback) relationship exists between economic growth and stock market performance. To achieve this, we employed the granger-causality statistic to test the statistical causality between the stock market performance and economic growth as well as to determine the predictive content of one variable beyond that inherent in the explanatory variable itself. The researcher's choice for the granger procedure is because it consists the more powerful and simpler way of testing causal relationship. In order to carry out the Granger causality test, the following bi-

variate model is estimated:

$$\text{rGDP}_\mathbf{t} = \beta_\mathbf{0} + \sum_{k=1}^{M} \beta_\mathbf{k}\, \text{rGDP}_\mathbf{t-k} + \sum_{l=1}^{N} \alpha_\mathbf{l}\, \text{Index}_\mathbf{t-l} + u_\mathbf{t} \qquad\qquad (3)$$

$$\text{Index}_\mathbf{t} = \gamma_\mathbf{0} + \sum_{k=1}^{M} \delta_\mathbf{k}\, \text{Index}_\mathbf{t-k} + \sum_{l=1}^{N} \gamma_\mathbf{1}\, \text{rGDP}_\mathbf{t-l} + v_\mathbf{t} \qquad\qquad (4)$$

where:

$\text{rGDP}_\mathbf{t}$ = the dependent in Equation (3) above

$\text{Index}_\mathbf{t}$ = the explanatory variable

$u_\mathbf{t}$ and $v_\mathbf{t}$ = mutually uncorrelated error terms (i.e. zero mean white noise error terms)

$\text{Index}_\mathbf{t}$ = the dependent in Equation (4) above

$\text{rGDP}_\mathbf{t}$ = the explanatory variable

'k' and 'l' = the number of lags

The null hypothesis is $\alpha_\mathbf{l} = 0$ for all l's and $\delta_\mathbf{k} = 0$ for all k's versus the alternative hypothesis that $\alpha_\mathbf{l} \neq 0$ and $\delta_\mathbf{k} \neq 0$ for at least some of the l's and k's. If the coefficients $\alpha_\mathbf{l}$'s are statistically significant but $\delta_\mathbf{k}$'s are not, then stock market performance granger causes economic growth. In the reverse case, economic growth granger causes stock market performance. If both $\alpha_\mathbf{l}$ and $\delta_\mathbf{k}$ are significant, then causality runs both ways.

Figures in parentheses are the probability levels; The decision rule of the causality test states that if the probability value of the estimate is higher than the 10 percent (0.1) level of significance, we do not reject the null hypothesis, and vice versa.

C.J. Granger [25] proposed that if causal relationship exists between variables, they can be used to predict each other. Results from Granger causality test are given in Table 5 above. The results show Granger causality between LN_INDEX and LN_GDP in only one direction, no Granger causality between LN_GDP and LN_INDEX; no Granger causality between LN_CPI and LN_GDP, but Granger

causality runs from LN_GDP to LN_CPI; no Granger causality is exhibited from LN_INDEX to LN_CPI, but there is Granger causality between LN_CPI and LN_INDEX. Overall, the study found no bi-directional Granger causality between stock market performance and economic growth. This is from the fact that, based on the probability values reported in Table 5: LN_INDEX does not Granger cause LN_GDP can be rejected, but the hypothesis that LN_GDP does not Granger cause LN_INDEX cannot be rejected. This shows the Granger causality to run in one way from LN_INDEX to LN_GDP but not the other way.

Table 5: Granger Causality Tests

Null Hypothesis	F-Statistic	Causal Inference
LN_INDEX does not Granger Cause LN_REALGDP	8.43540 (0.00015)	Causality
LN_REALGDP does not Granger Cause LN_INDEX	0.47706 (0.75221)	No causality
LN_CPI does not Granger Cause LN_REALGDP	0.23337 (0.91713)	No causality
LN_REALGDP does not Granger Cause LN_CPI	2.82429 (0.04447)	Causality
LN_CPI does not Granger Cause LN_INDEX	0.21900 (0.092551)	Causality
LN_INDEX does not Granger Cause LN_CPI	0.97296 (0.43854)	No Causality

4.4 Discussion of results

Since no autocorrelation is detected based on the Durbin-Watson statistic, the values of the p-value, which are used to test the significance of the results

obtained are more reliable. At 5 percent level of significance, the results show a significant positive effect on economic growth. A 1 percent increase in the stock market index raises economic growth by approximately 0.083 percentage. The explanatory power of the model (as measured by R2) corresponding to the optimal lag lengths m = 2, is within the acceptable range at 0.9048. In the estimation, all the lagged values of LINDEX (proxy for stock market performance) have a positive sign and all of them are statistically significant. The SIC determined lag length for the variable LINDEX OF four lags is quite consistent with the real world practical observations. As a result, the p-value statistic (measured at the 5 percent significance) associated with the Granger causality results allows us to reject the hypothesis that there is no causal relationship stock market performance and economic growth (LINDEX and LrealGDP). This findings lead to the conclusion of our second hypothesis where we detect a causal influence running from the LINDEX to LrealGDP. Again, we reject the null hypothesis that, there is no uni-directional causal link between stock market performance and economic growth. These findings are compatible with the forward-looking nature of the stock market as documented in a study by Fama [22].

