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**TITLE: STOCK MARKET PERFORMANCE AND ECONOMIC GROWTH:
EMPIRICAL EVIDENCE ON SELECTED AFRICAN COUNTRIES (2004– 2018).**

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**A Thesis Submitted to the department of Economics in partial fulfillment for
requirement of Degree of Master of Science in Economics**

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Declaration

I, Demeke Getnet, hereby declare that the thesis entitled: Stock market performance and economic growth: Empirical evidence on selected African countries (2004– 2018); is my own original work and has not been submitted for any degree either at this University or any other University and all sources of materials used for the study have been duly acknowledged. It is offered for the award of the degree of Master of Science in Economics from Addis Ababa University.

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CERTIFICATE

This is to certify that this study entitled: Stock market performance and economic growth: Empirical evidence on selected African countries (2004– 2018); was undertaken by Demeke Getnet for the partial fulfilment of Master of Science in Economics at Addis Ababa University, is an original work and not submitted earlier for any degree either at this University or any other University.

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Abstract

This study examines the causal relationship between stock market performance and economic growth in selected African countries which already have implemented stock exchange market for the period 2004-2018 using annual secondary data obtained from world development indicator. The major objective was to empirically analyze using granger causality test and examine the link between stock market performance and economic growth i.e. whether stock market performance causes economic growth, or it is a result of improved economic activity. Fixed effect estimation was utilized to determine how stock market performance affects economic growth of sampled countries based on their market capitalization ratio which was determined by running the Hausman test. The result disclosed that there is a positive and significant relationship between stock market performance and economic growth in these countries.

Finally, 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 depicted that the causality between economic growth and stock market runs entirely in one direction from the stock market performance to economic growth. As a result, it was inferred that changes in stock exchange of the countries under study reflect the macro economic conditions of the countries and can therefore be used to anticipate the future path of economic growth.

Much work leftovers to be done to best recognize the relationship between stock market performance and economic growth. Although this study examines the relevance of stock market performance on economic growth, it does not investigate the individual country cases nor analyses when is the right time for countries to get into stock market implementation.

Key words and phrases: *Stock market performance, Economic growth, Granger causality*

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Acronyms

LGDP: Logarithm of Gross domestic product

INF: Inflation

GDS: Gross domestic saving

FDI: Foreign direct investment

GGFC: Gross government final consumption

MCR: Market capitalization ratio

VAR: Vector Autoregressive

VECM: Vector error correction model

ADF: Augmented Dicky fuller

GMM: Generalized method of moment

ARDL: Autoregressive distributed lag

CHAPTER ONE: INTRODUCTION

1.1 Background of the study

Stock markets have become the central focus of recent development economists and policy makers as a result of its perceived benefits to the economy either directly or indirectly. A healthy and vibrant stock market can mobilize saving, diversify risks and facilitate the transaction of goods and services by ensuring corporate governance and control Mashika J. (2011). As an institution stock market has played a critical role in accelerating efficiency in resource allocation and capital formation according to T.O. Olweny and D. Kimani (2011). It can create a conducive environment to corporations and the government to finance new ideas and projects and develop existing operations. Alile (1984), has also observed that the performance of an economy can be improved when working capital is injected to the more productive economic units.

As economies expand, additional funds are required to sustain the expansion and the stock market can best play the role of mobilization and allocation of savings among the potential uses which are crucial for the growth and efficiency of the economy. It is in this sense that stock markets act as a critical parameter for economic performance by sustaining growth using its allocative capacity of capital to the most appropriate projects. It is also argued by Alile (1997) that the determination of overall growth of economy relies on how efficient stock markets are in its allocative function of capital.

There is increasing volume of literature both theoretical and empirical according to Tumaini Bulere (2015), regarding the contributions of stock markets to economic growth. The nexus between stock market and economic growth has been understood and outlined in different ways by various school of thoughts. Contradicting views have been noted on the direction of the relationship that there are school of thoughts claiming it is economic growth that promotes stock market development whereas others stand on the reverse. Other researchers argued that there is dual relationship and others dictate that stock markets do not have any effect on economic growth.

According to the arguments of advocates of positive contribution of stock markets to economic growth, the role of financial markets is to transfer funds from surplus savers to deficit runner enterprises to fill out shortage of finance source. This view stands with the conclusion that

financial markets are the promoters of physical capital accumulation which ultimately would enhance production and increase output hence, promoting economic growth. In the framework of the new growth theory, Levine and Zervos (1996), argued that stock markets are considered as a vital source of capital and creation of liquidity to let more profitable investments get access to finance and capital being allocated to projects that escalate long term growth.

On the other hand, Chakraborty (2008), argued that it is economic growth that implies stock market development. It was based on the study conducted in India to analyze the relationship between financial development and economic growth. This study based on the granger causality test showed that direction of relationship runs from real GDP (proxy of growth), to stock market capitalization (proxy of stock market). This justified that economic growth leads to stock market development.

In the understanding of theoretical underpinnings, Majid (2007) noted that the relation between financial development and economic growth has been the agenda of considerable interest in the development of economic and finance literatures. It was argued that the principal element of economic growth is the financial development as it can alter the productivity growth and the efficiency of capital. The theoretical origination can be traced back to the Shumpeter (1911), cited in Majid (2007), where it was concluded that financial intermediary's sector can change the mobilizing of savings for efficient projects by managing risks, monitoring managers, and then encouraging transactions which will essentially increase technological innovation and economic development.

The development theory of economic growth has been extensively used in the study of economic development. However, the role of financial development to encourage the economic growth got attention by few of the economic theories. Different views have been advanced by scholars on the nexus between economic growth and financial development of which the one is "the growth led finance hypothesis" or the demand following view. Robinson (1952) came with view by stating that financial development follows economic growth or where an enterprises flourish, finance follows. This view advocates accordingly that as the real side of the economy advances, it seeks for financial instruments, arrangements and markets increase leading to the emergence and growth of the financial services.

Stock exchange market is one of the most recent financial institution and hallmark of the modern economy to inspire entrepreneurial progress. With the advancement and progress of the economy, new ideas come to the upfront requiring the financing component and the size of the industrial enterprises tend to expand. This implies that the formation of the industrial organizations is not going to be restricted to proprietorships and partnerships as stock exchange markets ease the financial constraining factor to individual entrepreneurs. The primary role of stock exchange market in Kenya for instance and other African countries is productive management of money and developing the habit of saving, T.O. Olweny and D. Kimani (2011). As a result, it can be inferred that stock markets are institutions which creates an environment of transferring savings to productive investments and let savers to have investment income than keeping savings idle. In fact, this also may trigger the consumption to be reduced and people start credibly investing savings and earn a return.

Relative to other financial institutions a well-developed stock exchange market has the capacity to provide a well-versed financial service that may provide a different attribute to investment and growth. Levine and Zervos (1996), specifically outlined that a rise in the stock market capitalization as measured by the ratio of the stock market value to GDP or by the number of listed companies, can uplift the capacity of an economy to mobilize capital and diversify risks. In addition, Majid (2007), asserts that a well-functioning financial sector channels resources form surplus to limited units thereby creating an efficient resource allocation.

The importance of economic growth is not arguable and spans across disciplines affecting all areas of society directly and indirectly as noted by Rogers (1995). Additionally, macroeconomic policies on factors like interest rate and inflation rates assist in promoting economic growth and equally important, are vehicles of economic growth such as the stock market. But the basic proposition of growth theory is that, in order to sustain a conducive growth rate of output per capita in the long run there must be constant advancement in technological knowledge in the new goods, markets and process according to Olweny and Kimani (2011). This proposition can best be supported by the neoclassical growth model developed by Solow which dictates that in the absence of technological advancement, the effect of diminishing returns would finally cause economic growth to deteriorate. One of the significant challenges facing growth economists is identification of the major deriving forces of growth and explaining the great variation in cross

country economic performance overtime. Addressing the issue of uneven development and persistent international inequality has not been adequately addressed by both the neoclassical growth models and the endogenous growth model. As a result, conceptualizing the process of economic growth has been the ultimate objective that can demand a lot of dedications.

Theoretical studies have been conducted to link between the endogenous growth and financial markets. As outlined in T.O. Olweny and D. Kimani (2011), Bencivenga, Smith and Levine were the first in proposing endogenous growth models to identify the channels through which financial markets affect the long run economic growth. The stand of the studies focused on that financial markets have potentially diversify agent's liquidity, investment risk and attract more saving into productive investment prevent the premature withdrawal of fiscal capital invested in the long-term projects.

Innovation as a channel of transmission between finance and economic growth has been identified by King and Levine(1993). Financial markets facilitate the function of efficient resource allocation by evaluating the mostpotential innovative projects and finance the most promising ones.

1.2 Statement of the Problem

Stock market growth and development has been a concern of extensive theoretical and empirical studies of different scholars. In each of their separate studies, Levine and Zervos (1998), Shaw (1973) and Mckinnon (1973) observed that the advancement of financial markets and systems was significantly correlated with the level of per capita income.It is evident therefore that the financial markets are pillars in the advancement of macroeconomic development by providing investors and corporations the necessary finance to fund their projects.

However, there is little empirical work on the importance of stock markets to long run economic growth and almost none has been done on the developing countries according to Mohtadi . and Agarwal (2007). On the other hand, positive and significant correlation has been concluded by Levine and Zervos (1998) relying on the cross-sectional approach criticized for the limitations of the inability to sort country specific effects.

World stock markets are accelerating according to Demrigüç-Kunt and Levine (1995), for instance between 1982-1993 stock market capitalization has raised from \$2 trillion to \$10 trillion

an average of 15 percent per a year. Unreasonable move of this growth was in a newly created stock markets, which rose from 3 percent of world stock market capitalization to 14 percent in the same period. However, there is little evidence empirically how important the stock markets are for long-run economic growth which implies that economists have no common concept and even common measure of stock market development. Extracting data from 41 countries in a period 1986 to 1993 Demrigüç-Kunt and Levine has compared various indicators of stock market development. Each indicator has their own statistical shortcomings, as a result of different measures of stock market size, liquidity, concentration and volatility of institutional development.

In a review of stock market and real economy at the end of 2016, there was almost 50,000 companies listed on 81 exchange groups in the world. The cumulative market capitalization of these companies was approximately \$70 trillion. The companies listed on stock exchange come from all economic sector; manufacturing, service, mining and information technology according to UNCTAD report on world federation of exchanges. According to the report, a well-functioning exchange can facilitate the mobilization of domestic resources and foreign portfolio flows.

There are several debates on both empirical and theoretical literature on the relationship between stock markets and economic growth which triggers the interest to study this area. Some find a significant relationship while others don't especially in the context of developing countries Bulere (2015). Earlier studies basically have done more on the contribution of banking sector in its contribution to economic growth, however, the world stock markets, and the emerging markets primarily contributed to the interests of scholars to study the linkage between stock markets and economic growth in developing countries. The work of Levine and Zervos (1998) has insisted many of the developing countries to open a stock exchange market to get rewards of financial sector development.

Theoretically, the traditional growth literature was not conducive to examine the relationship between financial intermediation and economic growth as its concern was on steady state level of capital stock per worker or productivity not on the rate of growth attributed to the exogenous technical progress. The emerging interest of studying the link between stock market development

and economic growth stands from the insights of endogenous growth models, by which growth is self-sustaining affected by initial conditions Mohtadi H. and Agarwal S. (2007).

More and more empirical studies might better identify the causal linkage between stock market trends and economic growth in an effort to understand the relationship. This study therefore follows this line of thinking and stands to examine the causality between stock market performance and economic growth in selected African countries within the period 2004-2018.

1.3 Research Questions

1. Is there causal relationship between financial system development and economic growth?
2. Does the mixture of stock exchange markets and intermediaries' function in the economy encourage economic growth?
3. Does stock exchange drive economic growth?

1.4 Objectives

The general objective of this study is to analyze the correlation between stock market performance and economic growth in Africa. From this outlined general objective, the specific objectives that could frame the study are:

- i. To investigate the presence of causal relationship between stock market performance and economic growth.
- ii. To examine the role of stock exchange market in driving a sustainable economic growth.
- iii. To examine the direction of causality between the stock market performance and economic growth.

1.4.1 Methodology

The study has employed fixed effect estimation of panel data modeling to estimate and provide an empirical evidence on the nature of causal relationship between the stock market performance and economic growth. As this study covers more than one country, panel data modeling enables to control variables which cannot be observed or measured like cultural factors in the business practices or variables that change overtime but not across entities like national policies and

agreements. Granger causality test is used to capture the direction of causality between the stock market performance and economic growth.

1.5 Significance of the study

The significance of the study is to indicate and serve as a literature for further research work. In addition, it might have an insight towards the areas which are going to be open for further studies. In the meantime, as the Ethiopian government is ready to launch a stock exchange soon this paper might give the experience of those African countries which have already exercised the stock exchange. The government of Ethiopia would also be informed about the challenges it may face and the opportunities it may enjoy while deciding to implement stock exchange and the causal effect on the economic growth.

