Doctoral Dissertation:

Stock Market Development and Economic Growth: Global Perspectives: 1993 -2016

Written by: Francis Mensah

THE INTERNATIONAL SCHOOL OF MANAGEMENT
PARIS • NEW YORK • SHANGHAI • NEW DELHI • SÃO PAULO • CAPE TOWN

DETAILS

Author Name: Francis Mensah, PhD

Year: 2020

Title: Stock Market Development and Economic Growth: Global Perspectives: 1993 -2016

Document type: Doctoral dissertation

Institution: The International School of Management (ISM)

URL: https://ism.edu/images/ismdocs/dissertations/mensah-phd-dissertation-2020.pdf

Stock Market Development and Economic Growth:
Global Perspectives-1993-2016

Dissertation

Submitted to International School of Management, Paris-France

in Partial Fulfillment of the Requirements for the Degree of

DOCTOR OF PHILOSOPHY

by

FRANCIS MENSAH

Paris, France
July 2020

Abstract

The world stock markets surged over the last few decades, creating a lot of opportunities globally for capital allocation. However, most countries did not benefit from this boom and are still not utilizing the stock markets to its full potential in comparison to leading international capital markets. The purpose of this study is to find the causality between stock market development and, alongside the banking sector development, vis–a–vis macroeconomic and institutional factors enabling economic growth. A thorough literature review undertaken for this study reveals that there is a gap in the literature, due to different opinions concerning the relationship between the stock market development and economic growth and vice versa. Thus, this study aims to add additional insights and data-dependent shreds of evidence learnings on the topic through a rigorous and thorough quantitative research that covers multiple countries. The research method applied for this study consists of both panel and time-series data of different geographic zones from a multiplicity of secondary sources. Significant evidence and implication of the study is that enormous production developments require the real commitment of an exceptional magnitude of capital. Thus, the stock market facilitates the allocation of funds from investors as a source of capital. The results of the study suggest that the impact of stock markets on economic growth and vice versa in the selected geographic zones of this research leads to a variety of evidence and often to different conclusions for each case analyzed. This conclusion of this study corroborates the two causality models proposed in the literature, unveiling that the direction of causality between stock market development and economic growth and vice versa in the selected samples show that each geographic zone proclaims a different outcome. Limitations of the study include the use of annual data which is not ideal compared to monthly and quarterly data; thus, affects the precision of the parameter estimates. Opportunities exist to expand the scope of the study by adding more geographic zones. Stock markets development entails technical know-how and development of institutional structures to enhance competitiveness and patronage. Harmonization of legislation is required to allow for capital mobility from in/out of various geographic zones for the general financial system. Modern electronic systems and central depository systems are required to integrate the stock markets. As a way to improve the legal & accounting structure, private sector credit evaluation capabilities and public sector regulatory oversight are required to develop the stock markets.

Acknowledgements

À vaillant coeur rien d'impossible - Jacques Coeur

I am beholden to my family, friends and fellow ISM students who supported and encouraged me in the process of writing this dissertation. My dissertation advisor, Professor Dr. Ivo Pezzuto adeptly directed me through every stage of this quest and I am appreciative for his knowledge, endurance, and keenness throughout this evolution – "sono molto grato". My sincere gratitude goes to the ISM community, including Professor Dr. César Baena, director of doctoral research. Laurent Yacoub and Raphael E. Abanum, both ISM colleagues, have been attentive colleagues and inspirers. They painstakingly advised and provided invaluable feedback as I proceeded on this dissertation from the beginning to the end.

I am thankful to my family and friends including my wife Elorm and Children. I am also thankful to my buddies who stood by me in this complex research work- Robert, Randel and Sackitey for being with me throughout this process. Dr. Abu Atchuro, Dr. Lord Mensah and Dr. Saint Kuntu – I am grateful for the indefatigable pressure they exerted on me, especially for persistently asking about my progress and the thumps they placed on the work. Overall, my sincerest thanks go to the Almighty God, for Traveling Mercies. He guided me in all the numerous seminars that I attended in France and the United States. This path was more than sporadic.

As a technocrat, I desire to be on top of my work backed by new knowledge created in me hence pursuing a PhD was a dream. This Degree is dedicated to my late Mum, who taught me how to acquire things - hard work and determination. Finally, I am thankful to myself for sacrificing many of my Friday evenings to focus on the vision of completion of the task. I am always grateful for the trust all have in me to support this vision.

This page is intentionally left blank

Table of Contents

List of Tables

List of Figures

List of Abbreviations

ADF	Augmented Dickey-Fuller
AR	Autoregressive
BREES_IDX	Institutional-technological/innovative-financial variables
CIA	Central Intelligence Agency
D__GDSVNGS_2GDP	First difference of gross domestic savings to GDP
DBREES_IDX-	First difference of Institutional-technological/innovative-financial variables
DFDI_2GDP	First difference of foreign direct investment to GDP
DFRX	First difference of foreign exchange rate to USD
DINFLATN	First difference of inflation
DLGDP_P_CPT	First difference of log of GDP per capita
DLLISTED_COYS	First difference of log of number of listed companies
DM2_GDP	First difference of money supply to GDP (M2)
DMKT_CAP2GDP	First difference of market capitalization to GDP
DSTK_TRD_VL_2GDP	First difference of stocks traded total to GDP
DSTK_TRD_TRN	First difference of stocks traded turnover to GDP
DTX2GDP -	First difference of tax revenue to GDP
DLLISTED_COYS	Lag of first difference of log of number of listed companies
DMKT_CAP2GDP	Lag of first difference of market capitalization to GDP
DSTK_TRD_VL_2GDP	Lag of first difference of stocks traded total to GDP
DSTK_TRD_TRN (-1)	Lag of first difference of stocks traded turnover to GDP
DM_CRD__PRV_2GDP	Domestic credit to private businesses to GDP
FDI_2GDP	Foreign direct investment to GDP
FRX	Foreign exchange rate with USD
GDSVNGS_2GDP	Gross Domestic Savings to GDP
GDP-	Gross Domestic Product
GGDP-	Growth of gross domestic product

GGDP	Lag of growth of GDP
H_0	Null Hypothesis
H_1	Alternative Hypothesis
IMF	International Monetary Fund
INFLATN	Inflation
LGDP_P_CPT	Log of GDP per capita
LLC	Levin Lin & Chu
LLISTED_COYS	Log of number of listed companies
M2_GDP	Money supply to GDP (M2)
MKT_CAP2GDP	Market capitalization to GDP
OECI	Other economic & complementary variables
OLS	Ordinary Least Square
PP	Philips and Peron
SA	South Africa
SMD	Matrix of stock market development variables
STK_TRD_TRN	Stocks traded turnover to GDP
STK_TRD_VAL__GDP	Stocks traded total value to GDP
TX2GDP	Tax revenue to GDP
UK	United Kingdom
USA	United States
VAR	Vector Auto- Regressive
WDI	World Development Indicators
WEF	World Economic Forum
βMEI	Macroeconomic variables

Chapter 1: Introduction

The aspiration of many countries since time immemorial is to attain a viable high stage of economic growth and development. This aspiration was further fuelled by Adam Smith's renowned book "An Enquiry into the Nature and Causes of the Wealth of Nations" published in 1776. In the book, the growth phenomenon was attributed to factors such as labour, capital, and technology. This assertion was preached by traditional economists until recently when the economic growth theory witnessed tremendous developments. The neo-growth theory broadened the scope of factors that traditional economists believed causes economic growth which includes labour, capital, and technology and new dynamics that might also add to the growth process. These new dynamics comprise, but not limited to, the macroeconomic environment, financial development, foreign direct investment, monetary regimes and political stability. The financial sector is expanding globally. The sector can be categorized into both capital markets and the banking sector. Its growth cannot be measured by a single indicator, as argued by several economists. A broader definition of capital markets, (i.e. the stock market, venture capitalists, business angels, seed financing, private equity, hedge funds) even though, in several emerging and developing markets, these sources of capital may not yet be widely spread.

Additionally, there are other sources of financing in the market. These include, but not limited to, alternative credit such as peer-to-peer lending, venture capital and shadow banking. Many economists over the years, have devoted their concern on the nature of the link between one sub-sector of the financial market and growth in the real economy. The sub-sector that has held the utmost attention from researchers in the stock market. Enormous literature assesses the link between the stock market and the economy in certainty. Atje and Jovanovich (1993); Korajczyk (1996) and Levine & Zervos (1998) identify a strong positive relationship between the stock market and economic growth in their studies. Therefore, the capital market has become one of the essential sources of financing in developed, emerging and less developed economies. The pace and degree of the capital market expansion have been exceptional. The development has led primarily to the shift in the financial structures of both less developed countries and developed countries. As reported by Global Development Finance (2005), the stock market development has been vital to the domestic financial liberalization programs of most developing markets.

Background to the Study (Statement of the problem)

The past few decades saw the world stock markets surging, and emerging markets have also accounted for a huge amount of this boom. The speed and extent of the stock market development in developing countries have been exceptional and have led to a fundamental shift both in the financial structures. This may be attributed to capital flows from both developed nations and less developed counties. The pace and degree of the capital market expansion, in general, have been exceptional. However, according to a study conducted by Feldman & Kumar (1995), compared with the developed economies, most emerging and developing countries do not have a well-functioning stock market to take advantage of the benefits. Studies by Adjasi & Biekpe (2006) and Kuwornu (2012) recognize high transaction cost, high return volatility and poor information structure as major causes of the non-performance of stock markets in emerging and developing countries. A growing body of work reveals a close linkage between stock market development and economic growth (Arestis et al., 2001 & Caporale et al., 2004).

Ikikii & Nzomoi (2013); Rahman & Salahuddin (2010) and Enisan & Olufisayo (2009) establish a positive relationship between stock market development and economic growth, whereas some studies conclude that there is a negative relationship (Wang & Ajit, 2013). Oya & Domar (2006); Charif, (2001); Haque (2013); Ake & Ognaligui (2010) and Saba & Ghulam (2017) found no association between stock market development and economic growth.

Significance of the Study

The stock market is observing fast development globally. The tenet of equity holding, additionally, is witnessing a surge amid the world population in general – in both the developed and developing countries. Despite the growth of the stock market in both developed and developing economies, there seems to be a little research on the linkage between stock market development and economic growth in countries from different geographic zones and with different levels of the economic growth brackets. The purpose of the study is to fill the knowledge gap to empirically investigate the stock market development and economic growth relationship by using data on the Americas, Europe, Africa (Sub-Saharan) and Asia & Australia. In order to add to the present-day discussion on the role of the stock market and economic growth, the study provides further evidence in support of the endogenous growth theories in both developed and developing and countries.

Purpose of the Study

This research seeks to consider these factors, namely financial development, with a focus on stock market development while considering both the banking sector, macroeconomic factors, and other related factors and their influences on economic growth.

The auxiliary objectives of the study are:

i. To examine the direction of causality between stock market development and economic growth in the sample countries;

ii. To contribute to the existing literature between stock market development and economic growth linkage; and

iii. To stylize some policy inferences for sample countries based on the results of the thesis.

Research Hypotheses

The inconsistencies in the findings of earlier studies on the relationship between stock market development and economic growth gave a great motivation to the researcher to investigate the role of the stock market development on economic growth in the sample countries in this study. There is a need to hypothesize the thoughts surrounding the issues in undertaking this type of study. Consequently, the thesis is centred on the impact of the stock market development with the banking sector; macroeconomic and institutional-technological/innovative-financial factors on economic growth. Also, the impact of economic growth on stock market development with the banking sector; macroeconomic and other economic factors (i.e. institutional, technological-innovative and financial factors).

The hypotheses are guided below:

(1)

a) The Null hypothesis (H0): There is no relationship (negligible effect) between economic growth and stock market development of the sampled countries;

b) The Alternative hypothesis (H1): There is a relationship (positive or negative) between economic growth and stock market development of the sampled countries;

(2)

a) The Null hypothesis (H0): There is no relationship (negligible effect) between stock market development and economic growth of the sampled countries;

b) The Alternative hypothesis (H1): There is a relationship (positive or negative) between stock market development and economic growth of the sampled countries;

Each hypothesis is tested at a 5% level of significance. [1]

Theoretical Framework of the Research

The development of the stock market investigation reveals that it plays a pivotal role in forecasting future economic growth (Levine and Zervos, 1996). There are nonetheless a set of vast benefits in the sourcing of funding from the stock markets for the development of businesses, and it is very instructive to say that some countries are not taking the full benefit of it. One of the crucial indicators of the stock market development is market capitalization ratio.

The theoretical theory specifies that the development of the stock market might augment economic growth. The notion has been buttressed by empirical evidence. It is believed that the significance of financial development in economic growth was first established by Schumpeter (1911), who posits that credit markets are essential to economic growth. According to him, credit markets enhance economic growth by making available to businesses finances to acquire new technologies. In recent years, the role of financial development has established a lot of concern, vis-à-vis its role in economic growth. The emphasis nevertheless has mainly remained on the bank-oriented financial institution at the expense of the development of the stock market also, doubtfully, has been the case because, as argued by Demirguc-Kunt and Levine (1996), that

[1] Each hypothesis is tested at 5% level of significance as the standard for the research.

stock market indicators are much interrelated to the banking sector development. It is nonetheless worthy of mention that the literature on the development of the stock market and economic growth linkages is not widely acknowledged with the growth literature.

This may be due partly to the variations in the results of the few extant pieces of literature of the link between the two. The findings of some empirical studies reveal the presence of a positive link between the development of the stock market and economic growth, and others point to the existence of a negative relationship. In contrast, others are not clear the actual connection between the development of the stock market and economic growth. In a bid to justify the cause of the contradictory relationship between stock market development and economic growth in the case of developing countries, and arguing on this seeming change, Enisan & Olufisayo (2009) claim this may be as a result of issues like the degree of stock markets of the developing countries' efficiency. Also, comparatively, their small sizes, are different from that of developed countries.

The changes in the framework of economies and the overall macroeconomic setting is likely a contributing factor accountable for the findings obtained and hence requires both country and continent exact investigation to alleviate the concern of inconsistency. In summary, this research investigates the development of the stock market and economic growth linkage and vice-versa in the sampled settings [i.e. Continents (twenty countries); Americas; Europe; Asia & Australia and Africa (Sub-Saharan Africa) having five countries each per each continent].

The Research Method and Procedures

The study adopted the secondary data type of both panel data (at one instance) and time-series data (at another instance) of the selected countries. In this research, stock market variables considered include market capitalization ratio, stocks traded turnover ratio, stocks traded total value ratio, number of listed companies on the stock exchanges. In regards to macroeconomic and other economic growth indicators, the paper considered the following: Exchange rate and inflation as measures of the macroeconomic environment; domestic credit from banks to private businesses, money supply ratio (M2), gross domestic savings ratio, all as measures of the banking sector development. Other economic growth indicators include GDP per capita, foreign direct investment ratio and institutional-technological-innovative-financial factors. The primary dependent variables for this research are GDP growth and stock market development indicators (one serving as the dependent variable at a particular time; and vice versa). In the case of stock market development variables, market capitalization ratio mostly serves as the main proxy for the stock market development variables. On infrequent situations, where the market capitalization ratio is not feasible due to, among other things- presence of unit root in the data or non-stationarity of data, then other stock market development indicators are considered. In the case of economic growth, GDP growth serves as the proxy for economic growth. These variables are identified and selected based on literature, and theoretical connections with stock market development discussed thoroughly in the literature review.

The spur of this research is to assess the relationship and impact of the stock market development on economic growth, as indicated at the beginning of this chapter. Twenty countries are assessed into ten geographic zones to examine their stock markets as well as to determine their relationships with economic growth factors as done in Adjasi (2007)

The chosen time frame spans the period 1993 to 2016. Data is from World Bank’s World Development Indicators; International Monetary Fund's International Financial Statistics and the World Economic Forum's Global Competitiveness index.

In order to have a global picture of the relationship between stock market development and economic growth, the researcher sampled twenty countries globally into ten geographic zones (i.e. Continents of Twenty, Americas, Europe, Asia & Australia and Africa). Additionally, four countries are sampled individually (i.e. United States, United Kingdom, South Africa and Hong Kong).

The yardstick for the sampling is centred on best performing stock markets (magnitude of financial centres) on the selected continents. The countries under each geographic zone are- (a) Americas: - Argentina, Brazil, Canada, United States and Mexico; (b) Europe: - Germany, United Kingdom, France, Netherlands and Belgium (c) Asia & Australia: - China, Korea, Hong Kong, India and Australia and (d) Africa-Sub –Saharan: - Cote d'Ivoire, Ghana, Nigeria, South Africa and Mauritius. The chosen samples are based on the availability of reliable data, especially on the subject matter. Additionally, their exchanges have enhanced and consecutive data points (i.e. to a more considerable extent) as compared to others not considered in geographic zones. These exchanges are supposedly the best performing stock markets in their respective geographic zones. The method above of selection is adopted to unveil the significance of stock development and economic growth of the selected geographic zones.

Estimation Methods and Empirical Analysis

The analysis of the ten geographic zones is done in two approaches; panel data modelling and time-series modelling. The effect of stock market development vis-à-vis on economic growth (GDP growth) and vice versa the banking sector, macroeconomic factors and other related economic growth factors are analyzed via ordinary least square panel data modelling for the six geographic zones sampled. On the other hand, the effect of stock market development vis-à-vis on economic growth (GDP growth) and vice versa the banking sector, macroeconomic factors and other related economic growth factors are analyzed via least-square time-series data modelling for the four geographic zones sampled. Chronologically, the research uses Eviews 9.5 software. Fisher ADF and Fisher PP individual unit root methods, Pedroni- (Engle-Granger) and Kao- (Engle-Granger) set at ADF SIC selection and Johansen cointegration test methods depending on the selection that suffices. The ordinary least squares method and robust least squares for panel data and least-squares method for time series are applied for the regression. Each regression model goes through various robustness tests to ascertain its applicability and to determine if it conforms to the rule of thumb.

Limitation and Delimitations

The research is saddled with a few limitations, just comparable to any other study, nevertheless the struggles to make this study both very meticulously and modestly defendable. The researcher identified some macroeconomic factors that might not be fully accounted for in building up the models (environment, ecosystem and corruption). Second, the research was adversely affected by inadequate data. The use of annual data was not the ultimate type for this study. In studies of this sort, monthly or quarterly data are the ideal type of data. The twenty sampled countries for this study created insufficient observations that affected somewhat precision of results. In terms of future research, the choice of a substitute variable for stock market development presents another challenge. Though in some instances, the stock market capitalization ratio has been used as the primary representative of the stock market development, it is not an entirely appropriate representation variable for stock market development. It contains a possible price bubble effect that might produce biases in measuring the real stock market development based on extending the number of listed companies on financial markets. At other instances too, other stock market components were considered, such as companies listed on the stock exchanges, the stock traded total value, and stock traded turnover ratio, also not considered as most appropriate variables.

Structure of the Research

The study is organized into two parts, namely parts one and two. Part one comprises chapters one and two. Chapter one is the introduction and background of the research. The introduction attempts to give an impression and the relevance of the development of the stock market and economic growth. The background talks about the controversies regarding the effects of stock market development in general. It also examines the impact of its predisposing factors on economic growth. Chapter two discusses the literature from conceptual and theoretical viewpoints. It also spells on both the historical economic antecedents and stock markets of the sampled geographic zones. The stock market development indicators and economic growth indicators, including macroeconomic factors, are discussed in this session. The discussion includes definitions, purpose and general terms used in this study. Part two consists of chapters three, four and five. Chapter three is the methodology, and it comprises the research design, data description, the sampling method of the research, model specifications and estimation methods. It presents specifically, the analysis relating to the various methods used for this study. Chapter four reports the results of the research. It presents the impact of stock market development vis-a-vis macroeconomic and other related touching indicators on economic growth (GDP) and vice-versa on each geographic zone. Based on the significance of the effect, the relationship between economic growth and stock market development of each geographic zone is addressed. Chapter five is the final chapter; it spells on the conclusion and recommendations. These include policy prescriptions and concluding remarks of all the geographic zones. References and Appendices are in the final session of part two.

Definition of Key Terms

i Market capitalization ratio: - The market capitalization ratio is defined as the value of domestic equities traded on the stock market relative to GDP. The choice of market capitalization ratio is meant to highlight the economic importance of the stock market in our sample;

ii. Number of listed domestic companies on the exchange: - It refers to the number of domestic companies listed on the stock exchange;

iii. Stocks traded turnover ratio: - It refers to the turnover ratio of equities traded on the stock market relative to GDP.

iv. Stocks traded total value ratio: - The value of shares traded is the total number of shares traded, domestic and foreign, multiplied by their respective matching prices over GDP. This measure is used to gauge market liquidity;

v. GDP per capita: - It is gross domestic product divided by midyear population. It is used as a proxy for income as Income level.

vi. Exchange rate: - Exchange rate refers to the official rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is standardized as an annual average conventional on monthly means (local currency units relative to the U.S. dollar);

v. Inflation: - It is the persistent rise in the general level of price of goods and services in an economy over a period of time;

vi. Broad money ratio (M2): - Broad money per GDP is the sum of currency outside banks; demand deposits other than those of the central government other instruments including securities such as certificates of deposit and commercial paper divided by GDP;

vii. Domestic credit to private sector ratio: - Credit by banks to the private sector relative to GDP;

viii. Gross domestic savings ratio: - It is GDP minus final consumption expenditure expressed as a percentage of GDP;

ix. Tax revenue ratio: Tax revenue as % of GDP - this indicates the share of a country's output that is collected by the government through taxes;

x. Foreign direct investment, net inflows (% of GDP): - Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 % or more of voting stock) in an enterprise operating in an economy other than that of the investor divided by GDP; Definitions – (World Development Indicators- WB, 2016)

xi. Other economic indicators (i.e**.** indexed of institutional structures, technological/innovation and financial factors)

i. Goods market efficiency; it refers to the extent to which prices in the goods market mirror all available, relevant information;
ii. Labour market efficiency; it refers to the degree to which prices in the labour market reflect all available, relevant information;
iii. Market size; is a measurement of the total capacity of a given market;
iv. Institutions; these are regular and systematized design of behaviour or actions that are self-regulating in agreement with generally accepted norms (i.e. political, legal and economic institutions).
v. Infrastructure; it refers to the basic physical systems of a nation. For example, transportation, communication, sewage, water and electric systems;

vi. Business sophistication; it concerns the quality of a country's overall business network as well as the quality of the individual firm's operations and strategies. The sub-indexes of business sophistication are local supplier quantity, local supplier quality, state of cluster development, etc.;

vii. Innovation; it involves cautious use of information, imagination and inventiveness in developing greater or different values from resources, and includes all processes by which new ideas are engendered and transformed into useful products;

viii. Venture capital availability; it is the existence of financing that investors offer to startup companies and small businesses that are thought to have long-term growth potential;

ix. Regulation of securities exchanges; this refers to the existence of legal regimes to regulate transactions and other dealings that pertain to securities;

x. Ease of access to loans; it is the easiness with which people, business and institutions can access loan;

xi. Soundness of banks; this involves the use of capital adequacy, asset quality, management, earnings, liquidity and sensitivity (to systemic risk) to measure the robustness of a financial institution; and

Definitions - World Economic Forum- (GCI, 2016)

Statistical Terms

H_0: Null hypothesis

H_1: Alternative hypothesis

P-values: Probability values;

ADF test: Augmented Dickey-Fuller test

PP: Phillips and Peron

VECM: Vector Error Correction Model

Summary

The topic of this study is: "Stock Market Development on Economic Growth: Global Perspectives-1993-2016" employing a quantitative approach as the research methodology (Cooper & Schindler, 1998 and Kealey & Protheroe, 1996). This quantitative study is to describe the relevance of this study, the use of the stock market to raise funds for financing for development in the long-run and also to diversify risk of investors. Improvement in economic growth will create a conducive macro environment for the development of the stock market also, to diversify resource strategies to have a broader view in sourcing of resources by investors as well governments, and maintain financial sustainability. In the subject area, data is collected from the multiplicity of sources such as WDI, IMF, WEF and other scholarly works for analysis.

The research problem is that, although the world stock market surged over the last few decades, most countries around the globe did not benefit from this boom. Also, most countries are not taking advantage of the benefits of the stock market. Feldman & Kumar, 1995, posit that most emerging and developing countries do not have a well-functioning stock markets as compared with the developed economies. Adjasi & Biekpe (2006) and Kuwornu (2012) recognize that the major causes of the non-performance of stock markets in emerging and developing countries are due to high transaction cost, high return volatility, poor information and structure. Many studies state different opinions on the relationship between stock market development and economic growth. Ikikii & Nzomoi (2013), Rahman & Salahuddin (2010), and Enisan & Olufisayo (2009) establish a positive relationship; Wang & Ajit (2013) found a

negative relationship; Oya & Domar (2006), Charif, (2001), Haque (2013), Ake & Ognaligui (2010) and Saba & Ghulam (2017) found a negligible relationship.

The purpose of this study is to investigate the effects of stock market development on economic growth and vice versa. The work is underpinning the researcher's ambitions to engage in the economic debate that will encourage the development of the stock market on economic growth. The selected areas of research are drawn from four continents of twenty countries and put into a different grouping of six-panel data and four sets of time series data comprising four countries. Eviews9.5 software will be used to conduct the data set-up and analysis. The analytic technique to be employed on the secondary data include unit-root, correlation test, cointegration test, both ordinary least squares for panel data regression, least-square for time series data regression and robustness of the models.

The results of this study will eventually be a document that can be actively utilized by financial market practitioners, governments and other stakeholders as they seek to work toward deepening of the stock markets. Notwithstanding the preceding, academic peers will have the opportunity to expand the scope of this research further (i.e. identify imminent research possibilities) both by studying other geographic locations of the stock markets that are not captured in this study. Furthermore, the research hypotheses will be discussed within the context of the results, the purpose of the study and existing literature. In order to provide intuitions on the results of this research, the implications, recommendations, and conclusions are presented next.

Chapter 2: Literature Review

Introduction

This chapter provides an overview of theories, ideas, scholarly works and analysis of different views/opinions of research undertaken in the past in regards to this study. The key focus of the research is described in the framework. The context of the literature review work is an explanation of its specific purpose for this particular study; comments on the previous treatment of the broad topic of the effect of the development of the stock market on economic growth and vice versa. Also, the hint of the latitude of the research is presented in the literature. The primary purpose of the literature review work is to survey previous studies on stock market development on economic growth. This was in-order to scope-out the significant data collection requirements for secondary data research to be conducted, and it forms part of the emergent research design. The approach adopted was in line with current practice in a range of secondary data sources served as the key bibliographic tools for identifying relevant work for review. The Web of Science databases was key to the literature. Relevant publications were found in the literature of several academic domains, including journals. Most of these publications take the form of research papers and economic/business journals. Therefore, there is a plethora of extant literature (i.e. theoretical and empirical) on the stock market development and economic growth nexus.

Theoretical Literature

Fink et al. (2006) opine that the relationship between financial markets and the real economy can take one of five forms - interdependence, no causal relation, supply leading, demand-driven and negative causality from finance to growth. Amongst them is the supply-leading theory, also known as "Finance-Led Growth" hypothesis proposed (Mckinnon, 1973 & Shaw, 1973). They maintained that the accumulation of financial resources improves economic growth; thus, financial market development positively spurs economic growth. Schumpter (1911) is believed to have laid the substratum for this hypothesis. A well-functioning financial system will spur technological innovations through the efficiency of resource allocation from the unproductive sector to the productive sector, hypothesized by him. An observation was undertaken by Adamopoulos (2010) on the long-run relationship between variables using the Johansen cointegration analysis based on the standard unit roots tests. The empirical analysis submits that the variables that determine economic growth present a unit root. According to him, once a cointegrated relationship among relevant economic variables is established, the next issue is how these variables adjust in reaction to a random shock, becoming an issue of the short-run disequilibrium dynamics. He concludes that the results of Granger causality tests, however, indicate unidirectional causality between the development of the stock market and economic growth with direction from the development of the stock market to economic growth.

Vazakidis and Adawopoulos (2009) examine the causal nexus amid the context of the development of the stock market and economic growth in Russia, then affirm a positive relationship between them. On the contrary, the interest rate is negatively related to stock market development. Also, Ake & Dehuan (2010), in their bid to find the causal relationship between stock market proxies through stock market development indicators (i.e. market capitalization ratio, stock total traded value and stock traded turnover ratio); economic growth and foreign direct investment performed the Granger Causality Test. The results affirm a positive relationship between the stock market and economic growth for some countries (i.e. France and the United Kingdom), for which the stock market is highly active and liquid. On the other hand, the causality relationship is rejected for other countries (i.e. Belgium and Portugal) because the stock market is small and less liquid. Enisan & Olufisayo (2009) examine the long-term and causal relationship between stock market development and economic growth for seven sub-Saharan Africa countries using the autoregressive distributed lag (ARDL) bounds test. The study establishes that the stock market development is cointegrated with the economic growth in Egypt and South Africa. The test concludes that stock market development positively and significantly has a long-term impact on economic growth, in any case. The causality test using the VECM additionally demonstrates that the stock market development 'Granger causes' economic growth in Egypt and South Africa. Nevertheless, Granger causality in the perspective of VAR displays evidence of a bidirectional affiliation between stock market development and economic growth for Cote d'Ivoire, Kenya, Morocco and Zimbabwe. This means that the stock market helps to induce economic growth and in turn, economic growth stimulates stock market development in that circular flow. In the same vein, Ho and Odhiambo (2012) examine the relationship between stock market development and economic growth using time-series data from Hong Kong. They employed three proxies of stock market development in their study, namely: market capitalization ratio, the stock traded total value ratio and stock traded turnover ratio. The empirical results confirm the trend of the relationship between the development of the stock market and economic growth is contingent on the index used to assess the level of stock market development. According to them, when stock market capitalization ratio employed as a proxy for stock market development, a unidirectional causal flow from stock market development to economic growth prevails, without any response. Bayar et al. (2014) using Johansen-Juselius cointegration test and Granger causality test establish a long-run relationship between economic growth and stock market development indicators (i.e. stock market capitalization ratio, stocks traded total value ratio, stocks traded turnover ratio). They also establish unidirectional causality from market capitalization ratio; stocks traded total value and stocks traded turnover ratio to economic growth. They affirm a long-run relationship between stock market development and economic growth in Turkey and also, the stock market development moves economic growth positively. The presence of a well- functioning financial intermediation, according to Choong et al., (2004) will facilitate the scarce resources from surplus units to deficit units. It provides an efficient allocation of resources, thereby leading the other sectors in their growth process. Levine & Zervos (1999) posit that the stock market can influence economic growth positively through reassuring savings among individuals and provide opportunities for equity financing firms. Pagano, (1993); as cited in Bekaert et al. (1995) observes that there are three main conduits through which financial development and economic growth are connected. First; the financial development upsurges the amount of savings that are funnelled to investments; Second; financial development changes the saving rate, which impacts investment and Third; financial development also upsurges the capital allocation efficiency. Most of the extant literature on the subject maintains that the most significant is the second and last channel, through which the financial market interacts with the real economy. Beakaert & Harvey (1997) buttress the assertion.

Other researchers, including Levine & Zervos (1998) and Fry (1995) have found corroborative evidence which supports this premise. Several empirical studies have concluded that the financial sector stimulates economic growth. Nonetheless, the demand-driven hypothesis propounded by Friedman and Schwartz (1963) contends that economic growth precipitates the emergence of financial centres and accordingly concludes that financial development is

intricately linked to real economic growth. This hypothesis argues that economic growth leads to increased demand for financial services, which, in turn, causes the growth of financial markets. The Interdependence or Bi-Directional Hypothesis tried to establish the directionality of the causal relationship between stock market development and economic growth. Proponents of this hypothesis assert that there is a two-way relationship between financial market development and economic growth. Thus, the financial market develops as a derivative of economic growth, which in turn catalyzes real growth. This hypothesis was confirmed by Al Yousif (2002) using time series and panel data from 30 developing economies. His paper examines the causal relationship between financial development and economic growth and finds that financial development and economic growth are mutually causal, the causality being bi-directional. Also, Brasoveanu et al. (2008) investigate the relationship between capital market development and economic growth in Russia and note a positive correlation between them. They, however, indicate that the strongest linkage is from economic growth to capital market.
Nevertheless, Lucas (1988) submits that there is no causal relationship between the financial sector and economic growth. It is noteworthy that this hypothesis was valid only under the neo-classical supposition of no transaction costs and impeccable information (Graff, 2000, as cited in Fink, et al., 2006). Lucas's theory was widely criticized, as most of the economists today concur that it is not possible to have frictionless markets agency problems and transaction costs.

Beakaert & Harvey (1997a) argue that the view of the economists who remain sceptical and assert that there is barely any relationship between the stock market and economic activity is not surprising. They give some rational explanations, pointing to the seeming misconception in this view. The core thinking behind the uncertainty can be ascribed to information asymmetry present between the investors of a firm and its managers. Mostly, managers have adequate information about the firm's performance as compared to investors. Managers possess astute knowledge when the firm's equity is mispriced in the stock market.

Consequently, managers only issue new equity if shares of the firm are overpriced. As investors are aware of this development, they are unwilling to invest in new equities. Obviously, this clarifies why many corporations do not depend on new equity to finance their investments. While acknowledging this opinion as accurate, nevertheless (Beakaert & Harvey, 1997b) observe that this narrow view of the functioning of stock markets discounts some other vital functions of the stock market that directly relate to economic growth. They claim that the stock market efficiently aids individuals to spread firm-specific risks, hence making it attractive to investors. The Stock market also helps to lessen the moral hazard problem. Given the fact that the stock price is a point of reference for a firm's performance (i.e. using it as a peg for the manager's compensation) will minimize their incentives for engaging in unproductive ventures. As the stock market price is a mirror of a manager(s) performance(s), it may decline considerably because of the lackadaisical working attitude of managers. Stockholders may replace managers in such circumstances. Finally, this last contribution of the stock market can be summarized as a way of reducing the transaction costs of public offerings and generating prospects for the emergence of optimal ownership structure in the economy.

Mensah and Wong (2019) examine the stock market development and economic growth linkages, of selected five countries in Sub Saharan Africa (i.e. Ghana, Cote d'Ivoire, Nigeria, South Africa and Mauritius) using panel dynamic OLS and panel OLS models and conclude that the growth of the stock market size is not related to GDP growth in the long run. Nevertheless, the growth of the stock market in the short run seems to strengthen improvement in liquidity and income growth. Owusu and Odhiambo (2014) in their study, show that the development of the stock market and capital account liberalization guidelines do not have a positive effect in the long-run, on economic growth. In a related development, Owusu and Odhiambo (2015) additionally confirm that the development of the stock market and capital account liberalization policies do not have to boost impact on economic growth in the long-run in Ghana. The study of Haque and Hossain (2011), finds that the stock market and liquidity do not have any significant influence on the real economic growth in the SAARC countries.

Wang and Ajit (2013) did a study on the impact of stock market development on economic growth in China. Their results reveal that there exists a negative relationship between real stock market development and real GDP growth in, both the long run and the short run. Also, the likes of Haque (2013) and Ake & Ognaligui (2010) establish that stock market development has no significant impact on economic growth. A few other studies have also made theoretical pronunciations on the stock market development -economic growth. A study by Demirgüç-Kunt and Levine (1996) cautions against the negative effect of liquidity on economic growth through three main channels. In their discussions, they reiterate that excess liquidity would boost investment returns and then reduce the saving rates, consequently, this would cause precautionary savings that will plunge substantially, as less doubt brought by the excess liquidity would start to have an impact. They also claim that the stock market inspires investor short-sightedness, adversely influences corporate governance and hence hinders economic growth. Likewise, a study conducted by Arestis et al. (2001) conclude that the liquidity of the stock market is directly related to economic growth. They maintain that a liquid stock market makes financial assets less risky since it allows investors to trade quickly and change their financial position if their stock value has decreased. Less risky assets boost capital distribution, which is a crucial conduit of economic growth.

The Endogenous Growth Theory and the Stock Market

The Endogenous theory of growth prominence may be attributed to the continued long-run growth (Barro & Sala-i- Martin, 1995; Grossman & Helpman, 1991; Rebelo, 1991; Lucas, 1988 and Romer, 1986). The continued long-run growth is perceived as an endogenous factor in endogenous growth models. Also, in these models, countries have an immeasurable capability to develop ideas; thus, output per capita to grow minus bounds.

About the endogenous growth framework, the growth of an economy of a country is dependent on the policy actions and inactions of the government. Taxation, protection of intellectual property rights, regulations, the provision of infrastructure, and the maintenance of law & order can influence the speed of creative activity.

Thus, growth in a country's investment and consequently, economic growth depends heavily on its financial structures vis a vis government policy actions. An endogenous growth model developed by Levine (1991), where the stock market serves as a means of risk allocation investigates how the stock market alters the growth rate, serving as an incentive.

Levine (1991) establishes that the stock markets promote economic growth by serving as a seamless avenue through which ownership of a firm can change without causing any disruption to the production process. The stock market serves as a means through which investors can diversify their risk portfolio. Barring the existence of the stock market, firms in need of capital would have to liquidate their assets, thus rendering them less productive. Levine used the structure of preference of (1983) to develop liquidity risk in his model. He also included productivity shocks that culminate in production risk. The existence of risks, such as liquidity and productivity incited the emergence of stock markets. The actual thing tends productivity threat that rationally lowers welfare discourages agents from investing in firms. However, the ability of the twenty-four stock market to diversify risks and productivity shocks, means investors usually are willing to undertake investment in many firms. This will boost, among other things, the well-being, the share of wealth invested in companies; hence, the steady-state growth rate of the economy. In his model, Levine (1991) represents the economy as an immeasurable order of three period-living agents, and a quantifiable infinitude of agents is created in each period. He put the growth of the population at zero, subsequently considered young agents as similar. The results of Levine's study reveal that the stock market increases the growth rate by boosting firms' productivity levels or enhancing resource allocations. Stock markets ensure the firm's efficiency by removing the requirement for the precocious winding up of its operating capital.

Consequently, agents who contract liquidity shocks dispose of their shares to agents who are willing to buy them rather than liquidating their capital. As a result, more capital is retained in firms, which, in turn, fast-tracks the ratio of physical capital accumulation. Additionally, stock markets promote economic growth by ensuring an increase in the portion of capital apportioned to firms. It is plausible for companies to diversify their risks of production, through the stock markets, thus ensuring a surge in their investments in companies by risk-averse agents. Lastly, the advent of stock markets as a panacea for both productivity risk and liquidity risk promote economic growth via pushing to socially productive companies of resources.

A study conducted by Arestis et al. (2001) conclude that the liquidity of the stock market is directly related to economic growth. They maintain that a liquid stock market makes financial assets less risky since it allows investors to trade quickly and change their financial position if their stock's value has decreased. Less risky assets boost capital distribution, which is a crucial conduit of economic growth. Haque & Yakob (2018) did a study by revisiting the stock market development and economic growth nexus of Malaysia during 1981-2016 by using Granger test ARDL (with bound testing) approach, and multivariate regression approach to examine extent and direction of the relationships among variables empirically. The paper considers, additionally, the relationship between the stock market development and economic growth of Malaysia, by moderating the role of foreign capital inflows and exchange rate from 1981 to 2016. The results affirm unidirectional effects of the stock market development to economic growth via Granger causality test. The test for cointegration also finds a long-run association between stock market development and economic growth. ARDL model, however, indicates that in both the short and long runs, the stock market promotes economic growth which is consistent with the Granger causality test. Significantly, foreign capital inflows and the exchange rate have positive and negative moderating effects respectively on the relationship between the stock market development and economic growth. There is a combined positive effect on the relationship between the stock market development and economic growth when both foreign capital inflows and exchange rate relate with each other. Azam et al. (2016) confirm in their study that there is long-term cointegration among economic growth, foreign direct investment, stock market development, and inflation among four Asian countries (i.e. Bangladesh, India, China and Singapore), between 1991 and 2012. They employ annual time-series cross country data, and autoregressive distributed lag bound testing methods. They reiterate that the long-term elasticity estimates of the stock market development in all countries show expected signs but statistically significant for China and Singapore. Also, foreign direct investment (FDI) positively relates to economic growth in all the countries minus India, and not statistically significant for all the countries except China.

In the same study, they concluded that in the short-run, the stock market positively relates to economic growth in all countries, additionally significant for only India and China. Also, foreign direct investment (FDI) has a positive and significant influence on growth only for Singapore, and that of inflation, statistically significant for Bangladesh and Singapore. In all, their findings reveal that stock market development and FDI inflows play vital roles in the process of economic growth and development in these countries. Cho (1986) establishes a positive relationship exists between the development of the stock market and economic growth. He developed a model which also establishes that without stock markets, credit markets were inefficient.

Similarly, King & Levine (1993a) conclude that innovative activities serve as a source of growth, based on a model they developed. Per their conclusion, it is safe to infer that a surge in productivity growth rate, accordingly enhances economic growth via a superb attainment rate of innovation. In this model, two different forms of financial markets were captured. The intermediaries function as venture capital companies in the first form. These firms appraise and undertake to finance and supervise risky and expensive innovations. The stock market where the current value of an invention is shown by the price of the company on the stock exchange is the second form. In a nutshell, King and Levine conclude that the growth of the financial market can ensure innovations and consequently, economic growth. In their study, Rahman & Salahuddin (2010) conduct an empirical analysis of economic growth and its determinants' linkages with a specific emphasis on the development of the stock market in Pakistan from 1971 to 2006, using FMOLS and ARDL bounds- testing for the long-run relationship and error correction mechanism for the short-run dynamics. Their results, affirm a positive linkage between well-organized stock markets and economic growth, in both the short and long runs.

The outcomes of the study are in line with theoretical and empirical predictions such that foreign direct investment, stock market liquidity and human capital are positively related to economic growth. On the contrary, financial instability and inflation are adversely related to economic growth. Other studies have found a direct relationship between the stock market and economic growth.

In another study of how the stock market liquidity can influence economic growth using data from South Africa, Chipaumire and Ngirande (2014) determine that the stock market liquidity influences growth in South Africa. Likewise, Ndako (2008) examines the relationship between stock markets, banks and economic growth in South Africa using quarterly time-series data from 1983 - 2007 and also the vector error correction model. The study finds that the development of the stock market influences South African economic growth significantly. Possibly, Ndako's conclusions will instinctively be related to the emerging kind, scope and improvement of the financial system of South Africa positively.

Osakwe and Ananwude (2017) employ ARDL cointegration methodology to assess the stock market development and economic growth linkage in Nigeria and South Africa in 1981-2015 for both the short and long run. They determine for Nigeria, a long-run relationship on the development of the stock market and economic growth. However, it is reverse for South Africa. A granger causality test and analysis were further undertaken, and they concluded that economic growth in South Africa is influenced significantly by market capitalization ratio, unlike Nigeria. Though, their investigations support the theory for Nigeria; it is reverse for South Africa. Acharya et al. (2009) determine, across the Indian State that the stock market development and growth do have a long-run relationship. A few other studies have also found a positive relationship between stock market development and economic growth. For instance, Masoud &

Hardaker (2012), in their study of forty-two emerging markets during 1995-2006, reveal that the stock market development significantly and positively has a significant impact on economic growth. In their study of five Euronext countries (i.e. Belgium, France, Portugal, Netherlands and the United Kingdom) for the period 1995 – 2008, (Boubakari and Jin, 2010) affirm different results on the stock market development and economic growth's relationship, contrary to earlier results. In countries where the stock market is exceptionally active and liquid, the results show that the stock market and economic growth do have positive relationships. The causality linkage is not accepted for those countries where the stock market is trivial and not as much of liquid. Nguyen and Pham (2014) in their study of the nexus employ time series data for the period of 1981 Q3 to 2012 Q3 to examine the causality relationship between stock market development and economic growth in Canada and Australia. Their results from the study suggest by Granger causality test that there is a connection between the stock market development and economic growth in Canada but not for Australia. Also, there is a long-run relationship between the stock market and economic growth; thus, the stock market development does help to enhance some of the developed countries' future growth.

Wong and Zhou (2011) in their work, examine the development of financial markets and growth of five selected countries (i.e. Hong Kong, China, Japan, United States and the United Kingdom) throughout 1988–2008 confirm that the stock market development has independently, a strong positive correlation with industrial production. Given the results, the stock market development is one of the significant triggers of economic growth in the five examined countries.

Osaseri & Osamwonyi (2018) study the impact of stock market development on economic growth in BRICS (i.e. Brazil, Russia, India, China and South Africa) countries and conclude that the development of the stock market does have influences on economic growth significantly in BRICS countries.

The Essence of the Stock Market and Economic Growth.

Theoretically, according to (Singh (1997), it is expected that the stock market will boost the economy by serving as a conduit through which domestic savings and investments can be increased in qualitative and quantitative terms, which will further enhance economy growth. As posited by Levine & Zervos (1998), the stock market is regarded as one way of promoting domestic savings as it provides businesses and individuals with some supplementary financial tools that are relevant to achieve their risk preferences as well as their liquidity needs. Indeed, emerging hypothetical literature posits the importance of stock markets and its crucial roles of developing an economy, thus executing several functions discussed below:

Liquidness (Solvency)

The ability of the stock markets to create liquidity and consequently promote economic growth has been cited by many as one of the significant impacts of the stock markets on economic growth in the growth literature. One major role of the market, according to Yartey & Adjasi (2007) is to serve a financier of very lucrative and producing projects of long-term durations. This is by fulfilling investors' requirement both in the short-term and long term. It is essential for the provision of information, thus a motivating factor to bolster economic growth via corporate governance. A robust liquid stock market facilitates the used of much more vigorous techniques of production for long-term (Boyd and Smith 1998). They posit the availability of the above can boost the economy via large economies of scale typically ensuring economic growth. Yartey et al. (2007) further supported this assertion. They affirm that stock markets create liquidity which is essential for economic growth. Given its liquidity, the stock market is expected to minimize risk hazards and provide investors with the means to finance long-time term projects. The investors maintain access to their primary investment at every stage of the project as they can at any time dispose of their shares in the firm with less stress or minus any pecuniary cost to regain initial investments. It is expected that a robust highly stock market will in the long term, boost investment, thus conceivably having an advanced rate of return. Others have also argued against increasing liquidity of the stock market. According to Senbet and Otchere (2008), growing the stock market's liquidity nature can be potentially harmful, thus have adverse effects on corporate governance. They argue that if stocks are liquid, it is likely to result in investor short-sightedness. On the stock market, selling of large liquid stocks, thus, has the potential to abate the dedication of the investors, and likely to put off economic growth in the face of corporate control. Also, non-conforming shareholders, instead of trying to change management policies, will dispose of their shares. Likewise, a study by Jappelli and Pagano (1994) maintain that extremely liquid stock markets tend to have undulating adverse effects on economic growth by dropping doubt, which is likely to unfavourably upset the savings rate, coupled with severe drawbacks for enhancing economic growth.

Mobilizing Capital Resources

The capital resource mobilization, according to Levine (1997), indicates that savings are the utmost crucial role executed by the stock market. In the course of capital mobilizations, stock markets partake in mobilising savings from many investors for implementation of long-term projects by those who require them such as entrepreneurs, government and other fund users. It is worth mentioning that without intermediaries in the financial sector, it is not possible for a saver or an investor to solely find a borrower, nevertheless, would prefer to use a legitimate source for profit motive and security concerns. Stock markets and other intermediaries gather savings from individuals and make them accessible to those who need them to finance long term projects due to the unwillingness or the incapability of one saver to finance a project. This intend enhances economic growth via public and private investments as well. The financial markets' mobilizing role according to Hicks (1969) ensures the espousal and implementation of systems that provide enormous economies of scale. Hicks, additionally asserts the availability of existing options, like production technologies are joined to mobilise capital as the role of financial markets.

In the same vein, according to McKinnon (1973), the scenario ‘‘where a farmer who is not able to get a piece of specific equipment through his savings needs access to external financial resources’’. This financing is through financial intermediaries to enable the farmer to procure the equipment and augment his output. For that reason, the mobilization of savings allows the farmer to bring in a new technology, which consequently leads to an increase in his income. Levine (1997) observes that financial institutions encourage investment in the latest technologies by mobilizing savings and increasing the availability of funds and accessibility of the same to investors. The stock market offers opportunities (Yartey & Adjasi, 2007) for businesses such as small and medium scale, to raise funding at a reduced cost, compared to funding costs that are offered by banks and other financial intermediaries.

Nonetheless, Wargler (2000) observes that the only way which capital mobilisation through the stock market leads to enhance economic growth, that is, if it is typically linked to investment in feasible investment projects. It is worthy of note that without proper regulation of investors, stock market development can lead to a financial crisis and in turn adversely affect economic growth. Indeed, the US Government's in a quest to unravel the causes of the financial crisis of 2008 found that widespread failures in financial regulation and supervision destabilized the nation's financial markets. Similarly, Pezzuto (2013) observes that irresponsible lending, predatory lending, speculation, short-term profit incentives and fraudulent practices of many players in the global financial services industry caused the 2007 – 2009 financial crisis.

Information Production

The stock markets provide a medium to assess, aggregate and publicize information via a pricing procedure, which consequently makes it possible for efficient resources allotment to the corporations in several methods. Pezzuto (2011) as in Pezzuto (2008) buttress the idea that as a result of technological innovation and constant speed of communication devices globally, enhanced benefits and threats associated with global financial trading and investing, leads to a higher level of complexity. Fundamentally, according to Yartey et al. (2007), a company that needs capital for long term projects is avail of an option using the stock market. They contend that there is a positive distribution efficiency as information is obtained by whoever needs it (i.e. investors seek for information on corporations and decide to make a decision). Investment is made possible via stock markets, cheaply for individual investors such as savers to obtain reliable data or knowledge or outlook of the potential returns on investments, hence boosting output.

Information Production

The stock markets provide a medium to assess, aggregate and publicize information via a pricing procedure, which consequently makes it possible for efficient resources allotment to the corporations in many methods. Pezzuto (2011) as in Pezzuto (2008), buttress the idea that as a result of technological innovation and constant speed of communication devices globally, enhanced benefits and threats associated with global financial trading and investing, leads to a higher level of complexity. Fundamentally, according to Yartey et al. (2007), a company that needs capital for long term projects, is avail of an option using the stock market. They contend that there is a positive distribution efficiency as information is obtained by whoever needs it, for instance investors seek for information on corporations, and decide to make a decision. Investment is made possible via stock markets, cheaply for individual investors such as savers to obtain reliable data or knowledge or outlook of the potential returns on investments, hence boosting output.

Stock markets that serve as a spring of incentive to investors, according to Enisan and Olufisayo (2009), similarly, to gather information - it is imaged in stock prices, causing the security market to channel funds to the utmost productive projects at less risk. However, Stiglitz (1985) in an earlier work theorizes that stock markets can generate a free-rider effect. According to him, as an efficient stock market is capable of exposing information swiftly, it discourages independent enquiry by investors, as the price of the instruments holds entirely, the relevant evidence on them. This argument contradicts the conclusion drawn in the earlier submissions (Enisan & Olufisayo, 2009).

Transmission Mechanism for Monetary Policy

Monetary policy is used to manage liquidity. This tool is typically targeted to manage the inflation rate. The connection between monetary policy and the stock market in the monetary policy transmission mechanism is the effect of monetary policy on the rate of inflation. Tobin (1969) explains how the stock returns could respond to likely changes in the model of the monetary series. Similarly, Yartey & Adjasi (2007) demonstrate how stock markets provide a diffusion mechanism via the impact of inflation on the holding of the household's equity. Prices of stocks are usually determined by how much profit the company is expected to make in the short-run or the long-run.

Consequently, if a company is expected to perform well in the years to come, its stock prices will escalate. However, if it is reckoned from trends that the company is not likely to perform well in the long run, the stock prices will likely plummet. Hence, the price of a stock is directly proportional to the performance of a company. When inflation increases, the company earnings will also drop, which will negatively affect the stock prices and the returns of the company and, eventually, its contribution to GDP.

Risk Diversification

The ability of the stock market to minimize the risks associated with investment makes it possible for investors to spread risk to a reasonable level among themselves over several long-term projects. Levine (1991) identifies the threat of two types that can impact economic growth (i.e. liquidity and productivity risks). It is noteworthy that Levine proved the impact of these risks on economic growth in his research. The stock markets, according to Baele et al. (2007), help to advance long-term economic growth. The market ensures cautious and better risk-sharing. As a result, further aids the diversification of risk within an economy and optimises savings rate and allocation of resources. It is thus safe to infer from the above that, a stock market that is liquid enables individual savers to invest in instruments that are liquid, should the individual investor, such as a saver requires the irregular usage of savings. Stock markets, additionally are likely to lessen the threats to investors, linked to investments in projects either individually or by corporations by spreading the risk. Innovation can be affected by risk spreading; thus, a surge in productivity calls for the novelty to be introduced in the production course. This engrosses surge threats due to doubt concerning the expected returns. As was succinctly argued by King and Levine (1993b) by making it possible to pool risk, then stock markets turn to ease innovation and economic growth. Theoretical research recently submits that stock markets support substantial trade policy, thus enhancing economic growth by reducing risk.

Monitoring Managers and Exerting Corporate Control

According to Yeh et al. (2008), with the stock markets, the control of managers via voting and takeover mechanisms can be brought to bear. It is trite knowledge that even small shareholders can manipulate managers by joining forces with other shareholders. This is typically achieved via proxy voting. It is also achievable only if other voting shareholders' consent is obtained to do so to use at meetings via voting rights. According to Yartey & Adjasi (2007), the stock markets facilitate the productive use of past investments by managers through the use of the takeover approach. It has been said that a takeover threat incentivizes managers to increase shareholder value. The stock market, thus; saves as a check and balancing mechanism through which inefficient managers are incentivized to create value for their shareholders. Nonetheless, a high takeover threat is likely to mount extra costs on corporations because it forces and permeates managers to undertake investments in the interim for projects that have fast returns. This often takes resources away from long-term projects which have the potential to yield higher returns, boost the firm's value creation & competitiveness and that of the economy as a whole.

Stock Market against Banks Financing and Economic Growth

The issue of the exact type of financial development that is most appropriate for economic growth has been asked severally. Thus; prominent amongst them is whether the stock market development or banking-oriented system is more apposite? However, the endogenous growth theory postulates that financial development can boost economic growth. The majority of studies on the relationship between financial development and economic growth have used mainly the bank as a tool for financial sector development. As the most optimal type of financial institution for thriving economic growth has been discussed thoroughly and accordingly hinges on two concerns. First, can their roles be substituted by the other, and second, are stock markets superior to banks? The relevance of these two financial institutions in economic growth is linked to their use by investors. To make a proper juxtaposition, there is a need to understand how firms decide on which of the two financial intermediaries to use. Modigliani and Miller (1958) examine the worth of a corporation and the option of financing that is accessible. According to their theorem, it is based on two propositions; one is the overall cost of capital and value of the firm is independent of the capital structure. Many studies, thereafter, have likewise made various pronouncements on the subject. According to Myers and Majluf (1984), the decision of which kind of financing to use by a financial intermediary is based on a scale of preference. They further espouse that a classified striking directive of options are based on making decisions (i.e. firstly, internal financing is considered, second, the banks and the last are the stock markets accordingly). Several scholars have argued that, comparatively, banks are better placed to enhance economic growth.

These scholars contend that the optimal mode of financing for economic growth is that banks than the stock markets (Scholtens, 2000; Stulz, 2000 and Singh 1999). These scholars doubt the essence of the stock market in economic growth, even a well-developed one. Indeed, Stulz (2000) argues for small companies, asserts that these companies' inability to access capital via the stock markets stands a better chance of getting the same from banks at a lower cost. It is worth noting that due to the closeness of banks to firms, it minimizes the problem of information asymmetry, and they also reduce the associated agency cost.

A study conducted in the UK covering the period 1970 – 2000 indicated that the stock market had contributed positively to economic growth; indeed, Stulz (2000) argues for small companies, asserts that these companies' inability to access capital via the stock markets stands a better chance of getting the same from banks at a lower cost. It is worth noting that due to the closeness of banks to firms, it minimizes the problem of information asymmetry, and they also reduce the associated agency cost. Also, a bank-oriented system of finance is considered an improved fit according to Cameron (1997) for emerging countries, contrary to the earlier assertion. Demirguc-Kunt and Haizinga (2000) posit that the better means of financing growth is via the stock market.

They further argue that the stock markets provide a grander opportunity for competition, thus promoting entrepreneurship. It is worth pointing out that an array of functions that include, but not limited to aid investors to price and efficiently spread their risks. The market, as in stocks, affords the corporation or the entity an opportunity to diversify some of its risks by selling some of it to investors who are willing to bear these risks. The issue of whether the roles of the stock market and banks can be substituted by the other was addressed by Beck & Levine (2000) when they conclude that rather than acting as substitutes, each may be an accompaniment to the other to enhance economic growth via delivering outstanding financial services. Industries that appear to be dominant in jurisdictions with developed bank-oriented systems and stock markets were used to buttress their argument since they are likely to produce a faster firm's growth rate. This assertion was corroborated by Levine (2002), he concluded that both financial service providers are very vital for a country's economic growth. He went on to say that such services rendered by both the banks and the stock markets may be corresponding.

Similarly, Boyd and Smith (1998) propound an endogenous growth model, in which the capital structure was based on issuing equity and debt. According to them, the decision of an agent to select particular external financing for investment is predicated on the enormousness of information available to investors, which is needed to supervise management. They suggested that in the available technology, there are two options only to investors. The first one is debt, and that the return is exclusively easily apparent to the investor that initiates it, while equity is the second option, that the earnings are noticeable to the public. They concluded that as a country's economy develops and capital is accumulated from this fall in the cost of capital; thus, the relative cost of capital will plummet. The price of observing firms will also upsurge with the country budding up. This phenomenon will tilt the investors toward the second technology opportunity, which is publicly noticeable. Therefore, as a country is growing, the penchant for equity financing options will increase, thereby, disadvantaging debt financing. For the actuality of a bi-directional relationship between the stock market and economic growth in their model, Boyd & Smith (1998) point that in the long term, the stock market and banks play complementary roles as sources of financing.

In a similar vein, Cojocaru et al. (2015) indicate in their study that, credit to the private sector used for financial development has a positive impact on economic growth during 1990-2008. To estimate this relationship beyond the first post-transition decade, they employ a panel data from the period 1990-2008 to re-examine the relationship between financial development and economic growth in the transition economies of Central and Eastern Europe (CEE) including the Commonwealth of Independent States (CIS). They investigate numerous measures of the financial system, comprising indicators of financial efficiency as well as financial depth, emphasizing primarily on the features of the banking system as yardsticks of financial development. To account for possible endogeneity for a longer time period, they employed a system generalized method of moments estimation by Arrelano & Bond (1991), later developed by Arrelano & Bover (1995). Accordingly, they measure both the amount of private sector credit and the efficiency of the banking system and find that efficiency is more essentially and statistically significant, contrarily, the influence of private credit is minimal and not statistically significant.

The private sector credit in this study represents the banking sector development just as money supply or gross domestic savings. They also reveal strong evidence, particularly for the role of interest rate spreads and bank overhead costs on economic growth. Their results are in line with the general findings on the financial development-growth relationship in other countries. Within the frame of their sample and data, there are specific problems these countries encountered during the process of financial development. These results propose the importance of continued prominence on financial sector development in transition economies.

Institutional Factors and Policies on Economic Growth

Economists have been trying to unravel the causes of economic growth, factors that impact it, and how to sustain it for a very long time. However, they have been unable to find adequate answers. This may partly be so because many of them have concentrated on hard growth factors (i.e. investment and technologies) or their failure to appreciate that growth factors are flow instead of stock variables. Conditions, under which the economy grows, are therefore not static. Thus, soft growth factors, which include institutions, are equally essential for the explanation of economic growth. Segments of the economy (i.e. legal regimes, political stability, property right, regulation regimes, and liberalization of cross-border exchange) stimulate a higher supply of work, contribute to innovativeness, and its distribution, which culminate in quicker and more efficient economic growth.

As observed in the work of Zienkowski (2008), comparative international studies have shown that there is a parallel interdependence between the achieved level of economic growth and the quality and effectiveness of management. Economic policy is usually a consequence of decisions made within this institutional framework; therefore, the vibrancy of a particular economy may principally depend on the efficiency, stability, and durability of its institutions.

According to Ząbkowicz (1998), economic growth is determined by legal, political and social principles that form the basis for production, trade and distribution. A considerable number of empirical studies have shown that institutions are strong determinants of aggregate income and for that matter, economic growth. Traditional growth models tend to focus mainly on the role of physical and human capital in explaining economic growth. These factors have a lot to do with the ease and the cost of doing business. Studies have established that institutions play a principal role in influencing the impact of either human or physical capital or both on economic growth. The disparity in financial market performance and economic performance across countries is largely dependent on the institutional factors in various countries. Adam Smith captured this position in his work, The Wealth of Nations.

Collier (2006); Acemoglu et al. (2001); Aron (2000); Williamson (1995) and North (1990) in their studies ascertain that institutional factors matter prominently in the economic performance of countries. Researchers such as World Bank (2007); Ndulu (2006) and IMF (2003) have corroborated this assertion by asserting that the pitiable performance of countries in Africa is due to weak institutional factors. Sobhee (2009) and Subramanian & Roy (2001) also corroborate it by stating that good institutional factors are responsible for Mauritius' impressive economic successes. Researchers such as Acemoglu et al. (2002); Hall & Jones (1999); La Porta, et al. (1998) and Knack & Keeffer (1995) all conclude that institutional factors are key determinants of economic growth.

Copious studies on developing economies such as Coffee (1999); La. Porta et al. (1997 & 1999); Lombardo & Pagano (1999); Pistor (1999 & 2000) and Hooper (2009) establish the significance of law, judicial efficiency and the regulatory framework in economic growth. Edison (2003) concludes that institutions have a statistically considerable impact on economic performance, considerably increasing the level of per capita GDP. These deductions are relevant to whether the institutional quality is measured by broad-based variables by explicit factors and defined by the rule of law. These variables are deemed to be the perception index of public sector governance. These conclusions suffice for all measures of institutions, implying that economic outputs would be fairly improved, hence the stock market performance, if countries have good institutions.

Moers (1999) and Levine & Renelt (1992) observe that in empirical research where one uses economic growth models, which consist of institutional variables, the choice of explanatory variables is usually problematic. However, Aron (2000) highlights the differences ensuing from the usage of structural models and abridged forms of growth models, which explain the effect of institutional variables on economic growth in a different way. The introduction of institutional variables into structural growth models explains their actual impact on economic growth by boosting the efficiency of investment. It is, however, noteworthy that it will not be possible to establish the indirect impact of these variables on economic growth by increasing the level of investment in these abridged growth models because the level of investment is already included in the equation as a determinant of economic growth. Aron (2000) argues that both actual and indirect effects of institutional variables on economic growth may be estimated using a set of variables determining its level instead of using the variable describing the level of investment.

Another problem that Economists are confronted with is the issue of the endogenous nature of institutional factors in researches on dependencies between institutions and economic growth – the institutional configuration of a given country seldom remains unaffected in time; thus, institutional variables seldom are exogenous concerning growth. Aron (2000) emphasizes that the quality of institutions may deteriorate in times of low economic growth as a consequence of political instability, variations in the policies of the country, or external shocks. In the same vein, Rodrik (2004) argues that high-quality institutions are equally the final product of economic growth and the reason for it.

Other Segments of Financial Market and Economic Growth

This section deals with the impact of other segments of the financial market (i.e. such as shadow banking, peer to peer lending, venture capital, private equity, and business angels) on economic growth.

Venture Capital, Private Equity and Business Angels

Venture capital and private equity, as an investment class, is believed to be a significant contributor to the economic growth process than the actual amount of funds invested by this investment class. It is one source of non-bank financing, which is relatively popular in developed financial markets for small and medium-size firms (Keuschnigg, 1998). There is an empirical substantiation of the contribution of venture capitalists in the industrialization of developed countries. According to Amit et al. (1998) and Gompers & Lerner (2001), just like other mainstream financial institutions, the venture capital industry exists to mitigate the problem of informational asymmetry and the attendant adverse selection and moral hazard.

The ability of the venture capital industry to achieve this is crucial in explaining its role in the growth process. Venture capitalists serve as an intermediary between a set of organizations, i.e. investment banks, corporations, entrepreneurial companies) that are critical to innovation and its distribution (Florida and Kenny, 1988). This sophisticated set of overlying systems allows venture capitalists access to a vibrant network of information flow, with which they can manage many of the risks parallel to the enterprise formation. Through this informational access in the industry's networks, venture capitalists can mitigate informational asymmetries in the investment process, thus reducing the risk barriers for undertaking private investments. Due to this relative advantage in dealing with information asymmetries, governments across the world are deliberately supporting the development of the venture capital industry.

Venture capital offers a different model of innovation and technological change. As a model of innovation, the venture capital process addresses some of the disadvantages of irregular individual entrepreneurship as well as the lethargy that is frequently shown by entrepreneurs. In contrast with bank lending, venture capitalists are not inactive financiers (i.e. they play an active role in the management, strategic marketing, and planning of their investee companies). They provide advisory services to the management of the investee companies on the formulation of strategy.

Parhankangas (2012) emphasizes on, from the works of Mead & Liedholm (1998), access to finance is an essential factor in the growth process (i.e. financial constraints affect the business formation and improvement). Venture capitalists thereby contribute to the growth process through the provision of funding (i.e. credit finance and equity), for companies and their active approach to investment. Indeed, early researchers such as Bygrave & Timmons (1986) and Gorman & Sahlman (1989) cited in Parhankangas (2012), highlight the fundamental role of venture capitalists in stimulating innovation and growth in early-stage of companies.

A plethora of contemporary studies such as EVCA (2002); Ueda & Hirukawa (2003); IVCA (2005), and SAVCA (2009) have concluded that firms achieve organic growth and overcome the problem of underinvestment in innovative activities (cited in Parhankangas, 2012) when they are financed by venture capitalists.

In a similar vein, a plethora of scholarly evidence from Germany by Engel (2002); from Spain by Alemany & Martin (2005); from the United States by Davila et al. (2003); Hellman & Puri (2000); Jain & Kini (1995) and Zhang (2007) establish that venture-financed firms perform better than others re job creation and sales growth.

According to Mason (2009a), business angels are gradually becoming a remedy for economic lethargy and high unemployment. Wetzel (1983) submits that those business angels are the most likely source of funding for small and medium scale technology-centred firms. It is noteworthy that this submission is not universal. Some scholars, including Aldrich (2008), have argued that venture capitalist investments are limited in number and are beneficial to a few of companies and thus cannot be considered as a panacea for viable and comprehensive economic growth and wealth formation. In a similar consideration, business angels that are unsophisticated, according to Freear et al. (1994), have the tendency of damaging more than useful in their portfolio companies.

Shadow Banking

The vibrancy of financial markets is partly dependent on the proliferation of credit, within both the formal, structured banking channels and the unregulated or shadow banks. Shadow banks, unlike regular banks, operate beyond the purview of the monetary authorities. While lending and borrowing are subjects to systemic and immeasurable risks, the risks involved in the transactions of the unregulated banks are comparatively high. Due to the high inherent risks on the part of the unregulated banks, the charges levied on borrowers are also high. This makes loans from shadow banks unattractive to borrowers, especially those in developing countries. Unregulated banks include two types. The first type provides credit to those who financially alienated in the informal sector. The second variety of shadow banks are the Non-Banking Financial Companies (NBFCs), which typically deals with the formal sector, both in terms of their clients and specifically with regular banks as major fund providers. The NBFCs usually depend on deposits from the public and on borrowing from regular banks – these funds are used for extraordinarily high-risk operations.

A large portion of the world population is not banked. These unbanked individuals and small enterprises, especially in developing countries, have no access to credit from the regulated banks. They, therefore, rely on the unregulated banks for credit – which often results in personal tragedies and bankruptcies due to the harsh loan terms. Indeed, the global financial crisis of 2008 was attributed largely to the operation of the unregulated banks. For investment banks in the US caused the sub-prime crisis. These shadow banks also engage in transactions which destabilize the entire financial sector – when they fail to fulfil their loan obligations to the regulated banks. According to Sen (2017), the opening up of the financial markets for financial innovations (i.e. as a hedge against risk) has facilitated the operations of shadow banks. Through financial innovations, opportunities are created to invest in high-risk high-return projects. It is worthy of note that shadow banks welcome the chance to invest in these high-risk high-return projects, which ordinarily regulated banks would not finance.

The literature on the impact of shadow banks on economic growth is very scanty. However, from the foregoing analysis, it is clear that an ad hoc research is needed to make a clear pronouncement. It is nonetheless instructive to note that shadow banks allow for innovation, create employment and wealth.

Macroeconomic Variables - Monetary and Fiscal Policies on Economic Growth

Several researchers have made strong arguments for the impacts of certain macroeconomic factors on economic growth. Fischer (1991) finds that these variables include monetary and fiscal policies that help in influencing inflation, budget deficit, and the balance of payments.

Monetary policy, according to Wrightsman (1976) encompasses activities introduced by the central bank that targets the impacting the cost and availability of credits. Okwo et al., (2012) enunciate that monetary policy embraces a government formal effort to influence the money in its economy to achieve specific economic goals.

According to Ogunjimi (1997), monetary policy is an amalgamation of three measures (i.e. the level of interest rate; the amount of money in circulation and the functions of credit markets and the banking system) aimed at regulating the value, supply and cost of money in an economy, in tandem with the level of economic activity. Abeng (2006), argues that the validity of the monetary policy is dependent on the level of monetization of the economy. Thus, the efficacy of monetary policy is less effective in a less monetized economy. Theoretically, the impact of monetary policy on economic growth is not unanimous. According to the classicists, based on the supposition that the economy works at full employment coupled with the equation of exchange and stability in the velocity of money, the change in money supply will only impact price without any effect on real demand, investment, and output. The Keynesians, on the other hand, consider money and, for that matter, interest rate as a significant determinant of investment in the market economy. According to them, a change in the money supply could lead to an upsurge or a drop in interest rate. A drop in interest rate will affect aggregate investment and boost aggregate income and output. The investment process comprises the engagement of factors such as labour and capital, which in turn cause total employment to surge.

The classical economists' view of monetary policy is grounded on the quantity theory of money, which is generally discussed in term of Fisherian equation of exchange, which is given by the expression MV = PY, where M in the expression represents the supply of money; V represents the velocity of circulation; P represents the price level GDP, and Y denotes the level of output. PY, therefore, denotes the current nominal GDP. The equation of exchange dictates that the supply of money multiplied by the velocity of circulation must be equal to nominal GDP (PY). The classical economists hold that the economy is at all times at or close to the natural level of real GDP. They assume that Y in the Fisherian equation of exchange is fixed in the short run. Monetarists, whose thought on monetary policy is a contemporary modification of classical macroeconomists', believe that the supply of money is the key factor in ensuring economic stability, as well as growth. They also believe that to be able to achieve a stable growth rate, the money supply should not be regulated by the monetary authorities but should instead grow at a fixed rate.

In assessing the impact of monetary policy on Nigeria's economy, Anowor & Okorie (2016) reveal that monetary policy has a significant impact on the economy. This argument supports the disposition of Monetarists, and thus conflict the views of the Keynesian economists on the issue.

Several studies have tried to empirically unravel the effect of monetary policy on economic growth. Khabo (2002) investigates the impact of monetary policy on economic growth in South Africa for the period 1960-1997, using M3 as a measure of monetary policy. The results of the study show that money supply plays a crucial role in economic growth. Starr (2005) examines the relationships between monetary policy variables and both output and prices in Russia, Ukraine, Kazakhstan and Belarus from 1995 to 2003. With the exception of Russia, where interest rates have a significance on output, the study did not find any relationship between the variables in the three other countries.

Uhlig (2005) concludes that contractionary monetary policy shocks have no obvious effect on real GDP in the United States. In the same vein, Dele (2007), in his study of monetary policy and economic performance of West African Monetary Zone Countries (i.e. Ghana, Gambia, Nigeria, Guinea, and Sierra Leone), for the period 1991-2004 found that monetary policy was a cause of stagnation as it hurts real GDP of these countries. Fiscal policy, on the other hand, is believed to play a vital role in the growth process, and for that matter, economic growth. However, its effectiveness in improving economic conditions, in the long run, is not without controversy. In the conservative model, a tax cut without a matching reduction in expenditures will increase consumption expenditures and interest earnings due to a rise in personal disposable income. The Ricardian Equivalence Theorem (RET) controverted the position of the conventional model and dictates that a reduction in deficit-financed tax cut will not affect macroeconomic outcomes. A myriad of studies including Landau (1986), Fatas & Mihov (1998), Sinha (1998), Perotti (2005), Amanja & Morrissey (2005), Falk, et al., (2006), Rezk (2006), and Castro, et al. (2006) buttress the earlier assertion. These studies investigated the impact of fiscal policy variables on economic growth. Fiscal policy variables such as government spending, tax revenues, and budget deficits have been employed by these researchers.

The results of the studies by Heppke-Falk, et al. (2006) and Castro, et al. (2006) conclude that shocks to government spending positively influence the growth rate of GDP, while shocks to taxes negatively affect the growth rate of GDP. The results of studies by Iqbal & Zahid (1998) and Jafri, et al., (2006), show that the growth rate of GDP responds inversely to the budget deficit in the long run.

Researchers such as Romero de Avila & Strauch (2007); Amanja & Morrissey (2005); Bose, et al. (2003); Odedokun (2001); Kneller & Gemmell (1999); Tanzi & Zee (1997) and Barro & Sala-i-Martin (1995), conclude that variables are significant contributors to economic growth after using fiscal policy variables in their growth equations.

Other studies such as Levine & Zervos (1993); Barro (1991); Mwebaze (2002) and Balassa (1988), conclude that a rising budget deficit is one of the main constraints to economic growth. It is clear from the cited literature that fiscal policy affects economic growth. It is noteworthy that the studies fell short of determining the sign and magnitude of the effects of the fiscal policy variables on economic growth.

A plethora of studies tried to elucidate the impact of macroeconomic indicators on stock market development and economic growth. Maku and Atanda (2011) investigate the determinants of stock market performance in Nigeria by considering macroeconomic indicators. They confirm their test results that stock market prices and money supply are positively related. In another vein, Isenmila and Erah (2012), show that stock prices relate negatively with money supply in Nigeria. Asaolu and Ogunmuyiwa (2011), did an econometric analysis of the impact of macroeconomic variables on stock market movement in Nigeria and concluded that the money supply does not Granger-cause stock prices. Stock prices are among activities that are triggers of stock market development. Pilinkus and Boguslauskas (2009), conclude in their study that macroeconomic variables are significant determinants for stock market prices in Lithuania. They investigate the short-run relationship between macroeconomic variables and stock market prices in Lithuania. To test the existence of the short-run relationship, they employ the impulse response function.

Gross domestic product and money supply have a positive effect on stock market prices, while most often than not, unemployment rate, exchange rate, and short-term interest rates adversely affect stock market prices. The results of their investigation are comparable to the results of some other empirical studies. If the aggregated consumer price index is considered, then it is the best instance of an unstable link between a macroeconomic variable and stock market prices in Lithuania.

Nkechukwu et.al. (2015), did an evaluation of the effect of macroeconomic variables on stock market prices in Nigeria on annual time series datasets for the period 1980-2013 by using the OLS regression technique. The macroeconomic variables considered were the gross domestic product and broad money supply. Their results reveal that stock market prices have a long-run relationship with macroeconomic variables; nevertheless, GDP significantly has a long-run negative influence on stock prices in reverse to a priori expectation that GDP has a significant and positive influence on stock prices. However, the money supply has a long-run positive and significant influence on stock prices, the result being in line with a priori expectation. There is a unidirectional causal effect between gross domestic product and stock prices with direction running from stock prices to gross domestic product. There is no causal effect between stock prices and broad money supply, in any case. Additionally, nevertheless, in the short-run, both gross domestic product and money supply have positive but insignificant effects on stock prices. This outcome indicates that the stock market in Nigeria is not informationally efficient; thus, it is not easy to predict stock prices based on macroeconomic factors.

Also, Masuduzzaman (2012) examines macroeconomic fundamentals and the stock returns of Germany and the United Kingdom on both the long-run relationship and short-run dynamics. He applied Johansen co-integration, error correction model, variance decomposition, and impulse response functions. This, he did in a system incorporating the variables including consumer price index, interest rates, exchange rates, money supply, and industrial productions between the periods of February 1999 to January 201. He examines each case independently. The outcome of the study affirms both short and long-run causal relationships between stock prices and macroeconomic variables. Adebayo (2016) assesses the relationship between market value/capitalization and macroeconomic variables in an emerging market by using the OLS method. The study was on the Nigerian Stock Exchange from 1988 -2012, covering twenty-five years. He considered macroeconomic variables, including interest rate, inflation rate, lending rate, gross domestic product, and the unemployment rate in the investigation. The results of the study revealed varying influences such as negative influences of interest rate, inflation rate, lending rate, and unemployment on market capitalization ratio. In the final investigation, the result showed that there was a relationship but insignificant between market capitalization and components of macroeconomic.

Empirical Literature

Different approaches have been used by researchers to investigate the financial sector development - economic growth nexus across different countries. It is nonetheless worthy of note that the traditional literature on growth was not adequate to examine the financial markets and economic growth nexus. This is because the literature is mainly focused on the steady-state level of capital stock per worker or productivity instead of the rate of growth that is endorsed to exogenous technical progress. The driving force behind the growing interest of contemporary literature in the financial development - economic growth nexus stems from the tenets of endogenous growth models. According to the endogenous growth models, growth is autonomous and influenced by initial conditions. In this framework, the stock market is shown to have both level and rate effects. It is worthy of note that this framework is not generally accepted by all, as one school of thought contends that stock markets promote long-term economic growth. Greenwood and Smith (1996) corroborate this contention. They argued that stock markets lessen the cost of mobilizing savings and ensure investments in the most productive technologies. They further argued that stock markets ensure diversification of the risks associated with an investment.

Bencivenga, et al. (1996) and Levine & Renelt (1992) also conclude that stock market liquidity plays a vital role in economic growth. The other school of thought believes that for investments to be profitable, capital savers must not relinquish control of their savings for long periods. It is believed that liquid equity markets assuage this apprehension by providing assets to savers; those that are easily liquidated at any time, at the same time allowing firms stable access to capital that is raised from equity issues. Liquidity has also been thought to boost investor motivation to obtain information on firms and enhance corporate governance, thus facilitating growth.

A considerable amount of literature suggests that the development of the stock market is positively related to economic growth. Levine (1993) conducted a research on seventy-seven countries for the period 1960-1989, using different measures to check this relationship. He finds a positive relationship between financial sector development and economic growth. Likewise, Atje and Jovanovich (1993) establish that there is a strong positive relationship between stock market development and economic growth. Levine and Zervos (1998) also emphasize the fact that stock market liquidity measured as the value of stock traded relative to the size of the market, and the size of the economy is appreciably and positively related to the rate of economic growth. They also posited that the level of banking development measured as the ratio of bank loans to the private sector to GDP is directly related to the level of economic growth. This relevance of stock market development in economic growth is also corroborated by Beck and Levine (2001). They maintained that the expansion of both banks and stock markets significantly affects growth.

Also, Arestis (2005) analyzes the relationship between financial sector development and growth using the data of fourteen countries. He employs a series panel model and found a positive correlation between financial sector development and economic growth in most of his sample countries. Adjasi and Biekpe (2006) likewise, study this effect in African countries and find a positive relationship. The existence of causality between financial sector development and growth has also been observed by Mukherjee (2008) in India.

It is instructive to note, however, that the findings of Shan et al., (2001) reveal weak evidence of this positive relationship between the stock market development and economic growth in nineteen OCED countries.

According to Shahbaz (2008), for a country to achieve economic growth, it is imperative for that country to develop its stock market. Likewise, El-Wassal (2013) affirms that there are various crucial functions performed by stock markets in order to ensure economic growth. According to him, these functions include the reduction of transactional and monitoring costs. Bayar (2014) also examines this relationship in Turkey during the period from 1999-2013 using Johansen and Juselius cointegration tests. His findings reveal that the development of stock markets affects economic growth in the long run. Equally, Naik and Padhi (2015) find that financial sector development contributes positively towards economic growth using a panel of twenty-seven emerging markets. An argument has been made as to whether the same conclusion concerning the relationship between stock market development and economic growth can be applied evenly to countries with varying levels of stock market development. Recent empirical works have tried to investigate this.

In examining the causal relationship between stock market development and economic growth for five Euronext countries, namely, Belgium, France, Portugal, Netherlands, and the United Kingdom,) for the period 1995 to 2008, Boubakari and Jin (2010) employ Granger causality test. They also employ stock market development proxies (i.e. market capitalization ratio, the stock traded turnover ratio, and stock traded total value and GDP) and foreign direct investment as proxies for economic growth. Causal relations were investigated for each country. The study's result affirms a positive relationship between the stock market development and economic growth for some countries for which the stock market is liquid and highly active.

Conversely, the causal relationship is rejected for the countries in which the stock market is small and less liquid.

In the same vein, Osei (2005) examines the impact of stock market development on economic growth in Ghana using quarterly time-series data from 1991 to 2003. He employed a Vector Auto-Regressive (VAR) Model and applied Granger's description of causality. The variables used in the analysis were the natural logarithm of market capitalization and market capitalization ratio as the proxy for stock market development and the natural logarithm of real GDP for growth. The findings of his work indicate that the stock market development Granger cause economic growth in Ghana for the period of the study. It is noteworthy that the results for Ghana, whose stock market is relatively less developed, are consistent with theoretical predictions.

There is no universal agreement among researchers about the relationship between stock market development and economic growth from pieces of evidence reviewed so far. The study sampled countries from different continents with varying levels of stock market development to ascertain the relationship between stock market development and economic growth vice versa.

The Economy of Countries per Sample Continents in Perspective

Europe

As indicated in the preceding chapter, France, Germany United Kingdom, Netherland and Belgium were sampled under Europe for this study.

France

The economy of France is diversified across all sectors. The government has more or less denationalized many large companies, including Air France, France Telecom, Renault, and

Thales. Nonetheless, the government maintains a sturdy presence in some sectors, particularly power, public transport, and defence industries. The country's leaders remain committed to a capitalism in which they maintain social equity through laws, tax policies, and social spending that alleviate economic inequality. France's unemployment rate (including overseas territories) rose from 7.8% in 2008 to 10.2% in 2015. The country's public finances have historically been stressed by high spending and low growth. Notwithstanding policy introduced to restore public finances, the budget deficit grew from 3.3% of GDP in 2008 to 7.5% of GDP in 2009. The government has, in recent years, launched a sequence of economic reforms to increase competitiveness and boost economic growth.

Germany

The economy of Germany is ranked the fifth largest economy in the world in terms of PPP and the largest in Europe. Germany is a leading exporter of machinery, vehicles, household equipment, chemicals, and benefits from a highly skilled labour force. Between 1998 and 2005, the government at the time launched reform programs deemed necessary to address high unemployment and low average growth. These reforms achieved the desired targets by reducing unemployment and ensuring robust economic growth. Between 2008 and 2009, the government introduced stimulus and stabilization policies tax cuts. These actions increased the country's total budget deficit - including federal, state, and municipal - to 4.1% in 2010. However, the government slowed spending and increase tax revenues, thus reduced the deficit to 0.8% in 2011. In 2009, a constitutional amendment was approved, which limits the federal government to structural deficits of no more than 0.35% of GDP per annum as of 2016.

The German economy is dogged with low levels of investment, and the government plan to invest 15 billion euros during 2016-18, mainly in infrastructure to spur needed private investment. Domestic consumption, investment, and exports are likely to drive German GDP growth in the next few years, and the country's budget and trade surpluses are expected to remain high.

The United Kingdom (UK)

The UK is the third-largest economy in Europe. It is a leading trading power and financial centre. The country's agriculture is intensive, highly mechanized, and efficient by European standards, producing about 60% of food needs with less than 2% of the labour force. The country is endowed with vast coal, natural gas, and oil resources. Although the UK's oil and natural gas reserves are declining, the country has been a net importer of energy since 2005. The British GDP growth has been mainly caused by services – banking, insurance, and business services. However, Manufacturing has declined in relevance but still accounts for about 10% of the country's economic output.

Due to the importance of the UK's financial sector, the global financial crisis of 2008 hit the economy so hard. In the latter half of 2008, the economy went into recession due to falling home prices, high consumer debt, the global economic slowdown, and the government at the time was left with no choice but to implement a number of measures to kindle the economy and stabilize the financial markets. In 2010, the government had to initiate austerity measures due to burgeoning public deficits and debt levels. It is worthy of note that the UK, still, remains one of the highest in the G8.

In June 2016, the UK voted in a referendum to leave the European Union. Consequent to that, the country's economy has begun to slow. The continued depreciation of the British pound has increased consumer and producer prices, weighing on consumer spending without stimulating a significant increase in exports. The UK has a far-reaching trade relationship with other EU members through its single market membership, and economic observers have presaged the exit will endanger the country's position as the central location for the European financial services

Netherlands

The Netherlands is considered the sixth (6th) largest economy in the European Union (EU). The country regularly records high trade surpluses, low unemployment, and stable industrial relations. The Netherlands focuses predominantly on food processing, chemicals, petroleum refining, and electronics. Its agriculture sector is highly mechanized, and it employed about 2% of its workforce. Due to its high mechanization, the Netherland's agriculture sector is able to produce enough to feed the country and food processing – this has made the country the world's second-largest agricultural exporter. The Netherlands is a member of the Eurozone and as such, its monetary policy is regulated by the European Central Bank.

It is worthy of note that the financial sector of the Netherlands is highly concentrated with four commercial banks – these banks have own over 80% of banking assets, which is almost four times the size of the country's GDP. The financial crisis of 2008 caused the country's budget deficit to hit 5.3% of GDP. A prolonged recession from 2009 to 2013 caused unemployment to double to 7.4% and household consumption to shrink for four consecutive years. The economy, however, began to grow in 2014. The country implemented austere measures in 2010 to improve public finances and also implemented a myriad of structural reforms in key policy areas, including the energy market, the labour market, the housing sector, etc. The new policies are also meant to increase the demand for workers in the public and private sectors. These policies yielded a positive result, and the country's budget deficit began reducing, getting close to a surplus in 2016.

Belgium

Belgium economy is considered one of the most diversified economies in the world with an extensive mix of transport, manufacturing, services, and high tech. This diversification is due to the country's central geographical location and well-developed transport network. The country relies heavily on fossil fuel from foreign sources. The country is expected to close its seven nuclear plants in 2025, and this is expected to heighten the country's demand for energy from external sources.

Belgium is a regional logistic hub – this makes its economy exposed to shifts in foreign demand, especially with its EU trading partners, as three-quarters of its trades are with other EU countries. Belgium's GDP grew by almost 1.5% in 2016, with a budget deficit in the same region. The government has pledged to reduce the deficit in response to pressures from the EU to reduce its high public debt of about 104% of GDP. The government has also pledged to implement policies that would improve the country's competitiveness, including changes to labour market rules and welfare benefits. These changes are expected to make Belgian wages more competitive in the EU region.

Americas

Countries sampled under the Americas include; Argentina, Brazil, Canada, the United States of America and Mexico for this study, as indicated in the preceding chapter.

Argentina

Argentina boasts of rich natural resources, a highly literate population, an export-oriented agricultural sector, and a diversified industrial base. The country experienced severe economic problems during the greater part of the 20th century - from recurring economic crises, persistent fiscal and current account deficits, high inflation, mounting external debt, and capital flight. In 2016, the situation got worse; hence the country was downgraded by the World Bank from a high-income to upper-middle-income economy. In 2001, Argentina's severe depression, growing public and external indebtedness, and an unprecedented bank run culminated in the most severe economic, social, and political crisis in the country's turbulent history. The country's interim President at the time declared a default - at the time the largest ever - on the government's foreign debt in December of that year, and abruptly resigned only a few days after taking office. In, an effort to ‘’ right the ship’’, the new government announced an end to the peso's decade-long 1-to-1 peg to the US dollar in early 2002. This caused the economy to bottom out that year, with real GDP 18% smaller than in 1998. Real GDP, however, rebounded to grow by an average of 8.5% annually over the following six years. This resurgence was considered mainly as an advantage of the country's previously idled industrial capacity and labour, and expansionary monetary and fiscal policies. However, in late 2007, the rapid economic growth of previous years began to slow sharply. Government policies held back exports and the world economy fell into recession. In 2010, the economy experienced a surge but slowed in late 2011 even as the government continued to rely on expansionary fiscal and monetary policies, which kept inflation in the double digits.