4.5 Stock Market and the Economy

This research has empirically examined the long-run relationship between NSE 20-share index and growth in real GDP in terms of interdependency and causality. The findings arrived at is, there exists no causal influence from the past values of the stock market index showing that Nairobi stock exchange is a forward-looking stock market. This outcome is coherent with Fama [22]; an earlier study on stock returns who argued that stock returns are affected by the future values of real variables examined but are never led by them. The implication from the results is that, the Nairobi stock exchange market needs to be recognized and enhanced as an important engine for economic growth. As a

catalyst for economic growth, the bourse should be integral into the entire economic system and utmost consideration should be made whenever any economic policies are being drawn.

Among them would be to ensure that the capital markets authority properly plays its roles towards pushing for the stock market growth and development and efficiency of trading systems in order to boost the confidence in the market. Further to domestic participation, allowing more foreigners to buy domestic stocks may be beneficial as it increases international scrutiny and raises pressure for performance. Thus, the level of performance in the NSE is a good predictor of long-run rates of economic growth, capital accumulation and productivity improvements. The theoretical academic viewpoint provides conflicting aspects for the causal influence between stock market and economic growth. However, few empirical studies have concentrated on analyzing the reverse relationship. Nevertheless, the achievement of a rapid economic growth is one of the most distinctive features of a successful economy as well as any thriving stock market. Given the macroeconomic and political environments affect market liquidity, the policy makers should attempt to enhance the confidence with which investors can buy and sell their shares and this would go a long way to realize many gains in the stock market and financial system as a whole.

4.6 Direction of Causal Relationship between Stock Market Performance and Economic Growth

The other research objective was to investigate the direction of influence between the variables under study. Hence, Granger Causality test was applied to the two variables, which proved unidirectional (one-way) causality running from stock market performance to economic growth, that is, a rise in NSE 20-share index causes an increase in real GDP but the reverse was not found to be true.

Given the empirical results reported earlier in this study, many policy implications can be drawn. Among them, since the stock market performance (captured by NSE 20-share index) has a statistically positive influence on economic growth; this implies that a higher stock index predicts a higher economic growth rate. This recognizes the importance of the stock market as a component of the financial system in the process of economic growth. In spite of the dominating role of agriculture on the Kenyan economy, the findings from this study emphasize the role of the NSE in directing economic growth.

However, supposing the outcome of the empirical results exhibited a two-way (bi-directional) causality between stock market performance and economic growth; this would mean that not only does the Nairobi stock exchange boost economic growth, but economic growth also promotes stock market performance. The implication of a two-way causality would be where besides the stock market facilitating the allocation of capital, the government has also invested in the development of necessary infrastructure in the country including roads, energy, telecommunications which in turn nurture the growth of firms and consequently increasing productivity as well as the returns to those businesses thereby boosting the stock returns.

5 Summary of findings

The main objective of this research study was to test the direction of causality between stock market performance and economic growth for Kenya. The technique employed was the Granger Causality Test approach. It was envisaged that there were four probable results: (a) stock market performance driving economic growth; (b) economic growth driving stock market performance; (c) the bi-directional causal link and finally, (d) the absence of any causal link.The NSE 20-share index showed fluctuation over the quarterly periods in the years under

study with the lowest figure at 1043.4 points recorded in the third quarter of 2002. The highest figure for NSE 20-share index was recorded in the last quarter of 2006 at 5645.65. For the real GDP, 386372.00 was the highest recorded during the last quarter of 2010. The lowest figure of real output in terms of GDP was 244856.00 in the first quarter of 2001. The GDP figures depict a variable that oscillates from time to time. Again, during the period under study, the Nairobi stock exchange performance reached to its life high in terms of the NSE 20-share index. The real GDP rates showed high fluctuation and high volatility in general.

The empirical results of the Granger causality test, conducted here support the view of presence of a causal link between stock market performance and economic growth. One of the reasons for using the Granger causality test was to compare the result with that of Mahdavi and Sohrabian [41]'s who did a time series study in the United States. They used the Granger causality test and their findings were that while the rate of growth of a stock price index Granger-caused the rate of growth of the macroeconomy no reverse causation was observed. They also pointed further that variations in stock prices can be relied upon as a leading indicator of fluctuations in aggregate output. The Nairobi stock exchange is seen to give lenders of capital an immediate access to their funds while simultaneously offering borrowers a long-term supply of capital. In doing this, the stock market facilitates diversification thus allowing the economy to invest in relatively more risky assets. Again, investors facing liquidity shocks may be forced to withdraw funds invested in long-term investment projects were it not for the existence of a proper functioning stock market. Thus, the Nairobi stock exchange is seen to spur economic growth in Kenya.