1.6 Scope and limitation

This study has focused on performance of African stock markets with higher market capitalization and its impact on the economic growth over the specified period of 2004 to 2018. As a result, the study is limited in scope and the data to be used is collected by external for an intended purpose. Hence, the reliability and accessibility of the data might be the constraining factor for the study.

1.7 Organization of the study

The rest of the paper will be organized as follows: Chapter two gives an overview on the characteristics and development of stock exchange in big African economies as well as economic growth trend and theoretical and empirical evidence on stock market and economic growth relationship. Chapter three explains research methodology. The next chapter delivers the empirical analysis and presentation of the result. The final chapter then conclude the research with summary of the result and give recommendations.

CHAPTER TWO

2. REVIEW OF THEORETICAL LITERATURE AND EMPIRICAL EVIDENCES

2.1 THEORETICAL LITERATURE REVIEW

The recent revival of enthusiasm in the link between financial development and growth stems from the insights of endogenous growth model, in which growth is self-sustaining and influenced by initial conditions.

2.1.1 Endogenous Economic Growth Model

The endogenous growth theory was coming to effect in 1980's, as a response to criticism of the neo classical growth model. It holds that policy parameters can have an influence on the long run growth rate of an economy. Endogenous growth economists suppose that enhancements in productivity can be linked to a faster pace of innovation and additional investment in human capital. The theory has defined the economic growth initiated by factors within the production process, for instance, economies of scale, increasing returns or induced technological change; as opposed to exogenous factors like increase in population. In endogenous growth theory, the growth rate has determined on one variable: the rate of return on capital. Levine, in his work, outlines an evidence in support of the role of stock markets in economic growth. His study has created endogenous growth model, where the stock market played the role of risk diversification and hence how the market changes the incentives to invest in a manner that alter the growth rate. Levine has showed stock markets improve economic growth through delivering a means for firms to adjust ownership and not interrupt the production process as well as providing a means for agents to spread their investment risk. In the absence of stock market, lenders facing liquidity constraints would force firms to repay loans, forcing firms to dispose of their holdings Brown and Nyeche (2016)

Endogenous growth model has concerned with the link between financial development and long run economic growth, accentuating that productivity growth is most likely way out to the transmission from financial development to economic growth. As a result of progression in the endogenous growth model, recent models have been attempting to identify the mechanism through which financial markets influence economic growth, Caporale(2003). This model has

showed that economic growth performance is related to financial development, technology and income distribution. Greenwood and Jovanovic (1990), claimed that income per capita improves to define membership in an information processing intermediary that in turn facilitates investment decision and economic growth. Financial sector has been included in endogenous growth model by them to validate the interactions between financial markets and economic growth. Due to the developments in the endogenous growth literature, recent models have been trying to identify a method through which financial markets have an effect on economic growth. Different channels have been recommended: firstly, financial markets can influence economic growth through efficient resource allocation. King and Levine (1993), suggested a model in which innovation activities serve as the engine of growth. A higher rate of successful innovations outcomes in a higher growth rate of productivity. In the non-existence of financial markets, one might invest in projects that can be rapidly liquidated, instead of investing in assets that are more productive but financial illiquid. Markets can offer individuals with less risky and liquid productive investments (Levine 1993). Secondly, financial markets can affect economic growth through the information channel. Holmstrom and Tirole (1993), claimed that stock markets play a monitor of managerial performance because the stock price constitutes performance information that cannot be extracted from a firm's current or future data. A poorly performing management may become the target of take-over. Thus, the information exhibited in a firm share price is important for structuring managerial motivations to build up a firm's productivity, and hence economic growth in aggregate.

Existing literature has showed that there is no single theory which could exclusively explain the linkage between stock market and GDP as stated by Kipchumba (2017). Many of the theories of growth constituted elements such as capital and financial intermediaries in the economy.

2.1.2 Exogenous Growth Theory

The theory also called Solow-Swan model which is formulated under the neoclassical framework of long-term economic growth. Four key components are used by this theory to explain economic theory: productivity, capital, technological progress and population growth, Aghion and Howitt (1998). The model has argued that the long-term growth in the economy are determined with the factors outside the model specifications. The production function with

constant labor and capital which is reproducible is the flint of the model implying GDP is explained by capital and labor.

Diminishing returns to capital is assumed by the theory, meaning that if labor is given more capital goods with no technology, there will be stagnation of new capital investment. Another main assumption of the theory is that economic growth tends to converge to steady state in the long run depending on the labor force growth rate and improvement in technology in the economy. According to this theory it is argued that a country with high savings rate tends to grow faster than those with lower savings. The model states that capital accumulation has a smaller role in the long run compared to technological progress. As a result, more concern is given to the importance of technology on economic growth which offsets the effects diminishing returns which influences both labor increase and capital accumulation Aghion and Howitt (1998).

In summary, the theory focused on capital accumulation as the main element for economic growth according to Kipchumba (2017). This implies that the theory has a contribution to analyze how stock markets facilitate capital accumulation which is associated with economic growth.

2.1.3 Finance- Led Theory

The Finance-Led model was originally formulated by Schumpeter (1911) as cited in Kipchumba (2017) and emphasized on how financial institutions can organize domestic savings and investment through highly open and liberalized system and improving productivity by coming up with efficient markets. This model speculates that a well-functioning financial sector will improve technological innovations by allocating resources effectively from non-performing to performing sectors.

Many of the scholars have expound on this model. Wadud (2009) postulated that evolution of domestic stock markets may improve and bring more capital accumulation which may finally lead to more economic activities. Hassen and Yu (2011), claimed that the presence of an efficient financial sector in allocating financial resources from surplus sectors and deficit one which leads to expansion of the economy as well as firmness of other macroeconomic variables. This theory has emphasized the role of stock market in capital accumulation and how this influences growth like exogenous growth model.

2.1.4 The Finance Growth Nexus

The relationship between financial market and real economy can have either of the following forms as Fink et.al (2006) has suggested. These are supply leading, demand driven, interdependence, no causal relation and negative causality from finance to growth.

The supply-leading theory was initiated by Mckinnon (1973) and Shaw (1973) according to Lei P. and Vinod M. (2016), who argued that the accumulation of financial assets can boost economic growth implying that financial market development can have a positive causality as well. The demand driven hypothesis formulated by Freidman and Schwartz (1963), argued that economic growth leads to the emergence of financial centers and came up with the conclusion that financial development endogenously set by the growth of real economy. This view is consistent with the Coasetheorem (1956) and the new institutional economics, which argues that institutions adjust to marketimperfections in a way that maximizes individual utilities Fink et.al (2006). Most of today's economists agreed that it is unable to have frictionless markets agency problems and transaction costs. Lucas (1998), suggested that there is no causal relationship between financial sector and economic growth. However, this hypothesis's point was applicable only under the neo-classical assumption of no transaction costs and perfect information.

Additionally, there is also enough empirical evidence that support the positive relationship between economic growth and finance. The concern is directed towards identifying the mechanism through which financial markets are linked to the real economy and nature of causality as Lei and Vinod (2016) narrates. According to Pagano (1993), cited in Lei P. and Vinod (2016), three main channels are operational through which financial development and economic growth are linked together. First, saving level has increased that would flow directly to investment; Second, financial development has changed the saving rate and finally financial development also increases the capital accumulation efficiency. Most recent literature point out that the most important channel to make finance and economic growth to interact is the second and third one by improving the efficient allocation of capital.

According to Srinivasan (2014), the performance of an economy with regard to its growth pattern depends upon the growth of financial sectors in the economy. It is highly argued that the development of stock market has been considered as pillar of an economy since it provides additional channel for encouraging and mobilizing domestic savings, ensures improvements in

the productivity of investment through allocation of capital or resources. It can also boost managerial discipline through the market for corporate control. The stock market positively influences national savings, allocation of capital, financing funds and incentives for corporates and finally paves the way to economic growth. Given this importance of the stock market to economic performance, the stock market development has a crucial influence on economic growth. That is deliberate creation of financial institutions and markets increase the supply of financial services. The capital market increases savings and allocates them to the most productive investments. Thereby stock market can improve economic growth, and this is hypothesized as ‘supply leading’ which has been supported by Micknnon (1973) and Shaw (1973) and King and Levine (1993).

On the other hand, there is a causal relationship from economic growth to stock market development, i.e. ‘demand following’ hypothesis. Accordingly, this view postulates that stock market development appears because of economic development. Continuous economic expansion requires more financial services and new instruments. The financial system adapts itself to the financing needs of the real sector and fits in with its autonomous development. Therefore, this type of stock market development plays a positive role in the growth dynamics. For instance, Goldsmith (1969) and Jung (1986) showed that economic growth push forward financial development, acknowledging the ‘demand following’ hypothesis.

There is also a view that focuses on the reciprocal relationship between stock market development and economic growth. Economic growth makes the development of financial intermediation system profitable and the establishment of an efficient capital market system permits faster economic growth. By specializing in fund pooling, risk diversification and liquidity management, the capital market system improves the efficiency of capital allocation and the productive capacity of real sector. As Srinivasan (2014) claimed, technological efficiency of the stock markets increases its size, because economies of scale and practical experiences are present in financial intermediation activities. As a result, the real sector can exert a positive externality on the capital market through the volume of saving which signifies that stock market development and economic growth positively influences each other in the development process.

Efficiency of the financial system is argued as a pillar to economic growth by Abdella and Daffalla (2011), cited in Tinavapi (2017) due the existence of significant information and

transaction costs. In addition, it was claimed that asymmetric information creates adverse selection, moral hazard and high transaction cost which ultimately will result inefficiency. Saying this they advocated that an efficient financial system could enhance capital productivity and thereby induce economic growth by advancements in the collection of information, evaluation of projects, risk sharing and provision of liquidity. As a result, an efficient financial system can intermediate financial savings, and improve the allocations thereof across investments.

Abdella and Daffalla (2011), cited in Tinavapi (2017), have described three channels by which financial intermediation outcomes economic growth. The first channel stands from the findings of McKinnon (1973) and Shaw (1973) postulating that financial liberalization induces the level of savings and hence investment. It has been claimed that financial deepening results a better productivity in capital and accelerates the rate of savings which channeled to investment and growth. The second channel discussed was the reduction of information and transaction costs and how the outcome of the reduction induces fund balances that could flow from lenders to borrowers. In articulating the third channel by which financial intermediation serves in economic growth, it was noted that improvement in the allocation of resources that financial sector enables through fund pooling i.e. making large investment projects possible and providing lending easily, risk diversification (minimizing productivity risk by maintaining diversified portfolio), liquidity management (gathering and evaluating information on projects to channel resources to the most profitable projects) and monitoring i.e. to make sure borrowers are capable of paying back their commitments.

Financial sector development as a result is considered to be a source and accelerator of economic growth as evidenced by the enabling role it plays in confirming that the costs of acquiring information and the integrity reliability of the information is such that levels of asymmetry are minimized as well.

2.2 EMPIRICAL EVIDENCES

The early empirical studies dated back to schumpter (2011) have generally been focused on the relationship between financial development and economic growth implying that there have been limited studies held on the relationship between stock market development and economic growth

as outlined by Bayar Y. et al (2014). The studies focusing on the effect of the stock market have generally been considering market capitalization ratio, value traded ratio and turnover ratio as a representative of the stock market development and gross domestic product for economic growth. Most studies mainly implemented the Johansen cointegration and various causality tests. Bayar Y. et al (2014) have summarized their review of empirical literature and concluded that there is no everlasting finding indicating that some of them have found that stock market development had positive effect on economic growth where as others came up with no significant effects of stock market development on economic growth.

An empirical study has been held on effects of stock market development to economic growth in Turkey by Murat et al (2014). Implementing Johansen Juselius cointegration test and Granger causality test the study has come up with a long run relationship between economic growth and stock market capitalization, total value of stocks traded, turnover ratio of stocks with a unidirectional causality towards economic growth. Using the granger causality test bidirectional relationship has been established in Brazil by Matos (2003) cited in Godfery O. & Osad O. (2019). On the other hand, using the panel least square based on the fixed effect estimation Godfery O. & Osad O. (2019) have examined how stock market development affects economic growth in BRICS. After diagnosing the results of the regression for robustness' and stability they found that stock market development has significant impact on economic growth. The result showed that there is a positive correlation between stock market development indicators and BRICS's economic growth.

An empirical investigation was conducted on Indian stock market asking "Is the Indian stock market a casino?" and found that no support for the hypothesis that the Indian stock market development is associated with the economic growth in that country over the period of study (1981-2001). However, the study has notified that stock market has relevance to economic development on pre-market liberalization and even though it has negatively affected economic development during post liberalization according to Azarmi et al (2005). This study has focused mainly by hypothesizing that market is relevant to growth and another hypothesis is stock markets has no relevance to economic growth. The view that the Indian stock market is a casino is a result of the assertion that stock market developments does not contribute to a country's growth.