To deal with these problems, the government expanded state intervention in the economy. The government, at the time, expanded measures to restrict imports, and further tightened currency controls in an effort to bolster foreign reserves and stem capital flight. Nonetheless, between 2011 and 2013, the country's foreign reserves dropped from $52.7 billion to $21.3 billion. In 2014, Argentina and China agreed on an $11 billion currency swap. Consequently, the Argentine Central Bank received the equivalent of $3.2 billion in Chinese yuan, which it counts as international reserves.

With the coming into office of President Mauricio Macri in 2015, things began to change, as his administration took steps to liberalize the Argentine economy. He lifted capital controls, floated the peso, removed export controls on some commodities, cut some energy subsidies, and reformed the country's official statistics. The country negotiated debt payment terms with holdout bond creditors and returned to international capital markets in 2016.

Brazil

Brazil is currently ranked as the eighth-largest economy in the world. The country is recovering from a recession it underwent from 2015 to 2016, which has been considered as the worst in the country's history. The country's commodity prices fell, causing export revenues and investment to fall. This has gone a long way to weaken the country's currency and cut tax revenues. The weaker currency caused the existing public debt, which was primarily denominated in foreign currency, more expensive, and the lower tax revenues strained the government's budget.

In 2016, economic reforms were implemented with the aim of slowing the growth of government spending and reducing barriers to foreign investment. The reforms failed, albeit partly to achieve the desired results - government spending growth caused public debt to rise to 78% of GDP at the end of 2017, up from 50% in 2012. Policies to strengthen Brazil's workforce and industrial sector, such as local content requirements, may have boosted employment at the expense of investment.

Brazil’s economy has also been affected by multiple corruption scandals involving private companies and government officials. Sanctions against the firms involved — some of the largest in Brazil — have limited their business opportunities, producing a ripple effect on associated businesses and contractors. Besides, investment in these companies has declined because of the scandals. (World Factbook).

Canada

Canada operates a market-oriented economic system. Since World War II, the country’s manufacturing, mining, and service sectors have experienced impressive growth, thus, transforming the nation from a largely rural economy into one an industrial and urban one. Canada is endowed with a large oil and natural gas sector, with the majority of crude oil production derived from oil sands in the western provinces. The country is considered third in the world in proved oil reserves and the world’s sixth-largest oil producer.

The country’s 1989 Free Trade Agreement with the United States of America and the 1994 North American Free Trade Agreement (which includes Mexico) bolstered its trade and economic integration with the US. Canada has a comprehensive and highly balanced bilateral trade and investment relationship with the USA - with merchandise trade of $544 billion in 2016, services trade of over $80 billion, and two-way investment stocks of nearly $700 billion. Over seventy-five percent of Canada’s exports are destined for the US each year. The country enjoyed robust economic growth from 1993 through 2007, owing to its abundant natural resources, highly skilled labour force, and modern capital stock. The global economic crisis of 2007-08 moved the Canadian economy into a sharp recession by late 2008.

Canada's major banks emerged from the financial crisis of 2008-09 among the strongest in the world, due to the financial sector's tradition of conservative lending practices and strong capitalization. Since the fall in world oil prices in 2014, the country has experienced modest economic growth ever since.

United States of America

The economy of the United States of America is considered the most technologically dominant economy in the world. The country's technology firms are at or near the forefront in technological advances, especially in computers, pharmaceuticals, and medical, aerospace, and military equipment. It is noteworthy that their advantages have narrowed since the end of World War II. Based on GDP measured at purchasing power parity conversion rates, the US economy was considered the largest in the world for more than a century until it slipped into second place behind China, which has more than tripled the US growth rate for each year of the past four decades. The economy of the US is dogged with long-term economic problems - stagnation of wages for lower-income families, inadequate investment in deteriorating infrastructure, rapidly rising medical and pension costs of an aging population, energy shortages, and sizable current account and budget deficits.

The surge of technology has been a driving factor in the gradual development of the country's labour market – both the skilled and unskilled were assured of employment. However, the globalization of trade, and more especially the rise of low-wage producers such as China, has put additional downward pressure on wages and upward pressure on the return to capital. Since 1975, practically all the gains in household income have gone to the top 20% of households.

Since 1996, dividends and capital gains have grown faster than wages or any other category of after-tax income. (World Factbook).

Due to the industrialized nature of the economy, oil has a major impact on the overall health of the economy, thus, imported oil accounts for more than half of the country's consumption. Between 2001 and 2006, crude oil prices doubled, home prices peaked; higher gasoline prices ate into consumers' budgets, and many individuals fell behind in their mortgage payments. Between 2006 and 2008, oil prices jumped another 50%, and bank foreclosures more than doubled in the same period. Above and beyond dampening the housing market, high oil prices stimulated a drop in the value of the dollar, the country's merchandise trade deficit, which peaked at $840 billion in 2008. Since the country's economy is energy-intensive, falling oil prices since 2013 have alleviated many of the problems the earlier increases had created.

In 2008, the sub-prime mortgage crisis, falling home prices, investment bank failures, tight credit, and the global economic downturn caused the country's economy to slump. The country's GDP contracted until the third quarter of 2009. This was the severest and the most extended dip since the Great Depression. The US congress to stabilize the financial markets established a $700 billion Troubled Asset Relief Program (TARP) in October 2008. Some of these funds were used to purchase equity in US banks and industrial corporations, many of which had been returned to the government by early 2011. In 2009, an additional $787 billion fiscal stimulus was approved by congress and assented to by the president to be used over 10 years - two-thirds on additional spending and one-third on tax cuts - to create jobs and to help the economy recover. The federal budget deficit reached nearly 9% of GDP in 2010 and 2011. The government thereafter reduced the growth of spending in 2012, thus, causing the deficit to drop to 7.6% of GDP. Comparatively, US revenues from taxes and other sources are lower, as a percentage of GDP, than those of most other countries.

Due to the country's commitment to the wars in Iraq and Afghanistan national resources were shifted from civilian to military purposes. This contributed to the growth of the budget deficit and public debt. According to official figures, through the Fiscal year 2018, the direct costs of the wars will have totalled more than $1.9 trillion.

After the 2008 recessions, various policies were implemented to protect the country's financial markets and the economy as a whole. For instance, in 2010, the Wall Street Reform and Consumer Protection Act was passed – a law meant to ensure financial stability by protecting consumers from financial abuses, ending government bailouts of financial firms, dealing with troubled banks that are "too big to fail," and improving accountability and transparency in the financial system. These were to be achieved by ensuring that certain financial derivatives to be traded in markets are subject to government regulation and oversight. Also, in 2012, the Federal Reserve Board announced plans to acquire $85 billion per month of mortgage-backed and Treasury securities in a bid to hold down long-term interest rates and to keep short-term rates near zero until unemployment dropped below 6.5% or inflation rose above 2.5%. The Federal Reserve Board ended its purchases in 2014 after the unemployment rate dropped to 6.2% and inflation dropped to 1.7%. In December 2017, the president assented to the Tax Cuts and Jobs Act, which, among its various provisions, reduces the corporate tax rate from 35% to 21%; lowers the individual tax rate for those with the highest incomes from 39.6% to 37%, and by lesser percentages for those at lower income levels. It is estimated that the new law will reduce tax revenues and increase the federal deficit by about $1.45 trillion over the 2018-2027 period.

Mexico

Mexico's economy is ranked 11th largest in the world. Since signing the North American Free Trade Agreement (NAFTA) in 1994, the country has increasingly gravitated toward manufacturing. Owing to NAFTA, Mexico has become the US' second-largest export market and third-largest source of imports. Mexico has free trade agreements with 46 countries, putting more than 90% of its trade under free trade agreements. In 2012, Mexico formed the Pacific Alliance with Peru, Colombia, and Chile (World Factbook).

In recent years the government has emphasized economic reforms, passing and implementing sweeping energy, financial, fiscal, and telecommunications reform legislation, among others, with the long-term aim to improve competitiveness and economic growth across the Mexican economy. Mexico’s economic growth has averaged 2% annually, since 2013. Growth is predicted to remain below potential given falling oil production, weak oil prices, structural issues such as low productivity, high inequality, a large informal sector employing over half of the workforce, weak rule of law, and corruption. Its economy is predicted to be vulnerable in 2018 due to the uncertainty surrounding the future of NAFTA—because the US is its top trading partner and the two countries share integrated supply chains.

Africa (Sub-Sahara Africa Countries)

The diversity of Sub-Saharan Africa in terms of economic and political situations, thus, has become unnerving to sample Ghana, Cote d’Ivoire, Nigeria, Mauritius and South Africa for this study.

Ghana

Ghana's economy was strengthened by a quarter-century of relatively sound management, a competitive business environment, and relatively stable political landscape, but in recent years has suffered the consequences of loose fiscal policy, high budget and current account deficits, and a depreciating currency. Ghana has a market-based economy with relatively few policy barriers to trade and investment in comparison with other countries in the region. However, after the end of the country's over a decade old civil conflict in 2011, Cote d'Ivoire has experienced a surge in foreign investment and economic growth. In June 2012, the IMF and the World Bank announced US$ 4.4 billion in debt relief for the country under the Highly Indebted Countries (HIPC) Initiative. For the last 5 years, the country's growth rate has been among the highest in the world.

South Africa

South Africa is also selected based on an array of political and economic indicators. South Africa is a middle-income emerging market with an abundant supply of natural resources. The country has a well-developed financial, legal, communications, energy and transport sectors and stock exchange market that is Africa's largest and among the top twenty in the world. The economic growth of South Africa has decelerated in recent years, slowing to about 0.3% in 2016. The country's economic policy has focused on controlling inflation. Political infighting among the country's ruling party and the volatility of the country's currency, Rand risks economic growth (World Factbook).

Nigeria

Nigeria is one of the largest economies in Sub Saharan Africa and relies heavily on oil as its primary source of foreign exchange earnings and government revenues. Since the 2008 –

2009 global financial crises, Nigeria's economic growth has been driven by growth in agriculture, telecommunication, and services. Regulatory constraints and security risks have hampered new investments in oil and contracted every year since 2012. Somewhat due to lower oil prices on the international market, Nigeria entered recession in 2016. (www.cia.gov).

Mauritius

Mauritius since independence has undergone a remarkable economic transformation from a low income, agriculturally based economy to a diversified, upper middle – income economy with growing industrial, financial and tourism sectors. Mauritius' sound economic policies and banking practices helped mitigate the negative effects of the global financial crisis in 2008 – 2009. GDP grew in the 3 – 4% range from 2010 to 2016. The country continues to rank first in sub-Saharan Africa on the World Bank's Doing Business Report.

Asia & Australia

As indicated in the preceding chapter, China, Korea, Hong Kong, India, and Australia were sampled for this study.

China

China's economy has always been a centrally planned economy, until the late 1970s, when the country moved to a more market-oriented one that plays a major global role. China has over the years undertaken numerous reforms resulting in efficiency gains that have contributed to a more than tenfold increase in GDP since 1978. China's renaissance began with the elimination of unionized agriculture, then gradual liberalization of prices, fiscal decentralization, increased autonomy for state enterprises, growth of the private sector, development of stock markets and a modern banking system, and opening to foreign trade and investment. The country continues to pursue an industrial policy – rooted in state support of key sectors, and a restrictive investment system. Based on purchasing power parity (PPP), China was considered in 2016 as the largest economy in the world. Even though the country became the world's largest exporter in 2010, and the largest trading nation in 2013, it is per capita income below the world average. China kept its currency closely linked to the US dollar for years; however, in July 2005, the country moved to an exchange rate system that references a basket of currencies. The country became the fastest growing economy in the world from 2013 to 2017, averaging a little more than 7% real growth per year. To consolidate the gains, the Chinese government has since late 2015 strengthened capital controls and oversight of overseas investments to better manage the exchange rate and maintain financial stability.

Apart from the fact that the country's domestic household consumption is low as against its correspondingly high domestic savings rate, the country is dogged with several economic challenges. Notable among the challenges are: high corporate debt burden; off-balance sheet local government debt used to finance infrastructure stimulus; facilitating higher-wage job opportunities for the aspiring middle class; dampening speculative investment in the real estate sector without sharply slowing the economy; reducing industrial congestion; and raising productivity growth rates through the more efficient allocation of capital and state-support for innovation. The Chinese government in 2016 unveiled its 13th Five-Year Plan. The plan is intended to bolster innovation and enhance domestic consumption to make the economy less reliant on government investment, exports, and heavy industry. The plan also includes annual economic growth targets of at least 6.5% through 2020. The government has, in recent years, committed to giving the market a more decisive role in allocating resources. The country's leaders in 2010 committed to double the country's GDP by 2020. The country has, in recent years, resumed its support for state-owned companies in areas deemed relevant to economic security and also to ensure the global competitiveness of the said companies (World Factbook).

South Korea

South Korea emerged from its war with North Korea as one of the 20th century's most notable economic success stories. The country became a developed, internationally connected, high-technology civilization within decades. The GDP per capita of the country in the 1960s was parallel with levels in the most deprived countries in the world. Because of several government interventions, the country joined the trillion-dollar club of world economies in 2004.

In the early 1960s, the government at the time encouraged the importation of raw materials and technology, promoted saving and investment over consumption held wages low, and sent resources to export-oriented industries that stayed relevant to the economy to present. The country witnessed economic growth because of these policies and frequently grew by double-digits in the 1960s and 1970s. However, the country's rate of growth dropped in the 1990s as the economy developed, but stayed strong enough to push the country into the ranks of the advanced economies of the OECD by 1997. South Korea's companies were hit hard by the Asian financial crisis of 1997-98. This was due to their over-reliance on short-term borrowing, thus; the country's GDP plummeted by 7% in 1998.

In the following years, the government tried to restructure the economy by embarking numerous economic reforms, including streamlining some chaebols, increasing labour market plasticity, and opening to more foreign investment and imports (i.e. these reforms led to a speedy economic recovery). The country also started broadening its network of free trade agreements to help boost exports and has since implemented sixteen free trade agreements covering fifty-eight countries (i.e. including the United States and China) that collectively cover more than three-quarters of global GDP (World Factbook).

Hong Kong

Hong Kong operates a free market economy. The country relies heavily on international trade and finance. The total estimate of the country's goods and services trade, including the considerable share of exports, is close to four times its GDP. The country has no tariffs on imported goods. Hong Kong also levies excise duties on only four merchandise, whether imported or produced in the country: hard alcohol, tobacco, hydrocarbon oil, and methyl alcohol. The country has no quotas or dumping laws (World Factbook).

It is noteworthy that the country's open economy has left it vulnerable to the global economic situation. Its continual dependence on foreign trade and investment makes it open to renewed global financial market unpredictability or a hold up in the global economy. Hong Kong has also positioned itself as the foremost stock market for Chinese firms seeking to list abroad. In 2015, about 50% of the companies listed on the country's Stock Exchange was mainland Chinese companies, and they accounted for about 66% of the exchange's market capitalization.

During the past decade, the country's manufacturing industry moved to the mainland, and its service industry has experienced a steep growth. The integration of the country's economy, with the mainland is ostensibly evident in the banking and finance sector. Some key initiatives implemented by the government - the Hong Kong-Shanghai Stock Connect, the Hong Kong-Shenzhen Stock Connect the Mutual Recognition of Funds, and the Bond Connect scheme have all helped in opening up the Mainland's capital markets and have toughened Hong Kong's role as China's leading offshore RMB market.

Property prices in Hong Kong are considered unaffordable, especially for those in the lower and middle-income segments of the country's population. This has largely been to excess liquidity, low-interest rates and tight housing supply ((World Factbook).

India

India's economy is diverse as it covers traditional village farming, modern agriculture, handicrafts, a wide range of modern industries, and a large number of services. Close to half of the country's workforce is engaged in farming. However, the service sector contributes the most to the country's GDP, accounting for almost two-thirds of the country's output, even though it employs less than 25% of its labour force. India is a major exporter of information technology services, business outsourcing services, and software workers. All the same, per capita income of the country, remains below the world average.

India is gradually evolving into an open-market economy, yet traces of its past self-sufficient policies remain. To accelerate economic growth, the country in the early 1990s undertook some economic liberalization measures, including privatization of state-owned enterprises, industrial deregulation, and controls on foreign trade and investment. The country's economy thereafter grew at an average of 7% per year from 1997 to 2017. The country's growth rate fell in 2011 due largely to a fall in investment precipitated by high-interest rates, rising inflation, and pessimism on the part of investors about the government's commitment to further economic reforms and the dip in growth globally. However, in early 2014, a reduction of the country's current account deficit and the anticipation post-election reforms caused the outlook of the investors on the economy to improve, causing an increase in inbound capital flows and stabilization of the country's currency. It is noteworthy that most of the anticipated reforms have not materialized. It is also worth noting that despite India's comparatively high growth rate, state-owned banks were dogged by growing bad debt in 2015 and 2016, culminating in a low credit surge and restrained economic growth. Due to growing macroeconomic instabilities in India and improving economic conditions in Western countries, the country experienced capital flight as investors diverted capital away from the country, thus causing the rupee to depreciate through 2016. All in all, the long-term economic prospects of India look somewhat bright due mainly to its low dependency ratio as a consequence of its young population and matching, healthy savings and investment rates, and increasing integration into the global economy (World Factbook).

Australia

Australia run an open market with negligible restrictions on the importation of goods and services. The open structure of the economy has increased productivity, inspired growth, and made the economy more flexible and robust. Australia has, for the past two decades, experienced sustained growth, low unemployment, moderate inflation, very low public debt, and a strong and stable financial system. Australia is a major exporter of natural resources, energy, and food. The country's enormous and diverse natural resources - coal, iron, copper, gold, natural gas, uranium, and renewable energy - attract high levels of foreign investment. In recent years, demand for resources and energy from Asia and especially China has taken a nosedive, the drops in export prices have negatively impacted the country's growth.

The services sector is the largest part of the Australian economy, accounting for about 70% of GDP and 75% of jobs. Australia was comparatively unaffected by the global financial crisis as the banking system has remained strong, and inflation is under control. Australia has, in recent years, enjoyed an incremental surge in its terms of trade. However, this surge has inverted owing to falling global commodity prices (CIA Factbook).

Stylized Facts about Some Selected Stock Exchanges

This section considers the development of stock markets in the selected countries.

Europe in Perspective

The Stock Market (Exchanges) of United Kingdom

The largest stock market in the United Kingdom is the London Stock Exchange, headquartered in London. It is considered the largest stock exchange in Europe and among the largest in the world. The London Stock Exchange was established in 1801. The Exchange was deregulated in 1986 hence making it possible for external ownership of member firms. In 1995 it launched an Alternative Investment Market. The London Stock Exchange has in the early 2000s embarked on a project targeted at globalizing the operations of the Exchange. This strategy paid off immediately in 2006 when several large energy companies from Russia listed on the Exchange. Also, the Exchange in a bid to attract more mainland listings opened representative offices outside London. In 2007 the London Stock Exchange merged with Milan Stock Exchange – Borsa Italiana for USD 2.0 billion to form the London Stock Exchange Group Plc. The merger was intended to expand the London Stock Exchange's product offering and customer base.
The all-share deal watered down the stakes of existing London Stock Exchange shareholders, with Borsa Italiana shareholders receiving new shares representing 28 percent of the enlarged register. The London Stock Exchange runs numerous markets for listing that allows companies of various sizes to list. International companies are also allowed to list their products on the London Stock Exchange. In 2009, the London Stock Exchange Group acquired Millennium Information Technologies, Ltd., a Sri Lankan-based software company with a specialty in trading systems. In 2016, the London Stock Exchange announced it had reached an agreement with the Frankfurt-based stock exchange, Deutsche Börse AG, to merge. The two companies

agreed to come under a new holding company called UK TopCo, and maintain both headquarters in London and Frankfurt.

The London Stock Exchange Group Plc subsequently announced that it would not sell its fixed-income trading platform in Italy to Deutsche Börse AG, to allay fears of potential anti-trust violations. Nonetheless, the merger was blocked by the EU Competition Regulator. The Regulator's investigation resolved the merger would have created a real monopoly in the markets for clearing fixed income instruments. The number of companies listed on the London Stock Exchange was 1,927 and 1,858 in 1993 and 2014, respectively. Its market capitalization was USD 1.2 trillion in 1993 and USD 2.2 trillion in 2016 (WDI, 2017).

The Stock Market (Exchanges) of Germany

The stock exchange of Germany, known as the Deutsche Borse Group, is a market where trading of shares and securities takes place. The Deutsche Borse Group is a joint-stock company which was established in 1993 and is based in Frankfurt. As of 2016, it had listed over 750 companies and boasts of USD 1.7 trillion in market capitalization (WDI, 2017). It provides companies with access to the global capital market and also provides transactional services. The Deutsche Börse has operation centres in Germany, Czech Republic, Luxembourg, Spain, and Switzerland as well as representative offices in London, Beijing, Chicago, New York, Paris, Hong Kong, and Dubai. FWB Frankfurter Wertpapierbörse (Frankfurt Stock Exchange), which is one of the world's largest trading centres for securities and the largest stock exchange in Germany is operated by the Deutsche Börse AG. It has a share in turnover of around 90%. Deutsche Börse is also the proprietor of Clearstream, a Luxembourg based clearinghouse.
In May 2000, the London Stock Exchange and the Deutsche Börse announced a merger, but the deal fell through before the merger could be realized. In 2001, the Börse tried again to merge

with the London Stock Exchange, followed by a takeover bid in late 2004, but both offers were rejected by the London Stock Exchange. In October 2005, the Deutsche Börse launched the Entry Standard as a division within its Regulated Unofficial Market. This was to serve as a variance to EU-regulated segments for companies trying to access the capital markets. The Entry Standard is not sector-centric (i.e. it is meant to be a quick and cost-effective way for small to medium-sized companies to access capital through the stock exchange).

Deutsche Börse, has since 2007, in collaboration with SIX Swiss Exchange operates the joint venture (i.e. to provide a European derivative trading platform). In 2016, the company announced it had reached an agreement with the London Stock Exchange Group to merge. However, the merger was rejected by regulators in the European Union because the Regulator's investigation resolved that the merger would have created a de facto monopoly in the markets for clearing fixed income instruments.

The Stock Market (Exchanges) of the Netherlands

The Amsterdam Exchange (AEX), which was founded in 1602, is considered the oldest, still functioning stock exchange in the world. It is trite that before the formation of the AEX, many regions and towns had independent systems in the likeness of a stock exchange for asset valuation and trade regulation. The establishment of the exchange was meant to regularize asset valuation and trade regulation.

The exchange has, over the years, gone through several ownership changes. Looking to recent history, in 1997, the AEX merged with the European Options Exchange (EOE) to become AEX. The exchange again merged with the Paris Stock Exchange and the Brussels Stock Exchange to form Euronext Amsterdam. It is worthy of note that the Euronext is the largest cash equities market in Europe. Euronext Amsterdam has three broad equity indexes – the blue-chip, mid-cap AMX, and small-cap AScX. The AEX began from a base level of 100 index points on January 3, 1983. The index peaked at 703.18 on September 5, 2000, at the height of the dot-com bubble. This value more halved over the following two years before recovering in line with most global financial markets. The AEX also suffered its second-largest one-day loss on 29th September 2008, when the index closed at almost 9%. The exchange had a bad spell during 1998 and 2008, as it was adjudged the worst-performing stock index, behind OMX Iceland. The AEX is a capitalization-weighted index. The index weightings of companies in the index are capped at 15%. These weights are calculated regarding the closing prices of the companies on March 1 of every year (World Factbook).

The Stock Market (Exchanges) of Belgium

The foremost Belgian exchanges were solely commodities exchanges. The country's first stock exchange appeared in Brussel in the 19th century – it opened in 1801 as the Brussel Stock Exchange (BSE). In 2000, the BSE merged with the Paris Stock Exchange (founded in 1724), the Amsterdam Stock Exchange (founded in 1602) and later the Lisbon Stock Exchange (founded in 1769) to become Euronext Brussels. The most popular index on the Euronext Brussels is the BEL20, which is an instantaneous basket index that echoes the constant price evolutions of the most liquid Belgian shares listed on the Euronext Brussels. The index comprises a minimum of 10 and a maximum of 20 companies traded at the Brussels Stock Exchange.

The Stock Market (Exchanges) of France

The securities market of France is Euronext Paris, formerly known as the Paris Bourse. Euronext came into being when the Paris Bourse merged with exchanges of Lisbon, Amsterdam, and Brussels in 2000. It is the second-largest exchange in Europe, after the London Stock Exchange Group Plc. It operates two exchanges; MATIF futures exchange and MONEP. MATIF futures exchange deals in futures and options on interest rate products and commodities while MONEP trades equity and index futures options.

The equities market of France is in three parts; the Premier Marché, Second Marché and Nouveau Marché. Premier Marché relates to large French and foreign companies, and Second Marché lists medium-sized companies while Nouveau Marché lists fast-growing startups seeking capital to finance expansion. The main equity index of the Euronext Paris is the Cotation Assistée en Continu (CAC 40), which is the weighted measure of the forty major values among the 100 highest market capitalization on the Euronext Paris. The components of CAC 40 include Société des Bourses Françaises 120 Index (SBF 120 Index), Société des Bourses Françaises 250 Index (SBF 250), MIDCAC and SBF-FCI. The SBF 120 Index focuses on the 120 most actively traded listed stocks in Paris whilst the SBF 250 includes all the SBF 120 and considers the long-term performance of equity portfolios. The SBF-FCI index considers convertible bonds that constitute about 70% of the total capitalization of this market and the MIDCAC index comprises 100 of the most liquid medium-size stocks on the Premier Marché and Nouveau Marché.

In early 2005, Euronext attempted to buy the London Stock Exchange. The bid was, however, unsuccessful. In the same year, Euronext, in partnership with Borsa Italiana acquired a major stake in MTS. It is worthy of note that MTS is considered the largest electronic platform for debt instruments in Europe. In 2007, it merged with the New York Stock Exchange. This merger was meant to give greater pulling to Euronext outside Europe. The total number of domestic companies listed on the Stock Exchange of France as of December 1993 and December 2016 was 726 and 485 respectively. It had a market capitalization of USD 455.9 as of December 1993 and USD 2.2 trillion as of December 2016 (WDI, 2017) (World Factbook).

Americas in Perspective

There are quite many important stock exchanges all over the world, nevertheless, for this research, only a few selected exchanges are mentioned.

The Stock Market (Exchanges) of the United States

The United States is regarded as the biggest economy in the world, in terms of finance, has quite many exchanges such as:

I. New York Stock Exchange (NYSE)

II. Boston Stock Exchange.

III. Chicago Stock Exchange

IV. American Stock Exchange (AMEX)

V. Philadelphia Stock Exchange (PSE)

VI. San Diego Stock Exchange, (SDSE)

VII. National Stock Exchange (NSX - formerly Cincinnati Stock Exchange) and

VIII. National Association of Securities Dealers Automated (NASDAQ)

For, the purpose of this work, the emphasis is only made on the New York Stock Exchange (NYSE) and NASDAQ.

The National Association of Securities Dealers Automated

The National Association of Securities Dealers Automated (NASDAQ) is one of the largest stock exchanges in the United States and the world, (second-largest stock by market capitalization in the world). All stock trades are carried out electronically and the NASDAQ has much more trading volume as compared to any other electronic stock exchange in the world. Besides that, it is home to leading companies across all industry sectors, such as Microsoft, Intel, Google, Oracle, Nokia, K-Swiss, Carlsberg, Starbucks, and Staples. According to a study by Ernst and Young, (2007), NASDAQ has listed far more companies than any other exchange in over the last decade. Although it made its initial reputation as a growth-company exchange, NASDAQ currently offers a market tier with arguably the highest listing standards—the NASDAQ Global Select Market—to provide a platform for mature, blue-chip companies. It is the world's first electronic stock market. It has endeavoured to preserve its status as the leader in exchange technology. It is also known to offer trading speed of less than one millisecond. Thus, it trades more shares than any other US exchange. The exchange has made client services additional crucial point of diversity. It has developed a quantum of offerings to support listed companies with investor relations, equity research, risk management, and many more (Ernst Young, 2007).

The New York Stock Exchange (NYSE)

NYSE is the leading stock exchange in the world by market capitalization. Some years back, NYSE was doing 'face-to-face' on the trading floor. Currently, the NYSE offers a blended model, with a floor-based marketplace and an electronic one. More than fifty percent of all NYSE trades are carried out electronically. Floor traders still set price and deal in high volume institutional trading. The exchange can boast of, over 3,000 listed companies, trading on it. It is not only the world's most liquid equities marketplace. The exchange appears to maintain its brand image as the "gold standard," both in terms of listing standards and the blue-chip companies it hosts (Ernst Young, 2007).

As of 1993, 6,912 companies were listed on the various stock exchanges of the United States of America. This figure dropped to 4,331 in 2016. The total stock market capitalization of the United States was USD 5.3 trillion in 1993. It grew erratically between 1993 and 2016. It is noteworthy that as of December 2016, the market capitalization of all the stock exchanges in the United States of America put together was USD 27.4 trillion (WDI, 2017).

Toronto Stock Exchange

The Toronto Stock Exchange TSX is considered to be the largest stock exchange in Canada. It is also regarded as the third-largest in North America. In consideration by market capitalization, it is the seventh-largest in the world. The exchange is based in Toronto. A broad range of businesses from Canada, the United States, Europe, and other countries are represented on the exchange. The Toronto Stock Exchange has more mining and oil & gas companies listed than any other exchange in the world (Ernst & Young, 2007). As at the end of 2016, the total market capitalization was USD 2.0 trillion, and the number of listed companies was 3, 368 (WDI, 2017).

Another exchange in Canada was the Montreal Exchange, known in French as MX (Bourse de Montréal). It was formerly the Montreal Stock Exchange (MSE). It is a derivatives exchange, located in Montreal that trades futures contracts and options on equities, indices, currencies, ETFs, energy and interest rates. It is owned by Toronto- based TMX Group, and located in Montreal. The Exchange changed its name to the Montreal Exchange to reflect the rising importance of financial instruments other than stocks–primarily options and futures–on its trading floor in 1982.

In 1999, four exchanges (Vancouver, Alberta, Toronto and Montreal) agreed to reorganize the Canadian capital markets along with the bases of market specialization. This metamorphosed Montreal Exchange in assuming the position of Canadian Derivatives Exchange for the following ten years. By the end of 2001, the Exchange moved to a completely automated trading system, consequently the first traditional exchange in North America to complete this transformation. This development changed the market model for trading, from a traditional specialist model to a competing market making model for the equity options market. The Exchange became the sole provider of electronic trading systems and support for the Boston Options Exchange (BOX), on February 2004, thus, made it the first foreign exchange responsible for the day-to-day technical operations of an American exchange using the Sola Trading electronic platform. That contract currently provides the Montreal Exchange with a significant part of its revenue. As of September 2009, the Montreal Exchange has a 31.4% stake in the Boston Options Exchange (BOX), the percentage that has since risen to over 51% (MX, 2009). Montreal Exchange Inc was acquired by TSX Group in December 2007 for C$1.31 Billion. The acquisition process was finally completed on May 1, 2008. The corporation was successively renamed TMX Group Inc. The Montréal Exchange Inc. and TSX Group Inc. merged to form TMX Group in 2008. The London Stock Exchange proclaimed to agree for a merge with the TMX Group, Montreal Exchange's parent, on February 9, 2011, with the hope of creating a combined entity with a market capitalization of $5.9 trillion (£3.7 trillion), [TMX Group, 2011]

The Stock Market (Exchanges) of Argentina

Argentina Stock Exchange is the 44th largest exchange out of the 79 stock exchanges in the world (ASEX, 2017). Until the establishment of Buenos Aires Stock Exchange (Buenos Aires Stock Exchange [BUE].BA) in 1854, was the Banco Mercantil as the primary exchange. It is a self-directed, not-for-profit entity and self-directed that the board of Directors of the exchange comprised of representatives from all the sectors of Argentina's economy.

The MERVAL is a key stock market index which tracks the performance of big companies located in Argentina. The Merval is a weighted basket index. The market value of a stock portfolio is selected according to the market share in the Buenos Aires Stock Exchange, the number of transactions and quotation price. As of June 30, 1986, The Merval has a base value of $0.01. Market capitalization ratio, which, when compared to the historic ratio is an indicator that a market is over or undervalued, was 13.85% in 2016. As at the end of 2016, the Bolsa de Comercio de Buenos Aires's Market capitalization was USD 63.6 billion, and listed companies on the exchange were ninety-three.

The Stock Market (Exchanges) of Mexico

The Mexican Stock Exchange (MEX) (Bolsa Mexicana de Valores, or BMV), headquartered in Mexico City, is the full-service securities exchange of Mexico. It deals in cash equities, derivatives and fixed income products. It was established in 1886 as the Mexican Mercantile Exchange. Its current name was adopted in 1975. It is currently the second-largest stock exchange in Latin America in terms of the market capitalization of listed companies (after Brazil). Its trading system became fully electronic in 1999. One of its greatest achievements was the first listing of a foreign company (i.e. Citigroup) in 2001 and an initial public offering of the shares of the stock exchange in 2008.

The S&P/BMV IPC Index represents the largest and most liquid stocks on the stock exchange. The consumer staples, materials, financials, telecommunication services, industrial, consumer discretionary and utilities sectors comprise the index, which is reflective of the broader economy. Grupo Mexico SAB, America Movil SAB, Grupo Bimbo SAB, Fomento Economico Mexicano SAB, Grupo Televisa SAB, Wal-Mart de Mexico SAB, and Cemex SA are some of the prominent companies listed on the exchange. There were approximately 137 companies in total on the exchange at the end of 2016 with an aggregate market capitalization of over USD 350.8 billion, (WDI, 2017). The other stock exchange in Mexico is called the Institutional Stock Exchange, also known in Spanish as Bolsa Institucional de Valores, (BIVA). It is Mexico's second stock exchange, and it is based in Mexico City. BIVA trades in the same instruments that the first exchange (Bolsa Mexicana de Valores) does.

The Stock Market (Exchanges) of Brazil

The Brasil Bolsa Balcão S.A. is also known as B3. The Brazil Stock Exchange and Over-the-Counter Market), previously called BM & FBOVESPA, is the second oldest in Brazil. The Brasil Bolsa Balcão S.A is one of the largest exchanges in the World. By the close of 2015, however, due to the decline in economic growth associated with political problems, and additionally, the strengthening of the U.S. Dollar vis-à-vis the Brazilian Real, consequently, made the market capitalization to decline (CIA Factbook).

Sub –Saharan Africa in Perspective

The Stock Market (Exchange) of Ghana

The Ghana Stock Exchange (GSE) was inaugurated in 1989. Since the inauguration, its listings have been included in the main index, the GSE All-Share Index. In terms of performance, the GSE was adjudged in 1993 as the sixth-best index performing emerging stock market, with a capital appreciation of 116%. In the following year, 1994, it was adjudged as the top index performing stock market among all emerging markets, gaining 124.3% in its index level. 1995's index growth was a disappointing 6.3%, partly because of high inflation and interest rates. As of December 2006, the market capitalization of the Ghana Stock Exchange was about US$ 760 million. As of December 31, 2011, the GSE's market capitalization was US$ 3.9 billion. The Exchange, as of December 1993 had 15 companies listed on it. It rose to twenty-nine in 2016.

The Stock Market (Exchanges) of Cote d'Ivoire

Unlike other countries in Africa that have their stock exchanges, Cote d'Ivoire shares the only regional exchange in Africa, BRVM which is headquartered in Ivory Coast with seven other French-speaking West African countries of the West African Economic and Monetary Union (WAEMU). These countries are Benin, Burkina Faso, Guinea Bissau, Mali, Niger, Senegal and Togo. The BRVM was opened in 1998 and has branches in each WAEMU country. Although the bourse is majority-owned by the private sector, the member states own 13.4 percent of the capital. Business on the BVRM is electronically linked with a satellite. The central site in Abidjan is where brokers and agents transmit orders, access each other and revise quotation outcomes whilst in their workstations, offices or desks situated in national branch offices. The Depositaire Central/Banque de Reglement SA sees to it that trading is cleared and settled. Ivorian companies dominated the BRVM, thus making the exchange very unique. For this paper, the exchange shall be considered as being owned wholly by Cote d'Ivoire. The market capitalization of the bourse as of 2016 was USD 12.4 billion, and the companies listed on it in the same year was 43.

The Stock Market (Exchange) of South Africa

South Africa's Stock Exchange market known as Johannesburg Stock Exchange (JSE) Limited is the oldest and largest existing stock exchange in Africa. The JSE is currently ranked the 19th largest stock exchange in the world by market capitalization. Its market capitalization as of December 1993 was USD 217 billion and subsequently rose to USD 951 billion in 2016. Several heavyweights like British American Tobacco, SABmiller, BHP Billiton and GlencoreXstrata account for a large share of the market. A number of initiatives were introduced in the late 1990s to improve the efficient functioning of the exchange. The first major change occurred on November 1995, when the Stock Exchanges Control Act changed how stocks were traded in South Africa, opening the door to non-South Africans, and allowing brokers to buy and sell stocks for their account. The trading system is now automated through an electronic clearing and settlement system. The number of companies listed on the Johannesburg Stock Exchange dropped from 615 in 1993 to 303 in 2016.

The Stock Market (Exchange) of Nigeria

The Nigeria Stock Exchange (NSE) was established in 1960. The stock exchange of Nigeria currently has nine branches, and each branch has a trading floor. Data on the performance of companies listed on the Nigerian stock exchange are released daily, weekly, monthly, quarterly and yearly. In terms of market capitalization, it is ranked as the third-largest stock exchange in Africa. Its market capitalization dropped from USD 2.14 trillion to USD 29.8 billion in 2016. The number of companies listed on the Nigerian Stock Exchange in 1993 was 174. However, the number dropped to 169 in 2016. All listings are included in the Nigerian Stock Exchange All Shares index.

The Stock Market (Exchange) of Mauritius

The Stock Exchange of Mauritius Limited (SEM), however, was incorporated in 1989. The SEM initially started its operation with the Official Market only with five listed companies at the time and a market capitalization of nearly US$ 92 million. The size of the market has grown from market capitalization ratio of less than 4% in 1989 to a current market to GDP ratio exceeding 100% of GDP in an economy that has witnessed a 4% average growth rate during the last 25 years. Indeed, the market capitalization of the SEM was USD 700.6 million as of

December 1993. It is noteworthy that the market capitalization rose to USD 7.6 billion in 2016. The number of companies listed on the SEM in 1993 was 23, which later rose to 75 in 2016.

Asia in Perspective

The Stock Market (Exchange) of Hong Kong

The Hong Kong Stock Exchange (HKEX) is Asia's third-largest stock exchange in terms of market capitalization behind the Tokyo Stock Exchange and Shanghai Stock Exchange, and the sixth-largest in the world before Euronext. As of 31 October 2016, it had 1,955 listed companies, 989 of which are from mainland China (Red chip, H share and P chip), 856 from Hong Kong and 110 from other countries such as Macau, Taiwan, Malaysia, United States, and Singapore. HKEX is the fastest emerging stock exchange in Asia. HKEX is primarily the closest to China, the world's fastest-growing major economy. HKEX offers investors the opportunity to participate in China's developing economic growth through a more sophisticated stock market with more rich experience as compared to its counterparts on the continent. HKEX has somewhat less stringent corporate governance requirements and the favour of the Chinese government when privatizing state-owned enterprises (SOEs).

Given the remarkable performance and its credentials at hand, HKEX has hosted the world's largest initial public offering (IPOs) for two years running. For instance, the China Construction Bank, a formerly, a state-owned enterprise that raised US$9.2 billion in October of 2005, and the Industrial and Commercial Bank of China, also, formerly, a state-owned enterprise, that was able to raise US$16.1 billion in Hong Kong out of a total US$21.9 billion in October 2006.

The Chinese government's aspiration to keep the public offerings of its huge financial institutions close to home has benefited HKEX. Its leadership has indicated that no acquisition or merger partner was currently being sought even though consolidation trends in Europe were prevailing (Ernst &Young, 2007). Chinese companies strongly believe that the Hong Kong exchange has a significant number of merits over its rivals in the United States such as its proximity, Hong Kong is closer, inexpensive and culturally relaxed for mainland China executives. Hong Kong's listing standards are acceptably high, not as stern as those in the United States. HKEX does not want to use a tough regulatory system like the United States that has the propensity to bring down its market. It is very flexible, does not use aggressive marketing strategies. In such much as HKEX sought to maintain its status as Asia's financial hub, it lessened its rules and launched a commodity futures market to attract much more listings to broaden its businesses.

In the past, only companies registered in Hong Kong, mainland China, Bermuda, and the Cayman Islands can apply to list in the city. The HKEX sought to change this rule so that it can list companies domiciled in other Asia-Pacific countries, such as Australia, to reduce its dependence on China. Hong Kong has long been a base for Chinese IPOs, the mainland China stock exchanges, notably the Shanghai Stock Exchange, have started to provide some competition as they increase their capacity to add to their portfolios of services. Nevertheless, Hong Kong will likely remain the first choice for Chinese companies that would like to be listed on an international as well as world-class stock exchange.

As at the end of 2016, stock market capitalization and the number of listed companies were USD 3.2 trillion and 1,872 respectively (WDI, 2017).

The Stock Market (Exchanges) of China

Shanghai was the earliest city in China to see the advent of stocks, stock trading, and stock exchanges. Stock trading began in Shanghai in the 1860s. In 1891, the Shanghai Sharebrokers Association was established was regarded as the primitive method of stock bourses in China. Further on, in 1920 and 1921, the Shanghai Security Goods Exchange and the Shanghai Chinese Security Exchange commenced operations, respectively. Shanghai emerged as the financial centre of the Far East, where both Chinese and foreign investors could trade stocks, debentures, government bonds and futures as far back in the 1930s. Shanghai Securities Exchange Co., Ltd. was created in 1946, based on the Chinese Security Exchange, nonetheless folded up operations later in 1949.

China's securities market has evolved in tandem with the country's introduction of the reform and opening-up policy and the development of the socialist market economy since 1980. In 1981, the trading in treasury bonds was re-started in 1981. Thereafter, in 1984, stocks and enterprise bonds began trading in Shanghai and a few other cities within. The Shanghai Stock Exchange (SSE) came into existence in November 1990 but commenced full formal operations in December of the same year.

Currently, there are two exchanges on the mainland (i.e. the Shanghai and Shenzhen exchanges) were opened by the Chinese government in 1990 as a way of modernizing China's economy. The Hong Kong stock exchange is being integrated into other Chinese exchanges. That makes the HKEx loosely part of China's stock market. The Shanghai stock exchange (SSE) is China's largest. Its total market capitalization was $4.71 trillion in March 2015. Most of the companies listed are the large, state-owned companies responsible for China's economic growth.

The large investment firms and/or are pension funds and banking institutions. The SSE is located in Shanghai, China's financial capital.

The Shenzhen Stock Exchange (SZ) as compared to the Shanghai Stock Exchange is a slighter reduced exchange. It is located in Shenzhen, Guangdong, one of China's most modern cities, also closer to Hong Kong. The Shenzhen stock exchange trades smaller shares of more commercial businesses. These are businesses that are privately-owned, more innovative and more profitable than the state-owned companies. The companies include many hi-tech companies, thus making it similar to the NASDAQ. Their evolution is a delicate constituent of China's economic reform.

As at the end of 2016, the total stock market capitalization of the various stock exchanges in China was USD 7.3 billion and the number of listed companies 3,052 for all the exchanges put together (WDI, 2017).

The Stock Market (Exchanges) of India

Bombay Exchange is one of the oldest and the largest exchanges in India. Its history dates back to 1855 when twenty-two stockbrokers gathered under banyan trees in front of Mumbai's Town Hall. In 1986, the Bombay Stock Exchange (BSE) developed the S&P BSE SENSEX index, giving the BSE an indicator to gauge the overall performance of the exchange. BSE used this index to open up its derivatives market and trading of S&P BSE SENSEX futures contracts in 2000. The development of S&P BSE SENSEX options along with equity derivatives followed in 2001 and 2002, thus expanded the BSE's trading platform.

Historically an open outcry floor trading exchange, the Bombay Stock Exchange switched to an electronic trading system developed by CMC Ltd. in 1995. This automated, screen-based trading platform called BSE On-Line Trading (BOLT) had a huge capacity of taking millions of orders per day. The BSE has also introduced a centralized exchange-based internet trading system, BSEWEBx.co.in to enable investors anywhere in the world to trade on the BSE platform. The BSE is also a Partner Exchange of the United Nations Sustainable Stock Exchange initiative. In December 2016, BSE further secured another milestone by establishing the international exchange (INX) of India, the first-ever in India. (BSE, 2017). As at the end of 2016, stock market total capitalization and the number of listed companies were USD 1.6 trillion and 5820 respectively (WDI, 2017).

The Stock Market (Exchange) of Australia

Australian Stock Exchange was established on April 01, 1987, and incorporated under the legislation of the Australian Parliament as an amalgamation of the six-state securities exchanges. In 2006, it came together with the Sydney Futures Exchange for form one entity. The Australian stock exchange is one of the largest exchanges with the largest volumes of daily trades in the southern hemisphere. Though it has a relative size, multiple predisposing factors influence its movements on the Australian stock exchange (ASX, 2016). Australian markets are impacted by variations in anticipated production echelons and interest rates of more reputable and well-known markets such as the United States (US), Europe, and Japan, with the U.S. commanding the highest influence, (Yoda, 1994). The purpose of the Australian Securities Exchange (ASX) is mainly to maintain its dominance of the listings market in Australia, as it seeks to motivate many more listings from Southeast Asia through Low listing costs and strong performance. Australian Securities Exchange competitive advantages include Low listing costs and strong performance. As at the end of 2016, the stock market's total capitalization and the number of listed companies were USD 1.3 trillion and 1,969, respectively (WDI, 2017).

The Stock Market (Exchange) of Korea

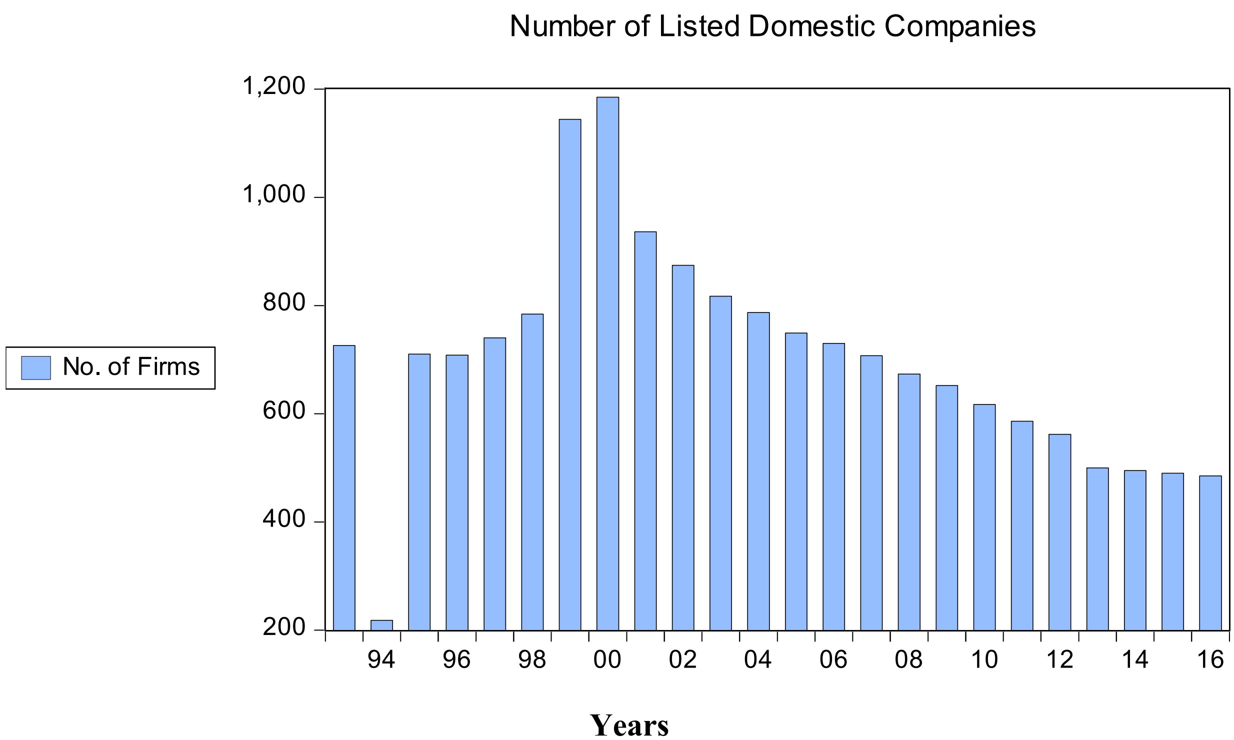
Korea Exchange (KRX) is one of the largest exchanges in Asia. The erstwhile Korea Stock Exchange is now a division of the much larger KRX. KRX is a full securities market. KRX was created through the integration of the Korea Stock Exchange. Since 1956, it operated singly before KRX was established. KRX is the sole securities exchange operator in South Korea. Some of the exchange's achievements and milestones include launching the Stock Index Futures Market in 1996 and the Stock Index Options Market in 1997 (KRX, 2016). In 1988, the exchange transcended to electronic trading. In 2000, it also transcended to warrant trading. In 2002, it did the same to equity options and exchange-traded funds (ETF). The Korea Composite Stock Price Index (KOSPI) is a wellness indicator for the stock market, just like the S&P 500 is in the United States. It contains all common stocks traded in the stock market division of the Korea Exchange. KOSPI is calculated on market capitalization like other major indexes. It also has a lot of larger companies such as Samsung and Hyundai carved in the index. It trades in huge volumes in excess of multiple hundreds of million shares. It has a lot of larger holdings in the index such as Samsung and Hyundai Motors. A variety of instruments can be traded on the exchange. These include stocks, bonds, ETFs, and real estate investment trusts (REIT). As at the end of 2016, the stock market’s total capitalization and the number of listed companies were USD 1.254 trillion and 2039, respectively (WDI, 2017).

Growth Pattern of Stock Market Indicators of the Selected Countries

European Countries

Stock Market Variables of France

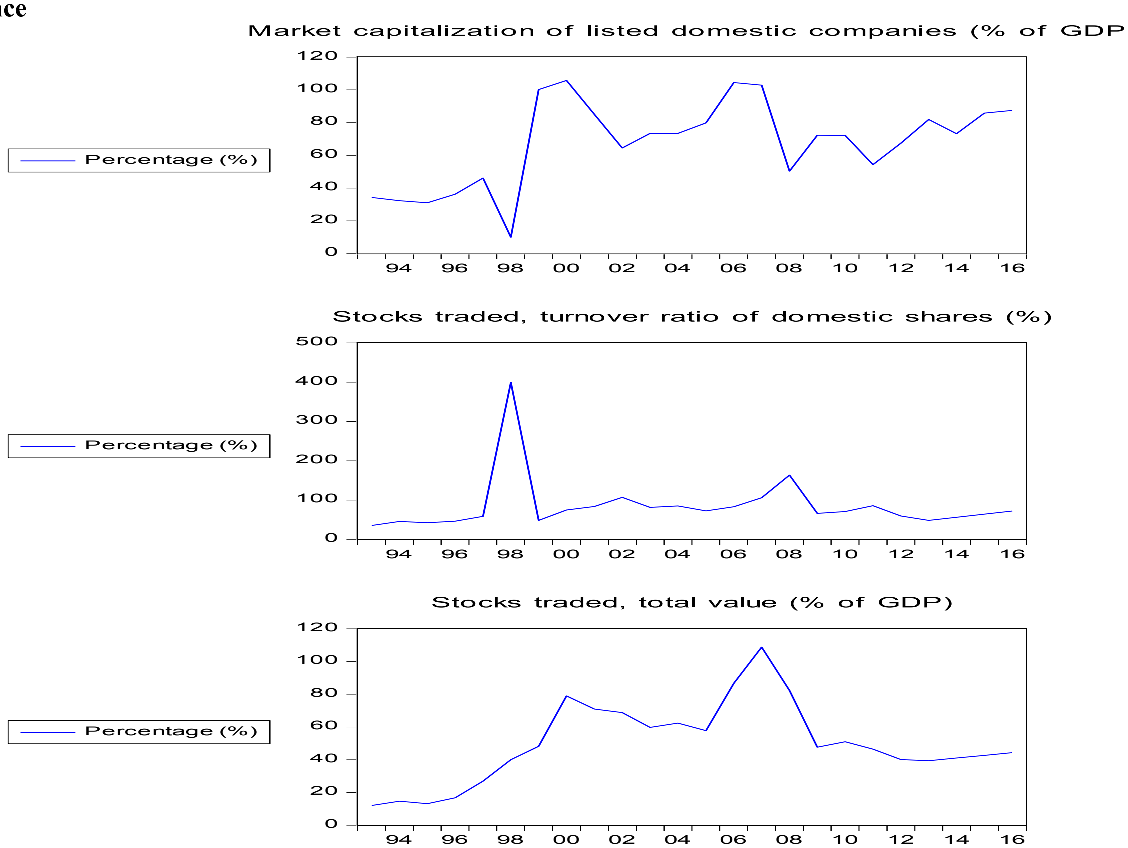
Figure 1FR: Number of Listed Domestic Companies on the Exchange of France



Source: Mensah (2020)

The number of companies listed on a stock exchange is an indicator of the development of the stock market. A higher number means that more companies use equity financing in their business and vice versa. The number of companies listed on a stock exchange also reflects the size of the economy; developed economies have more companies listed on their exchange and vice versa. From the figure above, the number of domestic companies listed on the stock exchange of France varied over the period under consideration. The number of companies listed on the stock exchange of the country witnessed a sharp fall in 1994 and after that rose. It rose steadily until 2001 then begun to fall; it fell up to 2013 and after that maintained a relatively constant growth rate.

Figure 2FR: Growth Pattern of Market Capitalization Ratio, Turnover Ratio and Value of Stocks Traded of France



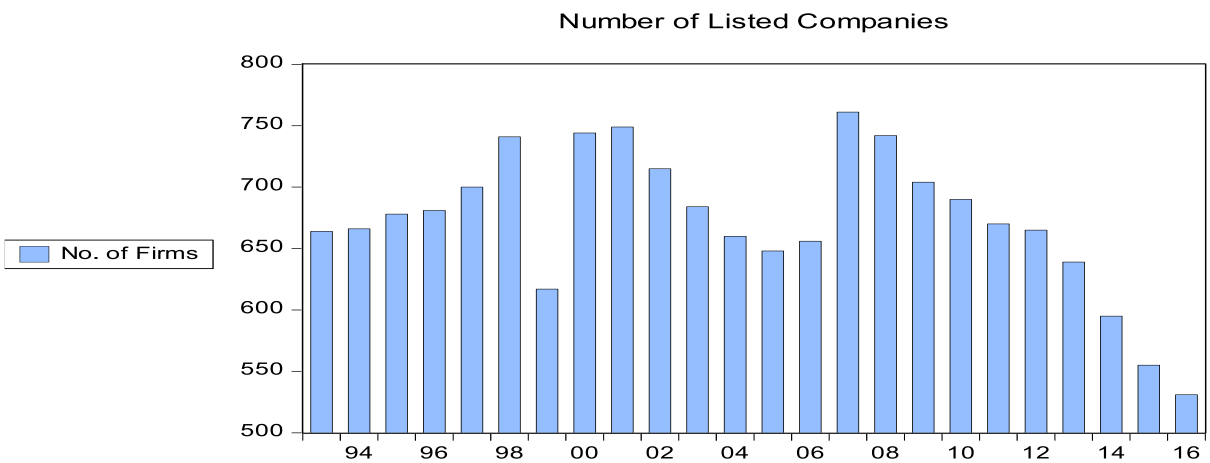
Years

Source: Mensah (2020)

The stock market capitalization ratio of France showed a topsy-turvy trend, with little growth until 1999 and 2000, when the value rose sharply and after that fell. However, it grew steadily until 2008 when it took a nosedive. The drop in 2008 can be attributed to the Global Financial Crisis of 2008. It recovered in 2009 but grew at an inconsistent rate from 2010 to 2014 and later grew steadily from 2015 to 2016. The turnover ratio of France, which is a measure of the value of equity transactions relative to the size of the equity market, witnessed an erratic pattern of growth during the period under consideration. It grew minimally from 1993 to 1998, where it peaked and thereafter resumed its erratic growth pattern. It has since 2013 been on a steady growth trajectory. It is noteworthy that it witnessed a rise in 2008; which is attributable to investors trying to liquidate their shares as a result of the global financial crisis. The volume of stocks traded on the stock market of France grew steadily from 1993 to 2000. It witnessed a patchy growth pattern from 2001 to 2009, and subsequently assumed steady, though, low growth rate.

Stock Market Variables of Germany

Figure 3GER: Number of Listed Domestic Companies on the Exchanges of Germany

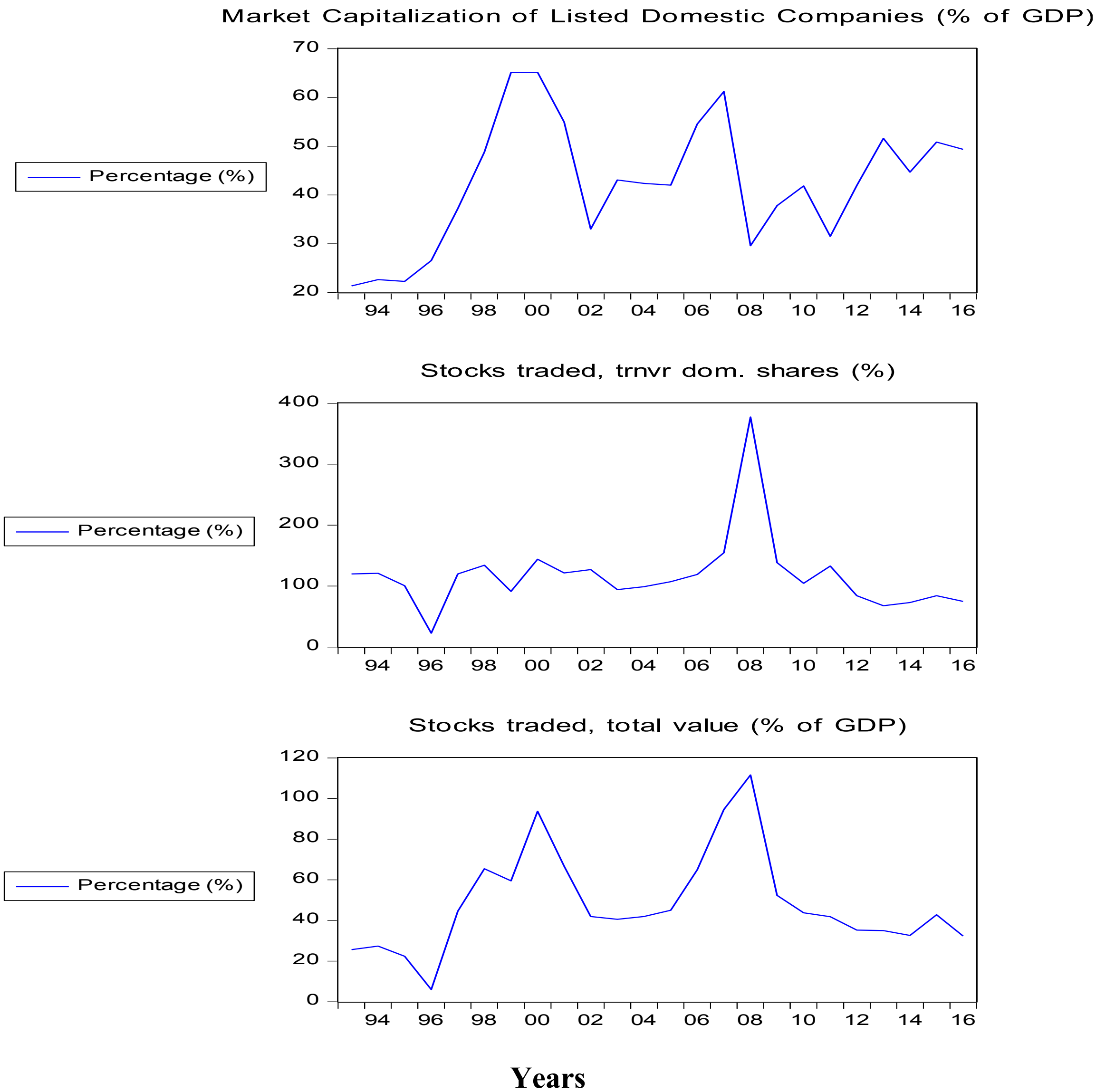


Years

Source: Mensah (2020)

The number of companies listed on the German stock exchange increased at an uneven pace from 1993 to 1998 and subsequently dipped. It grew again from 2000 to 2001 and fell steadily from 2002 to 2007 and rose in 2008. It has since 2009 been on a downward spiral, though, at varying degrees.

Figure 4GER: Growth Pattern of Market Capitalization, Turnover Ratio and Value of Stocks Traded

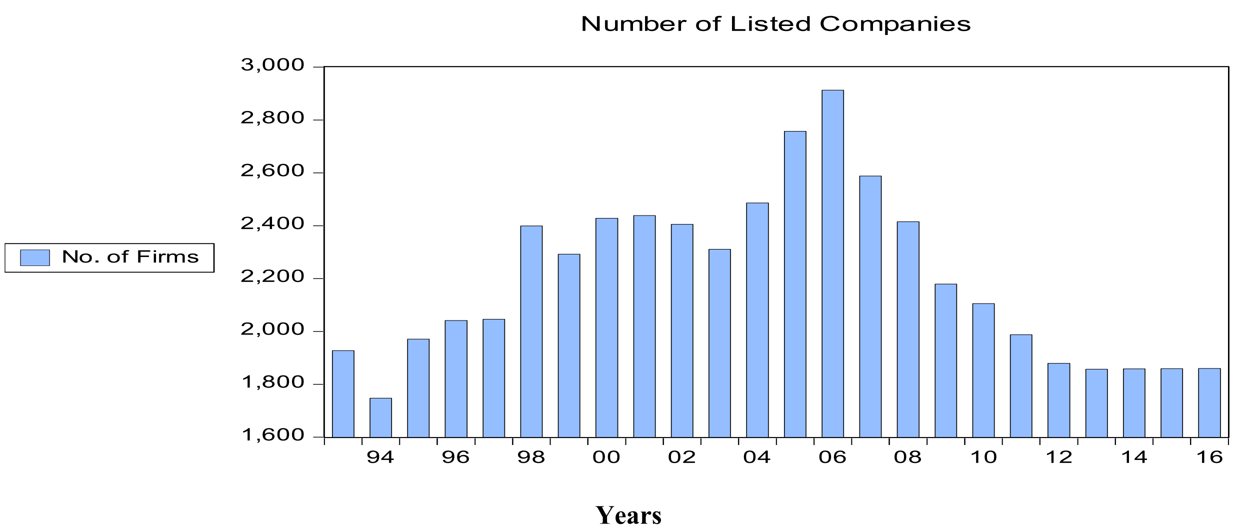


Source: Mensah (2020)

With respect to the market capitalization ratio of Germany, it grew progressively from 1993 to 2000 and from then on, grew disproportionately. It fell in 2008, due largely to the global financial crisis. In all, the market capitalization ratio of Germany during the period under consideration witnessed varying degrees of ups and downs. Volume of stock traded on the stock exchange of Germany for the period under review fell progressively from 1993 to 1995 and thereafter fell sharply. It later grew erratically until it peaked in 2009 and subsequently grew unevenly during the remainder of the period under consideration. The turnover ratio of Germany during the period under consideration peaked in 2008. This can be credited to the financial crisis at the time, which pushed investors to liquidate their stocks. The financial crisis caused an upsurge in activities in the secondary market. Prior to 2008, the turnover ratio of Germany witnessed a downward trend from 1993 to 1996, and subsequently rose steadily until it dipped again in 1999. It is noteworthy that this erratic pattern of growth repeated throughout the period under consideration.

Stock Market Variables of UK

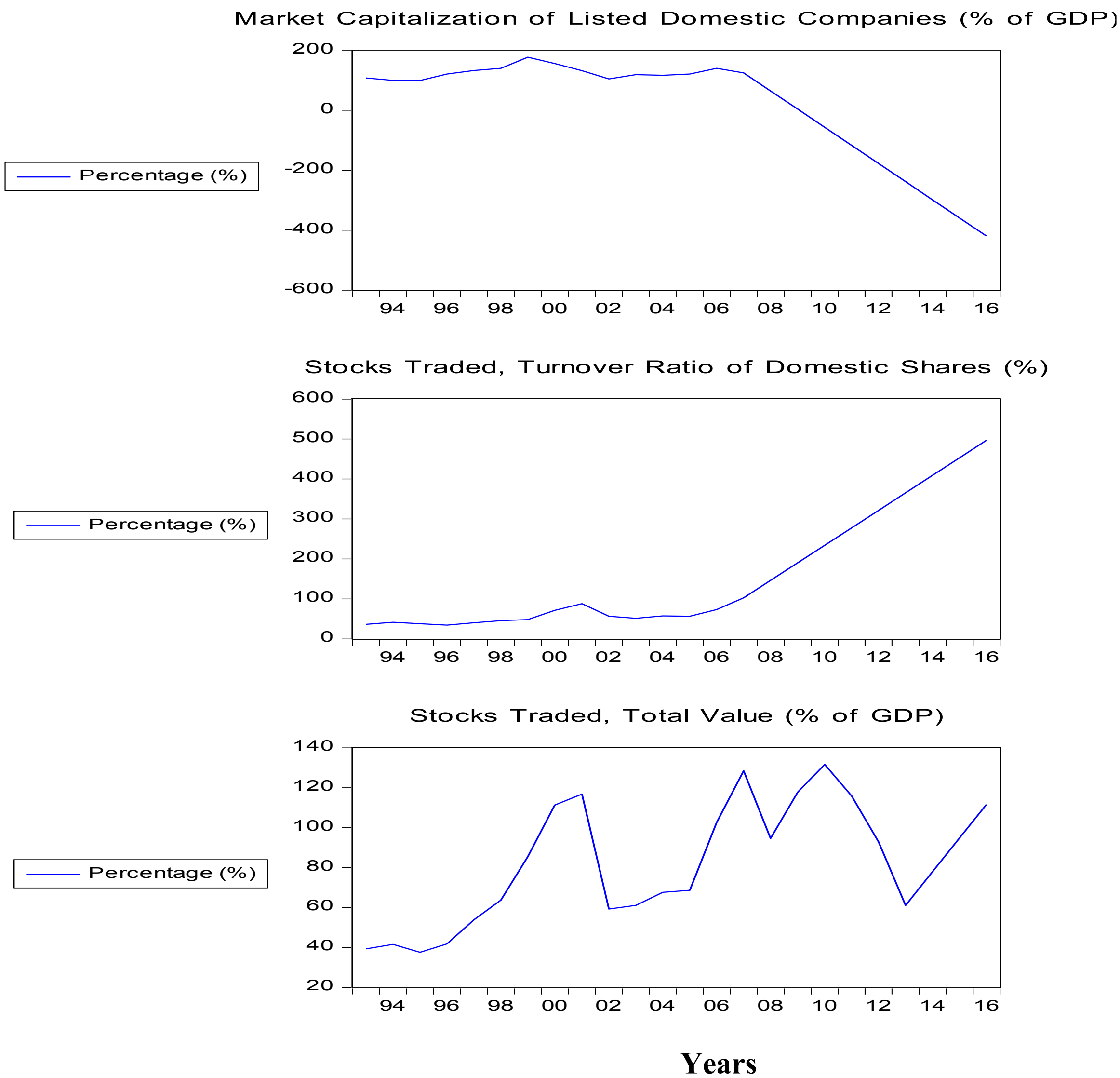
Figure 5UK: Number of Listed Domestic Companies on the Exchanges of UK



Source: Mensah (2020)

The number of domestic companies listed on the exchange grew unevenly for the greater part of the period under consideration. Nonetheless, it fell continuously from 2008 to 2012, and subsequently assumed a constant growth pattern for the remainder of the period under consideration.

Figure 6UK: Growth Pattern of Market Capitalization Ratio, Turnover Ratio and Value of Stocks Traded

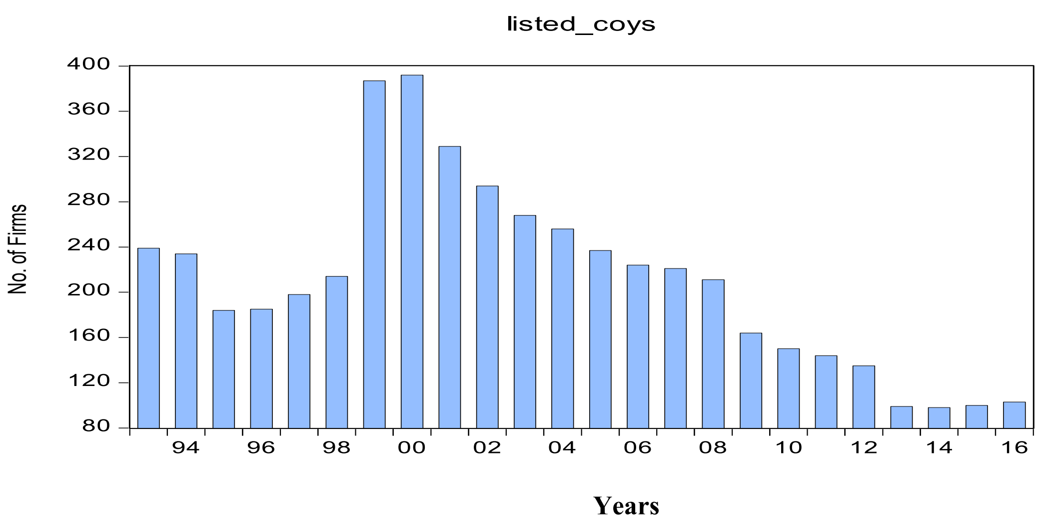


Source: Mensah (2020)

The market capitalization ratio of the United Kingdom grew progressively from 1993 to 1994, dipped minimally in 1995 and resumed progressive growth up to 1999. It fell from 2000 to 2002 and assumed a constant growth pattern between 2002 and 2007. It dropped to negative during the financial crisis of 2008 and has remained in negative ever since. The turnover ratio of the UK grew minimally from 1993 to 1998 and picked up slightly between 1999 and 2001. It has witnessed continuous growth since 2008. Juxtaposing the movement of the market capitalization ratio and turnover ratio against the number of domestic companies listed on the stock market, it is clear that companies in the UK are becoming less interested in equity financing The growth pattern of the value of stocks traded ratio of UK is not different from that of the other variables. It grew minimally at varying rates during the period under consideration.

Stock Market Variables of Netherlands

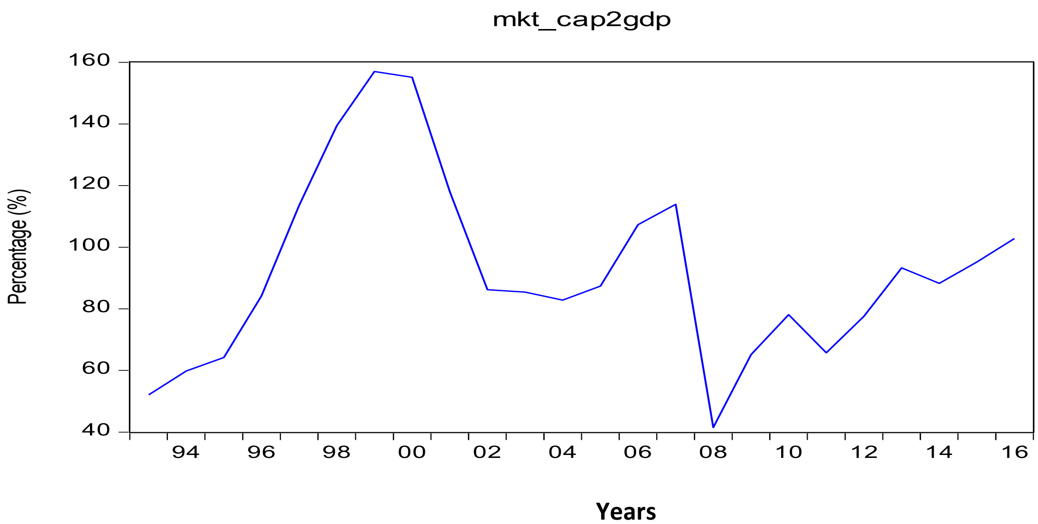
Figure 7NET: Trend of Listed Domestic Companies on the Exchanges of Netherlands



Source: Mensah (2020)

From figure 7N, the number of domestic companies listed on the stock market of the Netherlands showed a topsy-turvy growth pattern during the period under consideration, however, it has been in decline since 2001. This suggests that more companies are getting less interested in equity financing.

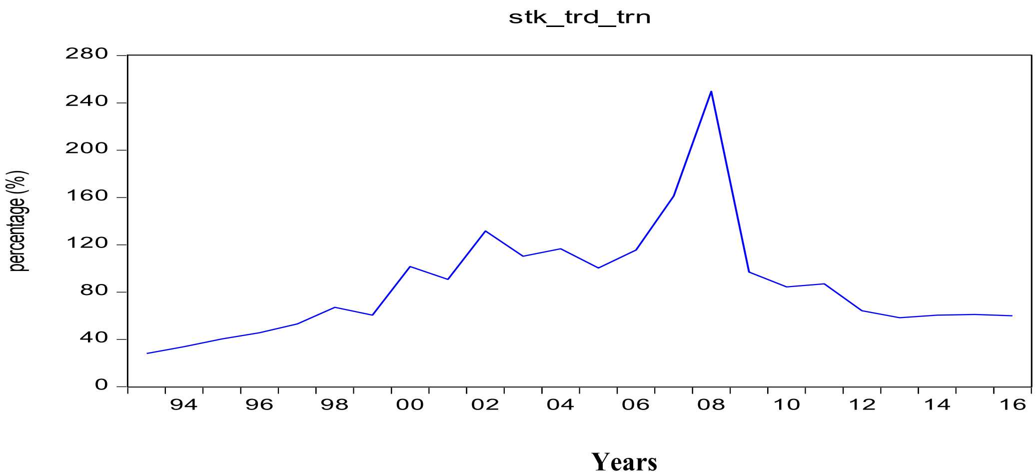
Figure 8NET: Growth Pattern of Market Capitalization ratio of Netherlands



Source: Mensah (2020)

The Netherlands is considered as one of the financial hubs in the world, as such, its market capitalization ratio grew progressively from 1994 to 2000, dropped minimally in 2001 then plummeted in 2002. It recorded the lowest figure in 2008. The growth pattern has generally been uneven. This was due to the global financial crises around the period.

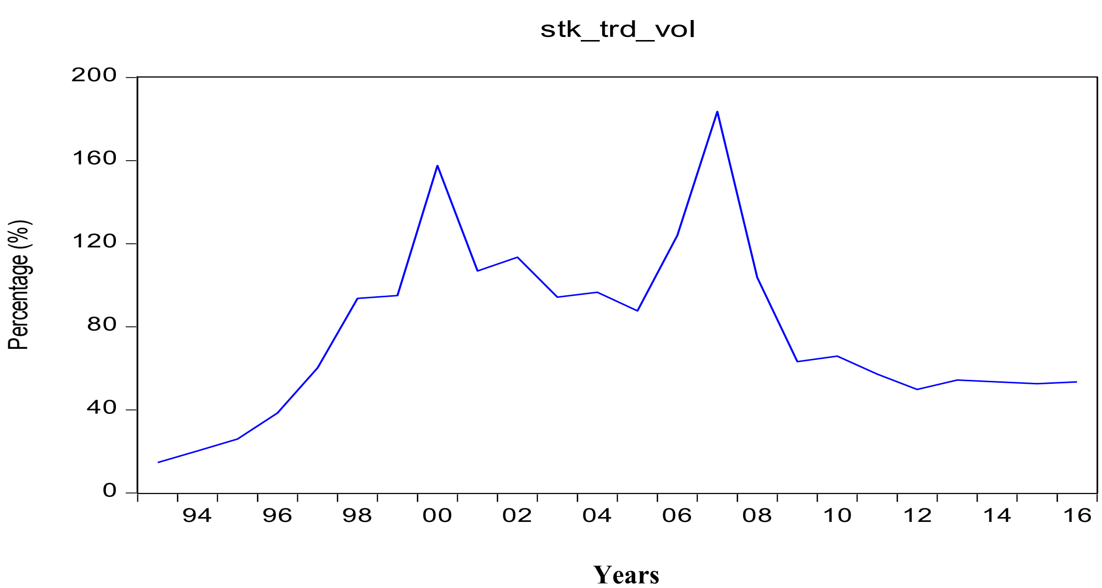
Figure 9NET: Growth Pattern of Turnover Ratio of Netherlands



Source: Mensah (2020)

The turnover ratio of the Netherlands grew steadily from 1993 to 1998. It after that grew erratically from 1999 to 2007. It peaked in 2008 owing largely to the global financial meltdown at the time. It is worthy of note that it has been on a downward trajectory since 2009.

Figure 10NET: Growth Pattern of Value of Stocks Traded of Netherlands



Source: Mensah (2020)

The total value of the stock traded ratio of the Netherlands for the period mimics the growth pattern of its turnover ratio during the period. It grew inconsistently during the period, but peaked in 2008**.**

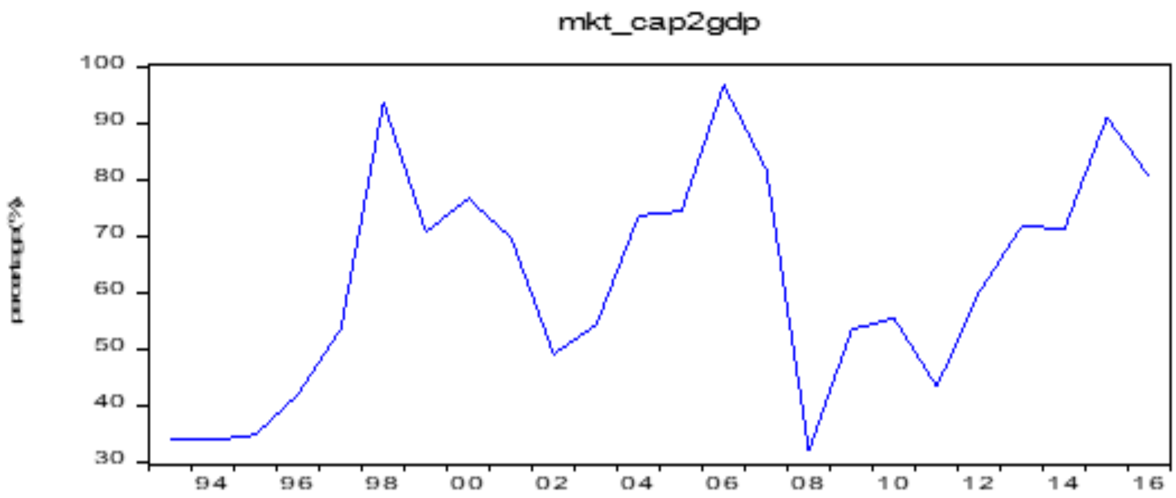
Stock Market Variables of Belgium

Figure 11BEL: Number of Listed Domestic Companies on the Exchanges of Belgium

Source: Mensah (2020)

The pattern of growth of companies listed on the Brussel Stock Exchange is in three parts; erratic, constant downward spiral and minimal upsurge. It grew erratically from 1993 to 2001 and assumed a downward spiral movement from 2003 to 2014. It has since 2015 increased at minimal rate.

Figure 12BEL: Growth Patterns of Market Capitalization Ratio of Belgium

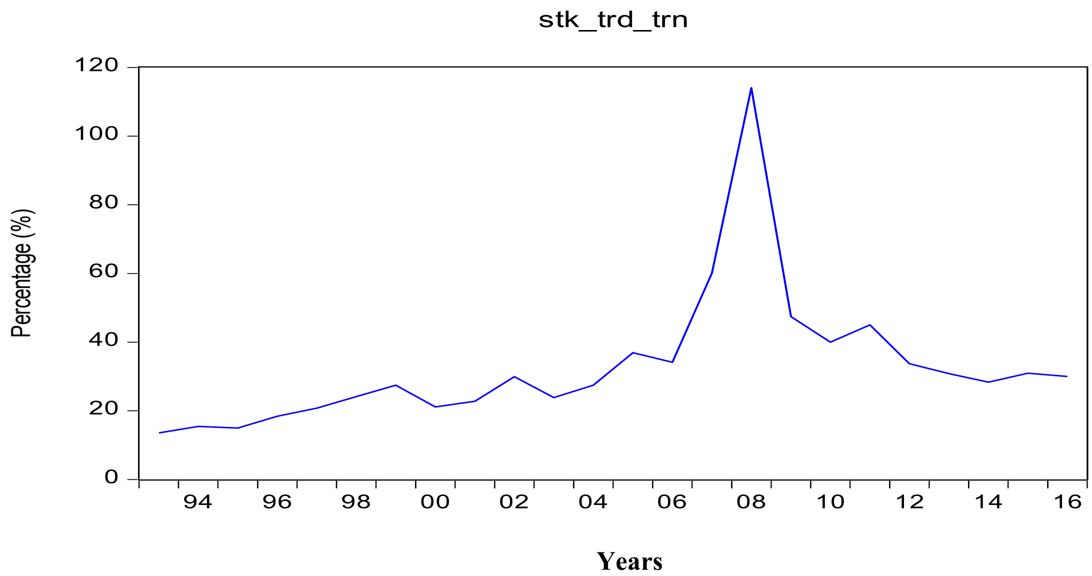


Years

Source: Mensah (2020)

The pattern of growth of market capitalization ratio of Belgium is not different from that of France and Germany. It grew irregularly from 1993 to 2007 and dipped sharply in 2008. In the face of the global financial meltdown in 2008, investors were so much interested in offloading their shares than buying primary shares. Likewise, the number of IPOs issued was not enough to offset the capital taken out of the market by investors. After 2008, market capitalization ratio of Belgium increased briefly in 2009 and has since 2010 been on an erratic trajectory. The pattern of growth of companies listed on the Brussel Stock Exchange is in three parts; erratic, constant downward spiral and minimal upsurge. It grew erratically from 1993 to 2001 and assumed a downward spiral movement from 2003 to 2014. It has since 2015 increased at minimal rate.

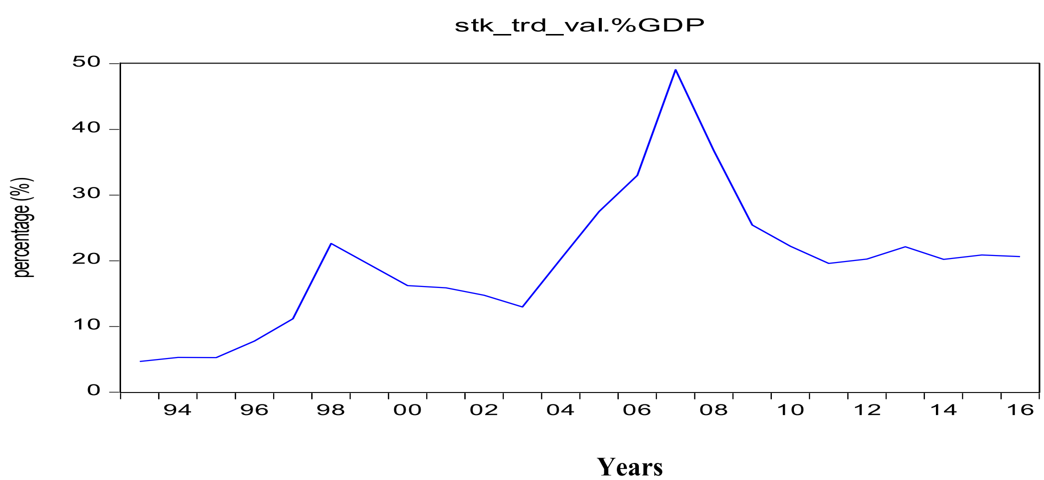
Figure 13BEL: Growth Pattern of Turnover Ration of Belgium



Source: Mensah (2020)

The turnover ratio of domestic shares of Belgium grew unevenly throughout the period under consideration. It, however, peaked in 2008.

Figure 14BEL: Growth Pattern of Value of Stocks Traded of Belgium



Source: Mensah (2020)

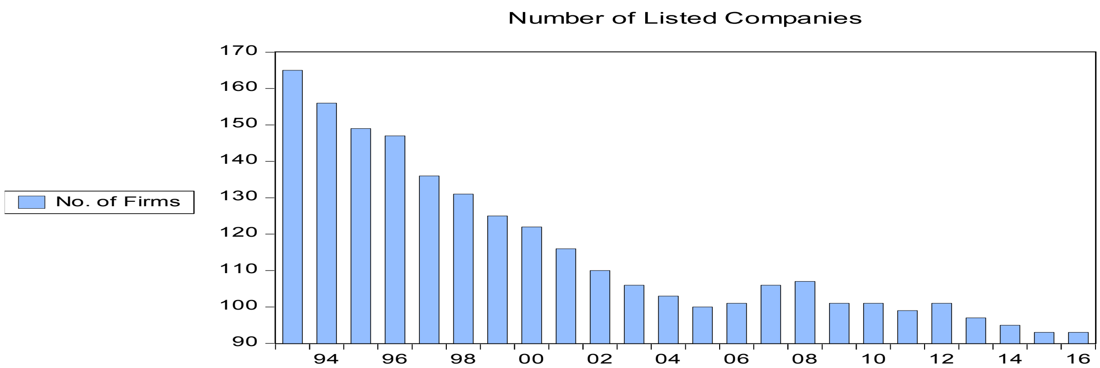
The total value of stocks traded ratio of Belgium grew erratically throughout the period under review. As can be seen from the figure above, it increased modestly between 1996 and

1998, fell steadily 1999 to 2003, and rose steadily from 2004 to 2008. It later plummeted in 2009 and thereafter assumed an erratic-growth pattern for the remainder of the period under consideration.

Americas

Stock Market Variables of Argentina

Figure 15ARG: Number of Domestic Companies Listed on the Exchanges of Argentina

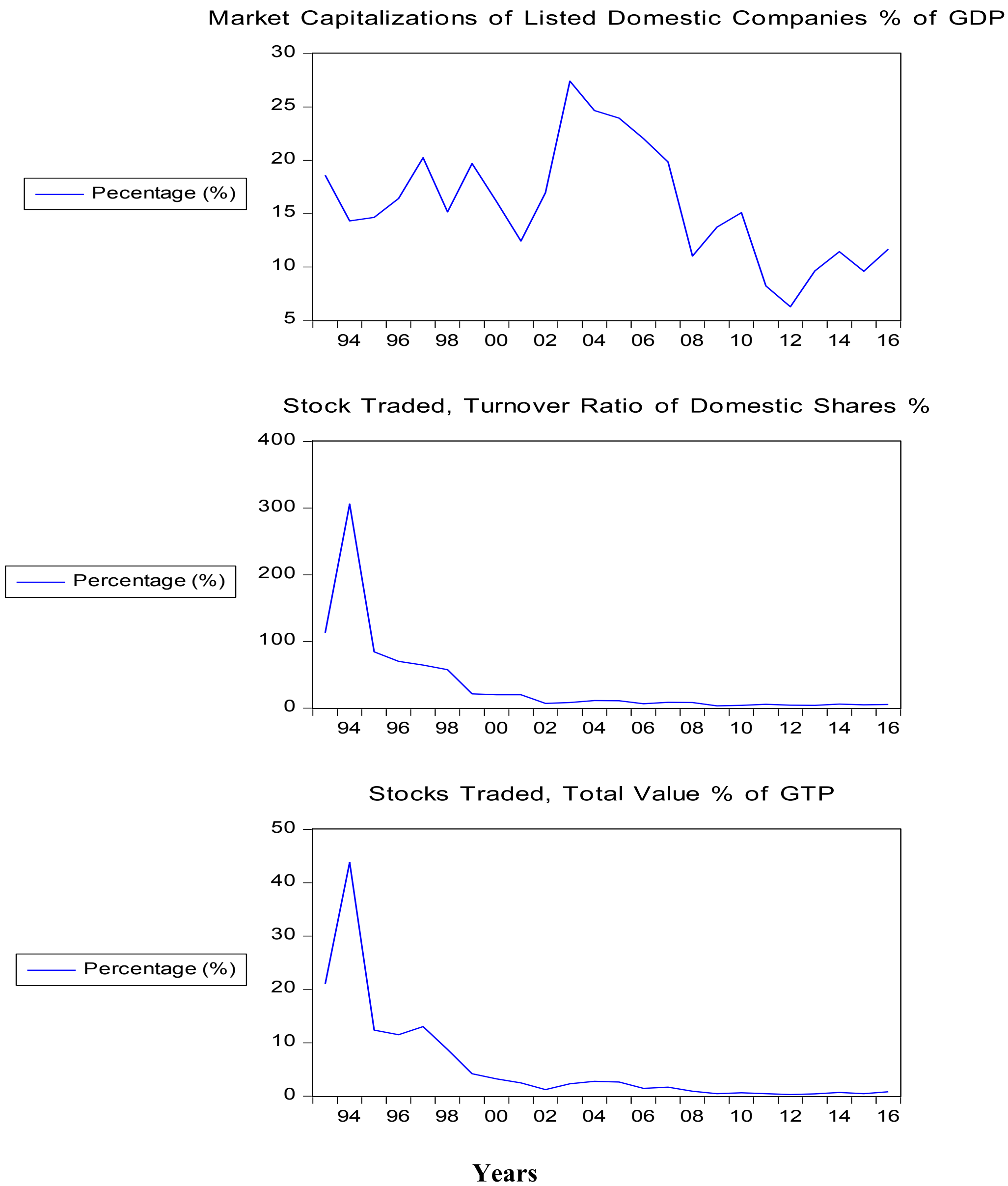


Years

Source: Mensah (2020)

The number of companies listed on the stock exchange of Argentina decreased steadily from 1993 to 1995. It after that, assumed an erratic growth pattern between 1996 and 2012. It is noteworthy that the number of companies listed on the stock exchange of Argentina dwindled progressively from 2012 to 2016.