5.1 Conclusion

From the findings of the study, it can be concluded that there is a one-way causality running between stock market performance and economic growth is established. This means that the present value of a stock today is the discounted

sum of the expected future cash flows (dividends and capital gain). As such, today's stock values therefore reflect the expected future dividends, and the NSE 20-share index might be therefore used to forecast the future economic activity. An increase in the Nairobi stock exchange's NSE 20-share index today potentially signals the market's expectation of higher dividends, corporate profits and in turn a higher economic growth. This agrees with the findings of Mahdavi and Sohrabian [41] who found that there was existence of an asymmetric causal relationship (in the Granger sense) between the two variables: while the rate of growth of a stock price index Granger-caused the rate of growth of the Unites States economy with no reverse causation was noted. Seyyed [60] stated as a possible explanation for why stock prices Granger cause economic activity is the wealth effect whereby fluctuations in stock prices through the change in wealth level, gives rise to change in aggregate consumption and aggregate demand. In this way, the level of economic activities is affected by fluctuations in the stock market.

The findings from this study are consistent with other studies as discussed earlier and although matters of economic growth are important in the expectations and decisions of investors in the stock market, the role played by the Nairobi stock exchange market cannot be overlooked. These findings are consistent with existing theoretical underpinnings as illustrated by the rational hypothesis and wealth effect. More so, the results justify the leading role of the stock market in determining economic activities even in a developing economy like Kenya, which has a relatively small capital market, although its bigger than all our immediate neighbors. This therefore shows the immense potential that the Nairobi stock exchange may have towards fostering the country's economy should the Kenyan government promote a saving culture and consequently improve investments income of the populace through appropriate policies. In spite of the dominating role of the banking sector in the Kenyan economy, the findings from this study emphasize on the role of the Nairobi stock exchange in directing economic

growth, and hence the NSE is has been found to be a leading indicator for economic growth. These findings fulfill the papers research objectives.

5.2 Recommendations

Based on the findings of the study, the study presents recommendations pertinent to the policy makers, financial market regulators and future researchers. In their study, Mahdavi and Sohrabian [41] argued that, if changes in stock prices are in fact causally related to the rate of economic growth, then an additional role may be defined for the stock market: it can serve as a policy instrument in stabilizing the economy meaning that measures designed to prevent excessive fluctuations in stock prices may contribute to macroeconomic stability. This view was earlier proposed by Heller, a former governor of the Federal Reserve Board, who suggested the use of a form of open-market operations in the stock market by the Federal Reserve Banks could help to mitigate excessive market volatility. As such therefore, the policy makers may as a policy reform tool use the stock market institution, and especially the listed stocks as a policy instruments.

On another hand, the government through its respective specialty departments should encourage savings and investments by putting in place appropriate policies which give equal importance to both bank-based financial sector as well as the market-based stock market of the economy in order to enhance capital formation and investments and consequently increasing the living standards of the people through increased economic growth. This view is supported by the central presumption of Solow's [65] type of growth model that higher saving precedes economic growth. The main policy implication advocated by this model is that countries that manage to increase their saving rate, and consequently investment, will increase their rate of growth. Another perspective that the policy makers should look into is to increase the openness of the economy so that the net foreign resource inflows (principally for FDI) may supplement

domestic saving and help the country to reach higher rates of investment and growth. Accordingly, as saving rate increases, it induces capital accumulation and eventually leads to higher output level.

In order to develop the Kenyan stock market further, this study recommends that the government should emphasize on the elimination of any impediments to the growth and development of the Nairobi stock exchange including any regulatory barriers that may act as disincentives to investment. The capital markets authority should check and avert any sharp practices by market operators (particularly the speculators) in order to safeguard the interests of shareholders. This is important because the confidence of the investors in the market operations is particularly important as many potential investors may be reluctant to invest in shares and other securities when they cannot give credence especially with the recent fall of some brokerage firms in the not so distant past – introduction of an effective investor compensation fund and making sure that only individuals of good repute and standing are licensed to operate investment banks and brokerage firms can help to curb this problem. Additionally, more companies and especially the small and medium enterprises should be encouraged to get listed in the stock exchange market and allowed access in order to access investible funds from the masses thereby stimulating and boosting the financial system and the stock market in particular and consequently raise economic growth.

5.3 Suggestions for Further Research

This study sought to investigate the nexus between stock market and economic activity in Kenya. The findings of this study have concluded that the stock market has a positive effect on economic growth. These results are consistent with earlier studies done by Mahdavi and Sohrabian [41]; Nurudeen [53].

The results of this paper can be extended in several other ways among them to check whether further to the findings, how devoted the Nairobi stock exchange

has been in transmitting information as well as channeling funds into productive areas. This will help to shed light on whether the allocative efficiency of the market has been fully achieved. Further work may also be done to establish whether other aspects of the stock market such as size, volatility, trade volume and, depth in terms of instruments on offer exhibits different results from the ones reached in the conclusion of this study. Another direction for future research is a cross-national study involving other developing countries such as the sub-Saharan African countries as well, in order to bring out further empirical evidence with regard to the direction of causality between the stock market and economic activity. In future, when larger samples of observations are available, the regression parameters may be re-estimated for comparative analysis with the empirical results of this study.

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