An investigative research has been done on stock market development and economic growth in Africa's frontier markets representing selected Sub-Saharan countries by Kanetsi B.(2014). The study has implemented vector autoregressive regressions and causality tests for the period from 1990 to 2012 and indicated that in the previous studies has concluded that causality runs from finance to growth. In addition, stock markets have had a positive effect on economic growth, especially in countries with well performing financial institutions. However, the study has criticized this conclusion of literature as inconclusive to the whole Africa market. As a result, the study has attempted to fill the knowledge gap whether the development of stock markets in Africa can be attributable to the swift economic growth and vice versa. Of the countries considered in the study, only Namibia has experienced bi-directional causality between stock market development and economic growth.

In justifying the relevance hypothesis Azarmi et al (2005), had mentioned the works of Walter Bagehot (1873) and John Hicks (1969) arguing that British financial system played pivotal role in accelerating industrialization in England by enabling mobilization of capital. Similarly, Shumpter (1912), has also asserted that well performing banks facilitate economic growth by promoting technological advancement and innovation through identifying and funding entrepreneurs with the best of chance of succeeding in implementing innovative products and production process. Financial institutions in today's market have contributions to economic growth by utilizing various financial instruments to accelerate trade in goods and services and channel resources from savers to investors.

The relevance hypothesis has also been supported by Goldsmith (1969) and Mckinnon (1973) articulating a close relationship between financial and economic development in different countries. One of the policy implications for the relevance hypothesis ranges from prescription for lack of government intervention in finance to call for interventions in particular circumstances.

In irrelevance hypothesis good articulation has been made by Joan Robinson (1952), who declares that "where enterprise leads finance follows". This implies that economic development creates demand for financial arrangements and financial system automatically responds to the demand. Another explanation of this view is that finance growth relationship is neither significant nor worthy of academic resources. The role of finance has been overemphasized in

economic growth according to Robert Lucas (1988) even though other development economists expressed their uncertainty by ignoring the role of finance altogether.

As analyzed by Azarmi et al (2005), the Keynesian thesis that the stock market is a casino might be as a result of the general claim that the financial system does not contribute to a country's growth. While the alternative relevance hypothesis can be stated as stock markets serve major economic functions even though there exist a well-developed banking sector in an economy.

The relevance hypothesis may be formulated on the basis that equity and debt financing are not perfect substitutes in imperfect markets. For instance, equity financing plays a role in alleviating the conflict of interest that may arise among different stakeholders within the firm causing a reduction in agency costs within an economy under asymmetric information and uncertainty. The contribution of stock markets then be related to minimization of information asymmetry. And this role of the stock market may be termed as information hypothesis. Demircug-Kunt and Maksimovic (1995), contend that the stock trading transfers information regarding a firm's prospect to potential investors and creditors.

The detailed diction of the relevance hypothesis applied to the stock market may be obtained in William Ryrle (1990) who justify that stock markets contribute to economic development by facilitating equity financing, creating efficient mechanism for spreading ownership widely in the population and mobilizing savings. In addition, it plays a critical role in allocating capital to most productive use and facilitating a link between the capital markets of a particular country and the markets of the industrial world.

The link between stock market development and economic activity has always been the corner stone of debates in the field of economics and causes empirical questions that may stock market developments influence economic activity and/or whether it is the result of increased economic activity. Srinivasan P. (2014), has conducted an empirical analysis with this regard to investigate the direction of causality between stock market development and economic growth in Indian context. Using the cointegration and causality tests for the period from 1991 to 2013 the study has come up with the result of well-defined long run equilibrium relationship between the stock market development indicators and economic growth in India. The empirical result of the study has showed that bidirectional causality from turnover ratio to economic growth both in the long run and short run. From this it can be inferred that the stock market development indicators such

as market capitalization and turnover ratio have a positive influence on economic growth in India.

There have been studies focused on the Chinese stock market, one of which was done by Wang and Ajit (2011). This study investigated the impact of stock market development on economic growth in China. It used the quarterly data for the period from 1996 to 2011 and the empirical investigation was conducted within the unit root and cointegration framework. The result has showed that the relationship between stock market development proxied by the total market capitalization and economic growth is negative. The authors have concluded that this result is consistent with the Harris' (1997) finding that the stock market development generally does not contribute positively to economic growth in developing countries if the stock market is mainly an administratively driven market.

Finance growth nexus has also been studied by different scholars in African countries who have been implementing a stock exchange market, for instance, Nigeria with relatively big market capitalization. Omoriyu A. (2015), conducted a time series econometric analysis applying unit root test, cointegration and granger causality test in Nigerian economy. The study has proxied economic growth by real gross domestic product while stock market development measures were market capitalization, turnover ratio, all shares indexes, and total value of shares traded. It has been revealed that turnover ratio has a positive and significant effect on both the short run and long run whereas total value of shares traded, and all share indexes were significant only in the short run. Market capitalization has positively and significantly influenced economic growth in the long run. From the time series mechanisms, the study has concluded that Granger causality test revealed that economic growth promotes stock market development even though there existed evidences showing causality running from stock market development to economic growth.

Demand-following hypothesis has been articulated by the work of Onwumere J. et al (2014), while studying the stock market and economic growth in Nigeria. However, there are little literature on the demand-following hypothesis which claims that it is the growth of the economy that causes increased demand for financial services which will lead to the development of financial market. This study has been done against this background employing the ordinary least

square and found that economic growth has positive and non-significant impact on market capitalization ratio and turnover ratio of the Nigerian stock exchange.

According to Onwumere J. et al (2014), the capital market connects the financial sector with the real sector of the economy and in the process facilitates real sector growth and economic development. The fundamental channels through which capital market connected to economic growth can be described as: capital market increases the proportion of long-term savings, which will turn to investments. This is because capital market enables contractual savings industry to mobilize long term savings from individual households and channel it into long term investment. It fulfills the transfer function of current purchasing power in monetary form from the sector with surplus to the sector having deficit for the sake of further strong purchasing power in the future.

Most of the studies on stock market development and economic growth have been based on the supply-leading hypothesis and few on the demand-following hypothesis. The former claims a causal relationship from financial development to economic growth by dictating that intentional creation and development of financial institutions and markets would increase the supply of financial services and hence led to economic growth Levine and Zervos (1998). There exists little literature available on demand-following hypothesis which claims increased demand for financial service is derived from the growth of the economy as stated by Lucas (1988).

Osama M. Badr (2015), had investigated the casual relationship between stock market development and economic growth in Egypt. The study used unit root tests for time series data within the period of 2002 to 2013 in their levels and their first differences according to Dicky-Fuller. Johansen co-integration analysis was conducted to examine whether variables are cointegrated of the same order. It also has chosen vector autoregression estimates to test the long run relationship between stock market development and economic growth. In addition to determine the direction of causality, VAR Granger causality test was applied whereas forecasting the future relationship has been analyzed using variance decomposition and impulse response function (IRF). Finally, the result of the study has showed there exist a relationship not just on stock market development and economic growth but also there is a link between stock market development, economic growth and foreign direct investment. As a result, it can be inferred that

the government should reshape and adjust stock market and take care of FDI to support economic growth.

While early studies advocate the causality goes from stock market to economic growth, the most recent studies do not clearly specify the direction of causality according to Osama M. Badr (2015). These studies have been grouped to different categories based on their methodology and result they reached. The first category has found that there is significant relationship between stock market and economic growth, for instance, Filer et al (2000) investigated the relationship between stock market and economic growth with sample scope of 70 countries for the period range from 1985 to 1997 using Granger causality tests. The study has found that there exists little relationship between stock market and economic growth within low income countries from the sample countries under study. Beck and Levine (2004), examined the impact of stock markets and banks on economic growth by figuring out 40 countries for their study under the period 1976 to 1998 deploying generalized method of moments (GMM). The study has found positive influence between stock market and economic growth.

Understanding the long and short run causal relationship between financial development and economic growth in Malaysia using ARDL, VECM and Granger causality tests was the aim of Choong et al (2005). According to this study, there existed positive long and short run impact of stock market development on economic growth. Another study in Malaysia has been done by Abg&Mckbbin(2007) to analyze whether financial development leads to economic growth using the cointegration and VAR causality test within the period 1960 to 2001. The study has found that financial development causes economic growth in the long run. Causal relationship between stock market and economic growth in real terms but not in nominal terms has been found by a study conducted in Nepal by Bahadur (2006) through the period 1998 to 2005 using Granger causality. This implies that stock market plays a significant role in framing economic growth and vice versa. One way causality generated from economic growth to stock prices in the long run and from stock prices to economic growth in the short run has been concluded by Liu and Sinclair (2008) under a study done in china using causality test under VECM framework for the period 1973 to 2003.

Karacaer K. (2010), examines the long and short run dynamics relationships between stock price index and basic factors i.e. inflation, industrial production and exchange rate as a proxy of

economic growth in Turkey within the period 2003 to 2010 by using Johansen cointegration and Granger causality tests. It was found a long run cointegration relationship between variables, whereas in the short run, there were unidirectional and bidirectional causal relationships among the variables. Marques et al (2013), have investigated the relationship between stock market and economic growth in Portugal through the period 1993 to 2011 by using VAR model, Granger causality test and impulse responses function. It was found that positive causal relationship existed between stock market development and economic growth. Rad and Etemadmoghaddamb(2014) has examined the long run and short run effects of stock market development and banking sector development on economic growth in Iran over the period 1995 to 2010 applying the ARDL to test long relation and ECM to test short run relationship. According to this study stock market development is one of the critical contributors of growth in the long run.

Another category of studies did not obtain a significant causal relationship between stock market development and economic growth. Zhao (1999) examined the relationship between stock returns and economic growth in China for the period 1993 to 1998 applying an OLS regression on a monthly data. The study concluded that an expected economic growth has a significant negative impact on stock returns. However, it does not examine the reverse impact from stock returns to economic growth. No significant relationship between stock market development and economic growth even after controlling and adjusting the development of stock market development according to Naceur and Ghazouani (2007). This study has practiced a generalized method of moments (GMM) to undertake the study in 11 MENA region countries for the period 1979 to 2003. Carp (2012), analyzed the dynamics of stock market and the impact of precariousness of the foreign capital inflows as proxy of economic growth in Central and Eastern Europe for the period span of 2000 to 2007 applying the Granger causality test. The conclusion from the study was that market capitalization and stock value traded do not exercise any impact on economic growth rates.

There is also a group of studies which find no relationship between stock market development and economic growth in one segment of study while proved existence of relationship with another segment of study. Rioja and Valev (2014), examined the impact of stock market on economic growth in low- and high-income countries applying a dynamic panel generalized

method of moments (GMM). It was found that stock markets have not contributed to the capital formation of productivity growth in low-income countries. On the other hand, stock markets have a measurable positive effect on both productivity and capital growth in high income countries. The causal relationship between stock returns and real economic growth in china has been examined by Guo (2014), applying a nonuniform weighting cross-correlation approach and a multivariate generalized autoregressive conditional heteroskedasticity model. No causal relation found on China's stock return and real economic growth in the period before subprime crisis. However, there is unidirectional causal relation in mean from real economic growth to stock returns and vice versa in variance after the subprime crisis.

2.3 Conceptual Framework

The conceptual framework as outlined in the existing literature shows that stock market performance is major accelerator of economic growth and depicted in the figure below. The below framework has been developed from the theoretical approach to finance growth nexus outlined by Levine (1997), cited in Tinavapi T. Cuthbert (2017). Levine (1997) enlightened how market frictions including information and transaction costs serve to promote the existence of financial markets and intermediaries. These intermediaries and markets provide a major role: facilitation of risk management, allocation of resources, monitoring of management and exertion of corporate control, mobilization of savings and facilitate exchange of goods and services. Accordingly, Levine emphasizes that each of the roles impact growth through two channels: capital accumulation and technological innovation.