Figure 16ARG: Growth Pattern of Market Capitalization Ratio, Turnover Ratio and Value of Stocks Traded of Argentina

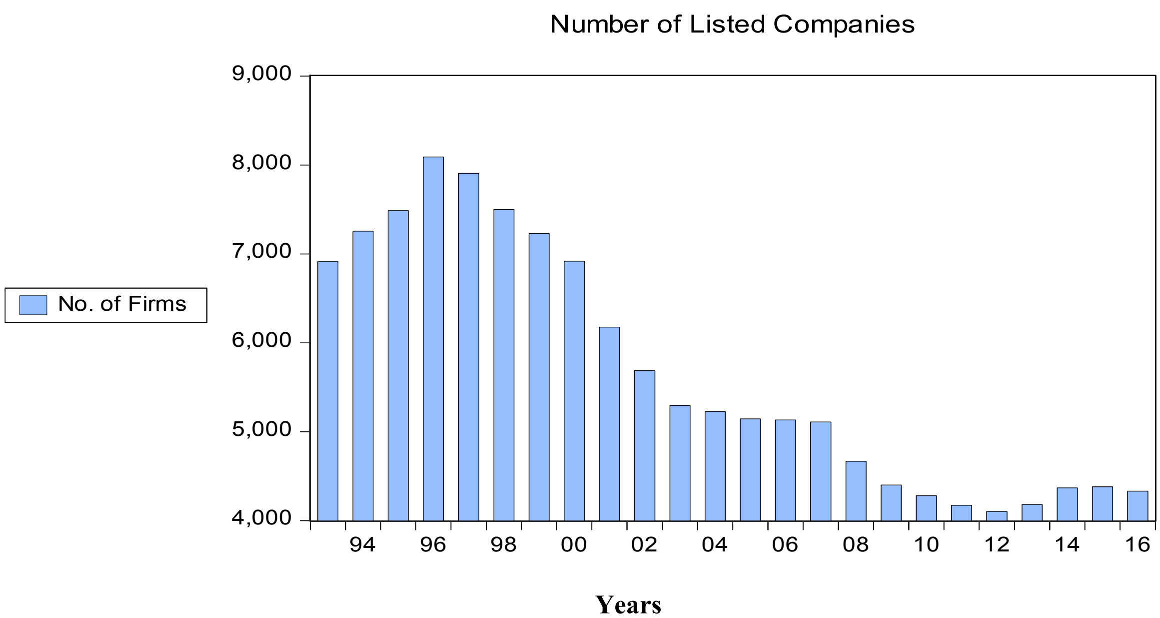


Source: Mensah (2020)

The market capitalization ratio of Argentina fell sharply in 1994 and grew steadily from 1995 until it plummeted in 1998. All in all, the market capitalization ratio of Argentina during the period under consideration experienced a patchy trend. It, however, experienced the lowest growth in 2012. Turnover ratio on the other hand, grew sharply in 1993 and fell thereafter. It grew inconsistently between 1995 and 2016. It is worthy of note that the growth of turnover ratio of Argentina after 2008 was minimal. Likewise, the stocks traded ratio of Argentina during the period under consideration experienced a topsy-turvy growth pattern. It also grew minimally at varying degrees between 2008 and 2016. Prior to 2008, the growth pattern was largely erratic.

Stock Market Variables of United

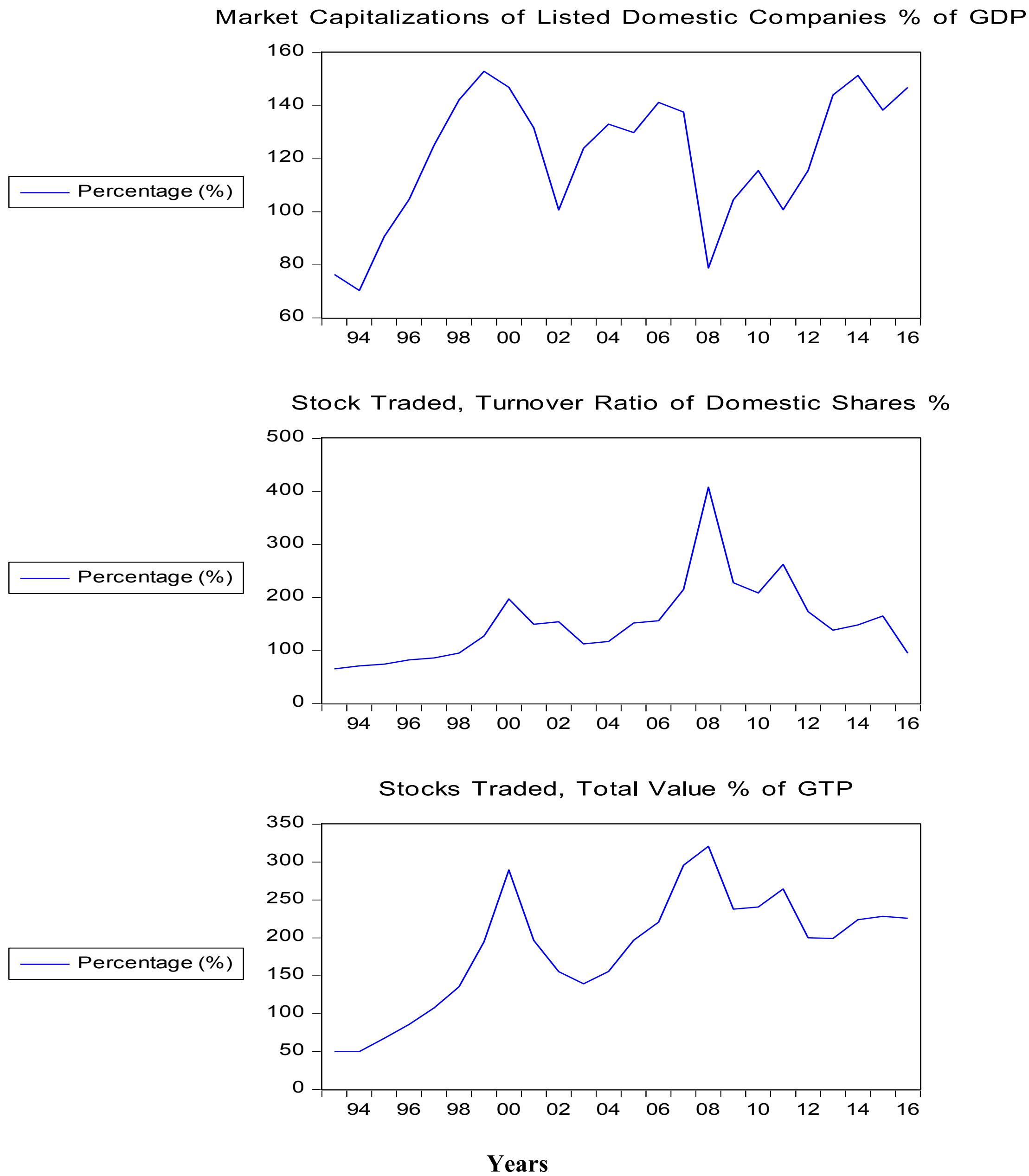
Figure 17US: Growth Pattern of Number of Domestic Companies Listed on the Exchanges of the United States of America



Source: Mensah (2020)

The number of companies listed on the US stock markets increased steadily from 1993 to 1996. It subsequently decreased continuously from 1997 to 2013. It increased minimally between 2014 and 2015 and thereafter fell.

Figure 18US: Growth Pattern of Market Capitalization Ratio, Turnover Ratio and Value of Stocks Traded of the United States of America



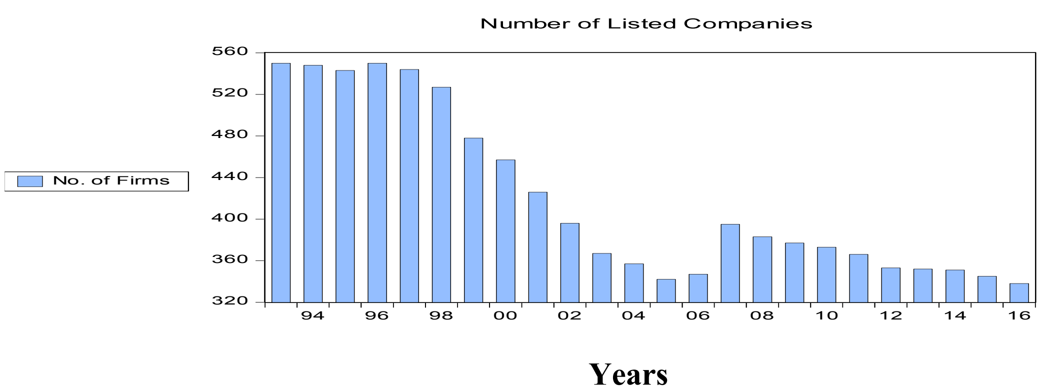
Source: Mensah (2020)

Market capitalization ratio of domestic companies listed on the stock markets of the United States of America grew progressively from 1994 to 1999 and then fell steadily from 2000 to 2002. The ratio grew erratically between 2003 and 2006. It is instructive to note that during the period under consideration, the market capitalization ratio of US experienced the lowest growth in 2008. The US is considered one of the financial hubs in the world, thus when the global financial crisis hit in 2008, the country's financial sector was significantly affected, adversely. In the ensuing years, the ratio improved at varying degrees due largely to government support to the sector. As can be seen from the figure above, the turnover ratio of the United States during the period grew unsteadily. In 2008, however, it recorded the highest turnover ratio. This is attributable largely to the global financial crises mentioned above.

In the midst of the crises, most investors had to liquidate their stocks. The stocks traded ratio on the other hand grew progressively between 1995 and 2000 and subsequently decreased continuously at varying degrees between 2001 and 2004. The stocks traded ratio of US during the period under consideration peaked in 2009, a year after the global financial crisis of 2008. In all, the stocks traded ratio of US grew inconsistently during the period.

Stock Market Variables of Brazil

Figure 19BZ: Number of Companies Listed on the Exchanges of Brazil

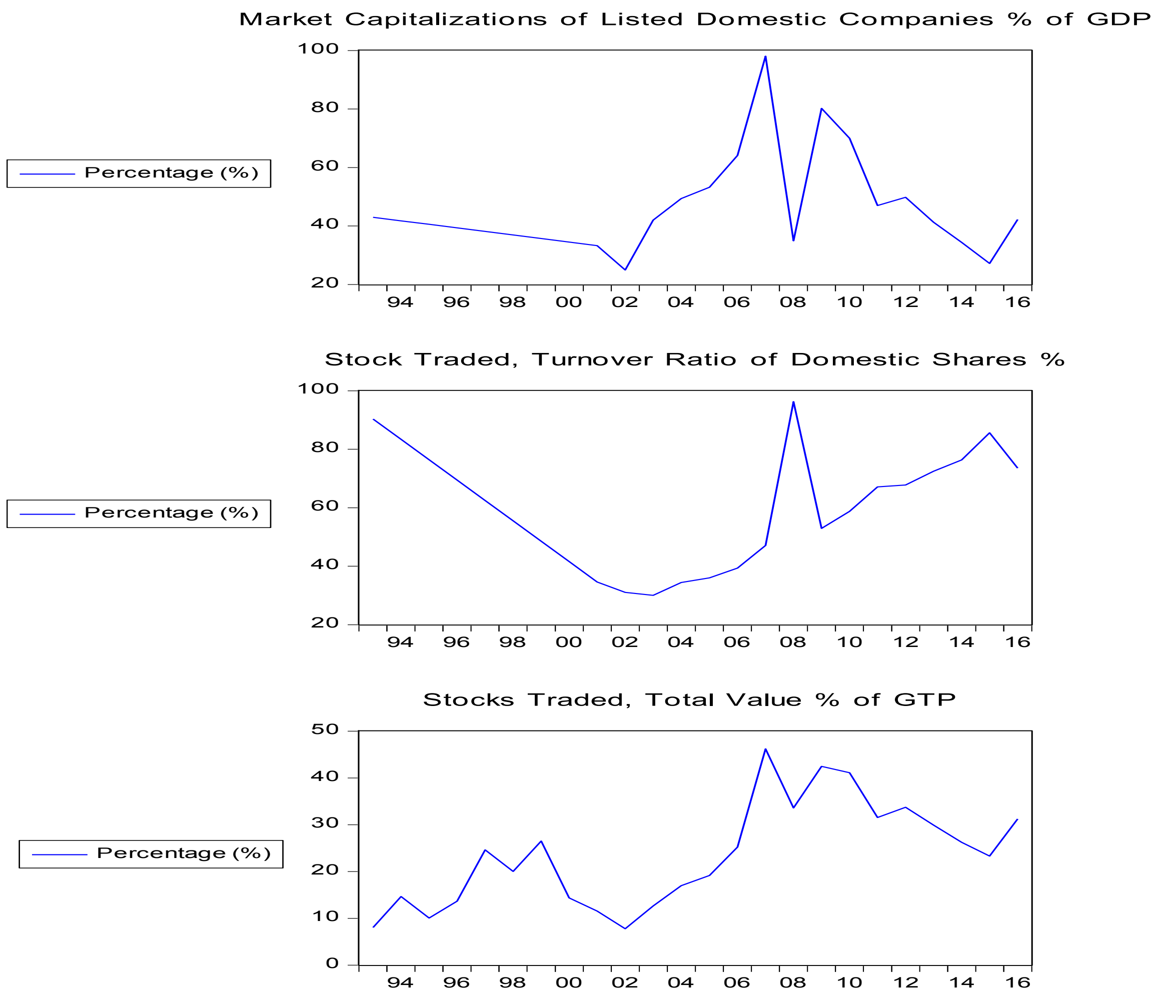


Source: Mensah (2020)

The number of companies listed on the stock exchange of Brazil decreased between 1993 and 1995. It increased minimally in 1996 and subsequently decreased consistently from 1997 to

2005. It increased sharply in 2007 and then declined continuously for the remainder of the period. In all, the growth pattern of the domestic companies listed on the stock exchange of Brazil reveals up-and-down pattern.

Figure 20BZ: Growth Pattern of Market Capitalization Ratio, Turnover Ratio and Value of Stocks Traded of Brazil



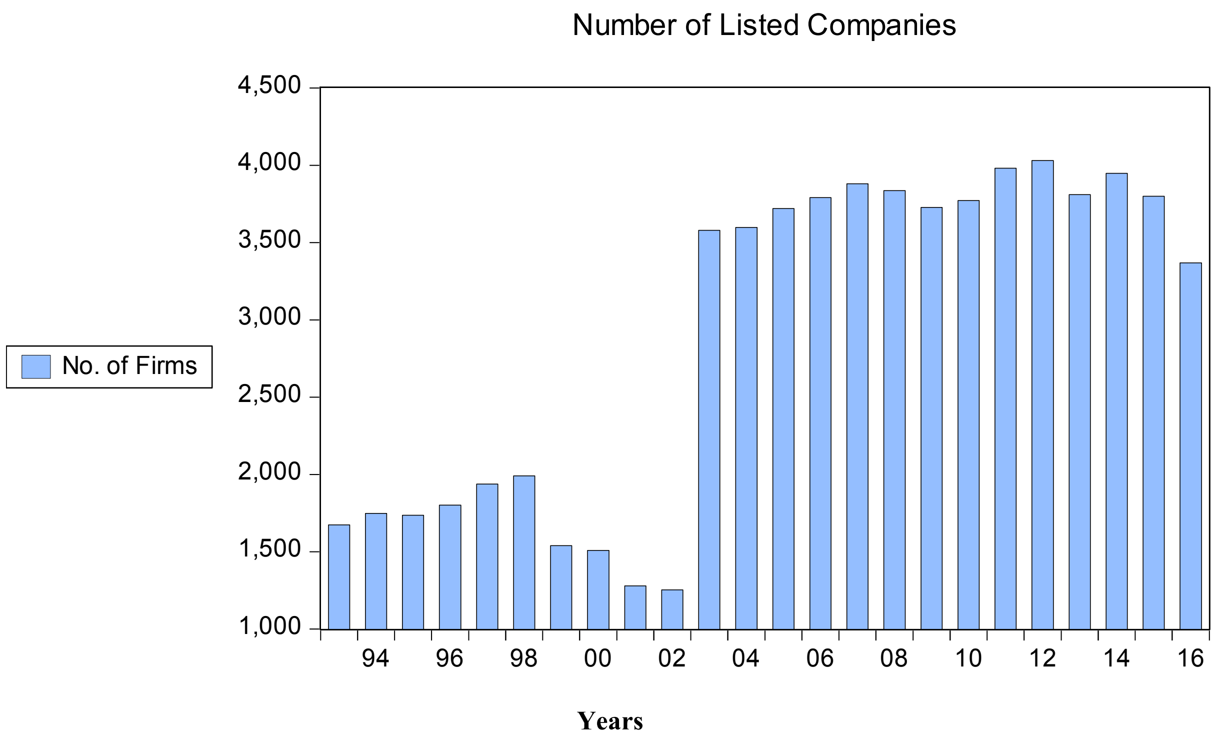
Years

Source: Mensah (2020)

The market capitalization ratio of Brazil decreased sharply between 1993 and 2001. It is crucial to note that in the midst of the topsy-turvy growth pattern exhibited by the ratio during the period under consideration, it fell sharply between 2008 and 2009, owing largely to the global financial crisis. Turnover ratio of domestic shares in a like manner fell steadily between 1993 and 2004. As expected, it rose from 2007 to 2008, due to the excitement created in the market by the global financial crisis. Stocks traded ratio on the other hand exhibited undulating growth pattern throughout the period under consideration. It however, peaked in 2009.

Stock Market Variables of Canada

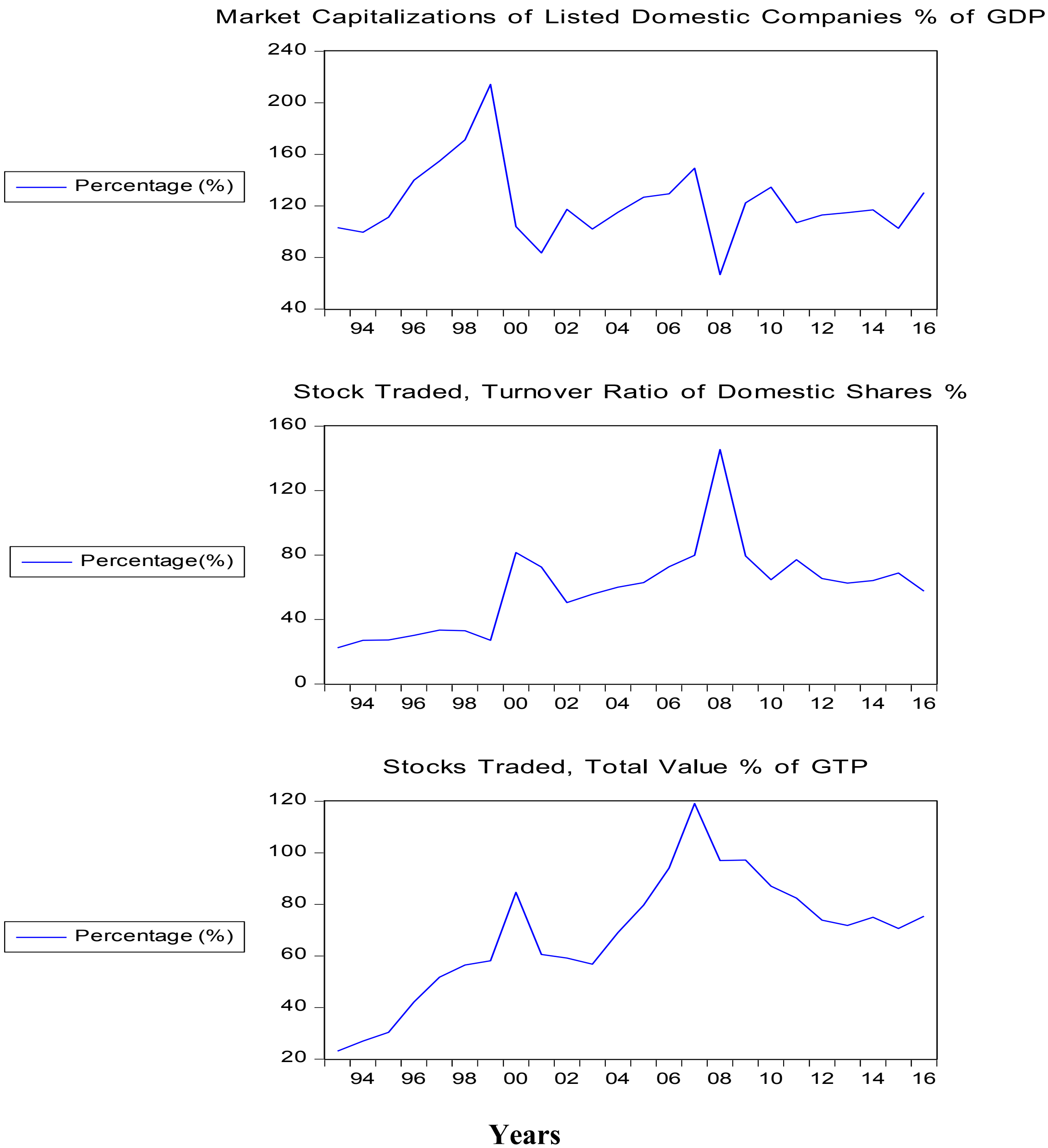
Figure 21CA: Growth Pattern of Number of Companies Listed on the Exchanges of Canada



Source: Mensah (2020)

The number of companies listed on the stock market of Canada increased consistently from 1993 to 1998, and dropped from 1999 to 2002. It subsequently increased progressively from 2003 to 2007. The entire period under consideration was characterized by this undulating growth pattern.

Figure 22CA: Growth Patterns of Market Capitalization Ratio, Turnover Ratio and Value of Stocks Traded of Canada



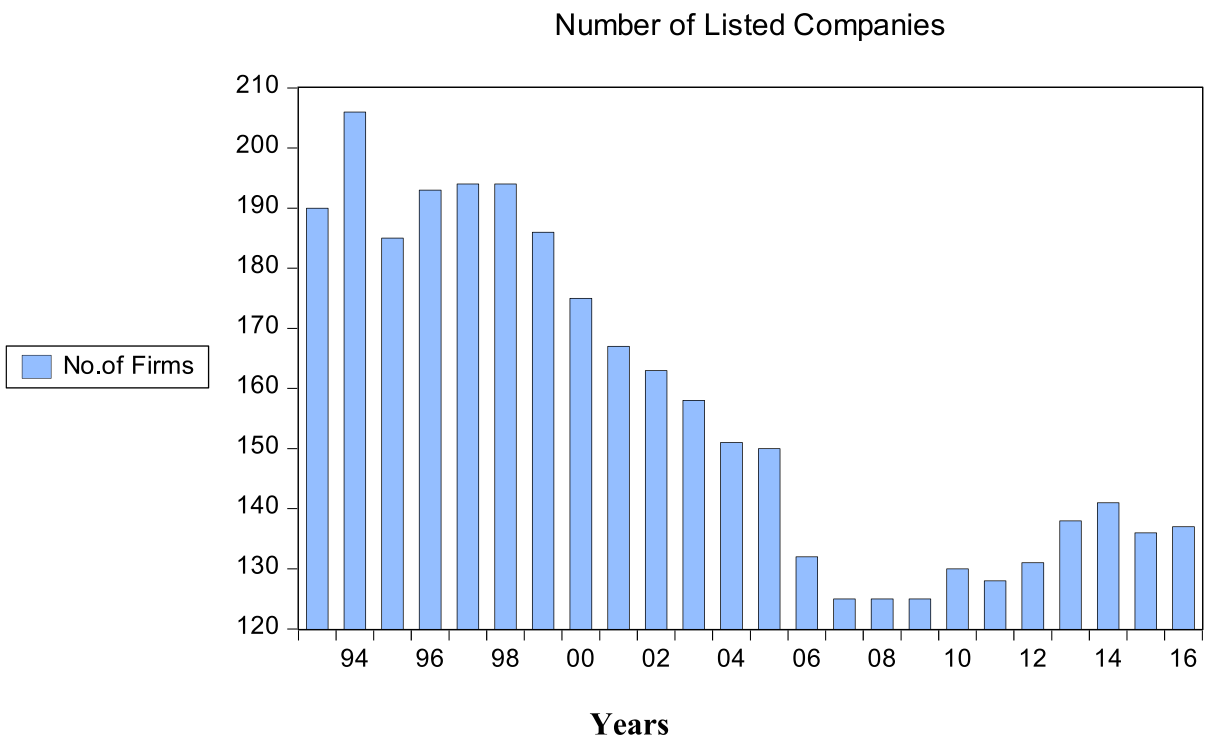
Source: Mensah (2020)

The market capitalization ratio of Canada grew unevenly during the period under consideration. It peaked in 1999 and recorded the lowest growth in 2008. The turnover ratio on the other hand peaked in 2008 due to the same reason that the market capitalization ratio fell in

2008 – the global financial crisis. As can be seen from the figure above, the stocks traded ratio of Canada during the period grew at varying degrees – it grew progressively between 2003 and 2006 then took a nosedive in 2007 and continued on the downward trend thereafter. It however grew minimally in-between.

Stock Market Variables of Mexico

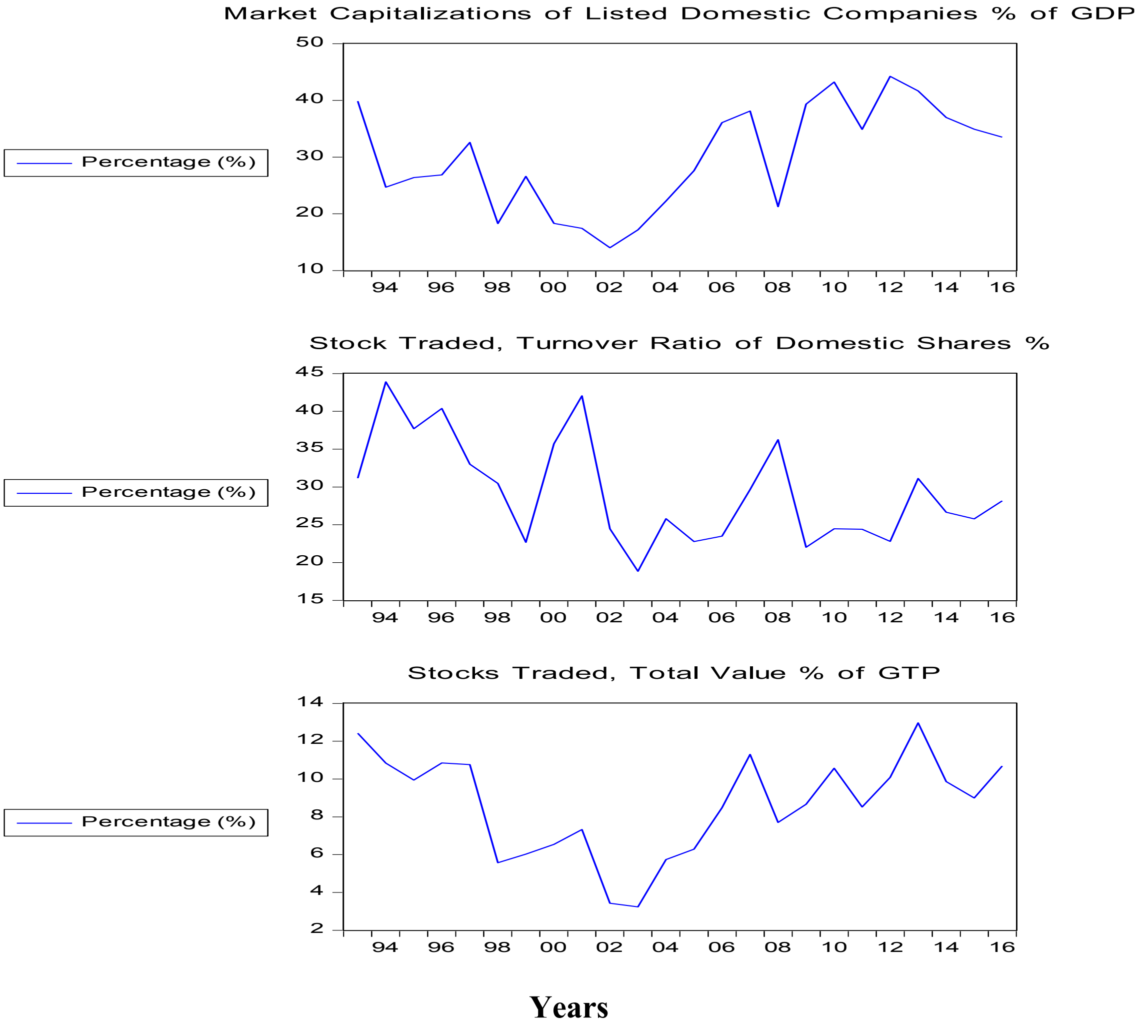
Figure 23MX: Growth Pattern of Domestic Companies Listed on the Exchanges of Mexico



Source: Mensah (2020)

As can be seen from the figure above, more companies listed on the stock market of Mexico in 1994 more than any other year during the period under consideration. It dropped steadily from 1998 to 2009, increased in 2010 then dropped again. The number of companies listed on the country's stock market increased minimally between 2014 and 2015. All in all, it is clear from the figure above that investors in the latter part of the period under review deemed the stock market a less attractive source of finance.

Figure 24MX: Growth Pattern of Market Capitalization Ratio, Turnover Ratio and Value of Stocks Traded of Mexico



Source: Mensah (2020)

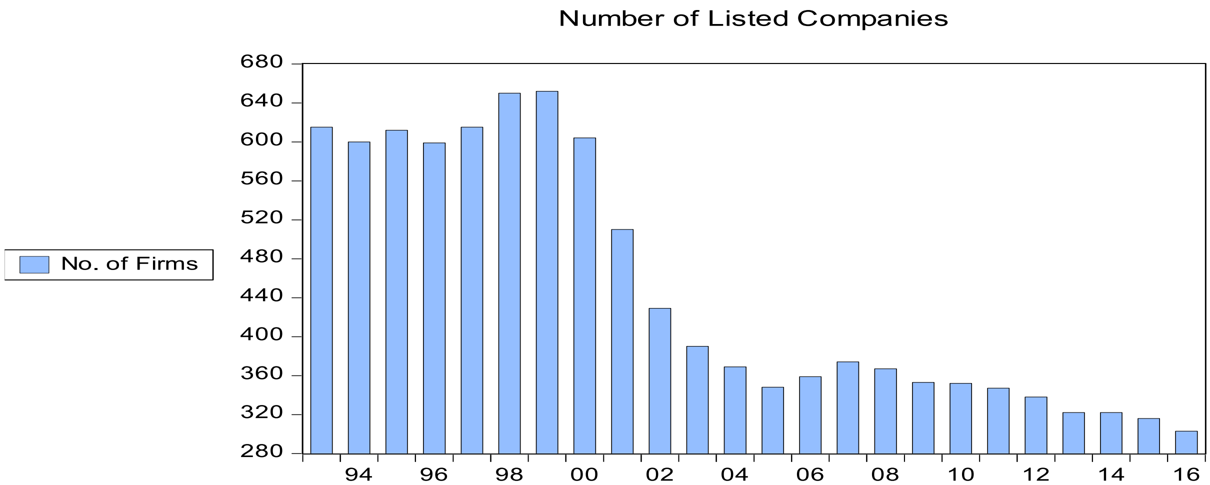
The market capitalization ratio of Mexico grew unevenly during the period under review. It however recorded the lowest growth in 2003. It is also worthy of note that the ratio dipped significantly in 2008 as well. It assumed a downward trajectory at the later stage of the period – 2013 to 2016. The turnover ratio of Mexico on the other hand recorded the highest growth in

2000 and the lowest in 2003. The growth pattern of the ratio during the period was generally erratic. Likewise, the growth pattern of stocks traded ratio during the period was irregular. It nonetheless recorded the lowest growth in 2003 and the highest in 2013.

African Countries

Stock Market Variables of South Africa

Figure 25ZA: Growth Pattern of Number of Domestic Companies Listed on the Exchange of South Africa

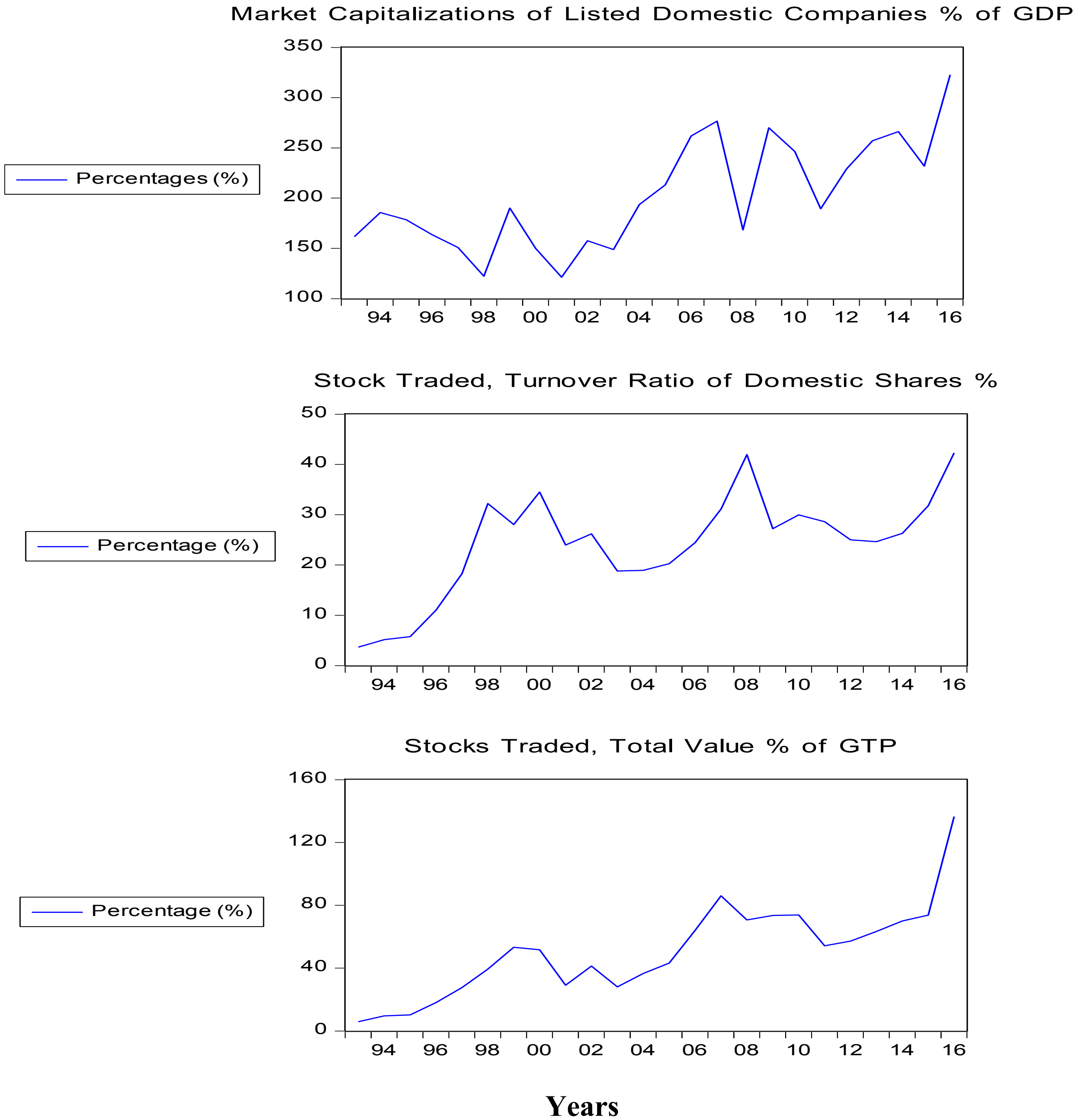


Years

Source: Mensah (2020)

South Africa had a lot of companies listed on its exchange between 1993 and 2001. It had the highest number of companies listed on its exchange in 2000. However, the number of companies dropped significantly from 2001 to 2016 with the lowest being in 2016.

Figure 26ZA: Growth Pattern of Market Capitalization Ratio, Turnover Ratio and Value of Stocks Traded of South Africa

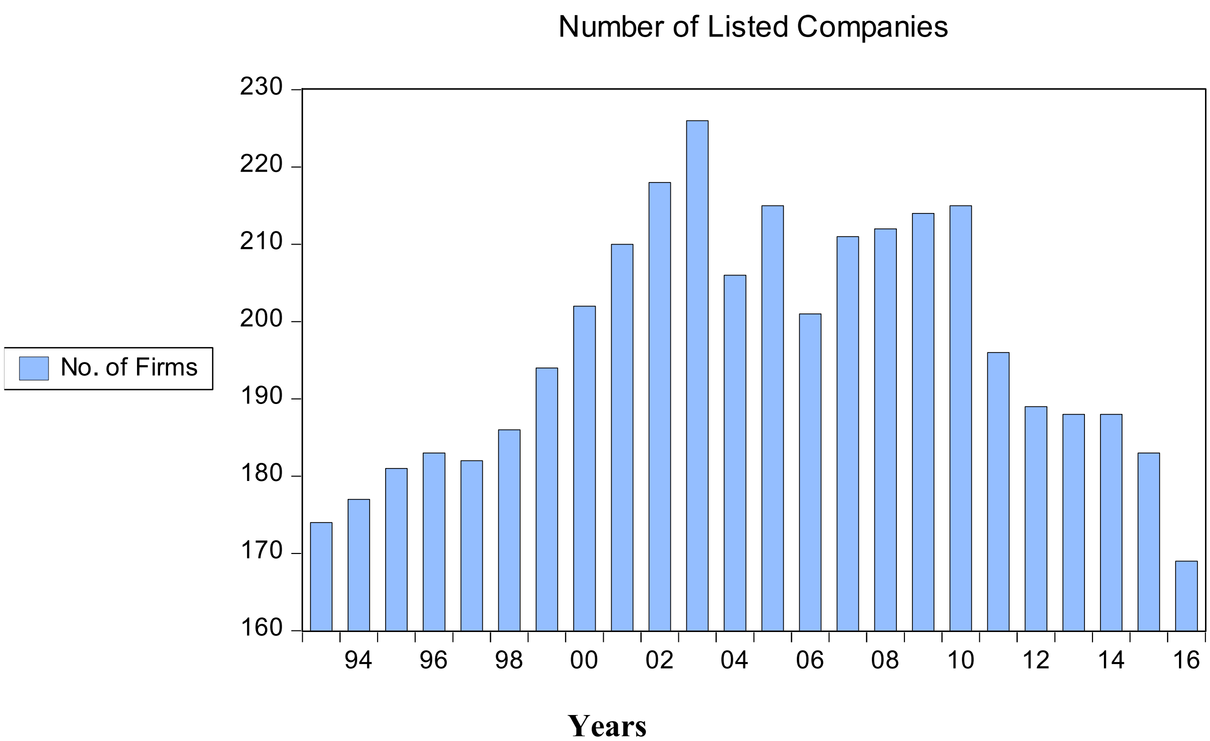


Source: Mensah (2020)

The market capitalization ratio of South Africa grew erratically throughout the period. Even though the growth trend was not consistent, the rate of growth remained somewhat high from 2009 to 2016. The turnover ratio grew steadily from 1994 to 1998. It peaked in 2008. Just like the market capitalization ratio and the turnover ratio, the stocks traded ratio experienced an irregular growth pattern. It is worthy of note, however, that it recorded a steady growth from 2011 to 2016.

Stock Market Variables of Nigeria

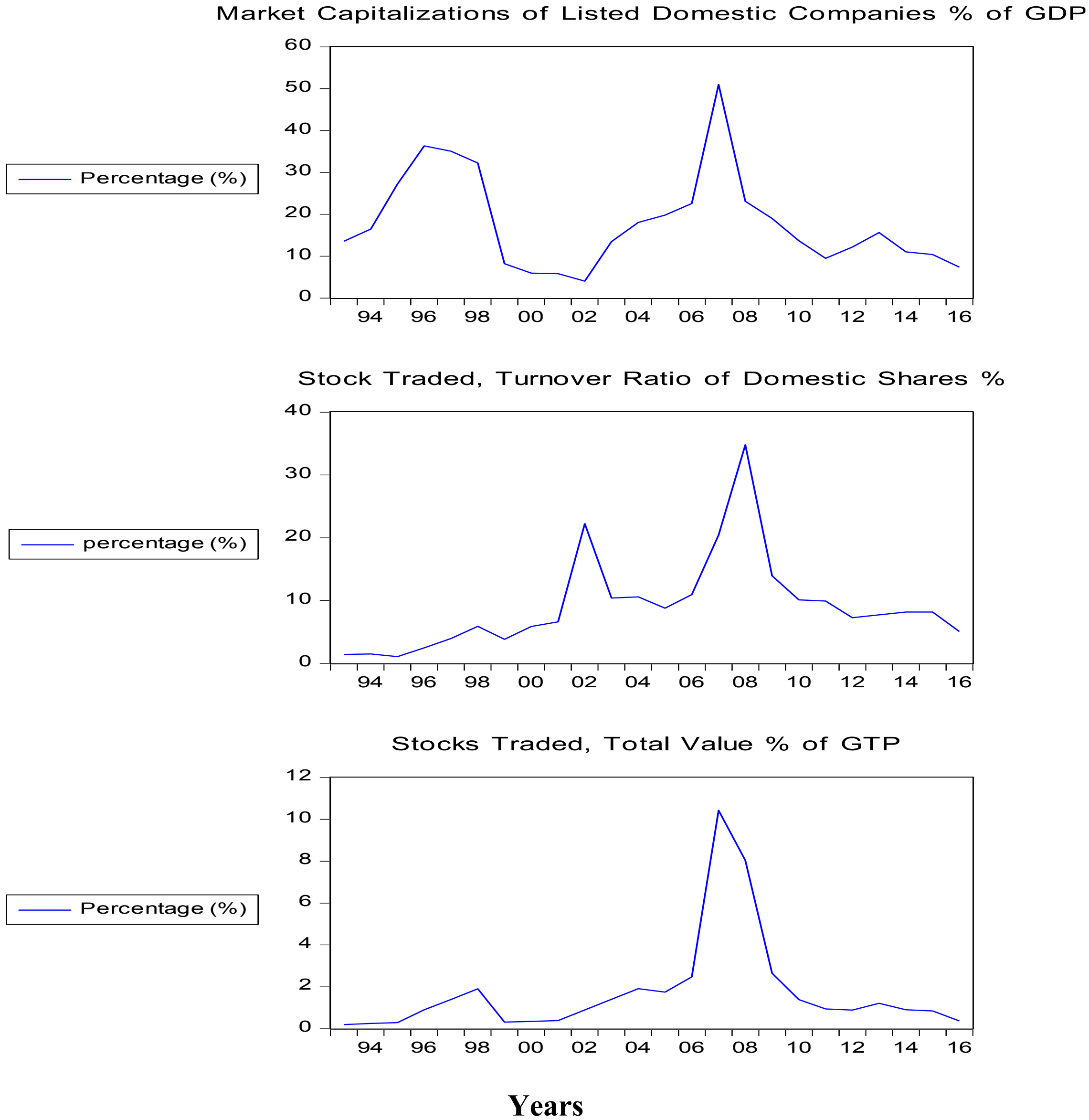
Figure 27NG: Growth Pattern of Number of Domestic Companies Listed on the Exchange of Nigeria



Source: Mensah (2020)

The number of companies listed on the stock exchange of Nigeria increased continuously from 1993 to 1996 and fell in 1997. It subsequently increased continuously from 1998 to 2003. The growth pattern became erratic after 2003. It is however instructive to note that in 2016, Nigeria had the lowest number of companies listed on its exchange. Considering the trajectory of growth from 2011 to 2016, it seems Nigerian companies are moving away from equity financing.

Figure 28NG: Growth Pattern of Market Capitalization Ratio, Turnover Ratio, and Value of Stocks Traded of Nigeria

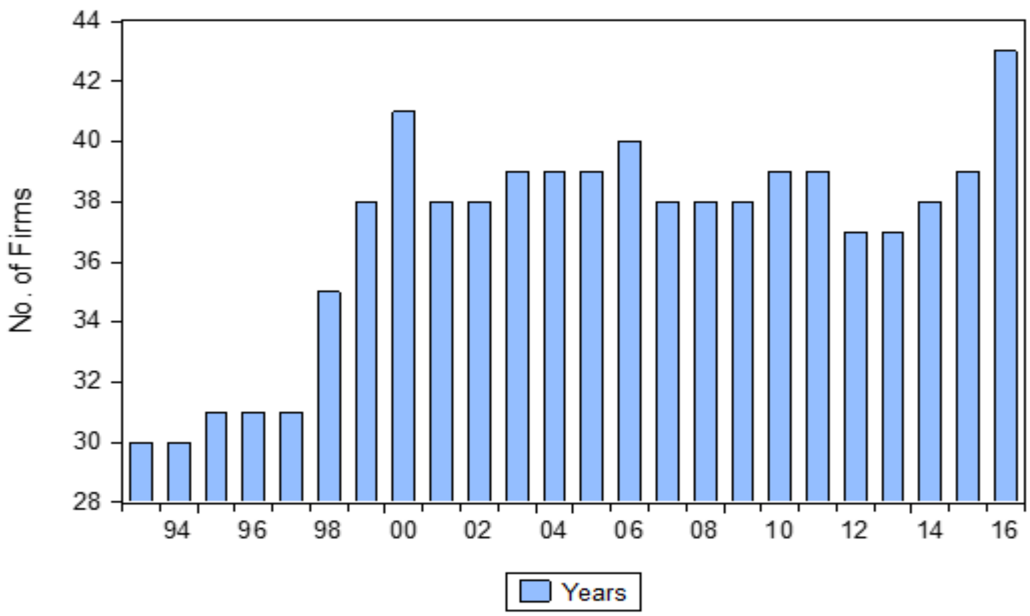


Source: Mensah (2020)

The market capitalization ratio of Nigeria grew sporadically throughout the period under review. It recorded the highest growth in 2008 and the lowest in 2002. The growth pattern took a downward trend from 2013 to 2016. The growth patterns of the turnover ratio and the stocks traded ratio are different from that of the market capitalization ratio – they also grew sporadically. During the period, both the turnover ratio and the stocks traded ratio of Nigeria recorded the highest growth in 2008, and subsequently begun to fall.

Stock Market Variables of La Cote d'Ivoire

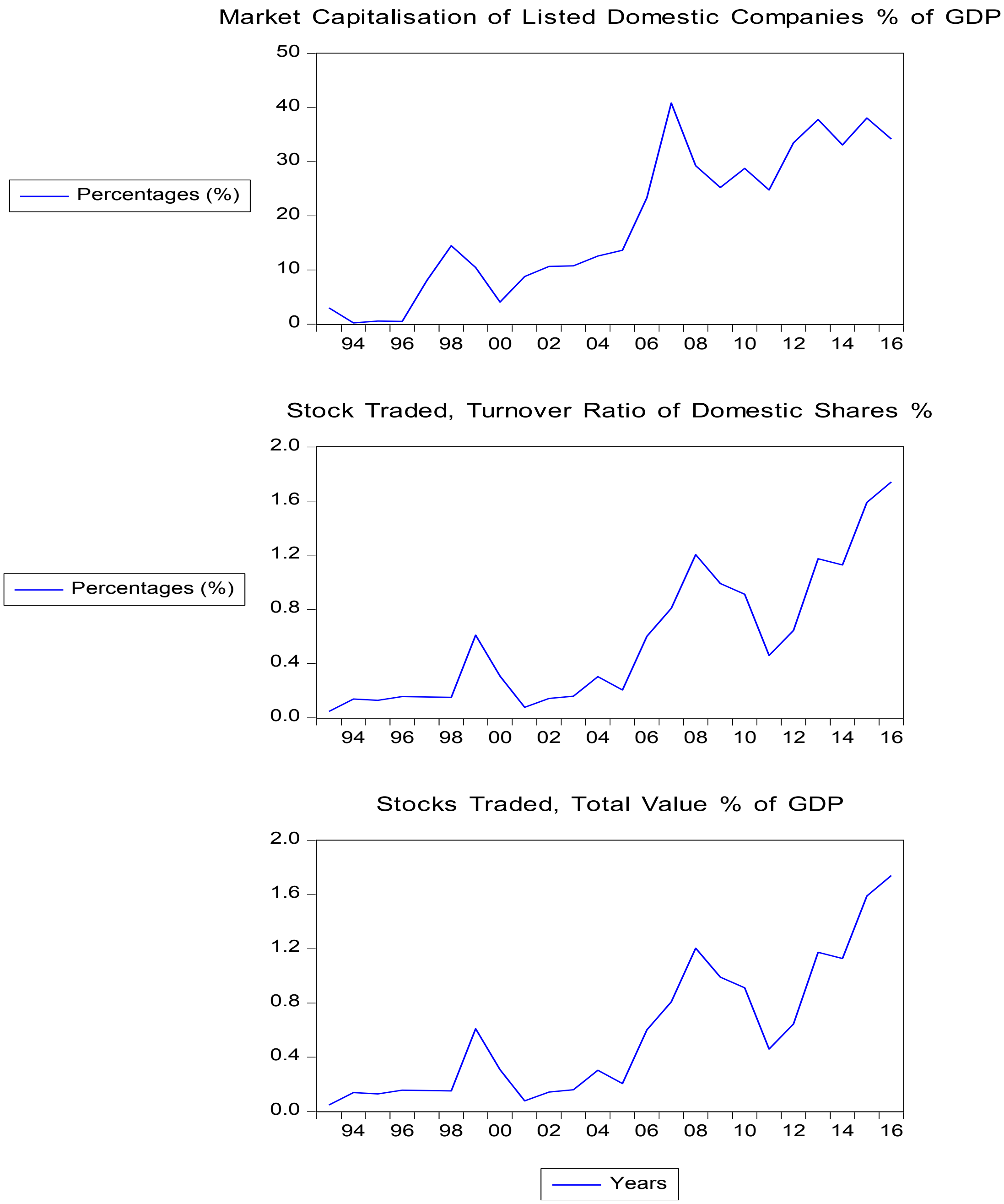
Figure 29LCD: Growth Pattern of Number of Companies Listed on the Exchange of La Cote d'Ivoire



Source: Mensah (2020)

During the period under consideration, the number of companies listed on La Cote d'Ivoire's stock market witnessed some significant increases with the highest being in 2016. The general pattern of growth during the period was uneven.

Figure 30LCD: Growth Pattern of Market Capitalization Ratio, Turnover Ratio and Value of Stocks Traded of La Cote d'Ivoire

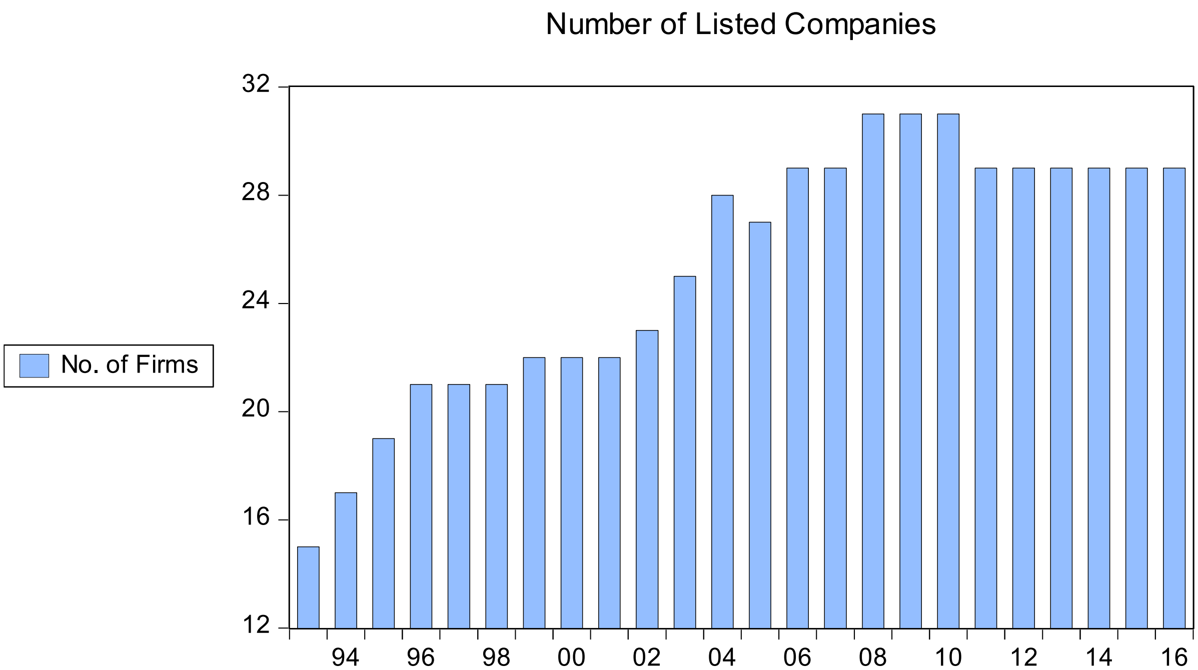


Source: Mensah (2020)

The market capitalization ratio of La Cote d'Ivoire during the period peaked in 2007 before it plummeted in 2008. Even though it fell in 2008, the ratio thereafter remained considerably high. The turnover ratio and the stocks traded ratio experienced a similar pattern of growth. They both recorded the highest growth in 2008 and upward movement from 2014 to 2016.

Stock Market Variables of Ghana

Figure 31GH: Growth Pattern of the Number of Domestic Companies Listed on the Exchange of Ghana

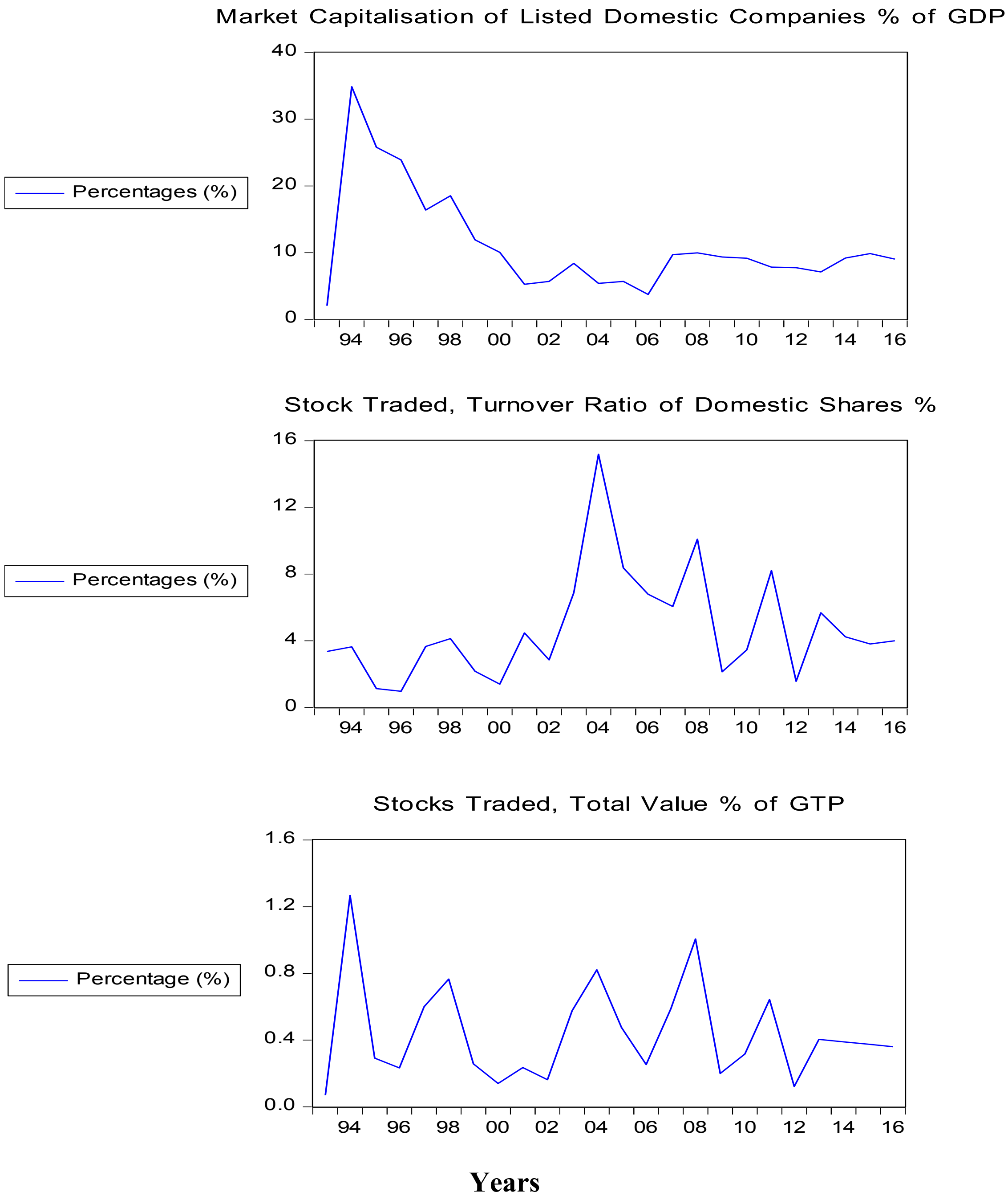


Years

Source: Mensah (2020)

The number of companies listed on the stock market of Ghana witnessed a significant increase in 2008. The number fell in 2010 and remained same throughout the remainder of the period.

Figure 32GH: Growth Pattern of Market Capitalization Ratio, Turnover Ratio and Value of Stocks Traded of Ghana

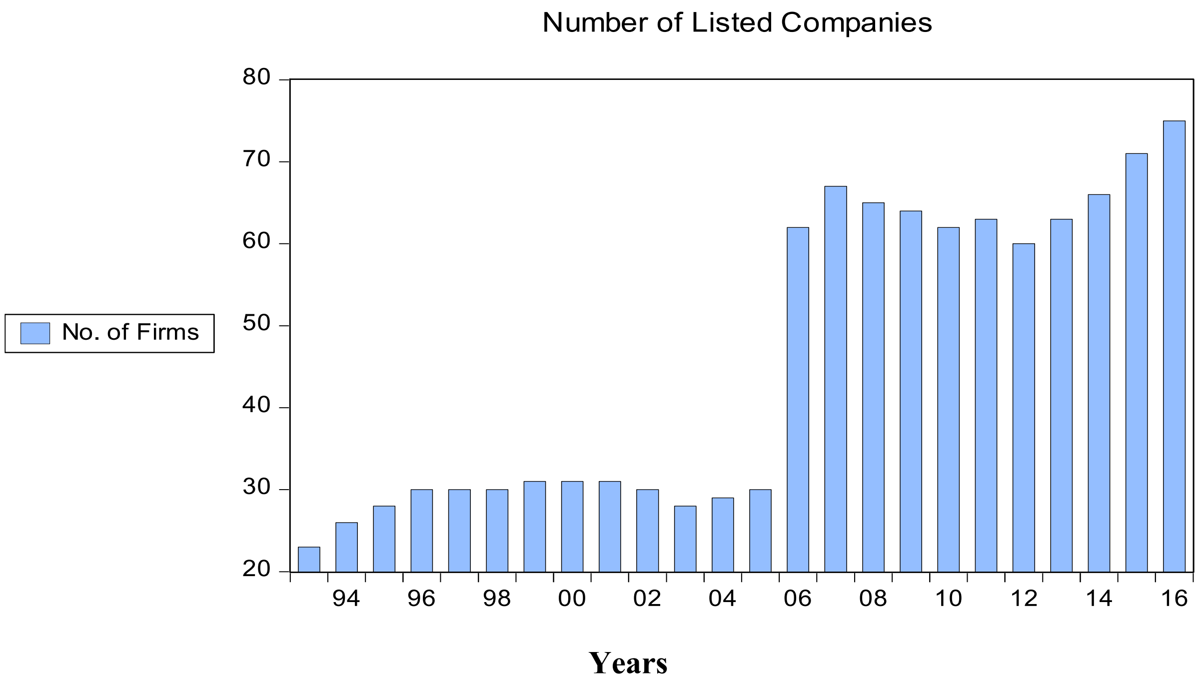


Source: Mensah (2020)

The market capitalization ratio of Ghana increased sharply in 1994 and thereafter assumed a downward movement, though, at varying degrees. In all, the growth pattern of the market capitalization ratio of Ghana during the period was patchy. The case is not different for the turnover ratio. It also experienced a patchy trend during the period. It however peaked in 2005. Just like the market capitalization ratio, the stocks traded ratio increased sharply in 1994 and thereafter assumed an inconsistent trend.

Stock Market Variables of Mauritius

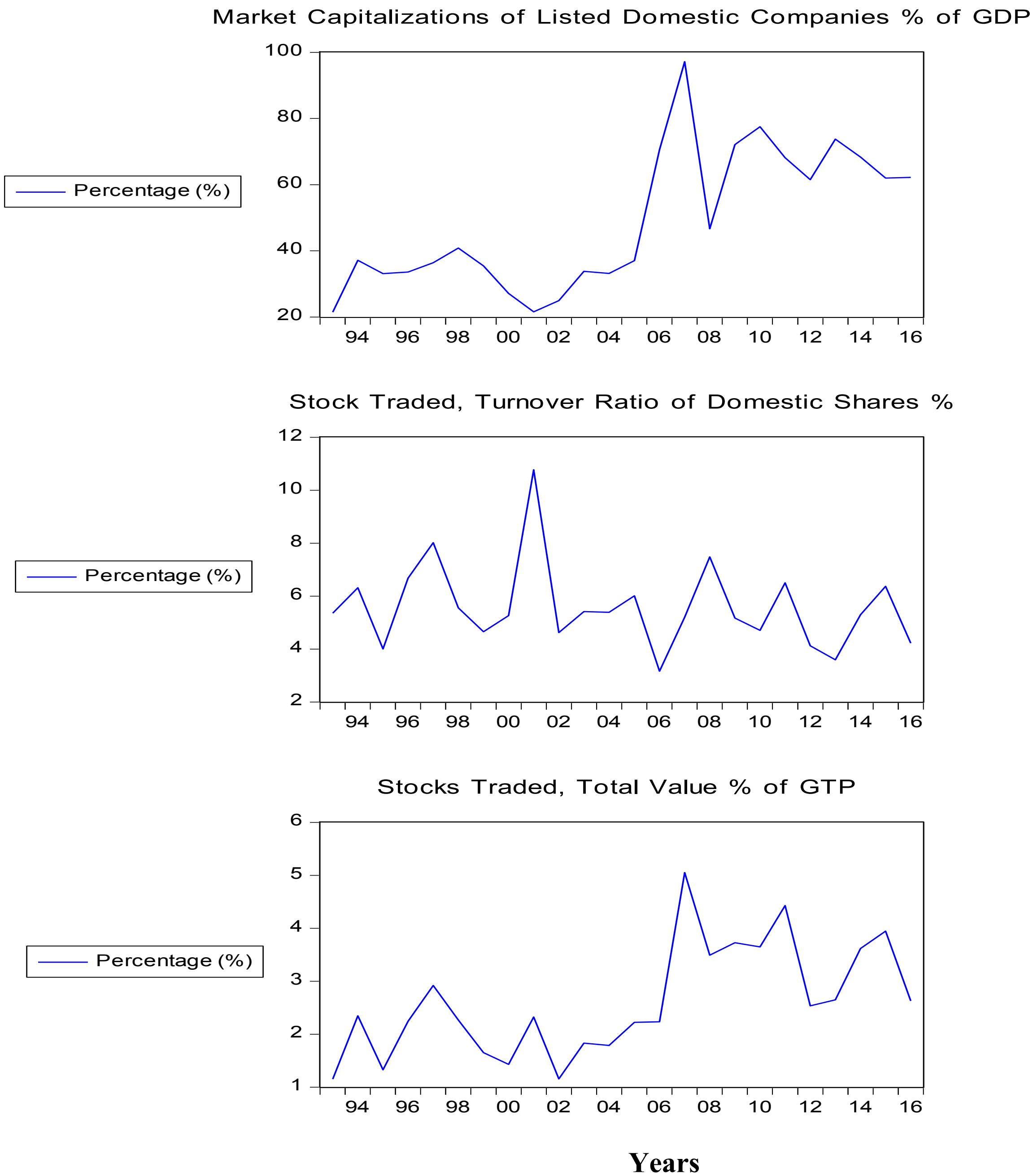
Figure 33MAU: Growth Pattern of the Number of Domestic Companies Listed on the Exchange of Mauritius



Source: Mensah (2020)

The number of companies listed on the stock market of Mauritius experienced a steady increase from 2012 to 2016. Prior to 2012, the growth pattern was topsy-turvy. It is worth mentioning that more companies begun to list on the country's stock market from 2006.

Figure 34MAU: Trend of Market Capitalization Ratio, Turnover Ratio and Value of Stocks Traded of Mauritius



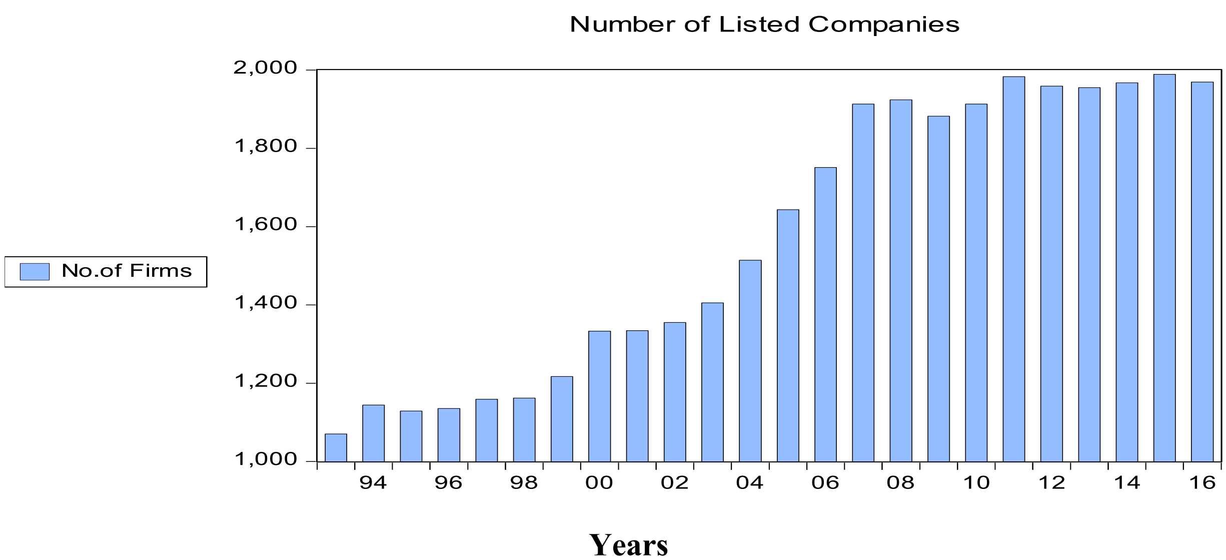
Source: Mensah (2020)

The market capitalization ratio of Mauritius grew inconsistently throughout the period under review. It however peaked in 2007 and thereafter took a nosedive in 2008. The ratio after 2008 remained high, with intermittent up and down movements. The growth pattern of turnover ratio and the stocks traded ratio was irregular throughout the period. The turnover ratio recorded the highest growth in 2001, while the stocks traded ratio recorded the highest growth in 2007.

Asia & Australia

Stock Market Indicators of Australia

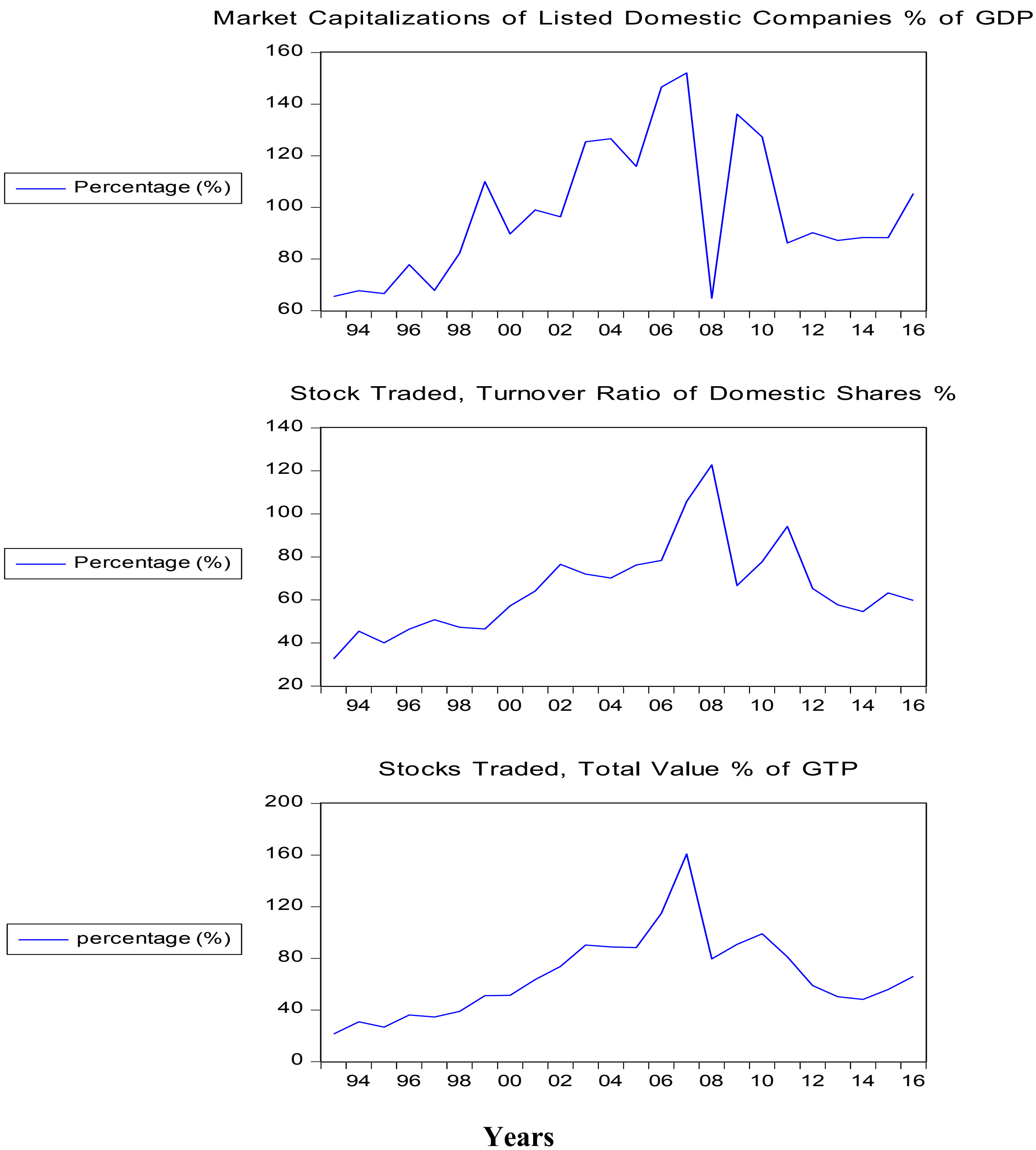
Figure 35AUS: Growth Pattern of the Number of Domestic Companies Listed on the Exchange of Australia



Source: Mensah (2020)

The pattern of growth of the number of companies listed on the stock market of Australia was erratic between 1993 and 2000. The number of companies then increased steadily from 2001 to 2008. It is crucial to note that the number of companies listed on the stock market of Australia increased significantly between 2004 and 2016.

Figure 36AUS: Growth Pattern Market Capitalization Ratio, Turnover ratio and Value of Stocks Traded of Australia

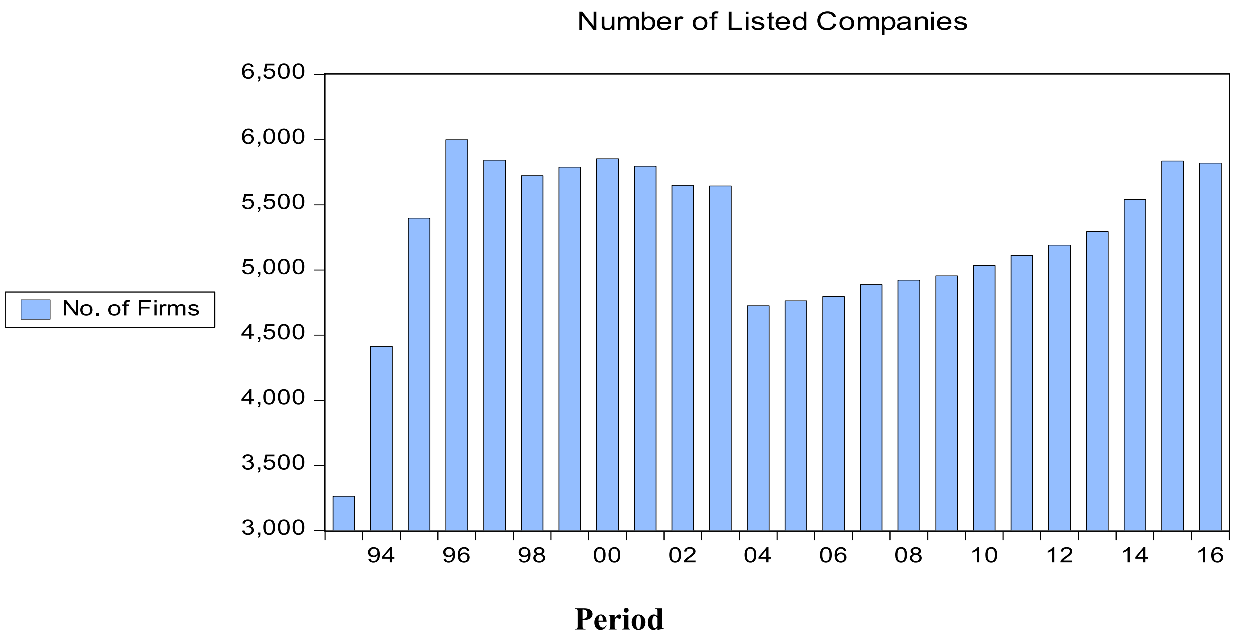


Source: Mensah (2020)

The growth pattern of market capitalization ratio of Australia was undulating throughout the period under review. It registered the highest growth in 2007 and plummeted in 2008. The ratio, however, increased sharply in 2009 and thereafter decreased. The growth pattern of the turnover ratio of Australia was not different – the pattern was inconsistent. It recorded the highest growth in 2008, due to the global financial crisis which caused many investors to liquidate their stocks. As can be seen from the figure above, the stocks traded ratio also experienced a topsy-turvy pattern during the period under consideration.

Stock Market Variables of India

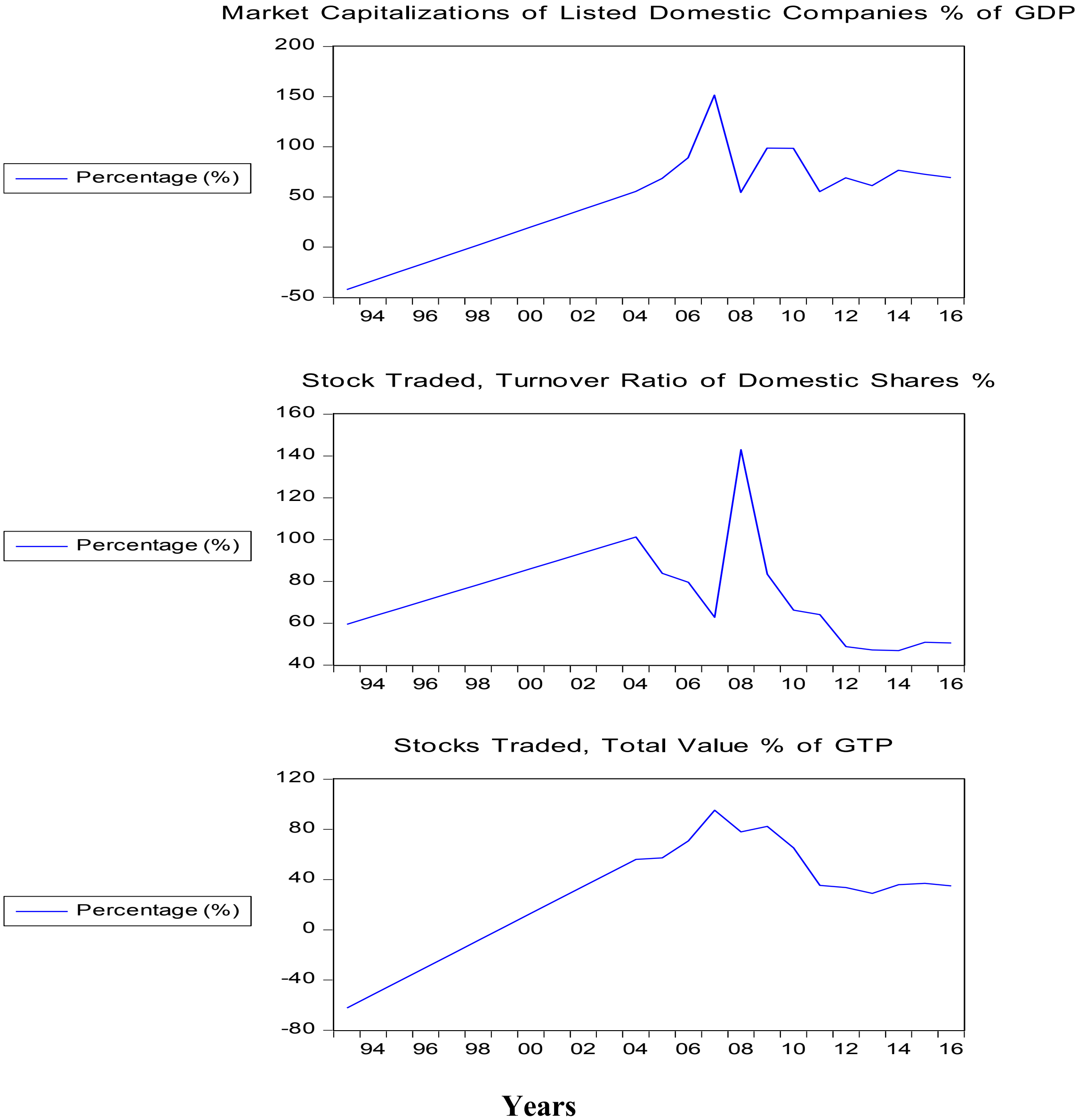
Figure 37IND: Growth Pattern of Number of Domestic Companies Listed on the Exchange of India



Source: Mensah (2020)

As can be observed from the diagram above, more companies listed on the stock market of India in 1996 than any other year during the period under review. The number of companies listed on the market was relatively high between 1995 and 2003. The numbers fell marginally between 2004 and 2013, and then increased relatively from 2014 to 2016.

Figure 38IND: Trend of Market Capitalization Ratio, Turnover Ratio and Stocks Traded of India



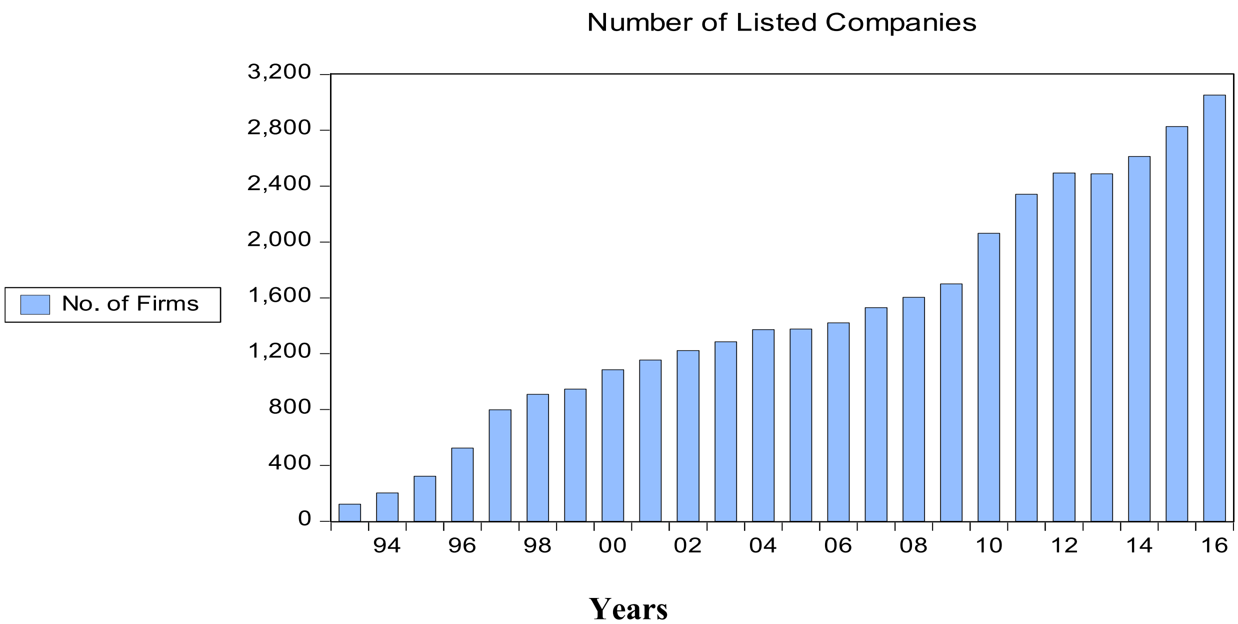
Source: Mensah (2020)

The market capitalization ratio of India increased steadily from 1993 to 2007. It subsequently plummeted in 2008 and thereafter assumed a patchy trend. In the same fashion, the turnover ratio of India rose consistently from 1993 to 2005. It recorded the highest growth in

2008. The stocks traded ratio also increased progressively from 1993 to 2005 and thereafter, assumed an irregular trend.

Stock Market Indicators of China

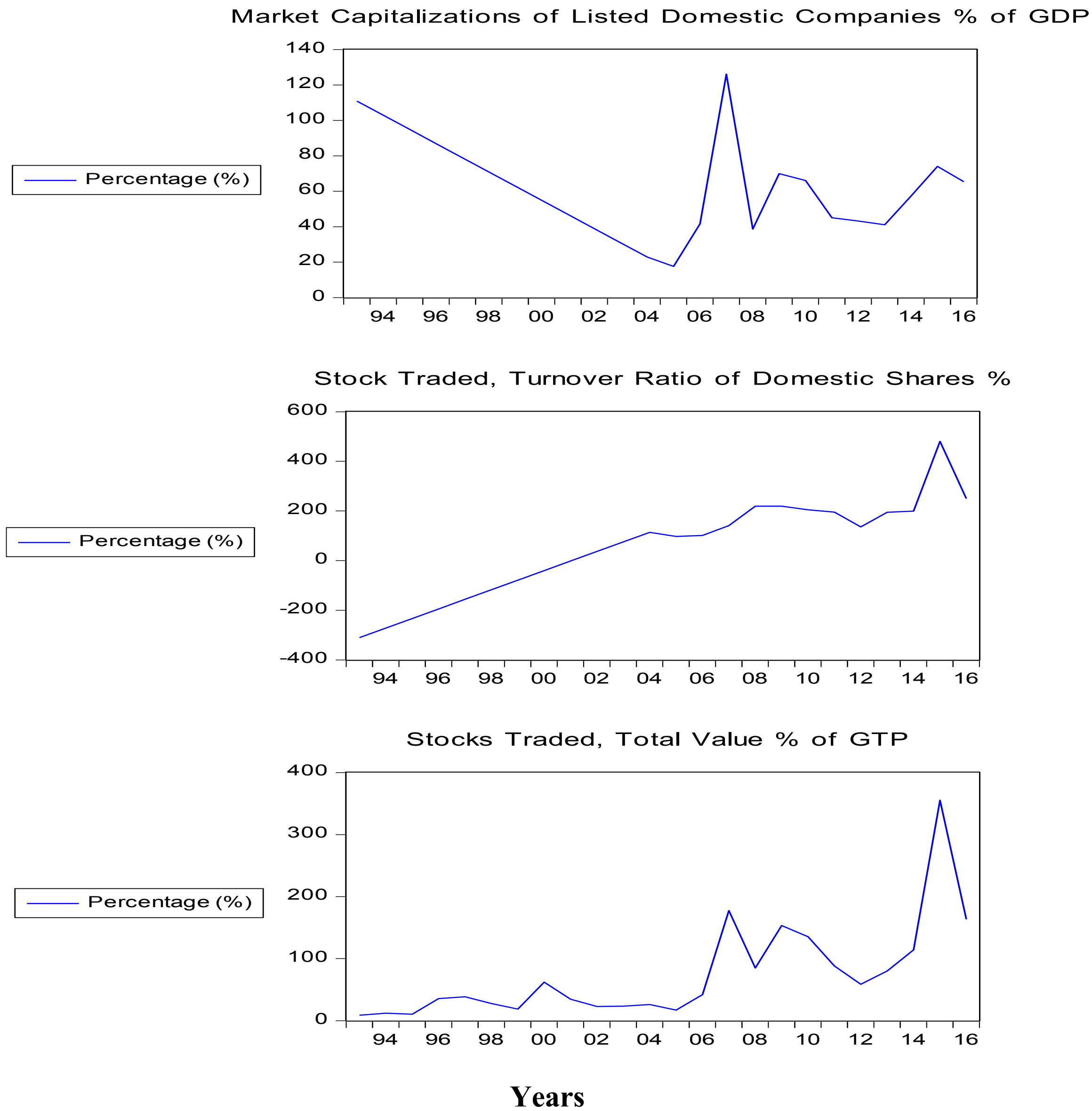
Figure 39CH: Growth Pattern of Number of Domestic Companies Listed on the Exchanges of China



Source: Mensah (2020)

As can be gleaned from the figure above, the number of companies listed on the stock market of China increased progressively from 1993 to 2004 and then dropped marginally in 2005. It thereafter grew consistently up to 2012. It is worth noting that the number of companies listed on the stock market increased at a relatively higher rate from 2013 to 2016.