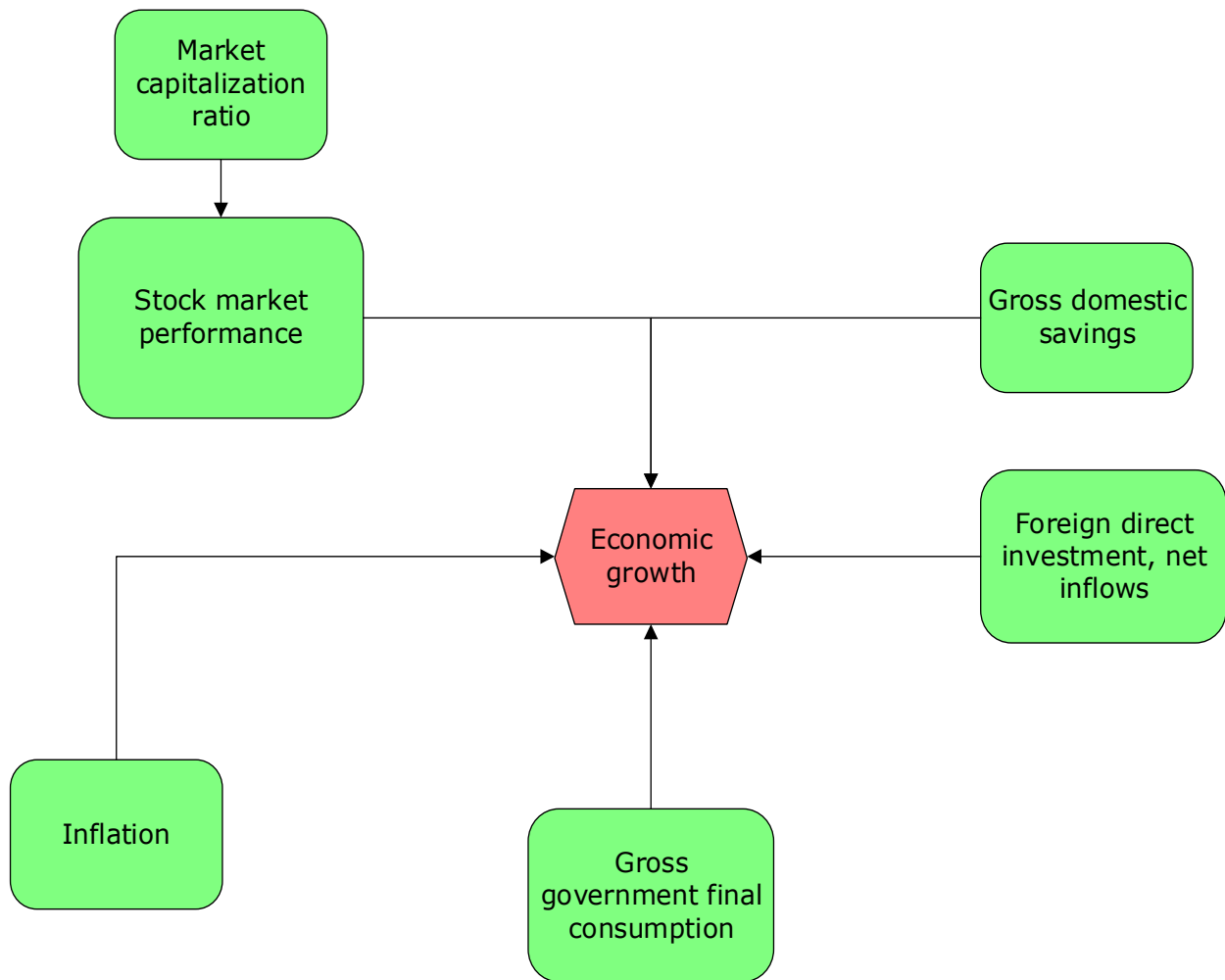
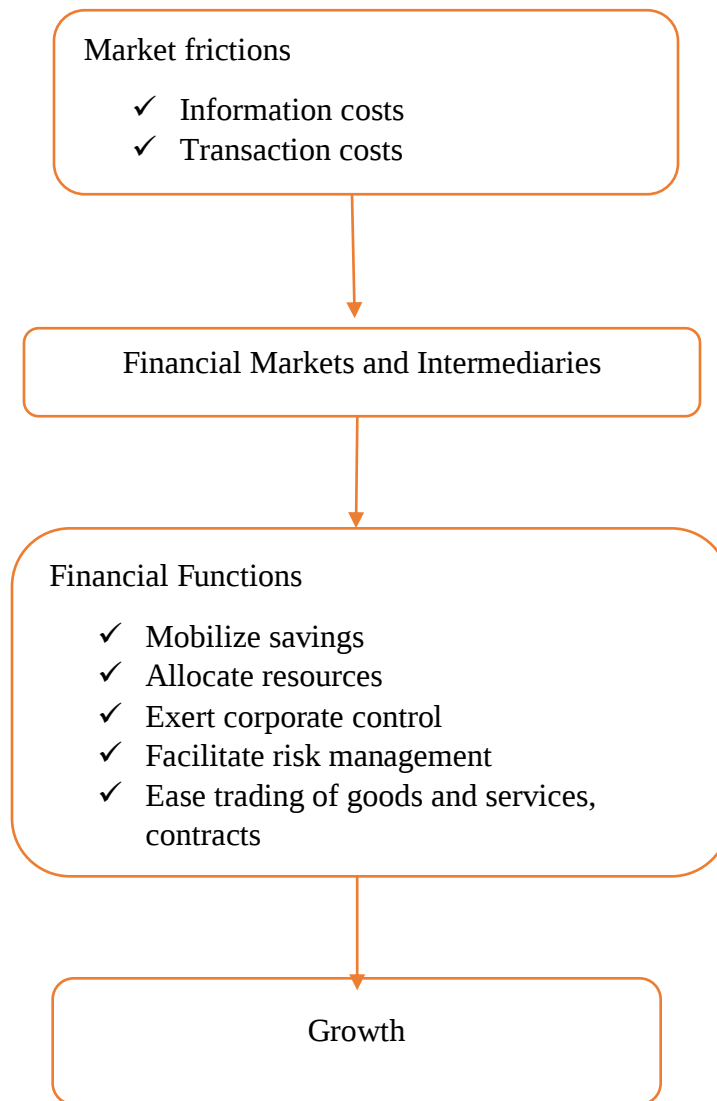


Fig. 2.1 Conceptual Framework explaining channel of impact.

Source: Own formulation based on theoretical background

Fig 2.2 Theoretical approach to Finance -Growth Nexus



Source: Levine (1997)

The above figure shows the roles created out of market frictions as well as the channels through which stock markets development results in economic growth. Countries with more developed financial well integrated system i.e. with giant banks and more attractive stock markets, may expect to grow at faster rates than their counter parts with less developed financial systems. Levine has pointed out that his assertion has been supported with many studies on how financial development is a critical catalyst for economic growth.

CHAPTER THREE: METHODOLOGY

This chapter of the study focused and dealt with the methodology of data analysis and nature of the data. In developing an econometric model for economic growth, it is not attainable to consider all the parameters because of data availability and non-quantifiability of some variables. To examine the relationship between stock market performance and economic growth, this study has deployed a panel data model with a cross section of six countries of fifteen years data.

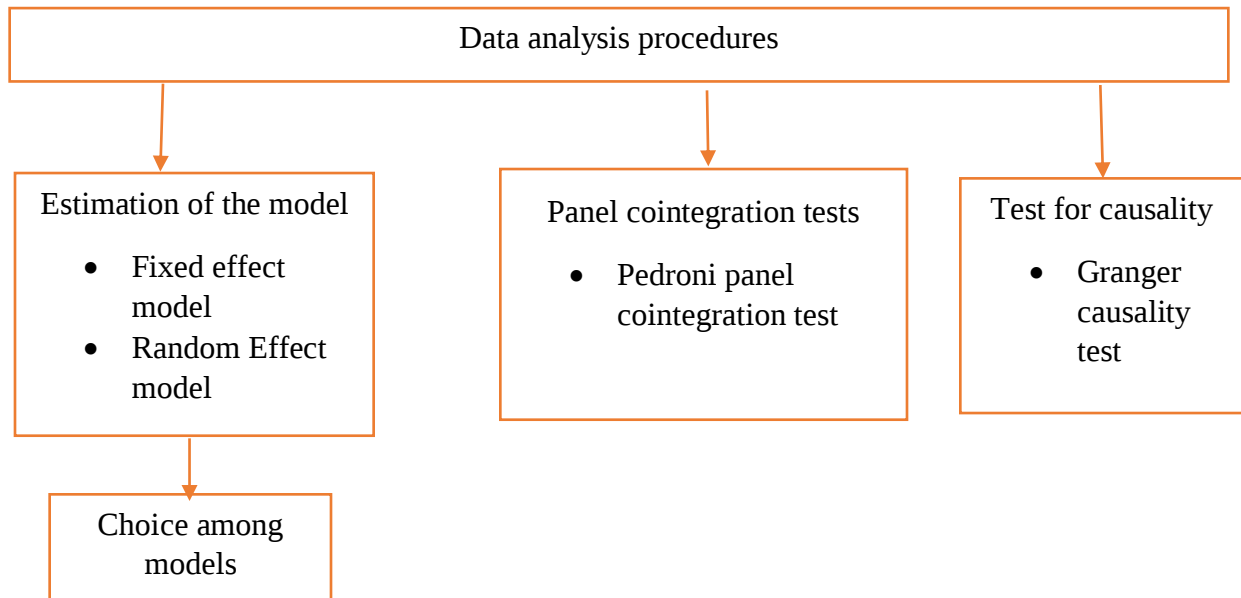
Considering the availability of data, the following independent variables are used in the study, foreign direct investment net inflow, gross domestic investment, gross government final consumption, inflation, and market capitalization ratio.

This study has primarily focused on analyzing the relationship between financial sector development and economic growth in African countries and developing an inference as an insight. It employed the longitudinal research design using data of selected African countries who have already been practicing a stock exchange. The data for the purpose of this study obtained from World bank indicators for the period 2004 to 2018 of countries taken into consideration.

This study hypothesized that economic growth proxied by growth of GDP is dependent on financial development channeled with other variables like market capitalization ratio. As a result, the dependent variable is GDP and the core independent variable be market capitalization ratio over the period from 2004 to 2018.

The specific model to be applied for this study, whether fixed effect or random effect, has to be selected with the help of Hausman tests. Once the long run relationship between the variables is measured through running a panel cointegration tests, the causal relationship between economic growth and stock market performance is going to be done with granger causality tests.

Fig 3.1 Data analysis procedures



Source: Own formulation

The model is specified as follows

$$\text{LGDP} = f(\text{GDS}, \text{FDI}, \text{INF}, \text{GGFC}, \text{MCR},)$$

Equation in econometric form:

$$\text{LGDP}_{it} = \beta_0 + \beta_1 \text{GDS}_{it} + \beta_2 \text{FDI}_{it} + \beta_3 \text{DC}_{it} + \beta_4 \text{GGFC}_{it} + \beta_5 \text{MCR}_{it} + \mu_t$$

Where: LGDP: Natural log of Gross domestic product

INF: Inflation as a percentage of GDP

GDS: Gross domestic saving as a percentage of GDP

FDI: Foreign direct investment net inflows as a percentage of GDP

GGFC: Gross government final consumption as percentage of GDP

MCR: Market capitalization ratio as a percentage of GDP

μ_t : Error term

β_0 is the constant term and other β 's are coefficients of the explanatory variables.

3.1 Definition of Variables and Expected sign of Coefficients

Gross domestic product and Inflation: Inflation rates are considered as sign of macroeconomic instability which might have both an adverse and promising impact to the economic growth. High and unpredictable inflation distorts the information content of the relative prices and increases the riskiness of long-time investment and hence affected growth (Oshikoya 1994).

In the Keynesian perspective, full employment is ignored, and hence expansionary fiscal policy creates an increase in output and price. This implies that economic growth and inflation has a stable long run positive relationship. Wage and price stickiness may cause to elapse long time to come to equilibrium for an economy. Regardless of this view moderate inflation can stimulate economic growth Mubarek (2005). Other economists declared that, with rational expectation and inflationary twisting raise in price levels through time may lead to high price level and macroeconomic instability and become harmful to economic growth Hasanov (2011). Monetarist on the other hand claimed that there is a short run positive relationship between inflation and economic growth because a decrease in unemployment. However, this is expected in the assumption that the policy raising aggregate demand is not anticipated. Contrary to this, New Keynesians focused on that the rise in inflation will have an adverse impact on economic growth. Low and stable inflation leads to economic growth and equitable distribution of national income Abdulaziz (2016).

This implies that there is noconsensus about the economic relationship between inflation and economic growth. Drukkeret *al* (2005) as cited in Hasanov (2005) classifies four major principles in the literature regarding the impact of inflation on economic growth: (a) Sidrauski(1967), predicts that there is no effect of inflation on economic growth i.e. money is super-neutral; (b) Tobin (1965) claimed that money is a substitute for capital, leading inflation to have a positive effect on long-run growth; (c) Stockman (1981) stands with cash-in advance model, by which money is complementary to capital causing inflation to have negative impact on long run growth; (d) New class of models in which inflation has a negative impact on long run growth, if the inflation rate exceed some threshold level and assuming that there is a non-linear relationship between inflation and economic growth.

As a matter of inception therefore, this study is going to expect a positive relationship between inflation and economic growth given the above facts.

GDP and Gross domestic saving: Saving is one from main factors to economic growth, as it creates investment, production, employment and ultimately improves economic growth. Different empirical evidences have come up with varying results of the impact of gross domestic saving on growth of the economy. For instance, Rasmi Datta P. (2011), has studied the granger causality of savings and economic growth in case study on Thailand assuming the convergence hypothesis. The result has depicted that growth rate of gross domestic saving does not play any role to create growth GDP. It has also been argued that saving does not have a permanent impact on economic growth in the neoclassical model also an increase in saving may lead to the short run positive effect, it might finally disappear through time.

GDP and Foreign direct investment net inflow: FDI stands for long term participation in the management, joint venture transfer of intellectuals or expertise from one country to the other. The literature extracted in the endogenous growth theory suggested that level of financial sector development might affect the role of FDI in most developing countries to accelerate knowledge transfers and spillover effects Maignon and Quiang (2010).

Many scholars have been interested towards articulating the role of foreign direct investment focusing on its contribution and pitfalls towards economic growth. Herzer D. (2010) examined the effect of FDI on economic growth on 44 developing countries over the period of 35 years using heterogeneous panel cointegration techniques. The study has concluded that FDI affects economic growth negatively on average in developing countries considered in the study.

Since the early 1980's, most restrictions in developing countries are cleared for foreign direct investment and many of the countries have designed seductive tax incentives and subsidies to attract foreign capital and remittances. The logic underlined here is that FDI induces to economic growth by motivating capital accumulation through positive externalities of knowledge transfer and spillover effects of local firms, as theory shows. However, as the empirics showed, the reality behind is different implying that FDI can reduce capital accumulation when foreign investors claim scarce resources such as import license, credit facilities and skilled manpower thereby crowding out investment from the domestic resources. In addition, it is claimed that knowledge transfers are misleading given that domestic firms are using primary technology for production and unskilled labor forces becomes unable to learn from the dynamic and complicated multinationals. Finally, critics said that foreign based firms can pull out demand

from local firms due to the economic advantages forcing local companies to reduce production which in turn reduces the productivity Haddad and Harrison (1993), cited in Herzer D. (2010).

Given the above fact and the nature of the economy of countries considered in this study, it is hypothesized that foreign direct investment might have a negative impact on economic growth.

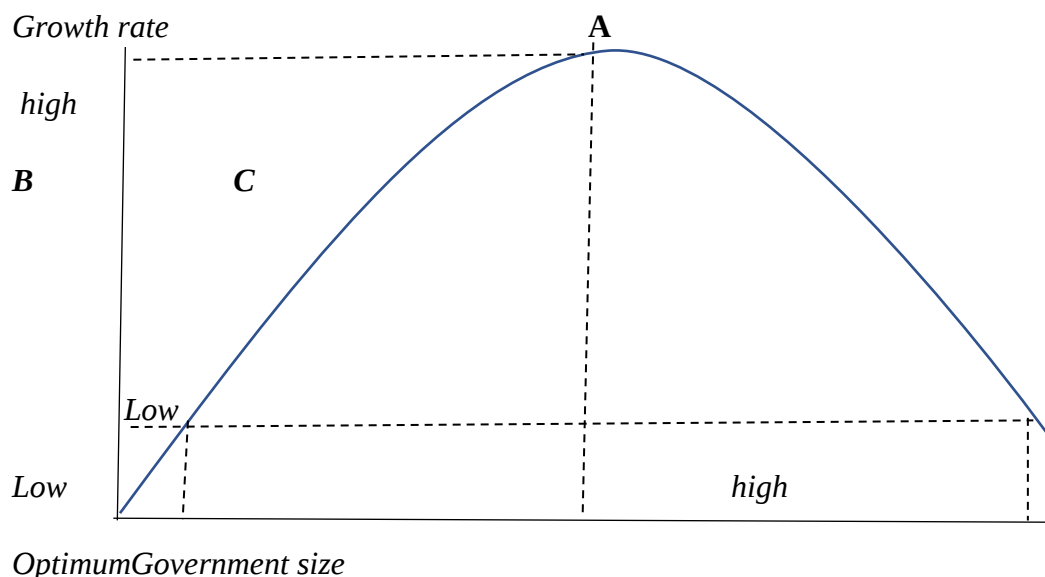
GDP and Gross Government Final Consumption: Government expenditure is one of the most critical elements of economic growth in theories and traditionally considered as component of the fiscal policy. However, in the current economic arena of global crisis it is evident that government involvement induces the crisis as most literature talks. Lahirushan S. and Gunasekara V. (2015) have studied the dynamics in the Asian economy regarding impact of government expenditure on economic growth. Accordingly, it stated that larger government size hinders an economic efficiency and growth as the tax required to cascade government projects disincentives investors to come with new idea and invest. In addition, it can absorb large sum of funds that might have been used by the private sector in profitable and feasible investment opportunities implying that resource allocation becomes inefficient and reduction in general output.

Most government operations have experienced failures and time lag as excessive burdens like regulatory process has increased the cost of implementation. Therefore, economies with high government expenditure as a proportion of output should experience lower growth. If the government expenditure does not picture out the economy's need it might have negatively drained the economy so that it is the society who bears the cost Lahirushan S. and Gunasekara V. (2015).

However, the Keynesians are advocates of high government involvement can boost the economy. In regions incorporating both developed and developing countries like Asia, most frequently it has been noticed that gross domestic product increased as their government has played a significant role. This prediction can be supported by the Adolf Wagner who is the first to recognize a positive and significant correlation between economic growth and government expenditure. In his justification for government involvement, Wagner said that the need for protection and regulatory services is vital to sustain the increment in economic wealth. Unfortunately, the US-senator Armey negated the theory. Armey said that if the role of government grows almost to full ownership economic resources and decision-making economic

growth may decline and reach zero. This is because of the crowding out effect of private investment due to higher tax charges and less free market.

Fig 3.2 Armey's Curve



Source: Lahirushan and Gunasekara (2015)

Point “A” of the above figure shows an optimal amount of public spending at which government prospects are maximized and whereas point “B” and “C” shows anarchy and absence of collective infrastructure and incentive traps demotivation and corruption in the public sector respectively.

Countries covered under this study are having a developing economy for which inefficiency and pitfalls are common for which it is expected that government expenditure might have a negative impact to the ultimate economic growth.

GDP and Market capitalization Ratio - market capitalization ratio deals with the intention that overall market size is positively correlated with the capacity of market to mobilize capital and diversify risk to the economy as a whole (Levine and Zervos 1996). There have been too many scholars who devoted their time and effort towards dealing with factors affecting economic growth and the recent financial crisis to different economic corridors gave attention to the effect of financial development on economic growth. Mehmet Fais B. *et al* (2016), have investigated the long-term impact of stock market performance on economic growth and examined whether the

result would be positive or otherwise using a panel vector autoregressive model in an emerging market. Even though the theoretical literature provides a contradicting prediction regarding the subject matter, the result of this pane VAR analysis concluded that stock market performance of emerging markets has significantly contributed to the economic growth.

Another case study has been done on Nigerian stock market anddictated that stock market serves as the source of capital for the corporate sector. This can be supported with the justification that the presence of stock market boosts the international investment climate and with a market capitalization of US \$4 billion the market represents a major mechanism for resource allocation Matthew o. *et al* (2009). On the other hand, the interlink between stock market and the real economy has been analyzed in China implementing ARDL methodology by Mishra V. and Lei P. (2016). The study has found that, a share market has a long run negative association with the real economy though the impact was not material and was suggested to not consider it. No evidence obtained over the short run according to the study.

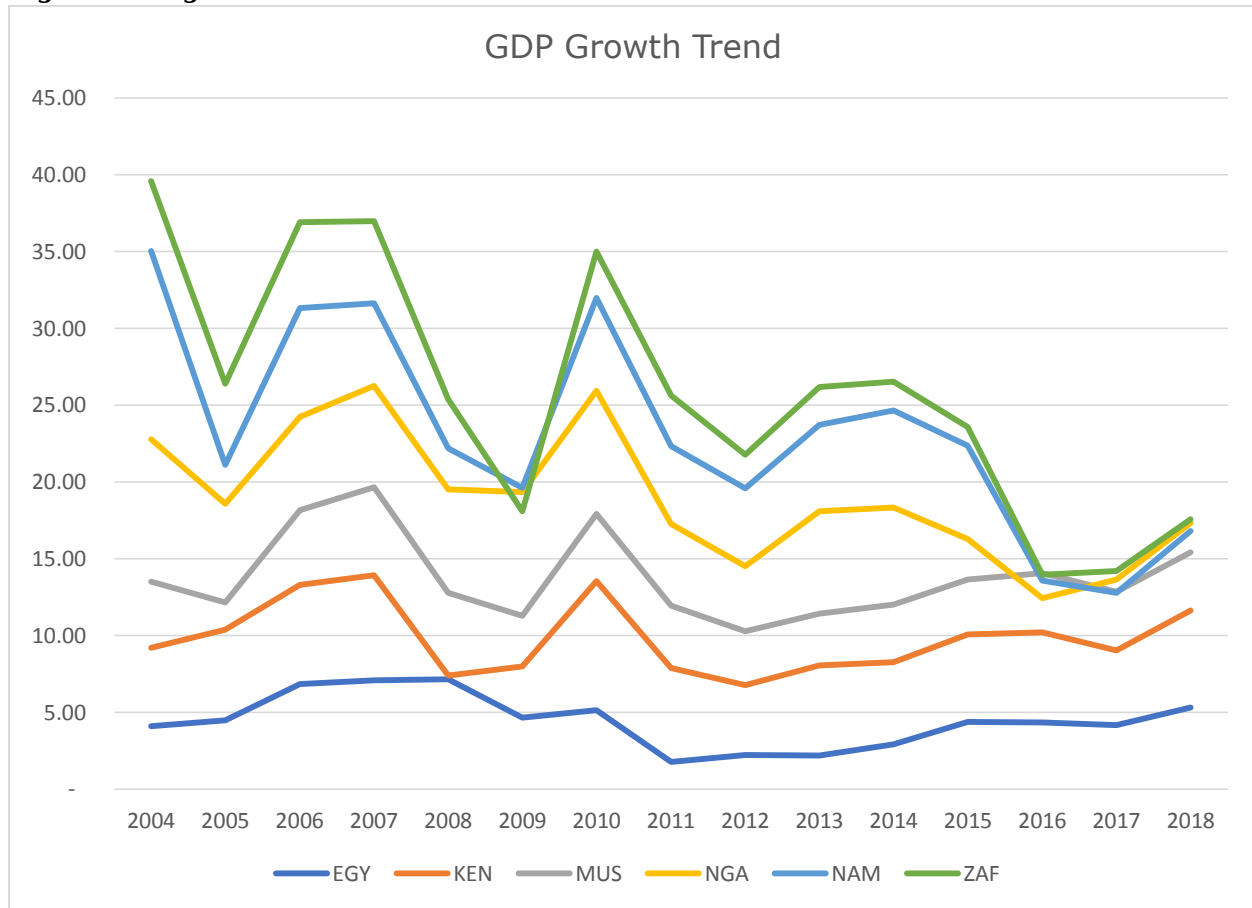
Economies considered in this study have emerging stock market with not highly strong market size and liquidity. As a result, it is feasible to hypothesis as most empirical evidences shows that stock market performance has a positive impact on economic growth.

Economic growth in Africa's frontier markets

The African markets incorporated in this study has qualified rapid growth in the last decade. Their stock exchange market has also been established and strengthened within the most recent decade. Many African countries have ironically implemented a stock market in the last decades according to Kanetsi B. (2014) hypothesizing accordingly that economic growth may emerged from other sectors of the economy. If, however, stock market development has played a role in economic growth it needs further investigation to analyze how and develop its contribution and let countries with no stock market start to implement it.

This part of the literature starts with some statistical diagram of GDP growth in the six African countries as well practicing stock exchange market in the last decade. The figure below, shows GDP growth in the most recent decade of sampled countries: Egypt, Mauritius, Nigeria, South Africa, Kenya and Namibia.

Fig 3.3 GDP growth trend



Source: Own compilation, World development indicator data

South Africa has experienced the highest growth overall in 2006 to 2007 followed by Namibia. Except Egypt countries sampled in this study have experienced a highest growth in 2007 in each respective trends of growth. Egypt and Mauritius have experienced a stable growth since 2011 whereas Nigeria, Namibia and South Africa's trend shows a volatile growth over the period from 2008 to 2018.

Nigeria seems to have a highly volatile and declining growth over the period of study and the overall trend gets highly declining up to recovery showed after 2016 for Nigeria, Namibia and South Africa.

One of the measures of stock market development is the number of listed local companies. According to Kanetsi B. (2014) this measure does not include investment companies, mutual funds or other collective investment solutions. In this study, stock market size is measured by the market capitalization ratio whereas the liquidity capacity is measured by its total stock traded value. The trend of these variables over the period of study is depicted below with diagrammatic illustration.

Fig 3.4 Market capitalization ratio trend



Source: own compilation, World development indicator data

South Africa has experienced the highest and volatile market size reaching its peak with a 10% rise in 2017 and immediate decline during 2018. Egypt on the other hand faced a declining trend of stock market size since 2008 and showed some revival after 2016. Nigeria, Mauritius Kenya and Namibia have a stable stock market size over the period of study even though there was no as such growth in their size of stock markets.