Figure 40CH: Growth Pattern of Market Capitalization Ratio, Turnover Ratio and Value of Stocks Traded of China

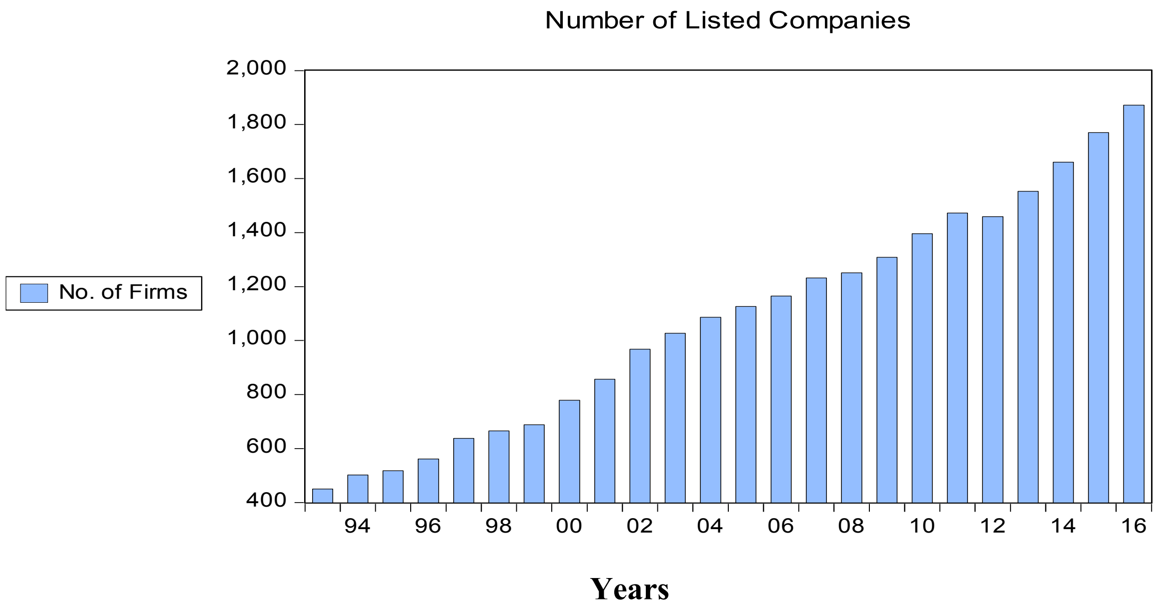


Source: Mensah (2020)

The market capitalization ratio of China decreased increasingly between 1993 and 2005. It, however, peaked in 2007 before plummeting in 2008. The turnover ratio of China, unlike the market capitalization ratio, increased consistently from 1993 to 2005. It experienced a patchy growth pattern during the remainder of the period under review. As can be seen from the diagram above, the stocks traded ratio experienced undulating growth pattern throughout the period.

Stock Market Variables of Hong Kong

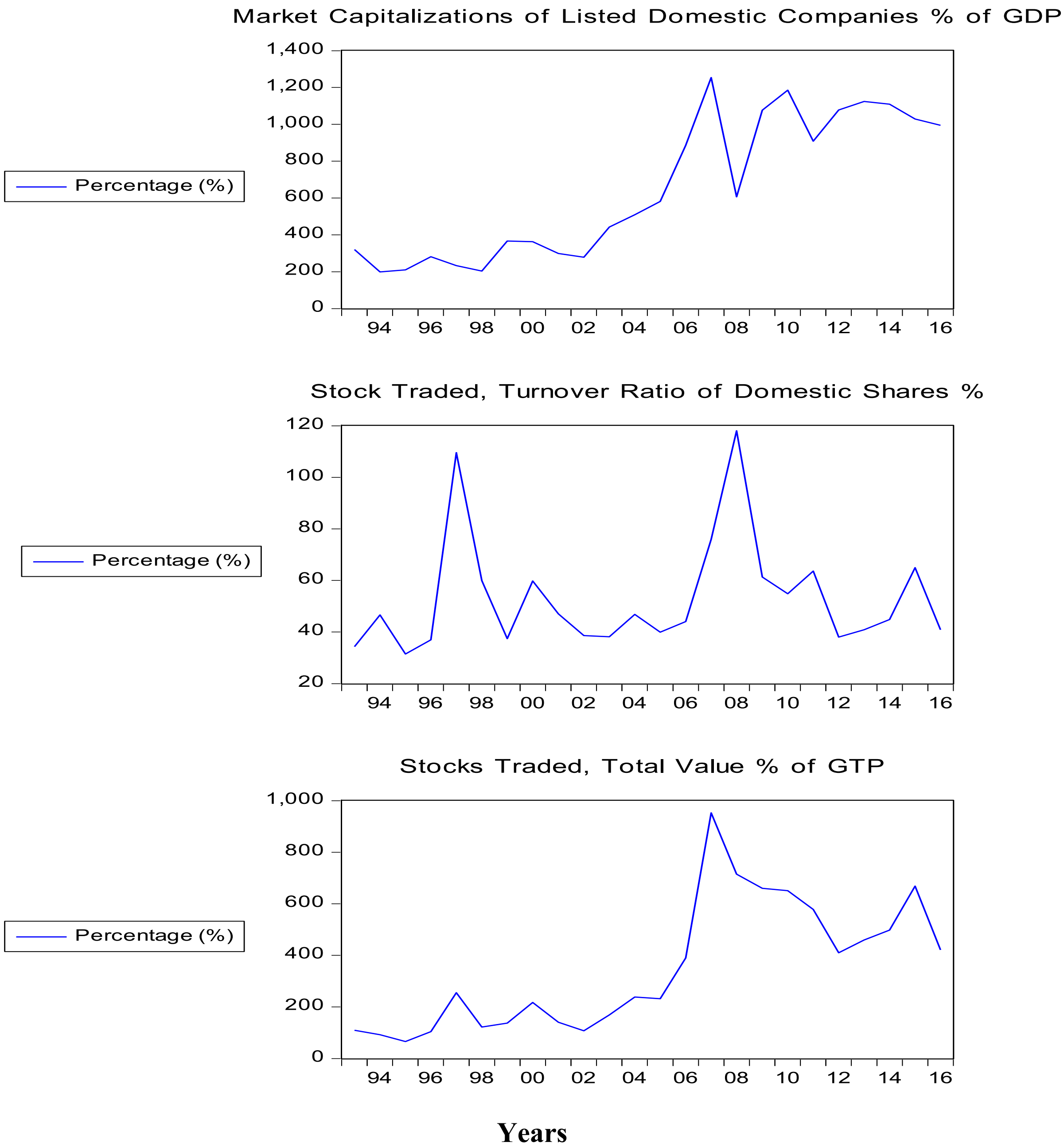
Figure 41HK: Growth Pattern of Number of Domestic Companies Listed on the Exchanges of Hong Kong



Source: Mensah (2020)

The number of companies listed on the Hong Kong stock exchange increased progressively from 1993 to 2011. It decreased marginally in 2011 and subsequently assumed an upward trend from 2014 to 2016.

Figure 42HK: Growth Pattern of Market Capitalization Ratio, Turnover Ratio and Value of Stocks Traded of Hong Kong

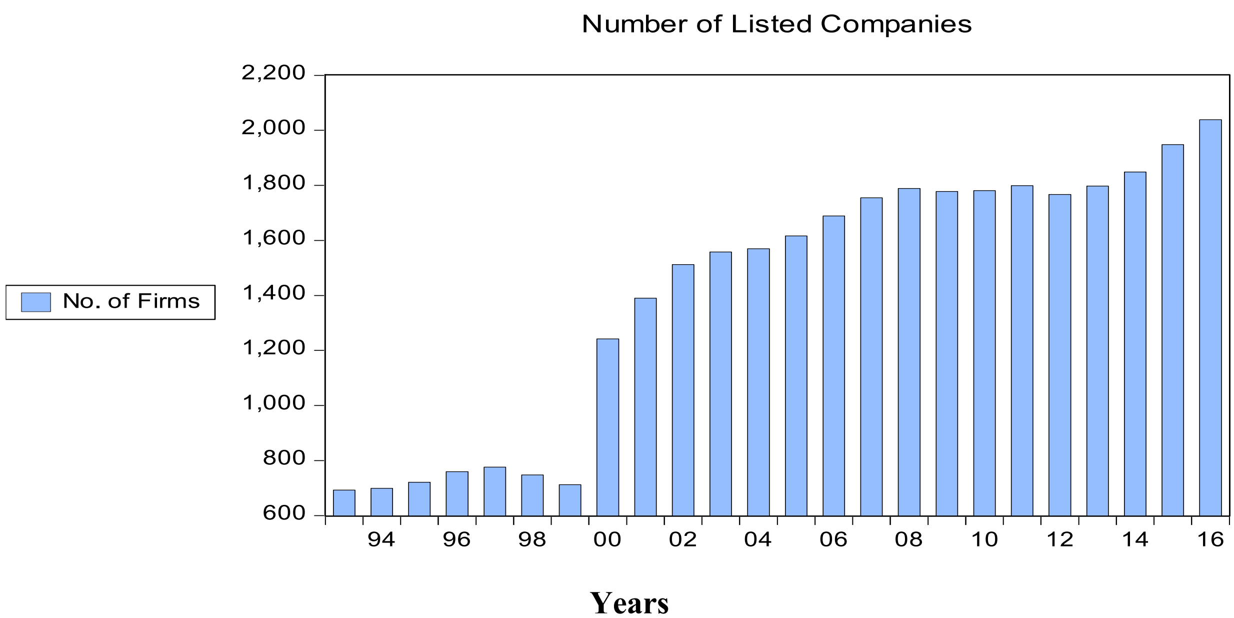


Source: Mensah (2020)

The market capitalization ratio of Hong Kong grew erratically between 1993 and 2006. It peaked in 2007 and plummeted in 2008**.** The turnover ratio also grew totteringly throughout the period. It nonetheless recorded the highest growth in 2008. Just like the turnover ratio, the stocks traded ratio of Hong Kong grew waveringly throughout the period. It also peaked in 2008.

Stock Market Variables of South Korea

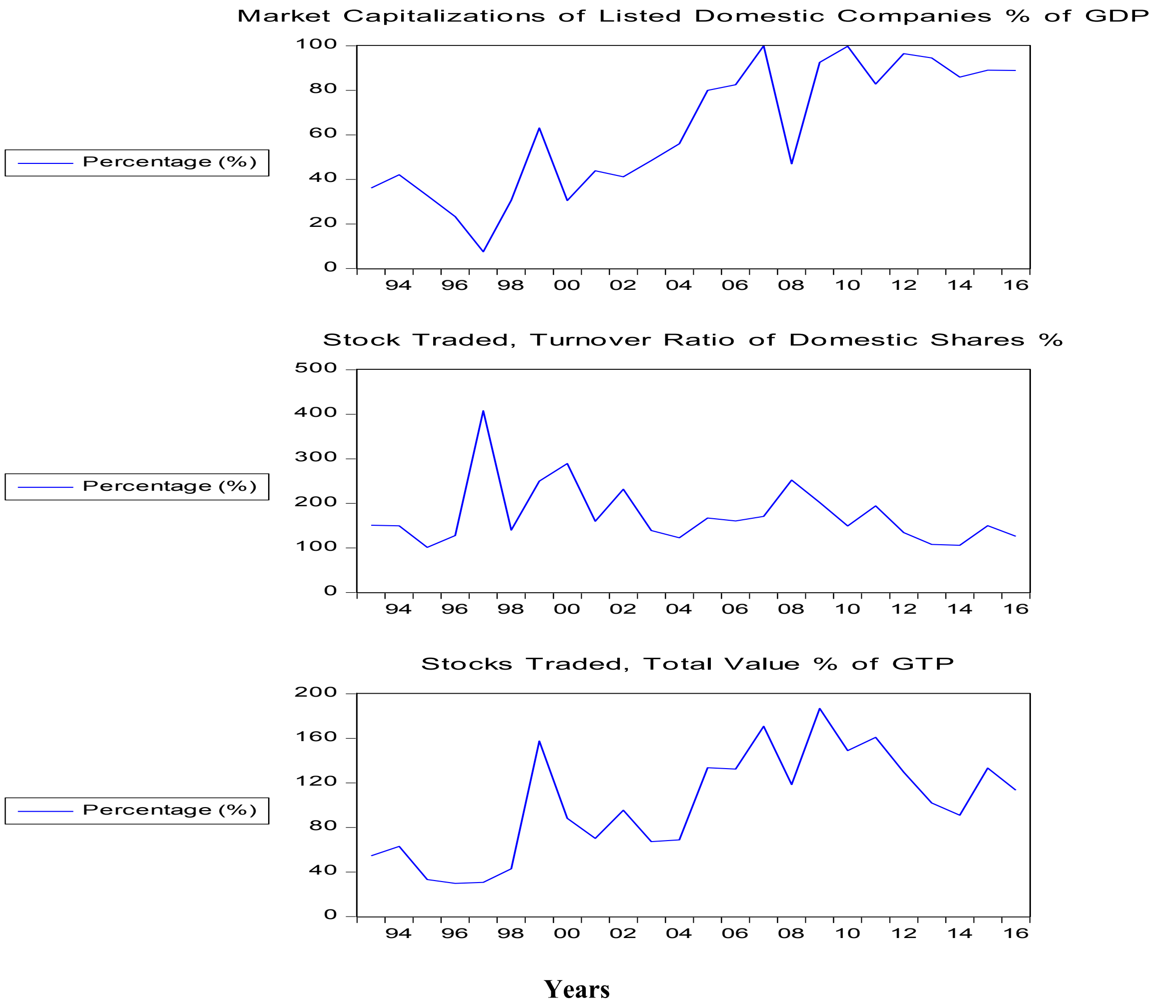
Figure 43SK: Growth Pattern of Number of Domestic Companies Listed on the Exchange of South Korea



Source: Mensah (2020)

Until 2000, the number of companies listed on the stock market of South Korea was relatively small. The stock market had the highest number of companies during the period in 2016. This, coupled with the growth trajectory after 1999 suggests that companies in South Korea are developing appetite for equity financing.

Figure 44SK: Growth Pattern of Market Capitalization Ratio, Turnover Ratio and Value of Stocks Traded of South Korea



Source: Mensah (2020)

The growth pattern of the market capitalization ratio of South Korea during the period was patchy, just like that of the turnover and stocks traded ratios.

Reason for the Continuous Decline in Companies Listed on the Sample Exchanges

As can be gleaned from the growth trend of the various sample countries above, the number of companies listed on the said exchanges have been in decline. For the past 20 years, public corporations around the world have been disappearing. The number of companies listed on major Stock Exchanges has dropped by over half since 1996. The dot.com bust of 2000 and the financial crisis of 2008 account for some of this decline, yet the downward trend has continued with little let-up, even as the markets have reached record highs. This may also be chalked to the volatility of the stock markets, which has forced companies to develop an appetite for debt financing at the expense of equity financing. Alternative financing (i.e. Venture capitalist, business angels, seed financing, private equity firms, hedge funds), have also contributed to the unattractiveness of the stock markets vis-à-vis equity financing.

Summary and Conclusion

This chapter appraised a copious amount of available literature on the subject under investigation and gave an overview of the economies and the stock markets of the sample countries. It also analyzed the growth patterns of the stock market indicators of the selected countries. Theoretical and empirical evidence for the stock market development-economic growth nexus was reviewed in order to provide a remit for the resulting analysis. In this regard, the chapter first conducted a review of extant theoretical literature on the nexus in order to set a theoretical framework for the study. The review considered the exposition of Fink et al (2006) on the relationship between financial markets and the real economy. They posited that the relationship between financial markets and stock markets take five forms – supply leading, demand-driven, interdependence, no causal relation and negative causality from finance to growth. The supply-leading theory, also known as "Finance-Led Growth" hypothesis propose by Mckinnon (1973) and Shaw (1973) stipulates that the growth of financial assets precipitates economic growth; thus; financial market development positively influences economic growth. Schumpter (1911), who is believed to be the pioneer of this hypothesis theorized that a well-functioning financial system would serve as a catalyst for technological innovations through the efficiency of resource allocation from the unproductive sector to the productive sector.

The chapter further looked at the demand-driven hypothesis, which was propounded by Friedman and Schwartz (1963). They argued that economic growth leads to increased demand for financial services, which in turn, causes the growth of financial markets. The Interdependence or Bi-Directional Hypothesis tried to establish the directionality of the causal relationship between stock market development and economic growth. The study of Lucas (1988) was reviewed in furtherance to Fink et al. (2006), the submission that the relationship between the stock market and economic growth can be nil. Lucas (1988) concludes that there is no relationship between financial sector development and economic growth.

A review of literature on the endogenous growth theory vis-a-vis stock market reveals that the stock market serves as a means of risk allocation, promotes economic growth by serving us a continuous avenue through which ownership of a firm can change without causing any disruption to the production process and serves as a means through which investors can diversify their risk portfolio. Barring the existence of the stock market, firms in need of capital would have to liquidate their assets, thus rendering them less productive.

The general impact of stock market development on economic growth was explored. It is found that, among other things, the stock market create liquidity by serving as a means of financing high earning long-term projects while fulfilling the short-term commitment requirements of investors; the stock markets partake in the process of capital mobilization as they join the savings of various investors for their efficient use in projects by entrepreneurs; the stock markets provide an economical means of assessing, aggregating and publicizing information through a pricing process, which consequently makes it possible for efficient allotment of resources to the firm in a number of ways and; the stock market to minimize the risks associated with investment makes it possible for investors to pool risk among themselves over several projects .

From the foregoing, the essence of stock market development in economic growth cannot be overemphasized. Because the financial market is largely considered to comprise of banks and stock market institutions, the question of what kind of financial development – stock market development or banking-oriented system is more appropriate for economic growth has been asked severally. It has been found that stock markets and banks may complement each other in supplying financial services for economic growth.

In general, the traditional empirical literature on growth was not adequate to examine the financial markets and economic growth nexus. This is because the literature is mainly focused on the steady-state level of capital stock per worker or productivity instead of the rate of growth that is endorsed to exogenous technical progress. The driving force behind the growing interest of contemporary literature in the financial development - economic growth nexus stems from the tenets of endogenous growth models. However, the review of extant empirical literature discloses the varying relationship between stock market development and economic growth (i.e. positive, negative and no relationship). This chapter also profiles the sampled countries and their economies. Data on the stock market indicators of these countries during the period under review were graphed and analyzed. It is worth mentioning that the trends of growth of these variables have been undulating.

The findings and results from this review, reveal mixed opinions from the significant extant literature on the specifics of the topic of investigation for this research. Undeniably, when well-thought-out together, it is clear that the results of previous studies on stock market development on economic growth or vice versa are inconclusive. This stems from the fact that they cannot be regarded as robust or complete, and are often contradictory in line with different opinions from researchers. A growing body of work reveals a close relationship between the stock market development and economic growth. Some studies establish a positive relationship between stock market development and economic growth, whereas some conclude that there is a negative relationship). Others also found a negligible relationship between stock market development and economic growth. In to this, though, to date, no significant work has come out massively on a particular relationship that supersedes others such as either positive or negative or negligible, it is perhaps inappropriate then to say that it is not possible to draw an appropriate theoretical framework for this research. Also, there is not really, literature that considers stock market development components on economic growth and other growth indicators vis-à-vis alternative credit solutions and the traditional macroeconomic variables at ago.

For this reason, literature was also considered and reviewed on other alternative credit and lending solutions, other sources of financial markets (OTC trading, shadow banking, peer to peer lending, venture capital finance) alongside other growth indicators that might have a direction on the stock market development (market capitalization ratio or stocks traded total value to GDP, stocks traded turnover to GDP or number of listed companies) and economic growth.

Chapter 3: Methodology

Introduction

The general objective of the research is to investigate the effects of stock market development on GDP growth. Specifically, the core objective is however spelt on financial development, with a focus on stock market development while considering both the banking sector, macroeconomic factors, and other related factors and their impact on economic growth. The chapter is the methodology section as indicated in chapter one; it detailed the outline of the research method used such as the philosophical approach, research design, data description, sampling method, model specifications, estimation methods and summary of the chapter.

Philosophical Approach

According to Creswell (2008), two significant elements of individual definition stand that the method to research encompasses philosophical assumptions as well as distinctive techniques or processes. Slife et al. (1995) as quoted in Creswell (2008), that while philosophical concepts stand generally hidden in research, they still have influences on the practice of research and requires to be detected. Creswell in his understanding, among other things, views pragmatism that it provides a philosophical foundation for research, and considers it as not committed to any one system of philosophy and reality. A proposal might include a section that addresses the under-listed in writing about worldviews according to Creswell (2008), as the philosophical worldview proposed in the study; a definition of crucial considerations of that worldview; and how the worldview shaped their approach to research. In this study, much more consideration was extended to different worldviews of the philosophical approach (i.e. epistemologies & ontologies, postpositivism, constructivism, advocacy/participatory, and pragmatism).

This study, however, considers the positivist/post-positivist worldview assumptions, that represent the orthodox arrangement of research. The justification is that the assumptions hold factual much more for quantitative research than qualitative research. This worldview is occasionally called the scientific technique or doing science research. It is also termed positivist research, empirical science, and postpositivism. In the works of Phillips & Burbules (2000), as stated in Creswell (2008), postpositivism, as it has been termed, represents the thinking subsequently positivism, challenging the traditional conception of the all-inclusive certainty of knowledge. Also, we recognize that we cannot be positive about our assertions of knowledge when studying the behaviour and actions of humans. Post-positivists hold a deterministic philosophy in which causes probably determine effects or outcomes. Thus, the problems studied by postpositivists reflect the need to identify and assess the causes that influence outcomes, such as found in experiments. It is also reductionistic in that the intent is to reduce the ideas into a small, discrete set of ideas to test, such as the variables that comprise hypotheses and research questions.

Creswell (2008), is of the view that the knowledge that evolves via a post-positivist lens is premised on careful observation and assessment of the objective reality that exists "out there" in the world. Thus, developing numeric measures of observations and studying the behaviour of individuals becomes paramount for a post-positivist.

Finally, the world is governed by laws or theories, and these need to be evaluated or verified and refined so that we can understand the world. Thus, in the scientific method, the accepted approach to research by postpositivism, an individual begins with a theory, collects data that either supports or refutes the theory, and then makes necessary revisions before additional tests are made (Creswell, 2008).

Approaches to Inquiry

Creswell (2008) emphasises that the scholar chooses not only a quantitative or a qualitative or a mixed method of study to conduct, but the researcher also resolves on a sort of study within these three choices. He explains that strategies of inquiry are forms of qualitative, quantitative and mixed techniques of designs or models that offer definite direction for measures in research design. Additionally, Creswell recognises in his previous work that other researchers, including himself, term them as approaches to inquiry (Creswell, 2007), or research methodologies (Mertens, 1998). He concluded by saying that procedures accessible to the scholar over the years grew, as computer technology has pushed forward data analysis and capability to assess multifaceted models. In the same vein, individuals have expressed new processes for undertaking social science study.

In the works of Stainton-Rogers (2006) and Blaikie (2000), as examined by Atchulo (2015), there are three logics of enquiry (i.e. induction, deduction, and abduction). Induction is a procedure of drawing inferences from observations in order to make generalisations, preferably, the procedure for induction involves of four primary phases; observation, analysis, inference, and confirmation according to Atchulo (2015, from the works of Stainton-Rogers, 2006 and Blaikie, 2000). These scholars, fundamentally express that the induction procedure is attaining knowledge via collecting objective data devoid of any preconceptions in order to establish regularities. Contrary to the inductive process is the deduction process. Deduction acknowledges that preconceptions play a vital role in the gaining of knowledge and that it is theory-driven.

According to Atchulo (2015), as cited in Stainton-Rogers (2006), putting a theory's predictions to test is crucial to the deductive procedure. There is a high propensity for the processes of induction and deduction due to the positivist nature to over-simplify highly complex things happening in the world. An abduction process is a term less familiar nevertheless spells on logic of enquiry acknowledged. It involves building up a new theory instead of testing it out. An abduction tends to focus on creating methods to conduct meaning analysis, instead of proliferating more comprehensive theories. The use of an abductive procedure does not provide an explanation; however, of what is likely to happen to be unfolded and uncovered (Atchulo, 2015). Explication appears to exceed an interpretation and considers what is happening in a particular situation.

Reason(s) of Analysis for the Research

The data for this research is sourced from quantitative reviews from WDI, IMF, OECD, AfDB and WEF reports. Consequently, a review of data such as data exploration under the study constituted prime data for the analysis. In reference to the examination of the various logics of analysis (i.e. induction, deduction, and abduction), this work acknowledges each to test the theory behind the way research, is undertaken.

The overall objective of this research is to examine the development of the stock market and economic growth and vice versa; thus, deductive and inductive methods are deemed appropriate for the study. As indicated in the final chapters, this study encompasses a multifaceted scene which the processes adopted would to a large extent result in simplification of the phenomenon being studied.

Therefore, the analysis for this study employs a sequence of observation and directions that guide the research objectives, and hypotheses outlined in Chapter One. Given the positivist/post-positivist perception embraced for the research, data was vigorously and mathematically explored not to pre-judge the data but to have a fair knowledge of the idea of the topic under study. The purpose of this research is to generalize, and therefore the inductive approach is appropriate for such a research. Additionally, the deductive method is equally sufficient in evaluating the data obtained for this analysis. The overall objective of this research is to investigate the effect of stock markets on economic growth and vice versa; hence both deductive and inductive methods are deemed appropriate for the analysis.

As revealed in later chapters, this study involves a highly complex phenomenon and the processes adopted would to a large extent result in simplification of the phenomenon being studied. Therefore, the analysis for this study employs a series of observation and headings that reflect the research questions outlined in Chapter One. Given not only the positivist perspective adopted for the study, postpostivism was equally considered. Data was vigorously and mathematically explored not to pre-judge the data but to have a fair knowledge of the idea of the topic under study.

Method of Research

This is essentially a quantitative research. The reason for choosing a quantitative technique, among other things is that it regularly ends with confirmation or rejection of the hypothesis tested. Further to the preceding, researchers using the quantitative method identify one or a few variables employable by them in undertaking research and continue with the collection of data connected to those variables. Quantitative processes often deal with outcomes or results computation in the area of finance and system examination using a scientific approach.

The objective of the quantitative technique is to develop and use models built on a mathematical approach, hypotheses, and theories pertaining to the impact of stock market development on economic growth. The procedure of dimension as stated in this chapter is the focus of quantitative technique in line with its connectivity amid empirical reflection and mathematical mien of quantitative relations. This technique is well-known as an iterative procedure where evidence is assessed, and hypotheses and theories are developed with some technical advances, leveraging on a statistical approach.

In conclusion, the quantitative method is well-matched with this study because it permits the research problem to be conducted in a very specific and set terms (Cooper & Schindler, 1998). Also, quantitative research simply and characteristically specifies both the independent and the dependent variables under investigation. The quantitative method furthermore, pursues doggedly, the original set of research goals, arriving at more objective deductions, testing hypothesis, determining the issues of causality and eliminates or minimizes subjectivity of judgment (Kealey & Protheroe, 1996). Furthermore, according to (Matveev, 2002), this technique permits for longitudinal measures of ensuing performance of research focuses.

Data Collection

The study adopted the secondary data type of both panel data (at one instance) and time-series data (at other instance) of the sampled countries. The choice of panel data, on the other hand, is also to allow for modelling the complexity of the variables under consideration. Andreß (2017) examines the use of panel data, and in his findings, states that stability and change are essential elements of social reality and economic progress. He further reiterates that cross-sectional investigations are ways of providing information on specific issues at a particular point in time, though without providing any information about the prevailing stability. According to him, limited information on change can be gotten by backdated questioning, but this is often weakened by “recall bias.” Nevertheless, valid information on change is essential for evaluating whether phenomena such as poverty are permanent or only temporary. He concluded that panel data analyses can address these difficulties as well as provide an essential tool for effective policy design.

Panel data holds numerous rewards over cross-sectional or time-series data, especially, by mixing the inter-individual differences and intra-individual undercurrents. Typically, it guarantees extra correct inference of model parameters. It usually contains more degrees of independence and more sample variability than time-series data. Panel data also permits the construction and testing of more complicated hypotheses. Considering the sample size of this study, it would be costly to use time-series data throughout. Also, the choice of panel data is to give universal dimension to the analysis.

The aim of the time series method is to ascertain telling characteristics in the data that can be used in making statements about future outcomes. As a linear model of analysis, the time series technique is partly employed to ascertain trends. More importantly, the time series method is partly adopted for the study because it is a useful tool in the measurement of both financial and endogenous growth, which is the crux of this study.

The study of Bhaskaran (2012) affirms that time series analysis is crucial to engineering, scientific, health care research, manufacturing and business endeavours.

Researchers learn about systems evolving through time, in the quest to distinguish their fundamental principles and create models useful to forecast or control them. The increase in the use of time-series data has initiated a countless deal of research and development efforts in the area of data mining hence the importance of the time series.

In this research, as indicated previously, data was collected from targeted secondary sources. The researcher relied on gathering information from other recognised scholarly sites as well. The data sources from the World Bank Development indicators and IFC sites, especially were selected since they are the most dependable and generally employed mostly by researchers. Data from these sources have benefits; they offer numerous arrangements tools such as, data can be downloaded into excel file without any constraint. The feeble side is that data available is not updated often, and do not come in monthly, quarterly and semi-annually.

In this study, data was collected through the use of numbers purposely for statistical analysis unlike for qualitative research where words and images of a few participants collected at their respective research sites. In undertaking this type of study, it appears that choosing one methodology over another severely limits the scope, just in any other study.

Creswell and Plano Clark (2007) perceive that one technique alone cannot answer all the questions that will arise in the course of researching a topic. In view of this and in order to ease more all-inclusive research, the researcher attempts to have access to all available research tools. The contrast, therefore, is reconsidered and the researcher appreciates that in studies of this nature, there must be proficiency in both methodologies. It is in this vein that a little aspect of the study is of a qualitative in nature, such as exploration of data to pre-direct the research.

Data Description

The researcher gives much consideration to the purpose of the research, and the focus is mainly on market capitalization as a percentage of GDP since it is less subjective than the other procedures. Also, different measures of stock market development are highly correlated (Demiguc-Kunt and Levine, 1996).

More variables of stock market development are used in the literature (i.e. the number of listed companies, changes in the stock market index, turnover ratio of the volume of stocks traded). In order to unravel the effect of stock market development on economic growth in the samples, as in the studies of Yartey et al. (2008) & Odhiambo et al. (2017), the paper employs economic growth on stock market development indicators and other complementary variables.

Singh (1997) asserts that the stock market is expected to fast-track economic growth by boosting domestic savings and increasing the quality and quantity of investment.

The stock market is expected to boost savings by providing individuals with a supplementary financial tool. Majority of studies employed broad money (M2) as a percentage of GDP to measure financial depth. In spite of that, King and Levine (1993), argue that this approach does not tell us whether the liabilities are those of the central bank, commercial banks or other depository institutions. Yartey (2008) though appreciates broad money (M2) as a measure of banking sector development, he supports King and Levine's assertion. He used domestic credit to private businesses to estimate banking sector development in his model instead of using the broad money supply. This paper considers bank credit to private firms, gross domestic savings and broad money (M2) to have a different view of the effect of the depth of banking sector development on stock market development. Their conclusion reiterates for stable macroeconomic environment as well as pressing for predictable and less inflation. It is not possible for investors to invest in the stock market where there are expectations of high inflation, the reverse enhances the stock market. Garcia and Liu (1999) find that a sound macroeconomic environment among other variables is an important determinant of stock market development in emerging markets.

In a study on the relationship between economic growth factors and stock price movement, Abimbola & Olusengun (2017) confirm a positive linkage between stock price movement and some growth factors such as aggregate output and exchange rate. From the foregoing, this paper will consider inflation and exchange rate as indicators of macroeconomic stability and for that matter, determinants of stock market development on growth. The data ranges from 1993 to 2016 (23 years). The research uses the income level as a complementary indicator of stock market development because it has been found to be highly correlated with the size of the stock market. Demand-driven hypothesis advocates, argue that the broadening of an economy will generate innovative demand for financial services. The research considers GDP per capita to measure the income level. To also measure private capital flow, the research employs FDI ratio. Foreign investors partake extensively in emergent stock markets over the past few decades, hence justified for the inclusion.

This has led to capital mobility (an increase in capital flow). The protagonist of foreign direct investment in the stock market development of developing economies is well-thought-out as very solid. Adam and Anokye et al. (2008) observe a triangular causal relationship between these two (i.e. foreign direct investment influences economic growth, economic growth exerts a positive influence on stock market development), thus; foreign direct investment promotes stock market development.

The Taxonomy of Sampling

Chiradee (2013) defines sampling as a way of identifying, selecting and gathering data from the individuals that will represent the population to achieve the objective of the research with the appropriate utilization of money, time and effort. Other researchers have defined it differently, though, with the same theme. For instance, Fraenkel, Wallen, & Hyun (2012) succinctly put it as the process of selecting individuals to partake in research.

According to David (2005) and Mercado (2006), it is a system of selecting population from the general population for research based on the objective of the study, time, availability of money and effort. They stated that the selected population must be representative.

Gill and Johnson (2002) do not directly define sampling, nevertheless, they consider it as the discovery of research population, which the researcher believes will present all information needed for answering the actual research question. Ary, Jacob and Rozavich (in Tejero, 2006) simply define sampling as the process of taking a part of the population, making observations on this representative group and then applying the findings to the larger population.

According to David (2006), Fraenkel, Wallen, & Hyun (2012) and Mercado (2006), sampling is divided into two broad categories (i.e. the random or probability sampling and the non-random or non-probability). As opined by Fraenkel, Wallen & Hyun (2012), in random sampling all the members of the population presumably had an equal chance of being selected. Cooper and Schindler (1998), cited in David (2005) point out that probability sampling is based on the concept that all elements in the population are given an equal possibility of being selected as a sample unit.

According to Gill & Johnson (2002), random sampling or probability sampling is meant to guarantee that those who partake in research are representative sub-set of the research population. Hence, any findings made based on the sub-set can be generalized to the bigger population. Mercado (2006) simply describes probability sampling as choosing the sample by chance. He further states that all the findings/results are applicable to the entire population. On the other hand, in non – probability or non- random sampling, no member of the population is guaranteed a chance of selection. Fraenkel, Wallen & Hyun (2012) simply describes it as a pejorative sampling. Opponents of this sampling technique argue that it allows for bias to be perpetuated, where certain type/class of sample units/ elements stand a better chance getting selected than others because of the preference of the researcher. Cooper and Schindler (1998), in David (2005) also points out that non- probability sampling is unscientific and is by and largely subjective. Under non- probability sampling, researchers choose sample cases as they desire.

Gill & Johnson (2002) state that when a sampling structure is not available, or where research is investigative, a researcher may decide to deliberately select a sample based on his/her judgment about the population interest, with a specific purpose in mind. However, because it is prejudice and purposive, it is crucial that the researcher provides a clear justification for his/her selection vis-a-vis the research objectives and questions. Sevilla et al. (2006) & Tejero (2006) maintain that in non-random sampling, all participants of the study are derived through like-chances.

Sampling Method

Tejero (2006) argues that when dealing with a large population or large group and taking the entire population would be controllable, it is better to get a sample or a smaller group. It stresses the expediency of sampling methods. There are a variety of sampling techniques under the two sampling groupings; random and non-random sampling. There are three different techniques under the non-random sampling taxonomy; systematic sampling, convenience sampling and purposive sampling (Fraenkel, Wallen & Hyun, 2012).

David (2005) and Mercado (2006), on the other hand, found two methods of sampling under non-random sampling (. i.e. the accidental sampling or incidental sampling and purposive sampling). According to Fraenkel, Wallen & Hyun (2012), systematic sampling is a process where every individual in the population list is selected for inclusion in the sample. With regards to convenience sampling, they succinctly put it as a group of individuals who (i.e. conveniently) are available for study. In the place of convenience sampling, other writers use the term incidental sampling or accidental sampling. According to David (2005), in accidental sampling, the sample units are selected as when they become available.

Fraenkel, Wallen & Hyun (2012) juxtaposed convenience sampling against purposive sampling and assert that under the latter, the researcher employs a specific purpose in selecting a sample. Also, the researchers use their judgement based on previous material to select a sample that they consider, that will provide the data they need. While under the former, the researcher uses whatever is available and places key prominence on it and generalises it. In purposive sampling, the researcher employs a specific purpose in selecting a sample.

According to Fraenkel, Wallen & Hyun (2012), random sampling has several procedures including; the simple random sampling, stratified random sampling, cluster random sampling, and the two-stage random sampling. Under simple random sampling, each member of the population is given an equal and independent possibility of being selected. Proponents of this sampling method argue that even when the random sample is sizeable, it is still likely to produce a sample that will be representative. David (2005), defines it as a process of choosing sample cases of the subset of sample cases from a population, giving all the sampling units equal probability of being included as a sample.

Fraenkel, Wallen & Hyun (2012) define stratified random sampling as a process in which certain sub-groups are chosen for the sample in the same amount as they exist in the population. A population is made up of groups of participants with different characteristics, which can perhaps affect the interpretation of responses. Before sampling is undertaken, the universal target is further stratified into less or many similar subgroups or strata. A sub-sample is selected from each subgroup, either by simple random sampling or systematic sampling with a random start. From the foregoing, stratified random sampling can be said to be a system of selecting a group, categorizing the determined group into smaller groups subject to its existing features and then getting the equal sample from the identified subgroups. Cluster sampling, according to Sevilla et al. (2006) & Tejero, 2006), occurs when you select the constituents of your sample in clusters instead of using separate individuals. A group of individuals with analogous characteristics is a cluster. The two-stage random sampling, on the other hand, is usually used to merge random cluster sampling and individual random sampling.

The sample countries used for this study were selected from different continents. These countries are diverse in many facets – economic, political and social; thus; there is the need to put them in a group where a common denominator can apply to all of them. The researcher, therefore, took a continental and best-performing approach where five economically best-performing countries vis-à-vis stock market development were selected from each continent - Sub-Saharan Africa, Europe, Americas, and Asia & Australia. The common denominator used to group the countries in the various continents into a stratified set is the performance of their stock market. Thus, the best-performing stock markets in; (a) Americas: - Argentina, Brazil, Canada, United States and Mexico; (b) Asia & Australia: - China, Korea, Hong Kong, India and Australia (c) Europe: - Germany, United Kingdom, France, Belgium and Netherlands (d); and (e) Sub-Saharan Africa: - Cote d'Ivoire, Ghana, Nigeria, South Africa and Mauritius.

From the given thoughts, the sampling technique employed for the research is the stratified random sampling method under the random or probability sampling taxonomy.

Testing Procedures- Panel Unit Root, Cointegration and Long Run Estimation

Conventionally, panel data econometrics centres on micro panels that usually include thousands of samples (large N), which are tracked over a short amount of time (small T). This study, however, employs Stock Market, Banking Sector, Macroeconomic and other related variables that are collected for several countries on different continents over a significant number of years. The usage of panel datasets with large N and large T presents challenges to researchers.

Panels with extensive temporal coverage are likely to result in spurious relationships. Economic variables, for that matter, macroeconomic variables are often plagued with non-stationarity.

According to Baltagi (2008), temporal based observations generated two strands of ideas – firstly, the use of heterogeneous regressions for each country and secondly, the extension of time series method to panel in order to address issues of non-stationarity and cointegration. In the first instance, instead of using coefficient homogeneity, heterogeneous regression is conducted for each country (Pesaran et al., 1999). Furthermore, the second idea, as utilized by Kao & Chiang (2000) and Pedroni (2000) employs the extension of time series methods to panels. Steps involved in cointegration analysis in panel data are not different from those involved in time series analysis. The steps are (i) unit root testing; (ii) cointegration testing; and (iii) estimation of long-run relationships.

Unit Root Tests

Panel unit root tests have become an area of interest for econometrists. The aim has largely been to improve the perceived low power of individual unit root tests, especially in small samples. Panel unit root test is conducted to ascertain the stationarity properties of the variables. These tests have theoretically been grouped into types. The first one, according to Maddala and Wu (1999); Choi (2001); Levin et al. (2002) and Im et al. (2003), are first-generation tests. These tests assume cross-sectional independence. The second ones are classified as second-generation tests. They expressly permit some form of cross-sectional dependence (Pesaran, 2007). They consider the following autoregressive (AR) method for panel data:

$$y_{it} = \rho_i y_{i,t-1} + \delta_i Z_{it} + u_{it}$$

Where

ρ_i is the AR coefficient

u_{it} (the error term) is presumed to be autonomous and identically distributed (i.i.d.).

Z_{it} comprises distinct deterministic effects, such as constants and linear time trends, which capture cross-sectional heterogeneity.

Levin et al., (2002) developed the LLC test, which is considered as a panel extension of the augmented Dickey-Fuller (ADF) test:

$$\Delta y_{it} = \alpha y_{i,t-1} + \sum_{j=1}^{p_i} \beta_{ij} \Delta y_{i,t-j} + \delta_i Z_{it} + u_{it}$$

Since the lag length of the differenced terms (p_i) is not unknown, Levin et al., (2002), propose the following three-step procedure; conduct separate ADF regressions for each individual and generate two perpendicular residuals; calculate the ratio of long-run to short-run innovation standard deviation for each individual; then compute the pooled *t*-statistics, using the average number of observations for each individual and average lag length. In this test, the null hypothesis assumes a mutual unit root (H_0: $\alpha = \rho - 1 = 0$) against the alternate hypothesis that each time series is stationary (H_1: $\alpha < 0$). This is because the related AR coefficient is constrained to be homogenous across individuals (i.e. $\alpha_i = \alpha$ for all i). Levin et al (2002) indicate that the pooled *t*-statistic has a restrictive normal distribution under the null hypothesis. Hence, this test is often recommended for use in moderate sized panels, particularly for N>10 and T>25.

Im et al. (2003) expand the LLC test proposed by Levin et al. (2002), to derive IPS. In their frame, they allow heterogeneity on the AR coefficient. Their test, estimates individual ADF regressions, and then combine the result to perform a panel unit root test. This approach permits different stipulations of the coefficients (α_i for each cross-section), the residual variance and lag-length. The *t*-bar statistic proposed in this test by the authors is based on the average of the individual unit root (ADF) test statistics. This statistic calculates whether the coefficient α is non-stationary across all individuals (H_0: $\alpha_i = 0$ for all i), against the substitute hypothesis that at least a portion of the series is stationary (H_1: $\alpha_i < 0$ for at least one i).

It is worthy of note that both LLC and IPS tests require N to be small relative to T. Baltagi (2008) observes that the LLC test also requires a well-balanced panel. He also modified the LLC steps to address these difficulties. To demonstrate that the power of the LLC and IPS tests statistics is sensitive to the specification of the deterministic constituents, such as the addition of individual-specific trends, Baltagi (2008) and Breitung (2000), used Monte Carlo experiments.

This test statistic assumes a mutual unit root process. This test is regularly recommended for samples of around N=20 and T=30, as it is shown to be asymptotically distributed as a standard normal. Other researchers have also recommended different ways of ascertaining stationarity. Maddala & Wu (1999) and Choi (2001) also propose the use of nonparametric Fisher tests. These tests pool the probability limit values (*p*-values) of unit root tests from each cross-section instead of average test statistics. These tests are normally employed using individual ADF or Phillips-Perron unit root tests, and their asymptotic distribution follows a chi-square (*P*-test). Choi (2001), also proposes an alternate Fischer-type statistic that assumes a standard normal distribution (*Z*-test). The commonality to both the IPS and Fischer-type tests is that they combine results of individual unit root tests. Nonetheless, studies have suggested that

Fischer tests have better power than the IPS test. The downside to the Fischer-type tests is that *p*-values must at first be derived through Monte Carlo simulations.

In a further attempt to find a better test for panel statistics, Hadri (2000), put forward a residual-based Lagrange multiplier (LM) test. According to (Baltagi, 2008), this test is a panel generalisation of the KPSS test.

The experiment employs the results from different OLS regressions of y_{it} on deterministic elements (constant and trend) to calculate the LM statistic. This test is unlike the previous ones because it is a stationarity test. The null hypothesis does not assume unit root in any of the time series (all panels stationary), against the alternative of non-stationarity for some cross-sections. The downside to the tests discussed above is that they assume that data is independent and identically distributed (i.i.d.) across individuals (cross-section independence). Several empirical researches have debunked this assumption. In practice, movements of a given variable through time are not independent across countries. Banerjee et al., (2005), show that first-generation tests perform poorly in the presence of cross-section dependence because they tend to have severe size distortions, which culminates in the over denunciation of the null hypothesis (unit root) when the causes of non-stationarity are common across individuals. These observations have led to the development of second-generation tests for unit root tests for panels with cross-sectional dependence. To remove the effect of cross-sectional dependence, Pesaran (2007), suggests augmenting standard ADF regressions with the cross-section means of lagged levels and first-differences of the separate series. This individual cross-sectionally augmented Dickey-Fuller (CADF) statistics can, in turn, be used to develop adjusted types of standard panel unit root tests such as Maddala and Wu's P, IPS's t-bar or Choi's Z. These tests can be used, both when $N>T$ and $T>N$; and also have right size and power properties, even when N and T are quite small. It is worthy of note that the CIPS's *t*-bar statistic can only be calculated for balanced panels. However, in the case of unbalanced panels, the adapted *Z* test can be used.

Characteristics of Unit Root Tests

Table 1: Characteristics of Unit Root Tests

Test	Null	Alternative Hypothesis	Deterministic Components	Autocorrelation Correction	Cross-Section Dependence	Unbalanced Panel (Gaps)
LLC	UR	No UR	None, F, T	Lags	demean	No (–)
Breitung	UR	No UR	F, T	Lags	robust[1]	No (–)
IPS	UR	Some CS without UR	None, F, T	Lags	demean	Yes (No)
Fisher	UR	Some CS without UR	None, F, T	Lags/Kernel	demean	Yes (Yes)
Hadri	No UR	Some CS with UR	F, T	Kernel	robust[1]	No (–)
Pesaran	UR	Some CS without UR	F, T	Lags	robust	Yes (No)

Obs.: 'UR' unit root, 'CS' cross-sections, 'None' no exogenous variables, 'F' fixed effect, 'T' individual effect and individual trend.

Source: Compiled from QMS (2007)

Cointegration

The use of panel data by economist has become common in empirical research. Exploration of associated subjects, such as cointegration and unit root tests has also become an area of interest for researchers. Kao (1997) and Pedroni (1997) are on record to be the first researchers to propose the initial tests for cointegration in panels under the null of no cointegration, which are the most frequently employed tests in empirical work. The Kao (1997) test is employed for homogeneous panels whilst Pedroni (1997) works both ways: testing cointegration in homogeneous panels and testing cointegration in heterogeneous panels. Other researchers have proposed different ways of studying cointegration. An argument on the use of the mean of the Augmented Dickey-Fuller (ADF) statistics over cross-sections based on Im *et al.*

(1997) to test the hypothesis of no cointegration in heterogeneous panels was advanced by McCoskey & Kao (1998).

Maddala & Wu (1999), also proposed a Fisher cointegration test, which is premised on the multivariate framework of Johansen (1988). They argued that the *p*-values of individual cointegration tests should be combined in order to obtain a panel test statistic. Moreover, Larsson et al (2001) suggest a likelihood ratio statistic (LR-bar) that averages individual rank trace statistics. Conversely, the test entails a large number of time-based observations. Both of these tests allow for multiple cointegrating vectors in each cross-section.

Westerlund (2007), built on the cointegration tests of Banerjee et al., (1998) by suggesting four cointegration tests. Westerlund's tests are based on structural instead of residual dynamic and permit heterogeneity to a large extent (e.g. discrete precise short-run dynamics, intercepts, linear trends and slope parameters). In these tests, all variables are assumed to be 1 (i). It is worthy of note that bootstrapping provides robust critical values in cases of cross-section dependence. The tests, evaluate the null hypothesis that the error correction term in a conditional ECM is zero (Baltagi, 2008). This means there is no cointegration

Banerjee et al., (2004), identify some shortcomings with Westerlund's tests. They observe that even though these tests permit cross-sectional reliance (thru the effects of short-run dynamics), they do not consider long-run dependence, caused by cross-sectional cointegration. They establish that in that case, panel cointegration tests may be significantly large (Baltagi, 2008). Furthermore, most cointegration tests may be misrepresentative in the company of stationary data, as they require all data to be 1 (i).

Park & Fuller Fuller (1993) introduce Weighted Symmetric Estimation – which has largely been used by economists for empirical work in time series. Weighted symmetric estimation typically yields better results about the most frequently used estimation methods in time series, the Dickey-Fuller (DF) and ADF estimations. Pantula et al., (1994), substantiate the individual most powerful test for testing unit roots in a single time series by the weighted symmetric estimation test. Other researchers such as Hoang & McNown (2006), establish that weighted symmetric estimation is popular than the other estimation approaches in testing unit roots in panel data in terms of test power. Pedroni, McCoskey and Kao tests have in recent years become the main choices for researchers in testing cointegration in heterogenous panels, especially where cointegration vectors are allowed variance between cross-sections. Pedroni employs the Dickey-fuller estimation and modifies the statistics like the Philip-Perron test for unit roots. McCoskey and Kao, on the other hand, use the ADF estimation and average the model statistics over cross-sections.

Current Test Regimes for Cointegration in Panel Data

Testing for Cointegration in Homogeneous Panels

Chihwa Kao (1997), consider the following system of cointegrated regressions in the homogeneous panels: Let

$$x_{it} = x_{it-1} + \epsilon_{it}$$

$$yit = yit{-}1 + vit$$

Consider the regression:

$$yit = \alpha i + xit\beta + uit \tag{1}$$

$$(i = 1,...,N, t = 1,...,T)$$

Where:

α_i are individual constant terms;

β is the slope factor;

ϵ_{it}, v_{it} are stationary disturbance terms and;

y_{it} and x_{it} are integrated processes of order 1 for all i

The zero mean vector $\xi_{it} = (v_{it}, \epsilon_{it})'$ satisfies

$$\frac{1}{\sqrt{T}} \sum_{t=1}^{[Tr]} \xi_{it} \Longrightarrow B_i(\Omega)$$

for all i as $T \longrightarrow \infty$, where $B_i(\Omega)$ is a vector of Brownian motion with asymptotic covariance Ω. With the residuals from panel least-squares dummy variable (LSDV) estimation as the centre piece, Kao derives two varieties of panel cointegration tests. The first variety is like Dickey-Fuller (DF) type, which can be applied to the residuals using:

$$u\hat{}it = \rho u\hat{}it{-}1 + eit \tag{2}$$

The OLS calculation of ρ is:

$$\hat{\rho} = \frac{\sum_{i=1}^{N} \sum_{t=2}^{T} \hat{u}_{it}\hat{u}_{it-1}}{\sum_{i=1}^{N} \sum_{t=2}^{T} \hat{u}_{it-1}^2}$$

The null hypothesis that $\rho = 1$ is verified by:

$$\sqrt{N}T(\hat{\rho} - 1) = \frac{\frac{1}{\sqrt{N}} \sum_{i=1}^{N} \frac{1}{T} \sum_{t=2}^{T} \hat{u}_{it-1} \Delta \hat{u}_{it}}{\frac{1}{N} \sum_{i=1}^{N} \frac{1}{T^2} \sum_{t=2}^{T} \hat{u}_{it-1}^2}$$

The second variety is an Augmented-Dickey-Fuller (ADF) type test. This can be calculated by:

$$\hat{u}_{it} = \rho\hat{u}_{it-1} + \sum_{j=1}^{p} \phi_j \Delta\hat{u}_{it-j} + e_{itp} \tag{3}$$

where p is selected so that the residuals e_{itp} are successively uncorrelated. The ADF test statistic here is the usual t-statistic with $\rho = 1$ in the ADF equation. The following depiction of null and alternative hypotheses is used: $H_0 : \rho = 1$, $H_1 : \rho < 1$.

Kao suggests four DF-variety statistics and an ADF statistic. The first two DF statistics rely on the strict assumption of stringent exogeneity of the regressors in relation to the errors in the equation, while the other two DF statistics permit endogeneity of the regressors. The Dickey-Fuller statistic, which allow endogeneity, and the ADF statistic include developing some nuisance parameters from the long-run conditional variances Ω. Kao proved that the asymptotic dispersals of all tests converge to a standard normal distribution as $T \longrightarrow \infty$ and $N \longrightarrow \infty$

Kao is recognized as the foremost author to propose the test for cointegration in standardized panels. The Kao test statistics are estimated by amalgamating all the residuals of all cross-sections in the panel.

Testing for Cointegration in Heterogeneous Panels

Pedroni (1997) proposes the following model for heterogeneous panel data

$yit = \alpha i + xit\beta i + uit$ (4)

$(i = 1,...,N, t = 1,...,T)$

For the processes:

$$x_{it} = x_{it-1} + \epsilon_{it}$$

$$yit = yit{-}1 + vit$$

where;

α_i are individual constant terms;

β_i is the slope parameter for the cross-section i of the panel;

ϵ_{it}, v_{it} are stationary nuisance terms and;

y_{it} and x_{it} are comprehensive processes of order 1 for all i

The zero-mean vector $\xi_{it} = (v_{it}, \epsilon_{it})'$ is presumed to satisfy

$$\frac{1}{\sqrt{T}} \sum_{t=1}^{[Tr]} \xi_{it} \Longrightarrow B_i(\Omega_i)$$

for each cross-section i as $T \longrightarrow \infty$, where $B_i(\Omega_i)$ is a vector of Brownian motion on the interval $r \in [0,1]$ with asymptotic covariance Ω_i. The asymptotic covariance matrix Ω_i is given by: and can be disintegrated as: $\Omega_i = \lim_{T\to\infty} E\left[\frac{1}{T}(\sum_{t=1}^{T} \xi_{it})(\sum_{t=1}^{T} \xi'_{it})\right]$

$$\Omega i = \Sigma i + \Gamma i + \Gamma i$$

where $\Sigma_i = \lim_{T\to\infty} \frac{1}{T} \sum_{t=1}^{T} E(\xi_{it}\xi'_{it})$ is the synchronous covariance amongst the constituents of ξ_{it} for a given cross section i, $\Gamma_i = \lim_{T\to\infty} \frac{1}{T} \sum_{k=1}^{T-1} \sum_{t=k+1}^{T} E(\xi_{it}\xi'_{it-k})$ is the robust covariance among the constituents of ξ_{it}. Ω_i is allowed to differ across specific sections of the panel. Ω_i can be reliably calculated by:

$$\hat{\Omega}_i = \hat{\Sigma}_i + \hat{\Gamma}_i + \hat{\Gamma}'_i$$

or

$$\hat{\Omega}_i = \frac{1}{T}\left[\sum_{t=1}^{T} \hat{\xi}_{it}\hat{\xi}'_{it} + \sum_{s=1}^{k_i}\left(1 - \frac{s}{k_i + 1}\right)\sum_{t=s+1}^{T}\left(\hat{\xi}_{it-s}\hat{\xi}'_{it} + \hat{\xi}_{it}\hat{\xi}'_{it-s}\right)\right] \tag{5}$$

where $\hat{\xi}_{it} = (\hat{v}_{it}, \hat{\epsilon}_{it})'$ is attained from autoregressions:

$x_{it} = \rho_i x_{it-1} + \epsilon_{it}$

and

$y_{it} = \rho_i y_{it-1} + v_{it}$

for each i. Term L_i is the lower triangular disintegration matrix of $\mathbf{\Omega}_i$:

$$\Omega i = L'_i L_i = \begin{bmatrix} L_{11i} & \\ 0 & L_{22i} \end{bmatrix} \begin{bmatrix} L_{21I} & L_{11i} & \\ L_{21i} & & L_{22i} \end{bmatrix} \quad 0$$

Then

$$L_{11i} = (\Omega_{11i} - \Omega^2_{21i}/\Omega_{22i})^{1/2}; L_{21i} = \Omega_{21i}/\Omega^{1/2}_{22i}; L_{22i} = \Omega^{1/2}_{22i} \tag{6}$$

Pedroni found two groups of test statistics. One is explained in homogeneous panels under the supposition that $\mathbf{\Omega}_i = \mathbf{\Omega}$ for all I whiles the other one is for heterogeneous panels where cointegration vector is allowed to differ across the cross sections and $\mathbf{\Omega}_i$ are dissimilar in each section of panels. In the second test, Pedroni built the statistics as follows:

(1) Calculate the projected cointegrating regression for each individual member of the panel in the form (4) $y_{it} = \alpha_i + x_{it}\beta_i + u_{it}$.

(2) With the original data, compute $\hat{\xi}_{it}$ by regressing the levels of x_{it} and y_{it} on the lagged levels and use these values of $\hat{\xi}_{it}$ to calculate the correct long run covariances $\hat{\Omega}_i$ for each member of the panel.

(3) Assemble the residuals $\hat{u}_{it}$ from the distinct regression for each panel member and estimate the lower triangular breakdown of the $\hat{\Omega}_i$, as given in (5).

(4) Run the following regression for each member of the panel:

$$\hat{u}_{it} = \hat{\rho}_i \hat{u}_{it-1} + \hat{e}_{it} \tag{7}$$

and build the group mean statistics for the null of no cointegration in heterogeneous panels as:

$$\tilde{Z}_{\hat{\rho}_{NT-1}} = \sum_{i=1}^{N} \frac{\sum_{t=1}^{T}(\hat{u}_{it-1}\Delta\hat{u}_{it} - \hat{\lambda}_i)}{\sum_{t=1}^{T}\hat{u}_{it-1}^2} \tag{8}$$

$$\tilde{Z}_{t_{NT}} = \sum_{i=1}^{N} \frac{\sum_{t=1}^{T}(\hat{u}_{it-1}\Delta\hat{u}_{it} - \hat{\lambda}_i)}{\left[\sum_{t=1}^{T}\frac{1}{\hat{L}_{11i}^2}\hat{u}_{it-1}^2\right]^{1/2}} \tag{9}$$

Where $\hat{L}_{11i} = (\hat{\Omega}_{11i} - \hat{\Omega}_{21i}^2/\hat{\Omega}_{22i})^{1/2}$. $\hat{\Omega}_i$ is computed as in (5). $\hat{\lambda}_i = \frac{1}{2}(\hat{\sigma}_i^2 - \hat{s}_i^2)$, for which, $\hat{s}_i^2$ is the concurrent modification of $\hat{e}_{it}$ and $\hat{\sigma}_i^2$ is the long-run variance of $\hat{e}_{it}$, they are reliably estimated by:

$$\hat{s}_i^2 = \frac{1}{T}\sum_{t=1}^{T}\hat{e}_{it}^2 \tag{10}$$

$$\hat{\sigma}_i^2 = \frac{1}{T}\left[\sum_{t=1}^{T}\hat{e}_{it}^2 + 2\sum_{s=1}^{k_i}\left(1 - \frac{s}{k_i+1}\right)\sum_{t=s+1}^{T}\hat{e}_{it}\hat{e}_{it-s}\right] \tag{11}$$

It has been showed by Pedroni that under the null of no cointegration ($\rho_i = 1$ $i = 1, 2,..,N$ in the equation $\hat{u}_{it} = \hat{\rho}_i\hat{u}_{it-1} + \hat{e}_{it}$). $\frac{T}{\sqrt{N}}\tilde{Z}_{\hat{\rho}_{NT-1}}$ and $\frac{1}{\sqrt{N}}\tilde{Z}_{\hat{t}_{NT}}$ congregate to the usual distributions with both T and N $\longrightarrow \infty$.

In conjunction with the Monte-Carlo residuals, the asymptotic distributions of these statistics can be expressed as:

$$\frac{T}{\sqrt{N}}\tilde{Z}_{\hat{\rho}_{NT}-1} + 9.05\sqrt{N} \xrightarrow{L} N(0,35. \tag{12}$$

$$\frac{1}{\sqrt{N}}\tilde{Z}_{\hat{t}_{NT}} + 2.03\sqrt{N} \xrightarrow{L} N(0,0. \tag{13}$$

These residuals to test the hypothesis of no cointegration in every cross-section of a panel

Average Augmented Dickey-Fuller Test

McCoskey & Kao (1998) recommend the average Augmented Dickey-Fuller (ADF) test for unpredictable slopes and changing intercepts across all the members of the panel. They consider the model:

$$yit = \alpha i + xit\beta i + uit \tag{14}$$

$(i = 1,\dots, N, t = 1,\dots,T)$

In ADF, individual cointegrating equation are computed individually for each cross-section and individual ADF statistics are estimated for each cross-section. In each test, the cross-sections are presumed independent of each other and heteroskedasticity across the cross-section is permissible. McCoskey and Kao used the analogous approach (of computing average of the ADF statistics of the cross-sections in testing unit roots in panels) in Im *et al.* (1995) to compute the panel test statistics in the same way. The individual ADF test can be formulated as:

$$\hat{u}_{it} = \rho_i \hat{u}_{it-1} + \sum_{j=1}^{p} \phi_j \Delta \hat{u}_{it-j} + e_{itp} \tag{15}$$

with $\hat{u}_{it}$ as OLS residuals from (14). We can rewrite equation (15) as:

$$\Delta\hat{u}_{it} = \rho_i \hat{u}_{it-1} + \sum_{j=1}^{p} \phi_j \Delta\hat{u}_{it-j} + e_{itp}$$

The null hypothesis is H_0: $\rho_i = 0$ and the t-statistic for each i is framed:

$$t_{iADF} = \frac{\left(\hat{u}'_{-1} Q_{X_p} \hat{u}_{-1}\right)^{1/2} \hat{\rho}_i}{s_e}$$

Where:

$\hat{u}_{-1}$ is the vector of observations of $\hat{u}_{it-1}$

and $Q_{X_p} = I - X_p(X'_p X_p)^{-1} X'_p$ where X_p

is the matrix of observations on the p regressors ($\Delta\hat{}u_{it-1},\ldots,\Delta\hat{}u_{it-p}$) and $s_e^2 = \frac{1}{T}\sum_{t=1}^{T} \hat{e}_{itp}^2$.

Phillips and Ouliaris (1990) show that the t_{iADF} congregates to a functional of Brownian motion. Lastly, McCoskey and Kao frame the panel statistics as:

$$\bar{t}_{ADF} = \frac{1}{N}\sum_{i=1}^{N} t_{iADF}$$

where

$E[t_{iADF}] = \mu_{ADF}$, and

$V\,ar[t_{iADF}] = \sigma_{ADF}{}^2$.

Therefore, the central limit theorem can be applied to derive:

$$\sqrt{N}(\bar{t}_{ADF} - \mu_{ADF}) \xrightarrow{L} N(0, \sigma^2_{ADF})$$

Phillips and Ouliaris observe that the limiting distribution of ADF test statistics in each cross-section relies solely on the number of regressors and is free of nuisance. McCoskey and Kao ran a simulation to ascertain the values of μ_{ADF} and σ_{ADF}, where they established that in the case of one regressor, $\mu_{ADF} = -2.206$ and $\sigma_{ADF} = .8200$.

Estimation of the Long-Run

A reliable and efficient computation of the long-run economic relationships is crucial. With cointegrating non-stationary variables, it is important to efficiently estimate and test the relevant cointegrating vectors. To this end, a plethora of panel estimators has been recommended in the extant literature. Majority of these tests are modifications of time series methods. An important difference is that contrary to its time-series counterpart, the panel OLS estimator of the (long-run) static regression model is unreliable (Baltagi, 2008).

Panel Dynamic OLS Estimator (DOLS)

This estimator was proposed by Kao & Chiang (2000). It is a simplification of the method initially put forth by Saikkonen (1991) and Stock & Watson (1993) for time-series regressions. The regression equation is:

$$y_{it} = \alpha_i + \beta' X_{it} + \sum_{j=-q}^{q} c_{ij}\, \Delta X_{i,t+j} + \varepsilon_{it}$$

where

X_{it} is a vector of descriptive variables

β is the expected long-run Impact

q is the quantity of leads and lags of the first-differenced data and

c_{ij} the associated parameters.

The estimator follows cross-sectional independence and is asymptotically generally distributed. They buttress their point that the finite-sample trappings of the DOLS estimator are greater those of fully-modified ordinary squares (FMOLS) and OLS estimators by providing with Monte Carlo results.

Pesaran et al. (1999) propose a pooled mean group (PMG) estimator for dynamic heterogeneous panels, fits an autoregressive distributed lag (ARDL) model to the data. This procedure can be re-specified as an error correction equation to ensure economic understanding. Consider the error correction illustration of an ARDL (p, q, q,…, q) model below:

$$\Delta y_{it} = {}_i y_{i,t-1} + \beta_i' X_{it-1} + \sum_{j=1}^{p-1} \lambda_{ij} \, \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \delta_{ij}' \, \Delta X_{i,t-j} + \mu_i + \varepsilon_{it}$$

Where:

X is a vector of descriptive variables,

ϕ_i holds data about the long-run influences

${}_i$ is the error correction indicator (due to standardization) and

δ_{ij} integrates short-run information.

The PMG is considered an intermediate procedure between the mean group (MG) estimator and the dynamic fixed-effects (DFE) approach. The MG estimator is gotten by calculating N independent regressions and then estimating the mean (unweighted) coefficients, whilst the DFE entails amalgamating the data and assuming that the slope coefficients and error variances are undistinguishable. The only difference is that the PMG limits the long-run coefficients to be same ($\beta=\beta_i$ for all i). With regards to short-run coefficients and error variances, PMG permits them to differ across countries. According to (Pesaran et al., (1999), this method can be used whether the regressors are I (o) or 1 (i).

Econometric Framework for Time Series Test

This study employed both panel and time series data for the analysis. This segment of the study defines the econometric techniques employ to investigate the nexus of the development of the stock market and economic growth, vis-à- vis time series data. A short description first of all of the procedure of the time series enquiry of cointegration method is specified, and the processes involved in the cointegration enquiry are elucidated.

Cointegration is defined as a sort of time series exercise employed by experimental researchers to detect continuous patterns of co-movement among variables. Cointegration is also used in the estimation of long-run equilibrium. The estimation of unit is a precondition for cointegration analysis – results of the unit root test cannot be useable unless the variables are nonstationary. Therefore, cointegration becomes difficult when the variables have unit roots. Nonetheless, an undying amalgamation of certain groups of nonstationary variables may be stationary, as Engle and Granger (1987) establish in their research. They explain further wherever series co-exist, whether, two or more, the variance between the series, in the long run, is constant; even if the series trend–these variables are likely to display the presence of a cointegration relationship. Due to the issue of non-stationarity in time series data, it is important to determine the order of integration of the variables – this indicates the number of times a time series must be differenced to ensure stationarity.

It is important to note that several time series data of economic nature, seem integrated of order one, I (1), which means they are differenced once to make them stationary – they are, hence, said to display a unit root. It is important to note that several time series data of economic nature, seem to be integrated of - I (1), of order one which means they are differenced only once in order to be stationary. Still, symmetric or arbitrage circumstances may indicate that certain amalgamations of the series under review are said to be stationary, I (0). The series are considered to be integrated in this scenario. The empirical literature vis-à-vis non-stationarity and cointegration have enhanced, in recent improvements the knowledge of both the short-run and long-run undercurrents in economics and the symmetric actions of economic indicators. Cointegration analysis lends proof of backing of the presence of an undeviating connection, linking the indicators under review that are stable in the long-run.

In the long run, the presence of linkages that achieve steadiness have significant effects and on the short-run performance of the fundamental series. This is because there should be a system that pushes the series to their long-run relationship. This modification method that culminates in the stipulation of error-correction models (ECM) is displayed by an error correction mechanism. In a nutshell, the three significant aspects to consider when calculating between the series' relationships are unit root properties, multivariate aspects, and the dynamics.

An econometric computing method, ideally must: (1) perform integration of all previous information of the existence of unit roots; (2) justify the concurrent settling of numerous series (to circumvent endogeneity predisposition); and (3) treat both the short and long run undercurrents sufficiently.

Stationarity and Unit Roots

According to Granger (1986) and (Engle & Granger 1987), a series is considered void of unit root if it possesses the following:

a) Limited difference, and not to rely on time;

b) Consequence of a certain arbitrary innovation remains transient;

c) Tendency to oscillate surrounding its mean; and

d) Autocorrelations that drop briskly as the lag appreciates.

Tong (1990), stipulates that a strictly stationary procedure is one in, which for any t_1, t_2,..., $t_T \in Z$, any $k \in Z$ and T=1,2,...

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

where F symbolizes the combined distribution function of the set of random variables.

The measure of probability according to Brooks (2008, for the order $\{y_t\}$ is the same as that for $\{y_{t+k}\}\forall k$, where $'\forall k'$ means for all values of k'. He subsequently stipulates that a series is exactingly void of unit root if the probability dispersal of its values remain constant as time evolves, meaning, the likelihood that reduces inside a certain interlude is unchanged now at somewhat for both in the past or future. It is worthy of note that this strict definition of stationarity can be problematic and as such weak stationarity is usually

Gujarati (2004), explains that for weak stationarity, the mean, variance and the covariance of a series must over time stay constant. Non-stationary data could be made stationary by differencing the data. Econometricians during the years before 1980s used to frame a conventional regression model to characterize the time series data performance, with the assumption that the drift element is a deterministic function of time, that recurrent elements characterize stationary movements about this drift. Later on, this postulation of stationarity was established to be untrue and their attendant consequences also observed to be spurious. It was also established, OLS regression running on non-stationarity data could yield a spurious result. A non-unit root series holds a stationary drift whereas a non-stationary time series holds a stochastic drift. A series perchance, may move either upwards or downwards gradually merely as a consequence of stochastic or random shocks. Because nearly, the time series of economic data nature hold drifts, it is believed also series of these sort have to lose any drifts prior to a complex regression analysis undertaken. To drop a drift in time series is by first differentials instead of the levels of the series, that is integrated series principle is employed in this case as the recommended technique in the literature. This is due to the fact that stochastic shocks have enduring effects in the stochastic system.

Perron (1989), explains that the future levels of the series are developed into and are incorporated into the time series, therefore the name integrated series. Non stationary data can be remedied by differencing and estimating, employing only differentiated variables. It is trite in econometrics that regressions where series of various orders of integration used can yield an unauthentic result. It was observed by Granger & Newbold (1974) and Engel & Granger (1987) that several of the series seen in the models of time series econometric are integrated series. To establish the non – unit root of the series, thus making them stationarity, the study carried out unit root tests on the univariate time series

Granger & Newbold (1974) and Engel & Granger (1987) observe that many of the variables that are seen in time series econometric models are integrated variables. In this study, unit root tests were undertaken on the univariate time series to establish the stationarity or otherwise of the series.

The estimation method adopted for the study of the Augmented Dickey-Fuller (ADF) test

The ADF test is employed to ascertain if the time series samples are stationary or otherwise. The ADF is the enhanced variety of the Dickey-Fuller test. According to Dickey & Fuller (1979), an autoregressive integrated moving average (ARIMA) process directed by the null hypothesis is examined by ADF. This process includes conducting the subsequent univariate regression test:

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

Where,

α is a deterministic element,

y_t is the series,

y_{t-1} is a one period lag of the series, and

u_t is the undetected error.

Haldrup & Jansson (2006), posit that the description above might join with a deterministic drift term if it is applicable. It is reiterated in this study that as by quantitative research that - null hypothesis is β = 0 (presence of a unit root) against the substitute hypothesis whilst β ≠ 0 (stationary). The test specification is certain as:

$$DF = \frac{\hat{\beta}}{\widehat{\sigma_\beta}}$$

Where

DF is the Dickey – Fuller distribution,

$\widehat{\sigma_\beta}$ is the least squares standard error of β.

When the distribution of the ADF is not following the standard t-distribution, the calculated t-statistic is equated with the critical values given by Mackinnon (1996). T – Statistics with high negative values reject the null hypothesis.

Conventional Cointegration Tests and their Limitations

Gujarati (2004), posits that two series are said to be cointegrated after sharing a mutual stochastic trend, which implies that perhaps, a long-run relationship exists between them. In this research, an effort was made to ascertain this co-movement by examining both stationarity and co- integration. When variables move in the same direction and the variance between them is steady over time, cointegration is said to be present.

The two commonly used cointegration methods are Engle & Granger's (1987) two-step residual procedure and Johansen's (1991, 1995) system-based reduced-rank approach. The Johansen approach has numerous merits above the Engle and Granger technique. The primary advantage of the Johansen approach is its ability to evaluate the amount of cointegrating vectors in the scheme. The technique of Engle and Granger is predicated on the assumption that one single exclusive cointegrating vector exists while the Johansen approach permits the assessment of multiple cointegrating vectors when the examinations consider above two variables. Having considered the two estimation approaches, this study employs the Johansen methodology. The Engle-Granger approach, the residual-based approached was not utilized because it has some shortcomings even though it can be implemented easily. In the residual-based approach, the long-run steadiness relationship's estimation comprises a simple OLS regression on levels of the series.

Some scholars prefer this procedure because of its computational expediency. Hendry et al. (1986), have other view (i.e. they argued that the exclusion of dynamics can engender considerable bias infinite sample), which undermines the performance of the estimator. They also pointed out that the endogeneity predisposition can impact trivial sample estimates, nevertheless, endogeneity predisposition presents insignificant effects asymptotically. Also, because the two-step approach utilizes the residual produced in the first phase to create a new regression model in the second phase, any errors caused in the first step are passed into the second step (Enders, 2004). The shortcomings of the two-step approach, observed by Park & Philips (1998), is that the OLS estimator has an abnormal asymptotic distribution in the first step, thus this hinges on nuisance bounds. Thus, the testified t- statistics on the long-run bounds might be spurious.

Johansen Methodology

The Johansen methodology is a complicated approach but a popular approach in academic literature. The first step in this methodology is the creation of a multivariate autoregressive model in the form:

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

Where,

z_t

is a (n x 1) matrix of n possibly endogenous variables, and each of the A_1 is a (n x n) matrix of parameters. This equation, however, can be reconfigured into a vector error correction procedure:

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

Where,

Γ_I =-(I-$\mathbf{A_1}$ -... -$\mathbf{A_i}$), (i= 1,... ,k- 1) and P=- (I - A, -... -Ak), with I being the identity matrix. The vector error correction model denotes vector of short-run and long-run through the computation of and congruently of Γ_I and $\prod$ respectively. It can be explained that $\prod = \alpha\beta'$, where α denotes the rapidity of alteration to unsteadiness and β denotes vector of long run coefficients. Johansen posited that in order to obtain the residual vectors R_a and $R_{kt,}$ Δz_t and z_{t-k} should be regressed on a constant and the Zt lagged differences respectively.

Lutkepohl (2006) explains that these residual vectors are used to generate residual matrices

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

In order to obtain eigenvectors, which are parallel to the sizable r eigenvalues, the equation below should be solved:

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

This method gives n eigenvalues $\lambda_1 > \lambda_2 > \ldots\ldots > \lambda_n$ and the analogous eigenvectors

V= (v,…, v). The r components in V are the co-integrating vectors. Johansen further demonstrates that ä = $S_{ak}{}^{\beta}$ the estimate of α can be obtained from it.

The complete model can be obtained after; (1) the estimation of α and β and the limitations; and (2) the estimation of the equation by OLS. One of the significant consequents of cointegration is the Granger representation theorem, which postulates that a data can be denoted by a correction model if more variables in the dataset are cointegrated by order of 1. Just like the two steps approach, the Johansen approach also has limitations. Pesaran et al., (2001) observed that the insertion of lags to eliminate the omitted predisposition pact the extents of freedom. He further described the selection of the optimum number of lags as the major drawback of Johansen's approach. Another drawback of this approach is its small sample properties. Nonetheless, the sample in this study is not sample.

Formulating the Vector Error Correction Models (VECM)

According to Lutkepohl (2006), a vector correction (VEC) model is constrained VAR meant for use with non-stationary series that obviously co-integrated. This can be typified by considering a model that has two variables, one co-integrating vector and no lags. The co-integrating equation is:

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

where,

$y_{2,t}$ and $y_{1,t}$

are the variables; and

β is the coefficient.

The analogous VEC model is:

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

The composition on the right-hand side indicates the error correction model term. This composition is equal to zero in the long run. In the case where y_1 and y_2 differ from the steadiness, the value of the error correction term turned out to be non-zero. Hence the y_1 and y_2 constantly fine-tune in order to bring the relationship back to equilibrium. The term α_2 denotes the rate at which the i^{th} variables in the model return to their steady-state. It is important to note that the VEC model specification can only be run after a Johansen cointegration test is conducted and the series are found to be co-integrated.

Correlation Test

In econometrics, there is no one clear method for the discovery and elimination of multicollinearity– econometrics rather proposes numerous techniques by which this can be detected and mitigated against. One way by which this can be achieved is by conducting correlation analysis of the variables selected for the model and excluding any series with a high correlation coefficient from the model. For the interpretation of the correlation coefficients, and to some extent inferring the degree of multicollinearity, some researchers have proffered rules of thumb.

It is noteworthy that these rules of thumb, somewhat, are domain particular. Some researchers observed that a pair-wise correlation coefficient values of 0.8 or more, or a high zero-order suggests the existence of serious multicollinearity. Other researchers such as Gujarati (2004), think otherwise. According to him, a high pair-wise correlation coefficient does not necessarily indicate the existence of collinearity, even though it suggests collinearity. He observed that there were instances where multicollinearity was found in models with correlation coefficient of less than 0.5. This supports the argument by other researchers that the dissimilarity in multicollinearity is not a substance of kind but a degree. The degree of existence of multicollinearity within any sample is measurable due to the fact that it is a sample feature. With this understanding, the researcher developed the following guidelines for the interpretation of the correlation coefficient to determine the possibility of the existence of multicollinearity and the acceptability of the variables for inclusion in the models; values between 0 and 0.4 (0 and -0.4) show a weak positive (negative) linear correlation. This also shows that the likelihood of the existence of a very feeble multicollinearity hence a high acceptability of the variables to be encompassed in the same model. Values between 0.4 and 0.7 (-0.4 and -0.7) show a reasonable positive (negative), respectively linear correlation and the likelihood of the existence of a reasonable multicollinearity hence a low acceptability of the variables to be encompassed in the unchanged model. If the variables in request, however, are crucial to the assessment they might still be added. Also, values between 0.7 and 1.0 (-0.7 and -1.0) point to a sturdy positive (negative) status respectively, an undeviating correlation and by elongation the likelihood of the presence of a sturdy multicollinearity, consequently a very poor acceptability of the variables to be encompassed in the unchanged model.

In this research, there is a quest to ensure the existence of the level of correlation and acceptable level of multicollinearity. The research chooses 0.5 as the cut-off point. This is in line with the threshold of 0.5 (Gujarati, 2004).

Data Processing

Data processing and pre-estimation diagnostics were carried out. Some of the data used in this study were in logged forms, and hence changed into natural logarithms in order to improve its consistency with other variables, interpretability, and consequently the statistical analysis. These include number of listed companies and GDP per capita. The rest of the explainable variables are in percentage of GDP, hence used as ratios and first differenced.

Model Specification, Estimation Methods and Empirical Analysis

Model Specification

The experimental model to examine the development of the stock market and economic growth effect is grounded on the ideas of Cadeleron-Rossell (1991), Demirguc-Kunt & Levine (1996), Levine & Zervos (1998), Garcia & Liu (1999) and Odhiambo et al., (2017). The reference line model of the above ideas is the functional equation based on the production function.

Equation:

Y=*f* (SMD, MEI, OECI, BREES_IDX)

Estimation of the regressions:

Yt= c+ βSMDt) + (βMEIt)+ βOECIit+ βBREES_IDXt + u

Where:

Yt = GDP growth (GGDP)

c = constant

u = usual white noise (the unobserved country specific)

SMD = is a matrix of stock market development variables such as:

i. Stock total value traded to GDP; (STK_TRD_VL__GDP)

ii. Stock traded turnover ratio; (STK_TRD_TRN)

iii. Number of listed companies on the exchange; (LISTED)

iv. Market capitalization ratio; (MKT_CAP2GDP)

βMEI = Macroeconomic

v. Inflation rate (INFL)

vi. GDP per capita; (GDP_CPT)

vii. Exchange rate, fixed to the USD (EXCR)

OECI = Other economic & complementary variables

viii. Domestic credit to private businesses to GDP; (DM_CREDIT)

ix. Gross domestic savings to GDP; (GDSVNGS_2GDP)

x. Money supply (M2) to GDP; (M2_2GDP);

xi. Foreign direct investment to GDP (FDI_2GDP)

xii. Tax revenue as percentage to GDP (TX2GDP)

xiii. **BREES_IDX = Institutional-technological/innovative-financial variables**

- Goods market efficiency (GMKTef)
- Labour market efficiency)
- Market size (MKTsz)
- Institutions (INSTs)
- Infrastructure (INFRC)
- Business sophistication (BSOP)
- Innovation (INNV)
- Venture capital availability (VCAv)
- Regulation of securities exchanges (RSE)
- Ease of access to loans (EAL)
- Soundness of banks (SOB)

Regression (Linear and Multiple)

Linear regression models are normally fitted using least squares (LS) estimates of the coefficients by either ordinary least squares (OLS), weighted least squares (WLS), or generalized least squares (GLS). Each of these types of LS estimates is simple, widely available in software packages, and regarded as being best linear unbiased estimates under commonly made assumptions, with minimum variance. Additionally, LS estimates are the best among both linear and nonlinear estimates when errors are normally distributed. On the other hand, it is also well known that LS estimates for linear regression models are quite non-robust. In the data-oriented sense, they can be very adversely distorted by just a few outliers in a sample. In the statistical sense, LS estimates can suffer from a substantial loss of efficiency under deviations from normality, i.e., they can have much larger variances than minimum attainable variances. Furthermore, under some types of deviations from normality LS estimates will be biased even in large sample sizes (i.e. asymptotically).

Multiple Regression

The statistical techniques of extending linear regression so as to consider two or more independent variables are known as multiple regression analysis. Multiple linear regression takes the following form:

$$Y = þ_o + þ_1x_1 + þ_2x_2 + \cdots + þ_nx_n + \varepsilon \quad (1.1)$$

Where $þ_o$ is the intercepts, $þ_1, þ_2, \cdots þ_n$ are regression coefficients

The method of least square is typically used to estimate the regression coefficients in a multiple linear model. The method of least square chooses the β's in the equation (1) so that the sum of squares of ε errors is minimized.

The motivation of applying multiple regressions is to know the relationship between several independent variables and a dependent variable. When multiple regressions are employed in psychology, many of the researchers use the term "independent variables" to determine those variables that will influence some other “dependent variable”. It is also preferable to use the term “independent variables” for those variables that can assist a study in predicting the score on another variable that is termed as “dependent variable”.

Robust Least Squares

Alternatively, robust least squares were also employed in addition to ordinary least squares multiple regression on the panel data to authentic regression results. Panel unit root test were carried out to attest for the stationarity of the data. In order to ensure the stationarity, the summary method under mostly the following at first difference, intercept and first difference, intercept and trend.

Levin, Lin & Chu t*;

Im, Pesaran and Shin W-stat;

ADF-Fisher Chi-square; and

PP-Fisher Chi-square

All the above were conducted with computed values of probabilities from Fisher Tests, employing asymptotic normality of Chi-square distribution with all further tests based on assumptions- asymptotic normality.

Panel data cointegration test was employed under eviews9.5. The method was Kao Residual Cointegration Test, which set the null hypothesis as variables’ no cointegration’, whilst the alternative hypothesis was set as ‘variables cointegrated’. This was under the automatic lag length based on Schwarz Criterion (SIC) with the software selecting the maximum lags. To ensure that the variables are cointegrated, cointegration tests were applied. Correlation tests were also applied to avoid high correlation of pairs of variables (avoid multi-collinearity among the variables). Models recognised for ordinary regression test for panel data was considered.

The model selection was done through hausman test in order to select the appropriate model for the analysis. The fixed effect model and the random effect model were both assessed and applied with reference to the 'rule of thumb' of test results. The appropriate model was selected having done a series of tests- random to check the results for the null hypothesis with the benchmark for rejecting and accepting the alternative hypothesis.

The fixed effect model at 'none cross section' and 'fixed time period' were the methods under the main regression model used for some of the observations whilst random effect model was also employed for some of the observations based on the outcome of test rests (the checks on each outcome were by the application of corrected random effects –hausman at period random effects tests comparisons).

Additionally, the residual diagnostics/robust tests checks were carried out to verify for the appropriateness of each model with the set rules on the null hypotheses, otherwise, alternative hypotheses suffice. The residual diagnostics was under the method- Cross section dependence test. If the null hypothesis was less than 5%, the model will be rejected and alternative accepted. The null hypothesis must be above 5%. All the tests were carried out to attest the models. The robust diagnostic tests were used when residual diagnostics under the method- Residual cross section dependence tests were rejected. These were under the following with different probabilities:

- Breusch-Pagan (p-value >5%) must be more than 5% to be accepted.
- Pesaran scaled LM (p-value >5%) must be more than 5% to be accepted.
- Pesaran CD (p-value >5%) must be more than 5% to be accepted.

A number of robust alternatives to least squares (LS) estimates exist that suffer relatively little from severe inefficiency and bias, auspiciously. This is according to Huber (1981), Huber and Ronchetti (2009), Hampel et al (1986), Rousseeuw and Leroy (1987), Maronna, Martin, and Yohai (2006), and the references therein. Specific types of outlier-robust regression methods are implemented in commercial statistical software programs such as SAS and STATA, as well as in the open-source R (R Core Team, 2012). Regression M-estimates of one form or another is perhaps the most widely available types, also in Eviews9.5 upwards. Statistical inference methods for robust regression coefficients, such as robust t-tests, F-tests, robust Rsquared and robust model selection criteria, have been available in the academic literature for many years.

Nevertheless, one rarely sees research papers that report statistical inference results for the robust regression. It is also good to say that the primary use of robust regression to date has been for diagnostic purposes.

According to Tukey (1979), "It is perfectly proper to use both classical and robust/resistant methods routinely, and only worry when they differ enough to matter. But when they differ, you should think hard." This is good advice that leaves open the question of how much is "enough" in "when they differ enough", and so it is desirable to have a test statistic whose rejection region defines "enough". If such a test statistic has reliable level and adequate power, then acceptance of an appropriately defined null hypothesis would lead a user who routinely computes both LS and robust regressions to take comfort in the LS results. Rejection of the null hypothesis would support reliance on the robust regression estimate and associated robust inferences on the other hand.

What then is robust regression? It offers a substitute to least squares regression that works with less restrictive assumptions. It offers much better regression coefficient estimates when outliers are present in the data, precisely. The assumption of normally distributed residuals in the least square method is violated by outliers. They tend to mislead the least squares coefficients by having much more influence than they deserve. One would expect that the weight attached to each observation would be about 1/N in a dataset with N observations, usually. Nonetheless, outlying observations may receive a weight of 10, 20, or even 50 %, thus leading to serious distortions in the estimated coefficients. As a result of the distortion, these outliers are not easy to identify since their residuals are much smaller than their purported scopes. When only one or two or more independent variables are used, these outlying points may be visually detected in various scatter plots. However, the complexity added by additional independent variables often hides the outliers from view in scatter plots. Robust regression down-weights the influence of outliers. This makes residuals of outlying observations larger and easier to spot. Robust regression is an iterative procedure that seeks to identify outliers and minimize their impact on the coefficient estimates.

The robust least square regression was the alternative for testing of the appropriate models for the research. After running the robust regression in order to eliminate the likely outliers in the model, the residual diagnostics were carried out (i.e. under the methods correlogram –Q-statistics and Correlogram – Squared Residuals) to test for respective autocorrelation, partial correlation, Q-Statistics and probabilities.

Robust M Regression Estimation

The paper considers estimation in the linear regression model:

$$yi = x'i\beta o + ei \qquad i = 1 \ldots n \qquad (1.2)$$

under the assumption that the observed data $zi = (xi, yi)$ consists of independent and identically distributed (i.i.d.) random variables. The assumption here is that, there is always an additional intercept term α_o and that it is included in the model (1.2) as part of the error term ei

rather than as a component of βo. Specifically, it is presumed that the xi do not contain a column of 1's. Then if the true model contains an intercept, will capture it plus part of the error term. It is of worthy of note that α_o is often viewed as a nuisance parameter.

Define column vectors X'=(1, X') and ø'=(α, β') (1.3)

Model Specification:

$$Yt = þ_o + þ_1x_1 + þ_2x_2 + \cdots + þ_nx_n + \varepsilon \quad (1.4)$$

Hypothesized and Designed Models

In order to account for the accuracies of the consequence variables, alternate models were specified on two models. The earlier sequence of tests and considerations confirmed for further procedures for the research, thus; the traditional OLS estimation methods for panel data and least-squares methods for time-series data were used for the models (i.e. basically, the effect of stock market development on economic growth and vice versa.

For the panel data, the models are as follows:

In model 1, the effect of stock market development on the economic growth of the selected countries using the indicators of stock market development, alongside banking sector development variables, macroeconomic/other economic indicators and institutional-technological/innovative-financial variables to have a complete idea of how stock market development Impacts on economic growth. The model is designed as 'Economic Growth on Stock Market Development'.

In model 2, the effect of economic growth on stock market development of the selected countries using the key indicator of economic growth (i.e. GDP growth), alongside economic indicators, banking sector development indicators and institutional-technological/innovative-financial variables and also occasionally, some stock market development indicators to have a complete idea of how stock market development is developed. (Stock Market Development on Economic Growth)

Based on the objectives and research hypotheses, models were developed. The models are as:

Model One (1)

H_0 = There is no relationship between economic growth and stock market development.

H_1 = There is a relationship (positive or negative) between economic growth and stock market development.

Model Two (2)

H_0 = There is no positive relationship between stock market development and economic growth

H_1 = There is a relationship (positive or negative) between stock market development and economic growth

The hypotheses were tested at 5% level of significance.

The following methods were used to achieve the above results.

Depending on the outcome of initial test results such as correlation tests, four (4) equations for economic growth have been developed for a particular case under the two models, likewise stock market development. Subsequently, variables were controlled for each scenario and captured in the regression tables.

The baseline equation:

Baseline Equation for Model One (1)

GGDP = MKT_CAP2GDP + STK_TRD_VL__GDP + LISTED + + STK_TRD_TRN + M2_2GDP + DM_CREDIT + GDSVNGS_2GDP + FDI_2GDP + EXCR+ INFL+ TX2GDP + BREES_IDX + GGDP (-1)

Baseline Equation for Model Two (2)

MKT_CAP2GDP = GGDP+ STK_TRD_VL__GDP+ LISTED + STK_TRD_TRN + M2_2GDP + DM_CREDIT + GDSVNGS_2GDP + FDI2GDP + EXCR+ INFL+ TX2GDP + BREES_IDX + MKT_CAP2GDP (-1)

According to Levine and Zervos (1998b); Bekaert et al (2001); Rajan and Zingales (2003), a common gauge for evaluating the stock market size is market capitalization ratio, which is equal to the market value of listed shares over the appropriate GDP. This indicator has been widely used in the study as steady and the main indicator to measure stock market development for two obvious reasons. One, it is a measure of the size of the stock market, which is positively related to the capacity to mobilize capital and diversify risk. Additionally, it is assumed to add firms' previous retained earnings and future growth prospects so that a higher ratio can indicate growth prospects as well as stock market development.

According to Adelegan (2008), the main limitation of this measure is that a high ratio exclusively driven by the appreciated values of only a few companies with little or no change in the sum of funds organize and no change in the scope of the stock market may be misread as stock market development. In effect, as indicated in chapter one, all the four key indicators for measuring the stock market were used: market capitalization ratio, the value of stocks traded turnover ratio, stocks traded total value ratio and number of listed companies as clearly reviewed.

Times Series Data

Time-series data was used for testing best-performing stock market countries from each of the selected four (4) continents by the degree of financial centres:

- United Kingdom;

- United States of America
- Hongkong, and
- South Africa;

Following the laid down procedures for carrying out this research, time-series data was used to develop equations to assess four (4) countries designed on the two models. This is to address the research questions (in chapter one). In model 1, the effect of stock market development on economic growth in the selected best four countries from the four (4) continents using the indicators of stock market development alongside banking sector development variables, macroeconomic indicators and other growth variables. This is to have a complete idea of how the stock market development affects economic growth in that country.

In model 2, the effect of economic growth on stock market development in the selected best four (4) countries from the four (4) continents using the indicators of stock market development alongside banking sector development variables, macroeconomic indicators and other growth variables. This is to have a complete idea of how economic growth develops the stock market in that country.

Time series – baseline equation for models 1 and 2

Baseline Equation for Model One (1)

$$GGDP = MKT\_CAP2GDP + STK\_TRD\_VL\_\_GDP + LISTED + STK\_TRD\_TRN + M2\_2GDP$$
$$+ DM\_CREDIT + GDSVNGS\_2GDP + FDI\_2GDP + EXCR + INFL + TX2GDP + BREES\_IDX$$
$$+ GGDP(-1)$$

Note: In this model, the dependent variable is the GDP growth

Model 2= **Baseline Equation for Model Two (2)**

MKT_CAP2GDP = GGDP+ STK_TRD_VL__GDP + LISTED + STK_TRD_TRN + M2_2GDP + DM_CREDIT + GDSVNGS_2GDP + FDI_2GDP + EXCR+ INFL+ TX2GDP + BREES_IDX + MKT_CAP2GDP (-1)

In this model, the dependent variable is the market capitalization ratio (i.e. alternatively any stock market development indicator could be selected as the dependent variable if it becomes necessary). The study considers market capitalization ratio as mainly the stock market development indicator alongside domestic credit from banks to private businesses, money supply to GDP and gross domestic savings as the main banking sector development indicators. Exchange rate, inflation GDP and GDP per capita are considered as macroeconomic indicators. Other economic and complementary variables include foreign direct investment and tax revenue to GDP. Additionally, the indexed institutional-technological/innovative-financial variables also complement the variables used for the research.

Depending on the outcome of initial test results such as unit root, correlation, cointegration and regression tests for a particular case under the two models, variables were controlled and dropped as indicated in each scenario.

Data (Empirical) Analysis

The stock market development on economic growth and vice versa are examined using both ordinary least squares and partly robust least square regression methods on samples of six geographic locations or settings for a panel data as stated in chapter one.

Panel data has a dependent variable followed by a list of regressors including ARMA and PDL terms, or an explicit equation like Y= c(1) + c(2) *X. The method, as stated in the previous text, is least squares (NLS and ARMA). In another vein, the dynamic impact of stock market development on economic growth and vice versa was examined on time series data using the 'least square method' on a sample each from four geographic locations namely Americas, Africa, Europe and Asia. Time series data on the other hand has; dependent variable followed by a list of regressors including ARMA and PDL terms, or an explicit equation like Y = c(1) + c(2) *X. The method as stated in the previous text is least squares (NLS and ARMA). Furthermore, both panel and times series data were empirically processed by eviews9.5 software

Summary and conclusion

This chapter has detailed how data was collected for the research, how the data was interpreted and analyzed. The chapter reviewed various impressions of ideas under the philosophical approach to the thesis and the various tests undertaken to make this research a painstaking one. The topic of this dissertation is "Stock Market Development and Economic Growth: Global Perspectives-1993-2016" using a quantitative approach on secondary data (i.e. both panel and time series). The purpose of this study is to explain and organise the perceptions of stakeholders and experts in finance what policy prescriptions can help improve systems that are affiliated to stock markets and the economy in general. Also, to diversify resource strategies to have a broader view in the sourcing of financial resources (i.e. by investors, governments and businesses) and maintain financial sustainability.

In this study, much more consideration was extended to different worldviews Slife et al. (1995) as cited in Creswell (2008) of the philosophical approach to research (i.e. epistemologies & ontologies, postpositivism, constructivism, advocacy/participatory, and pragmatism). This study is of positivist nature as well as of postpositivism perspective (Phillips & Burbules, 2000; Creswell, 2008). Postpositivism, as it has been termed, represents the thinking, then positivism, challenging the traditional notion of the all-inclusive certainty of knowledge. Both the positivist and postpositivism were not only merely considered but justified. The scientific viewpoint of the positivist is the establishment of uniformities and regularities among observable events. The positivist position argues for the use of a laboratory type experimental approach in the generation and justification of knowledge. But this study's objective is to test any theories or hypotheses against observations in the process of generating and justifying knowledge.

According to Atchulo (2015), from the works of Stainton-Rogers (2006) and Blaikie, (2000), one school of thought has the perception largely that all knowledge must be grounded in logic experience that is subjected to methodological control. This perception is further linked to the concept of formal rationality. This worldview has economic rationality as its basis and conventions on economics. Other scholars do not disagree with the existence of a real, material world; however, they do disagree that this real-world can ever be basically 'discovered'. Others also are of the view that there will never be one single reality, in line with this thinking. A diversity of various types of knowledge are constructed by people, and each of this is made real by human meaning making.

Another school of thought is affiliated further to the notion of substantive rationality. This worldview acknowledges taking into account social, environmental and other externalities in decision-making. Even though some have subscribed to this worldview on sustainability assessment modelling, to some extent, others claim it is not sufficient to explore how organizations integrate social, environmental and other externalities in decision-making (Atchulo, 2015; Stainton-Rogers, 2006; Blaikie, 2000). This is mostly because of some bias for the notion that knowledge is constructed rather than discovered. The economic/financial aspect of sustainability assessment modelling is expected to suffer from this bias. Another school of thought argue that science involves the formation of contestable hypotheses about how the world works that are then tested against observations.

Furthermore, some scholars spell out hard on three logics of investigation (i.e. induction, deduction, and abduction). The processes according to these scholars involved drawing inferences from observations in order to make generalisations. Also, the process is to attain knowledge via collecting objective data without any preconceptions to establish regularities. The process also buttress that preconceptions play a vital role in the gaining of knowledge and that it is theory-driven. Thy also claim putting a theory's predictions to test is crucial to the process. The processes are positivist nature to oversimplify highly complex things happening in the world. The claim of the processes is to build up a new theory instead of testing it out, which tends to focus on creating methods to conduct meaning analysis, instead of proliferating more comprehensive theories. Also, does not provide an explanation; however, of what is likely to happen to be unfolded and uncovered. They explain that what is happening in a particular situation is more than interpretation (Atchulo, 2015; Stainton-Rogers, 2006 and Blaikie, 2000). In the view of the above, scientific knowledge consists of a body of tentative theories or hypotheses which have not been rejected to date.

Relevant econometric parameters such as sampling, multicollinearity, cointegration, stationarity and unit root and regressions were subsequently discussed extensively. The sampling approach selected for the study is the stratified random sampling, which is a system of selecting a group, categorizing the determined group into smaller groups subject to its existing features and then getting the equal sample from the identified subgroups. This approach is deemed apposite because the sample countries for the study are drawn from different continents based on common denominators. A benchmark of 50% was set for correlation (i.e. up to 50% as a proxy for selection of a variable- any set of variables with correlation coefficients of more than 50% is or are evicted). Since the study uses both panel and time series data, OLS estimation methods were selected for panel data and explored, and least squares methods were selected for time series data.

To satisfy the purpose of this secondary data research, data was collected through multiplicity of sources; thus, from WDI, IMF, WEF and other scholarly articles. Further, the data available for this research are used to meet the models' parameters for processing estimations to be in line with the study's objectives. The choice of both deductive and inductive methods of analysis was explained. The primary object of this choice is the realization of the overall objective of this research, which is to examine stock market development on economic growth and vice versa. The subsequent chapters of the thesis are organization, presentation, interpretation and empirical analysis of the secondary data gathered from the many sources and finally, the conclusion and policy recommendation.

Chapter 4: Results of the Study

Introduction

The topic of this dissertation is: "Stock Market Development on Economic Growth: Global Perspectives-1993-2016" using quantitative approach on secondary data. As indicated in Chapter three (3) of this research, the work is structured in both partly panel data type and partly time series data type. The first part of this reportage is in relation with the panel data and the second part of it is in relation with time series data. The work started with a broad set of thirteen independent variables that were found to be relevant for the stock market development. The primary purpose of this study is to investigate the development of the stock market vis-à-vis economic growth and vice versa. The work is underpinning the researcher's ambitions to engage in the economic debate that will encourage the development of the stock market to enhance economic growth and vice versa. The study explored the insights of the stock market indicators and followed the trends of these indicators over the period under investigation and captured in Chapter two. This was to give an insight to subject matter experts on the issue of the tactical inputs that are required to build and improve the stock markets. The main research problem is the inability of countries to take advantage of the stock markets to source reliable financing for long term projects, and to diversify their risks. Whilst some countries took advantage of the stock market over the last two decades, others have not. Data was gathered from WDI, IMF, WEF and other scholarly publications to support the validity and reliability of this secondary and quantitative research. The compilation was enhanced by the careful sampling of twenty (20) countries from different geographic zones, and further put into ten (10) lots. While each individual geographic location was treated and analysed as an independent case, the data, both panel and time series were analysed using ordinary least 208 squares and least squares. Various results went through robustness checks as well to strengthen the study's purpose and research validity. The emerging patterns from the analysis were organised into specific categories and formats to address the purpose of the study and research questions, and to additionally test and improve the conceptual framework of the relationship between the stock market development and economic growth.

This research is premised on a set of hypotheses. Appreciating, however, that results from a series of tests may be biased due to the presence of unit root and multicollinearity, the models were restructured. The research considers by first differencing variables that were not stationary, and dropping highly correlated variables that were likely to pose multicollinearity of variables that were impractical in a particular situation due to irrelevant statistical values. The sequence of reporting the results of the tests are individual unit root, correlation, cointegration, regression test, robustness test and discussions. In this chapter, results and discussions of the stock market development on economic growth and vice versa for countries selected from four continents are provided to describe and present the views of the subject for all stakeholders. The study aims to develop policy prescriptions for not only looking at the stock market in isolation but its connection with the banking sector, macroeconomic environment and institutional structures in general. Additionally, the actual results are compared with the theoretical framework reviewed to describe and show any changes or knowledge obtained from this research. The research problem and the purpose of the study have the following hypotheses, as stated in chapter one:

(1)

a. Null hypothesis (H0): There is no relationship (negligible effect) between economic growth and stock market development of the sampled countries;

b. Alternative hypothesis (H1): There is a relationship (positive or negative) between economic growth and stock market development of the sampled countries;

(2)

a. Null hypothesis (H_0) There is no relationship (negligible) between stock market development and economic growth of the sampled countries;

b. Alternative hypothesis (H_1): There is a relationship (positive or negative) between stock market development and economic growth of the sampled countries;

The results of stock market development on economic growth and vice versa for the selected countries for this research are captured in the sequence below:

1) All continents (Panel)
2) Best Countries (Panel)
3) Americas (Panel)
4) Europe (Panel)
5) Africa- Sub-Saharan Africa (Panel)
6) Asia Australia (Panel)
7) United States (Time Series)
8) United Kingdom (Time Series)
9) South Africa (Time Series)
10) Hong Kong (Time Series)

PANEL DATA: CONTINENTS COMBINED

Results of Model One (1)

Model one (1) is designed as economic growth on stock market development. The processes set out for undertaking this research were followed. All the variables were tested for unit root tests at all stages: level & individual intercept, level & individual intercept and trend, first difference & individual intercept, and first difference & individual intercept and trend. Results are reported in Table 2CC1 and 3CC2 below using Augmented Dickey-Fuller (ADF) and the Philips and Peron (PP) unit root tests respectively for the relevant variables:

Table 2CC1: ADF Unit Test Results for Sampled Continents Combined

Variables	Level				1st Difference			
	Individual Intercept		Intercept and Trend		Individual Intercept		Intercept and Trend	
	Stats	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**
GDSVNGS_2GDP	73.0496	0.0011	58.0131	0.1952	184.867	0.0000	141.864	0.0000
BREEIS_IDX	46.1466	0.2331	37.1623	0.5987	190.44	0.0000	138.688	0.0000
DM_CRD__PRV_2GDP	36.1780	0.6430	38.0101	0.5601	159.099	0.0000	129.857	0.0000
FDI_2GDP	99.9066	0.0000	83.8973	0.0001	222.290	0.0000	158.529	0.0000
FRX	57.6585	0.0213	75.6241	0.0003	292.810	0.0000	300.035	0.0000
GGDP	142.551	0.0000	134.972	0.0000	325.254	0.0000	250.723	0.0000
INFLATN	384.263	0.0000	360.746	0.0000	530.058	0.0000	488.029	0.0000
LGDP_P_CPT	17.2280	0.9994	22.1355	0.9901	140.936	0.0000	99.0941	0.0000
LLISTED_COYS	35.0985	0.6903	48.5521	0.1671	117.842	0.0000	84.8413	0.0000
M2_GDP	22.7253	0.9872	53.7903	0.0713	179.097	0.0000	129.838	0.0000
MKT_CAP2GDP	62.0866	0.0008	49.3509	0.1476	249.159	0.0000	199.628	0.0000
STK_TRD_TRN	204.851	0.0000	156.004	0.0000	279.612	0.0000	228.231	0.0000
STK_TRD_VAL__GDP	110.696	0.0000	77.0116	0.0004	224.479	0.0000	205.169	0.0000
TX2GDP	61.4162	0.0163	53.5798	0.0740	172.993	0.0000	135.452	0.0000

Source: (Mensah, 2020). ADF Unit root tests for the variables. Data via eviews9.5

Table 3CC2: PP Unit Root Tests Results for the Sampled Continents Combined - Panel

Variables	Level				1st Difference			
	Individual Intercept		Intercept and Trend		Individual Intercept		Intercept And Trend	
	Stats	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**
GDSVNGS_2GDP	73.7533	0.0009	47.4407	0.1952	314.155	0.0000	508.278	0.0000
BREEIS_IDX	84.8236	0.0000	83.8685	0.0001	715.579	0.0000	1123.56	0.0000
DM_CRD__PRV_2GDP	53.1730	0.0794	79.1570	0.0002	366.913	0.0000	620.894	0.0000
FDI_2GDP	121.869	0.0000	115.495	0.0000	717.790	0.0000	961.879	0.0000
FRX	36.5295	0.5375	51.9727	0.0650	257.163	0.0000	214.983	0.0000
GGDP	188.596	0.0000	134.972	0.0000	1196.17	0.0000	1178.83	0.0000
INFLATN	165.684	0.0000	150.251	0.0000	653.922	0.0000	1121.11	0.0000
LGDP_P_CPT	19.5525	0.9973	17.0553	0.9994	189.161	0.0000	136.067	0.0000
LLISTED_COYS	65.4981	0.0067	41.5404	0.4034	226.025	0.0000	208.487	0.0000
M2_GDP	19.4578	0.9974	306.969	0.0000	590.447	0.0000	751.627	0.0000
MKT_CAP2GDP	74.4167	0.0008	81.1535	0.0001	615.702	0.0000	1275.36	0.0000
STK_TRD_TRN	120.965	0.0000	140.843	0.0000	1077.17	0.0000	2016.57	0.0000
STK_TRD_VAL__GDP	73.1771	0.0011	56.0428	0.0474	409.840	0.0000	548.320	0.0000
TX2GDP	76.1435	0.0005	52.4789	0.0894	296.226	0.0000	382.452	0.0000

Source: (Mensah, 2020). PP Unit root tests for the variables in levels. Data via eviews9.5
Note: Symbols of variables after first differencing to make them stationery start with D.
(GDSVNGS_2GDP changes to DGDSVNGS_2GDP and BREEIS_IDX changes to DBREEIS_IDX)

As indicated in the tables above, the series are tested at ‘‘first difference and individual intercepts. The p- values obtained are below 5%. Thus, the null hypothesis for each series is rejected because the individual result is not more than 5%. The alternative hypothesis for the individual series was accepted.

A correlation test was done and based on the results, which are captured in Table 4CC3, two of the variables; money supply and domestic credit to private businesses are highly correlated, thus likely to produce multicollinearity. Domestic credit to private businesses was dropped and money supply to GDP maintained.

Table 4CC3: Correlation Test Result for Sample Continents Combined

Name of Series	D__GDSVNGS_2GDP	DBREES_IDX	DDM_CRD__PRV_2GDP	DFDI_2GDP	DFRX	DINFLATN	DLGDP_P_CPT	DLLISTED_COYS	DM2_GDP	DMKT_CAP2GDP	DSTK_TRD_TRN	DSTK_TRD_VL_2GDP	DTX2GDP
D__GDSVNGS_2GDP	1.0000	-0.2077	-0.0827	0.0332	0.0935	0.1193	0.0638	-0.0217	-0.1004	0.0002	0.0293	0.0309	0.0168
DBREES_IDX	-0.2077	1.0000	-0.0178	-0.0206	-0.0011	-0.0029	-0.0096	0.0294	-0.0394	-0.0430	-0.0330	-0.0042	0.0453
DDM_CRD__PRV_2GDP	-0.0827	-0.0178	1.0000	0.0209	0.1031	0.0872	-0.1120	0.0272	0.6197	0.0185	0.0282	0.0097	-0.0172
DFDI_2GDP	0.0332	-0.0206	0.0209	1.0000	0.0014	-0.0013	0.0168	0.0278	0.0278	0.0326	0.0276	0.2558	0.0475
DFRX	0.0935	-0.0011	0.1031	0.0014	1.0000	0.0131	-0.3059	-0.0141	0.0932	-0.0036	-0.1288	-0.0244	-0.0296
DINFLATN	0.1193	-0.0029	0.0872	-0.0013	0.0131	1.0000	-0.0930	0.0063	0.0390	0.0015	0.0097	0.0094	0.0148
DLGDP_P_CPT	0.0638	-0.0096	-0.1120	0.0168	-0.3059	-0.0930	1.0000	0.1215	-0.1928	-0.0330	0.1100	0.0261	0.0241
DLLISTED_COYS	-0.0217	0.0294	0.0272	0.0278	-0.0141	0.0063	0.1215	1.0000	-0.0206	0.0160	0.0230	0.0344	0.0267
DM2_GDP	-0.1004	-0.0394	0.6197	0.0278	0.0932	0.0390	-0.1928	-0.0206	1.0000	0.1589	-0.0396	0.0618	-0.0082
DMKT_CAP2GDP	0.0002	-0.0430	0.0185	0.0326	-0.0036	0.0015	-0.0330	0.0160	0.1589	1.0000	-0.1973	0.4430	-0.0336
DSTK_TRD_TRN	0.0293	-0.0330	0.0282	0.0276	-0.1288	0.0097	0.1100	0.0230	-0.0396	-0.1973	1.0000	0.2840	0.0488
DSTK_TRD_VL_2GDP	0.0309	-0.0042	0.0097	0.2558	-0.0244	0.0094	0.0261	0.0344	0.0618	0.4430	0.2840	1.0000	0.0487
DTX2GDP	0.0168	0.0453	-0.0172	0.0475	-0.0296	0.0148	0.0241	0.0267	-0.0082	-0.0336	0.0488	0.0487	1.0000

Source: (Mensah, 2020). Data via eviews9.5

Finally, some variables operate in the first difference, denoted as D. Cointegration test was subsequently carried out using Kao Residual cointegration test, and the results are in Table 5CC5. The series are all cointegrated and have long-run association.

Table 5CC4: Cointegration Test for the Sample Continents Combined

ADF	t-Statistic -1.769381	Prob. 0.0384
Residual variance	18.88547	
HAC variance	1.945299	

Source: (Mensah, 2020). **Augmented Dickey-Fuller Test Equation- SERIES:** D__GDSVNGS_2GDP; DBREES_IDX; DDM_CRD__PRV_2GDP; DFDI_2GDP; DINFLATN; DFRX; DLGDP_P_CPT; DLLISTED_COYS; DM2_GDP; DMKT_CAP2GDP; DSTK_TRD_TRN; DSTK_TRD_VL_2GDP; DTX2GDP GGDP.

The null hypothesis is rejected, and the alternative hypothesis accepted. The P-Value is 0.0384, thus 3.8% (less than 5%).

Following the preceding tests, five (5) equations were adopted for model one (1) for regressions. For the baseline equation, all the stock market development indicators were used, and the results are captured in Table 6CC5.

Table 6CC5: Model One - Results for Economic Growth on Stock Market Development for Sample Continents

Dependent Variable Growth	BL	EQ1	EQ2	EQ3	EQ4
DMKT_CAP2GDP	0.0000019 (0.9562)	0.0000098 (0.7585)			
DSTK_TRD_TRN	-0.000035 (0.3297)		-0.0000266 (0.4467)		
DSTK_TRD_VL_2GDP	0.0000138 (0.7519)			0.0000031 (0.9350)	
DLLISTED_COYS	-0.005409 (0.6690)				-0.009636 (0.0000)
DM2_GDP	-0.000742 (0.0007)	-0.000740 (0.0009)	-0.000728 (0.0009)	-0.000728 (0.0009)	-0.000727 (0.4633)
D__GDSVNGS_2GDP	0.002634 (0.0000)	0.002522 (0.0000)	0.002519 (0.0000)	0.002521 (0.0000)	0.002501 (0.0009)
DLGDP_P_CPT	1.024156 (0.0000)	1.009726 (0.0000)	1.010383 (0.0000)	1.009717 (0.0000)	1.010998 (0.0000)
DFDI_2GDP	-0.000139 (0.6173)	-0.000159 (0.5965)	-0.000161 (0.5642)	-0.000163 (0.5660)	-0.000159 (0.0000)
DTX2GDP	0.000214 (0.8232)	0.000734 (0.4591)	0.000749 (0.4495)	0.000723 (0.4658)	0.000752 (0.5673)
DINFLATN	-0.00002 (0.1751)	-0.0000154 (0.3035)	-0.0000156 (0.2982)	-0.0000155 (0.3019)	-0.0000148 (0.4479)
DFRX	0.0000630 (0.1982)	0.0000734 (0.1354)	0.0000670 (0.1791)	0.0000735 (0.1351)	0.0000742 (0.3259)
DBREES_IDX	-0.027657 (0.1603)	-0.030186 (0.1374)	-0.031016 (0.1265)	-0.030471 (0.1333)	-0.030302 (0.1353)
GGDP(-1)	0.011565 (0.3088)	0.025825 (0.0540)	0.025111 (0.0608)	0.025717 (0.0559)	0.026371 (0.0494)

Source: (Mensah, 2020). Dependent variable: GDP Growth. Data Output via Eviews9.5. Method: Panel Least Square - Fixed- Effect Model. Probability values of significance levels are in curly parenthesis.
Model one (1) regression equation: ggdp c dmkt_cap2gdp dstk_trd_trn dstk_trd_vl_2gdp dllisted_coys dm2_gdp dlgdp_p_cpt d__gdsvngs_2gdp dfdi_2gdp dtx2gdp dinflatn dfrx dbrees_idx ggdp (-1)

The results of the baseline equation in Table 6CC5 look quite thought-provoking. The equation uses all the indicators of the stock market development, but none of them has a significant effect on economic growth. The baseline regression equation also indicates that DMKT_CAP2GDP and stocks traded total value have coefficients of 0.0000019 and 0.0000138 respectively but are not significant, though they have positive influences on economic growth. On the other hand, stocks traded turnover ratios, and the number of listed companies have coefficients of -0.000035 and -0.005409 respectively, which negatively influence growth, though they are not significant.

The coefficients of the variables considered yield either negative or positive relationship between the variables and economic growth, even though the level of influence of most of them is not statistically significant. The only most significant variables include; DM2_GDP which has a coefficient of -0.000742 and negatively related to GGDP. D__GDSVNGS_2GDP and DLGDP_P_CPT have coefficients of 0.002634 and 1.024156 respectively and are positively related to GGDP. Garcia and Liu (1990) support the indications given by gross domestic savings and GDP per capita. DFDI_GDP also has a coefficient of -0.000139 but not statistically significant. On the other hand, the ratios of tax revenue to GDP, DFLX and GGDP (-1) have coefficients of 0.000214, 0.0000630 and 0.011565 respectively and are positively related to GGDP, however, the degree of influence is not statistically significant. DBREES_IDX and DINFLATN have coefficients of -0.027657 and -0.00002 but they are not significant. The coefficient of tax revenue to GDP ratio contradicts the findings of studies such as Gemmell, Kneller & Sanz (2014), Romer & Romer (2010), Barro & Redlick (2011) and Ferede & Dahlby (2012), which all find a negative and significant relationship between tax revenue to GDP ratio and economic growth. The coefficient and the extent of degree of influence of inflation as found in this test contradicts the finding of Mallik and Chowdhury (2001). They conclude that there is a positive relationship between inflation and economic. The coefficient of the determination, that is, R –squared is 0.949196, which connotes that 95% accounted for all variations on the dependent variable (GDP growth. The F-statistic is 612.2475 with a p-value of less than 5% (0.0000). From the preceding, all the explainable variables jointly affect GGDP.

The results of equation 1 in Table 6CC5 also look quite interesting. The equation uses market capitalization ratio as the main stock market development indicator, and it has a coefficient of 0.0000098, though it has a positive influence, it is very minimal and also not statistically significant.

DM2_GDP has a coefficient of -0.000740, and negatively related to economic growth; D__GDSVNGS_2GDP has a coefficient of 0.002522 and positively related to GGDP, and DLGDP_P_CPT has a coefficient of 1.009726 and positively related to GGDP, and are the three most statistically significant variables here that influence growth. The coefficients and the statistical significance of DM2_GDP as captured in Table 6CC5 controverts the conclusions of Zapodeanu and Cociuba (2010), Hameed and Amen (2011) and Ihsan and Anjum (2013), that money supply (M2) positively Impacts economic growth. The result for D__GDSVNGS_2GDP in Table 6CC5 confirms the findings of Masih & Peters (2010) and Singh (2010), that savings have a positive effect on economic growth.

DTX2GDP, DINFLATN, DFRX, DBREES_IDX and GGDP (-1)] have varying coefficients of 0.000734, -0.0000154, 0.0000734, -0.03018 and 0.025825 respectively, and are all not significant. The R-squared is 0.951465, meaning that 95% accounted for the variations that affected the dependent variable. Also, the F-statistics is 258.0097 and has a Prob (F-statistic) of 0.000000, less than 5%. This clearly states that all the independent variables jointly explained GGDP.

In equation 2, the ratio of stock traded turnover is used as the main indicator for stock market development. The stock traded turnover ratio has a coefficient of -0.0000266 and negatively related to GGDP and not statistically significant. Here, the most significant coefficient values are DM2_GDP, D__GDSVNGS_2GDP and DLGDP_P_CPT, all have coefficients of -0.000728; 0.002519 and 1.010383 respectively, and also, they are all significant. The coefficient and the level of degree of influence of stock traded turnover ratio refutes the findings of Bayar (2014). DFDI_2GDP, DTX2GDP, DINFLATN, DFRX, DBREES_IDX and GGDP (-1) have varying coefficients influences of -0.000161, 0.000749, -0.0000156, 0.0000670, -0.031016 and 0.025111 respectively, but they are all not significant. The R- squared is 0.951523, thus indicating that 95.15% accounted for all the variations in the dependent variable, and the F-statistics is 258.3323 and Prob (F-statistic) of 0.000000 less than 5%. All independent variables jointly explained the outcome of GGDP.

In equation 3, which uses the ratio of stock traded total value as the main indicator of stock market development, stock market development has a coefficient of 0.000003, however, and has a minimal positive impact on GGDP, and also not statistically significant. The stock traded total value is indicative of liquidity on the stock markets. An increase in the stock market through the boost of liquidity pushes GGDP by paltry coefficient of 0.000003.

Here, the most significant coefficient values are: DM2_GDP, it has a coefficient of -0.000728 and negatively related to GGDP; additionally, it is statistically significant; gross domestic savings and GDP per capita both have coefficients of 0.002521 and 1.009717 respectively and are statistically significant, as well. Additionally, they positively influenced economic growth; Garcia and Liu (1990) support the indications given by D__GDSVNGS_2GDP and GDP per capita. The results of macroeconomic indicators and DBREES_IDX have varying influences on GGDP. DINFLATN's coefficient of -0.0000156, though minimal, it negatively influenced GGDP. DTRX has a coefficient of 0.000749 and positively related to GGDP; however, the extent of influence is insignificant. On the other hand, the coefficient of DFRX is 0.0000670, has a minimal positive effect on GGDP, but not significant. DBREES_IDX, surprisingly is negatively related to GGDP with a coefficient of -0.031016 that is negative three (3) percentage points. The level of impact is not significant, though. The R-Squared is 0.951455, indicating 95% accounting for variations in GGDP. The F-statistic is 257.9513 and of Prob (F-statistic) 0.000000, less than 5%.

In the case of equation 4, which uses the number of listed companies as an indicator of stock market development, while, controlling for other stock market development indicators. It influences GGDP negatively with a coefficient of -0.009636, and it is significant. This result is out of line with several studies that find a positive relationship stock market development and economic growth. Bencivenga, et al., (1996) and Levine & Renelt (1992) and Enisan & Olufisayo (2009), conclude that stock market development positively and significantly has long term impact on economic growth. The other significant variables include DM2_GDP with a coefficient of -0.000727, and negatively influenced economic growth, though not significant. D__GDSVNGS_2GDP positively influenced GGDP with a coefficient of 0.002501, and GDP per capita also has a coefficient of 0.002501, and they are significant (attributed to the findings of Garcia and Liu, 1999). The lag of GGDP has a coefficient of 0.026371 and also statistically significant. It has positive influence on GGDP for the period under review.

DFDI_2GDP influenced GGDP negatively and has a coefficient of -0.000159, and it is statistically significant. DTX2GDP and DFRX have positive coefficients of 0.000752 and 0.0000742 respectively, contrary to DBREES_IDX and DINFLATN that negatively influenced GDP growth with coefficients of -0.030302 and -0.0000148 respectively. They are all insignificant. The R-Squared is 0.951455, indicating 95%, accounting for variations in GGDP.

The F-statistic is 257.9513 and of Prob (F-statistic) 0.000000, less than 5%, implying that all the independent variables jointly explain GGDP.

In addition to panel least square model used above, robust least-squares method was tried on the base line model only, incorporated all the stock market indicators in addition to macroeconomic indicators, other economic growth indicators and the indexed institutional technological/innovative and financial factors stated in the work. Six variables are statistically significant but have differing influences on GGDP, as indicated in the table below.

Table 7CC6: Regression Results of Sample Continents Combined (Model 1)

Variables	Coefficient	Std. Error	z-Statistic	Prob.	Remarks below 5%	Remarks above 5%
C	0.01259	0.00059	21.52943	0.00000	*	
DMKT_CAP2GDP	0.00000	0.00001	0.32973	0.74160		**
DSTK_TRD_TRN	-0.00001	0.00001	-0.59919	0.54900		**
DSTK_TRD_VL_2GDP	0.00000	0.00001	0.04514	0.96400		**
DLLISTED_COYS	-0.00355	0.00402	-0.88525	0.37600		**
DM2_GDP	-0.00015	0.00007	-2.20508	0.02740	*	
DLGDP_P_CPT	1.06000	0.00408	259.59970	0.00000	*	
D__GDSVNGS_2GDP	-0.00035	0.00017	-2.02593	0.04280	*	
DFDI_2GDP	-0.00001	0.00009	-0.16896	0.86580		**
DTX2GDP	0.00019	0.00031	0.63626	0.52460		**
DINFLATN	-0.00002	0.00000	-4.08256	0.00000	*	
DFRX	0.00005	0.00002	3.22874	0.00120	*	
DBREES_IDX	0.00490	0.00624	0.78526	0.43230		**
GGDP(-1)	0.01537	0.00360	4.26445	0.00000	*	

Source: (Mensah, 2020). Dependent Variable: GGDP. Robust Least Squares Method
Model one (1) ggdp c dmkt_cap2gdp dstk_trd_trn dstk_trd_vl_2gdp dllisted_coys dm2_gdp dlgdp_p_cpt d__gdsvngs_2gdp dfdi_2gdp dtx2gdp dinflatn dfrx dbrees_idx ggdp (-1)
Note: P-values less than 5% =* and above 5% = **

Results show R-squared with P-value of 0.791931, meaning that 79% accounted for the variations of the explainable variables on GGDP. The probability of F-statistic is less than 5% (0.0000) in the baseline model. The P-value of the F-statistic is less than 5%, thus an indication that all the independent variables jointly explained GGDP.

In the Table 7CC6 above, all the four (4) stock market development indicators are not significant. However, DSTK_TRD_TRN and DLLISTED_COYS have negative influences on GGDP, while DMKT_CAP2GDP and DSTK_TRD_VL_2GDP have positive influences on GGDP. It is worthy of note that despite the coefficients of the aforementioned stock market development indicators, they have no or negligible effect on economic growth. In another vein, DTRX and DBREES_ID stated in work have positive influences on GGDP. Conversely, DFDI_GDP and DINFLATN have negative influences on GGDP.

Discussion of the Results of Model one (1) for all sampled – Twenty Countries

Economic growth on stock market development of selected twenty countries from four continents has been tested and analysed. It is established from the results that stock market development does not have effect on economic growth (negligible effect). This is in line with hypothesis (1a) which is H_0- Null hypothesis: There is no relationship (negligible effect) between economic growth and stock market development in the sampled countries; and confirmed by works of Oya & Domar (2006), Charif, (2001), Haque (2013), Ake & Ognaligui (2010), Saba & Ghulam (2017.

DMKT_CAP2GDP and DSTK_TRD_VL_2GDP variables have positive effects on economic growth, though not significant. These results partly contrast the findings of Masoud and Hardaker (2012), which establish a positive and significant relationship between stock market development and economic growth. Other stock market indicators have negative effects on economic growth. Nonetheless, DLLISTED_COYS has a negative influence on economic growth, it is significant. This validates the findings of Wang and Ajit (2013), which find a negative relationship between stock market development and economic growth. D__GDSVNGS_2GDP and DLGDP_P_CPT, positively influence economic growth. D__GDSVNGS_2GDP, which is an index of savings and investment, nonetheless is associated with income. These savings find themselves into the banking sector as well. It is expected that savings will be higher, thus higher capital flows will pass through the stock market. Likewise, DM2_GDP is negatively related to GGDP. This result invalidates the findings of Ogunmuyiwa (2010). He finds a positive and significant relationship between money supply and economic growth when he studied the money supply (M2)-economic growth nexus of Nigeria for the period 1980 and 2006. Also, the influence of DLGDP_P_CPT explains that the expansion of an economy will generate new demand for financial services. This will apply pressure to create larger and more sophisticated and competitive financial institutions to fulfil the new demand for their services.

From all indications, money supply, which is an indication of banking sector development is very influential on economic growth. Just like money supply, foreign direct investment, thus capital mobility enhances private capital flows, even though it has a negative effect on GGDP. From the results of the panel data analysis of the selected countries from the four (4) sampled continents, it is observed that though, stock market development factors influence GGDP, their effects are negligible.

Results of Model Two (2)

Model two (2) is designed as stock market development on economic growth. The study already tested variables for a unit root in model one and the results indicated that they are all stationary at first difference and intercept. Subsequently, the correlation test was undertaken with the exclusion of DMKT_CAP2GDP because it was used as the dependent variable.

Table 8CC7: Correlation Test Results for Sample Continents Combined (Model 2)

Series	D__GDSVNGS_2GDP	DBREES_IDX	DDM_CRD__PRV_2GDP	DFDI_2GDP	DFRX	DINFLATN	DLGDP_P_CPT	DLLISTED_COYS	DM2_GDP	DSTK_TRD_TRN	DSTK_TRD_VL_2GDP	DTX2GDP	GGDP
D__GDSVNGS_2GDP	1.0000	-0.2077	-0.0827	0.0332	0.0935	0.1193	0.0638	-0.0217	-0.1004	0.0293	0.0309	0.0168	0.1234
DBREES_IDX	-0.2077	1.0000	-0.0178	-0.0206	-0.0011	-0.0029	-0.0096	0.0294	-0.0394	-0.0330	-0.0042	0.0453	-0.0337
DDM_CRD__PRV_2GDP	-0.0827	-0.0178	1.0000	0.0209	0.1031	0.0872	-0.1120	0.0272	0.6197	0.0282	0.0097	-0.0172	-0.1465
DFDI_2GDP	0.0332	-0.0206	0.0209	1.0000	0.0014	-0.0013	0.0168	0.0278	0.0278	0.0276	0.2558	0.0475	0.0126
DFRX	0.0935	-0.0011	0.1031	0.0014	1.0000	0.0131	-0.3059	-0.0141	0.0932	-0.1288	-0.0244	-0.0296	-0.2747
DINFLATN	0.1193	-0.0029	0.0872	-0.0013	0.0131	1.0000	-0.0930	0.0063	0.0390	0.0097	0.0094	0.0148	-0.1008
DLGDP_P_CPT	0.0638	-0.0096	-0.1120	0.0168	-0.3059	-0.0930	1.0000	0.1215	-0.1928	0.1100	0.0261	0.0241	0.9716
DLLISTED_COYS	-0.0217	0.0294	0.0272	0.0278	-0.0141	0.0063	0.1215	1.0000	-0.0206	0.0230	0.0344	0.0267	0.1160
DM2_GDP	-0.1004	-0.0394	0.6197	0.0278	0.0932	0.0390	-0.1928	-0.0206	1.0000	-0.0396	0.0618	-0.0082	-0.2279
DSTK_TRD_TRN	0.0293	-0.0330	0.0282	0.0276	-0.1288	0.0097	0.1100	0.0230	-0.0396	1.0000	0.2840	0.0488	0.0965
DSTK_TRD_VL_2GDP	0.0309	-0.0042	0.0097	0.2558	-0.0244	0.0094	0.0261	0.0344	0.0618	0.2840	1.0000	0.0487	0.0230
DTX2GDP	0.0168	0.0453	-0.0172	0.0475	-0.0296	0.0148	0.0241	0.0267	-0.0082	0.0488	0.0487	1.0000	0.0242
GGDP	0.1234	-0.0337	-0.1465	0.0126	-0.2747	-0.1008	0.9716	0.1160	-0.2279	0.0965	0.0230	0.0242	1.0000

Source: (Mensah, 2020).

The regression results of model 2 are captured in Table 9CC8 below. All the stock market indicators were controlled one after the other to check the impact of each on market capitalization ratio.

Table 9CC8: Regression Results for Sample Continents Combined- Twenty Countries (Model 2)

Variables	BL	EQ1	EQ2	EQ3
DSTK_TRD_TRN	-0.343424 (0.0000)		-0.139932 (0.0138)	-0.287107 (0.0000)
DSTK_TRD_VL_2GDP	0.740426 (0.0000)	0.527766 (0.0000)		0.629164 (0.0000)
DLLISTED_COYS	18.46604 (0.2372)	16.20420 (0.3014)	15.47808 (0.4311)	18.72833 (0.2107)
DDM_CRD__PRV_2GDP	0.658169 (0.0487)	0.210105 (0.5363)	0.519163 (0.2160)	
DLGDP_P_CPT	17.77590 (0.7735)	6.180621 (0.9209)	22.26240 (0.7747)	28.61172 (0.6251)
D__GDSVNGS_2GDP	-0.180645 (0.7858)	-0.223178 (0.7393)	-0.007456 (0.9929)	-0.277194 (0.6636)
DFDI_2GDP	-0.458653 (0.1748)	-0.335650 (0.3237)	0.484642 (0.2467)	-0.489128 (0.1299)
DTX2GDP	-1.109621 (0.3434)	-1.156285 (0.3278)	-0.495510 (0.7366)	-1.104353 (0.3257)
DINFLATN	-0.007075 (0.6936)	-0.003389 (0.8516)	-0.003588 (0.8739)	-0.003515 (0.8357)
DFRX	-0.039454 (0.5185)	-0.031974 (0.5873)	0.021652 (0.7779)	-0.106185 (0.0738)
GGDP	-24.64115 (0.6722)	-20.45901 (0.7276)	-29.45338 (0.6879)	-37.22584 (0.5001)
DBREES_IDX	-18.96095 (0.4288)	-18.64529 (0.4403)	-24.31751 (0.4202)	-24.32818 (0.2895)
DMKT_CAP2GDP(-1)	-0.473562 (0.0000)	-0.297973 (0.0000)	-0.347740 (0.0000)	-0.303768 (0.0000)
DSTK_TRD_TRN(-1)	-0.117769 (0.0127)		-0.154621 (0.0093)	0.014814 (0.7629)
DSTK_TRD_VL_2GDP(-1)		-0.377750 (0.0000)		-0.383556 (0.0000)
DLLISTED_COYS(-1)				13.94101 (0.2817)
GGDP(-1)				-6.812922 (0.6555)

Source: (Mensah, 2020). Dependent Variable: market capitalization ratio. Regression via Eviews9.5 software

In the baseline equation, the dependent variable of attention is stock market development, hence market capitalization ratio is used. GGDP is the model driver and the main independent variable linking the market capitalization ratio has a coefficient of -24.64115, which negatively influences DMKT_CAP2GDP and also not significant. DM2_GDP ratio was dropped because of high correlation with DDM_CRD__PRV_2GDP. DDM_CRD__PRV_2GDP positively influences market capitalization ratio with a coefficient of 0.658169, but not statistically significant. The results also indicate that an increase in domestic credit to the private businesses will boost the ratio of market capitalization ratio. The extent of influence matters. However, this is likely to boost the exchangeability between debt and equity, thus, the coefficient of domestic credit will affect market capitalization ratio in the long run. This is in line with the findings of King and Levine (1993). DSTK_TRD_VL_2GDP has a positive impact on DMKT_CAP2GDP with a coefficient of 0.740426. DSTK_TRD_TRN, though, highly significant, the coefficient is -0.343424, thus an increase in DSTK_TRD_TRN negatively affects DMKT_CAP2GDP. The lags of DSTK_TRD_TRN (-1) and DMKT_CAP2GDP (-1) have coefficient values of -0.117769 and -0.473562 respectively, thus having negative influences on DMKT_CAP2GDP.

In another vein, the variables below with their corresponding coefficients have negative influences on market capitalization ratio, though they are all not statistically significant. These include DFDI_2GDP -0.458653, DINLATN -0.007075, DFRX -0.039454, D__GDSVNGS_2GDP -0.180645, DBREES_IDX factors -18.96095. On the other hand, GDP per capita and number of listed companies on the stock exchanges have coefficient values of 17.77590 and 18.46604 respectively, positively related to DMKT_CAP2GDP, however, they are not significant. The results for DFDI_2GDP contradicts Adam and Tweneboah (2008). They argue that if the long-term impact of FDI on economic growth is channeled through the process of rapid technological progress, then the causality direction is reversed, because FDI then indirectly affects stock market movements positively. The coefficient of DINLATN confirms the findings of Adebayo (2016).

In equation 1, DSTK_TRD_TRN was controlled for, thus DSTK_TRD_VL_2GDP has a coefficient value of 0.527766 and positively related to DMKT_CAP2GDP and also significant. However, and interestingly, DSTK_TRD_VL_2GDP (-1) is significant and has a coefficient of -0.377750, thus negatively related to DMKT_CAP2GDP. Also, DLLISTED_COYS has a coefficient of 16.20420 but not significant. On the other hand, the following variables do have positive influences on DMKT_CAP2GDP, however, they are not significant. These include-DDM_CRD__PRV_2GDP of a coefficient of 0.210105, DLGDP_P_CPT of a coefficient of 56.18062. Contrary to the preceding, the rest of the variables do have negative influences on market capitalization ratio, albeit, they are statistically insignificant. These include-D__GDSVNGS_2GDP -0.223178, DFDI_2GDP -0.335650, DTX2GDP -1.156285, DINFLATN -0.003389, DFRX -0.031974, GGDP-20.45901 and DBREES_IDX -18.64529.

In equation 2, stock traded value to GDP was controlled for the regression, as can be gleaned from the results. DSTK_TRD_TRN has a coefficient of - 0.139932, and negatively related to DMKT_CAP2GDP, thus significant. The following variables have their coefficient values in the same direction, thus negatively related to the market capitalization ratio. They are not statistically significant. These include DTXRGDP -0.495510; DINFLATN -0.003588; GGDP -29.45338; DMKT_CAP2GDP (-1) -0.347740, DSTK_TRD_TRN (-1) -0.154621, DBREES_IDX -24.31751, and D__GDSVNGS_2GDP - 0.007456.

In equation 3, market capitalization ratio was used as the representative indicator of the stock market development. To ascertain if stock market development is correlated or have an association with banking sector development, the study considers three variables as banking sector development indicators as well as barometers of financial depth such as DM2_GDP, D__GDSVNGS_2GDP and DDM_CRD__PRV_2GDP. In this study, unless

DDM_CRD__PRV_2GDP and DM2_GDP have data issues they are considered mostly as barometers of financial depth. Contrary to this view, King and Levine (1993), posit that this DM2_GDP does not inform who the liabilities belong to (either central bank or commercial banks or other depository institutions and vouch for DDM_CRD__PRV_2GDP. However, this study gives credibility to all, and to measure any one of them or all. It is also assumed that high levels of banking sector development will boost the exchangeability between debt and equity, thus, the coefficient of domestic credit will have adverse effect on market capitalization ratio in the long run. DSTK_TRD_TRN has a coefficient of -0.287107 whilst DSTK_TRD_VL_2GDP has a positive coefficient of 0.629164. DLLISTED_COYS and GDP per capita have coefficients of 18.72833 and 28.61172 respectively, meaning that they all have positive influence on the ratio of market capitalization, though, they are not statistically significant. In addition to the preceding, the following variables with their corresponding coefficients D__GDSVNGS_2GDP -0.277194; DFDI_2GDP -0.489128; DTX2GDP -1.104353; DINFLATN -0.003515; DFRX -0.106185; GGDP -37.22584; DBREES_IDX -24.32818 have negative influences on market capitalization ratio. On the other hand, the lag of all the stock market development indicators and GDP growth have varying influence on market capitalization ratio. DMKT_CAP2GDP, DSTK_TRD_TRN, DSTK_TRD_VL_2GDP, DLLISTED_COYS and GGDP have coefficients of -0.303768; 0.014814; -0.383556; 13.94101 and -6.812922 respectively.

In addition to the Panel Least Squares Method, (fixed effect model), robust least squares method was used to run a regression to ascertain whether or not the results are too far from each other. The results of the test are captured in Table 10CC9 below.

Table 10CC9: Robust Least Squares Results for Sample Continents-Panel Data Twenty Countries (Model 2)

Variable	Coefficient	Std. Error	z-Statistic	Prob.	Remarks below 5%	Remarks above 5%
C	0.894774	0.732192	1.222048	0.2217		**
DSTK_TRD_VL_2GDP	0.651913	0.014437	45.15527	0.0000	*	
DSTK_TRD_TRN	-0.463983	0.013393	-34.64258	0.0000	*	
DLLISTED_COYS	2.921092	4.645146	0.628848	0.5294		**
DLGDP_P_CPT	4.928218	18.57535	0.265310	0.7908		**
D__GDSVNGS_2GDP	-0.072776	0.200855	-0.362333	0.7171		**
DFDI_2GDP	-0.154941	0.101884	-1.520754	0.1283		**
DTX2GDP	-0.233109	0.350920	-0.664279	0.5065		**
DINFLATN	0.000894	0.005358	0.166931	0.8674		**
DFRX	-0.031053	0.018757	-1.655549	0.0978		**
GGDP	-6.418092	17.44796	-0.367842	0.7130		**
DBREES_IDX	10.07674	7.170814	1.405243	0.1599		**
DMKT_CAP2GDP(-1)	0.045010	0.013395	3.360198	0.0008	*	
DSTK_TRD_VL_2GDP(1)	0.017449	0.017817	0.979349	0.3274		**
DSTK_TRD_TRN(-1)	0.000354	0.015078	0.023496	0.9813		**
DLLISTED_COYS(-1)	4.470870	4.083013	1.094993	0.2735		**
GGDP(-1)	-0.235925	4.180309	-0.056437	0.9550		**

Source: (Mensah, 2020). Note: P-values less than 5% =* and above 5% = **. Also * means statistically significant, ** means not statistically significant.

The results in Table 10CC9 show that three (3) variables are very significant to the market capitalization ratio. The stock traded value ratio (GDP DSTK_TRD_VL_2GDP) has a coefficient of 0.651913, thus has a positive influence on market capitalization ratio and more so, significant. The lagged of market capitalization ratio (DMKT_CAP2GDP (-1)) is significant and also influence market capitalization ratio for the period under review, positively with a coefficient of 0.045010. Typically, stock turnover ratio (DSTK_TRD_TRN) inversely influences the market capitalization ratio by coefficient of -0.463983. It is worthy of note that the degree of influence is significant. In order to appreciate the magnitude of the influences of macroeconomic and other related variables on stock market development, the test results are shown with their corresponding respective influences, significances and their remarks below:

- The number of listed companies (DLLISTED_COYS) has a coefficient of 2.921092, has a positive influence on the dependent variable and not statistically significant.
- GDP per capita (DLGDP_P_CPT) has a coefficient of 4.928218, positive influence on the dependent variable and not statistically significant.
- Gross domestic savings to GDP (D__GDSVNGS_2GDP) has a coefficient of -0.072776, negative influence on the dependent variable and not statistically significant.
- Foreign direct investment (DFDI_2GDP), has a coefficient of -0.154941, has negative influence on the dependent variable and not statistically significant.
- Tax revenue to GDP (DTX2GDP) has a coefficient of -0.233109, has a negative influence on the dependent variable and not statistically significant
- Inflation (INFLTN) has a coefficient of 0.000894, positive influence on the dependent variable and not statistically significant.
- Exchange rate (DFRX) has a coefficient -0.031053, negative influence on the dependent variable and not statistically significant
- GDP growth (GGDP) has a coefficient of -6.418092, negative influence on the dependent variable not statistically significant.
- Institutional-technological/innovative-financial factors (DBREES_IDX) have a coefficient of 10.07674, positive influence on the dependent variable and not statistically significant

- Stock traded value (DSTK_TRD_VL_2GDP) has a coefficient of 0.017449, positive influence on the dependent variable and not statistically significant;
- Stock turnover ratio (DSTK_TRD_TRN) 0.000354, positive influence on the dependent variable
- Lag of listed companies (DLLISTED_COYS) 4.470870, positive influence on the dependent variable
- Lag of GGDP [GGDP (-1)] -0.235925, negative influence on the dependent variable.

Overall, the model is significant at 5% level indicating that the regression jointly explained fluctuations in the regressand.

Discussion of the Results of Model 2 – Twenty Countries

Stock market development on economic growth of twenty countries from four (4) continents has been tested and analyzed. It is established from the results that economic growth has no effect on stock market development in the twenty countries. This is in line with hypothesis (2a) which is H_0- Null hypothesis: There is no relationship (or there is negligible relationship) between stock market development and economic growth in the twenty countries. This corroborates the findings of Naik and Padhi (2015), Ake & Ognaligui (2010) and Saba & Ghulam (2017).

The results indicate that stock market indicators such as stock traded turnover ratio, stock traded value to GDP and lagged of market capitalization ratio have direct effects on the overall stock market development. From the empirical analysis, the domestic credit to private businesses, an indicator of the banking sector development is significant in the development of stock market. Accordingly, it is seen as an accompaniment to stock markets in financing investment. It is true that the stock market cannot develop in isolation without macroeconomic and other related factors such as institutional, technological/innovative and financial factors, hence the selection of these factors. Finally, economic growth, which is regarded as an enabling factor in driving market capitalization ratio does not have much influence on stock market development, based on the results from the panel data of the selected countries from the four (4) continents.

PANEL DATA - BEST COUNTRIES BY DEGREE OF FINANCIAL CENTRES

Results of Model One (1)

Model one (1) is designed as economic growth on stock market development. Individual unit root tests were carried out at - ‘‘level and first difference at both individual intercept/ individual intercept and trend’’ respectively. All series are stationary at ‘‘first difference and individual intercept’’. The series have p-values less than 5%; therefore, the series do not have unit roots. The results of the Augmented Dickey-Fuller (ADF) and the Phillips and Peron (PP) Unit Root tests for the relevant variables are reported in Tables 11BC1 and 12BC2 below:

ADF Unit Root Tests for the Variables in Levels

Table 11BC1: ADF Unit Root Test Results for Best Countries (Model 1)

Variables	Level				1st Difference			
	Individual Intercept		Intercept and Trend		Individual Intercept		Intercept and Trend	
	Stats	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**
GDSVNGS_2GDP	12.8547	0.1169	10.6291	0.2236	27.5282	0.0006	21.2330	0.0066
BREEIS_IDX	18.6535	0.0168	10.8747	0.2089	33.1209	0.0001	23.5170	0.0028
DM_CRD__PRV_2GDP	8.78164	0.3611	7.51059	0.4827	18.5175	0.0177	10.9176	0.2964
FDI_2GDP	21.4853	0.0060	17.2558	0.0276	41.3537	0.0000	29.2039	0.0003
FRX	6.55832	0.3636	2.90741	0.8204	26.6222	0.0002	21.7052	0.0014
GGDP	22.7045	0.0038	17.5374	0.0250	54.7414	0.0000	41.5667	0.0000
INFLATN	19.9606	0.0105	15.7641	0.0459	63.2694	0.0000	52.2952	0.0000
LGDP_P_CPT	17.2280	0.9994	22.1355	0.9901	140.936	0.0000	99.0941	0.0000
LLISTED_COYS	35.0985	0.6903	48.5221	0.5713	117.842	0.0000	84.8413	0.0000
M2_GDP	22.7253	0.9872	53.7903	0.0713	179.097	0.0000	129.838	0.0000
MKT_CAP2GDP	62.0866	0.0141	49.3509	0.1476	249.159	0.0000	199.628	0.0000
STK_TRD_TRN	204.851	0.0000	156.004	0.0000	279.612	0.0000	228.231	0.0000
STK_TRD_VAL__GDP	110.696	0.0000	77.0116	0.0004	224.479	0.0000	205.169	0.0000
TX2GDP	61.4162	0.0163	53.5798	0.0740	172.993	0.0000	135.234	0.0000

Source: (Mensah, 2020). ADF test examines unit root and ensures stationarity of the series

PP Unit Root Tests for the Variables in Levels

Table 12BC2: PP Unit Root Test Results for Best Countries (Model 1)

Variables	Level				1st Difference			
	Individual Intercept		Intercept and Trend		Individual Intercept		Intercept and Trend	
	Stats	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**
GDSVNGS_2GDP	6.16248	0.6290	2.96382	0.9366	35.4858	0.0000	39.3873	0.0000
BREEIS_IDX	18.3110	0.0190	11.7773	0.1614	86.0345	0.0000	73.8171	0.0000
DM_CRD__PRV_2GDP	6.25678	0.6185	3.9857	0.8635	29.6141	0.0002	19.2656	0.0135
FDI_2GDP	21.5154	0.0006	20.6375	0.0082	133.031	0.0000	309.244	0.0000
FRX	4.05747	0.6689	1.22717	0.9755	23.1278	0.0008	32.8378	0.0000
GGDP	22.1258	0.0047	17.0961	0.0291	131.128	0.0000	108.223	0.0000
INFLATN	27.7640	0.0005	23.4455	0.0028	111.351	0.0000	101.275	0.0000
LGDP_P_CPT	19.5525	0.9973	17.0533	0.9994	189.161	0.0000	136.067	0.0000
LLISTED_COYS	65.4981	0.0067	41.5404	0.4034	226.025	0.0000	208.487	0.0000
M2_GDP	19.4578	0.9974	306.969	0.0000	590.447	0.0000	751.627	0.0000
MKT_CAP2GDP	74.4167	0.0008	81.1535	0.0001	615.702	0.0000	1275	0.0000
STK_TRD_TRN	120.965	0.0000	140.843	0.0000	1077.17	0.0000	2016.57	0.0000
STK_TRD_VAL__GDP	73.1771	0.0011	56.0428	0.0474	409.840	0.0000	548.320	0.0000
TX2GDP	76.1435	0.0005	52.4789	0.0894	296.225	0.0000	382.452	0.0000

Source: (Mensah, 2020). PP test examines unit root and ensures stationarity of the series

Subsequently, the level of correlation was verified for all the independent variables to ascertain if any pair or pairs were highly correlated. The results are captured in Table 13BC3 below. Two (2) variables were found to be highly correlated, that is exchange rate and GDP per capita giving a value of 0.76, thus 76%. To do away with possible multicollinearity, and to get a better outcome, initial regressions were applied, thus using each of the variables to see the effect of each on the equation.

The standard error of GDP per capita in absolute terms is higher than the exchange rate, thus is likely to give a spurious outcome for the regression. The exchange rate was consequently selected and, GDP per capita was dropped. P-values are less than 5% but their standard errors were considered.

Table 13BC3: Correlation Test/Analysis for Best Countries (Model 1)

	D__GDSVNGS_2GDP	DBREES_IDX	DDM_CRD__PRV_2GDP	DFDI_2GDP	DFRX	DINFLATN	DLGDP_P_CPT	DLLISTED_COYS	DM2_GDP	DMKT_CAP2GDP	DSTK_TRD_TRN	DSTK_TRD_VL_2GDP	DTX2GDP
D__GDSVNGS_2GDP	1.0000	0.1171	-0.2618	0.2017	0.1817	0.1038	0.0055	0.0722	-0.2798	0.0072	0.0362	0.0903	0.2485
DBREES_IDX	0.1171	1.0000	-0.0934	0.0891	0.0098	0.0227	0.0400	0.0894	-0.1751	-0.2477	-0.1751	-0.1323	0.0827
DDM_CRD__PRV_2GDP	-0.2618	-0.0934	1.0000	0.1115	-0.0468	-0.0154	0.0649	0.1457	0.2432	0.0282	0.0153	-0.0341	0.0750
DFDI_2GDP	0.2017	0.0891	0.1115	1.0000	-0.0135	0.0886	0.0810	0.1891	0.0739	0.0073	0.1210	0.3851	0.3175
DFRX	0.1817	0.0098	-0.0468	-0.0135	1.0000	0.2571	-0.7608	-0.1513	-0.0837	0.0074	0.0049	0.0283	-0.0067
DINFLATN	0.1038	0.0227	-0.0154	0.0886	0.2571	1.0000	0.0085	0.1144	-0.2214	0.0119	0.1139	0.2434	0.1233
DLGDP_P_CPT	0.0055	0.0400	0.0649	0.0810	-0.7608	0.0085	1.0000	0.1276	-0.1075	0.0069	0.0056	0.0847	0.1546
DLLISTED_COYS	0.0722	0.0894	0.1457	0.1891	-0.1513	0.1144	0.1276	1.0000	0.2344	0.0690	-0.0290	0.1336	0.1829
DM2_GDP	-0.2798	-0.1751	0.2432	0.0739	-0.0837	-0.2214	-0.1075	0.2344	1.0000	0.4061	-0.1359	0.1395	-0.0646
DMKT_CAP2GDP	0.0072	-0.2477	0.0282	0.0073	0.0074	0.0119	0.0069	0.0690	0.4061	1.0000	-0.2582	0.4609	-0.0868
DSTK_TRD_TRN	0.0362	-0.1751	0.0153	0.1210	0.0049	0.1139	0.0056	-0.0290	-0.1359	-0.2582	1.0000	0.3138	0.1994
DSTK_TRD_VL_2GDP	0.0903	-0.1323	-0.0341	0.3851	0.0283	0.2434	0.0847	0.1336	0.1395	0.4609	0.3138	1.0000	0.2045
DTX2GDP	0.2485	0.0827	0.0750	0.3175	-0.0067	0.1233	0.1546	0.1829	-0.0646	-0.0868	0.1994	0.2045	1.0000

Source: (Mensah, 2020). Correlation tests examine correlation of variables and remove highly correlated variables to avoid multicollinearity if any. Variables operate in the first difference, thus, denoted as D.

Additionally, the variables were tested for cointegration to determine whether they are integrated and have long run associations. The results are captured in Table 14BC4, clearly state that the series are cointegrated and have long run associations. Null hypothesis was rejected and alternative hypothesis accepted. The P-value is less than 5%.

Cointegration Test

Table 14BC4: Cointegration Test for Best Countries (Model 1)

ADF	T-STATISTICS	PROB
		0.0001
RESIDUAL VARIANCE	0.665339	
HAC VARIANCE	0.176814	

Source: (Mensah, 2020). Kao Residual Cointegration Test.

Null hypothesis= Series are not cointegrated

Alternative hypothesis = series are not cointegrated

Decision: p values less than %5, that is (P< 5%), then null hypothesis is rejected.

After initial tests for robustness, regression tests were conducted on model one (1). Some variables were dropped because they were found to be irrelevant – these are foreign direct investment (DFDI) and stock traded value (DSTK_TRD_TRN). Some of the variables were also controlled to ascertain the relevance of the results. Table 15BC5 and Appendices B (5, 6, 7, and 8) captured the regression results of four (4) equations under model one (1).

The regression equations are shown below:

Equation one (1): ggdp c dmkt_cap2gdp dstk_trd_trn dllisted_coys dm2_gdp d__gdsvngs_2gdp dfrx dinflatn dtx2gdp dbrees_idx ggdp(-1) dmkt_cap2gdp(-1)

Equation two (2): ggdp c dmkt_cap2gdp dstk_trd_trn dllisted_coys ddm_crd__prv_2gdp d__gdsvngs_2gdp dfrx dinflatn dtx2gdp dbrees_idx ggdp(-1) dmkt_cap2gdp(-1)

Equation three (3): ggdp c dmkt_cap2gdp dstk_trd_trn dllisted_coys ddm_crd__prv_2gdp d__gdsvngs_2gdp dfrx dinflatn dtx2gdp ggdp(-1) dmkt_cap2gdp(-1)

Equation four (4): ggdp c dmkt_cap2gdp dstk_trd_trn dllisted_coys dm2_gdp d__gdsvngs_2gdp dfrx dinflatn dtx2gdp ggdp(-1) dmkt_cap2gdp(-1)

Table 15BC5: Regression Results for Best Countries (Model 1)

Dependent Variable Growth	EQ1	EQ2	EQ3	EQ4
C	0.057876 (0.0000)	0.052081 (0.0000)	0.052753 (0.0000)	0.058396 (0.0000)
DMKT_CAP2GDP	0.000122 (0.0463)	7.52E-05 (0.1922)	6.62E-05 (0.2288)	0.000118 (0.0465)
DSTK_TRD_TRN	-9.02E-05 (0.5638)	-8.07E-05 (0.6140)	-0.000107 (0.4829)	-0.000105 (0.4780)
DLLISTED_COYS	-0.151945 (0.1308)	-0.221035 (0.0249)	-0.216051 (0.0264)	-0.148075 (0.1343)
DDM_CREDIT		0.000301 (0.7009)	0.000258 (0.7383)	
DM2_GDP	-0.001858 (0.0594)			-0.001891 (0.0512)
D_GDSVNGS_2GDP	0.009965 (0.1684)	0.015517 (0.0354)	0.015679 (0.0320)	0.010079 (0.1591)
DTX2GDP	0.006839 (0.3340)	0.006433 (0.3766)	0.006837 (0.3414)	0.007111 (0.3079)
DINFLATN	0.005965 (0.0524)	0.007948 (0.0000)	0.007960 (0.0078)	0.005971 (0.0496)
DFRX	-0.115810 (0.0000)	-0.118606 (0.0000)	-0.118658 (0.0000)	-0.115983 (0.0000)
DBREEIS_IDX	0.033553 (0.7196)	0.054950 (0.5657)		
GGDP(-1)	0.183979 (0.01040)	0.178877 (0.0149)	0.175264 (0.0157)	0.181611 (0.0102)
DMKT_CAP2GDP(-1)	0.000124 (0.0262)	0.000106 (0.0696)	0.000109 (0.0591)	0.000126 (0.0221)

Source: (Mensah, 2020). Independent variable: GGDP. Data output via Eviews 9.5. Model one (1) - Economic Growth on Stock Market Development Note: Panel EGLS (Random Effect Model Method); Probability values of significance levels are in curly parenthesis.

Hausman test was carried out and the test approved random effect model as more suitable for the regression rather than the fixed effect model. The null hypothesis was rejected because the p-value is more than 5% in the outcome of the Hausman test as in Table 16BC6

Table 16BC6: Hausman Test for Best Countries (Model 1)

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	9.360719	11	0.5886

Source: (Mensah, 2020). Regression results for hausman test via Eviews9.5. Using equation one (1)

From Table 15BC5 above, in equation one (1), DDM_CREDIT was controlled for, and DM2_GDP used as a banking sector indicator. The indication is that DMKT_CAP2GDP ratio has a coefficient of 0.000122, thus a positive influence on GGDP, and very significant. This is in consonance with the findings of [Osaseri & Osamwonyi (2018); Ikikii & Nzomoi (2013); Rahman & Salahuddin (2010), Enisan & Olufisayo (2009)].

Likewise, DMKT_CAP2GDP (-1) has a coefficient of 0.000124, statistically significant and has a positive impact on GGDP during the period under consideration. In the same vein, GGDP has a coefficient of 0.183979, that is 18.3 percentage points and statistically significant – it has a positive influence on GGDP.

Other indicators of the stock market development such as stock turnover ratio and a number of listed companies have negative coefficients of -9.02E-05 (-0.0001) and -0.151945 respectively, implying that they have negative influence on the economic growth. However, these results are not significant. Further to the above, the coefficient of money supply to GDP is -0.001858, thus indicating a negative influence on GDP growth. In addition to the preceding, D__GDSVNGS_2GDP, DTX2GDP, DINFLATN) and DBREES_IDX have coefficients of 0.009965, 0.006839, 0.005965 and 0.033553 respectively on GGDP. They are positively related to GGDP, but are not statistically significant. Finally, although DFRX is very significant with a coefficient of -0.115810, its effect on GGDP is negative.

In equation 2, market capitalization ratio has a coefficient of 7.52E-05, implying that it has a positive influence on GGDP, albeit it statistically insignificant. As expected, turnover ratio has a coefficient of -8.07E-05, denoting an inverse relationship with GGDP, though statistically insignificant. DLLISTED_COYS has a coefficient of -0.221035, thus has a negative effect on GDP growth, though statistically significant. DMKT_CAP2GDP (-1) has a coefficient of

0.000106, also, significant and has a positive influence on GGDP. All the stock market indicators used in this equation give equal and different influences on GGDP. Whilst number of listed companies and stock turnover ratio are inversely related to GGDP, DMKT_CAP2GDP and DMKT_CAP2GDP (-1), that is it lag are directly related to GGDP. DDM_CREDIT, which serves as an indicator of banking sector development has a coefficient of 0.000301, though positive, the degree of influence is not statistically significant. Other related and macroeconomic variables such as D__GDSVNGS_2GDP, DTX2GDP, DINFLATN and DFRX have coefficients of 0.01551; 0.006433; 0.007948 and -0.118606 respectively. With the exception of DFRX, which has negative influence and statistically significant, the other variables have positive influences on GGDP. Also, DTX2GDP has a positive effect, it is, nonetheless not statistically significant. D__GDSVNGS_2GDP and DINFLATN are statistically significant. Finally, in this equation, DBREEIS_IDX has a coefficient of 0.054950, though positively related to GGDP, it is not statistically significant.

In equation 3, DBREES_IDX and money supply were controlled**.** The results in Table B5 indicated the same results just as in equation 2 – the Variables move in the same direction and their statistical positions.

In equation 4, DBREES_IDX and domestic credit to private businesses were controlled. Apart from inflation that has a coefficient of 0.005971 and statistically significant and positively influenced GDP growth which was not expected, all other variables have moved in the same direction and have their statistical positions just as in equation one (1) in Table 15BC5.

Discussion of the Results of Model One (1)

Economic growth on stock market development of Best Countries by Degree of Financial Centres has been tested and analysed. Following the outcome of the regression, it is well established that stock market development has a positive effect on economic growth. This is in line with hypothesis (1b) which is N_1- Alternative hypothesis: There is a positive relationship between economic growth and stock market development in a sampled country (ies). This is confirmed by the works of Ikikii & Nzomoi (2013), Rahman & Salahuddin (2010), and Enisan & Olufisayo (2009) which establish a positive relationship.

From the analysis, it is very clear that stock market development in the best performing countries by size in terms of financial centres (United States, United Kingdom, Hong Kong and South Africa) has significant impact on economic growth. Market capitalization ratio is positively related to GGDP and fairly significant. However, this cannot be in isolation without the interference of the banking sector development. The banking sector development indicators; DDM_CREDIT, DM2_GDP and D__GDSVNGS all have varying influences on the GGDP of these countries. There are instances that DM2_GDP has negative influences, while D__GDSVNGS has positive influences. At another instance, DDM_CREDIT and D__GDSVNGS positively influenced GGDP, but only the latter is significant.

Additionally, macroeconomic variables are very relevant (DINFLATN and DFRX) on economic growth. Surprisingly, inflation is found to be positively influencing GDP growth but not significant, whilst exchange rate is influencing GGDP negatively and it is significant. DMKT_CAP2GDP, the main stock market development indicator has a positive and significant impact on GGDP.

Results of Model Two (2)

Model two (2) is designed as stock market development on economic growth. The highlight of this model is to overall ascertain the effect of stock market development on economic growth. Going further, correlation test and analysis were carried out on the variables excluding market capitalization ratio, which is used as a sole indicator of stock market development. Eleven variables were selected after the correlation test. DFRX and DLGDP_P_CPT DP were dropped. The test results are captured in table B7 below;

Table 17BC7: Correlation Test/Analysis for Best Performing Countries (Model Two)

	D__GDSVNGS_2GDP	DBREES_IDX	DDM_CRD__PRV_2GDP	DFDI_2GDP	DFRX	DINFLATN	DLGDP_P_CPT	DLLISTED_COYS	DM2_GDP	DSTK_TRD_TRN	DSTK_TRD_VL_2GDP	DTX2GDP	GGDP
D__GDSVNGS_2GDP	1.0000	0.1171	-0.2618	0.2017	0.1817	0.1038	0.0055	0.0722	-0.2798	0.0362	0.0903	0.2485	-0.0086
DBREES_IDX	0.1171	1.0000	-0.0934	0.0891	0.0098	0.0227	0.0400	0.0894	-0.1751	-0.1751	-0.1323	0.0827	0.0348
DDM_CRD__PRV_2GDP	-0.2618	-0.0934	1.0000	0.1115	-0.0468	-0.0154	0.0649	0.1457	0.2432	0.0153	-0.0341	0.0750	0.0690
DFDI_2GDP	0.2017	0.0891	0.1115	1.0000	-0.0135	0.0886	0.0810	0.1891	0.0739	0.1210	0.3851	0.3175	0.0743
DFRX	0.1817	0.0098	-0.0468	-0.0135	1.0000	0.2571	-0.7608	-0.1513	-0.0837	0.0049	0.0283	-0.0067	-0.7600
DINFLATN	0.1038	0.0227	-0.0154	0.0886	0.2571	1.0000	0.0085	0.1144	-0.2214	0.1139	0.2434	0.1233	-0.0212
DLGDP_P_CPT	0.0055	0.0400	0.0649	0.0810	-0.7608	0.0085	1.0000	0.1276	-0.1075	0.0056	0.0847	0.1546	0.9916
DLLISTED_COY	0.0722	0.0894	0.1457	0.1891	-0.1513	0.1144	0.1276	1.0000	0.2344	-0.0290	0.1336	0.1829	0.0891
DM2_GDP	-0.2798	-0.1751	0.2432	0.0739	-0.0837	-0.2214	-0.1075	0.2344	1.0000	-0.1359	0.1395	-0.0646	-0.1222
DSTK_TRD_TR	0.0362	-0.1751	0.0153	0.1210	0.0049	0.1139	0.0056	-0.0290	-0.1359	1.0000	0.3138	0.1994	0.0048
DSTK_TRD_VL_2GDP	0.0903	-0.1323	-0.0341	0.3851	0.0283	0.2434	0.0847	0.1336	0.1395	0.3138	1.0000	0.2045	0.0807
DTX2GDP	0.2485	0.0827	0.0750	0.3175	-0.0067	0.1233	0.1546	0.1829	-0.0646	0.1994	0.2045	1.0000	0.1491
GGDP	-0.0086	0.0348	0.0690	0.0743	-0.7600	-0.0212	0.9916	0.0891	-0.1222	0.0048	0.0807	0.1491	1.0000

Source: (Mensah, 2020). GDP per capita/GGDP = 0.9916; GGDP/DFRX =0.7600

A regression test was subsequently conducted with only a single equation with the rest of the independent variables from the outcome of the correlation test, unlike model one, which has four equations. DBREES_IDX was controlled, because in model one, for all the equations, with or without it, there was no difference in the results.

Table 18BC8: Regression Results for Best Performing Countries (Model 2)

Regressor	Coefficient	Standard error	T-statistics	P-value
C	-14.98088	10.26705	-1.45912	0.15010
DSTK_TRD_TRN	-0.61948	0.25246	-2.45382	0.01730
DSTK_TRD_VL_2GDP	0.94771	0.12565	7.54261	0.00000
DDM_CRD__PRV_2GDP	2.56513	1.05934	2.42145	0.01870
DM2_GDP	5.21029	1.34728	3.86727	0.00030
GGDP	46.33069	104.58970	0.44298	0.65950
D__GDSVNGS_2GDP	23.02902	10.34301	2.22653	0.03000
DFDI_2GDP	-2.13635	1.52148	-1.40412	0.16580
DTX2GDP	-28.75843	12.07016	-2.38261	0.02060
DINFLATN	2.41878	4.28322	0.56471	0.57450
DMKT_CAP2GDP(-1)	-0.50411	0.08807	-5.72415	0.00000

R-squared	0.797499	Mean dependent var	5.575250
Adjusted R-squared	0.685400	S.D. dependent var	116.0317
S.E. of regression	65.08127	Akaike info criterion	11.46444
Sum squared resid	237192.0	Schwarz criterion	12.36529
Log likelihood	-472.4353	Hannan-Quinn. criter	11.82737
F-statistic	7.114247	Durbin-Watson stat	2.142851
Prob(F-statistic)	0.000000		

Source: (Mensah, 2020). Dependent variable: Market capitalization ratio. Source: Data Output via Eviews9.5 Panel Least Square Method (Fixed Effect Model) regression.

As indicated in Table 19BC9, the null hypothesis is 0.0190, indicating a p-value of less than 5%. The fixed-effect model was appropriate for this model. The null hypothesis was rejected. This reveals that the random effect model has been rejected by the Hausman test.

Table 19BC9: Hausman Test for Best Performing Countries (Model Two)

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	21.31365	10	0.019

Source: (Mensah, 2020). Regression results for hausman test via Eviews9.5.

The regression results indicate that seven (7) out of ten (10) independent variables are statistically significant. However, stock turnover has a coefficient of -0.61948, tax revenue to GDP has a coefficient of -28.75843 and lag of market capitalization ratio has a coefficient of -0.50411, all of them influenced market capitalization ratio negatively. The other four variables tied to GDP (stock traded value, domestic credit to the private businesses, money supply and gross domestic savings) have coefficients of 0.9477; 2.56513; 5.21029 and 23.02902 respectively. In another vein, foreign direct investment has a coefficient of -28.75843, which means it influences capitalization ratio negatively, though it is not statistically significant. On the hand, GGDP's coefficient of 46.33069 indicate that it influences market capitalization ratio positively, though the level of influence is not statistically significant. Likewise, inflation in the same direction, has a coefficient of 2.41878 but also not significant. The R-squared is 0.797499, thus 80% accounted for variations in market capitalization ratio whilst, 20% accounted for unobserved factors. The F-statistic is 7.114247 of a P-value of less than 5%. Overall, the model is significant at 5% level indicating that the regression jointly explained fluctuation in the regress.

Discussion of the Results of Model two (2) of the Best Performing Countries

The stock market development and economic growth of Best Countries (i.e.by a high degree of financial centres) have been tested and analyzed. Following the outcome of the regression, it is well established that economic growth has no effect on stock market development. This is in line with the hypothesis (2a) which is N_0- Null hypothesis: There is no relationship or negligible effect between economic growth and stock market development in sampled countries. This corroborates the findings of Naik and Padhi (2015), Ake & Ognaligui (2010) and Saba & Ghulam (2017.

From the results, economic growth, though it has a positive impact on stock market development, it is not significant. Also, other stock market indicators such as stock traded turnover ratio and stocks traded total value as accompaniments to GGDP have negative and positive Impacts respectively on market capitalization ratio. These impacts, however, are very significant. It can be observed from the results further that the banking sector development is very crucial in the stock market development. This stems from the fact that domestic credit to private businesses, money supply and gross domestic savings; all representing the banking sector development have positive and significant impacts on market capitalization ratio, thus stock market development. Additionally, the lag of market capitalization ratio, though has an inverse relationship with its current state, it is influencing it negatively and significantly. Thus, the spillovers of the market have serious effects on its current state. Inflation, which is one of the macroeconomic indicators has a direct impact on market capitalization ratio, hence, an increase in inflation increases market capitalization ratio. However, the extent of influence is not significant. This is reverse of the work of Zucchi (2013). Foreign direct investment has a negative impact on market capitalization ratio, though, not statistically significant. Tax revenue negatively and significantly affects the capitalization ratio. This is due to the fact that when resources were mopped out of the economy, it hampered investment. In summary, economic growth has a positive impact on stock market development in best-performing countries by size in terms of financial centres (United States, United Kingdom, Hong Kong and South Africa) in the long run, yet, significant.

PANEL ANALYSIS OF SAMPLED INDIVIDUAL CONTINENTS

AMERICAS

Results of Model One (1)

Model one (1) is designed as GDP growth on stock market capitalization ratio. As indicated for the preceding sample countries' panel data, individual unit root tests were carried out for all the variables at all stages - level and first difference at both individual intercept/

individual intercept & trend respectively. The results are captured in Tables 20AM1 and 21AM2. All series are stationary at ‘‘first difference and individual intercept’’. Series with p-values less than 5% are stationary (The standard of test for stationarity is: first difference & individual intercept).

The results of the Augmented Dickey-Fuller (ADF) and the Philips and Peron (PP) unit root tests in the table below:

Table 20AM1: ADF Unit Root Test Results for Sampled Variables in Levels for America (Model One)

Variables	Level				1ST Difference			
	Individual Intercept		Intercept and Trend		Individual Intercept		Intercept and Trend	
	Stats	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**
GDSVNGS_2GDP	30.1121	0.0009	12.3531	0.2621	52.3761	0.0000	49.4531	0.0000
BREEIS_IDX	13.0037	0.2235	9.83928	0.4547	71.2415	0.0000	49.1321	0.0000
DM_CRD__PRV_2GDP	9.01002	0.5312	8.36645	0.5931	105.226	0.0000	41.2730	0.0000
FDI_2GDP	49.1077	0.0000	35.1387	0.0001	81.1291	0.0000	61.9293	0.0000
FRX	2.67159	0.9532	6.26157	0.6180	20.2115	0.0096	12.2644	0.1398
GGDP	40.0504	0.0000	28.6693	0.0014	87.9119	0.0000	59.8164	0.0000
INFLATN	41.7866	0.0000	32.8151	0.0003	126.770	0.0000	110.934	0.0000
LGDP_P_CPT	4.66371	0.9125	12.1432	0.2756	43.4273	0.0000	31.1152	0.0006
LLISTED_COYS	10.2617	0.4178	4.00959	0.9469	47.0054	0.0000	37.5222	0.0000
M2_GDP	5.48077	0.8568	277.257	0.0000	101.145	0.0000	77.9386	0.0000
MKT_CAP2GDP	25.3694	0.0047	17.4340	0.0653	100.669	0.0000	74.8622	0.0000
STK_TRD_TRN	133.646	0.0000	101.404	0.0000	65.7076	0.0000	15.9472	0.1012
STK_TRD_VAL__GDP	15.9472	0.1012	46.4677	0.0000	66.4046	0.0000	49.8660	0.0000
TX2GDP	21.9379	0.0154	5.85840	0.8270	58.5459	0.0000	48.3397	0.0000

Source: (Mensah, 2020). ADF Unit root tests for the variables in levels

Table 21AM2: PP Unit Root Test for sampled Variables in Levels for America (Model One)

Variables	level				1st difference			
	Individual Intercept		Intercept and trend		Individual Intercept		Intercept and Trend	
	Stats	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**
GDSVNGS_2GDP	22.9005	0.0111	12.3531	0.2621	52.3761	0.0000	45.6165	0.0000
BREEIS_IDX	13.0037	0.2235	12.0065	0.2846	103.010	0.0000	96.7093	0.0000
DM_CRD__PRV_2GDP	18.1575	0.0524	42.6209	0.0000	111.429	0.0000	109.763	0.0000
FDI_2GDP	36.2370	0.0001	24.6994	0.0059	126.646	0.0000	192.157	0.0000
FRX	2.96153	0.9367	2.80914	0.9458	20.4936	0.0086	13.7108	0.0896
GGDP	40.2797	0.0000	29.1236	0.0012	273.059	0.0000	363.196	0.0000
INFLATN	65.1929	0.0000	59.8144	0.0000	174.147	0.0000	321.830	0.0000
LGDP_P_CPT	7.28289	0.6985	3.20269	0.9762	43.4988	0.0000	31.0647	0.0006
LLISTED_COYS	9.59247	0.4769	3.42417	0.9696	46.4358	0.0000	36.6028	0.0001
M2_GDP	6.02165	0.8134	277.156	0.0000	354.415	0.0000	558.274	0.0000
MKT_CAP2GDP	24.8809	0.0056	19.6467	0.0328	116.114	0.0000	97.6281	0.0000
STK_TRD_TRN	20.3634	0.0260	18.1639	0.0523	144.977	0.0000	336.278	0.0000
STK_TRD_VAL__GDP	15.0240	0.1312	9.65673	0.4711	66.4046	0.0000	144.313	0.0000
TX2GDP	7.73121	0.6551	2.12856	0.9953	58.0662	0.0000	55.4220	0.0000

Source: (Mensah, 2020). PP Unit root tests for the variables in levels.

Subsequently, the series were checked for degree of correlation to avoid the presence of multicollinearity. Results are in Table 22AM3 below.

Table 22AM3: Correlation Test Results for America (Model One)

	D__GDSVNGS_2GDP	DBREEIS_IDX	DDM_CRD__PRV_2GDP	DFDI_2GDP	DFRX	DINFLATN	DLGDP_P_CPT	DLLISTED_COYS	DM2_GDP	DMKT_CAP2GDP	DSTK_TRD_TRN	DSTK_TRD_VOL	DTX2GDP
D__GDSVNGS_	1	0.025346	-0.03284	0.194104	0.208	0.336	-0.42503	0.002901	-0.09	-0.08472	0.03492	0.037735	0.1
DBREEIS_IDX	0.02534632	1	0.01071	0.034538	-0.166	-0.002	0.158596	0.050108	-0.02	0.065537	-0.1665	-0.01994	0.05
DDM_CRD__PRV_2GDP	-0.03283775	0.01071	1	-0.16375	-0.102	0.1314	-0.05778	-0.08307	0.788	-0.05258	0.0598	-0.0207	-0.05
DFDI_2GDP	0.19410404	0.034538	-0.16375	1	-0.081	0.0011	0.033842	-0.03351	-0.33	-0.0653	0.07222	0.260016	0.03
DFRX	0.2077448	-0.16556	-0.1019	-0.08083	1	0.0222	-0.48904	-0.07141	-0.04	0.012925	-0.0278	-0.04026	0.02
DINFLATN	0.335997	-0.00195	0.131407	0.001104	0.022	1	-0.17334	-0.0019	0.062	0.006943	0.0134	0.031702	0.02
DLGDP_P_CPT	-0.42502981	0.158596	-0.05778	0.033842	-0.489	-0.173	1	0.169912	-0.16	-0.06864	0.11064	0.0615	-0.01
DLLISTED_COY	0.00290074	0.050108	-0.08307	-0.03351	-0.071	-0.002	0.169912	1	-0.17	-0.05116	0.02691	0.073153	0.1
DM2_GDP	-0.09116392	-0.01655	0.787536	-0.33422	-0.038	0.0616	-0.16029	-0.17319	1	-0.08459	-0.0117	-0.14634	-0.03
DMKT_CAP2G	-0.08472378	0.065537	-0.05258	-0.0653	0.013	0.0069	-0.06864	-0.05116	-0.08	1	-0.4296	0.053441	-0.05
DSTK_TRD_TR	0.03492084	-0.16646	0.059801	0.072217	-0.028	0.0134	0.110639	0.026907	-0.01	-0.42963	1	0.563136	0.06
DSTK_TRD_VO	0.03773532	-0.01994	-0.0207	0.260016	-0.04	0.0317	0.0615	0.073153	-0.15	0.053441	0.56314	1	0.1
DTX2GDP	0.10293386	0.052683	-0.04988	0.034275	0.021	0.0201	-0.0148	0.099618	-0.03	-0.05238	0.06189	0.10488	1

Source: (Mensah, 2020). Correlation values: DM2_GDP)/DDM_CREDIT at 0.787536028 and DSTK_TRD_TRN/DSK_VL at 0.563135726
Benchmark: values>50%, means highly correlated.

Variables that were highly correlated were dropped because of their degree of correlation. These pairings are DM2_GDP)/DDM_CREDIT at 0.787536028 and DSTK_TRD_TRN/DSK_VL at 0.563135726. Also, initial regressions were run (pre-tested) and FDI_2DGP was dropped for its irrelevance to the model. Cointegration test was also carried out to find out if the variables are cointegrated and have a long-run association. The results are captured in Table 23AM4 below.

Table 23AM4: Cointegration Test Results for America (Model One)

	t-Statistic	Prob.
ADF	3.204864	0.0007
Residual variance	3357.102	
HAC variance	618.9304	

Source: (Mensah, 2020). Kao Residual Cointegration Test

Hypotheses are set below:

Null hypothesis= Series are not cointegrated

Alternative hypothesis = series are cointegrated

Decision: p-values less than %5, that is (P< 5%), then the null hypothesis is rejected.

From the test results, the null hypothesis is rejected, and the alternative hypothesis accepted because P-value is less than 5%.