CHAPTER FOUR

4.1 EMPIRICAL RESULT AND DISCUSSION

This chapter has dealt with the analysis of empirical result which entirely bases on the output of the data used to the outfit model. As described in the earlier chapter this study has deployed a panel data analysis for which its detailed result and data tests must be discussed below.

4.1.1 Unit Root Test

The implications of the unit root test in a macroeconomic data are, at least, reflective. If a structural variable such as real output, is truly $I(1)$, shocks to it will have a permanent effects. If confirmed, then this observation would mandate some rather serious reconsideration of the analysis of macroeconomic policy (W. Green, 2006). Augmented Dicky fuller (ADF) test is critical to determine the existence of a unit root. If the time series data is stationary at level, it is integrated of zero or $I(0)$ meaning that it is no spurious. However, if the data is not stationary at level, we take first difference, second difference and so on until it becomes stationary. If a non-stationary time series data becomes stationary after taking a difference it is a difference stationary data. A time series data is said to be stationary if the calculated ADF is greater than the critical ADF at a given level Gujarati (2004).

Given the above fact, the data which is going to be used in this study for each variable has been tested for a stationarity. Accordingly, the result has showed that some variables are stationary at level whereas others are at first difference using the test of Levin, Lin & Chu t, Im, Pesaran and Shin W-stat, ADF - Fisher Chi-square and PP - Fisher Chi-square. All except Fisher's tests has been done assuming asymptotic normality whereas an asymptotic Chi-square distribution are used by Fisher.

As shown below in the summary of panel unit root estimation GDP, Foreign direct investment, gross government final consumption and gross domestic saving are stationary at first difference. The rest of the variables such as inflation and market capitalization ratio are stationary at level. It is noted that at level the null hypothesis that there is a unit root can not be rejected except for inflation and market capitalization ratio. This implies that stationary variables are obtained at different levels of differencing. Given the fact that there is a unit root before differencing for some variables, it becomes essential to consider co-integration tests.

Table 4.1: Panel unit root Estimation

Variables	Method	Statistic	Prob.
D(LGDP)	Levin, Lin & Chu t*	-2.55597	0.0053
	Im, Pesaran and Shin W-stat	-2.30532	0.0106
	ADF - Fisher Chi-square	25.4001	0.0130
	PP - Fisher Chi-square	43.3859	0.0000
D(FDI)	Levin, Lin & Chu t*	-3.20110	0.0007
	Im, Pesaran and Shin W-stat	-3.61296	0.0002
	ADF - Fisher Chi-square	34.8299	0.0005
	PP - Fisher Chi-square	95.8036	0.0000
	Im, Pesaran and Shin W-stat	-3.61296	0.0002
D(GDS)	Levin, Lin & Chu t*	-3.37793	0.0004
	Im, Pesaran and Shin W-stat	-3.92660	0.0000
	ADF - Fisher Chi-square	37.6402	0.0002
	PP - Fisher Chi-square	83.5280	0.0000
	Im, Pesaran and Shin W-stat	-3.92660	0.0000
INF	Levin, Lin & Chu t*	-5.16346	0.0000
	Im, Pesaran and Shin W-stat	-2.97372	0.0015
	ADF - Fisher Chi-square	30.6652	0.0022
	PP - Fisher Chi-square	37.2974	0.0002
	Im, Pesaran and Shin W-stat	-2.97372	0.0015
D(GGFC)	Levin, Lin & Chu t*	-12.8742	0.0000
	Im, Pesaran and Shin W-stat	-7.31001	0.0000
	ADF - Fisher Chi-square	59.8983	0.0000
	PP - Fisher Chi-square	51.8862	0.0000
	Im, Pesaran and Shin W-stat	-7.31001	0.0000
	ADF - Fisher Chi-square	59.8983	0.0000
MCR	Levin, Lin & Chu t*	-3.36793	0.0004
	Im, Pesaran and Shin W-stat	-2.22873	0.0129
	ADF - Fisher Chi-square	26.7434	0.0084
	PP - Fisher Chi-square	31.5183	0.0016
	Im, Pesaran and Shin W-stat	-2.22873	0.0129

Source: Own Computation

4.1.2 Co-integration Test

Once a unit root has been confirmed in a data series, there comes a concern of whether the possibility of long-term relationship exists or not among the set of variables. It has been argued that a test for cointegration can be considered as a pre-test to avoid spurious regression results. Variables might be co-integrated if they have a long-term relationship between them. A co-integration test makes sure that even if individual variables are not stationary taken separately, the linear combinations of these variables might be stationary Gujarati (2004). Differencing of variables to achieve stationarity status leads to loss of long-term nature of variables.

Table4.2. Pedroni Co-integration test result

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-0.997740	0.8408	-1.084471	0.8609
Panel rho-Statistic	1.846513	0.9676	1.964986	0.9753
Panel PP-Statistic	-1.613858	0.0533	-0.816870	0.2070
Panel ADF-Statistic	-1.828197	0.0338	-1.527810	0.0633
Panel v-Statistic	-0.997740	0.8408	-1.084471	0.8609
Alternative hypothesis: individual AR coefs. (between-dimension)				
	Statistic		Prob.	
Group rho-Statistic	3.147396		0.9992	
Group PP-Statistic	-0.687400		0.2459	
Group ADF-Statistic	-1.833126		0.0334	

Source: Own computation

As shown in the above table, the probability value of most test statistic is not significant implying that the null hypothesis of no cointegration is accepted by majority as eleven tests implied out of the total thirteen. This result has been obtained in an assumption of no deterministic trend. The study as a result has to accept the null hypothesis stating that there is no co integration and can conclude that variables have a short- term relationship.

4.1.3 Granger causality test

A causality analysis is applied to articulate causation between two variables and to determine the direction of causality if there is relationship. Here the study has applied the Granger causality tests to examine the relationship between Market capitalization ratio and the gross domestic product. Granger causality test claimed the direction of relationship between two variables for instance X and Y. In case the current Y values can predicted by the past values of X rather than its current value, then Granger causality exists in the direction from X to variable Y (Ozer Kaya and Ozer ,2011) cited in Murat et al (2013). In running the granger causality, we have checked that both stock market performance variable and gross domestic product are stationary and one important assumption is that the residual values are uncorrelated. As a result, we made the null hypothesis that stock market performance does not granger cause economic growth and vice versa.

Table 4.3: Granger Causality Test

Null Hypothesis:	F-Statistic	Prob.
FDI does not Granger Cause LGDP	2.48321	0.0905
LGDP does not Granger Cause FDI	1.10842	0.3356
GDS does not Granger Cause LGDP	0.67906	0.5103
LGDP does not Granger Cause GDS	0.63409	0.5333
GGFC does not Granger Cause LGDP	0.46828	0.6279
LGDP does not Granger Cause GGFC	0.32098	0.7265
INF does not Granger Cause LGDP	0.40708	0.6671
LGDP does not Granger Cause INF	3.75037	0.0282
MC does not Granger Cause LGDP	4.89687	0.0101
LGDP does not Granger Cause MC	1.31386	0.2751
GDS does not Granger Cause FDI	1.22689	0.2992
FDI does not Granger Cause GDS	1.07027	0.3482
GGFC does not Granger Cause FDI	1.36597	0.2616
FDI does not Granger Cause GGFC	2.29767	0.1077
INF does not Granger Cause FDI	1.84051	0.1660
FDI does not Granger Cause INF	2.02209	0.1397
MC does not Granger Cause FDI	0.51566	0.5993
FDI does not Granger Cause MC	0.45261	0.6377
GGFC does not Granger Cause GDS	0.13718	0.8720
GDS does not Granger Cause GGFC	3.26015	0.0440
INF does not Granger Cause GDS	0.48325	0.6187
GDS does not Granger Cause INF	0.38584	0.6813
MC does not Granger Cause GDS	2.39548	0.0983
GDS does not Granger Cause MC	0.08759	0.9162
INF does not Granger Cause GGFC	0.76003	0.4713
GGFC does not Granger Cause INF	2.15199	0.1236
MC does not Granger Cause GGFC	0.94652	0.3928
GGFC does not Granger Cause MC	0.33485	0.7165
MC does not Granger Cause INF	0.59122	0.5563
INF does not Granger Cause MC	0.48674	0.6166

Source: Own computation

As shown in the table above the direction of causation between stock market performance and economic growth is identified and implied that stock market performance represented by market capitalization ratio, Granger causes economic growth, which is represented by the gross domestic product. The tests statistic of granger causality test depicts that p value is 1.01% which is below 5% and hence the null hypothesis of market capitalization does not granger causes GDP is rejected.

However, the null hypothesis that GDP does not granger cause market capitalization ratio is accepted as p value is 27.51% meaning it is stock market performance which granger causes economic growth.

4.1.4 Multicollinearity

Multicollinearity refers to the condition that anticipates the linear relationship among the explanatory variables without ruling out of non-linear relationship. If perfect multicollinearity exists, the regression coefficients of the explanatory variables are indeterminate their standard errors are become infinite. On the other hand, if multicollinearity is less than perfect, the regression coefficients, although determinate, have larger standard error (in relation to coefficient themselves) implying that coefficients cannot be estimated with great precision or accuracy. Variance inflation factor is used to determine the existences of the problem of multicollinearity in making inferences. When $VIF > 10$, there is the problem of multicollinearity and hence we cannot reject the hypothesis that of no correlation among explanatory variables Gujarati (2004).

Table 4.4 Correlation test result

	INF	FDI	GDS	GGFC	MC
INF	1	-0.08	0.011	-0.48	-0.31
FDI	-0.08	1	-0.063	0.31	-0.19
GDS	0.01	-0.06	1	-0.28	0.26
GGFC	-0.48	0.31	-0.28	1	0.34
MCR	-0.31	-0.19	0.26	0.34	1

Source: Own Computation

As shown in the above table of correlation test result, it can be inferred that there is no problem of multicollinearity among explanatory variables as variance inflation factor become less than ten.

4.1.5 Residual Cross-Section Dependence Test

An important assumption in the regression dynamics is that the disturbance appearing in the regression result is homoscedastic i.e. they all have the same variance. However, there exist an outlying observation in relation to the observation in the sample assumption of constant variance is violated and referred as heteroscedasticity. Breusch-Pagan test for heteroscedasticity is used with the null hypothesis of constant variance and possible to reject the hypothesis when p value is greater than 5%. Unfortunately, the test result of this study rejects the null hypothesis of constant variance and accept the inference in the literature postulated that heteroscedasticity had never been a reason to drop out a model which fulfills other test measures, Gregory Mankiw (1990). Another caution by John Fox (2009), says that “unequal error variance is worth correcting only when the problem become severe, and one cannot wholly generalize the harm of heteroscedasticity.

Table 4.5: Residual cross-section dependence tests

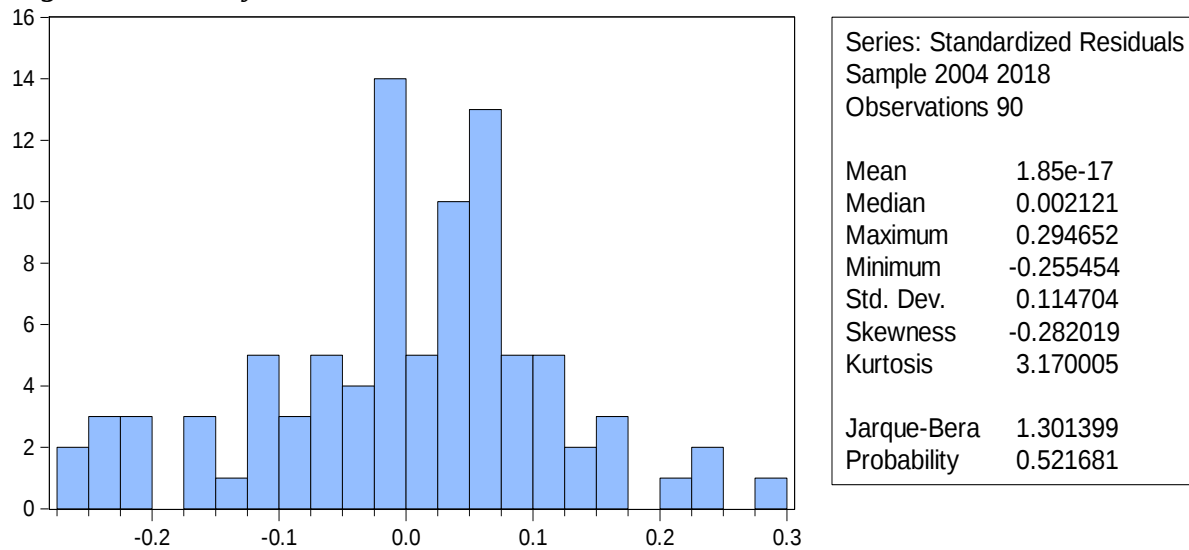
Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	61.54111	15	0.0000

Source: Own Computation

4.1.6 Normality tests

Normality test is applied to accentuate that the residuals are normally distributed or not. Although different normality tests have been discussed in the literature such as a) histogram of residuals b) normal probability plot, a graphical device and c) JarqueBera (JB) test Gujarati (2004). The Jarque-Bera test emphasis on the measure of skewness and kurtosis that is the distribution is symmetric and mesokurtic. Therefore, the simplest test of normality according to Gujarati (2004), is to find out the whether the compound values of skewness and kurtosis depart from the norms of 0 to 3. On the other hand, using the p-value of the tests result we can made inferences and hence as shown below the probability value is 52.17% which is greater than 5% implying that we can accept the null hypothesis of residuals are normally distributed.