Regression Results

The regression results in Table 24AM5 show the coefficient values of 0.00012, 0.00008 and 0.02542 for DMKT_CAP2GDP, DSTK_TRD_TRN and DLLISTED_COYS respectively. Though, they all have positive influences on GGDP, they are all not significant. These results to some extent are rooted in theories, except for the level of influences.

D__GDSVNGS_2GD has a coefficient of 0.01193 and is significant, whilst DM2_GDP has a coefficient of -0.00015 (it is expected), also statistically significant. TX2GDP has a coefficient of -0.00024 likewise, GGDP (-1) has a coefficient of 0.02069. They are not significant. DLGDP_P_CPT, DINFLATN, and DFRX all have coefficients of 0.87514, -0.00007 and -0.00657 respectively, but only series DLGDP_P_CPT and DINFLATN are statistically significant. However, exchange rate is insignificant. In another vein, DBREEIS_IDX has a coefficient of 0.02764, has a positive influence on GGDP, but it is insignificant.

The coefficient of determination, that is, the R-square is 0.974403, implying that 97.4 % accounted for the variations in the dependent variable, that is GGDP, while 12.6% accounted for unobserved factors. F-statistic has a coefficient of 339.1463 and a P–value of less than 5%, implying that all the explainable variables jointly influenced the dependent variable (GGDP), thus, the regression model is good.

Table 24AM5: Regression Results - GDP Growth on Stock Market Development (Market Capitalization Ratio) for America (Model One)

Regressors	Coefficient	Standard error	T-statistics	P-value
DMKT_CAP2GDP	0.00012	0.00012	1.02990	0.30560
DSTK_TRD_TRN	0.00008	0.00007	1.22877	0.22210
DLLISTED_COYS	0.02542	0.02057	1.23602	0.21940
DLGDP_P_CPT	0.87514	0.01895	46.17585	0.00000
D__GDSVNGS_2GDP	0.01193	0.00157	7.60019	0.00000
DINFLATN	-0.00007	0.00001	-6.09036	0.00000
DFRX	-0.00657	0.00332	-1.98036	0.05050
M2_GDP	-0.00015	0.00006	-2.73036	0.00750
DTX2GDP	-0.00024	0.00088	-0.27332	0.78520
DBREEIS_IDX	0.02764	0.03444	0.80242	0.42430
GGDP(-1)	0.02069	0.01660	1.24624	0.21560

R-squared	0.974403	Mean dependent var	0.053234
Adjusted R-squared	0.971530	S.D. dependent var	0.140502
S.E. of regression	0.023707	Sum squared resid	0.055078
F-statistic	339.1463	Durbin-Watson stat	1.128601
Prob(F-statistic)	0.000000		

Source: (Mensah, 2020)**.** Dependent variable**:** GGDP. Data Output via Eviews9.5; Method: Panel EGLS (Period random effects) regression.

The model was initially tested to ascertain if the random effect model or fixed effect model was appropriate for the regression test. The Hausman method was applied on the initial random-effect model and results stated in Table 25AM6 below.

The hypotheses set below:

Null hypothesis: Random effect model

Alternative hypothesis: Fixed effect model

Table 25AM6: Hausman Test for America (Model One)

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob
Period random	15.919085	11	0.1442

Source: (Mensah, 2020). Correlated Random Effects - Hausman Test- Test period random effects

As indicated in Table 25AM6, the figures show that the null hypothesis is more than 5%; therefore, the null hypothesis is not rejected, thus accepted. Consequently, the random effect model is more appropriate for running the regression test (subsequently confirmed for the regression test in Table 24AM5).

Discussion of the Results of Model One (1)

Economic growth on stock market development of Americas has been tested and analysed. Following the outcome of the regression, it is well established that stock market development does not have an effect (has a negligible effect) on economic growth in the Americas. This is in line with the hypothesis (1a) which is N_{0}- Null hypothesis: There is no relationship (or negligible effect) between economic growth and stock market development in the Americas. This is confirmed by the works of Oya & Domar (2006), Charif (2001), Haque (2013), Ake & Ognaligui (2010), Saba & Ghulam (2017).

Further to the above, Stock market development has a positive influence on GDP growth on the panel data of Americas, though not significant. Interestingly, the stock turnover ratio is positively related (not expected). The banking sector development does have varying influences on GGDP. DM2_GDP has a negative influence on GGDP (it is expected). This invalidates the conclusions of Zapodeanu and Cociuba (2010), Hameed and Amen (2011) and Ihsan and Anjum (2013), that money supply (M2) is positively related to economic growth. Contrarily, D__GDSVNGS_2GDP, also a banking sector indicator is positively related to GDP growth; thus, the banking sector development is very relevant in the development of the stock market. This validates the finding of Masih and Peters (2010) and Singh (2010) that savings have a positive effect on economic growth.

Macroeconomic factors such as DINFLATN negatively influenced GGDP, likewise DFRX, and it is expected. Indeed, the coefficient of inflation as found in this test contradicts the finding of Mallik and Chowdhury (2001). They find that there is a positive relationship between inflation and economic. The coefficient of DFRX is also out of line with the conclusion of Aghion *et al.* (2006). They reveal that changes in exchange rates may play a significant role and influence on productivity growth in the long-term. DBREEIS_IDX is directly related to GGDP, and though not significant, it is clear that they create an enabling environment for GGDP. DTX2GDP has a negative and insignificant influence on GGDP. This implies that though tax revenue generates revenue from goods and services, but is negatively influencing GGDP. This finding though insignificant, it validates the findings of studies such as Gemmell et al., (2010), Romer & Romer (2010), Barro & Redlick (2011) and Ferede & Dahlby (2012), which all find a negative relationship between tax revenue to GDP ratio and economic growth.

Results of Model Two (2) –Americas

Model two (2) is modeled as stock market development through market capitalization ratio on growth of GDP. As indicated in model one earlier, the same processes are used for model two, in exception of market capitalization ratio in the correlation test/analysis. It now serves as the dependent variable.

Table 26AM7: Correlation Test Results - America (Model Two)

	D__GDSVNGS_2GDP	DBREEIS_IDX	DDM_CRD__PRV_2GDP	DSTK_TRD_VOL	DINFLATN	GGDP	DFDI_2GDP	DFRX	DLGDP_P_CPT	DLLISTED_COYS	DM2_GDP	DSTK_TRD_TRN	DTX2GDP
D__GDSVNGS_2GDP	1	0.025346	-0.03284	0.03774	0.336	-0.319	0.194104	0.207745	-0.42503	0.002901	-0.0912	0.034921	0.1029339
DBREEIS_IDX	0.02535	1	0.01071	-0.0199	-0.002	0.1786	0.034538	-0.16556	0.158596	0.050108	-0.0166	-0.16646	0.0526825
DDM_CRD__PRV_2GDP	-0.0328	0.01071	1	-0.0207	0.131	-0.106	-0.16375	-0.1019	-0.057783	-0.08307	0.78754	0.059801	-0.049875
DSTK_TRD_VOL	0.03774	-0.01994	-0.0207	1	0.032	0.0643	0.260016	-0.04026	0.0615	0.073153	-0.1463	0.563136	0.1048797
DINFLATN	0.336	-0.00195	0.131407	0.0317	1	-0.227	0.001104	0.022185	-0.173342	-0.0019	0.06163	0.013397	0.0201143
GGDP	-0.3191	0.178632	-0.10638	0.06429	-0.227	1	0.068341	-0.48152	0.974386	0.182311	-0.1994	0.120466	-0.004409
DFDI_2GDP	0.1941	0.034538	-0.16375	0.26002	0.001	0.0683	1	-0.08083	0.033842	-0.03351	-0.3342	0.072217	0.0342747
DFRX	0.20774	-0.16556	-0.1019	-0.0403	0.022	-0.482	-0.08083	1	-0.489035	-0.07141	-0.0382	-0.02776	0.0211917
DLGDP_P_CPT	-0.425	0.158596	-0.05778	0.0615	-0.173	0.9744	0.033842	-0.48904	1	0.169912	-0.1603	0.110639	-0.014797
DLLISTED_COYS	0.0029	0.050108	-0.08307	0.07315	-0.002	0.1823	-0.03351	-0.07141	0.169912	1	-0.1732	0.026907	0.0996185
DM2_GDP	-0.0912	-0.01655	0.787536	-0.1463	0.062	-0.199	-0.33422	-0.03823	-0.160291	-0.17319	1	-0.01173	-0.026163
DSTK_TRD_TRN	0.03492	-0.16646	0.059801	0.56314	0.013	0.1205	0.072217	-0.02776	0.110639	0.026907	-0.0117	1	0.0618899
DTX2GDP	0.10293	0.052683	-0.04988	0.10488	0.02	-0.004	0.034275	0.021192	-0.014797	0.099618	-0.0262	0.06189	1

Source: (Mensah, 2020). Correlation pairings and values for model two (2):
DM2_GDP/DDM_CRD_PRV_2GDP=0.78754; GGDP/DLGDP_P_CPT=0.9744 and
DSK_TRD_TRN/DSK_TRD_VL=0.5631
Benchmark: values>50%, means highly correlated.

Variables that were highly correlated were dropped, such as DM2_GDP) and GDP per GDP_CPT and DSK_TRD_TRN. On the other hand, D__GDS_2GDP was also dropped due to its irrelevance in terms of integrating the other series in the initial cointegration test.

As indicated in the procedure of tests of the research, a cointegration test was undertaken. The results in Table 27AM8 below show that the series are cointegrated. The null hypothesis is rejected, and the alternative hypothesis accepted. P-value is less than 5%.

Table 27AM8: Cointegration Test Results - America (Model Two)

	t-Statistic	Prob.
ADF	-1.773707	0.0381
Residual variance	0.010528	
HAC variance	0.000811	

Source: (Mensah, 2020)**.** Kao Residual Cointegration Test.

Regression Results

As captured in Table 28AM9 below, GDP growth has a coefficient of -1.62550, more so, it is not statistically significant. DSTK_TRD_VL has a coefficient of 0.14112 and not significant. DDM_CRD__PRV_2GDP has a negative coefficient of -0.75308, and statistically significant; likewise, DFDI_2GDP, has a coefficient of -2.64391 and statistically significant. DINFLATN and DFRX have coefficients of -0.01332 -2.46912 respectively, but they are all not statistically significant. DMKT_CAP2GDP (-1)) and DSTK_TRD_VOL (-1)) have coefficients of -0.27166 and -0.05206 respectively. However, only DMKT_CAP2GDP (-1)) is statistically significant. DDM_CRD__PRV_2GDP (-1)) has a coefficient of 0.76904, additionally, it is statistically significant. DBREEIS_IDX has a coefficient of 26.05799 on capitalization ratio; however, it is not statistically significant. The coefficient of determination is 0.612840, implying that 61% accounted for variations on the dependent variable (market capitalization ratio), and 28.8% cannot account for such variations. Also, the F-statistic is 3.982807 and Prob (F-statistic) value of 0.000000. This is enough evidence that all the independent variables jointly explain the dependent variable.

Table 28AM9: Regression Results - America (Model Two)

Regressors	Coefficient	Standard error	T-statistics	P-value
C	2.13283	1.99691	1.06807	0.28880
GGDP	-1.62550	17.11420	-0.09498	0.92460
DSTK_TRD_VOL	0.14112	0.08451	1.66997	0.09890
DDM_CRD__PRV_2GDP	-0.75308	0.35219	-2.13824	0.03560
DFDI_2GDP	-2.64391	1.26174	-2.09545	0.03940
DINFLATN	-0.01332	0.01393	-0.95617	0.34190
DFRX	-2.46912	2.35928	-1.04656	0.29850
DBREEIS_IDX	26.05799	23.77222	1.09615	0.27640
DMKT_CAP2GDP(-1)	-0.27166	0.11850	-2.29253	0.02460
DSTK_TRD_VL(-1)	-0.05206	0.08121	-0.64105	0.52340
DDM_CRD__PRV_2GDP(-1)	0.76904	0.29589	2.59908	0.01120

R-squared	0.612840	Mean dependent var	1.035551
Adjusted R-squared	0.458969	S.D. dependent var	21.29945
S.E. of regression	15.66678	Akaike info criterion	8.579009
Sum squared resid	19144.94	Schwarz criterion	9.364603
Log likelihood	-439.8455	Hannan-Quinn criter.	8.897650
F-statistic	3.982807	Durbin-Watson stat	2.078486
Prob(F-statistic)	0.000000		

Source. (Mensah, 2020). Dependent variable: Market capitalization ratio. Data Output via Eviews9.5; Method: Panel Least Squares, regression.

The model was initially tested to ascertain if the random effect model or fixed effect model was appropriate for the regression test. The Hausman method was applied on the initial random-effect model, and results stated in Table 29AM10 below.

The hypotheses set below:

Null hypothesis: Random effect model

Alternative hypothesis: Fixed effect model

Table 29AM10: Hauman Test Results - America (Model Two)

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob
Period random	20.90089	11	0.0344

Source: (Mensah, 2020**).** Correlated Random Effects - Hausman Test. Test period random effects. **Series**:

As indicated in Table 29AM10, the figures show that the null hypothesis is below 5%, therefore the null hypothesis is rejected; hence the alternative hypothesis accepted. Consequently, the random effect model is not appropriate, but the fixed-effect model is more appropriate for running the regression test (subsequently confirmed for the regression test in Table 28AM9).

Discussion of the Results of Model Two (2)

Stock market development on economic growth of the Americas has been tested and analysed. Based on the outcome of the regression, it is well established that economic growth does not have effect (has a negligible effect) on stock market development. The results are not significant. This is in line with the hypothesis (2a), which is N_0- Null hypothesis: There is no relationship between stock market development and economic growth in the Americas. This is reverse to the works of Levine and Zervos (1998).

Following the outcome of the regression of model two (2), it is noteworthy that GDP growth influenced DMKT_CAP2GDP in the Americas over the period under review. However, it is not significant. This implies that GGDP affects stock market development negatively.

DSTK_TRD_VL, though not significant, it influences DMKT_CAP2GDP. This suggests that a hike in the value of the total shares traded both domestic and foreign on the exchanges, thus increases DMKT_CAP2GDP.

DMKT_CAP2GDP (-1) and DSTK_TRD_VL have negative influences on market capitalization ratio, thus, indicating that spillovers from the previous period have impact on current period. DMKT_CAP2GDP (-1) is statistically significant, while DSTK_TRD_VL(-1) is not.

DDM_CRD__PRV_2GDP statistically, significantly and negatively influenced market capitalization ratio. Each time the banking sector extends credit to domestic businesses, it negatively influences DMKT_CAP2GDP. In the same vein, DDM_CRD__PRV_2GDP(-1) negatively influenced DMKT_CAP2GDP but not significant. From the above, the banking sector development is a key factor in developing the stock market in the Americas. The banking sector, thus, is seen as an alternative and a competitor to the stock markets.

DFDI_2GDP negatively influenced DMKT_CAP2GDP, and also significant. This suggests that when net inflows come into these countries collectively, the market capitalization of the stock exchanges are affected negatively.

Macroeconomic indicators such as DINFLATN and DFRX negatively influenced DMKT_CAP2GDP on the panel data of Americas, though statistically insignificant. DBREEIS_IDX positively influenced DMKT_CAP2GDP, nevertheless not significant. DBREEIS_IDX is pertinent in stock market development.

EUROPE

Results of Model One (1)

Model one is designed as economic growth on stock market capitalization. All the variables were tested for unit root tests at all stages: level & individual intercept, level & individual intercept and trend, first difference & individual intercept, and first difference &

individual intercept and trend. Results are reported in Tables 30ER1 and 31ER2 below using Augmented Dickey-Fuller (ADF) and the Philips and Peron (PP) unit root tests for the relevant variables. All the series are stationary at ‘‘first difference and individual intercept’’ and have p-values less than 5%; therefore, series do not have unit-roots. The results of the Augmented Dickey-Fuller (ADF) and the Philips and Peron (PP) unit root tests in the table below:

Table 30ER1: ADF Unit Root Test for the Variables in Levels - Europe (Model One)

Variables	level				1st difference			
	Individual intercept		Intercept and trend		Individual intercept		Intercept and trend	
	Stats	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**
GDSVNGS_2GDP	14.2232	0.1631	16.8967	0.0767	59.0235	0.0000	41.7347	0.0000
BREEIS_IDX	21.5710	0.0174	18.7375	0.0437	104.923	0.0000	85.5462	0.0000
DM_CRD__PRV_2GDP	14.8675	0.1370	18.8567	0.0421	52.6113	0.0000	42.5614	0.0000
FDI_2GDP	26.0272	0.0037	19.5892	0.0334	87.9788	0.000	68.4669	0.000
FRX	57.2863	0.0000	66.7018	0.0000	37.7447	0.0000	20.6704	0.0021
GGDP	39.3728	0.0000	26.9256	0.0027	99.0691	0.0000	77.6705	0.0000
INFLATN	44.1795	0.0000	34.8015	0.0001	97.2979	0.0000	78.6557	0.0000
LGDP_P_CPT	5.94133	0.8202	11.0862	0.3508	40.7049	0.0001	28.3894	0.0016
LLISTED_COYS	5.30753	0.8697	18.1878	0.0519	53.3765	0.0000	41.2509	0.0000
M2_GDP	5.05761	0.8873	16.1951	0.0942	48.1065	0.0000	33.7366	0.0002
MKT_CAP2GDP	29.5625	0.0010	20.4106	0.0256	60.4288	0.0000	44.4263	0.0000
STK_TRD_TRN	31.5490	0.0005	27.9819	0.0018	86.9445	0.0000	53.3687	0.0000
STK_TRD_VAL__GDP	14.5395	0.1498	7.44879	0.6825	54.3052	0.0000	40.8860	0.0000
TX2GDP	22.6881	0.0120	23.0236	0.0107	55.2754	0.0000	40.7066	0.0000

Source: (Mensah, 2020). **ADF** Unit root tests for the variables in levels.

Table 31ER2: PP Unit Root Test Results in Levels - Europe (Model One)

Variables	level				1st difference			
	Individual intercept		Intercept and trend		Individual intercept		Intercept and trend	
	Stats	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**
GDSVNGS_2GDP	10.7176	0.3799	9.27857	0.5059	67.2886	0.0000	71.6045	0.0000
BREEIS_IDX	21.3398	0.0188	18.7187	0.0440	121.414	0.0000	104.301	0.0000
DM_CRD__PRV_2GDP	11.2439	0.3388	14.2100	0.1636	94.6041	0.0000	172.398	0.0000
FDI_2GDP	25.7808	0.0040	15.9773	0.1003	108.306	0.0000	111.047	0.0000
FRX	7.92237	0.4411	10.2386	0.1150	41.1310	0.0000	30.7079	0.0000
GGDP	35.4292	0.0001	24.6487	0.0061	204.657	0.0000	156.112	0.0000
INFLATN	44.0141	0.0000	41.3584	0.0000	155.167	0.0000	136.910	0.0000
LGDP_P_CPT	7.62174	0.6657	1.45639	0.9991	36.8356	0.0001	25.8912	0.0000
LLISTED_COYS	8.15556	0.6136	5.26423	0.8728	80.7135	0.0000	100.475	0.0000
M2_GDP	4.21355	0.9372	11.7430	0.3026	73.1823	0.0000	60.6723	0.0000
MKT_CAP2GDP	16.8650	0.0774	11.1596	0.3452	87.0892	0.0000	114.637	0.0000
STK_TRD_TRN	21.6764	1.0168	329.988	0.0000	411.738	0.0000	14.0841	0.1692
STK_TRD_VAL__GDP	14.0841	0.1692	6.12775	0.8044	54.2453	0.0000	43.7901	0.0000
TX2GDP	27.2195	0.0024	14.2931	0.1600	59.1808	0.0000	49.5368	0.0000

Source: (Mensah, 2020). **PP** Unit root tests for the variables in levels

Following the preceding tests, a correlation test was carried out to ascertain the levels of correlation of the variables. Those that were correlated above 50% indicated multicollinearity between them. Results are in Table 32ER3 below:

The symbols for the variables changed to: DGDSVNGS_2GDP, DBREEIS_IDX, DDM_CRD__PRV_2GDP, DFDI_2GDP, DFRX, DINFLATN, DLGDP_P_CPT, DLLISTED_COYS, DM2_GDP, DMKT_CAP2GDP, DSTK_TRD_TRN, DSTK_TRD_VAL__GDP and DTX2GDP

Table 32ER3: Correlation Test/Analysis - Europe (Model One)

variables	D__GDSVNGS_2GDP	DBREEIS_IDX	DINFLATN	DLGDP_P_CPT	DMKT_CAP2GDP	DDM_CRD__PRV_2GDP	DTX2GDP	DFDI_2GDP	DFRX	DLLISTED_COYS	DM2_GDP	DSTK_TRD_TRN	DSTK_TRD_VAL__GDP
D__GDS+A21:A32VNGS_2GDP	1	0.06366267	0.09465	0.179728	0.04182	-0.24967	0.179482	0.183037	0.018761	0.079161	-0.22838	0.308383	0.3830578
DBREEIS_IDX	0.06366267	1	0.07286	-0.1278	0.031226	-0.18853	0.087322	-0.13544	0.003068	0.059158	-0.10118	0.011402	-0.0098309
DINFLATN	0.09464731	0.072859217	1	0.005552	-0.06626	-0.05275	0.013939	0.046999	0.096005	0.067769	-0.1027	0.05516	0.0111822
DLGDP_P_CPT	0.17972818	-0.1277965	0.005552283	1	-0.07035	-0.02875	0.008937	0.072578	-0.24008	-0.00566	-0.07273	0.122049	-0.0315579
DMKT_CAP2GDP	0.04181983	0.031225618	-0.06626257	-0.07035	1	0.174924	0.065449	0.140583	0.069905	0.102895	0.125431	-0.52922	0.2812315
DDM_CRD__PRV_2GDP	-0.2496688	-0.18852579	-0.05275402	-0.02875	0.174924	1	0.011623	0.008988	0.00579	0.027437	0.515826	-6.63E-02	0.0443081
DTX2GDP	0.17948174	0.087322061	0.013938946	0.008937	0.065449	0.011623	1	0.062587	0.069829	0.045753	0.13241	0.141779	0.1428949
DFDI_2GDP	0.18303696	-0.13543948	0.046999083	0.072578	0.140583	0.008988	0.062587	1	-0.00104	3.37E-02	0.118102	0.00659	0.428461
DFRX	0.01876118	0.003067865	0.096005119	-0.24008	0.069905	0.00579	0.069829	-0.00104	1	-0.14115	0.037332	0.010414	0.0368845
DLLISTED_COYS	0.0791606	0.059157823	0.06776913	-0.00566	0.102895	0.027437	0.045753	0.033722	-0.14115	1	0.036979	-0.04814	0.1087727
DM2_GDP	-0.2283794	-0.1011814	-0.10270001	-0.07273	0.125431	0.515826	0.13241	0.118102	0.037332	0.036979	1	-5.86E-05	0.1944054
DSTK_TRD_TRN	0.30838342	0.011401949	0.055159804	0.122049	-0.52922	-0.06627	0.141779	0.00659	0.010414	-0.04814	-5.86E-05	1	0.295053
DSTK_TRD_VL__GDP	0.38305778	-0.00983089	0.011182213	-0.03156	0.281232	0.044308	0.142895	0.428461	0.036884	0.108773	0.194405	0.295053	1

Source: (Mensah, 2020). **Correlation values.**

Variables highly correlated were dropped because of their degree of correlation. These pairings are DM2_GDP)/DDM_CREDIT at 0.516 and DSTK_TRD_TRN/DMKT_CAP2GDP at -0.529. Cointegration was adequately done to ascertain if the series are cointegrated and have a long-run association. The test results as captured in Table 33ER4, shown a p-value of 0.0046 that is (p<5). The null hypothesis is rejected, and the alternative hypothesis accepted because the null hypothesis is less than 5%. The hypotheses for cointegration test are set as:

Null hypothesis: No cointegration

Alternative hypothesis: Cointegration

The series are therefore cointegrated.

Table 33ER4: Cointegration Test - Europe (Model One)

	t-Statistic	Prob.
ADF	-2.602233	0.0046
Residual variance	1.247078	
HAC variance	0.196138	

Source: (Mensah, 2020). **Kao Residual Cointegration Test**

Following the initial regression test outcome, it was discovered that some selected variables were not really relevant because of their very insignificant figures given, hence were dropped from the final regression test such as DINFLATN, DFRX, DFDI_2GDP and LLISTED_COYS.

Regression Results

After a sequence of tests, regression test was undertaken and results shown in Table 34ER5. The coefficient of DMKT_CAP2GDP is -0.00005, and it is statistically significant. DDM_CRD__PRV_2GDP has a coefficient of 0.00001, but it is insignificant. D__GDSVNGS_2GDP has a coefficient of -0.00208 and looks statistically significant. DLGDP_P_CPT has a coefficient of 0.98483; additionally, it is statistically significant. DBREEIS_IDX on the hand has a coefficient of -0.01127, DTX2GDP has a coefficient of -0.00129 and GGDP (-1) also has a coefficient of -0.01365. They are all not statistically significant.

The R-square is 99.8%, implying that 99.8% accounts for the variations in the dependent variable (GGDP). F-statistic has a coefficient of 1745.554 and a P –value of less than 5%, implying that all the explainable variables jointly have influences on the dependent variable (GGDP); thus, the regression model is good.

Table 34ER5: Regression Results - Economic Growth on Stock Market Development - Europe (Model 1)

Regressor	Coefficient	Standard error	T-statistics	P-value
C	0.00950	0.000701	13.56239	0.0000
DMKT_CAP2GDP	-0.00005	2.15E-05	-2.359409	0.0207
DDM_CRD__PRV_2GDP	0.00001	0.000113	0.104339	0.9172
D__GDSVNGS_2GDP	-0.00208	0.000910	-2.282581	0.0251
DLGDP_P_CPT	0.98483	0.013570	72.57361	0.0000
DBREEIS_IDX	-0.01127	0.011840	-0.951952	0.3440
DTX2GDP	-0.00129	0.000806	-1.600769	0.1133
GGDP (-1)	-0.01365	0.014327	-0.952668	0.3436

R-squared	0.998345	Mean dependent var	0.033923
Adjusted R-squared	0.997774	S.D. dependent var	0.090654
S.E. of regression	0.004278	Akaike info criterion	-7.849627
Sum squared resid	0.001482	Schwarz criterion	-7.137682
Log likelihood	460.7295	Hannan-Quinn criter.	-7.560858
F-statistic	1745.554	Durbin-Watson stat	1.088118
Prob(F-statistic)	0.000000		

Source: (Mensah, 2020). Dependent variable: GGDP. Data Output via Eviews9.5; Method: Panel Least Square Method (Fixed Effect Model) regression.

Discussion of Model One (1)

Economic growth on stock market development of Europe has been tested and analyzed. Based on the outcome of the regression, it is realized that stock market development through market capitalization has a relationship (negative) on economic growth in Europe. This is in line with the hypothesis (1b) which is N$_1$- Alternative hypothesis: There is a positive or negative relationship between economic growth and stock market development in the sample country or countries. The results are in line with Wang & Ajit (2013), that there is a negative relationship between economic growth and stock market development. The findings of Levine and Zervos (1999), Arestis et al. (2001) and Caporale et al. (2004) though, supports the hypothesis, the relationship is positive and opposite to the works of Wang & Ajit (2013).

Further to the above, D__GDSVNGS_2GDP, which is a representative of the banking sector development, has a negative influence on GGDP over the period, and it is significant. This implies that the high supply of money in Europe has adverse consequences on economic growth. This contravenes the findings of Masih and Peters (2010) and Singh (2010) that savings have a positive effect on economic growth.

DLGDP_P_CPT has a significant influence on GGDP. DBREEIS_IDX, an indicative of global competitiveness instead has a negative influence on GGDP. DTX2GDP has negative effects on economic growth, probably, too much tax affects growth. The lag of economic growth has a transmission effect from the previous period on the current growth of the period.

Results of Model Two

Model (2) is designed as a stock market capitalization on economic growth. As indicated in model one earlier, the same processes were followed for model two, in exception of not featuring DMKT_CAP2GDP in the correlation test/analysis. This is of the fact that it serves a new role as the dependent variable.

DLGDP_P_CPT was dropped since it was highly correlated with GGDP. In the same vein, money supply was dropped because of signs of multicollinearity (highly correlated with DDM_CRD_PRV). Correlation test is captured in Table 35ER6.

Table 35ER6: Correlation Test - Europe (Model Two)

	D__GDSVNGS_2GDP	DBREEIS_IDX	DINFLATN	DLGDP_P_CPT	DDM_CRD__PRV_2GDP	DTX2GDP	DFDI_2GDP	DFRX	DLLISTED_COYS	DM2_GDP	DSTK_TRD_TRN	DSTK_TRD_VAL__GDP	GGDP
D__GDSVNGS_2	1	0.06366267	0.094647312	0.179728	-0.24967	0.179482	0.183037	0.018761	0.079161	-0.22838	0.308383	0.383058	0.1689648
DBREEIS_IDX	0.06366267	1	0.072859217	-0.1278	-0.18853	0.087322	-0.13544	0.003068	0.059158	-0.10118	0.011402	-0.00983	-0.1361408
DINFLATN	0.09464731	0.072859217	1	0.005552	-0.05275	0.013939	0.046999	0.096005	0.067769	-0.1027	0.05516	0.011182	0.0110008
DLGDP_P_CPT	0.17972818	-0.1277965	0.005552283	1	-0.02875	0.008937	0.072578	-0.24008	-0.00566	-0.07273	0.122049	-0.03156	0.9976215
DDM_CRD__PR\	-0.2496688	-0.18852579	-0.05275402	-0.02875	1	0.011623	0.008988	0.00579	0.027437	0.515826	-0.06627	0.044308	-0.0203028
DTX2GDP	0.17948174	0.087322061	0.013938946	0.008937	0.011623	1	0.062587	0.069829	0.045753	0.13241	0.141779	0.142895	-0.0136523
DFDI_2GDP	0.18303696	-0.13543948	0.046999083	0.072578	0.008988	0.062587	1	-0.00104	0.033722	0.118102	0.00659	0.428461	0.072725
DFRX	0.01876118	0.003067865	0.096005119	-0.24008	0.00579	0.069829	-0.00104	1	-0.14115	0.037332	0.010414	0.036884	-0.2417467
DLLISTED_COYS	0.0791606	0.059157823	0.06776913	-0.00566	0.027437	0.045753	0.033722	-0.14115	1	0.036979	-0.04814	0.108773	-0.0069464
DM2_GDP	-0.2283794	-0.1011814	-0.10270001	-0.07273	0.515826	0.13241	0.118102	0.037332	0.036979	1	-5.86E-05	0.194405	-0.064508
DSTK_TRD_TRN	0.30838342	0.011401949	0.055159804	0.122049	-0.06627	0.141779	0.00659	0.010414	-0.04814	-5.86E-05	1	0.295053	0.1214014
DSTK_TRD_VAL_	0.38305778	-0.00983089	0.011182213	-0.03156	0.044308	0.142895	0.428461	0.036884	0.108773	0.194405	0.295053	1	-0.0278451
GGDP	0.16896477	-0.13614078	0.011000798	0.997621	-0.0203	-0.01365	0.072725	-0.24175	-0.00695	-0.06451	0.121401	-0.02785	1

Source: (Mensah, 2020). **Correlation values.**

Cointegration was adequately done to ascertain if the series are cointegrated and have a long-run association. The test results as captured in Table 36ER7, show a p-value of the majority of six equations depict probability value of less than 5% (p<5), The null hypothesis is rejected, and alternative hypothesis accepted because the null hypothesis is less than 5%. The hypotheses are set as:

Null hypothesis: No cointegration

Alternative hypothesis: Cointegration

The series are therefore cointegrated.

Table 36ER7: Cointegration Test: Johansen Fisher Panel Cointegration Test - Europe (Model Two)

Unrestricted Cointegration Rank Test (Trace and Maximum Eigenvalue)				
Hypothesized	Fisher Stat.*		Fisher Stat.*	
No. of CE(s)	(from trace test)	Prob.	(from max-eigen test)	Prob.
None	41.00	0.0000	41.00	0.0000
At most 1	225.3	0.0000	117.8	0.0000
At most 2	137.0	0.0000	73.92	0.0000
At most 3	82.79	0.0000	42.44	0.0000
At most 4	49.43	0.0000	34.91	0.0001
At most 5	24.85	0.0056	15.15	0.1266
At most 6	32.07	0.0004	32.07	0.0004

Source: (Mensah, 2020).
Note: Unlike, model one, model two uses Johansen Fisher Panel Cointegration Test.

Table 37ER8: Regression Results - Europe (Model Two)

Regressor	Coefficient	Standard error	T-statistics	P-value
C	-0.696844	3.067364	-0.22718	0.8207
GGDP	-12.59906	28.4174	-0.443357	0.6585
D__GDSVNGS_2GDP	2.053423	2.585144	0.794317	0.4289
DDM_CRD__PRV_2GDP	0.221633	0.391637	0.565913	0.5727
DSTK_TRD_TRN	-0.226565	0.02796	-8.103297	0.0000
DTX2GDP	2.497053	2.667824	0.935989	0.3515
DBREEIS_IDX	26.74932	36.29708	0.736955	0.4629
DFRX	2.770712	2.44282	1.134227	0.2594
DMKT_CAP2GDP(-1)	0.469907	0.077556	6.058923	0.0000

R-squared	0.533478	Mean dependent var	-1.61714
Adjusted R-squared	0.496526	S.D. dependent var	21.62216
S.E. of regression	15.3422	Sum squared resid	23773.7
F-statistic	14.43696	Durbin-Watson stat	2.336894
Prob(F-statistic)	000000		

Source: (Mensah, 2020). Dependent variable: GGDP. Data Output via Eviews9.5; Method: Panel Least Square Method (Fixed Effect Model) regression.

Regression Results –Model Two (2)

The results in Table 37ER8 show that GGDP has a coefficient of -12.59906, thus negatively related to DMKT_CAP2GDP, but the value is not significant. In another manner, D__GDSVNGS_2GDP has a coefficient of 2.053423, but it is statistically insignificant. DDM_CRD__PRV_2GDP has a coefficient of 0.221633 and not significant. DSTK_TRD_TRN has a coefficient of -0.226565, inversely related to DMKT_CAP2GDP and statistically significant. DTX2GDP, DBREEIS_IDX, DFRX and DMKT_CAP2GDP (-1) have coefficients of 2.497053; 26.74932; 2.770712 and 0.469907 respectively, and they are all not significant. The R-square is 0.533478, implying that 53.35 % accounted for the variations in the dependent variable (market capitalization ratio). F-statistic has a coefficient of 14.43696 and a P–value of less than 5%, also implying that all the explainable variables jointly influenced the dependent variable (DMKT_CAP2GDP); thus, the regression model is appropriate.

Discussion of the Results of Model Two (2)

Stock market development on economic growth of Europe has been tested and analyzed. Following the outcome of the regression, it is well established that economic growth does not have effect (has a negligible effect) on stock market development. The results are not statistically significant. This is in line with the hypothesis (2a) which is N_0- Null hypothesis: There is no relationship (or negligible) between stock market development and economic growth in Europe. This is reverse to the works of Levine and Zervos (1998).

The summary of the results indicates that GGDP is inversely related to market capitalization ratio in Europe for the period under review, but the influence is not significant. D__GDSVNGS_2GDP, an indicator of the banking sector development, has a positive influence on stock market development, but the influence is not significant. Another indicator of the banking sector development – DDM_CRD__PRV_2GDP has no significant influence on the stock market through DMKT_CAP2GDP. This is indicative of the fact that when credit from the banking sector to private businesses increases, it affects market capitalization ratio. In this scenario, they both move in opposite directions. DSTK_TRD_TRN, a component of the stock market development, negatively influenced the stock market. This implies that the intensity of how much stocks are traded over the exchanges, has a significant and negative influences on the stock market development via DMKT_CAP2GDP in Europe over the period. On the other hand, for the period under review, DTX2GDP, though has a positive influence on DMKT_CAP2GDP, it is not significant. DBREEIS_IDX, has a direct influence on the stock market; it is also not significant. This implies that institutional-technological-innovative and financial factors have no significant impact on the stock market development in Europe. DFRX, an indicator of macroeconomic environment has no influence on the stock market development. However, DMKT_CAP2GDP (-1) has a positive transmission and significant effect on stock market development, thus, the transmission effect influenced DMKT_CAP2GDP positively.

AFRICA

Results of Model one (1)

Model one (1) is designed as GDP growth on stock market capitalization. All the variables were tested for unit root at all stages: level & individual intercept, level & individual intercept and trend, first difference & individual intercept, and first difference & individual intercept and trend. Series with p-values less than 5%, thus have no unit root (are stationary). Results are reported in Table 38AF1 and 39AF2 below using Augmented Dickey-Fuller (ADF) and the Philips and Peron (PP) unit root tests respectively for the relevant variables:

Table 38AF1: ADF Unit Root Test Results - Africa (Model One)

VARIABLES	**Level**				**1ST Difference**			
	Individual Intercept		Intercept and Trend		Individual intercept		Intercept and Trend	
	Stats	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**
GDSVNGS_2GDP	18.6852	0.0444	13.8587	0.1795	54.9348	0.0000	43.5334	0.0000
BREEIS_IDX	22.9718	0.0109	19.2813	0.0368	59.2443	0.0000	47.0951	0.0000
DM_CRD__PRV_2GDP	11.8777	0.2933	11.7612	0.3014	55.5389	0.0000	42.8614	0.0000
FDI_2GDP	30.8877	0.0006	30.8253	0.0006	57.4787	0.0000	40.3051	0.0000
FRX	2.44748	0.9916	3.99730	0.9475	31.9434	0.0004	23.4090	0.0093
GGDP	37.0714	0.0001	24.4745	0.0064	76.2838	0.0000	57.6942	0.0000
INFLATN	35.9100	0.0001	49.7122	0.0000	134.742	0.0000	146.605	0.0000
LGDP_P_CPT	3.37246	0.9713	4.48710	0.9227	34.6347	0.0001	22.9338	0.0110
LLISTED_COYS	7.87654	0.6409	9.57475	0.4786	24.1454	0.0072	16.3690	0.0895
M2_GDP	9.95418	0.4445	9.89074	0.4501	33.6407	0.0002	22.8500	0.0113
MKT_CAP2GDP	14.5029	0.1513	14.3926	0.1558	59.8604	0.0000	49.2666	0.0000
STK_TRD_TRN	39.7623	0.0000	24.5329	0.0063	57.4844	0.0000	44.2801	0.0000
STK_TRD_VAL__GDP	23.8925	0.0079	19.7560	0.0316	56.7186	0.0000	41.8899	0.0000
TX2GDP	15.3573	0.1196	15.2777	0.1223	43.6035	0.0000	33.2645	0.0002

Source: (Mensah, 2020). **ADF** Unit root tests for the variables in levels.

Table 39AF2: PP Unit Root Test Results - Africa (Model One)

Variables	**Level**				**1st Difference**			
	Individual intercept		Intercept and trend		Individual intercept		Intercept and trend	
	Stats	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**
GDSVNGS_2GDP	33.5158	0.0002	24.5066	0.0064	145.238	0.0000	343.958	0.0000
BREEIS_IDX	35.9645	0.0001	33.6972	0.0002	357.926	0.0000	580.991	0.0000
DM_CRD__PRV_2GDP	21.6366	0.0171	19.8980	0.0302	119.086	0.0000	311.805	0.0000
FDI_2GDP	29.8419	0.0009	25.8718	0.0039	162.709	0.0000	345.635	0.0000
FRX	8.42827	0.5871	8.42480	0.5874	57.2801	0.0000	44.3310	0.0000
GGDP	62.1473	0.0000	45.4167	0.0000	497.182	0.0000	451.284	0.0000
INFLATN	38.1723	0.0000	40.5155	0.0000	232.150	0.0000	330.234	0.0000
LGDP_P_CPT	2.46910	0.9913	8.24141	0.6053	62.6655	0.0000	46.0952	0.0000
LLISTED_COYS	11.5369	0.3172	4.13490	0.9411	41.0714	0.0000	35.6012	0.0001
M2_GDP	7.64976	0.6630	6.76708	0.7472	60.1013	0.0000	45.8114	0.0000
MKT_CAP2GDP	14.8865	0.1363	25.9020	0.0039	184.483	0.0000	499.402	0.0000
STK_TRD_TRN	37.8290	0.0000	73.4572	0.0000	254.003	0.0000	598.708	0.0000
STK_TRD_VAL__GDP	28.8571	0.0013	25.7164	0.0041	168.584	0.0000	272.404	0.0000
TX2GDP	26.7086	0.0029	22.2269	0.0140	96.6811	0.0000	207.021	0.0000

Source: (Mensah, 2020). **PP** Unit root tests for the variables in levels

In tables 38AF1 and 39AF2 above, the results indicate that there are no unit roots in the individual series. The null hypothesis says, there is unit root whilst the alternative hypothesis says, there is no unit root. The p-value for each series is less than 5%, thus, each series is stationary. The null hypothesis is rejected, and the alternative hypothesis is accepted. Correlation test was undertaken to ascertain if any of the selected variables do have high degrees of correlation between them, likely to pose multicollinearity. The results in Table 40AF3 indicate the presence of high correlation between some of the variables.

Table 40AF3: Correlation Test/Analysis - Africa (Model 1)

	DSTK_TRD_VL	DSTK_TRD_TRN	DMKT_CAP2GDP	DM2_GDP	DLLISTED_COYS	DLGDP_P_CPT	DINFLATN	DFRX	DFDI_2GDP	DDM_CRD__PRV_2GDP	DBREES_IDX	D__GDSVNGS_2GDP	DTX2GDP
DSTK_TRD_VL	1.0000	0.1698	0.6121	0.0395	0.0139	-0.0968	0.0134	-0.0250	-0.1031	0.1865	0.1133	-0.0264	0.0179
DSTK_TRD_TRN	0.1698	1.0000	-0.1478	0.0453	0.0257	-0.1903	0.2452	0.4934	-0.0988	0.2192	0.0748	0.1024	-0.0901
DMKT_CAP2GDP	0.6121	-0.1478	1.0000	-0.0659	0.0824	-0.0284	-0.0228	-0.0354	-0.0380	0.0738	0.0820	-0.0689	-0.0318
DM2_GDP	0.0395	0.0453	-0.0659	1.0000	-0.2049	-0.4573	-0.3080	0.0137	0.2463	0.5570	0.2408	-0.1750	0.1157
DLLISTED_COYS	0.0139	0.0257	0.0824	-0.2049	1.0000	0.0673	0.0269	-0.0014	0.0404	0.0025	-0.0171	-0.0523	-0.1097
DLGDP_P_CPT	-0.0968	-0.1903	-0.0284	-0.4573	0.0673	1.0000	0.1392	-0.3568	-0.1390	-0.3898	-0.1373	0.1977	0.0540
DINFLATN	0.0134	0.2452	-0.0228	-0.3080	0.0269	0.1392	1.0000	0.2594	-0.3046	-0.1515	-0.1217	0.3855	-0.0423
DFRX	-0.0250	0.4934	-0.0354	0.0137	-0.0014	-0.3568	0.2594	1.0000	0.0090	0.2017	0.0849	0.1712	-0.0168
DFDI_2GDP	-0.1031	-0.0988	-0.0380	0.2463	0.0404	-0.1390	-0.3046	0.0090	1.0000	0.3618	0.0417	-0.0646	0.1011
DDM_CRD__PRV_2GDP	0.1865	0.2192	0.0738	0.5570	0.0025	-0.3898	-0.1515	0.2017	0.3618	1.0000	0.1585	-0.1074	0.0914
DBREES_IDX	0.1133	0.0748	0.0820	0.2408	-0.0171	-0.1373	-0.1217	0.0849	0.0417	0.1585	1.0000	-0.3553	0.0354
D__GDSVNGS_2GDP	-0.0264	0.1024	-0.0689	-0.1750	-0.0523	0.1977	0.3855	0.1712	-0.0646	-0.1074	-0.3553	1.0000	-0.0152
DTX2GDP	0.0179	-0.0901	-0.0318	0.1157	-0.1097	0.0540	-0.0423	-0.0168	0.1011	0.0914	0.0354	-0.0152	1.0000

Source: (Mensah, 2020). Correlation values.

As per the correlation tests results, DSTK_TRD_VAL__GDP is correlated to DMKT_CAP2GDP at 61%. At the same time, DM2_GDP is correlated to DM_CRD__PRV_2GDP at 55.7%. DSTK_TRD_VAL__GDP and DM2_GDP were dropped to avoid multicollinearity in the regression model. This is based on the benchmark set down for the research (more than 50% means multicollinearity).

Following the research compliance, cointegration test was carried out, and the results are indicated in table 41AF4 below.

Hypotheses set as for the test are below:

Null hypothesis= Series are not cointegrated

Alternative hypothesis = series are cointegrated

Table 41AF4: Panel Cointegration Results - Africa (Model One)

	T-STATISTICS	PROB
ADF	-4.159793	0.0000
RESIDUAL	50.45447	
HAC VARIANCE	5.511749	

Source: (Mensah, 2020). Kao Residual Cointegration Test
Note: Decision: p values should be less than %5, that is (P< 5%); otherwise, the null hypothesis is rejected.

The variables are cointegrated. The null hypothesis is rejected because the results indicated a p-value of less than 5%; therefore, the alternative hypothesis is accepted. As indicated in the previous text, this model is designed as GDP growth on stock market development. Regression tests were undertaken, and the results are captured in Table 42AF5 below.

Table 42AF5: Regression Results - Africa (Model One)

Regressor	Coefficient	Standard error	T-statistics	P-value
C	0.02625	0.00438	5.99601	0.00000
DMKT_CAP2GDP	-0.00003	0.00016	-0.19213	0.84800
DLLISTED_COYS	-0.03845	0.04330	-0.88805	0.37670
DSTK_TRD_TRN	-0.00040	0.00066	-0.60390	0.54730
DDM_CRD__PRV_2GDP	-0.00256	0.00103	-2.47781	0.01490
DGDP_P_CPT	1.18606	0.02852	41.59163	0.00000
D__GDSVNGS_2GDP	-0.00039	0.00078	-0.49289	0.62320
DINFLATN	0.00032	0.00030	1.07587	0.28470
DFRX	0.00032	0.00016	1.94994	0.05410
DFDI_2GDP	-0.00161	0.00228	-0.70841	0.48040
DTX2GDP	0.00038	0.00253	0.15060	0.88060
DBREES_IDX	-0.05770	0.03893	-1.48215	0.14150
GGDP(-1)	-0.00315	0.02118	-0.14854	0.88220

R-squared	0.967336	Mean dependent var	0.095619
Adjusted R-squared	0.963295	S.D. dependent var	0.191881
S.E. of regression	0.036761	Sum squared resid	0.131086
F-statistic	239.3870	Durbin-Watson stat	1.744031
Prob(F-statistic)	0.000000		

Source: (Mensah, 2020). Dependent variable: GGDP. Source: Data Output via Eviews9.5- Method: Panel EGLS (Period random effects) regression equation.

The regression results state a coefficient of -0.00003 for DMKT_CAP2GDP, and also statistically insignificant. At the same time, the coefficients of -0.03845 and -0.00040 indicate for DLLISTED_COYS and DSTK_TRD_TRN respectively, implying that they have negative influences on GGDP, also, they are not significant.

DDM_CRD__PRV_2GDP has a coefficient of -0.00256 and accordingly, statistically significant. DGDP_P_CPT also has a coefficient of 1.18606, thus has a positive influence on

GGDP, and it is very significant. In the same manner, though DINFLATN and DFRX are not statistically significant, they have positive influences on GGDP. They have coefficients of 0.00032 and 0.00032, respectively. Contrarily to the preceding, D__GDSVNGS_2GDP, DFDI_2GDP, DBREES_IDX, GGDP (-1) have coefficients of -0.00039, -0.00161, -0.05770 and -0.00315 respectively, however they are not statistically significant.

The R-squared of 0.967336, implies that 96.7% of variations accounted for variations in GGDP, and 3.3% accounted for unobserved factors. In an added disposition, the F-statistics is 239.3870 and Prob (F-statistic) value of 0.000000. This informs the study that all the independent variables jointly explain the dependent variable.

As a procedure for selecting an appropriate model for the running of the regression test, hausman test was performed. As indicated in Table 43AF6 below, the random effect model is more appropriate for the regression, and accordingly accepted, because the p-value is 0.5811, more than 5%.

Table 43AF6: Correlated Random Effect (Hausman Test) - Africa (Model One)

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
Period random	10.397479	12	0.5811

Source: (Mensah, 2020). Note: Null Hypothesis= random effect (p >5%). Alternative hypothesis = Fixed effect model (p<5%)

Discussion of the Results of Model one (1)

Economic growth on stock market development of sampled countries in Africa has been tested and analyzed. It is established from the results that stock market development does not have effect on economic growth (negligible effect). This is in line with the hypothesis (1a) which is H_0- Null hypothesis: There is no relationship (negligible) between economic growth and stock market development in the sampled countries; and confirmed by the works of Oya & Domar (2006), Charif, (2001), Haque (2013), Ake & Ognaligui (2010) and Saba & Ghulam (2017.

The results from the regression proof that for the period under review, the stock market development through DMKT_CAP2GDP from the panel data of the five selected countries in Africa has no significant influence on GDP growth, though, inversely related to economic growth, the influence is negligible. Additionally, other stock market development indicators such as DLLISTED_COYS and DSTK_TRD_TRN also followed the same trend. This is reverse to the work of Levine (1998). DDM_CRD__PRV_2GDP, an indicator of banking sector development, has a negative and significant influence on GDP growth. On the other hand, D__GDSVNGS_2GDP, also an indicator of the banking sector development has negatively influenced GGDP, however, it is not significant.

Contrarily to the preceding, DGDP_P_CPT positively influenced GGDP. This indicates that the quality of living has influence on how fast the economy is growing. Macroeconomic and other related indicators have varying but negligible influences on economic growth. Inflation and exchange rate have positive influences on GGDP. DFDI_2GDP, has a negative influence on economic growth, implying that when there is an increase in DFDI_2GDP, it affects GGDP negatively. DTX2GDP, contrarily has a positive influence on economic growth but it is negligible. DBREES_IDX has a negative influence on GGDP, however, it is insignificant. GGDP (-1), has a negative influence on GGDP, but insignificant.

Results of Model Two (2)

Model two is designed as Stock market development on economic growth. All the variables were already tested for unit roots and found to be stationary at first difference & individual intercept in Table 38AF1 and 39AF2 accordingly.

A correlation test was undertaken again to check for the degree of correlation between the variables without DMKT_CAP2GDP because it serves as the new dependent variable. DM2_GDP and DGDP_P_CPT were dropped due to their degree of correlation, in order to avoid the presence of multicollinearity. Results are captured in Table 44AF7.

Table 44AF7: Correlation Test Results - Africa (Model Two)

	D__GDSVNGS_2GDP	DBREES_IDX	DDM_CRD__PRV_2GDP	DFDI_2GDP	DFRX	DINFLATN	DLGDP_P_CPT	DLLISTED_COYS	DM2_GDP	DSTK_TRD_TRN	DSTK_TRD_VL	DTX2GDP	GGDP
D__GDSVNGS_2GDP	1.00000	-0.35525	-0.10738	-0.06461	0.17118	0.38554	0.19774	-0.05227	-0.17497	0.10237	-0.02645	-0.01517	0.22712
DBREES_IDX	-0.35525	1.00000	0.15847	0.04171	0.08493	-0.12167	-0.13728	-0.01712	0.24077	0.07477	0.11331	0.03542	-0.17043
DDM_CRD__PRV_2GDP	-0.10738	0.15847	1.00000	0.36183	0.20165	-0.15155	-0.38984	0.00249	0.55698	0.21918	0.18647	0.09144	-0.43107
DFDI_2GDP	-0.06461	0.04171	0.36183	1.00000	0.00905	-0.30461	-0.13900	0.04044	0.24634	-0.09876	-0.10308	0.10112	-0.15999
DFRX	0.17118	0.08493	0.20165	0.00905	1.00000	0.25943	-0.35678	-0.00137	0.01371	0.49341	-0.02496	-0.01684	-0.28804
DINFLATN	0.38554	-0.12167	-0.15155	-0.30461	0.25943	1.00000	0.13922	0.02692	-0.30805	0.24521	0.01343	-0.04229	0.18750
DLGDP_P_CPT	0.19774	-0.13728	-0.38984	-0.13900	-0.35678	0.13922	1.00000	0.06732	-0.45730	-0.19028	-0.09677	0.05402	0.97891
DLLISTED_COYS	-0.05227	-0.01712	0.00249	0.04044	-0.00137	0.02692	0.06732	1.00000	-0.20488	0.02574	0.01395	-0.10967	0.05199
DM2_GDP	-0.17497	0.24077	0.55698	0.24634	0.01371	-0.30805	-0.45730	-0.20488	1.00000	0.04528	0.03955	0.11575	-0.53162
DSTK_TRD_TRN	0.10237	0.07477	0.21918	-0.09876	0.49341	0.24521	-0.19028	0.02574	0.04528	1.00000	0.16975	-0.09014	-0.16396
DSTK_TRD_VL	-0.02645	0.11331	0.18647	-0.10308	-0.02496	0.01343	-0.09677	0.01395	0.03955	0.16975	1.00000	0.01787	-0.10293
DTX2GDP	-0.01517	0.03542	0.09144	0.10112	-0.01684	-0.04229	0.05402	-0.10967	0.11575	-0.09014	0.01787	1.00000	0.03411
GGDP	0.22712	-0.17043	-0.43107	-0.15999	-0.28804	0.18750	0.97891	0.05199	-0.53162	-0.16396	-0.10293	0.03411	1.00000

Source: (Mensah, 2020). GGDP and GDP per capita = 0.97891; and Money supply and DDM Credit = 0.5568

Following the above, a series of regression tests were carried out and the results captured in Appendix 9 indicate that some variables are not significant. DLGDP_P_CPT and TX2GDP were dropped.

Cointegration test was carried out accordingly and the results captured in Table 45AF8 below. The hypotheses are set for undertaking the test are as below:

Null hypothesis= Series are not cointegrated

Alternative hypothesis = series are not cointegrated

Decision: p values less than %5, that is (P< 5%), then the null hypothesis is rejected.

Table 45AF8: Panel Data Cointegration - Africa (Model Two)

ADF	T-STATISTICS	PROB
	-2.136027	0.0163
RESIDUAL	51.60698	
HAC VARIANCE	6.762565	

Source: (Mensah, 2020). Kao Residual Cointegration Test.

The variables are cointegrated. The null hypothesis is rejected because the results indicated a p-value of less than 5%; therefore, the alternative hypothesis accepted.

Regression results are captured in Table 46AF9 below, which uses DMKT_CAP2GDP as the main dependent variable. DSTK_TRD_TRN has a coefficient of -1.48747, DSTK_TRD_VL has a coefficient of 2.051174. This implies that they have negative and positive influences respectively on market capitalization ratio. They are statistically significant. Additionally, DMKT_CAP2GDP (-1), DSTK_TRD_TRN and DSTK_TRD_VL have coefficients of -0.20122, -0.63298 and -1.14514 respectively. They are also significant to stock market development, however, they have negative influences on DMKT_CAP2GDP.

DLLISTED_COYS has a coefficient of 25.9645 and DDM_CRD__PRV_2GD also has a coefficient of 0.690579; they are not significant. D__GDSVNGS_2GDP has a coefficient of -

0.22746, not significant, though, they all have positive influences on DMKT_CAP2GDP. Additionally, DBRSS_IDX has a coefficient of 6.261795 but is not significant. GGDP has a coefficient of 9.575909, but it is insignificant. DINFLATN has a coefficient of 0.01003, and DFRX also has a coefficient of -0.04774. Surprisingly, none of them is significant. On the other hand, DMKT_CAP2GDP (-1), DSTK_TRD_TRN(-1) and DSTK_TRD_VL(-1) have coefficients of -0.20122, -0.63298 -1.14514 respectively, they are all not significant.

The coefficient of determination is 0.703136, implying that 70% accounted for variations on the dependent variable (DMKT_CAP2GDP), and 30% cannot account for such variations. The F-statistic also is 19.145 and Prob(F-statistic) value of 0.000000. This is enough evidence that all the independent variables jointly explain the dependent variable (DMKT_CAP2GDP).

Table 46AF9: Regression Results - Africa (Model Two)

Regressor	Coefficient	Standard error	T-statistics	P-value
C	-1.28364	1.670444	-0.76844	0.4441
DSTK_TRD_TRN	-1.48747	0.305251	-4.87294	0.0000
DSTK_TRD_VL	2.051174	0.172094	11.91894	0.0000
DLLISTED_COYS	25.9645	15.06173	1.723872	0.0879
D__GDSVNGS_2GDP	-0.22746	0.275073	-0.82692	0.4103
DBREES_IDX	6.261795	13.90559	0.450308	0.6535
GGDP	9.575909	8.242429	1.161782	0.2482
DDM_CRD__PRV_2GDP	0.690579	0.37804	1.826735	0.0708
DINFLATN	0.01003	0.09818	0.102159	0.9188
DFRX	-0.04774	0.057968	-0.82358	0.4122
DMKT_CAP2GDP(-1)	-0.20122	0.078152	-2.57466	0.0115
DSTK_TRD_TRN(-1)	-0.63298	0.229514	-2.7579	0.0070
DSTK_TRD_VL(-1)	-1.14514	0.359424	-3.18603	0.0019
R-squared	0.703136	Mean dependent var	1.313622	
Adjusted R-squared	0.666411	S.D. dependent var	23.02583	
S.E. of regression	13.29907	Sum squared resid	17155.92	
F-statistic	19.14577	Durbin-Watson stat	1.939207	
Prob(F-statistic)	0.000000			

Source: (Mensah, 2020). **Dependent variable**: DMK_GDP. Source: Data Output via Eviews9.5. R**egression Note:** The stock market development on GGDP was based on the random effect model. The hausman test justifies the random effect model.

Discussion of the Results of Model Two (2)

Stock market development on economic growth of Africa has been tested and analysed. Following the outcome of the regression, it is well established that economic growth does not have effect (negligible effect) on stock market development in Africa. The results are not significant. This is in line with the hypothesis (2a), which is N_0- Null hypothesis: There is no relationship (negligible) between stock market development and economic growth in sampled countries. This is reverse to the works of Levine and Zervos (1998) and Nabieu and Barnor (2016).

From the analysis, one can conclude that GGDP has a positive influence on stock market development, but it is not significant. Other stock market development indicators

DSTK_TRD_TRN, DSTK_TRD_VL, DSTK_TRD_TRN (-1) and DSTK_TRD_VL (-1) from the panel data of the five selected countries in Africa have varying influences on DMKT_CAP2GDP. DSTK_TRD_VL positively influenced DMKT_CAP2GDP significantly and DSTK_TRD_TRN thus negatively influenced DMKT_CAP2GDP significantly. Though DLLISTED_COY on the exchanges positively influenced on DMKT_CAP2GDP, it is not significant. Additionally, DMKT_CAP2GDP (-1) has a negative and significant influence on DMKT_CAP2GDP, implying that the spillovers of the previous development on DMKT_CAP2GDP reflected on the current period.

DDM_CRD__PRV_2GDP, an indicator of the banking sector development on one side, positively influenced the stock market development for the period under review, but it is not significant. Also, on the other side, D__GDSVNGS_2GDP, another banking sector development indicator negatively influenced the stock market development, but the impact is negligible. These results are very conflicting. The only consolation the research can vouch for is that the indications are negligible. DINFLATN positively influenced DMKT_CAP2GDP but not significant. Though it is not expected, it is shown for the African countries. This is in line with the work of Mallik and Chowdhury (2001). DFRX, contrary to DINFLATN has a negative influence on DMKT_CAP2GDP. In summary, GGDP and macroeconomic environment are very significant in the development of the stock market, including other related indicators. They are very relevant, thus cannot be ignored, though they have varying influences on stock market development through DMKT_CAP2GDP.

ASIA & AUSTRALIA

Results of Model One (1)

Model one (1) is designed as economic growth on stock market development. For the processes of undertaking this research, all the variables were tested for unit root at all stages: level & individual intercept, level & individual intercept and trend, first difference & individual intercept, and first difference & individual intercept and trend. Series with p-values less than 5%, thus have no unit root (are stationary). Results are reported in Table 47AA1 and 48AA2 below using Augmented Dickey-Fuller (ADF) and the Philips and Peron (PP) unit root tests respectively for the relevant variables:

Table 47AA1: ADF Unit Root Test Results - Asia and Australia (Model One)

	Individual Intercept		Intercept and Trend		Individual Intercept		Intercept and Trend	
	Stats	**Prob**	**Sats**	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**
GDSVNGS_2GDP	7.36755	0.6903	2.40611	0.9922	27.5620	0.0021	23.1390	0.0102
BREEIS_IDX	6.16058	0.8016	6.80254	0.7439	49.7908	0.0000	36.3006	0.0001
DM_CRD__PRV_2GDP	3.06545	0.9798	4.49201	0.9224	26.6745	0.0029	17.6093	0.0619
FDI_2GDP	21.6388	0.0171	23.1924	0.0101	63.6308	0.0000	47.6380	0.0000
FRX	10.9208	0.3637	6.26071	0.7929	36.8899	0.0001	27.8691	0.0019
GGDP	32.4007	0.0003	20.2854	0.0267	77.3275	0.0000	59.4152	0.0000
INFLATN	26.1667	0.0035	14.7749	0.1405	55.8579	0.0000	45.8420	0.0000
LGDP_P_CPT	1.92648	0.9969	7.90440	0.6382	30.5683	0.0007	19.5776	0.0335
LLISTED_COYS	9.70959	0.4663	12.4288	0.2574	33.7182	0.0002	24.3626	0.0067
M2_GDP	10.8085	0.3726	43.8413	0.0000	33.9575	0.0002	11.1403	0.3467
MKT_CAP2GDP	10.6721	0.3836	83.0722	0.0000	69.8407	0.0000	17.8452	0.0576
STK_TRD_TRN	12.7472	0.2381	69.0696	0.0000	57.5014	0.0000	16.7236	0.0807
STK_TRD_VAL__GDP	14.7767	0.1404	85.0816	0.0000	66.0140	0.0000	47.5452	0.0000
TX2GDP	47.5452	0.0000	34.3016	0.0002	73.5194	0.0000	52.0971	0.0000

Source: (Mensah, 2020). **ADF** Unit root tests for the variables in levels.

Table 48AA2: PP Unit Root Test Results - Asia & Australia (Model One)

VARIABLES	LEVEL				1ST DIFFERENCE			
	Individual Intercept		Intercept and Trend		Individual Intercept		Intercept and Trend	
	Stats	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**
GDSVNGS_2GDP	6.61940	0.7608	1.30243	0.9994	49.2517	0.0000	47.1006	0.0000
BREEIS_IDX	16.4229	0.0881	19.4460	0.0349	133.229	0.0000	36.3006	0.0001
DM_CRD__PRV_2GDP	2.1350	0.9952	4.49201	0.9224	41.7940	0.0000	26.9282	0.0027
FDI_2GDP	30.0091	0.0009	48.9460	0.0000	320.129	0.0000	313.040	0.0000
FRX	10.6753	0.3834	21.2103	0.0197	92.1917	0.0000	90.3016	0.0000
GGDP	50.7403	0.0000	35.7830	0.0001	221.273	0.0000	208.236	0.0000
INFLATN	8.56262	0.1405	92.4580	0.0000	45.8420	0.0000	323.134	0.0000
LGDP_P_CPT	2.17874	0.9948	4.15283	0.9402	46.1613	0.0000	33.1059	0.0003
LLISTED_COYS	36.2132	0.0001	28.7171	0.0014	57.8045	0.0000	35.8084	0.0001
M2_GDP	1.57287	0.9987	11.3031	0.3344	102.748	0.0000	86.8689	0.0000
MKT_CAP2GDP	17.7843	0.0587	24.4452	0.0065	228.016	0.0000	563.696	0.0000
STK_TRD_TRN	31.4496	0.0005	27.5452	0.0021	348.201	0.0000	669.842	0.0000
STK_TRD_VAL__GDP	15.2118	0.1245	14.5419	0.1497	88.3413	0.0000	87.8130	0.0000
TX2GDP	14.4842	0.1520	13.8303	0.1809	82.2969	0.0000	70.4723	0.0000

Source: (Mensah, 2020). **PP Unit** root tests for the variables in levels

In Tables 47AA1 and 48AA2, results indicate that all the variables did not have unit root in them, thus are stationary at first difference & individual intercept. The p-values are less than 5%. The symbols for the variables were charged after first differencing them to be stationary, thus DGDSVNGS_2GDP, DBREEIS_IDX, DDM_CRD__PRV_2GDP, DFDI_2GDP, DFRX DINFLATN, DLGDP_P_CPT, DLLISTED_COYS, DM2_GDP, DMKT_CAP2GDP DSTK_TRD_TRN, DSTK_TRD_VAL__GDP and DTX2GDP.

The variables were tested for correlation to check for the degree of correlation among them**.** As indicated in Table 49AA3, DLGDP_P_CPT and DFRX are correlated at 60%; thus DLGDP_P_CPT was dropped for the next levels of tests.

Table 49AA3: Correlation Test - Asia & Australia (Model One)

NAME OF SERIES	D__GDSVNGS_2GDP	DBREEIS_IDX	DDM_CRD__PRV_2GDP	DFDI_2GDP	DFRX	DINFLATN	DLGDP_P_CPT	DLLISTED_COYS	DM2_GDP	DMKT_CAP2GDP	DSTK_TRD_TRN	DSTK_TRD_VL	DTXGDP
D__GDSVNGS_2GDP	1.000	-0.033	-0.230	0.095	0.074	0.118	0.185	-0.144	-0.226	0.076	-0.081	0.074	-0.084
DBREEIS_IDX	-0.033	1.000	-0.117	0.058	-0.065	0.166	0.071	0.013	-0.242	-0.132	-0.028	-0.017	0.073
DDM_CRD__PRV_2GDP	-0.230	-0.117	1.000	0.038	0.139	-0.074	-0.145	0.011	0.380	-0.011	0.043	-0.007	-0.049
DFDI_2GDP	0.095	0.058	0.038	1.000	0.003	0.087	0.021	0.009	0.024	0.013	0.066	0.364	0.234
DFRX	0.074	-0.065	0.139	0.003	1.000	0.142	-0.607	-0.063	0.214	-0.003	-0.277	-0.029	-0.136
DINFLATN	0.118	0.166	-0.074	0.087	0.142	1.000	-0.006	-0.056	-0.250	-0.010	-0.014	0.101	0.182
DLGDP_P_CPT	0.185	0.071	-0.145	0.021	-0.607	-0.006	1.000	0.273	-0.284	-0.068	0.264	0.059	0.149
DLLISTED_COYS	-0.144	0.013	0.011	0.009	-0.063	-0.056	0.273	1.000	0.035	-0.048	0.145	-0.001	0.042
DM2_GDP	-0.226	-0.242	0.380	0.024	0.214	-0.250	-0.284	0.035	1.000	0.339	-0.143	0.133	-0.160
DMKT_CAP2GDP	0.076	-0.132	-0.011	0.013	-0.003	-0.010	-0.068	-0.048	0.339	1.000	-0.138	0.474	-0.123
DSTK_TRD_TRN	-0.081	-0.028	0.043	0.066	-0.277	-0.014	0.264	0.145	-0.143	-0.138	1.000	0.307	0.082
DSTK_TRD_VL	0.074	-0.017	-0.007	0.364	-0.029	0.101	0.059	-0.001	0.133	0.474	0.307	1.000	0.097
DTXGDP	-0.084	0.073	-0.049	0.234	-0.136	0.182	0.149	0.042	-0.160	-0.123	0.082	0.097	1.000

Source: (Mensah, 2020). Benchmark: values>50%, means highly correlated. GDP per capita /exchange rate =60%

Cointegration test was undertaken in order to ascertain if the series are cointegrated and have a long-run association. The results are captured in Table 50AA4 below.

Hypotheses set for the cointegration test are as below:

Null hypothesis= Series are not cointegrated

Alternative hypothesis = series are cointegrated

Table 50AA4: Cointegration Test Results - Asia & Australia

ADF	T-Statistics	Prob
	-2.607870	0.0046
RESIDUAL		
HAC VARIANCE		

Source: (Mensah, 2020). Kao Residual Cointegration Test
Note: Decision: p values less than %5, that is (P< 5%), then the null hypothesis will be rejected.

The decision rule is that if the results indicate a p-value less than 5%, the null hypothesis will be rejected. In the test above, the p-value is less than 5%, thus, indicated a value of 0.0046, therefore, the null hypothesis is rejected and the alternative hypothesis accepted.

Following the above tests, the variables were run for a regression test, and results are captured in Table F5 below. D__GDSVNGS_2GDP and DLLISTED_COYS have coefficients of 0.0167 and 0.1918; additionally, they are significant. In another vein, DFRX has a negative coefficient of -0.0008 but also significant. Though DM2_GDP, DBREEIS_IDX and GGDP(-1) have positive coefficients, they are not significant. Lastly, DMKT_CAP2GDP and DMKT_CAP2GDP(-1) have respective coefficients of same values -0.0001 and -0.0001, interestingly, none of them is significant. The R-squared value is 0.680431, implying that 68 % account for the variations in the dependent variable (GGDP). F-statistic has a coefficient of 5.873699 and a P–value of less than 5%, implying that all the explainable variables jointly influence the dependent variable (GGDP); thus, the regression model is good.

Table 51AA5: Regression Results - Asia & Australia (Model One)

Regressor	Coefficient	Standard error	T-statistics	P-value
C	0.065721	0.011028	5.959306	0.0000
DMKT_CAP2GDP	-7.43E-05	9.51E-05	-0.781558	0.4368
D__GDSVNGS_2GDP	0.016728	0.005824	2.872367	0.0052
DFRX	-0.000784	0.000126	-6.204797	0.0000
DLLISTED_COYS	0.191770	0.089692	2.138082	0.0356
DM2_GDP	2.60E-05	0.001151	0.022630	0.9820
DBREEIS_IDX	0.036638	0.087688	0.417824	0.6772
GGDP(-1)	0.133844	0.094141	1.421742	0.1590
DMKT_CAP2GDP(-1)	-0.000126	8.90E-05	-1.411016	0.1621

R-squared	0.680431	Mean dependent var	0.083022
Adjusted R-squared	0.564587	S.D. dependent var	0.104614
S.E. of regression	0.069030	Akaike info criterion	-2.281537
Sum squared resid	0.381216	Schwarz criterion	-1.545042
Log likelihood	155.4845	Hannan-Quinn criter.	-1.982811
F-statistic	5.873699	Durbin-Watson stat	1.688049
Prob(F-statistic)	0.000000		

Source: (Mensah, 2020). **Dependent variable:** GGDP. Source: Data Output via Eviews9.5**- Method:** Panel Least Square Method (Fixed Effect Model) **regression.**

As a procedure for selecting an appropriate model for running the regression test, the Hausman test was performed. As indicated in Table 52AA6 below, the fixed effect model was more appropriate for the regression, and accordingly accepted, because the p-value is less than 5%; thus, the random-effect model is not appropriate.

Table 52AA6: Correlated Random Effects (Hausman Test) - Asia & Australia

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
Period random	26.170264	8	0.0010

Source: (Mensah, 2020). Note: Null Hypothesis= random effect (p >5%). Alternative hypothesis = Fixed effect model (p<5%)

Discussion of the Result of Model One (1)

Economic growth on stock market development of sampled countries in Asia & Australia has been tested and analyzed. It is established from the results that stock market development does not have effect on economic growth (negligible effect) on Asia &Australia. This is in line with the hypothesis (1a) which is H_0- Null hypothesis: There is no relationship (negligible) between economic growth and stock market development in the sampled countries; this is confirmed by the works of Oya & Domar (2006), Charif, (2001), Haque (2013), Ake & Ognaligui (2010) and Saba & Ghulam (2017. From the results, D__GDSVNGS_2GDP, as one of the banking sector development indicators, has a direct influence on GGDP, and it is significant. As gross domestic savings go up, GGDP increases as well. One of the stock market indicators, DLLISTED_COYS, has a positive influence on GGDP, and it is significant. Thus, when more companies are listed on the stock exchanges, that is enough justification that more capital will be mobilsed on the exchanges for long term projects, which will enhance economic growth. Contrary to the first- two indicators, if DFRX depreciates, it inversely influences GGDP. DBREEIS_IDX and GGDP(-1) have direct influences on GGDP, but they are not significant.

The competitiveness of countries by ranking in thematic areas of economic development do have strong impact on GGDP. However, in the case of Asia & Australia, DBREEIS_IDX though has a positive influence on GGDP, it is insignificant. In this same vein, DFRX's influence is significant, though, negative. This is out of line with the findings of Aghion *et al.* (2006). They investigate the changes in exchange rates and productivity growth in line with the role of financial development. They reveal that changes in exchange rates may play a significant role and influence on productivity growth in the long-term. DMKT_CAP2GDP for the current period and its preceding period have inverse impacts on GGDP; likewise, they are not significant. This is reverse to most studies typically to the work of Levine, 1998. In most studies, just like this research, the dependent variable or component of stock market development is set as DMKT_CAP2GDP. The study, however, states that apart from DMKT_CAP2GDP, any stock market development indicator could be used as a dependent variable or the key representation of the stock market development, provided it is feasible.

Surprisingly, DLLISTED_COYS of the panel data of the selected countries of Asia and Australia have a direct and positive impact on GDP growth. This could also be a good indicator which economic growth could depend on.

Results of Model Two (2)

Model two is designed as Stock market development on GDP growth. In model two, correlation test was carried out in-exception of market capitalization ratio because it assumed the role of the dependent variable. As indicated in the earlier text, the correlation test was necessary to check for the degree of correlation between the variables. DM2_GDP and DLGDP_P_CPT were dropped due to their degree of correlation, in order to avoid the presence of multicollinearity in the model. Results are captured in Table 53AA7.

Table 53AA7: Correlation Test/Analysis - Asia & Australia (Model Two)

	D__GDSVNGS_2GDP	DBREEIS_IDX	DFDI_2GDP	DFRX	DLLISTED_COYS	DM2_GDP	DDM_CRD__PRV_2GDP	DINFLATN	DLGDP_P_CPT	DSTK_TRD_TRN	DSTK_TRD_VL	DTXGDP	GGDP
D__GDSVNGS_2GDP	1.0000	-0.0327	0.0948	0.0743	-0.1439	-0.2256	-0.2298	0.1181	0.1852	-0.0805	0.0738	-0.0842	0.2011
DBREEIS_IDX	-0.0327	1.0000	0.0581	-0.0653	0.0128	-0.2424	-0.1166	0.1656	0.0710	-0.0278	-0.0170	0.0728	0.0695
DFDI_2GDP	0.0948	0.0581	1.0000	0.0025	0.0088	0.0240	0.0382	0.0868	0.0210	0.0664	0.3641	0.2340	0.0228
DFRX	0.0743	-0.0653	0.0025	1.0000	-0.0625	0.2144	0.1385	0.1421	-0.6066	-0.2770	-0.0295	-0.1357	-0.5577
DLLISTED_CO	-0.1439	0.0128	0.0088	-0.0625	1.0000	0.0354	0.0106	-0.0557	0.2729	0.1454	-0.0005	0.0424	0.2737
DM2_GDP	-0.2256	-0.2424	0.0240	0.2144	0.0354	1.0000	0.3804	-0.2498	-0.2839	-0.1431	0.1335	-0.1598	-0.3021
DDM_CRD__	-0.2298	-0.1166	0.0382	0.1385	0.0106	0.3804	1.0000	-0.0737	-0.1451	0.0430	-0.0069	-0.0492	-0.1545
DINFLATN	0.1181	0.1656	0.0868	0.1421	-0.0557	-0.2498	-0.0737	1.0000	-0.0056	-0.0139	0.1014	0.1821	-0.0001
DLGDP_P_CP	0.1852	0.0710	0.0210	-0.6066	0.2729	-0.2839	-0.1451	-0.0056	1.0000	0.2639	0.0586	0.1495	0.9935
DSTK_TRD_T	-0.0805	-0.0278	0.0664	-0.2770	0.1454	-0.1431	0.0430	-0.0139	0.2639	1.0000	0.3068	0.0824	0.2364
DSTK_TRD_VL	0.0738	-0.0170	0.3641	-0.0295	-0.0005	0.1335	-0.0069	0.1014	0.0586	0.3068	1.0000	0.0971	0.0583
DTXGDP	-0.0842	0.0728	0.2340	-0.1357	0.0424	-0.1598	-0.0492	0.1821	0.1495	0.0824	0.0971	1.0000	0.1486
GGDP	0.2011	0.0695	0.0228	-0.5577	0.2737	-0.3021	-0.1545	-0.0001	0.9935	0.2364	0.0583	0.1486	1.0000

Source: (Mensah, 2020). Correlation values.
Note: Benchmark: values>50%, means highly correlated. If values are more than 50%, they are dropped.

As indicated in the table, DLGDP_P_CPT and GGDP are correlated at 99%; likewise, GGDP/DFRX are correlated at 0.56%. Thus, DLGDP_P_CPT and DFRX were dropped for the next level of test to avoid multicollinearity.

Subsequently, the study carried out a cointegration test, and the results are captured table 54AA8 below. Hypotheses set for the cointegration test are below:

Null hypothesis= Series are not cointegrated

Alternative hypothesis = series are cointegrated

Decision: p-values less than %5, that is (P< 5%), is rejected.

Table 54AA8: Cointegration Test Results - Asia & Australia (Model Two)

	T-Statistics	Prob.
ADF	-1.782115	0.0374
RESIDUAL	3.798891	
HAC VARIANCE	0.487763	

Source: (Mensah, 2020). Kao Residual Cointegration Test

The null hypothesis is rejected because the results indicate a p-value of less than 5%; therefore the alternative hypothesis is accepted. The variables are cointegrated.

Regression Results

The study carried out a regression test using the ordinary least square method, as stated in the method of underrating this study. The results captured in Table 55AA9 show positive coefficient values for DSTK_TRD_VL and DM2_GDP of 0.655509 and 2.283566, respectively, and they are also significant. GDP (DMKT_CAP2GDP (-1) has a negative coefficient value of-0.52616; it is significant, in any case. On the other hand, D__GDSVNGS_2GDP, DBREEIS_IDX and GGDP have negative coefficients of -0.37955, -73.4727 and -116.418, all of them are insignificant. DFDI_2GDP has a coefficient of 0.179605; additionally, it is significant. DINFLATN, on the other hand, has a coefficient of 1.916829, but it is not significant. The R-squared value is 0.69187, implying that 69 % accounted for variations in the dependent variable DMKT_CAP2GDP. F-statistic has a coefficient of 6.19405and a P–value of less than 5%, implying that all the explainable variables jointly explained dependent variable (DMKT_CAP2GDP); thus, the regression model is good**.**

Table 55AA9: Regression Results - Asia & Australia (Model Two)

Regressor	Coefficient	Standard error	T-statistics	P-value
C	8.49165	11.26653	0.753706	0.4532
GGDP	-116.418	88.07075	-1.32187	0.1900
D__GDSVNGS_2GDP	-0.37955	5.437312	-0.06981	0.9445
DM2_GDP	2.283566	1.093746	2.087839	0.0400
DFDI_2GDP	0.179605	1.483122	0.121099	0.9039
DBREEIS_IDX	-73.4727	84.67968	-0.86765	0.3882
DSTK_TRD_VL	0.655509	0.111608	5.873296	0.0000
DINFLATN	1.916829	3.503493	0.547119	0.5858
DMKT_CAP2GDP(-1)	-0.52616	0.089573	-5.87403	0.0000
R-squared	0.69187	Mean dependent var	8.600811	
Adjusted R-squared	0.58017	S.D. dependent var	101.9094	
S.E. of regression	66.03167	Akaike info criterion	11.44515	
Sum squared resid	348814.50000	Schwarz criterion	12.18164	
Log likelihood	-599.48310	Hannan-Quinn criter.	11.74387	
F-statistic	6.19405	Durbin-Watson stat	2.279631	
Prob(F-statistic)	0.00000			

Source: (Mensah, 2020). **Dependent variable:** Market capitalization ratio. Source: Data Output via Eviews9.5- **Method:** Panel Least Square Method (Fixed Effect Model) **regression.**

As a procedure for selecting an appropriate model for running the regression test, Hausman test was performed. As indicated in Table 56AA10 below, the fixed-effect model is more appropriate for the regression, and accordingly accepted, because the p-value is less than 5; thus, the random effect model is not an appropriate model of regression for model two (2).

Table 56AA10: Correlated random effects - Asia & Australia (Model Two)

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f	Prob.
Period random	20.654910	8	0.0081

Source: (Mensah, 2020). Note: Null Hypothesis= random effect (p >5%). Alternative hypothesis = Fixed effect model (p<5%)

Discussion of the Results of Model Two (2)

Stock market development on economic growth of Asia & Australia has been tested and analysed. Following the outcome of the regression, it is well established that economic growth does not have an effect (negligible effect) on stock market development in Asia & Australia. The results are not significant. This is in line with the hypothesis (2a), which is N_0- Null hypothesis: There is no relationship (negligible effect between stock market development and economic growth in sampled countries. This confirms the findings of Owusu & Odhiambo (2014) and Owusu & Odhiambo (2015).

Subsequent to the outcome from the regression results, it is noted that DSTK_TRD_VL and DM2_GDP have direct and significant relationships with DMKT_CAP2GDP. When DSTK_TRD_VL goes up, it impacts directly on DMKT_CAP2GDP.

The banking sector development through DM2_GDP, which is the total broad money if it goes up, DMKT_CAP2GDP also increases. DMKT_CAP2GDP (-1), negatively influenced DMKT_CAP2GDP and also significant. This specifically refers to the period preceding the current period. DMKT_CAP2GDP has a transmission effect, which is a negative influence on the current period. DINFLATIN, the main macroeconomic indicator has no significant influence on DMKT_CAP2GDP, though, it has a positive influence. D__GDSVNGS_2GDP, DBREEIS_IDX and GGDP inversely affect DMKT_CAP2GDP, but interesting; however, they are not significant. DFDI_2GDP that is supposed to channel the flow of private funds to an economy, thus boosts investment has a positive influence on stock market development through DMKT_CAP2GDP but it is insignificant in the selected countries in Asia.

In summary, banking sector development is very significant in developing the stock markets through money supply. It can be seen that stock market activities are carried out through the banking sector, therefore even though investors might choose where to source financing for their projects, the two similarly complements each other. Also, when the stock traded value that gauges the market liquidity, thus measuring trading relative to economic activity (Levine and Zervos, 1998) increases, it influences market capitalization ratio as well for Asia and Australia.

TIME SERIES DATA RESULTS FOR FOUR (4) SELECTED COUNTRIES

UNITED STATES

Results of Model One (1)

Model one is structured as economic growth on the stock market development. The exchange rate (FRX) was dropped for the United States because the United States Dollar (USD) cannot be pegged against itself; hence thirteen variables were considered for a series of tests.

Unit Root Test

The individual unit root test for each of the series indicated that each is free from the unit root at ‘’first difference and at intercept’’, in exception of LGDP_P_CPT) and LLISTED_COYS at ‘’second difference’’. They were however dropped from the list of variables for the next test.

Table 57US1: Unit Root Test Results - United States of America (Model One)

Variables	Level				1st Difference			
	Individual Intercept		Intercept and Trend		Individual Intercept		Intercept and Trend	
	Stats	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**
GDSVNGS_2GDP	-3.029970	0.6185	-3.632896	0.0932	-3.029970	0.0010	-3.673616	0.0031
BREEIS_IDX	-2.998064	0.1281	-3.622033	0.2436	-3.004861	0.0000	-3.632896	0.0000
DM_CRD__PRV_2GDP	-3.004861	0.2811	-3.632896	0.5620	-3.004861	0.0524	-3.632896	0.1625
FDI_2GDP	-3.040391	0.0014	-3.690814	0.0090	-3.004861	0.0009	-3.632896	0.0054
FRX	-	-	-	-	-	-	-	-
GGDP	-3.004861	0.1198	-3.632896	0.1702	-3.012363	0.0011	-3.644963	0.0071
INFLATN	-3.004861	0.0438	-3.632896	0.1318	-3.012363	0.0025	-3.644963	0.0137
LGDP_P_CPT	-3.004861	0.5362	-3.632896	0.7067	-3.004861	0.0952	-3.632896	0.1731
LLISTED_COYS	-3.004861	0.5943	-3.632896	0.3602	-3.004861	0.1175	-3.632896	0.3300
M2_GDP	-2.998064	0.9016	-3.622033	0.2600	-3.004861	0.0008	-3.632896	0.0052
MKT_CAP2GDP	-2.998064	0.1424	-3.622033	0.3602	-3.004861	0.0014	-3.644963	0.0299
STK_TRD_TRN	2.998064	0.1514	-3.622033	0.4256	-3.004861	0.0001	-3.632896	0.0007
STK_TRD_VAL__GDP	-2.998064	0.2655	-3.632896	0.2751	-3.004861	0.0053	-3.632896	0.0196
TX2GDP	-3.004861	0.0527	-3.632896	0.0719	-3.004861	0.0384	-3.632896	0.1401

Source: (Mensah, 2020). **ADF** Unit root tests for the variables in levels at 5% significance. Generated through Eviews9.5. Notes: * and ** denote stationary and non-stationary respectively.

The variables became stationary at first differences; thus for simplicity for this study, their symbols were changed to read as; DGDSVNGS_2GDP, DBREEIS_IDX, DFDI_2GDP, DINFLATN, DM2_GDP DMKT_CAP2GDP, DSTK_TRD_TRN, DSTK_TRD_VL__GDP, DTX2GDP.

Table 58US2: Correlation Test - United States of America (Model One)

Series	DBREEIS_IDX	DDM_CRD__PRV_2GDP	DINFLATN	DM2_GDP	DMKT_CAP2GDP	DSTK_TRD_VOL	D__GDSVNGS_2GDP	DFDI_2GDP	DSTK_TRD_TRN	DTX2GDP
DBREEIS_IDX	1.0000	0.0023	-0.1169	0.1840	0.3199	-0.0635	0.1081	0.0745	-0.4347	-0.0454
DDM_CRD__PRV_2GDP	0.0023	1.0000	0.3463	-0.2085	-0.1817	0.4948	0.1460	0.3321	0.5062	0.4521
DINFLATN	-0.1169	0.3463	1.0000	-0.4351	0.1152	0.4184	0.1950	0.1990	0.2129	0.5917
DM2_GDP	0.1840	-0.2085	-0.4351	1.0000	-0.1727	-0.0425	-0.5328	-0.3374	0.0585	-0.4420
DMKT_CAP2GDP	0.3199	-0.1817	0.1152	-0.1727	1.0000	-0.0702	0.5400	0.1699	-0.6730	0.2661
DSTK_TRD_VOL	-0.0635	0.4948	0.4184	-0.0425	-0.0702	1.0000	0.1375	0.6093	0.6962	0.6212
D__GDSVNGS_2GDP	0.1081	0.1460	0.1950	-0.5328	0.5400	0.1375	1.0000	0.4058	-0.1599	0.6913
DFDI_2GDP	0.0745	0.3321	0.1990	-0.3374	0.1699	0.6093	0.4058	1.0000	0.3423	0.5422
DSTK_TRD_TRN	-0.4347	0.5062	0.2129	0.0585	-0.6730	0.6962	-0.1599	0.3423	1.0000	0.3177
DTX2GDP	-0.0454	0.4521	0.5917	-0.4420	0.2661	0.6212	0.6913	0.5422	0.3177	1.0000

Source: (Mensah, 2020). ADF Unit root tests for the variables in levels at 5% significance. Data generated through Eviews9.5. Notes: * and ** denote stationary and non-stationary respectively.

The research continued with the correlation test, and results are captured in Table 58US2 above. Series DFDI_2GDP, DSTK_TRD_TRN, DGDSVNGS_2GDP and DTX2GDP were dropped due to high correlation pairing values with others.

Cointegration Test

Cointegration test was done, and the results are in Table 59US3. From the results, and making hypothetical reference to the hypotheses set below:

H_0= Series are not cointegrated

H1= Series are cointegrated

Table 59US3A: Cointegration Test: Unrestricted Cointegration Rank Test (Trace) - United States of America (Model One)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.990772	183.4036	95.75366	0.0000
At most 1 *	0.889096	89.69370	69.81889	0.0006
At most 2	0.645076	45.71181	47.85613	0.0784
At most 3	0.551358	24.99479	29.79707	0.1616
At most 4	0.334265	8.964214	15.49471	0.3687
At most 5	0.040504	0.826943	3.841466	0.3632

Source: (Mensah, 2020). Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 60US3B: Unrestricted Cointegration Rank Test (Maximum Eigenvalue) - United States of America (Model One)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.990772	93.70990	40.07757	0.0000
At most 1 *	0.889096	43.98189	33.87687	0.0023
At most 2	0.645076	20.71702	27.58434	0.2937
At most 3	0.551358	16.03058	21.13162	0.2231
At most 4	0.334265	8.137272	14.26460	0.3649
At most 5	0.040504	0.826943	3.841466	0.3632

Source: (Mensah, 2020). Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The null hypothesis is rejected, and the alternative hypothesis is accepted. All the variables are cointegrated and have a long-run association (i.e. the P-values are all less than 5%).

Regression Test/Results (for model 1)

In carrying out the regression, the hypotheses were stated, and consequently, tests were undertaken.

Null hypothesis H_0: β1= β2= β3= β4= β5= β6=0

Alternative hypothesis H_1: ≠ 0 (not all are simultaneously equal to 0)

- β1DMKT_CAP2GDP

- β2 DSTK_TRD_VL
- β3 DM2_GDP
- β4 DBREEIS_IDX
- β5DINFLATN
- β6GGDP(-1)

Table 61US4: Regression Results - United States of America (Model One)

Variable (Regressors)	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006523	0.002252	2.896939	0.0117
DMKT_CAP2GDP	0.000128	9.95E-05	1.286477	0.2191
DSTK_TRD_VL	8.95E-05	4.34E-05	2.063945	0.0581
DM2_GDP	-0.005956	0.000984	-6.053908	0.0000
DBREEIS_IDX	-0.020033	0.025349	-0.790296	0.4425
DINFLATN	0.005313	0.005637	0.942601	0.3619
DGGDP(-1)	-0.150202	0.133980	-1.121076	0.2811
R-squared	0.883439	Mean dependent var	-0.000991	
Adjusted R-squared	0.833485	S.D. dependent var	0.019878	
S.E. of regression	0.008111	Akaike info criterion	-6.529894	
Sum squared resid	0.000921	Schwarz criterion	-6.181720	
Log likelihood	75.56389	Hannan-Quinn criter.	-6.454332	
F-statistic	17.68487	Durbin-Watson stat	1.529674	
Prob(F-statistic)	0.000008			

Source: (Mensah, 2020). Dependent Variable: DGGDP. Source: Data Output via Eviews9.5
Method: Least Squares (NLS and ARMA) regression.

As indicated in Table US4 above, DM2_GDP has a negative coefficient of -0.005956; additionally, statistically significant. This implied that DM2_GDP negatively influenced GGDP in the United States of the period under investigation. Two of the main components of the stock market development- DMKT_CAP2GDP and DSTK_TRD_VL have positive coefficients 0.000128 and 8.95E-05, respectively. Though positive, they are very minimal and insignificant.

DINFLATN has a positive coefficient of 0.005313; DBREEIS_IDX has a negative coefficient of -0.020033 and DGGDP (-1) also has a negative coefficient of -0.150202. These variables are all not statistically significant.

The coefficient of determination, that is, R squared is 0.883439. This indicates that 88.34% of the independent variables accounted for variations in the dependent variable, whereas 11.66% accounted for unobserved factors. F-Statistic is 14.39604, and has a p-value of 0.000008 ($P < 5\%$), indicating that all the independent variables jointly explained or influenced GGDP.

The research employed a couple of robust tests to ensure that the research models are appropriate. In an orderly sequence, the serial correlation test was undertaken to find out if the series are free from serial correlation. The hypotheses set for the test, and the results are below:

H_0: No serial correlation

H1: There is a serial correlation

The results in Table 62US5 show that there is no serial correlation. The p-value is more than 5% (p>5%); therefore, the model is good. The null hypothesis cannot be rejected, because the p-value of the observed R-squared is 0.0749, 7.49% more than 5%.

Table 62US5: Serial Correlation Test - United States of America (Model One)

F-statistic	0.582585	Prob. F (2,10)	0.5735
Obs*R-squared	1.858583	Prob. Chi-Square (2)	0.3948

Source: (Mensah, 2020). **Method:** Breusch-Godfrey Serial Correlation LM Test

Table 63US6: Heteroskedasticity Test - United States of America (Model One)

F-statistic	0.859031	Prob. F(8,12)	0.5473
Obs*R-squared	5.650877	Prob. Chi-Square(8)	0.4634
Scaled explained SS	1.891597	Prob. Chi-Square(8)	0.9294

Source: (Mensah, 2020). **Method**: Heteroskedasticity Test- Breusch-Pagan-Godfrey

The study carried out a heteroscedasticity test, and results are captured in Table 63US6 above. The hypotheses set for the test, and results obtained are below:

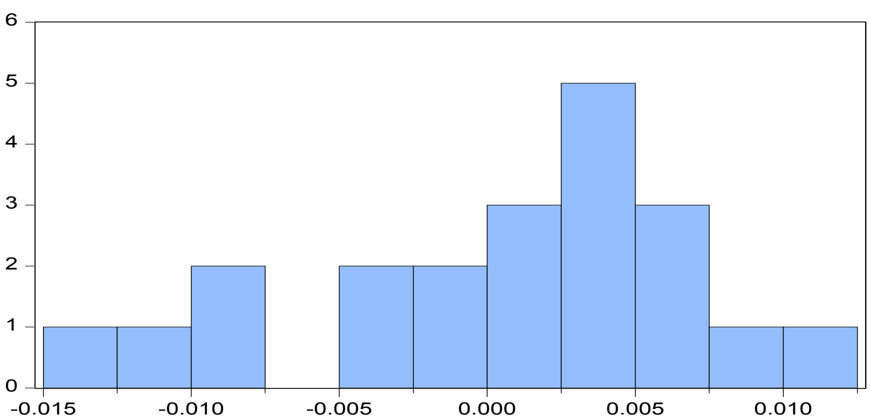
Null hypothesis H_0: Residuals (u) homoscedastic

Alternative H_1: Residuals (u) heteroscedastic

The results indicate a p-value of more than 5% (P>5%) of the observed R-squared, thus a p-value of 0.4634 (46.34 %), residuals have constant variance which is desirable, implying that residuals are homoscedastic. The null hypothesis cannot be rejected.

The research further carried out normality test to ascertain the appropriateness of the model; consequently, a p-value obtained is more than 5% (p> 5%), thus 61.29% with a Jacque-Bera value of 0.9789944.

Figure 45US1: Normality Test – United States of America (Model One)



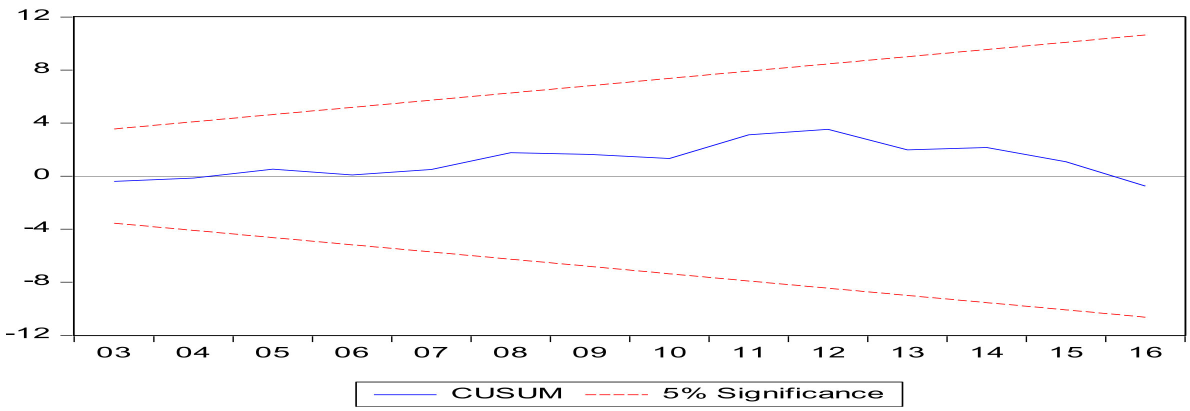
Series: Residuals	
Sample 1996 2016	
Observations 21	
Mean	-2.15e-18
Median	0.002184
Maximum	0.012229
Minimum	-0.014316
Std. Dev.	0.006786
Skewness	-0.467734
Kurtosis	2.506348
Jarque-Bera	0.978944
Probability	0.612950

Source: (Mensah, 2020). Normality Test. Generated by Eviews9.5

As can be seen in the figure above, residuals follow a normal distribution.

Finally, the stability test was carried out. In the figure US3 below, the results indicate that the dependent variable, which is the GGDP is within the allowable space between the two dotted lines, (at 5% level of significance) as stated by the rule of thumb. The model is, therefore, stable.

Figure 46US1: Cumulative Sum of Recursive Estimates – United States of America (Model One)



Source: (Mensah, 2020). Stability Test: Generated through Eviews9.5

Alternatively, another regression method (Robust Least Squares Method) was used for model one to compare the authenticity of results (indicated in Table 64US7).

Table 64US7: Regression Test - United States of America (Model One)

Variable (Regressors)	Coefficient	Std. Error	t-Statistic	Prob.
C	0.00563	0.00210	2.68165	0.00730
DMKT_CAP2GDP	0.00019	0.00009	1.99716	0.04580
DSTK_TRD_VL	0.00011	0.00004	2.81481	0.00490
DM2_GDP	-0.00624	0.00092	-6.79964	0.00000
DBREEIS_IDX	-0.01350	0.02364	-0.57132	0.56780
DINFLATN	0.00339	0.00526	0.64547	0.51860
GGDP(-1)	-0.33717	0.12493	-2.69893	0.00700
Robust Statistics				
R-squared	0.586235	Adjusted R-squared	0.40891	
Rw-squared	0.951045	Adjust Rw-squared	0.95105	
Akaike info criterion	41.5785	Schwarz criterion	50.83854	
Deviance	0.000635	Scale	0.00464	
Rn-squared statistic	140.3536	Prob(Rn-squared stat.)	0.00000	

Source: (Mensah, 2020). Dependent Variable: GGDP. Source: Data Output via Eviews9.5.
Method: Robust least square method

The robust least square method was applied, and the results show DMKT_CAP2GDP of a coefficient of 0.00019 and DSTK_TRD_VL of a coefficient of 0.00011 – both are statistically significant. DM2_GDP has a negative coefficient of -0.00624, additionally, statistically significant. This implies that a percentage increase in DM2_GDP affects the United States' GGDP by -0.00624. DBREEIS_IDX has a coefficient of -0.01350 but insignificant. DINFLATN has a coefficient of 0.00339 and DGGDP (-1) also has a coefficient of -0.33717, but all are not significant. The R-Square is 0.586235, implying that 58.6% accounted for variations in GGDP, and Prob. (Rn-squared stat.) is 0.00000 ($p<5\%$). The model is fit using the two methods of regression.

Discussion of the Results of Model one (1)

Economic growth on stock market development of the United States has been tested and analyzed. From the first regression and what has been adopted for the study, the results proclaim that stock market development does not have an effect on economic growth (negligible effect). This is in line with the hypothesis (1a) which is H_0- Null hypothesis: There is no relationship (negligible) between economic growth and stock market development in the sampled countries; and confirmed by the works of Oya & Domar (2006), Charif, (2001), Haque (2013), Ake & Ognaligui (2010) and Saba & Ghulam (2017.

The stock market development indicators DMKT_CAP2GDP and DSTK_TRD_VL though have positive influences on GGDP; their influences are minimal and insignificant. These results partly contrast the findings of Masoud and Hardaker (2012), which establish a positive and significant relationship between stock market development and economic growth.
DM2_GDP has a negative influence on GGDP. This implies that an increase in DM2_GDP affects the growth of the United States GGDP of the period under review. This can be aligned to economic theory that an increase in DM2_GDP will boost the economy in the short term, but in the long term, it will lead to inflation. This result invalidates the findings of Ogunmuyiwa (2010). He finds a positive and significant relationship between money supply and economic

growth. DINFLATN's positive influence on GGDP, together with stock market development indicators is reverse to Mishkin's (2001) assertion. Mishkin relates that high rates of inflation increase the cost of living and shift resources from stock market instruments. The positive influence is attributed to the work of Mallik and Chowdhury (2001),

DBREEIS_IDX influenced economic growth negatively in the United States, which is not expected. DBREEIS_IDX in developed countries are key determinants of growth; however, in the case of the United States for the period under review, it was adversarial. This could be attributed to the role institutions played (relaxed) in their duties, leading to the financial crises.

Results of Model Two (2)

Model two is designed as Stock Market Development on economic growth. An initial unit root test was conducted, and series that were not stationary were drooped and used for the model one earlier. Model two was streamlined by changing the dependent variable to market capitalization ratio. In the sequence of tests for the research, the correlation test was undertaken on the series, and highly correlated pairs of series dropped (results captured in Table 65US8).

Table 65US8: Correlation Test/Analysis - United States of America (Model Two)

Series	DBREEIS_IDX	DDM_CRD__PRV_2GDP	DINFLATN	DM2_GDP	DSTK_TRD_VOL	DGGDP	D__GDSVNGS_2GDP	DSTK_TRD_TRN	DTX2GDP	DFDI_2GDP
DBREEIS_IDX	1.0000	0.0021	-0.1180	0.1969	-0.0639	-0.2631	0.1122	-0.4347	-0.0449	0.0742
DDM_CRD__PRV_2GDP	0.0021	1.0000	0.3451	-0.2405	0.4942	0.1418	0.1562	0.5070	0.4557	0.3309
DINFLATN	-0.1180	0.3451	1.0000	-0.5104	0.4170	0.5592	0.2181	0.2148	0.6011	0.1952
DM2_GDP	0.1969	-0.2405	-0.5104	1.0000	-0.0620	-0.8809	-0.5009	0.0695	-0.4519	-0.3925
DSTK_TRD_VOL	-0.0639	0.4942	0.4170	-0.0620	1.0000	0.2636	0.1487	0.6973	0.6258	0.6085
DGGDP	-0.2631	0.1418	0.5592	-0.8809	0.2636	1.0000	0.5113	0.0550	0.4794	0.4835
D__GDSVNGS_2GDP	0.1122	0.1562	0.2181	-0.5009	0.1487	0.5113	1.0000	-0.1665	0.6937	0.4284
DSTK_TRD_TRN	-0.4347	0.5070	0.2148	0.0695	0.6973	0.0550	-0.1665	1.0000	0.3175	0.3437
DTX2GDP	-0.0449	0.4557	0.6011	-0.4519	0.6258	0.4794	0.6937	0.3175	1.0000	0.5486
DFDI_2GDP	0.0742	0.3309	0.1952	-0.3925	0.6085	0.4835	0.4284	0.3437	0.5486	1.0000

Source: (Mensah, 2020). Generated through Eviews9.5

The correlation results indicated high correlation values for pairings of DM2_GDP /GGDP, DINFLATN/DTX2GDP, DSTK_TRD_VOL/DSTK_TRD_TRN, DFDI_2GDP/DSTK_TRD_VOL. They were all, however, dropped.

Going forward, GGDP, DDM_CRD_PRV_2GDP, DSTK_TRD_TRN, DFDI_2GDP and DBREEIS_IDX are used for the rest of the tests.

The variables were tested for cointegration and the results are captured in Table 66US9 below.

Table 66US9A: Unrestricted Cointegration Rank Test (Trace) - United States of America (Model Two)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.971158	141.5875	95.75366	0.0000
At most 1	0.755074	67.12290	69.81889	0.0805
At most 2	0.624896	37.58011	47.85613	0.3207
At most 3	0.382957	16.98850	29.79707	0.6409
At most 4	0.220690	6.849345	15.49471	0.5952
At most 5	0.073937	1.613062	3.841466	0.2041

Source: (Mensah, 2020)
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Trend assumption: Linear deterministic trend
Lags interval (in first differences): 1 to 1

Table 67US9B: Cointegration Test - Unrestricted Cointegration Rank Test (Maximum Eigenvalue) - United States of America (Model Two)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.971158	74.46464	40.07757	0.0000
At most 1	0.755074	29.54280	33.87687	0.1510
At most 2	0.624896	20.59161	27.58434	0.3016
At most 3	0.382957	10.13915	21.13162	0.7315
At most 4	0.220690	5.236283	14.26460	0.7118
At most 5	0.073937	1.613062	3.841466	0.2041

Source: (Mensah, 2020). Data output via Eviews 9.5
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 68US10: Regression Results - United States of America (Model Two)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-12.06639	9.604521	-1.256324	0.2296
DBREEIS_IDX	-56.53922	43.03628	-1.313757	0.2100
GGDP	10.21957	323.4231	0.031598	0.9752
DINFLATN	4.768679	7.193393	0.662925	0.5181
DFDI_2GDP	11.93409	5.417839	2.20274	0.0449
DSTK_TRD_TRN	-0.348287	0.062464	-5.575769	0.0001
DMKT_CAP2GDP(-1)	0.219191	0.206881	1.059504	0.3073
GGDP(-1)	313.2117	242.0034	1.294245	0.2165
R-squared	0.770947	Mean dependent var		3.480268
Adjusted R-squared	0.65642	S.D. dependent var		20.65997
S.E. of regression	12.10998	Akaike info criterion		8.101225
Sum squared resid	2053.123	Schwarz criterion		8.497967
Log likelihood	-81.11347	Hannan-Quinn criter.		8.194685
F-statistic	6.731596	Durbin-Watson stat		2.07145
Prob(F-statistic)	0.001282			

Source: (Mensah, 2020). **Dependent Variable**: Market capitalization ratio. Source: Data Output via Eviews9.5. Method: Least Squares (NLS and ARMA) regression.

In this regression, the study lagged the dependent variable and GGDP. From Table 68US10, GGDP has a coefficient of 10.21957, DINFLATN has a coefficient of 4.768679, and DBREEIS_IDX has a negative coefficient of -56.53922. However, they are all not significant. Additionally, DMKT_CAP2GDP (-1) and GGDP (-1) have coefficients of 0.219191 and 313.2117, respectively, and yet not significant. In another vein, DFDI_2GDP has a positive coefficient of 11.93409, and statistically significant, also DSTK_TRD_TRN has a coefficient of -0.348287, likewise, statistically significant. The coefficient of determination (i.e. R-squared) is 0.770947, implies that 77% accounted for variations in the market capitalization ratio, while 23% accounted for unobserved The Regression's F-statistic is 6.731596 with the Prob (F-statistic) as 0.001282.

Table 69US11A: Unrestricted Cointegration Rank Test (Trace) - United States of America (Model Two)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.993074	191.0084	95.75366	0.0000
At most 1 *	0.840816	86.58649	69.81889	0.0013
At most 2 *	0.757121	47.99497	47.85613	0.0485
At most 3	0.463301	18.27592	29.79707	0.5457
At most 4	0.145372	5.207250	15.49471	0.7864
At most 5	0.086869	1.908392	3.841466	0.1671

Source: (Mensah, 2020). Data output via Eviews 9.5
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Trend assumption: Linear deterministic trend
Lags interval (in first differences): 1 to 1

Table 70US11B: Unrestricted Cointegration Rank Test (Maximum Eigenvalue) - United States of America (Model Two)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.993074	104.4219	40.07757	0.0000
At most 1 *	0.840816	38.59152	33.87687	0.0127
At most 2 *	0.757121	29.71905	27.58434	0.0262
At most 3	0.463301	13.06867	21.13162	0.4459
At most 4	0.145372	3.298857	14.26460	0.9249
At most 5	0.086869	1.908392	3.841466	0.1671

Source: (Mensah, 2020). Data output via Eviews 9.5
Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 71US12: Regression Results - United States of America (Model Two)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-23.7276	11.98624	-1.97957	0.0664
DBREEIS_IDX	-4.15938	38.73551	-0.10738	0.9159
DINFLATN	-2.77378	6.780612	-0.40908	0.6883
DDM_CRD__PRV_2GDP	-2.81437	2.471236	-1.13885	0.2726
GGDP	641.8437	283.5647	2.263482	0.0389
DMKT_CAP2GDP(-1)	0.177887	0.204673	0.869127	0.3985
DSTK_TRD_TRN	-0.25883	0.059106	-4.37902	0.0005

R-squared	0.715928	Mean dependent var	3.480268
Adjusted R-squared	0.602299	S.D. dependent var	20.65997
S.E. of regression	13.0289	Akaike info criterion	8.225589
Sum squared resid	2546.285	Schwarz criterion	8.572739
Log likelihood	-83.48148	Hannan-Quinn criter.	8.307367
F-statistic	6.300588	Durbin-Watson stat	1.787357
Prob(F-statistic)	0.001807		

Source: (Mensah, 2020). Dependent variable: DMKT_CAP2GDP(-1). Regression: Data output via Eviews 9.5

In this regression, the study controlled DFDI_2GDP and GGDP (-1). From Table 71US12 above, the results indicate negative coefficients for DBREEIS_IDX - 4.15938, DINFLATN -2.77378 and DDM_CRD__PRV_2GDP -2.81437. DMKT_CAP2GDP (-1) on the same level has a coefficient of 0.177887, yet, they are all not significant. GGDP has a coefficient of 641.8437, and it is significant. DSTK_TRD_TRN also has a coefficient of -0.25883, likewise significant. The R-squared is 0.715928, implying that 72% accounted for variations in the market capitalization ratio, while 28% accounted for unobserved factors. The Regression's F-statistic is 6.300588 with the Prob (F-statistic) as 0.001807.

Discussion of the Results of Model Two (2)

Stock market development on economic growth of the United States has been tested and analyzed. The results proclaim that stock market development has a positive influence on economic growth. This is in line with the hypothesis (2b) which is H_1- Alternative hypothesis:

There is a relationship (positive or negative) between stock market development and economic growth in the sampled country or countries). This is in line with the works of Ikikii & Nzomoi (2013), Rahman & Salahuddin (2010), Enisan & Olufisayo (2009) and Levine and Zervos (1998). Two regressions were considered in model two, controlling for certain variables upon initial regressions, thus indicating of not relevant values. Consequently, regression results in Table US12 was adopted. The results proclaim that DSTK_TRD_TRN has significantly influenced DMKT_CAP2GDP. This implies that equities traded on the stock market relative to GDP negatively impact DMKT_CAP2GDP. For the mere fact that the stock turnover ratio negatively influenced its own complementary component in developing the stock market was an indication of the status of disposing or acquiring stocks (thus, the level of liquidity on stock markets in the United States). DMKT_CAP2GDP (-1) negatively influenced DMKT_CAP2GDP, though not significant, this can be attributed probably to a spill-over effect.

The banking sector development, which is a conduit through which funds are channelled to domestic businesses has a negative influence on stock market development through DMKT_CAP2GDP, though not significant. The indication here is that a percentage increase in DDM_CRD__PRV_2GDP decreases DMKT_CAP2GDP. This implies that the banking sector is contradictory with the direction of the stock market in the United States during the period under review. DBREEIS_IDX surprisingly and negatively influenced stock market development, and probably, the institutions failed to detect wrongdoings such as the role of Enron leading to the market crisis during the period under investigation. The robust fitness confirmed the models; thus, the empirical detailing is satisfactory. DINFLATN, the main microeconomic indicator, influenced United States stock market development negatively, though not significant. This implies that a percentage increase in inflation affects market capitalization ratio negatively. This confirms the findings of Adebayo (2016), that there is a statistically insignificant and negative relationship between stock inflation and market capitalization. The variables also have long-run association.

UNITED KINGDOM

Results of Model One (1)

Model one is designed as GDP growth on stock market development (i.e. market capitalization ratio). The test procedures followed accordingly.

Unit Root Test

All the series were tested for individual unit roots at all stages- ‘‘level and first difference at both individual intercept/ individual intercept and trend’’ respectively. The results are captured in Table 72UK1. GDP per capita, domestic credit to private businesses, market capitalization ratio, money supply ratio and stock traded turnover ratio were dropped for the next level of the test due to the presence of unit-roots. The rest of the series are stationary at ‘‘first difference and individual intercept’’ (i.e. each has no unit root thus; the series have their p-values less than 5%.).

Table 72UK1: Unit Root Rest Results - United Kingdom (Model One)

VARIABLES	LEVEL				1^{ST} DIFFERENCE			
	INDIVIDUAL INTERCEPT		INTERCEPT AND TREND		INDIVIDUAL INTERCEPT		INTERCEPT AND TREND	
	Stats	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**
GDSVNGS_2GDP	-2.998064	0.6142	-3.622033	0.8530	-3.004861	0.0034*	-3.644963	0.0340
BREEIS_IDX	-2.998064	0.4557	-3.622033	0.7096	-3.004861	0.0046*	-3.658446	0.0135
DM_CRD__PRV_2GDP	-3.004861	0.2209	-3.632896	0.2041	-3.004861	0.4252**	-3.644963	0.3367
FDI_2GDP	-2.998064	0.0696	-3.622033	0.2221	-3.004861	0.0001*	-3.632896	0.0010
FRX	-3.020686	0.2397	-2.998064	0.5966	-3.004861	0.0919**	-3.632896	0.1832
GGDP	-3.012363	0.0249	-3.690814	0.0722	-3.020686	0.0003*	-3.658446	0.0025
INFLATN	-2.998064	0.0055	-3.690814	0.2187	-3.004861	0.0000*	-3.632896	0.0001
LGDP_P_CPT	-3.029970	0.5599	-3.690814	0.9929	-3.029970	0.1091**	-3.690814	0.0639
LLISTED_COYS	-2.998064	0.6991	-3.622033	0.8751	-3.004861	0.0039*	-3.632896	0.0027
M2_GDP	-3.004861	0.4070	-3.004861	0.1408	-3.632896	0.2652**	-3.004861	0.9881
MKT_CAP2GDP	-3.004861	0.9981	-3.622033	0.9988	-3.052169	0.8122**	-3.632896	0.1459
STK_TRD_TRN	-3.020686	0.9396	-3.622033	0.9982	-3.020686	0.8105**	-3.632896	0.2075
STK_TRD_VAL__GDP	-2.998064	0.2724	-3.622033	0.3885	-3.004861	0.0054*	-3.632896	0.0270
TX2GDP	-2.998064	0.0860	-3.622033	0.2407	-3.004861	0.0003*	-3.632896	0.0020

Source: (Mensah, 2020). ADF Unit root tests for the variables in levels at 5% significance. Data generated through Eviews9.5. Notes: * and ** denote stationary and non-stationary respectively.

Correlation Test

Correlation test was carried out to assess the degree of correlation of the variables. The standard set in this research is that any value more than 50% is termed ‘highly correlated’, thus one of the pairing variables has to be dropped. There is a likelihood that variables posing multicollinearity in the model might give false results, hence exchange rate and foreign direct investment were dropped. The results are captured in Table 73UK2 below.

Table 73UK2: Correlation Test/Analysis - United Kingdom (Model One)

Series	D__GDSVNGS_2GDP	DBREEIS_IDX	DFDI_2GDP	DFRX	DINFLATN	DLLISTED_COYS	DSTK_TRD_VAL__GDP	DTX2GDP
D__GDSVNGS_2G	1.0000	0.3049	0.1688	-0.4279	-0.0452	-0.0221	0.0724	0.3828
DBREEIS_IDX	0.3049	1.0000	0.2393	-0.0050	0.0920	0.1298	0.0249	0.2775
DFDI_2GDP	0.1688	0.2393	1.0000	0.0429	0.2043	0.3931	-0.0897	0.5469
DFRX	-0.4279	-0.0050	0.0429	1.0000	-0.0818	-0.1455	0.1591	-0.2534
DINFLATN	-0.0452	0.0920	0.2043	-0.0818	1.0000	0.3123	-0.1560	-0.0248
DLLISTED_COYS	-0.0221	0.1298	0.3931	-0.1455	0.3123	1.0000	0.1093	0.2819
DSTK_TRD_VAL_	0.0724	0.0249	-0.0897	0.1591	-0.1560	0.1093	1.0000	0.1494
DTX2GDP	0.3828	0.2775	0.5469	-0.2534	-0.0248	0.2819	0.1494	1.0000

Source: (Mensah, 2020). Correlation test results. Generated through Eviews9.5

Cointegration Test

Consequently, some variables were dropped in the pre-testing for cointegration to ascertain that all the variables are cointegrated, thus have a long-run association. The study, however, dropped the number of listed companies and either of tax revenue and foreign direct investment because they were distorting set of variables prepared for the regression model. The results of cointegration are captured in Table 74UK3. The trace test indicates the existence of four (4) cointegrating equations at 5% level. The null hypothesis is rejected, and the alternative hypothesis is accepted. The maximum Eigenvalue test also indicates below five (5) cointegrating equations at 5% level; also, the null hypothesis is rejected, and the alternative hypothesis accepted. The series are cointegrated, thus have a long-run association.

Table 74UK3A: Cointegration Test Results (Trace) - United Kingdom (Model One)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
None *	0.992357	260.3234	95.75366	0.0000
At most 1 *	0.949815	157.9712	69.81889	0.0000
At most 2 *	0.918381	95.13845	47.85613	0.0000
At most 3 *	0.725275	42.51882	29.79707	0.0010
At most 4	0.493469	15.38713	15.49471	0.0519
At most 5	0.051195	1.103584	3.841466	0.2935

Source: (Mensah, 2020): Cointegration Test. Trace test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegration Rank Test (Trace)

Table 75UK3B: Cointegration Test Results (Maximum Eigenvalue) - United Kingdom (Model One)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.992357	102.3522	40.07757	0.0000
At most 1 *	0.949815	62.83273	33.87687	0.0000
At most 2 *	0.918381	52.61962	27.58434	0.0000
At most 3 *	0.725275	27.13169	21.13162	0.0063
At most 4 *	0.493469	14.28355	14.26460	0.0496
At most 5	0.051195	1.103584	3.841466	0.2935

Source: (Mensah, 2020). Cointegration Test. Max-eigenvalue test indicates 5 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Regression Results

In carrying out the regression, hypotheses were stated, and consequently, tests were undertaken.

Null hypothesis H0: $\beta1= \beta2= \beta3= \beta4= \beta5= \beta6=\beta7=\beta8=0$

Alternative hypothesis H1: $\neq 0$ (not all are simultaneously equal to 0**)**

- β1DSTK_TRD_VL__GDP
- β2D__GDSVNGS_2GDP

- β3DINFLATN
- β4DFRX
- β5DBREEIS_IDX
- β6DGGDP(-1)
- β7DSTK_TRD_VL__GDP(-1)
- β8D__GDSVNGS_2GDP(-1)

The results from the regression test are captured in Table 76UK4 below. The effects of stock market development on GDP growth in the United Kingdom through the stock traded value has a coefficient of -0.00046, also not significant. In another vein, its lagged version has a positive coefficient of 0.00036, but it is not significant. D__GDSVNGS_2GDP and D__GDSVNGS_2GDP (-1) have coefficients of 0.03198 and -0.02828 respectively but the values are not statistically significant. DINFLATN and DFRX have coefficients of 0.00620 and -1.69256 respectively, but only DFRX is statistically significant.

On the other hand, DBREEIS_IDX has a coefficient of 0.38643 but not significant. GGDP (-1) has a coefficient of -0.52039, but it is statistically insignificant. The R-Squared value is 0.785374, indicating of 78.5% of the independent variables accounted for the variations in the GDP growth, and 21.5% accounted for unobserved factors. The F-Statistics is 4.472447, and a Prob (F-statistic) of 0.011398. This implies that all the independent variables jointly explain GDP growth. The variables in Table 76UK4 have a long-run association.

Table 76UK4: Regression Test Results - United Kingdom (Model One)

Variable (Regressors)	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.00497	0.01502	-0.33071	0.74660
DSTK_TRD_VL__GDP	-0.00046	0.00067	-0.69546	0.50000
D__GDSVNGS_2GDP	0.03198	0.02072	1.54331	0.14870
DINFLATN	0.00620	0.00809	0.76532	0.45890
DFRX	-1.69256	0.39900	-4.24204	0.00110
DBREEIS_IDX	0.38643	0.27101	1.42590	0.17940
GGDP(-1)	-0.52039	0.18909	-2.75200	0.01750
DSTK_TRD_VL__GDP(-1)	0.00036	0.00060	0.59924	0.56020
D__GDSVNGS_2GDP(-1)	-0.02828	0.01941	-1.45726	0.17070

R-squared	0.785374	Mean dependent var	-0.012053
Adjusted R-squared	0.609771	S.D. dependent var	0.095697
S.E. of regression	0.059780	Akaike info criterion	-2.490526
Sum squared resid	0.039311	Schwarz criterion	-1.993134
Log likelihood	36.15052	Hannan-Quinn criter.	-2.382579
F-statistic	4.472447	Durbin-Watson stat	1.296957
Prob(F-statistic)	0.011398		

Source: (Mensah, 2020). Dependent Variable: DGGDP. Source: Data Output via Eviews9.5
Method: Least Squares (NLS and ARMA) regression.

DLLISTED_COYS and either DTRX or DFDI_2GDP was employed in the model again to ascertain its impact on GGDP, not considering the long-run association of the series. The results in Tables UK6a and UK6b display coefficients of the variables. DLLISTED_COYS has a coefficient of 0.4899, but not statistically significant. DBREEIS_IDX has a positive coefficient of 0.4899, thus statistically significant. DFRX, GDP(-1) and D__GDSVNGS_2GDP(-1) have coefficients of -1.8201, -0.4631 and -0.0399 and are all statistically significant in that order. The rest of the variables have varying influences, and they are all not significant. These results are exciting. Though the variables do not have a long-run association as those in Table 76UK4, they have passed the robustness tests.

Table 77UK5A: Regression Test Results – United Kingdom (Model One)

Variable (Regressors)	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.006254	0.012173	-0.513742	0.6186
DSTK_TRD_VAL__GDP	-0.000342	0.000544	-0.628785	0.5436
DLLISTED_COYS	-0.379962	0.187914	-2.022000	0.0707
D__GDSVNGS_2GDP	0.036494	0.016637	2.193495	0.0530
DINFLATN	0.008128	0.006486	1.253171	0.2387
DFDI_2GDP	-0.004494	0.003619	-1.241811	0.2426
DFRX	-1.764393	0.317893	-5.550279	0.0002
DBREEIS_IDX	0.510172	0.215296	2.369633	0.0393
DGGDP(-1)	-0.476190	0.149371	-3.187969	0.0097
DSTK_TRD_VAL__GDP(-1)	0.000761	0.000508	1.498371	0.1649
D__GDSVNGS_2GDP(-1)	-0.039986	0.015690	-2.548567	0.0289
R-squared	0.880455	Mean dependent var	-0.012053	
Adjusted R-squared	0.760911	S.D. dependent var	0.095697	
S.E. of regression	0.046793	Akaike info criterion	-2.980494	
Sum squared resid	0.021896	Schwarz criterion	-2.433363	
Log likelihood	42.29518	Hannan-Quinn criter.	-2.861752	
F-statistic	7.365080	Durbin-Watson stat	1.427839	
Prob(F-statistic)	0.002026			

Source: (Mensah, 2020). Dependent Variable: DGGDP. Data Output via Eviews9.5
Method: Least Squares (NLS and ARMA) regression.

Table 78UK5B: Regression Test Results - United Kingdom (Model One)

Variable (Regressors)	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.008775	0.012801	-0.685458	0.5086
DSTK_TRD_VAL__GDP	-0.000132	0.000576	-0.228931	0.8235
DLLISTED_COYS	-0.447314	0.196882	-2.271993	0.0464
D__GDSVNGS_2GDP	0.032744	0.017396	1.882274	0.0892
DTX2GDP	-0.010466	0.024104	-0.434218	0.6733
DFRX	-1.867187	0.352063	-5.303564	0.0003
DINFLATN	0.006831	0.006830	1.000201	0.3408
DBREEIS_IDX	0.510307	0.233294	2.187394	0.0536
GGDP(-1)	-0.450795	0.161080	-2.798571	0.0188
DSTK_TRD_VAL__GDP(-1)	0.000742	0.000692	1.072075	0.3089
D__GDSVNGS_2GDP(-1)	-0.040546	0.016766	-2.418301	0.0362

R-squared	0.864574	Mean dependent var	-0.012053
Adjusted R-squared	0.729148	S.D. dependent var	0.095697
S.E. of regression	0.049804	Akaike info criterion	-2.855757
Sum squared resid	0.024804	Schwarz criterion	-2.308626
Log likelihood	40.98545	Hannan-Quinn criter.	-2.737016
F-statistic	6.384102	Durbin-Watson stat	1.583489
Prob(F-statistic)	0.003565		

Source: (Mensah, 2020). Dependent Variable: DGGDP. Data Output via Eviews9.5
Method: Least Squares (NLS and ARMA), regression.

The results in Table 77UK5A (employing DFDI_2GDP into the regression model) displays varying coefficients for DFRX, DBREEIS_IDX and GGDP (-1) of -1.764393, 0.510172 and -0.476190 respectively. They are also statistically significant. D__GDSVNGS_2GDP also has a coefficient of -0.039986, additionally significant. On the other hand, DSTK_TRD_VAL__GDP , DLLISTED_COYS, D__GDSVNGS_2GDP, DINFLATN and DFDI_2GDP varying coefficients of -0.000342, -0.379962, 0.036494, 0.008128 and -0.004494. They are all not statistically significant. Unfortunately, all the series do not have a long-run association, though they passed the robustness tests.

The results in Table 77UK5B (employing number of listed companies and tax revenue to GDP into the regression model) displays statistically significant and varying coefficients for

DLLISTED_COYS of -0.447314, DFRX of -1.867187 and DGGDP(-1) of -0.450795. On the other hand, insignificant and varying coefficients for DSTK_TRD_VAL__GDP of -0.000132, D__GDSVNGS_2GDP of 0.032744, DTX2GDP of -0.010466, DINFLATN of 0.006831, DBREEIS_IDX of 0.510307, DSTK_TRD_VAL__GDP (-1) of 0.000742 and D__GDSVNGS_2GDP(-1) of -0.040546. Though the model has passed robustness tests, they do not have a long-run association.

Robustness Test

A couple of robust tests were undertaken based on the earlier cointegration and regression tests to find out if the model was appropriate. A serial correlation test was undertaken to ascertain if the series are free from a serial correlation. The hypotheses set for the test are below:

H_0: No serial correlation

H_1: There is a serial correlation

From, the above, and in Table 79UK6, the results show that there is no serial correlation. The null hypothesis cannot be rejected, because the p-value of the observed R-squared is 0.0749 (i.e. 7.49%, which is more than 5% (p>5%), therefore the model is good.

Table 79UK6: Serial Correlation Test - United Kingdom (Model One)

F-statistic	0.839799	Prob. F(2,10)	0.4601
Obs*R-squared	3.019930	Prob. Chi-Square(2)	0.2209

Source: (Mensah, 2020). Method**:** Breusch-Godfrey Serial Correlation LM Test. Generated by Eviews9.5

The study carried out a heteroscedasticity test, and results are captured in Table 80UK7. Hypotheses set below are:

Null hypothesis H_0: Residuals (u) homoscedastic

Alternative H_1: Residuals (u): heteroscedastic

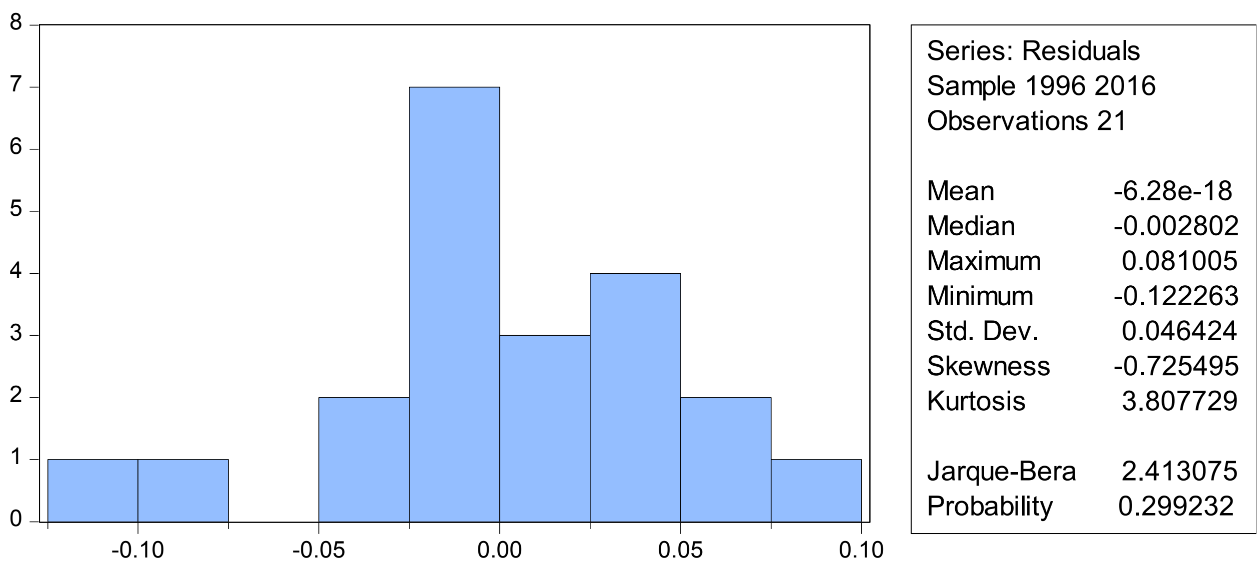
The null hypothesis cannot be rejected because of a p-value greater than 5% of the observed R-squared, thus a p-value of 0.9821 (98 %), residuals have constant variance, which is desirable. This implies that residuals are homoscedastic.

Table 80UK7: Heteroskedasticity Test - United Kingdom (Model One)

F-statistic	0.154610	Prob. F(8,12)	0.9935
Obs*R-squared	1.962279	Prob. Chi-Square(8)	0.9821
Scaled explained SS	0.89951	Prob. Chi-Square(8)	0.9988

Source: (Mensah, 2020). Method: Heteroskedasticity Test- Breusch-Pagan-Godfrey. Generated by Eviews9.5

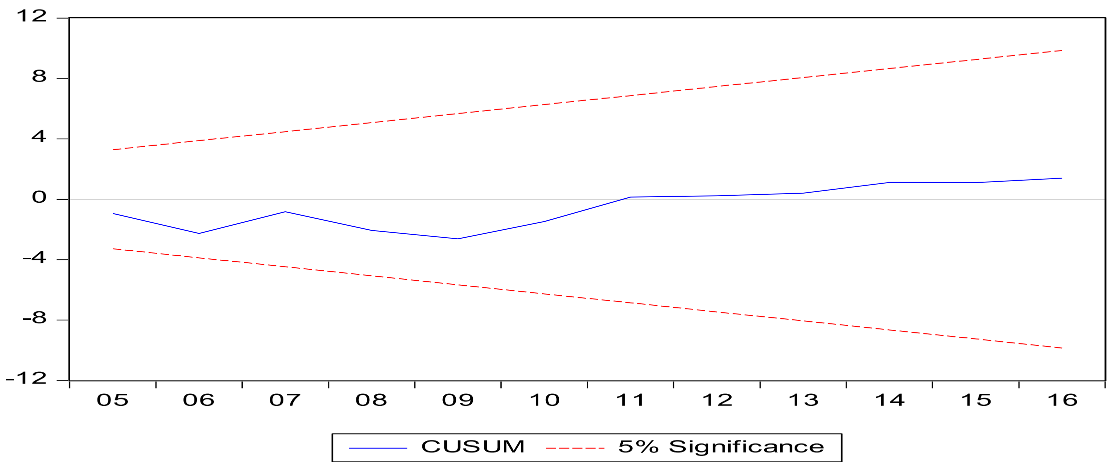
Figure 47UK1: Normality Test – United Kingdom (Model One)



Source: (Mensah, 2020). Normality Test. Generated by Eviews9.5

The regression model of GDP growth on the stock market development (market capitalization ratio) is fit. Normality test was undertaken to ascertain the appropriateness of the model. P – value> 5%, thus 29.9% with a Jacque-Bera value of 2.4130. Residuals follow a normal distribution, as shown in figure 47UK1 above. Finally, the study undertook the stability test by running the recursive estimates. Figure 48UK1 below shows the straight lines representing critical bounds at 5% significance level.

Figure 48UK1: Cumulative Sum of Recursive Estimates – United Kingdom (Model One)



Source: (Mensah, 2020). Stability Test. Data generated through Eviews9.5

Discussion of the Results of Model One

Economic growth on stock market development of United Kingdom has been tested and analysed. From the first regression in Table UK5 and what has been considered for the study, the results proclaim that stock market development does not have effect on economic growth (negligible effect). This is in line with hypothesis (1a) which is H_0- Null hypothesis: There is no relationship (negligible) between economic growth and stock market development in the sampled country or countries; and confirmed by the works of Oya & Domar (2006), Charif, (2001), Haque (2013), Ake & Ognaligui (2010), Saba & Ghulam (2017.

From our results, the effects of stock market development on GDP growth in the United Kingdom through DSTK_TRD_VAL__GDP is negative, even though the influence is insignificant. In another manner, DSTK_TRD_VAL__GDP(-1) has positive influence on GGDP however, the influence is insignificant. These results partly contrast the findings of Masoud and Hardaker (2012), which establish a positive and significant relationship between stock market development and economic growth. The banking sector development through D__GDSVNGS_2GDP and D__GDSVNGS_2GDP (-1) have varying influences – positive and negative influences respectively on GGDP but are insignificant. The banking sector development is thus very important because it channels money into the economy for goods and services as well as businesses. It serves as both a competitor and an ally of the stock market development on GGDP, though in the United Kingdom, it is negligible. These results partly confirm the findings of Masih and Peters (2010) and Singh (2010) that savings have a positive effect on economic growth.

DINFLATN and DFRX, the two macroeconomic factors have varying influences, thus positive and negative effects respectively, and only DFRX is significant. DINFLATN impacts on the GGDP positively in the UK, though negligible. This partly confirms the findings of Mallik and Chowdhury (2001) that there is a positive and significant relationship between inflation and economic. DFRX has a negative effect on GGDP; thus, a depreciation of the exchange rate affects GGDP adversely. The coefficient of DFRX is also out of line with the conclusion of Aghion et al., (2006). They reveal that changes in exchange rates may play a significant role and influence on productivity growth in the long-term. DBREEIS_IDX positively influenced GGDP, but it is insignificant, in any case. This implies that institutional structures, technology/innovation and financial factors such as access to credit, easiness to banks, and availability of venture capital are all very imperative in complementing the enhancement of economic growth. GGDP (-1) negatively and insignificantly influenced GGDP of UK.

This is due to spillovers from the previous period. The variables have a long-run association. In summary, stock market development negatively and negligibly influenced GGDP in the United Kingdom for the period 1993-2016.

Results of Model Two (2)

This model is designed as stock market development on economic growth. An initial unit root test was conducted, and the series not stationary were dropped as done and used in model one. A correlation test was conducted on the series, and highly correlated pairs of series dropped including DM_CRD__PRV_2GDP, M2_GDP, MKT_CAP2GDP and STK_TRD_TRN as captured in Table 81UK8).

Table 81UK8: Correlation Test - United Kingdom (Model Two)

Series	D__GDSVNGS_2GDP	DBREEIS_IDX	DFRX	DINFLATN	DLGDP_P_CPT	DSTK_TRD_VAL__GDP	DTX2GDP	GGDP	DFDI_2GDP
D__GDSVNGS_2GDP	1.0000	0.3049	-0.4279	-0.0452	0.4486	0.0724	0.3828	0.4336	0.1688
DBREEIS_IDX	0.3049	1.0000	-0.0050	0.0920	0.0426	0.0249	0.2775	0.0242	0.2393
DFRX	-0.4279	-0.0050	1.0000	-0.0818	-0.9576	0.1591	-0.2534	-0.9605	0.0429
DINFLATN	-0.0452	0.0920	-0.0818	1.0000	0.2154	-0.1560	-0.0248	0.2328	0.2043
DLGDP_P_CPT	0.4486	0.0426	-0.9576	0.2154	1.0000	-0.1067	0.2983	0.9978	0.0853
DSTK_TRD_VAL__GDP	0.0724	0.0249	0.1591	-0.1560	-0.1067	1.0000	0.1494	-0.0967	-0.0897
DTX2GDP	0.3828	0.2775	-0.2534	-0.0248	0.2983	0.1494	1.0000	0.2652	0.5469
GGDP	0.4336	0.0242	-0.9605	0.2328	0.9978	-0.0967	0.2652	1.0000	0.0646
DFDI_2GDP	0.1688	0.2393	0.0429	0.2043	0.0853	-0.0897	0.5469	0.0646	1.0000

Source: (Mensah, 2020). **Correlation Test:** Generated through Eviews9.5

In the regression for model two, the dependent variable used is DLLISTED_COYS. The reason is that it is one of the stock market development indicators that is stationary apart from stock traded value. It also connects the model fairer as compared to DSTK_TRD_VAL__GDP in the pre-testing of the model.

Regression Model/ Results

To undertake the regression test, hypotheses were stated, and consequently, tests were undertaken.

Null hypothesis H_0: β1= β2= β3= β4= β5= β6= β7= β8=0

Alternative hypothesis H_1: ≠ 0 (not all are simultaneously equal to 0)

β1 D__GDSVNGS_2GDP

β2 DFDI_2GDP

β3 DINFLATN

β4 GGDP

β5 DSTK_TRD_VL_2GDP

β6DBREEIS_IDX

β7DLLISTED_COYS (-1)

β8 GGDP(-1)

β9D__GDSVNGS_2GDP(-1)

Table 82UK9: Regression Test Results - United Kingdom (Model Two)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.0361	0.0223	-1.6168	0.1319
D__GDSVNGS_2GDP	0.0034	0.0246	0.1379	0.8926
DFDI_2GDP	0.0026	0.0046	0.5731	0.5771
DINFLATN	0.0128	0.0075	1.7165	0.1117
GGDP	0.0705	0.2347	0.3003	0.7691
DSTK_TRD_VAL__GDP	0.0006	0.0007	0.8186	0.4290
DBREEIS_IDX	0.3250	0.3155	1.0299	0.3234
DLLISTED_COYS(-1)	0.0658	0.2561	0.2568	0.8017
GGDP(-1)	0.5349	0.2660	2.0114	0.0673
D__GDSVNGS_2GDP(-1)	-0.0365	0.0232	-1.5739	0.1415
R-squared 0.509242	Mean dependent var 0.002849			
Adjusted R-squared 0.141173	S.D. dependent var 0.070486			
S.E. of regression 0.065321	Akaike info criterion -2.316038			
Sum squared resid 0.051203	Schwarz criterion -1.820109			
Log likelihood 35.47642	Hannan-Quinn criter. -2.199212			
F-statistic 1.383550	Durbin-Watson stat 1.860634			
Prob(F-statistic) 0.294198				

Source: (Mensah, 2020). Dependent Variable: DLLISTED_COYS. Source: Data Output via Eviews9.5 Method: Least Squares (NLS and ARMA) regression.

From the regression results displayed in Table 82UK9 above, DSTK_TRD_VAL__GDP, DLLISTED_COYS (-1) and D__GDSVNGS_2GDP and DFDI_2GDP have coefficients of 0.0006, 0.0658. 0.0034, -0.0365 and 0.0026 respectively. Though all are insignificant, they are positively related to the DLLISTED_COYS except the D__GDSVNGS_2GDP(-1) that is negatively related to DLLISTED_COYS. DINFLATN and GGDP and GGDP (-1) on the other hand, have positive coefficients of 0.0128, 0.0705 and 0.5349 in that order, but they are not statistically significant. Finally, DBREEIS_IDX has a coefficient of 0.3250; also, the index is not statistically significant. The R-squared is 0.509242, implying that 51% accounted for variations on DLLISTED_COYS, while 49% also accounted for unobserved factors. Surprisingly, the F-statistic is 1.383550 and Prob(F-statistic) is 0.294198. This implies that all the independent variables do not jointly explain the dependent variable, because the p-value is more than 5%.

Robustness Test

The study undertook a number of robustness tests sequentially, and the results are captured in the tables and figures below. Hypotheses set for serial correlation test are:

H_0: No serial correlation

H_1: There is a serial correlation

The results in table 83UK10 show a P- value more than 5% (P>5%,) therefore, the null hypothesis is accepted. P-value of the observed R-squared is 40%, more than 5%. This implies that there is no serial correlation.

Table 83UK10: Serial Correlation Test - United Kingdom (Model Two)

F-statistic	0.453920	Prob. F(2,10)	0.6476
Obs*R-squared	1.831020	Prob. Chi-Square(2)	0.4003

Source: (Mensah, 2020). Method: Breusch-Godfrey Serial Correlation LM Test. Generated by Eviews9.5

The heteroskedasticity test was undertaken. Hypotheses set for the test are below:

Null hypothesis (H_0): Residuals (u) homoscedastic

Alternative (H_1): Residuals (u): heteroscedastic

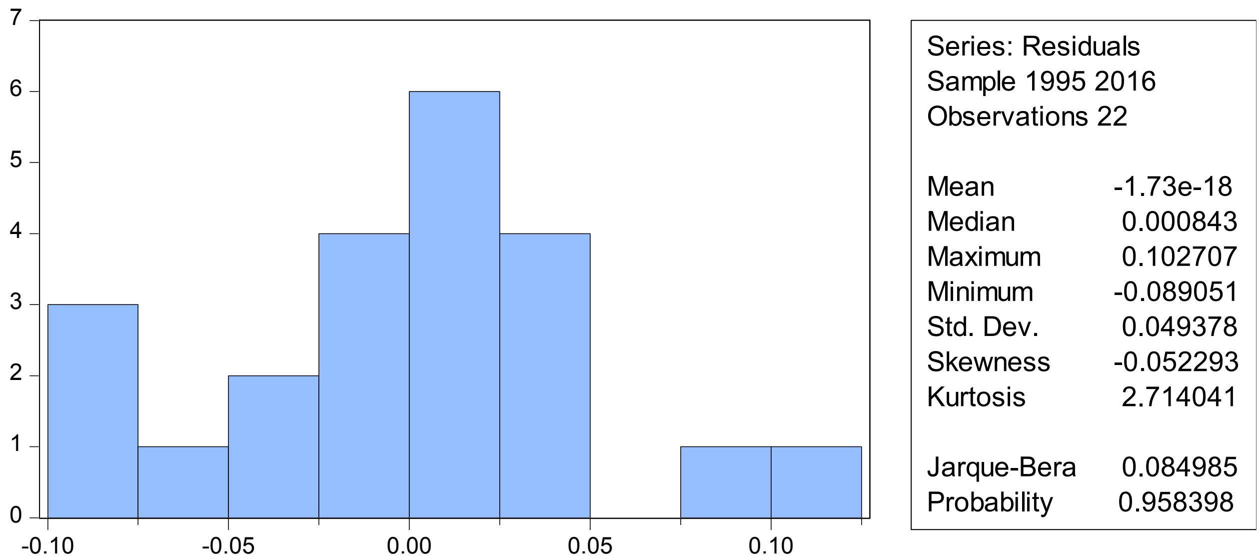
The results in Table 84UK11 show a p-value more than 5% (P>5%) of the observed R-squared, thus a p-value of 0.7652 (76.52%). The null hypothesis cannot be rejected. The residuals have constant variance, which is desirable. This implies that residuals are homoscedastic.

Table 84UK11: Heteroskedasticity Test - United Kingdom (Model Two)

F-statistic	0.471202	Prob. F(8,12)	0.8677
Obs*R-squared	5.744663	Prob. Chi-Square(8)	0.7652
Scaled explained SS	1.464782	Prob. Chi-Square(8)	0.9974

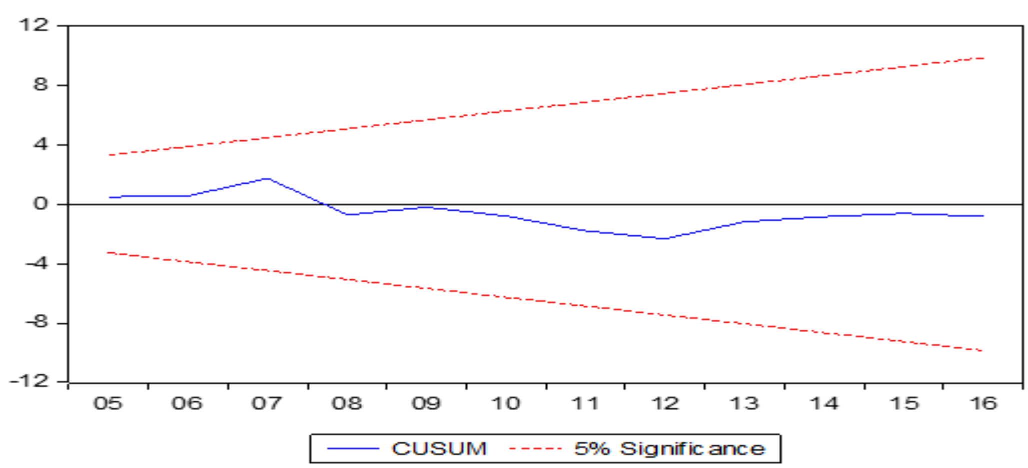
Source: (Mensah, 2020). Method: Heteroskedasticity Test- Breusch-Pagan-Godfrey. Generated through Eviews9.5

Figure 49UK2: Normality Test – United Kingdom (Model Two)



Source: (Mensah, 2020) . Normality test (data) through Eview9.5

Figure 50UK2: Cumulative Sum of Recursive Estimates – United Kingdom (Model Two)



Source: (Mensah, 2020). Stability Test. Data generated through Eviews9.5

The normality test justifies the appropriateness of the model, P – value> 5%, thus 98% with Jarque –Bera of 0.084 in the fig above. The stability examination was carried out finally to ascertain if the dependent variable is stable, results displayed CUSUM test of 5% level of significance; thus, the model is stable.

Alternatively, a robust least square method of regression was used to check the model alongside the least square method used previously. This is to ensure that the processes meticulously conform to research standards and compare results as well due to unexpected results obtained from the least square method.

Table 85UK12: Regression Results - United Kingdom (Model Two)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.012721	0.007108	-1.789592	0.0735
D__GDSVNGS_2GDP	0.008335	0.007835	1.063850	0.2874
DFDI_2GDP	0.004293	0.001465	2.930079	0.0034
DINFLATN	0.012019	0.002380	5.049891	0.0000
GGDP	0.253066	0.074735	3.386167	0.0007
DSTK_TRD_VL__GDP	0.000940	0.000225	4.171463	0.0000
DBREEIS_IDX	-0.232607	0.100469	-2.315222	0.0206
DLLISTED_COYS(-1)	0.310865	0.081552	3.811887	0.0001
GGDP(-1)	0.265007	0.084679	3.129538	0.0018
D__GDSVNGS_2GDP(-1)	-0.015123	0.007381	-2.048896	0.0405

R-squared	0.552841	Adjusted R-squared	0.217471
Rw-squared	0.971387	Adjust Rw-squared	0.971387
Akaike info criterion	55.61914	Schwarz criterion	76.17760
Deviance	0.008039	Scale	0.013326
Rn-squared statistic	175.4337	Prob(Rn-squared stat.)	0.000000

Source: (Mensah, 2020). Dependent Variable: DLLISTED_COYS. Source: Data Output via Eviews9.5 Method: Robust Least Squares, regression.

The results displayed coefficients for D__GDSVNGS_2GDP) of 0.008335 and coefficient of 0.004293 for DFDI_2GDP. DINFLATN has a coefficient of 0.012019 whilst

GGDP has a coefficient of 0.253066, DSTK_TRD_VL__GDP has a coefficient of 0.000940, DBREEIS_IDX has a coefficient of -0.232607. On the other hand, DLLISTED_COYS (-1) GGDP (-1) and finally D__GDSVNGS_2GDP (-1) have coefficients of 0.310865, 0.265007 and -0.015123. Finally, D__GDSVNGS_2GDP has a coefficient of 0.008335. Apart from D__GDSVNGS_2GDP, the rest of the variables are statistically significant.

Discussion of the Results of Model Two (2)

Stock market development on economic growth of the United Kingdom has been tested and analyzed. The results proclaim that stock market development does not influence economic growth. This is in line with the hypothesis (2b) which is H_{0}- Null hypothesis: There is no relationship or (negligible effect) between stock market development and economic growth in the sampled country or countries). This is in line with the works of Shan et al., (2001) and reverse to the work of Ikikii & Nzomoi (2013), Rahman & Salahuddin (2010), and Enisan & Olufisayo (2009).

The results from model two using least square method indicate that DSTK_TRD_VAL__GDP, a complementary stock market development indicator in this model positively influenced the stock market development through DLLISTED_COYS, yet, it is not significant. DLLISTED_COYS (-1), on the other hand, positively influenced stock market development through DLLISTED_COYS. Its spillover effect from the previous period directly has effects on it. The banking sector development through D__GDSVNGS_2GDP influenced the stock market development positively. This is a clear indication that the banking sector is very relevant in the financial sector, where the stock market activities are dependent on.

DFDI_2GDP positively influenced DLLISTED_COYS, likewise the former, though all are insignificant. This implies that capital mobility through foreign direct investment plays a crucial in the development of the stock market. DINFLATN influenced the stock market development in the United Kingdom, implying that when inflation increases, it impacts DLLISTED_COYS positively, thus enhanced the market development somewhat. GGDP positively influenced stock market development through DLLISTED_COYS, though, it is not significant. Likewise, GGDP (-1) influenced the former positively and inappropriately; it is not significant. In the same manner, DBREEIS_IDX positively influenced the stock market development, but it is insignificant. Finally, in exception of all the variables, D__GDSVNGS_2GDP(-1) has a negative influence on the stock market development. Thus, the previous activities of the banking sector negatively influenced the stock market development through DLLISTED_COYS.

Further to the above, the study employed the robust-least square regression method to compare the results of the least square method. Results indicate that the majority of the variables are statistically significant. DBREEIS_IDX negative influence on the stock market development is unusual for the UK, although it is also significant. GDP's positive influence enhances stock market development. It is believed that factors that create a sound economic environment will assist companies to seek funding through the stock markets. Other components of stock market development in the regression, such as DSTK_TRD_VAL__GDP and DLLISTED_COYS (-1) have positive and matching influences on the stock market development. This is an indication that the value traded of stocks and the previous period of DLLISTED_COYS of United Kingdom. D__GDSVNGS_2GDP, an indicator of the banking sector development, has positively influenced the stock market development, but it is insignificant.

DINFLATN, a macroeconomic indicator, influenced stock market development positively and significantly, thus the Impact enhancing activities that transmit direct effects.

DFDI_2GDP channels private equity funds into stock markets positively and significantly. Some of the funds will find itself on activities on the exchanges leading to market development. This implies that the magnitude of the companies will lead to attracting foreign investors. In summary, the results from the two regressions are inconclusive. While the least-square method provides no relationship or negligible effect on economic growth, robust least square provides a positive effect on the stock market development.

HONG KONG

Results of Model One (1)

Model one is designed as GGDP on stock market development. As indicated in the results for the previous countries, the tests processes consequentially unfold in that manner.

Unit Root Test

All the series were tested for individual unit roots at all stages- ‘‘level and first difference at both individual intercept/ individual intercept and trend’’ respectively. The summary of results is captured in Table 86HK1. DM_CRD__PRV_2GDP was dropped from the list of variables for the next level of the test due to the presence of unit-root. The rest of the series are stationary at ‘‘first difference and individual intercept’’ (each has no unit root); thus, series have their p-values less than 5%.

Table 86HK1: Summary of Unit Root Test Results – Hong Kong (Model One)

Variables	Level				1ST Difference			
	Individual Intercept		Intercept and Trend		Individual Intercept		Intercept and Trend	
	Stats	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**
GDSVNGS_2GDP	-2.998064	0.8684	-3.622033	0.8990	-3.004861	0.0029 *	-3.632896	0.0121
BREEIS_IDX	-2.998064	0.0272	-3.622033	0.0758	-3.004861	0.0000 *	-3.632896	0.0000
DM_CRD__PRV_2GDP	-3.029970	0.9314	-3.658446	0.0876	-3.029970	0.1124 **	-3.673616	0.1132
FDI_2GDP	-2.998064	0.2120	-3.632896	0.0525	-3.012363	0.0008 *	-3.644963	0.0039
FRX	-2.998064	0.2766	-3.622033	0.6627	-3.012363	0.0014 *	-3.644963	0.0025
GGDP	-3.020686	0.0003	-3.658446	0.0011	-3.029970	0.0000 *	-3.673616	0.0000
INFLATN	-2.998064	0.1656	-3.622033	0.4785	-3.012363	0.0016 *	-3.644963	0.0045
LGDP_P_CPT	-3.004861	0.9768	-3.622033	0.9157	-3.004861	0.0158 *	-3.632896	0.0467
LLISTED_COYS	-2.998064	0.2265	-3.622033	0.7942	-3.004861	0.0044 *	-3.632896	0.0112
M2_GDP	-3.012363	0.9441	-3.622033	0.0336	-3.012363	0.0007 *	-3.644963	0.0045
MKT_CAP2GDP	-3.012363	0.8448	-3.622033	0.0405	-3.012363	0.0000 *	-3.644963	0.0004
STK_TRD_TRN	-2.998064	0.0091	-3.622033	0.0459	-3.012363	0.0002	-3.632896	0.0008
STK_TRD_VAL__GDP	-2.998064	0.4082	-3.622033	0.4309	-3.004861	0.0007	-3.632896	0.0044
TX2GDP	-3.040391	0.8200	-3.690814	0.4690	-3.040391	0.0000	-3.690814	0.0000

Source: (Mensah, 2020). ADF Unit root tests for the variables in levels at 5% significance.
Notes: * and ** denote stationary and non-stationary respectively.

Table 87HK2: Correlation Test Results - Hong Kong (Model One)

Series	D__GDSVNGS_2GDP	DBREEIS_IDX	DFDI_2GDP	DFRX	DINFL	DLLISTED_COYS	DM2_GDP	DMKT_CAP2GDP	DSTK_TRD_TRN	DSTK_TRD_VL	DTXGDP	DLGDP_P_CPT
D__GDSVNGS_2GDP	1.0000	0.0867	0.3092	0.1551	0.1186	0.3461	-0.2055	0.0628	0.2291	0.1237	0.1266	-0.0052
DBREEIS_IDX	0.0867	1.0000	0.1051	0.0394	-0.0248	0.0139	-0.2988	-0.4649	0.1798	-0.2391	0.0521	0.1280
DFDI_2GDP	0.3092	0.1051	1.0000	0.2840	0.1318	0.1150	-0.0472	-0.0078	0.3652	0.4275	0.4711	0.2919
DFRX	0.1551	0.0394	0.2840	1.0000	0.2545	0.4264	-0.0261	-0.0808	0.3473	0.4273	0.1614	0.1917
DINFL	0.1186	-0.0248	0.1318	0.2545	1.0000	0.1288	-0.4492	0.0272	0.3890	0.4093	0.3290	0.5726
DLLISTED_COYS	0.3461	0.0139	0.1150	0.4264	0.1288	1.0000	-0.2923	-0.0955	0.4103	0.2524	0.1160	0.1185
DM2_GDP	-0.2055	-0.2988	-0.0472	-0.0261	-0.4492	-0.2923	1.0000	0.5329	-0.4587	0.1776	-0.2008	-0.5554
DMKT_CAP2GDP	0.0628	-0.4649	-0.0078	-0.0808	0.0272	-0.0955	0.5329	1.0000	-0.4073	0.4843	-0.1617	-0.1367
DSTK_TRD_TRN	0.2291	0.1798	0.3652	0.3473	0.3890	0.4103	-0.4587	-0.4073	1.0000	0.4589	0.2304	0.6484
DSTK_TRD_VL	0.1237	-0.2391	0.4275	0.4273	0.4093	0.2524	0.1776	0.4843	0.4589	1.0000	0.2301	0.3589
DTXGDP	0.1266	0.0521	0.4711	0.1614	0.3290	0.1160	-0.2008	-0.1617	0.2304	0.2301	1.0000	0.1183
DLGDP_P_CPT	-0.0052	0.1280	0.2919	0.1917	0.5726	0.1185	-0.5554	-0.1367	0.6484	0.3589	0.1183	1.0000

Source: (Mensah, 2020). Generated through Eviews9.5. Note: High correlation figure is any number above 50% is regarded as high correlation.

Correlation Test

The correlation test was carried out and results displayed above. From the pairings in Table HGK2 above, DLGDP_P_CPT is highly correlated with DINFL, DM2_GDP, DSTK_TRD_TRN. At the same time (DM2_GDP), is highly correlated with MKT_CAP2GDP. Due to the high values of correlation pairings, DLGDP_P_CPT, MKT_CAP2GDP and DSTK_TRD_TRN were dropped to avoid the presence of multicollinearity.

Going further, a number of variables were dropped. These variables were not complementing other variables for cointegration. These include DLLISTED_COYS, DTXGDP, DINFL and D__GDSVNGS_2GDP. The remaining variables used for setting the model include GGDP, DFRX, DINFLATN, FDI_2GDP, STK_TRD_VAL__GDP and DBREEIS_IDX.

Cointegration Test and Results

The variables were tested for cointegration and the results are displayed in the table below.

The null hypothesis set below:

Null hypothesis (H_0): Series are not cointegrated

Alternative hypothesis (H_1): Series are cointegrated

The null hypothesis was rejected because the test results indicated a p-value of less the 5% (p<5%).

Table 88HK3A: Cointegration Test (Trace) - Hong Kong (Model One)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
None *	0.939464	151.6669	95.75366	0.0000
At most 1 *	0.873337	95.57650	69.81889	0.0001
At most 2 *	0.795237	54.25206	47.85613	0.0111
At most 3	0.438833	22.53399	29.79707	0.2697
At most 4	0.313619	10.97927	15.49471	0.2128
At most 5	0.158560	3.452818	3.841466	0.0631

Source: (Mensah, 2020). Cointegration Tes.t
Trace test indicates 3 cointegrating eqn(s) at the 0.05 level. * denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values. Unrestricted Cointegration Rank Test (Trace)

Table 89HK3B: Cointegration Test (Maximum Eigenvalue) – Hong Kong (Model One)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.939464	56.09043	40.07757	0.0004
At most 1 *	0.873337	41.32443	33.87687	0.0054
At most 2 *	0.795237	31.71807	27.58434	0.0139
At most 3	0.438833	11.55472	21.13162	0.5919
At most 4	0.313619	7.526451	14.26460	0.4289
At most 5	0.158560	3.452818	3.841466	0.0631

Source: (Mensah, 2020). Cointegration Test.
Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level. * denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values. Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Regression Results

For the regression test, DSTK_TRD_VL was used as the main component of the stock market development indicator. As displayed in Table below, DSTK_TRD_VL has a coefficient of 0.00009. Though it is positive, it is not statistically significant. DM2_GDP has a negative coefficient of -0.00316, and it is statistically significant. DFDI_2GDP, DFRX and DBREEIS_IDX have coefficients of 0.00069, 0.81675 and 0.01334 respectively and are insignificant. On the other hand, GGDP (-1) and DSTK_TRD_VL (-1) have coefficients of -0.27877 and -0.00008, also not significant.

Table 90HK4: Regression Test Results - Hong Kong (Model One)

Variable (Regressors)	Coefficient	Std. Error	t-Statistic	Prob.
C	0.02739	0.01321	2.07314	0.05860
DSTK_TRD_VL	0.00009	0.00007	1.32916	0.20670
DM2_GDP	-0.00316	0.00097	-3.26543	0.00610
DFDI_2GDP	0.00069	0.00085	0.80771	0.43380
DFRX	0.81675	0.60823	1.34284	0.20230
DBREEIS_IDX	0.01334	0.12317	0.10833	0.91540
GGDP(-1)	-0.27877	0.19201	-1.45187	0.17020
DSTK_TRD_VL(-1)	-0.00008	0.00006	-1.24761	0.23420

R-squared	0.652658	Mean dependent var	-0.001328
Adjusted R-squared	0.465627	S.D. dependent var	0.053711
S.E. of regression	0.039263	Akaike info criterion	-3.354726
Sum squared resid	0.020041	Schwarz criterion	-2.956813
Log likelihood	43.22463	Hannan-Quinn criter.	-3.268369
F-statistic	3.489581	Durbin-Watson stat	1.537598
Prob(F-statistic)	0.024825		

Source: (Mensah, 2020) Dependent Variable: GGDP. Data Output via Eviews9.5
Method: Least Squares (NLS and ARMA) regression.

The coefficient of determination, that is R-Squared is 0.652658, thus indicating that 65.26% accounted for the variations on the dependent variable (GDP growth). At the same time, 34.74% accounted for the unobserved factors. The F-statistic is 3.489581, and a p-value of

0.024825 (P < 5%), implying that all the independent variables above jointly explain or influence the population, that is GGDP on stock market development through DSTK_TRD_VL.

Robustness Test

The study runs several robust tests to ascertain the veracity of the regression model. In an orderly manner, the tests run were: serial correlation, heteroskedasticity, normality and stability tests.

Table 91HK4: Serial Correlation Test - Hong Kong (Model One)

F-statistic	0.919212	Prob. F(2,10)	0.4274
Obs*R-squared	3.007137	Prob. Chi-Square(2)	0.2223

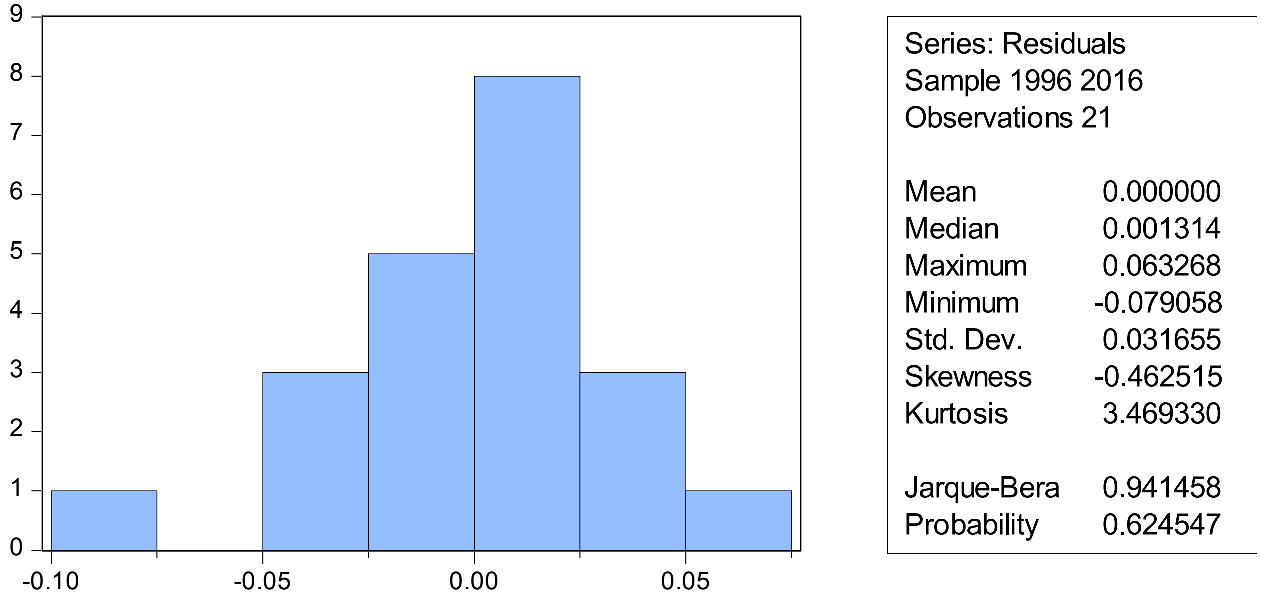
Source: (Mensah, 2020). Method: Breusch-Godfrey Serial Correlation LM Test. Generated by Eviews9.5

Table 92HK5: Heteroskedasticity Test – Hong Kong (Model One)

F-statistic	0.375584	Prob. F(8,12)	0.9007
Obs*R-squared	3.532568	Prob. Chi-Square(8)	0.8318
Scaled explained SS	1.671428	Prob. Chi-Square(8)	0.9758

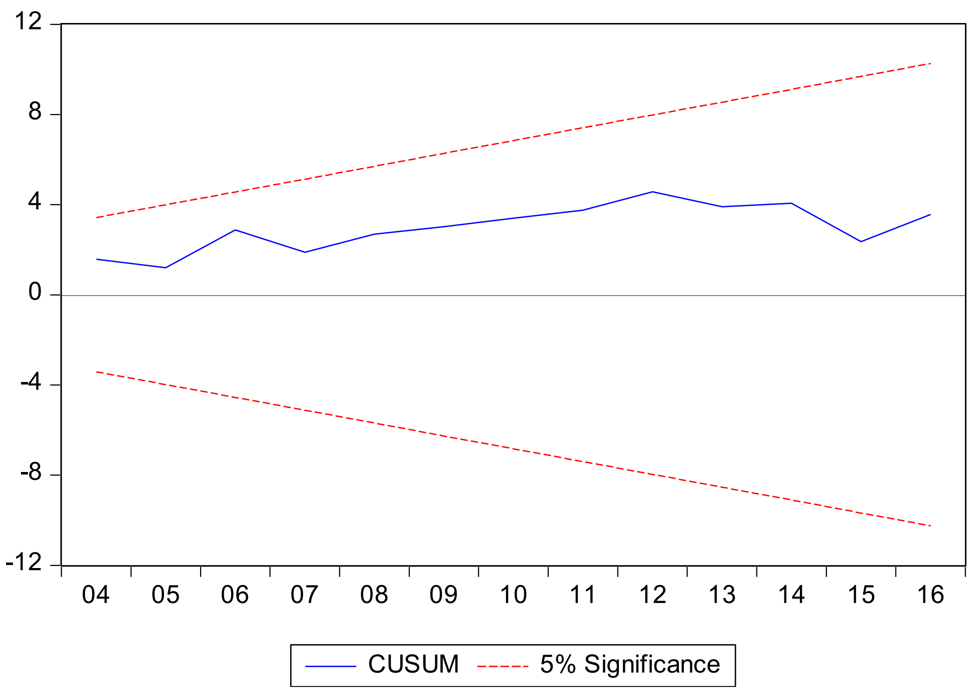
Source: (Mensah, 2020). Method: Heteroskedasticity Test- Breusch-Pagan-Godfrey. Generated through Eviews9.5

Figure 51HK1: Normality Test - Hong Kong (Model One)



Source: **Source**: (Mensah, 2020). Normality test (data) through Eview9.5

Figure 52HK1: Cumulative Sum of Recursive Estimates - Hong Kong (Model One)



Source: (Mensah, 2020). Stability Test. Data generated through Eviews9.5

The results for serial correlation are captured in Table 91HK4. Hypotheses set for serial correlation are set below:

H_0: No serial correlation

H_1: There is a serial correlation

From the tables above, P-value is more than 5% (P>5%,); therefore, the null hypothesis is accepted. P-value of the observed R-squared is 0.2223, thus 22.2%, which is more than 5%. This implies that there is no serial correlation.

The heteroskedasticity test was undertaken, and the results are captured in;

Null hypothesis H0: Residuals (u) homoscedastic

Alternative H1: Residuals (u): heteroscedastic

Cannot reject the null hypothesis. The p-value is more than 5% (P>5%) of the observed R-squared, thus a p-value of 0.9758 (97.58%), residuals have constant variance, which is desirable. The value obtained, implying that residuals are homoscedastic.

The normality test results show a P – value> 5%, thus 62.45 % with Jarque –Bera of 0.94418 in the fig above. Finally, the study tested for stability of the model and results displayed CUSUM test of 5% level of significance (i.e. thus, the model is stable).

Another regression was run on the variables with the robust least-squares method to compare the least-squares method used previously. The results are captured in Table 93HK6.

Table 93HK6: Regression Results - Hong Kong (Model One)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.01321	0.00911	1.44965	0.14720
DSTK_TRD_VL	0.00001	0.00005	0.20521	0.83740
DM2_GDP	-0.00138	0.00067	-2.06138	0.03930*
DFDI_2GDP	0.00131	0.00059	2.22122	0.02630*
DFRX	1.10839	0.41929	2.64350	0.00820*
DBREEIS_IDX	0.01368	0.08491	0.16116	0.87200
GGDP(-1)	-0.15681	0.13236	-1.18468	0.23610
DSTK_TRD_VL(-1)	-0.00006	0.00004	-1.40514	0.16000

R-squared	0.549434	Adjusted R-squared	0.306821
Rw-squared	0.767420	Adjust Rw-squared	0.767420
Akaike info criterion	29.49255	Schwarz criterion	45.62573
Deviance	0.011982	Scale	0.023735
Rn-squared statistic	30.37566	Prob(Rn-squared stat.)	0.000081

Source: (Mensah, 2020) Dependent Variable: GDP growth. Source: Data Output via Eviews9.5. Method: Robust Least Squares, regression.

DM2_GDP, DFDI_2GDP and DFRX have coefficients of -0.00138, 0.00131 and 1.10839 respectively, and they are all statistically significant. DSTK_TRD_VL and DBREEIS_IDX have coefficients of 0.00001 and 0.01368, respectively. Interestingly, they are statistically significant. In the case of foreign direct investment, the result is inconsistent with the findings of Adam et al., (2008). The result of DFRX is 1.10839; additionally, it is statistically significant. Also, the lagged of GDP growth [DGGDP (-1)] and the lagged of stock traded value [DSTK_TRD_VL (-1)] have negative coefficients of -0.15681 and -0.00006; however, they are statistically insignificant.

Discussion of the Results of Model One (1)

Economic growth on stock market development of Hong Kong has been tested and economic growth (negligible effect). This is in line with the hypothesis (1a) which is H_0- Null hypothesis: There is no relationship (negligible) between economic growth and stock market development in the sampled country or countries; and confirmed by the works of Oya & Domar (2006), Charif, (2001), Haque (2013), Ake & Ognaligui (2010) and Saba & Ghulam (2017.

The study's concentration is on the effects of stock market development on economy growth. DSTK_TRD_VL positively and insignificantly influenced GDP growth. Though the effects are minimal, it indicated that when the stock market is developed, it conveys that progress to enhance GGDP. On the other hand, DSTK_TRD_VL (-1) has a negative influence on GGDP. Thus, the influence implying that the effect from the previous period stock traded total value diffused spillovers onto the current period, thus influencing GGDP. This is an indication of the sensitivity of the stock market. Banking sector development, on the other hand, through money supply, has negatively and statistically influenced GGDP in Hong Kong over the period under investigation. The sector complements the efforts of stock market development and macroeconomic factors to impact on GDP growth. This controverts the conclusions of Zapodeanu and Cociuba (2010), Hameed and Amen (2011) and Ihsan and Anjum (2013), that money supply (M2) is positively related to economic growth. DFDI_2GDP positively and significantly influenced GGDP through channeling of private equity for investment. This implied that private equity funds into Hong Kong Impacted on the GGDP. The exchange rate, an essential indicator of macroeconomic environment significantly and positively influenced GGDP. The suppleness or volatility of the exchange rate seriously have effects on GGDP depending on the type of exchange rate regime; if it is a flexible exchange rate, such volatility will reduce trade and economic growth. In summary, having considered all these outcomes on Hong Kong, it is evidenced that stock market development has varying effects with time on GGDP, considering its spillovers.

Results of Model Two (2)

The model is designed as stock market development on the growth of GDP. Just like model one, correlation test was carried out without the market capitalization ratio, because it is the dependent variable for model two.

Table 94HK7: Correlation Test Results - Hong Kong (Model Two)

Variables	D__GDSVNGS_2GDP	DBREEIS_IDX	DFDI_2GDP	DFRX	DINFL	DLGDP_P_CPT	DLLISTED_COYS	DM2_GDP	DSTK_TRD_TRN	DSTK_TRD_VL	DTXGDP	GGDP
D__GDSVNGS_2GDP	1.0000	0.0867	0.3092	0.1551	0.1186	-0.0052	0.3461	-0.2055	0.2291	0.1237	0.1266	-0.0207
DBREEIS_IDX	0.0867	1.0000	0.1051	0.0394	-0.0248	0.1280	0.0139	-0.2988	0.1798	-0.2391	0.0521	0.1084
DFDI_2GDP	0.3092	0.1051	1.0000	0.2840	0.1318	0.2919	0.1150	-0.0472	0.3652	0.4275	0.4711	0.2977
DFRX	0.1551	0.0394	0.2840	1.0000	0.2545	0.1917	0.4264	-0.0261	0.3473	0.4273	0.1614	0.1874
DINFL	0.1186	-0.0248	0.1318	0.2545	1.0000	0.5726	0.1288	-0.4492	0.3890	0.4093	0.3290	0.5387
DLGDP_P_CPT	-0.0052	0.1280	0.2919	0.1917	0.5726	1.0000	0.1185	-0.5554	0.6484	0.3589	0.1183	0.9812
DLLISTED_COYS	0.3461	0.0139	0.1150	0.4264	0.1288	0.1185	1.0000	-0.2923	0.4103	0.2524	0.1160	0.1416
DM2_GDP	-0.2055	-0.2988	-0.0472	-0.0261	-0.4492	-0.5554	-0.2923	1.0000	-0.4587	0.1776	-0.2008	-0.5636
DSTK_TRD_TRN	0.2291	0.1798	0.3652	0.3473	0.3890	0.6484	0.4103	-0.4587	1.0000	0.4589	0.2304	0.6130
DSTK_TRD_VL	0.1237	-0.2391	0.4275	0.4273	0.4093	0.3589	0.2524	0.1776	0.4589	1.0000	0.2301	0.3387
DTXGDP	0.1266	0.0521	0.4711	0.1614	0.3290	0.1183	0.1160	-0.2008	0.2304	0.2301	1.0000	0.1293
GGDP	-0.0207	0.1084	0.2977	0.1874	0.5387	0.9812	0.1416	-0.5636	0.6130	0.3387	0.1293	1.0000

Source: (Mensah, 2020). Correlation Test. Data generated through Eviews9.5. Note: Pairing values greater than 50% = High correlation.

As a result of the high correlation pairing values as captured in Table HGK8, DLGDP_P_CPT, DINFLATN, DSTK_TRD_TRN and DM2_GDP were dropped.

Cointegration Test and Results

Several pre-testing were done; hence it became necessary to remove additional variables such as DLLISTED, DFDI_2GDP and DTXGDP to make the set of variables cointegrated. Also, DFDI_2GDP and DTXGDP values in an initial regression were not relevant to the model. Variables were tested for cointegration subsequently. The hypotheses set are:

Null hypothesis (H_0): Series are not cointegrated

Alternative hypothesis (H_1): Series are cointegrated

The results are captured in Table HGK 9.

Table 95HK8A: Cointegration Test (Trace) - Hong Kong (Model Two)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
None *	0.975910	177.7072	95.75366	0.0000
At most 1 *	0.861883	99.46204	69.81889	0.0000
At most 2 *	0.772051	57.88938	47.85613	0.0043
At most 3	0.524427	26.83804	29.79707	0.1057
At most 4	0.293220	11.23010	15.49471	0.1977
At most 5 *	0.171163	3.942358	3.841466	0.0471

Source: (Mensah, 2020.) Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegration Rank Test (Trace)

Table 96HK8B: Cointegration Test Results - Hong Kong (Model Two)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.975910	78.24514	40.07757	0.0000
At most 1 *	0.861883	41.57266	33.87687	0.0050
At most 2 *	0.772051	31.05134	27.58434	0.0172
At most 3	0.524427	15.60794	21.13162	0.2486
At most 4	0.293220	7.287744	14.26460	0.4557
At most 5 *	0.171163	3.942358	3.841466	0.0471

Source: (Mensah, 2020) Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

From the results, the null hypothesis is rejected, and the alternative hypothesis accepted. The null hypothesis was rejected because the test results indicated a p-value of less than 5% (p<5%). The series are cointegrated.

Regression Results

As shown in Table HGK10, GGDP has a coefficient of 474.2721 though positive, it is insignificant. D__GDSVNGS_2GDP has a coefficient of -11.73802 and insignificant. DFRX has a coefficient of -1129.121 and not significant. DBREEIS_IDX has a coefficient of -465.2150 and not significant. On the other hand, DSTK_TRD_VL has a coefficient of 0.767201 but not statistically significant; likewise, DMKT_CAP2GDP(-1) and GGDP(-1) have coefficients of -0.557073 and -1554.750, respectively. The R-Squared value is 0.6765, implying that 67.65% accounted for the variations in the dependent variable, while 32.35% accounted for the unobserved factors. The F-statistic also indicated a value of 4.184092 and a p-value of 0.01095, less than 5%, implying that the independent variables jointly explained the dependent variable.