Fig 4.1: Normality Test



Source: Own Computation

4.1.7 Hausman Test

The framework of this study is based on and supported with rich literature with most of the scholars being analyzing stock market capitalization as independent variable and gross domestic product (GDP) as dependent variable as is done here. The panel regression is applied mainly focused with fixed effect and random effect modeling most importantly going to be determined by the correlated-random effect Hausman test.

Hausman test need to be conducted to inform a choice of a more appropriate technique to adopt between fixed effect and random effect models. The Hausman test is applied to test for exogeneity of the unobserved error component. The test is essential because the random effect needs to be uncorrelated with the explanatory variables; otherwise there is endogeneity problem and the random effect problem will be inconsistent Goldfrey O & Osad O. (2019). Thus, the null hypothesis for the Hausman test is that $H_0: \beta_{RE} = \beta_{FE}$ where β_{RE} and β_{FE} are coefficient vectors of the time varying explanatory. Accordingly, if the null hypothesis is rejected, the inference that can be drawn is that the random effect model is inconsistent: and the fixed effect model will be selected. Therefore Table 4.6 represents the Hausman test report on comparison between fixed effect estimator and the random effects estimator. According to the result shown below the null hypothesis that random effect model is the preferred one, is rejected as the P-value is less than 5% which implies that the fixed effect model is selected to be used in this study.

Table 4.6 Test cross-section random effects

Test Summary		Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
Cross-section random		7335.955428	5	0.0000
Correlated Random Effects - Hausman Test				
Variable	Fixed	Random	Var(Diff.)	Prob.
FDI	-0.015277	-0.050880	0.000022	0.0000
MC	0.001458	-0.017427	0.000000	0.0000
INF	0.001006	0.080624	0.000002	0.0000
GDS	-0.027407	0.065201	0.000003	0.0000
GGFC	-0.004584	-0.036123	0.000074	0.0003

Source: Own Computation

An observation of the generalized Hausman tests shows that the fixed effect model is chosen. This decision is based on the significance of the estimated results of p-value less which is below 5% implying that a rejection of the null hypothesis in favor of the fixed effect model.

4.1.7.1 Fixed effect

The fixed effect model controls for all time invariant differences between the individuals to that the estimated coefficients of the fixed effect models cannot be biased because of omitted time-invariant characteristics like culture, religion etc. One shortcoming of the fixed effect model is that it cannot be used to investigate time-invariant causes of the dependent variable. Time invariant characteristics technically are perfectly collinear with the person, entity, or dummies.

Fixed effect data modeling has been implemented by many of the researchers in different area of interest. Fixed effect estimators are most importantly used to limit selection bias. For instance, it is well noted that with panel data, fixed effect models eliminate time-invariant puzzling. As Mummolo J. and Peterson E. (2017) outlined, while interpreting fixed effect estimation results, they have to consider conjectural changes in the independent variables that could reasonably occur within units to prevent overstating the substantive importance of the variable's effect.

Fixed effect modeling is naturally used in the estimation of causal effects in observational data by avoiding large segments of variation thought to contain confounding factors. When units in a panel data set are thought to vary systematically in unobservable ways that affect the result of

interest, unit fixed effects used given that it avoids all among unit variation, delivering an estimate of a variable average effect within units overtime Wooldridge 2010, cited in Mummolo J. and Peterson E. (2017).

A data consultant, Oscar Torres Rayan at Princeton University, has discussed the mechanics of using the fixed effect modeling. Accordingly, the discussion outlined that fixed effect models can explore the relationship between predictor and outcome variables within an entity (country, person, company etc). Each entity has its own specific characteristics which might or might not influence the predictor, for instance, being a male or female might influence the opinion towards certain agendas or political system of a particular nation could have some effect on trade and GDP or other business practices of a company may affect its stock price.

While applying the fixed effect models, it is assumed that something with in the individual may impact or affect the predictor or outcome variables which needs controlling this effect. This is the rationale behind the hypothesis of the correlation between entity's error term and outcome variables. Another important assumption regarding fixed effect model is that time invariant traits are distinctive to the individual and should not be correlated with other individual characteristics. If the error terms become correlated, then fixed effect is no longer best model since inferences might not be correct and it needs to model that relationship (may be using the random effect), this is the rationale behind the need for Hausman test.

4.2 Estimation Results and Discussion

Before estimation was held, all the variables considered in the study were tested for unit root to ensure that they were used as a stationary variable in the model.

Table 4.7: Fixed Effect Model Estimation result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	-0.015277	0.007906	-1.932308	0.0569
MCR	0.001458	0.000578	2.520200	0.0137
INF	0.001006	0.003344	0.300940	0.7643
GDS	-0.027407	0.002645	-10.36174	0.0000
GGFC	-0.004584	0.009218	-0.497229	0.6204
C	28.62061	0.153040	187.0133	0.0000
Effects Specification				

Cross-section fixed (dummy variables)

R-squared	0.996912	Mean dependent var	28.21507
Adjusted R-squared	0.996521	S.D. dependent var	2.064003
S.E. of regression	0.121747	Akaike info criterion	-1.259654
Sum squared resid	1.170972	Schwarz criterion	-0.954121
Log likelihood	67.68441	Hannan-Quinn criter.	-1.136445
F-statistic	2550.045	Durbin-Watson stat	1.045057
Prob(F-statistic)	0.000000		

Source: Own Computation

The estimated model in its functional form is as follows:

$$LGDP = C_0 + C(1) * FDI + C(2) * GDS + C(3) * GGFC + C(4) * INF + C(5) * MC$$

$$LGDP = 28.6206 - 0.0153 FDI - 0.0274 GDS - 0.0046 GGFC + 0.001 INF + 0.0015 MC$$

(0.0079) (0.0026) (0.0092) (0.0033) (0.0006)

Result of the estimated fixed-effect model validates the overall relevance of the model and the Durbin-Watson statistic is greater than the coefficient of determination (R-squared) and the probability value (0.0000) of the F-statistics shows the model is good fit.

The above empirical result of fixed effect estimation showed that among variables considered in the study, market capitalization ratio (MCR) and gross domestic saving (GDS) are become significant with p value less than 0.05 where as others such as foreign direct investment (FDI), inflation rate (INF) and gross government final consumption (GGFC) are insignificant factors towards economic growth inferring its above 0.05 p value. As shown in the Table 4.7 above, foreign direct investment, gross government final consumption has negatively affected economic growth whereas inflation has positive impact to economic growth though insignificant.

Gross domestic saving has a significant and negative impact to economic growth which is unfortunate to most of the empirics and obtained that gross domestic saving does not granger cause economic growth indicating that the impact is indirect. Opschoor A. (2015), has studied on the relationship between the savings and economic growth and found that there is a positive relationship. However, this study has proceeded one step and divide the saving in to private and public saving and found that positive relationship is between the public saving and economic growth concluding that private saving has no impact on economic growth.

On the other hand, market capitalization ratio has positive and significant impact to accelerate economic growth. Significant and positive relation between the stock market performance and economic growth has also been supported by the work of Levine and Zervos (1996). Their study has concluded that stock market performance become significant even after controlling other variables which would have long run relationship with economic growth. To examine the independent empirical link between the economic growth and stock market performance, they included a financial depth and found still strong relationship.

On the other hand, this study has incorporated market capitalization ratio as a representative to stock market performance and found that a unit change in it can contribute 0.15 % towards the economic growth of the countries considered in this study. In terms of market size, the market capitalization ratio has envisaged a positive relationship between stock market performance and economic growth which confirms the prior expectation of the relationship. This result has enlightened that the number of companies operating in the stock exchange market and their availability of fund for productive investment ideas would in turn induces economic growth.

As Table 4.7 shows, the result supports the finance led growth hypothesis that stock market is growth encouraging especially to the emerging economies as also verified by Osakwe L. and Ananwude C. (2017).

The other objective of this study was to investigate the direction of causality between the interest variables of the stock market performance and economic growth. Hence, Granger Causality test applied to the two variables (market capitalization ratio and GDP) which prove a uni-directional causality running from stock market performance to economic growth that is an improvement in market capitalization circulating in the market increases GDP and hence economic growth but the reverse do not found to be true.

CHAPTER FIVE

5. Conclusion and Recommendations

5.1. Conclusion

The increasing importance of stock market has got due attention to many researchers to examine the impact of stock market performance on economic growth. Although too many studies have been conducted to different corridors of the globe they did not come to the same position of conclusion.

Africa is considered as an investment destination which insists to look forward in developing the financial markets and hence empirically analyze the way out and evidences. This study has empirically examined and answers the question whether causal relationship exists or not between stock market performance and economic growth and direction of causality in selected African countries by which their economy has already incorporated stock exchange market. The study has covered 15 years of data from 2004 to 2018 for six African countries (Egypt, Mauritius, Nigeria, Kenya, Namibia and South Africa) by which the data is obtained from World Development Indicator.

From the findings of the study, it can be concluded that there is a one-way direction of causality running between stock market performance and economic growth. This implies that it is the stock market represented by market capitalization ratio which contributes to the growth of the economy whereas the reverse does not hold true.

Stock market performance has significantly accelerated economic growth in emerging economies like incorporated in this study with its positive impact. The granger causality analysis infers that economic growth in Egypt, Mauritius, Nigeria, Kenya, Namibia and South Africa is significantly affected by the market capitalization.

Given the empirical results described in this study, policy implications can be inferred. Since the stock market performance has a statistically positive influence on economic growth, it implies that the greater the capacity of stock markets through market capitalization, the higher economic growth achieved. This recognizes the importance of stock market as a component of the financial system in the process of economic growth.

5.2 Recommendations

The relevance of stock market development towards inducing economic growth cannot be overlooked. Results, discussions, and conclusions indicated that there exists a unidirectional relationship between stock market performance and economic growth. Therefore, this study recommends implementers to the stock exchange market to formulate and enact policies that aimed at stabilizing the stock market to promote capital formation, promote investment and strengthen economic growth. Measures such as tax incentives to facilitate purchase of securities by investors such as stocks, treasury bills and bonds. In addition, countries should familiarize a rigorous measure in terms of regulation to promote the confidence of investors.

Many of the African countries governors have been giving more attention to developing of the banking sector by reducing the involvement of credit allocation, reducing taxation for financial intermediaries. Therefore, the stock market needs to be encouraged by scrutinizing regulatory framework and policies under which the stock market operates with the aim of avoiding unnecessary entry barriers. For instance, governors should through the capital market authority manage barriers to stock market such as taxes, legal and other regulatory inhibitions to ease firms can get listed and trade in the stock exchange market.

Ongoing reforms and adjustments in the financial sector should be encouraged and inspected towards its contribution to the stock market operations. This is superficial that the existence of a well-established and well-organized capital market will support to the objective of rapid and sustainable growth. Capital markets are to be reframed as competent tools of domestic resource mobilization with policies and measures implemented to increase their depth and competitiveness. These reforms might constitute of reduction of the cost intermediation and floating new issues; acceptance of measures and strategies to reinforce and augment official administration of trading in the securities market so as to make them attractive assets.

Advance financial infrastructure through the development of various financial products and services, which has been the major problem justifying against the level of investment in developing economies.

Trading system of stock markets should be enhanced since this might accelerate stock market operations, enabling stocks to trade more frequently and speeds up the purchase and sale process of stocks which in turn might promote stock market liquidity.

As stock market practices relate to the growth of the economy, changes in stock prices can causally related to the rate of economic growth and can serve as policy instrument to stabilizing the economy meaning that measures formulated to prevent excessive volatility in stock prices may contribute to macroeconomic stability.

Ethiopia can have takeaways from this study that could add value to its plan of establishment of the stock exchange. As Ethiopian firms' dependence on external finance is highly significant in their capital structure, overcoming this dependence is crucial to firms which ultimately helps to create liquid stock exchange market. There are several initiatives in Ethiopia, privatization of government owned companies, revision of commercial codes and corporate governance. Though improvements in the financial infrastructures is vital, it must be comprehensive enough to serve development of stock market in the country. The government of Ethiopia should consider formulating appropriate regulatory bodies for proper implementation and operation of the stock exchange. In addition, cost and benefit analysis of the stock market has to be given a due attention before implementing it by educating the public through awareness creation campaign.

In developing the stock exchange market, the government of Ethiopia should emphasize to highlight and reduction of any bottlenecks including regulatory barriers that might act as disincentives to investment. Ethiopia must establish the authority to check the practice and preserve the confidence of investors in the market operation and formulate licensed brokerage firms. Additionally, more companies especially small and medium firms should be encouraged to get listed and productive investment ideas get access to finance and raise economic growth.

5.3 Suggestions on further research

This study has examined the nexus between stock market and economic growth in major economies of Africa that are implementing stock markets in their financing structure. The findings of this study concluded that the stock market performance has a positive and significant effect on economic growth. However, the result can be extended in several other ways to check how devoted the stock exchange markets are in channeling resources into productive projects and transmitting information. This will help to pinpoint the allocative efficiency of the stock market and further work can be done to formulate whether other features of stock market such as

size, liquidity, trade volume and depth in terms of instruments on offer might come up with different results from the one reached in the conclusion of this study.

Much work leftovers also to be done to best recognize the relationship between stock market performance and economic growth. Although this study examines the relevance of stock market performance on economic growth, it does not investigate the individual country cases nor analyses when is the right time for countries to get into stock market implementation. Finally, to better appreciate the causal relationship between the development of the stock market and economic growth, one may need to implement more complex vector autoregressive models that have been established for panel data.

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Appendix: Eviews-9 Test results

Panel unit root test: Summary

Series: **D(LGDP)**

Date: 05/19/20 Time: 10:00

Sample: 2004 2018

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t^*	-2.55597	0.0053	6	72
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.30532	0.0106	6	72
ADF - Fisher Chi-square	25.4001	0.0130	6	72
PP - Fisher Chi-square	43.3859	0.0000	6	78

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Series: **D(FDI)**

Date: 05/19/20 Time: 10:01

Sample: 2004 2018

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t^*	-3.20110	0.0007	6	72
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-3.61296	0.0002	6	72
ADF - Fisher Chi-square	34.8299	0.0005	6	72
PP - Fisher Chi-square	95.8036	0.0000	6	78

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Series: D(GDS)

Date: 05/19/20 Time: 10:02

Sample: 2004 2018

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections
Null: Unit root (assumes common unit root process)			
Levin, Lin & Chu t*	-3.37793	0.0004	6
Null: Unit root (assumes individual unit root process)			
Im, Pesaran and Shin W-stat	-3.92660	0.0000	6
ADF - Fisher Chi-square	37.6402	0.0002	6
PP - Fisher Chi-square	83.5280	0.0000	6

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Series: INF

Date: 05/19/20 Time: 10:03

Sample: 2004 2018

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-5.16346	0.0000	6	78
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.97372	0.0015	6	78
ADF - Fisher Chi-square	30.6652	0.0022	6	78
PP - Fisher Chi-square	37.2974	0.0002	6	84

Panel unit root test: Summary

Series: D(GGFC)

Date: 05/19/20 Time: 10:22

Sample: 2004 2018

Exogenous variables: Individual effects

User-specified lags: 1
Newey-West automatic bandwidth selection and Bartlett kernel
Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-12.8742	0.0000	6	72
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-7.31001	0.0000	6	72
ADF - Fisher Chi-square	59.8983	0.0000	6	72
PP - Fisher Chi-square	51.8862	0.0000	6	78

** Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Series: MC

Date: 05/19/20 Time: 10:25

Sample: 2004 2018

Exogenous variables: Individual effects

User-specified lags: 1

Newey-West automatic bandwidth selection and Bartlett kernel

Balanced observations for each test

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-3.36793	0.0004	6	78
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-2.22873	0.0129	6	78
ADF - Fisher Chi-square	26.7434	0.0084	6	78
PP - Fisher Chi-square	31.5183	0.0016	6	84

Panel cointegration tests:

Pedroni Residual Cointegration Test

Series: LGDPC FDI GDS GGFC INF MC

Date: 05/20/20 Time: 11:08

Sample: 2004 2018

Included observations: 90

Cross-sections included: 6

Null Hypothesis: No cointegration**Trend assumption: No deterministic trend**

Automatic lag length selection based on SIC with a max lag of 1

Newey-West automatic bandwidth selection and Bartlett kernel

Alternative hypothesis: common AR coefs. (within-dimension)

	<u>Statistic</u>	<u>Prob.</u>	Weighted <u>Statistic</u>	<u>Prob.</u>
Panel v-Statistic	-0.997740	0.8408	-1.084471	0.8609
Panel rho-Statistic	1.846513	0.9676	1.964986	0.9753
Panel PP-Statistic	-1.613858	0.0533	-0.816870	0.2070
Panel ADF-Statistic	-1.828197	0.0338	-1.527810	0.0633

Alternative hypothesis: individual AR coefs. (between-dimension)

	<u>Statistic</u>	<u>Prob.</u>
Group rho-Statistic	3.147396	0.9992
Group PP-Statistic	-0.687400	0.2459
Group ADF-Statistic	-1.833126	0.0334

Kao Residual Cointegration Test

Series: LGDP INF FDI GDS GGFC MC

Date: 05/23/20 Time: 16:51

Sample: 2004 2018

Included observations: 90

Null Hypothesis: No cointegration

Trend assumption: No deterministic trend

User-specified lag length: 1

Newey-West automatic bandwidth selection and Bartlett kernel

	<u>t-Statistic</u>	<u>Prob.</u>
ADF	-2.761151	0.0029
Residual variance	0.002067	
HAC variance	0.005605	

Endogeneity test –**Wald Test: for FDI**

Equation: Untitled

Test Statistic	Value	Df	Probability
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t-statistic	-1.932308	79	0.0569
F-statistic	3.733815	(1, 79)	0.0569
Chi-square	3.733815	1	0.0533

Null Hypothesis: C(1)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(1)	-0.015277	0.007906

Restrictions are linear in coefficients.

Wald Test: Gross

domestic saving

Equation: Untitled

Test Statistic	Value	df	Probability
-			
t-statistic	10.36174	79	0.0000
F-statistic	107.3657	(1, 79)	0.0000
Chi-square	107.3657	1	0.0000

Null Hypothesis: C(1)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(1)	-0.027407	0.002645

Restrictions are linear in coefficients.

Wald Test:

Government gross

final consumption

Equation: Untitled

Test Statistic	Value	Df	Probability
-			
t-statistic	0.497229	79	0.6204
F-statistic	0.247237	(1, 79)	0.6204
Chi-square	0.247237	1	0.6190

Null Hypothesis: $C(1)=0$
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(1)	-0.004584	0.009218

Restrictions are linear in coefficients.

Wald Test: Inflation

Equation: Untitled

Test Statistic	Value	df	Probability
t-statistic	0.300940	79	0.7643
F-statistic	0.090565	(1, 79)	0.7643
Chi-square	0.090565	1	0.7635

Null Hypothesis: $C(1)=0$
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(1)	0.001006	0.003344

Restrictions are linear in coefficients.

Wald Test: Market capitalization

Equation: Untitled

Test Statistic	Value	df	Probability
t-statistic	2.520200	79	0.0137
F-statistic	6.351409	(1, 79)	0.0137
Chi-square	6.351409	1	0.0117

Null Hypothesis: $C(1)=0$
Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(1)	0.001458	0.000578

Restrictions are linear in coefficients.

Wald Test: MC alternatively.

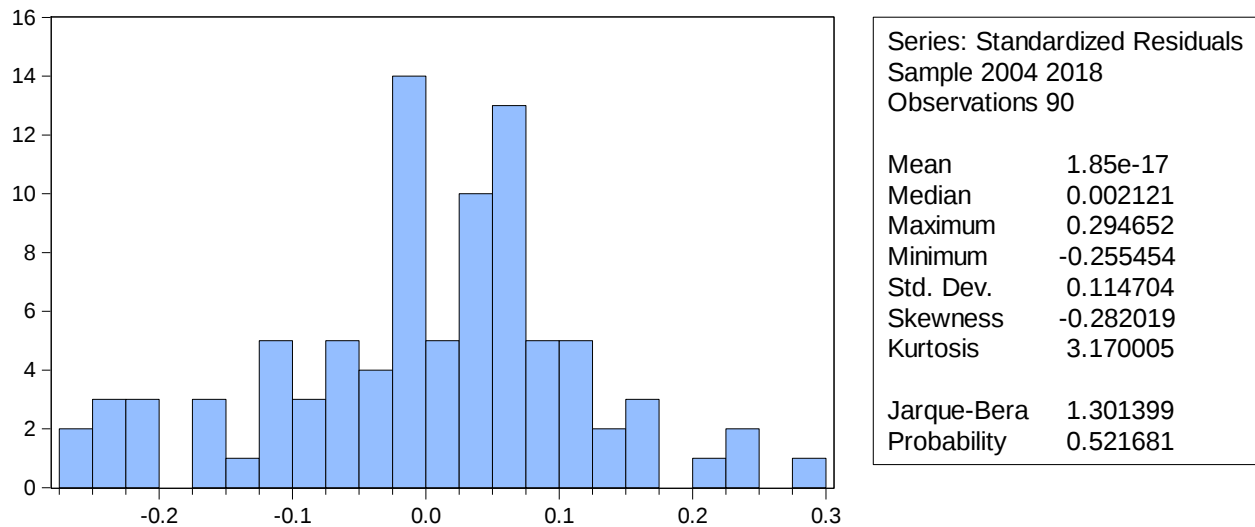
Equation: Untitled

Test Statistic	Value	df	Probability
t-statistic	1.972432	78	0.0521
F-statistic	3.890489	(1, 78)	0.0521
Chi-square	3.890489	1	0.0486

Null Hypothesis: C(1)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(1)	0.001142	0.000579



Normality test

Granger causality test result

Null Hypothesis:	Obs	F-Statistic	Prob.
FDI does not Granger Cause LGDP	78	2.48321	0.0905
LGDP does not Granger Cause FDI		1.10842	0.3356
GDS does not Granger Cause LGDP	78	0.67906	0.5103
LGDP does not Granger Cause GDS		0.63409	0.5333
GGFC does not Granger Cause LGDP	78	0.46828	0.6279
LGDP does not Granger Cause GGFC		0.32098	0.7265
INF does not Granger Cause LGDP	78	0.40708	0.6671
LGDP does not Granger Cause INF		3.75037	0.0282
MC does not Granger Cause LGDP	78	4.89687	0.0101
LGDP does not Granger Cause MC		1.31386	0.2751
GDS does not Granger Cause FDI	78	1.22689	0.2992
FDI does not Granger Cause GDS		1.07027	0.3482
GGFC does not Granger Cause FDI	78	1.36597	0.2616
FDI does not Granger Cause GGFC		2.29767	0.1077
INF does not Granger Cause FDI	78	1.84051	0.1660
FDI does not Granger Cause INF		2.02209	0.1397
MC does not Granger Cause FDI	78	0.51566	0.5993
FDI does not Granger Cause MC		0.45261	0.6377

GGFC does not Granger Cause GDS	78	0.13718	0.8720
GDS does not Granger Cause GGFC		3.26015	0.0440
INF does not Granger Cause GDS	78	0.48325	0.6187
GDS does not Granger Cause INF		0.38584	0.6813
MC does not Granger Cause GDS	78	2.39548	0.0983
GDS does not Granger Cause MC		0.08759	0.9162
INF does not Granger Cause GGFC	78	0.76003	0.4713
GGFC does not Granger Cause INF		2.15199	0.1236
MC does not Granger Cause GGFC	78	0.94652	0.3928
GGFC does not Granger Cause MC		0.33485	0.7165
MC does not Granger Cause INF	78	0.59122	0.5563
INF does not Granger Cause MC		0.48674	0.6166

Residual Cross-Section Dependence Test

Null hypothesis: No cross-section dependence (correlation) in residuals

Failed to reject the null hypothesis

Equation: Untitled

Periods included: 15

Cross-sections included: 6

Total panel observations: 90

Cross-section effects were removed during estimation

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	61.54111	15	0.0000
Pesaran scaled LM	7.401761		0.0000
Bias-corrected scaled LM	7.187475		0.0000
Pesaran CD	6.732680		0.0000

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	7335.955428	5	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
FDI	-0.015277	-0.050880	0.000022	0.0000
MC	0.001458	-0.017427	0.000000	0.0000
INF	0.001006	0.080624	0.000002	0.0000
GDS	-0.027407	0.065201	0.000003	0.0000
GGFC	-0.004584	-0.036123	0.000074	0.0003

Correlation test

	INF	FDI	GDS	GGFC	MC
INF	1	-0.08	0.011	-0.48	-0.31
FDI	-0.08	1	-0.063	0.31	-0.19
GDS	0.01	-0.06	1	-0.28	0.26
GGFC	-0.48	0.31	-0.28	1	0.34
MC	-0.31	-0.19	0.26	0.34	1