Table 97HK9: Regression Test Results - Hong Kong (Model Two)

Variable (Regressors)	Coefficient	Std. Error	t-Statistic	Prob.
C	92.57591	49.77447	1.859908	0.0840
GGDP	474.2721	1026.512	0.462023	0.6512
D__GDSVNGS_2GDP	-11.73802	32.30651	-0.363333	0.7218
DFRX	-1129.121	2741.075	-0.411926	0.6866
DSTK_TRD_VL	0.767201	0.256925	2.986086	0.0098
DBREEIS_IDX	-465.2150	482.2200	-0.964736	0.3510
DMKT_CAP2GDP(-1)	-0.557073	0.216031	-2.578670	0.0219
GGDP(-1)	-1554.750	949.8627	-1.636816	0.1239
R-squared	0.676590	Mean dependent var	36.20915	
Adjusted R-squared	0.514884	S.D. dependent var	223.1858	
S.E. of regression	155.4495	Akaike info criterion	13.20581	
Sum squared resid	338303.6	Schwarz criterion	13.60255	
Log likelihood	-137.2639	Hannan-Quinn criter.	13.29927	
F-statistic	4.184092	Durbin-Watson stat	2.144697	
Prob(F-statistic)	0.010951			

Source: (Mensah, 2020) Dependent Variable: DMKT_CAP2GDP. Data Output via Eviews9.5
Method: Least Squares (NLS and ARMA), regression.

Table 98HK10: Serial Correlation Test Results - Hong Kong (Model Two)

F-statistic	0.257133	Prob. F(2,10)	0.6206
Obs*R-squared	0.426708	Prob. Chi-Square(2)	0.5136

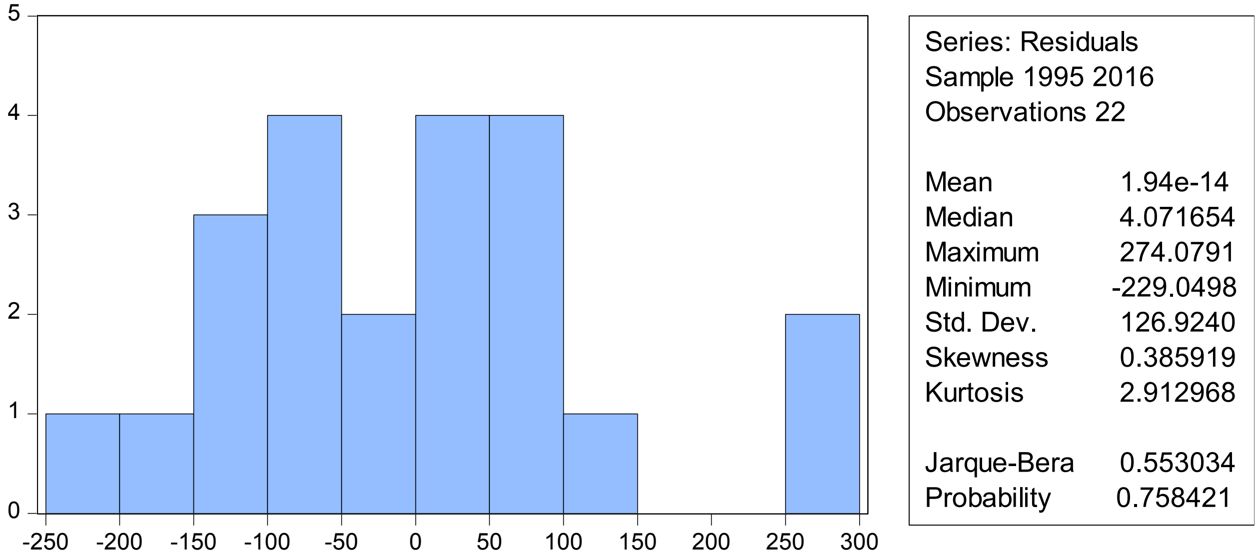
Source: (Mensah, 2020). Method: Breusch-Godfrey Serial Correlation LM Test. Generated by Eviews9.5

Table 99HK11: Heteroskedasticity Test Results - Hong Kong (Model Two)

F-statistic	1.116166	Prob. F(8,12)	0.4058
Obs*R-squared	7.880083	Prob. Chi-Square(8)	0.3433
Scaled explained SS	3.085488	Prob. Chi-Square(8)	0.8770

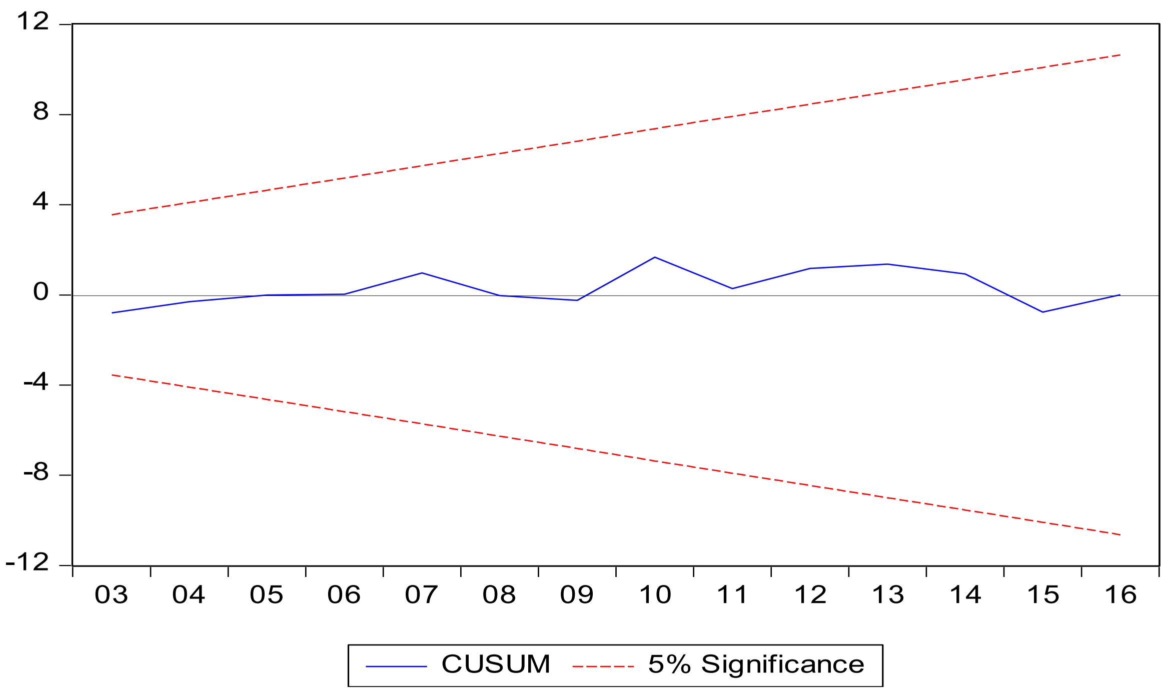
Source: (Mensah, 2020). Method: Heteroskedasticity Test- Breusch-Pagan-Godfrey. Generated through Eviews9.5

Figure 53HK2: Normality Test - Hong Kong (Model Two)



Source: (Mensah, 2020). Normality test (data) through Eview9.5

Figure 54HK2: Cumulative Sum of Recursive Estimates - Hong Kong (Model Two)



Source: (Mensah, 2020). Stability Test. Data generated through Eviews9.5

Robustness Test Results

Robustness tests were carried out on the variables, and the results are reported below:
Hypotheses set are:

H0: No serial correlation

H1: There is a serial correlation

From the tables above, P- value is more than 5% (P>5%,) therefore, the null hypothesis is accepted. P-value of the observed R-squared is 0. 0.5136, thus 51.36 %, which is more than 5%. This implies that there is no serial correlation.

The heteroskedasticity test was undertaken, and the results are shown in Table 99HK11.

Hypotheses set for the test are:

Null hypothesis H_0: residuals (u) homoscedastic

Alternative H_1: residuals (u): heteroscedastic

The study cannot reject the null hypothesis. The p-value is more than 5% (P>5%) of the observed R-squared, thus a p-value of 0.8770 (87.7%), residuals have constant variance, which is desirable, implying that residuals are homoscedastic.

The normality test results show a P – value> 5%, thus 75.8 % with Jarque –Bera of 0.553034 in the fig above.

The study tested for stability of model and results are shown in the figure above. A cumulative sum of recursive estimates was run at a CUSUM test of 5% level of significance. The CUSUM is within the dotted lines; thus, the model is stable. In summary, the regression model of stock market development (stock traded value) on GDP growth is fit.

Discussion of the Results of Model Two (2)

Stock market development on economic growth of Hong Kong has been tested and analyzed. The results proclaim that stock market development has no effect or negligible influence on economic growth. This is in line with the hypothesis (2a) which is H_0- Null hypothesis: There is a no relationship (negligible effect) between stock market development and economic growth in the sampled country or countries. This is in line with the works of Shan et al., (2001) and reverse to the work of Ikikii & Nzomoi (2013), Rahman & Salahuddin (2010), and Enisan & Olufisayo (2009). Results from model two reveal that economic growth has a positive influence on stock market development through market capitalization ratio. The Impact, though not significant, it enlightens that GDP growth is necessary for the market size to develop. The banking sector development through D__GDSVNGS_2GDP has a negative influence on the stock market development through DMKT_CAP2GDP. The market cannot develop without the presence of the banking sector through the injection of money management and financial services. This implies that the presence of the activities of the sector boost the stock market development all other things being equal.

DSTK_TRD_VL positively influenced stock market development through DMKT_CAP2GDP, though the impact is negligible, it moves in the same direction with market DMKT_CAP2GDP; thus, any movement of DSTK_TRD_VL affects DMKT_CAP2GDP. DSTK_TRD_VL's positive influence also stems from the fact that stock market development also depends on its indicators by also serving a complementing role with GDP growth.

Finally, DMKT_CAP2GDP (-1) negatively and significantly influenced stock market development. Likewise, GGDP (-1) has negatively influenced stock market development; however, the impact is negligible. Though the results indicated only two statistically significant variables on the model, it looks good, considering its robustness. In summary, from the results, the inference here is that the magnitude of liquidity is very imperative in the stock market development alongside GGDP; however, their effects are very minimal for Hong Kong.

SOUTH AFRICA

Results of Model one (1)

Model one is designed as economic growth on stock market development. The test procedures were followed accordingly.

Unit Root Test

All the series were tested for individual unit roots at all stages- ‘‘level and first difference at both individual intercept/ individual intercept and trend’’ respectively. The results are captured in Table 100ZA1.

Variables such as LGDP_P_CPT, M2_GDP and LLISTED_COYS were dropped due to unit roots in them. The remaining variables are stationary at ‘‘first difference and individual intercept’’ (each has no unit root); thus, series have their p-values less than 5%.

Table 100ZA1: ADF Unit Root Tests Results - South Africa (Model One)

VARIABLES	LEVEL				1^{ST} DIFFERENCE			
	INDIVIDUAL INTERCEPT		INTERCEPT AND TREND		INDIVDUAL INTERCEPT		INTERCEPT AND TREND	
	Stats	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**	**Stats**	**Prob**
GDSVNGS_2GDP	-3.004861	0.0222	-3.632896	0.0834	-3.004861	0.0141	-3.632896	0.0610
BREEIS_IDX	-3.029970	0.0005	-3.673616	0.0034	-3.040391	0.0001	-3.690814	0.0004
DM_CRD__PRV_2GDP	-2.998064	0.2382	-3.622033	0.2414	-3.004861	0.0006	-3.632896	0.0045
FDI_2GDP	-2.998064	0.0010	-3.622033	0.0065	-3.020686	0.0002	-3.658446	0.0007
FRX	-2.998064	0.9740	-3.632896	0.6406	-3.004861	0.0460	-3.632896	0.1292
GGDP	-3.004861	0.0530	-3.632896	0.1728	-3.020686	0.0014	-3.658446	0.0068
INFLATN	-2.998064	0.0054	-3.658446	0.0070	-3.004861	0.0000	-3.632896	0.0000
LGDP_P_CPT	-3.004861	0.5377	-3.632896	0.5345	-3.004861	0.0634	-3.632896	0.1987
LLISTED_COYS	-3.012363	0.0703	-3.632896	0.0703	-3.012363	0.0609	-3.673616	0.1181
M2_GDP	-3.004861	0.5363	-3.632896	0.7999	-3.004861	0.0729	-3.632896	0.1753
MKT_CAP2GDP	-2.998064	0.3637	-3.622033	0.0400	-3.012363	0.0002	-3.644963	0.0009
STK_TRD_TRN	-2.998064	0.2457	-3.673616	0.0032	-3.004861	0.0005	-3.632896	0.0029
STK_TRD_VAL__GDP	-2.998064	0.9268	-3.690814	0.0145	-3.004861	0.0422	-3.632896	0.1631
TX2GDP	-2.998064	0.5392	-3.632896	0.0737	-3.004861	0.0129	-3.632896	0.0546

Source: (Mensah, 2020). ADF Unit root tests for the variables in levels at 5% significance. Notes: * and ** denote stationary and non-stationary respectively.

Note: The symbols of the variables changed after first differencing and stationarity test.

Table 101ZA2: Correlation Test Results - South Africa (Model One)

Series	D__GDSVNGS_2GDP	DBREES_IDX	DDM_CRD__PRV_2GDP	DFDI_2GDP	DFRX	DINFLATN	DMKT_CAP2GDP	DSTK_TRD_TRN	DSTK_TRD_VL	DTX2GDP
D__GDSVNGS_2GDP	1.00000	0.01467	-0.04603	0.10022	0.38350	0.27236	-0.33160	0.35213	-0.00621	-0.11022
DBREES_IDX	0.01467	1.00000	0.15583	-0.01744	0.04463	0.12493	0.10627	0.28967	0.48088	0.23058
DDM_CRD__PRV_2GDP	-0.04603	0.15583	1.00000	0.51140	-0.11814	-0.35001	0.07032	0.07405	0.25521	0.40699
DFDI_2GDP	0.10022	-0.01744	0.51140	1.00000	0.05286	-0.18945	-0.16964	-0.21529	-0.22683	0.19688
DFRX	0.38350	0.04463	-0.11814	0.05286	1.00000	0.56661	0.02852	0.27391	0.29192	-0.08904
DINFLATN	0.27236	0.12493	-0.35001	-0.18945	0.56661	1.00000	0.11698	0.39043	0.41761	-0.03347
DMKT_CAP2GDP	-0.33160	0.10627	0.07032	-0.16964	0.02852	0.11698	1.00000	-0.41819	0.64418	-0.17375
DSTK_TRD_TRN	0.35213	0.28967	0.07405	-0.21529	0.27391	0.39043	-0.41819	1.00000	0.35566	0.29911
DSTK_TRD_VL	-0.00621	0.48088	0.25521	-0.22683	0.29192	0.41761	0.64418	0.35566	1.00000	0.05059
DTX2GDP	-0.11022	0.23058	0.40699	0.19688	-0.08904	-0.03347	-0.17375	0.29911	0.05059	1.00000

Source: (Mensah, 2020). Correlation test results. Generated through Eviews9.5
Standard set: Any pairing above 50% is regarded as high correlation and dropped.

From the results above, DMKT_CAP2GDP, DINFLATN and DFDI_2GDP were dropped because of high correlation pairing values. Subsequently, the series were pre-tested for both cointegration and regressions tests, respectively. DSTK_TRD_TRN and DM_CRD__PRV_2GDP were also dropped due to the above (they did not make any practical sense to ensure cointegration and good regression. The results are captured in Table 102ZA3 and 103ZA4 below.

Cointegration Test and Results

The variables were tested for cointegration, and the results are displayed in Table 102ZA3 below.

Hypothesis set for the test are below:

Null hypothesis (H0): Series are not cointegrated

Alternative hypothesis (H1): Series are cointegrated

Table 102ZA3A: Cointegration Test (Trace) - South Africa (Model One)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
None *	0.988580	210.2313	95.75366	0.0000
At most 1 *	0.931968	120.7830	69.81889	0.0000
At most 2 *	0.881310	67.02735	47.85613	0.0003
At most 3	0.594587	24.40247	29.79707	0.1840
At most 4	0.267142	6.345485	15.49471	0.6547
At most 5	0.006450	0.129423	3.841466	0.7190

Source: (Mensah, 2020) Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegration Rank Test (Trace

Table 103ZA3B: Cointegration Test Results - South Africa (Model One)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.988580	89.44832	40.07757	0.0000
At most 1 *	0.931968	53.75564	33.87687	0.0001
At most 2 *	0.881310	42.62488	27.58434	0.0003
At most 3	0.594587	18.05698	21.13162	0.1277
At most 4	0.267142	6.216062	14.26460	0.5856
At most 5	0.006450	0.129423	3.841466	0.7190

Source: (Mensah, 2020) Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

As displayed in Table 10ZA3A, the trace test indicates the existence of three (3) cointegrating equations at 5% level. The null hypothesis is rejected, and the alternative hypothesis is accepted. The maximum Eigenvalue test also indicates below three (3) cointegrating equations at 5% level; also, the null hypothesis is rejected, and the alternative hypothesis accepted. The series are cointegrated, thus have a long-run association.

Regression Test/Results

Model One

In carrying out the regression, hypotheses were stated, and consequently, tests were undertaken.

Null hypothesis H_0: β1= β2= β3= β4= β5= β6=0

Alternative hypothesis H_1: ≠ 0 (not all are simultaneously equal to 0)

- β1DSTK_TRD_VL
- β2D__GDSVNGS_2GDP
- β3DFRX
- β4DBREEIS_IDX
- β5DTX2GDP
- β6GGDP(-1)

Table 104ZA4: Regression Test Results - South Africa (Model One)

Variable (Regressors)	Coefficient	Std. Error	t-Statistic	Prob.
C	0.060562	0.029744	2.036105	0.0611
DSTK_TRD_VL	-0.000582	0.001819	-0.320193	0.7536
D__GDSVNGS_2GDP	0.029663	0.035493	0.835748	0.4173
DFRX	-0.109252	0.025988	-4.203992	0.0009
DBREES_IDX	1.924383	0.851138	2.260952	0.0402
DTX2GDP	-0.082251	0.029519	-2.786323	0.0146
GGDP(-1)	-0.355558	0.162613	-2.186537	0.0463
R-squared 0.693107		Mean dependent var -0.008738		
Adjusted R-squared 0.561582		S.D. dependent var 0.175459		
S.E. of regression 0.116177		Akaike info criterion -1.206206		
Sum squared resid 0.188959		Schwarz criterion -0.858032		
Log likelihood 19.66516		Hannan-Quinn criter. -1.130643		
F-statistic 5.269761		Durbin-Watson stat 1.279077		
Prob(F-statistic) 0.004949				

Source: (Mensah, 2020). Dependent Variable: GGDP. Source: Data Output via Eviews9.5
Method: Least Squares (NLS and ARMA) regression.

From the regression results displayed in Table 104ZA4, DSTK_TRD_VL has a negative coefficient of -0.000582 and it is not statistically significant. D__GDSVNGS_2GDP on the hand has a positive coefficient of 0.029663, but not statistically significant. DFRX, DBREES_IDX, DTX2GDP and GGDP (-1) have coefficients of -0.109252, 1.924383, -0.082251 and -0.355558 respectively. Additionally, they are all statistically significant.

The R-square, which is the coefficient of determination, is 0.693107 (i.e. 69.3% accounted for variations on the dependent variable), while 21.7% accounted for unobserved factors. F-statistic is 5.269761 and has a P-value of 0.004949, thus less than 5%, implying that all the independent variables jointly explained the dependent variable (GGDP).

Robustness Test

The study undertook a sequence of robust tests based on the final regression tests to find out if the model was appropriate. A serial correlation test was undertaken, with hypotheses set below:

H_0: No serial correlation

H_1: There is serial correlation

From, the above, and in Table 105ZA4, the results indicated that the null hypothesis could not be rejected, because the p-value of the observed R-squared is 0.0761, thus 7.61%, which is more than 5% (p>5%), therefore there is no serial correlation in the variables.

Table 105ZA5: Serial Correlation Test - South Africa (Model One)

F-statistic	1.949961	Prob. F(2,10)	0.1848
Obs*R-squared	5.150866	Prob. Chi-Square(2)	0.0761

Source: (Mensah, 2020). Method**:** Breusch-Godfrey Serial Correlation LM Test. Generated by Eviews9.5

Heteroscedasticity test was undertaken, and results captured clearly in Table 106ZA6 with the hypotheses set below:

Null hypothesis H_0: Residuals (u) homoscedastic

Alternative H_1: Residuals (u): heteroscedastic

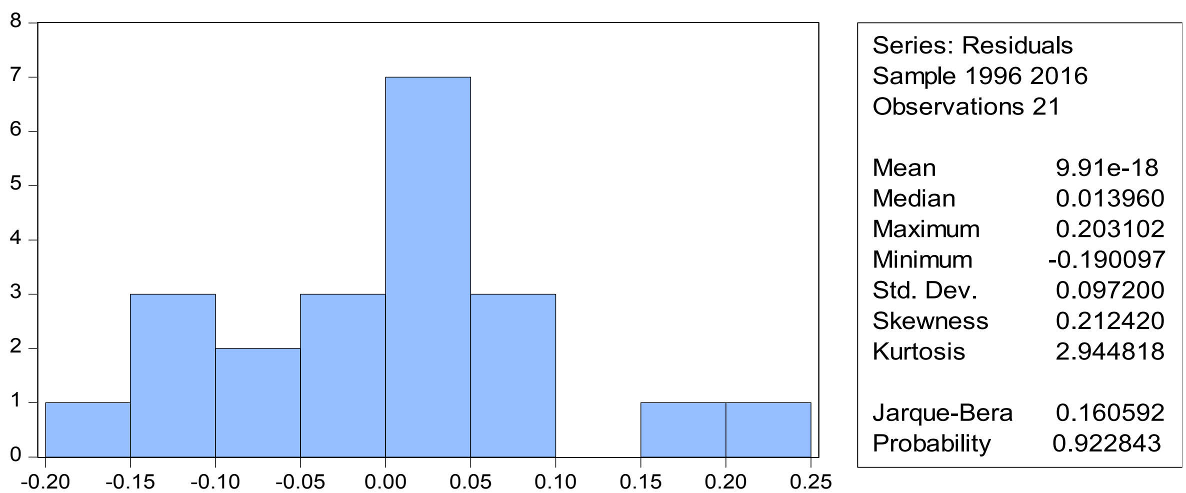
Cannot reject null hypothesis because the p-value (P>5%) of the observed R-squared, thus a p-value of 0.7978 (79.78%), residuals have constant variance which is desirable, implying that residuals are homoscedastic.

Table 106ZA6: Heteroskedasticity Test - South Africa (Model One)

F-statistic	1.202764	Prob. F(8,12)	0.3606
Obs*R-squared	7.142915	Prob. Chi-Square(8)	0.3078
Scaled explained SS	3.087037	Prob. Chi-Square(8)	0.7978

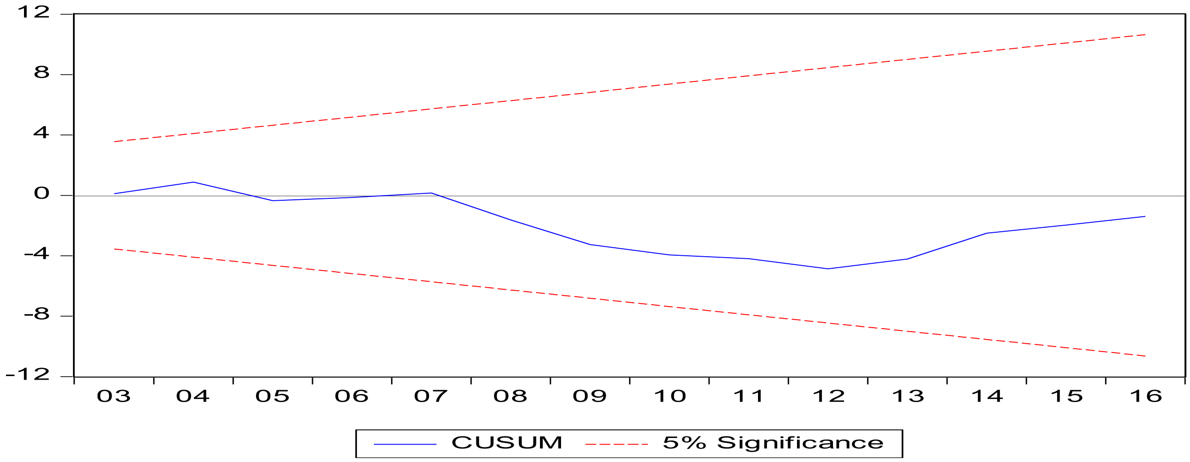
Source: (Mensah, 2020). Method: Heteroskedasticity Test- Breusch-Pagan-Godfrey. Generated by Eviews9.5

Figure 55ZA1: Normality Test - South Africa (Model One)



Source: (Mensah, 2020). Normality Test. Generated by Eviews9.5

Figure 56ZA1: Cumulative Sum of Recursive Estimates - South Africa (Model One)



Source: (Mensah, 2020). Stability Test. Data generated through Eviews9.5

Normality test was undertaken on the model. The results indicated a P – value> 5%, thus 92.228 % with a Jacque-Bera value of 0.160. The residuals follow a normal distribution, as shown in figure SA1 above. Finally, the study carried out a stability test by running the recursive estimates, CUSUM method. Figure 56ZA1 shows two straight dotted lines within which has the lop-sided line represent critical bounds at 5% significance level. The regression model of GDP growth on the stock market development (stock traded value) is fit.

Discussion of the Results of Model One (1)

Economic growth on stock market development of South Africa has been tested and analysed. From regression results shown in Table SA5 and what has been considered for the study, the results proclaim that stock market development does not have an effect on economic growth (negligible effect). This is in line with the hypothesis (1a) which is H_0- Null hypothesis: There is no relationship (negligible effect) between economic growth and the stock market development in the sampled country or countries; and confirmed by the works of Oya & Domar (2006), Charif, (2001), Haque (2013), Ake & Ognaligui (2010) and Saba & Ghulam (2017.

The results from GGDP on stock market development has come out with exciting results. Stock market development through stock traded value positively influenced GGDP, though inimical and insignificant. This is implying that attempts to develop the stock market instead affected GGDP negatively in South Africa for the period (1993-2016) under investigation. In another vein, GGDP (-1) negatively influenced the current period's GGDP. This is attributed to the spillover effect from the previous economic imbalances for the period in South Africa.

The banking sector development through D_GDSVNGS_2GDP positively influenced GGDP, and significant for the period. The signal here is that GGDP is contingent on the development of the banking sector unswervingly in South Africa. Additionally, the banking sector development moves in tandem with stock market development to enhance economic growth. This confirms the findings of Masih and Peters (2010) and Singh (2010), that savings have a positive effect on economic growth.

The macroeconomic environment is very imperious in achieving GGDP growth. This has been evidenced through the exchange rate. The depreciation DFRX affects GGDP. Without sound economic triggers, the stock market cannot enhance economic growth. DTX2GDP negatively influenced economic growth. This is implying that tax revenue affects stock market development transcending onto economic growth. When investors are taxed, it affects channeling of private equity funds and gross domestic savings to stock markets. This goes a long way to affect economic growth. This is a circular flow linking GGDP, which has been evidenced in South Africa over the period. This finding confirms the findings of studies such as Gemmell, Kneller & Sanz (2010), Romer & Romer (2010), Barro & Redlick (2011) and Ferede & Dahlby (2012), which all find a negative relationship between tax revenue to GDP ratio and economic growth.

DBREES_IDX is very critical in economic development; it positively influenced the GGDP significantly over the period. This suggests that other economic pillars (i.e. institutional structures, technology/innovation and financial factors such as business sophistication, access to market, research & development, innovation, access to credit, easiness to banks, and availability of venture capital) are all very imperative in complementing the enhancement of economic growth. The stock market development alone cannot influence GGDP growth in South Africa. These factors mentioned complement stock market development and GGDP.

Results Model Two (2)

Model two (2) is designed as stock market development on economic growth. As stated for the procedure of undertaking this study, unit root tests were adequately undertaken for the variables in model one (1) as indicated in Table 100ZA1.

LGDP_P_CPT, M2_GDP and LLISTED_COYS were dropped due to unit roots in them. The remaining variables are stationary at ‘‘first difference and individual intercept’’ (each has no unit root); thus, the series have their p-values less than 5%.

Correlation Test/Analysis

A correlation test/analysis was undertaken without the main stock market development indicator because it is used as the dependent variable in model two (2). The results are displayed in Table 107ZA7.

Table 107ZA7: Correlation Test Results - South Africa (Model Two)

Series	D__GDSVNGS_2GDP	DBREES_IDX	DFRX	DTX2GDP	DGGDP	DDM_CRD__PRV_2GDP	DFDI_2GDP	DINFLATN	DMKT_CAP2GDP	DSTK_TRD_TRN
D__GDSVNGS_2	1.00000	0.01622	0.38705	-0.10410	-0.04267	-0.04931	0.09887	0.30892	-0.33789	0.35278
DBREES_IDX	0.01622	1.00000	0.04366	0.22931	0.23122	0.15736	-0.01681	0.12353	0.10853	0.28977
DFRX	0.38705	0.04366	1.00000	-0.09447	-0.53030	-0.11628	0.05398	0.58491	0.03180	0.27415
DTX2GDP	-0.10410	0.22931	-0.09447	1.00000	-0.33208	0.41617	0.20122	-0.07483	-0.16654	0.30112
DGGDP	-0.04267	0.23122	-0.53030	-0.33208	1.00000	-0.07643	-0.20520	-0.38542	0.10751	-0.27351
DDM_CRD__PR	-0.04931	0.15736	-0.11628	0.41617	-0.07643	1.00000	0.51093	-0.35270	0.06668	0.07414
DFDI_2GDP	0.09887	-0.01681	0.05398	0.20122	-0.20520	0.51093	1.00000	-0.19144	-0.17217	-0.21537
DINFLATN	0.30892	0.12353	0.58491	-0.07483	-0.38542	-0.35270	-0.19144	1.00000	0.15000	0.41238
DMKT_CAP2GD	-0.33789	0.10853	0.03180	-0.16654	0.10751	0.06668	-0.17217	0.15000	1.00000	-0.41943
DSTK_TRD_TRN	0.35278	0.28977	0.27415	0.30112	-0.27351	0.07414	-0.21537	0.41238	-0.41943	1.00000

Source: (Mensah, 2020). Correlation test results. Generated through Eviews9.5Standard set: Any pairing above 50% is regarded high correlation and variables above are dropped.

From the table above, DFRX and DFDI_2GDP were dropped because they were highly correlated to GGDP and DM_CRD__PRV_2GDP, respectively. At the same time, DFRX was correlated to DINFLATN. Following the correlation test, the study did a pretesting of the variables for cointegration and regression. Subsequently, some variables were dropped, and these include DINFLATN, DSTK_TRD_VAL__GDP and DGDSVNGS_2GDP. Results of the cointegration test is captured in Table 108ZA8 below.

Table 108ZA8A: Cointegration Test Results (Trace) - South Africa (Model Two)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
None *	0.922696	139.2360	95.75366	0.0000
At most 1 *	0.817432	88.03574	69.81889	0.0009
At most 2 *	0.669262	54.02314	47.85613	0.0118
At most 3 *	0.587312	31.89459	29.79707	0.0283
At most 4	0.434049	14.19331	15.49471	0.0778
At most 5	0.131005	2.808355	3.841466	0.0938

Source: (Mensah, 2020) Trace test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegration Rank Test (Trace)

Table 109ZA8B: Cointegration Test Results (Maximum Eigenvalue) - South Africa (Model Two)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.922696	51.20022	40.07757	0.0019
At most 1 *	0.817432	34.01260	33.87687	0.0482
At most 2	0.669262	22.12855	27.58434	0.2139
At most 3	0.587312	17.70128	21.13162	0.1414
At most 4	0.434049	11.38495	14.26460	0.1359
At most 5	0.131005	2.808355	3.841466	0.0938

Source: (Mensah, 2020) Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

As displayed in the tables above, the variables are cointegrated, thus have a long-run association.

Regression Test/Results (for model 2)

Null hypothesis H_0: β1= β2= β3= β4= β5= β6=0

Alternative hypothesis H_1: ≠ 0 (not all are simultaneously equal to 0)

- β1DSTK_TRD_VL
- β2D__GDSVNGS_2GDP
- β3DFRX

- β4DBREEIS_IDX
- β5DTX2GDP
- β6GGDP(-1)

Table 110ZA9: Regression Test Results - South Africa (Model Two)

C	1.437243	2.550144	0.563593	0.5814
GGDP	-31.93550	15.85742	-2.013915	0.0623
DMKT_CAP2GDP	0.292559	0.062264	4.698660	0.0003
DTX2GDP	-1.119865	3.184803	-0.351628	0.7300
DDM_CRD__PRV_2GDP	-0.194224	0.566825	-0.342653	0.7366
DBREES_IDX	212.4337	72.05211	2.948334	0.0100
DSTK_TRD_VL(-1)	0.636202	0.293379	2.168531	0.0466
R-squared	0.733709	Mean dependent var	5.769826	
Adjusted R-squared	0.627193	S.D. dependent var	17.32875	
S.E. of regression	10.58057	Akaike info criterion	7.809287	
Sum squared resid	1679.227	Schwarz criterion	8.156437	
Log likelihood	-78.90216	Hannan-Quinn criter.	7.891065	
F-statistic	6.888241	Durbin-Watson stat	2.116984	
Prob(F-statistic)	0.001159			

Source: (Mensah, 2020). Dependent Variable: DSTK_TRD_VL. Source: Data Output via Eviews9.5 Method: Least Squares (NLS and ARMA), regression.

From the regression results displayed in Table 110ZA9, GGDP, DTX2GDP and DDM_CRD__PRV_2GDP) have coefficients of -31.93550, -1.119865, and -0.194224 in that order, also, they are not statistically significant. DMKT_CAP2GDP), DBREES_IDX and DSTK_TRD_VL(-1) have coefficients of 0.292559, 212.4337 and 0.636202 respectively, additionally, they are statistically significant.

The R-square, which is the coefficient of determination is 0.733709 (i.e. 73.37%) accounted for variations in the dependent variable, while 26.63% accounted for unobserved factors. F-statistic is 6.888241 and has a P-value of 0.001159, thus less than 5%, implying that all the independent variables jointly explained the dependent variable (stock traded value).

Robustness Test

A series of orderly robust tests were undertaken to ascertain the veracity of the variables. A serial correlation test was undertaken, with hypotheses set below:

H_0: No serial correlation

H_1: There is a serial correlation

From the above, and in Table 111ZA10, the results indicated that the null hypothesis could not be rejected, because the p-value of the observed R-squared is 0.0761, thus 7.61%, which is more than 5% (p>5%) therefore there is no serial correlation in the variables.

Table 111ZA10: Serial Correlation Test - South Africa (Model Two)

F-statistic	0.814004	Prob. F(2,10)	0.4644
Obs*R-squared	2.448465	Prob. Chi-Square(2)	0.2940

Source: (Mensah, 2020). Method**:** Breusch-Godfrey Serial Correlation LM Test. Generated by Eviews9.5

Heteroscedasticity test was also undertaken, and the results captured in Table 112ZA11 with the hypotheses set below:

Null hypothesis H_0: Residuals (u) homoscedastic

Alternative H_1: Residuals (u): heteroscedastic

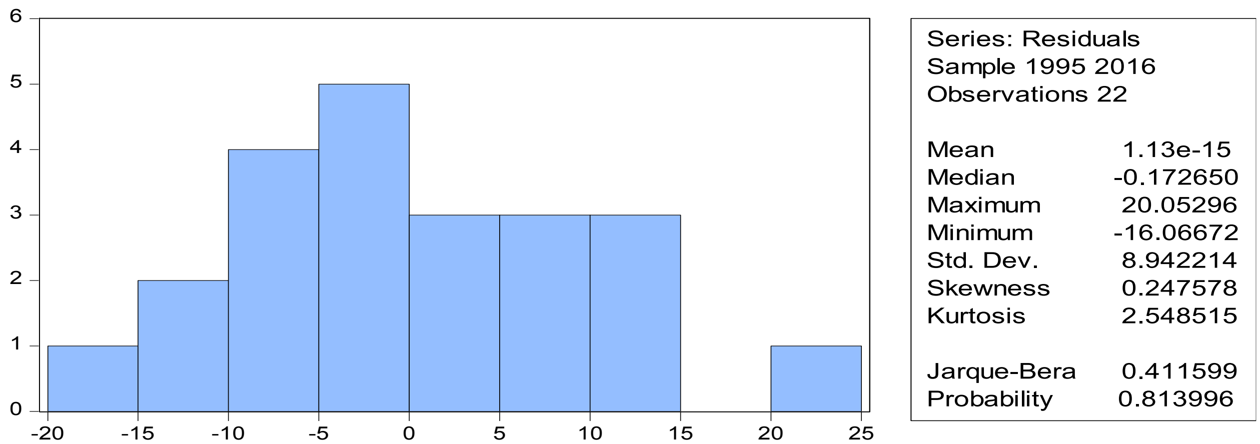
The null hypothesis cannot be rejected because the p-value of the observed R-squared is greater than 5%, thus a p-value of 0.7982 (79.82%), residuals have constant variance, which is desirable, implying that residuals are homoscedastic.

Table 112ZA11: Heteroskedasticity Test - South Africa (Model Two)

F-statistic	1.594747	Prob. F(8,12)	0.2163
Obs*R-squared	8.568158	Prob. Chi-Square(8)	0.1994
Scaled explained SS	3.083970	Prob. Chi-Square(8)	0.7982

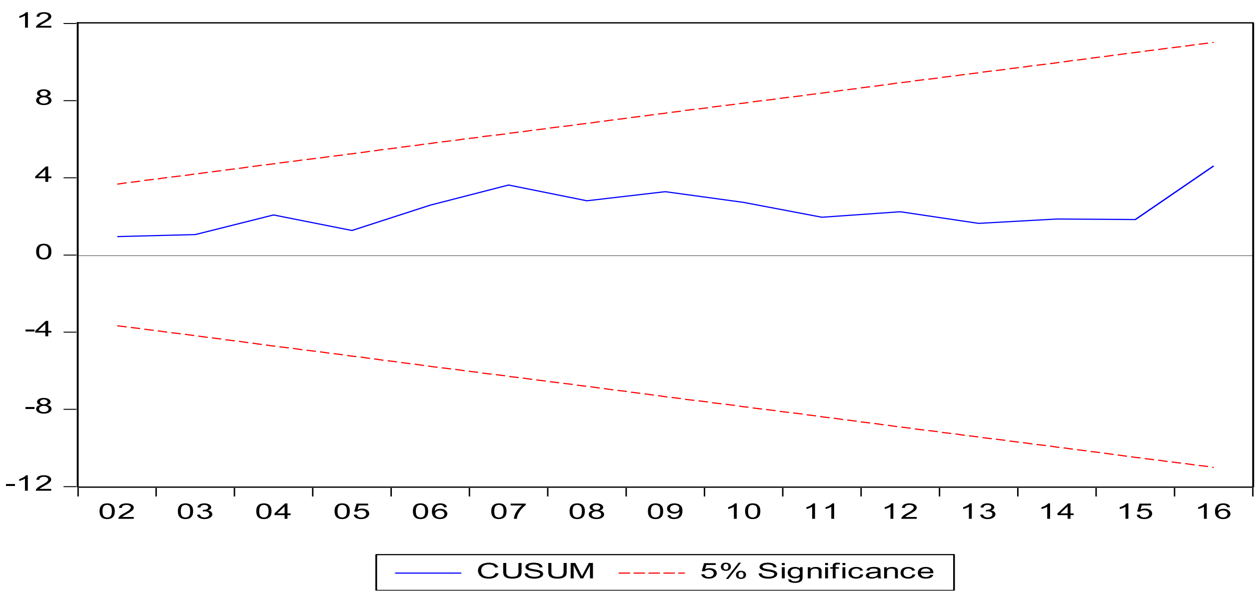
Source: (Mensah, 2020). Method: Heteroskedasticity Test- Breusch-Pagan-Godfrey. Generated by Eviews9.5

Figure 57ZA2: Normality Test - South Africa (Model 2)



Source: (Mensah, 2020). Normality Test. Generated by Eviews9.5

Figure 58ZA2: Cumulative Sum of Recursive Estimates – South Africa (Model 2)



Source: (Mensah, 2020). Stability Test. Data generated through Eviews9.5

The study undertook normality test, and results indicated in figure SA3 show a p-value more than 5% (P – value> 5%), thus 81.39 % with a Jacque-Bera value of 0.411. The residuals follow a normal distribution, as shown in figure SA1 above. Finally, the study carried out a stability test by running the recursive estimates, CUSUM method. Figure SA4 shows two straight dotted lines within which is a lop-sided line representing critical bounds at 5% significance level. The regression model of stock market development (stock traded value) on GDP growth is fit.

Discussion of the Results of Model Two (2)

Stock market development on economic growth of South Africa has been tested and analyzed. The results proclaim that economic growth does not influence stock market development. This is in line with the hypothesis (2b) which is H_0- Null hypothesis: There is no relationship or (negligible effect) between stock market development and economic growth in the sampled country or countries). This is in line with the works of Shan et al., (2001) and reverse to the work of Ikikii & Nzomoi (2013), Rahman & Salahuddin (2010), and Enisan & Olufisayo (2009). Following the results from model two (i.e. stock market capitalization ratio on GDP growth), the latter negatively influenced stock market development through DSTK_TRD_VL__GDP, though not significant, thus for the entire period under investigation in South Africa, economic growth negatively affected stock market development, a situation, rather interesting. DMKT_CAP2GDP, also an indicator of the stock market development positively and significantly influenced the market. GGDP negatively affected stock market development through DMKT_CAP2GDP. In another vein, DSTK_TRD_VL (-1) value positively influenced the development of the market through its current period. DTRX, on the other hand, negatively influenced stock market development through DSTK_TRD_VL, though minimal. DTRX thus collected the needed funds from investing in the stock market and another instance, complementing GGDP to influence stock markets. The banking sector development through DDM_CRD__PRV_2GDP negatively influenced the stock market development. In South Africa, for the period under investigation, an increase in domestic credit to private businesses affected liquidity in the stock market. Investors rather took credits from the banks rather than going to the stock market. The banking sector development, thus runs rivalry with stock market development. This also enhances competition between the stock market and the banking sector. DBREES_IDX positively influenced the stock market development through DSTK_TRD_VL. This suggests that other economic pillars (i.e. institutional structures, technology/innovation and financial factors such as business sophistication, access to market, research & development, innovation, access to credit, easiness to banks, availability of venture capital) are all very imperative in complementing the enhancement of the stock market development in South Africa.

It is evidenced that without these factors mentioned, the stock market cannot develop in isolation. Robust institutions are seen as a way of sustaining investor's confidence in brokers and other capital intermediaries and stakeholders. It safeguards fair play and transparency in the market operations, thus reassures investment and trading in the stock market. In summary, GGDP negatively influenced the stock market development in South Africa between 1993 and 2016.

Chapter 5: Conclusions, Implications and Recommendation

Introduction

Chapter five validates the importance of the research results. The topic of this dissertation is “Stock Market Development and Economic Growth: Global Perspectives-1993-2016” using a quantitative approach on secondary data (both panel and time series). The specific research problem is that a gap exists in the theoretical literature of stock market development on economic growth and vice versa. Studies posit several opinions on the relationship between stock market development and economic growth. Ikikii & Nzomoi (2013); Rahman & Salahuddin (2010); and Enisan & Olufisayo (2009) establish a positive relationship. Wang & Ajit (2013) found a negative relationship. Oya & Domar (2006); Charif, (2001); Haque (2013); Ake & Ognaligui (2010) and Saba & Ghulam (2017) found a negligible relationship. The purpose of this study is to find out the relationship between the stock market development and economic growth and vice versa. This is to explain and document the perceptions of stakeholders and experts of finance in the development of the financial market (i.e. the stock markets) and what policy prescriptions can help improve systems that are affiliated to the general sector and economic growth. Also, to diversify resource strategies to have a broader view in the sourcing of resources by investors as well as governments, and maintain financial sustainability.

The stratified random sampling method was employed to ensure randomization, diversity within the defined sample groups, to simply and meticulously test the hypotheses in line with the objectives of the study (i.e. there is no relationship or there is a relationship between stock market development and economic growth and vice versa). Data was gathered and explored of the selected countries’ stock markets from four different continents spread under ten geographic zones to achieve the goals of this study. The multiplicity of sources of data collection are WDI, IMF, AfDB, OECD and WEF, gathered on twenty countries globally. The arrangement of the study, as indicated in the methodology chapter, was both panel and time-series data. The geographic zones or groupings include:

1. Panel data for twenty countries' stock markets;
2. Panel data for four countries' stock markets, one from each of the four continents (i.e. rated by the magnitude of financial centres by recognition) - United States, United Kingdom, Hong Kong and South Africa;
3. Panel data for Americas' stock markets - United States, Canada, Mexico, Argentina and Brazil;
4. Panel data for Europe's stock markets - United Kingdom, France, Belgium, Germany and Netherlands;
5. Panel data for Africa's (Sub-Saharan) stock - Cote d'Ivoire, Ghana, Nigeria, South Africa and Mauritius; and
6. Panel data for Asia and Australia - Hong Kong, South Korea, China, India and Australia.

On the other hand, time series data was analyzed for four (4) stock markets, one from each of the four continents, by the magnitude of financial centres by recognition. These include:

7. Time series data - United Kingdom
8. Time series data - United States
9. Time series data - South Africa, and
10. Time series data -Hong-Kong

.

Implications of the Study

Stock markets are well-known to influence growth and development, among other things via market liquidity, ability to mobilize resources for projects and long-term investments. A rise in stock market activity positively influences economic growth by encouraging savings, boosting investment activities, and allocating and utilizing resources in a more efficient manner (Adjasi, 2007). There are divergent views, however, as to whether stock markets play a pivotal role in economic growth. Stiglitz (1985, 1994), believes that stock market development may upset economic growth.

The implications of the results of this study are discussed in this section. This, consequently, summaries the need for this research to explain and codify the understandings of subject matter whizzes in financial markets of the policy prescriptions needed to develop the stock market. This will broaden the financial markets and its sustainability. The study examines the direction of causality between stock market development and economic growth in the sample countries. Though the stock market plays an essential role in fostering economic development, in this study, the results pointing to literature are not definite for all the ten geographic zones. The results reveal a positive relationship for some countries, negative for others while negligible or no effect for others too. The implications of the results are discussed in this section and organised by hypothesis. In this study, ten geographic zones were considered for testing the various relationships outlined above. Definite conclusions were reached based on each hypothesis tested in each case scenario or each geographic zone. General deductions were consequently drawn from each geographic zone's conclusion.

ALL CONTINENTS (TWENTY- FIVE COUNTRIES)

1a) Null hypothesis (H_0): There is no relationship (negligible effect) between economic growth and stock market development in the sampled countries.

1b) Alternative hypothesis (H_1): There is a relationship between economic growth and stock market development in the sampled countries.

For All Continents (i.e. panel data of twenty countries), stock market has no effect on economic growth; thus, there is no relationship. Hypothesis One (1a) – Null Hypothesis (H_0) was not rejected; it was accepted. This implies that there is no relationship between stock market development and economic growth. The results confirm the hypothesis that there is no relationship between the stock market development and economic growth of panel data of twenty countries drawn from ‘four Continents’, namely- United States, Canada, Mexico, Argentina, Brazil, Germany, United Kingdom, France, Netherlands, Belgium, Ghana, Cote d’Ivoire, Nigeria, Mauritius, South Africa, China, Korea, Hong Kong, India, and Australia.

The only significant part is evident in the number of listed companies on the exchanges as compared to capitalization ratio, and stocks traded total value and stock turnover ratios. The banking sector development through its two indicators- gross domestic savings and money supply play significant influences on economic growth. This signals the importance of money supply and liquidity to economic growth. However, their influences are positive and negative respectively, thus conflicting in the panel data of twenty countries of all Continents. In exemption of GDP per capita which plays a significant role in economic growth, other macroeconomic factors- inflation and foreign exchange play insignificant roles, and have negative and positive influences respectively. On the other hand, foreign direct investment and tax revenue play varying influences – negative and positive, respectively, thus play insignificant roles on economic growth. Stock markets are supposed to shield investors from macroeconomic turbulences.

2a) Null hypothesis (H_0): There is no relationship (negligible effect) between stock market development and economic growth of the sampled countries.

2b) Alternative hypothesis (H_1): There is a relationship between stock market development and economic growth of the sampled countries.

All Continents (panel data of twenty countries), economic growth has no significant effect on the stock market development. (Hypothesis Two (2a) - Null hypothesis (H_0) was not rejected; it was accepted. The results confirm the hypothesis that there is no relationship between economic growth and the stock market development of panel data of twenty countries drawn from four continents, namely United States, Canada, Mexico, Argentina, Brazil, Germany, United Kingdom, France, Netherlands, Belgium, Ghana, Cote d'Ivoire, Nigeria, Mauritius, South Africa, China, Korea, Hong Kong, India, and Australia.

. Stock market development's other indicators such as stocks turnover ratio play a significant role, its influence is negative. Stock traded value ratio, on the other hand, has a positive impact on the stock market, and additionally plays a significant role. These two variables are indications of liquidity on the exchanges. Primarily, liquidity relates to the riskiness of the investment. An investment is deemed to be less risky where investors can modify their portfolios speedily and inexpensively.

Furthermore, ideally, apportionment of capital is more efficient, and for that matter, liquid market augments long-term economic growth. The banking sector development through domestic credit to private businesses plays a significant role in the development of the stock market. The positive influence is seen as an accompaniment to the markets in financing investment. Indeed, the stock market cannot develop in isolation without sound macroeconomic environment such as GDP per capita, inflation and exchange rate; however, they play insignificant roles and have negative influences on the stock market in exception of GDP per capita that plays a positive role. Gross domestic savings, foreign direct investment, tax revenue, and institutional, technological/innovative and financial factors have negative influences and play insignificant roles in the stock market development. However, the lags of market capitalization ratio and stocks traded total turnover ratios play significant roles, and have inverse influences on the stock market development. These transmission effects play negative roles which could be due to information, thus show the importance of information of the efficient capital markets.

FOUR BEST COUNTRIES

1a) Null hypothesis (H_0): There is no relationship (negligible effect) between economic growth and stock market development of the sampled countries.

1b) Alternative hypothesis (H1): There is a relationship between economic growth and stock market development of the sampled countries.

For Four Best Countries (panel data of four countries), the stock market development has a significant effect on economic growth. Hypothesis One (1a) – Null Hypothesis (H_0) was rejected; it was not accepted. Hypothesis One (1b) Alternative - hypothesis (H1) was accepted. Consequently, the results confirm the hypothesis that there is a relationship (positive) between economic growth and stock market development of panel data of Four Best Countries, namely- United States, United Kingdom, South Africa and Hong Kong. The stock market development through market capitalization ratio plays a significant role in economic growth. Stocks traded turnover and number of listed companies play no significant roles though their influences are negative. Money supply, an indicator of the banking sector development, plays no significant influence on GDP growth. It has a negative influence on GDP growth. In the same manner, gross domestic savings plays no significant role but has a positive influence. Tax revenue, though has a positive impact on economic growth, plays no significant role. Also, there exists a negative relationship between economic growth and exchange rate. Thus, the fluctuation of the exchange rate has an adverse impact on economic growth. Inflation also plays a significant role on economic growth of these countries and has a positive influence. This implies that inflation enhances GDP growth in the Best Countries. Institutional, technological/innovative and financial factors have negative influences on economic growth, but play insignificant roles for the period covered. The lags of GDP growth and market capitalization ratio play both positive and significant roles on economic growth. This implies that the transmission effects of these variables have positive influences on GDP growth.

2a) Null hypothesis (H_0): There is no relationship (negligible effect) between stock market development and economic growth in the sampled countries;

2b) Alternative hypothesis (H1): There is a relationship between stock market development and economic growth in the sampled countries;

For Four Best Countries (panel data of four countries), economic growth has no significant effect on stock market development. Hypothesis Two (2a) - Null hypothesis (H_0) was not rejected, it was accepted. The results confirm the hypothesis that there is no relationship between the stock market development and economic growth in four ‘Best Performing Countries’, namely, United States, United Kingdom, South Africa and Hong Kong. GDP growth plays no significant role in the interrelationship, though it has a positive influence on stock market development of the above countries. Other stock market development indicators such as stock turnover and stocks traded value ratios have negative and positive influences respectively; they play significant roles on the market capitalization ratio, the main driver of the stock market development. This implies that these variables play complementary roles to develop the market size. Domestic credit to private businesses and money supply on the hand play significant roles and have positive influences on the stock market through market capitalization. The banking sector development indicators are very relevant, thus increases in their activities enhance the stock market rather than oppose it. Foreign direct investment that drives private capital into the economy does not play any significant role on stock market activities. However, it has a corresponding negative influence in the Best Countries. Tax revenue, on the other hand, has a negative influence on stock market activities but plays a significant role. This implies that as taxation increases, it affects funds available to be channelled towards stock market activities in these countries. Inflation in a similar manner plays no significant role, meaning that the macroeconomic environment does not have effects on the stock market development for the period covered. The lag of market capitalization ratio, though it has a negative effect on the market size, it plays a significant role. This implies that the transmission effect adversely affects the market size.

AMERICAS

1a) Null hypothesis (H_0): There is no relationship (negligible effect) between economic growth and stock market development in the sampled countries.

1b) Alternative hypothesis (H_1): There is a relationship between economic growth and stock market development in the sampled countries.

For the Americas (i.e. panel data of five countries), the stock market has no effect on economic growth. Hypothesis One (1a) - (H_0) was not rejected; it was accepted]. This implies that there is no relationship between the stock market development and economic growth. The results confirm the hypothesis (1a) that there is no relationship between the stock market development and economic growth of panel data of five countries of Americas, namely, United States, Canada, Mexico, Argentina and Brazil. From the empirical analysis, the main indicator of the stock market development (market capitalization ratio) though has a positive influence, it plays no significant role on the economic growth. Other stock market indicators such as stock traded turnover ratio and a number of listed companies on the exchanges in a similar manner play no significant roles. GDP per capita, which is an interrelation with GDP growth, plays a very significant role along with other accompanying variables and has a positive effect. Inflation on the hand is very significant and plays its natural role of adverse effect on GDP growth. Gross domestic savings and money supply, which are banking sector indicators, have conflicting influences- negative and positive on GDP growth, are significant. Tax revenue is not significant in GDP growth, though it has a positive influence.

On the other hand, institutional, technological/innovative and financial factors, though have positive influences on economic growth, they play insignificant roles. Similarly, the lag of GDP growth has no significant influence on economic growth, though it is positively related to it. The transmission effect directly influenced GDP growth, however.

2a) Null hypothesis (H_0): There is no relationship (negligible effect) between stock market development and economic growth in the sampled countries.

2b) Alternative hypothesis (H_1): There is a relationship between stock market development and economic growth in the sampled countries

For Americas (panel data of five countries) economic growth has no effect on stock market development. Hypothesis Two (2a) - (H0) null hypothesis was not rejected; it was accepted. The results confirm the hypothesis (2a) that there is no relationship between the stock market development and economic growth of panel data of five countries of Americas, namely, United States, Canada, Mexico, Argentina and Brazil over the period under review.

It is noteworthy that GDP growth negatively influences market capitalization, but the role was not significant. Stocks traded value influences the stock market development through the market size but plays no significant role. This suggests that a hike in the value of the total shares traded both domestic and foreign on the exchanges thus increases market size. The lags of other stock market development variables have negative influences on market size, thus, indicating that spillovers from the previous period have transmitting impacts on stock markets. The impacts are not significant, however. Domestic credit to the private sector significantly and negatively influences the market size. This implies that each time the banking sector extends credit to domestic businesses, it has an opposing effect on the market size. In this regard, it plays a rivalry role with the motive of sourcing funds from there; instead, the banking sector becomes an alternative. Other macroeconomic and growth indicators like foreign direct investment has a negative influence on market capitalization, also plays a significant role. This suggests that when net inflows come into these countries collectively, market capitalization on the stock exchanges are affected adversely. In the same vein, inflation and exchange rate negatively influence the market size, but the roles insignificant. Though other economic pillars (i.e. institutional, technological/innovative and financial factors) are pertinent in stock market development, they do not play any significant role in the Americas, though their influence is positive.

EUROPE

1a) Null hypothesis (H_0): There is no relationship (negligible effect) between economic growth and stock market development of the sampled countries.

1b) Alternative hypothesis (H_1): There is a relationship between economic growth and stock market development of the sampled countries.

For Europe (panel data of five countries), the stock market development has a significant effect on economic growth. Hypothesis One (1b) - Alternative Hypothesis (H_1) was accepted, and the Null Hypothesis (H_0) rejected. Consequently, the results confirm hypothesis (H_1) that there is a negative relationship between economic growth and stock market development of panel data of five countries of Europe, namely- Germany, United Kingdom, France, Netherlands and Belgium.

Gross domestic savings has a negative influence on GGDP over the period, and it plays a significant role. This implies that the high supply of money in Europe has adverse consequences in the run on economic growth. On the other hand, domestic credit to private businesses plays no significant role, but the influence is positive. These two variables are informing the study of the conflicting roles of the banking sector on economic growth. GDP per capita has a positive influence on economic growth and plays a significant role as well in Europe. Tax revenue has a negative effect on economic growth, which could be attributed to the effects of too much taxation. The lag of economic growth has a negative transmission effect on GDP growth. Institutional, technological/innovative and financial factors have negative impacts on GDP growth but plays no significant pertinent role.

2a) Null hypothesis (H_0): There is no relationship (negligible effect) between stock market development and economic growth of the sampled countries.

2b) Alternative hypothesis (H_1): There is a relationship between stock market development and economic growth of the sampled countries

For Europe (i.e. panel data of five countries), economic growth has no effect on stock market development. Hypothesis Two (2a) - (H0) null hypothesis was not rejected; it was accepted. The results confirm the hypothesis (2a) that there is no significant relationship between the stock market development and economic growth of panel data of five countries of Europe, namely - Germany, United Kingdom, France, Netherlands and Belgium.

. GGDP has an inverse relationship with market capitalization ratio but actually, plays no significant role on market capitalization ratio. Gross domestic savings, an indicator of the banking sector development, has a positive influence on stock market development but plays no significant role. Likewise, domestic credit to private businesses plays no significant role but has a negative influence. This is indicative of the fact that when credit from the banking sector to private businesses increases, it affects market capitalization. This implies that the banking sector and stock market moves in the same direction; thus, the stock market needs the banking sector to develop. Stocks traded turnover ratio, a component of the stock market development has a negative influence on the market the stock market. This implies that intensity of how much stocks are traded over the exchanges plays a significant role in the stock market development through market sizes over the period.

On the other hand, tax revenue though has a positive influence, it plays no significant role on the market size. Institutional-technological-innovative and financial factors have no significant impact on the stock market development in Europe, though it has a positive influence.

Likewise, exchange rate, an indicator of the macroeconomics environment has no influence on the stock market development through market capitalization ratio. The lag of market capitalization ratio has a positive transmission and significant effect on stock market development, thus, the transmission effect influences stock market size.

AFRICA

1a) Null hypothesis (H_0): There is no relationship (negligible effect) between economic growth and stock market development of the sampled countries.

1b) Alternative hypothesis (H_1): There is a relationship between economic growth and stock market development of the sampled countries.

For Africa (i.e. panel data of five countries), stock market development has no effect on economic growth. Hypothesis One (1a) – Null Hypothesis (H_0) was not rejected; it was accepted. This implies that there is no relationship between stock market development and economic growth. The results confirm the hypothesis (1a) that there is no relationship between the stock market development and economic growth of panel data of five African countries namely - Ghana, Cote d'Ivoire, Nigeria, Mauritius and South Africa. Though stock market development was inversely related to economic growth, the influence was negligible, thus, plays no significant role. Other stock market development indicators such as the number of listed companies and stocks traded turnover ratio also followed the same trend. Domestic credit to the private businesses, an indicator of banking sector development has a negative and significant influence on GDP growth.

On the other hand, gross domestic savings also an indicator of the banking sector development has a negative influence GDP growth; however, the influence is not significant. Contrarily to the preceding, GDP per capita has a positive influence on GDP growth. This clearly indicates that quality of living really has an influence on how fast the economy is growing. Macroeconomic and other related indicators have varying influences but negligible on economic growth. Inflation and exchange rate have positive influences on economic growth. This implies the macroeconomic environment is a necessary accompaniment for enhancing economic growth. Whilst foreign direct investment has a negative influence, tax revenue contrarily has positive influence on economic growth but they are negligible and play no significant roles. On the other hand, institutional-technological-innovative and financial factors have negative influences on GGDP, however they play insignificant roles. The lag of economic growth has a transmission negative effect on GDP growth, hence plays no significant pertinent role.

2a) Null hypothesis (H_0): There is no relationship (negligible effect) between stock market development and economic growth of the sampled countries.

2b) Alternative hypothesis (H_1): There is a relationship between stock market development and economic growth of the sampled countries

For Africa (i.e. panel data of five countries), economic growth has no effect on stock market development. Hypothesis Two (2a) - (H0) null hypothesis was not rejected, it was accepted. The results confirm the hypothesis (2a) that there is no relationship between the stock market development and economic growth of panel data of five countries of Africa, namely- Ghana, Cote d'Ivoire, Nigeria, Mauritius, South Africa. From empirical results, the study can conclude that economic growth plays no significant role in the stock market development, though has positive influence over it. Just like the former, stock traded value ratio has positive influence over the stock market development. Stock traded turnover ratio on the other hand has negative influence over stock market development but both play no significant roles. The number of listed companies has a negative influence but plays no significant role. Gross domestic savings has a negative influence on market capitalization while domestic credit to private businesses has a positive influence. The two banking sector development indicators do not play significant roles in the market size; additionally, their influences are conflicting. The macroeconomic environment plays no significant role in the stock market development in Africa. Inflation and exchange rate play positive and negative influences, respectively. Institutional-technological-innovative and financial factors have positive influences on the stock market through market capitalization ratio; however, they are not significant. The lags of market capitalization, the stock traded turnover, and stock traded value ratios play significant roles on stock market development. The transmission effects, however, are adverse.

ASIA & AUSTRALIA

1a) Null hypothesis (H_0): There is no relationship (negligible effect) between economic growth and stock market development in the sampled countries.

1b) Alternative hypothesis (H_1): There is a relationship between economic growth and stock market development in the sampled countries.

For Asia & Australia (i.e. panel data of five countries), stock market development has no effect on economic growth. Hypothesis One (1a) – Null Hypothesis (H_0) was not rejected, it was accepted. This implies that there is no relationship between stock market development and economic growth. The results confirm the hypothesis (1a) that there is no relationship between the stock market development and economic growth of panel data of five countries of Asia & Australia namely- China, Korea, Hong Kong, India, and Australia.

Empirical results reveal that gross domestic savings, one of the banking sector development indicators have a positive influence on economic growth, also plays a significant role in the period covered. As gross domestic savings goes up, the banking sector makes the availability of money, thus transmits this effect on to the economy as well. One of the stock market indicators, the number of listed companies, has a positive influence on economy growth and plays a significant role. Thus, when more companies are listed on the stock exchanges, there is enough justification that more capital will be mobilized on the exchanges for long term projects. This conflicts with the results of market capitalization, the main indicator of the stock market. This buttresses the point that the market size has nothing to do with economic growth.

Exchange rate has an inverse influence on economic growth, but it plays no significant role along with market size for the period covered. Though institutional-technological-innovative and financial factors have direct influences on economic growth, they play no significant role. It is seen that the competitiveness of countries in thematic areas of economic development should a strong impact on economic growth. However, in the case of Asia & Australia, though, there exist positive influences, they do not play any significant role. Market capitalization for the current period and its preceding period have inverse influences on economic growth; likewise, they do not play any significant roles. The lag of GDP growth has a positive influence on the current period but plays no significant role.

2a) Null hypothesis (H_0): There is no relationship (negligible effect) between stock market development and economic growth in the sampled countries.

2b) Alternative hypothesis (H_1): There is a relationship between stock market development and economic growth in the sampled countries

For Asia & Australia (panel data of five countries), economic growth has no effect on the stock market development. Hypothesis Two (2a) - (H0) null hypothesis was not rejected, it was accepted. The results confirm the hypothesis (2a) that there is no relationship between the stock market development and economic growth of panel data of five countries of namely- China, Korea, Hong Kong, India, and Australia.

Though economic growth has a negative influence on stock market development, it plays no significant role. Stocks traded value, a complement of market capitalization ratio of the market size has a positive influence on stock market development. It plays a significant role, as well. Similarly, stock traded value ratio, which gauges the market liquidity- measuring trading relative to economic activity, when it increases, it influences market capitalization ratio as well for Asia and Australia. The banking sector development through money supply to GDP, which is the total broad money plays a significant role, but its influence is positive. This implies that if money supply increases, it enhances market capitalization. The stock market activities are carried out through the banking sector, and therefore even though investors might choose where to source financing for their projects, the two are accompaniment to each other, one cannot do without the other. Gross domestic savings, another banking sector development indicator, on the other hand, has a negative influence on the market size but plays no significant role. Foreign direct investment that is supposed to channel the flow of private funds to an economy, thus boosts investment has a positive influence on stock market development through the market size but plays no significant role. Inflation has a positive influence on the stock market development via the market size but the plays no significant role on the market size. This implies that the macroeconomic environment has no accompanying effects on the market size in Asia & Australia for the period covered. Institutional-technological-innovative and financial factors have direct influences on economic growth but play no significant role. Institutional structures, technology and financial development, do not play any significant role on the market size though they have positive influences on the market for Asia & Australia. The lag of market capitalization ratio has a negative influence on the current period and plays a significant role. The transmission effect among other things comes from information, thus; information is very key in the efficient capital markets.

UNITED STATES

1a) Null hypothesis (H_0): There is no relationship (negligible effect) between economic growth and stock market development of the sampled country.

1b) Alternative hypothesis (H_1): There is a relationship between economic growth and stock market development of the sampled country.

For United States (i.e. time series data), stock market development has no effect on economic growth. Hypothesis One (1a) – Null Hypothesis (H_0) was not rejected, it was accepted. This implies that there is no relationship between the stock market development and economic growth. The results confirm the hypothesis (1a) that there is no relationship between the stock market development and economic growth of United States for the period investigated.

The market size of the stock markets (i.e. market capitalization ratio and stocks traded total value ratio) has influence but it is minimal and plays no significant role on economic growth in the United States for the period covered. Money supply to GDP has a negative influence on economic growth. This implies that an increase in money supply affects economic growth adversely of the period under review. This can be aligned to economic theory that spells that an increase in money supply will boost the economy in the short term, but in the long term, it will lead to inflation. Institutional structures, technology and financial development, have negative influences on economic growth and play no significant roles on the market size. In developed countries, these factors are the key determinants of growth; however, in the case of the United States for the period under review, it was adversarial. This could be attributed to the role institutions played (relaxed) in their duties, leading to the financial crises and transmitted through the periods. The lag of GDP growth has a negative effect on the current period, though, it plays no significant role.

2a) Null hypothesis (H_0): There is no relationship (negligible effect) between stock market development and economic growth of the sampled country.

2b) Alternative hypothesis (H_1): There is a relationship between stock market development and economic growth of the sampled country.

For the United States (i.e. time series data) economic growth has a significant effect on the stock market development. The Null hypothesis (H_0), was rejected- not accepted. Hypothesis Two (2b) – Alternative hypothesis (H1) was accepted; the results therefore confirm the hypothesis (H1,) that there is a relationship (positive) between stock market development and economic growth of the United States over the period investigated. The results proclaim that stocks traded turnover ratio has a significant influence on the market size. This implies that equities traded on the stock market relative to GDP has adverse effects on market capitalization ratio. The indication here is that; stock turnover ratio has negative influence on market capitalization ratio. All the same, it serves as a complementary component to market capitalization ratio in developing the stock market. It is an indication of the status of disposing or acquiring stocks (thus, the level of liquidity on stock markets in the United States). The banking sector development, which is an icon of channelling funds to domestic businesses has a negative influence on stock market development through the market size. It plays no significant role in the period covered. The indication here is that a percentage increase in credit to private businesses decreases market capitalization. This also implies that the banking sector competes with stock market development for the same period. Inflation has a negative influence on stock market development, though it plays no significant role. The indication, however, is that a percentage increase in inflation affects market capitalization ratio adversely. Institutional structures, technology and financial development, have negative influences on stock market development. Though the roles are not significant, it is probably due to the fact that the institutions did not see ahead of the market crisis.

Additionally, the role some of some supervisory institutions such as Enron played during the period under investigation. The lag of market capitalization ratio has a negative influence on the current period though it plays no significant role; this could be attributed to a spill-over effect due to information in the market. Investors are sensitive to information, making it is a key factor in the efficient markets.

1a) Null hypothesis (H_0): There is no relationship (negligible effect) between economic growth and stock market development of the sampled country.

1b) Alternative hypothesis (H_1): There is a relationship between economic growth and stock market development of the sampled country.

For the United Kingdom (i.e. time-series data), the stock market development has no effect on economic growth. Hypothesis One (1a) – Null Hypothesis (H_0) was not rejected; it was accepted. This implies that there is no relationship between stock market development and economic growth. The results confirm the hypothesis (1a) that there is no relationship between the stock market development and economic growth of the United Kingdom for the period investigated. The effects of stock market development on GDP growth in the United Kingdom through stocks traded value has a negative influence on economic growth; it plays no significant role. In another manner, the lag of stocks traded value has a positive influence on economic growth; however, the influence is insignificant. This is attributed to transmission effects onto the current period. This is key to information in efficient markets. Gross domestic savings, an indicator of the banking sector development, has a positive effect but plays no significant role on economic growth. In another development, the lag of gross domestic savings has a negative influence on the economic growth, though not significant, it signals that the previous period's transmission effects may alter economic growth in the UK. Inflation has a negative impact on economic growth but plays no significant role. In another vein, exchange rate has a negative effect on economic growth, but the role it plays is not significant. Exchange rate fluctuation influences economic growth adversely. The indications of the two indicators imply that the macroeconomic environment has no influence on economic growth for the period in the UK. Institutional structures, technology/innovation and financial factors have positive influences on economic growth; they play no significant role. This implies that issues such as access to credit, easiness to banks, availability of venture capital, market access, labour market efficiency and goods market efficiency are all imperative in complementing the enhancement of economic growth. Unfortunately, in the case of the UK, they do not play any significant influence. The lag of economic growth has a negative and insignificant influence on its current period. This is due to spillovers from the previous period.

2a) Null hypothesis (H_0): There is no relationship (negligible effect) between stock market development and economic growth of the sampled country.

2b) Alternative hypothesis (H_1): There is a relationship between stock market development and economic growth of the sampled country.

For the United Kingdom (i.e. time-series data), economic growth has significant no effect on the stock market development. Hypothesis Two (2a) - (H_0) null hypothesis was not rejected; it was accepted. The results confirm the hypothesis (2a) that there was no relationship between the stock market development and economic growth of the United Kingdom for the period investigated.

Stocks traded value ratio, a complementary stock market development indicator has a positive influence on the stock market development through the number of listed companies, though it plays no significant role. The number of listed companies, on the other hand, has a positive influence on the stock market development. Its spillover effect directly has a transmission effect on it. Gross domestic savings has a positive influence on the stock market development, though it plays no significant role. This is a clear indication that the banking sector is very relevant in the financial sector, where the stock market activities depend largely. Foreign direct investment has a positive influence, though it plays no significant influence, it implies that capital mobility through foreign direct investment plays importance in the development of the stock market by channeling private investor funds into the economy. It also means that the magnitude of the number of listed companies will lead to attracting foreign investors.

SOUTH AFRICA

1a) Null hypothesis (H_0): There is no relationship (negligible effect) between economic growth and stock market development of the sampled country.

1b) Alternative hypothesis (H_1): There is a relationship between economic growth and stock market development of the sampled country

For South Africa (i.e. time-series data), stock market development has no significant effect on economic growth. Hypothesis One (1a) – Null Hypothesis (H_0) was not rejected; it was accepted. This implies that there is no relationship between stock market development and economic growth. The results confirm the hypothesis (1a) that there was no relationship between the stock market development and economic growth of South Africa for the period investigated.

Interesting, the stock market development through stock traded value has a positive effect on economic growth, though it plays an inimical role. This implies that attempts to develop the stock market instead impacts adversely on GDP growth for the period 1993-2016. The lag of GDP growth has a negative impact on the current period. This is ascribed to the spillover effect from the previous economic imbalances. The banking sector development through gross domestic savings has a positive influence on GDP growth. It also plays a significant role. The signal here is that GDP growth is contingent on the development of the banking sector unswervingly in South Africa. Exchange rate has a negative influence on GDP growth, and also plays a significant role. The fluctuation of the exchange rate affects GDP growth adversely. Macroeconomic environment plays a dominant role in economic growth for the period covered. Without sound economic triggers, the stock market cannot enhance economic growth.

On the other hand, tax revenue has a negative influence on economic growth. When investors are taxed, it affects the channeling of private equity funds and gross domestic savings to stock markets. This goes a long way to affect economic growth. This is a circular flow linking GDP growth. Other economic pillars (i.e. institutional structures, technology/innovation and financial factors) have positive influences on GDP growth. They also play significant roles, implying that their various components (i.e. business sophistication, access to market, research & development, innovation, access to credit, easiness to banks, and availability of venture capital) are all very imperative in complementing the stock markets to enhance GDP growth in South Africa.

2a) Null hypothesis (H_0): There is no relationship (negligible effect) between stock market development and economic growth of the sampled country.

2b) Alternative hypothesis (H_1): There is a relationship between stock market development and economic growth of the sampled country.

For South Africa (i.e. time-series data), economic growth has no significant effect on stock market development. Hypothesis Two (2a) - (H_0) null hypothesis was not rejected; it was accepted. The results confirm the hypothesis (2a) that there was no relationship between the stock market development and economic growth of South Africa for the period investigated. Though GDP growth has a negligible negative effect on stock market development through stocks traded total value ratio, it plays no significant role. Market capitalization ratio has a positive effect on stock traded total value and plays a significant role in stock market development along other complementing factors. Domestic credit to private businesses has a negative influence but plays no significant role in the stock market development through stock traded total value ratio. An increase in domestic credit to private businesses affect liquidity in the stock market. Investors rather align to sources of funding from the banks rather than the stock market. This implies that, banking sector development, thus runs rivalry to the stock market development. This enhances competition between the stock market and the banking sector. The lag of stock traded value has a positive influence on its current period, transcending to the market development. It plays a significant role, thus, the transmitting positive influences on the market size. Tax revenue, on the other hand, has a negative effect on the stock market development through the essence of liquidity of the market size, though it plays an insignificant role. Other economic pillars (i.e. institutional structures, technology/innovation and financial factors) have positive influences on the stock market development. This suggests that business sophistication, access to market, research & development, innovation, access to credit, easiness to banks, and availability of venture capital complement the augmentation of the stock market in South Africa. The empirical evidence shows that robust institutions are critical to the development of the market size. It is also seen as a way of sustaining investor's confidence in brokers and other capital intermediaries and stakeholders. It safeguards fair play and transparency in the market operations, thus; reassures investment and trading in the stock market.

HONG KONG

1a) Null hypothesis (H_0): There is no relationship (negligible effect) between economic growth and stock market development of the sampled country.

1b) Alternative hypothesis (H_1): There is a relationship between economic growth and stock market development of the sampled country.

For Hong Kong (i.e. time-series data), stock market development has no significant effect on economic growth. Hypothesis One (1a) – Null Hypothesis (H_0) was not rejected; it was accepted. This implies that there is no relationship between stock market development and economic growth. The results confirm the hypothesis (1a) that there was no relationship between the stock market development and economic growth of Hong Kong for the period investigated.

Stocks traded total value has a positive influence but plays insignificant roles on economic growth. Though the effects are minimal, it indicates that if the stock market is developed, it conveys that progress to enhance economic growth in Hong Kong. On the other hand, the lags of stocks traded total value has a negative influence on GDP growth. This implies that the effect from the previous period diffuse spillovers onto the current period, thus influencing economic growth. This is an indication of the sensitivity of the stock market. Money supply has a negative effect and plays a statistical role on economic growth in Hong Kong over the period under investigation. Thus, the banking sector development complements the efforts of stock market development and macroeconomic factors to influence GDP growth.

On the other hand, foreign direct investment has a positive effect on economic growth, also plays a significant role through channeling of private equity funds for investment. Exchange rate, an important factor of the macroeconomic environment has a positive influence, also plays a significant role. The suppleness or volatility of the exchange rate seriously have effects GDP growth, such a volatility reduces trade and economic growth.

Institutional structures, technology/innovation and financial factors have positive influences on GDP growth, but they play insignificant roles. This denotes the that fundamentals such as business sophistication, access to market, research & development, innovation, access to credit, easiness to banks and availability of venture capital do not influence GDP growth in Hong Kong.

2a) Null hypothesis (H_0): There is no relationship (negligible effect) between stock market development and economic growth of the sampled country.

2b) Alternative hypothesis (H_1): There is a relationship between stock market development and economic growth of the sampled country.

For Hong Kong (i.e. time-series data), economic growth has no significant effect on stock market development. Hypothesis Two (2a) - (H_0) null hypothesis was not rejected, it was accepted. The results confirm the hypothesis (2a) that there was no relationship between the stock market development and economic growth of Hong Kong for the period investigated.

GDP growth influences stock market development through market capitalization ratio, though, it plays no significant impact, it reveals that economic growth is necessary for the market to develop. Gross domestic savings influence market capitalization. The market size cannot develop without the presence of the banking sector through the injection of money supply and financial services. This implies that the presence of the activities of the sector boost the stock market development all other things being equal. Another stock market development component - stock traded total value, has a positive influence on stock market capitalization; nevertheless, it plays no significant impact. This stems from the fact that stock market development also depends on its indicators by also serving a complementing role with GDP growth. The lag of market capitalization ratio has a negative influence and plays a significant role on its current period. Likewise, the lag of GDP growth has a negative influence on stock market development through market capitalization ratio, and plays no significant role in Hong Kong for the period covered. Other economic factors (i.e. institutional structures, technology/innovation and financial factors) adversely influence GDP growth, but they play insignificant roles. This denotes the fact that fundamentals such as business sophistication, access to market, research & development, innovation, access to credit, easiness to banks, and availability of venture capital do not have effects on the stock market in Hong Kong. The empirical analysis reveals different responses of the effect of the stock market development on economic growth and vice versa in the table below.

Table 113: Summary of Results of the Study – Model One

Model One (1) –The effect of the stock market development on economic growth			
Panel Data	Relationship (positive)	Relationship (negative)	No relationship (no significant effect)
All Continents (20)			Yes
All Continents (20)			Yes
Best Countries (4)	Yes		
Americas (5)			Yes
Europe (5)		Yes	
Asia & Australia (5)			Yes
Africa (5)			Yes
Time Series Data			
Geographic Zones			
United States			Yes
United Kingdom			Yes
South Africa			Yes
Hong Kong			Yes

Source: Mensah (2020)

Table 114 Summary of Results of the Study - Model Two

Model Two (2) –The effect of economic growth on stock market development			
Panel Data	Relationship (positive)	Relationship (negative)	No relationship (no significant effect)
All Continents (20)			Yes
Best Countries (4)			Yes
Americas (5)			Yes
Europe (5)			Yes
Asia (5)			Yes
Africa (5)			Yes
Time Series Data			
United States	Yes		
United Kingdom			Yes
South Africa			Yes
Hong Kong			Yes

Source: Mensah (2020).

Conclusions

The purpose of this secondary quantitative research is to find out if there is a relationship between the stock market development and economic growth and vice versa. This is to explain and document the insights of stakeholders and experts in finance (i.e. the development of the financial markets with importance on the development of the stock market) and what policy prescriptions can help improve systems that are affiliated to capital markets and economic growth. Also, to diversify resource strategies to have a broader view in the sourcing of resources by investors as well as governments, and maintain financial sustainability. It is believed by some schools of thought that the stock markets are well-known to influence growth and development through via market liquidity, ability to mobilize resources for projects and for long-term investments purposes. Therefore, a rise in stock market activity positively influences economic growth by encouraging savings, boosting investment activities, and allocating & utilizing resources in a more efficient manner. The results of this study underpin empirical evidence of some of the earlier works undertaken in this area of research.

It is evident from the panel data that there are positive and negative relationships between economic growth and stock market development of Four Best Countries and Europe, respectively. On the other hand, there is no relationship between economic growth and stock market development from the panel data of Twenty Countries, likewise for Americas, Asia & Australia and Africa. In another vein, there is no relationship between the stock market development and economic growth from the panel data of Twenty Countries, equally for the panel data of Four Best Countries, Americas, Europe, Asia & Australia and Africa.

It is also shown from the time-series data analysis that the United States is the only country that shows a positive relationship between economic growth and stock market development from a list of ‘’Four Best’’ countries tested individually. Contrarily, United Kingdom, South Africa and Hong Kong; thus each of them shows no relationship between economic growth and stock market development from a list of ‘’Four Best’’ countries tested individually. In another vein, from the time-series data, United States, United Kingdom, South Africa and Hong Kong, show no significant effect of the stock market development on economic growth, hence no relationship. The ten geographic zones portray different outcomes. This could be attributed to the fact that the ‘’geographic zones’’ stock markets have different economic environments, including the perception of investors.

The United States stock market development has a positive relationship as compared to the European ones. This might be the result of the short-term mindset of many public companies to meet quarterly earnings at the cost of long-term investment. The US investors engage in fast and speculating short-term trading, and thus its markets exhibit efficiency. Short term investment, has the potential to emasculate future economic growth in nonexistence of long-term investment. Short term also, will eventually lead to weakening GDP, higher unemployment levels, and lower future investment returns for savers (i.e. implications that could upset growth).

In the case of European countries, it seems that investors have ‘’long-term’’ investment horizon which favors economic growth, thus as compared to the US investors (i.e. they are committed to ‘’patient’’ long-terms investments) who are short-term bound investment like’ but more efficient market performances.

Recommendations

The results of this research suggest the importance of developing a set of composite data each for stock market development, banking sector development, macroeconomic indicators and other economic pillars (i.e. institutional structures, technological-innovative, financial, economic, & legal factors) that can really compact the large number of variables for this type of research. This will also examine a specific indicator in the cross-sectional data gathered. This study used mostly market capitalization ratio as a proxy for stock market development but there were instances where other indicators were used. This stems from the fact that some of the selected indicators were either non–stationary or highly correlated with each other, thus there was no space to produce tangible results from the regression analysis.

Recommendation for Academia

Using the results obtained in this study as a foundation for further lines of investigation, there is a need to increase the scope. This could consider additional zones or grounded theory research on the basis of the results of this study.

Further research should seek additional corroboration of established causality models between stock market development indicators chosen and defined macroeconomic indicators, extension of models and identification of additional factors such as institutional structures. This study has corroborated the two causality models proposed in the literature. The direction of causality between stock market development and economic growth and vice versa in the samples show that each geographic zone proclaims a different outcome.

By accepting methods similar to those used in other studies, this study used all the variables at one instance and controlled other variables intermittently. Further research should seek additional corroboration of these models and identify exogenous factors that influence them.

Further research should seek correlations between individual series and measures of financial development; thus; stock market performance just like the study of Adjasi & Yartey (2007).

Also, research should be conducted by using composite data for all the endogenous variables on stock market development. An average composite tally would provide a means in which to rate the theoretical effectiveness of a banking sector development or macroeconomic indicators on stock market development. Due to its direct measurability such as in the data obtained in this study, either measure could be a basis for hypotheses in grounded theory research relating other variables. Observed differences and correlations based on this uniform composite measure would be more powerful than measures related to individual or a limited number of series employed in the prior literature.

A research in the future should expand understanding of the role of institutional structures in financial development. A major contribution of this study lies in its inclusion of the indexed of institutional structures as a link to stock market development. Institutions should be well structured to play significant roles in the development of the financial sector, hence ensuing the development of the stock market. Without solidification of institutional structures, the stock market can plug the financial systems into crisis. In this study, from the panel data of Best Four Countries from different geographic zones, only South Africa's solid institutional structures play significant roles both in economic growth and stock market development.

Lastly, rigorous qualitative studies are encouraged to be done on the same study.

Recommendation for Policy

Governments and Central Banks are to ensure sound macroeconomic environments. A solid macroeconomic environment is imperative for stock market development. Macroeconomic instability heightens the problem of informational asymmetries and turns to a source of vulnerability to the general financial system. Information is key in developing the stock market. Pezzuto (2008) opines that as a result of technological innovation and constant speed of communication devices globally, enhanced benefits and threats associated with global financial trading and investing, leads to a higher level of complexity.

Low and anticipated rates of inflation are much more likely to contribute to stock market development and economic growth. When expectations of high inflation are great investors, both domestic and foreign are likely to be reluctant to invest in the stock markets. Garcia and Liu (1999) reveal that sound macroeconomic environments and sufficiently high-income levels—GDP per capita, domestic savings, and domestic investments—are important determinants of stock market development in emerging markets.

Other macroeconomic policies exclusively on exchange rate should be designed and implemented in line with stock market activity. For instance, some countries' exchange rate shocks affect stock market activity in a prolonged style. Stock market activity is stifled for long periods with exchange rate fluctuations. Development Partners such as the WB, IMF, WB and AfDB should encourage the use of capital markets as compared to external DP financing so as to offload the pressure of DPs and their ''conditionalities'' on countries. External financing through these DPs stifles countries debt sustainability.

Future research should explore the feedback of listed firms by sector to changes in macroeconomic economic pointers. The research can also be expanded to practitioners of financial markets and policy think-tanks to determine the extent stock markets encourage savings, boost investment activities, and allocate & utilize resources in a more efficient manner.

There is also a prospect to broaden the specific subject area by developing arguments to support and increase the research hypotheses. This is a way to magnify financial market players that have implemented the suggested outcomes. All the relevant financial market players will reference this study that (i.e. stock markets provide market liquidity, ability to mobilize resources for project and for long-term investment).

Recommendation for Financial Sector Practitioners

In finance, if reckless lending, greedy lending, speculation, short-term profit inducements and deceitful practices of many players '' short termism'' in the industry can be mitigated, financial crisis is not inevitable. Long-term investment for growth ‘’ long termism’ can be encouraged to avoid practices leading to financial crisis.

Limitations

This study suffers from a number of limitations, characteristic of major quantitative studies. Notwithstanding that, a lot of inputs was made to make this study analytically defendable. The usage of modelling limits inputs and the selection of model unavoidably shapes outputs. It is noted to a greater extent that quantitative researchers employ a variety of models. This study employed models which were reflected capable of creating simulations from ten geographic zones economic data. Data was somewhat a problem. For instance, the number of observations was not adequate, for some of the countries- economic data was not available from 1970 onward. In studies of this nature, monthly or quarterly data are more desirable to guarantee precision of the parameter estimates. The use of annual data could have reduced the precision of the parameter estimates.

Also, the choice of an indicator to represent stock market development is highly required. As stock markets continue to develop with time, lengthier time-series is likely to stimulate much more comprehensive and pragmatic cases or geographic zones on relationships between stock markets and economic growth and vice versa. The OLS Model is considered to be one of the best estimation models, however, there are few limitations such as outliers and its sensitiveness in data analysis. Running a variety of tests for the variables was a challenge, in some instances, some series tend to be non-stationary at all levels, prompting such variables to be removed. Also, series that were highly correlated, two or more though very important, were deleted, and whilst ordinary least squares produce results in a certain pattern, robust least squares also produce results in a different pattern.

Chapter Summary

Chapter five has outlined the conclusions of the research results and its implications and linked these to the literature review. Findings and implications were analysed in retort to the research's problem statement and aligned with the research purpose and its significance. Recommendations for the practice and future research, relevant for the financial market players and expanding the findings of how the stock market can be developed were discussed.

References

Abeng, M. O. (2006). Financial sector reform outcomes in Nigeria: A quantitative evaluation. *CBN Bullion,* Vol. 30(2), 53-69.

Abimbola, A.B., & Olusegun, A. J. (2017). Appraising the exchange rate volatility, stock market performance and aggregate output nexus in Nigeria. *Business and Economic Journal*, 8:29

Acharya, D., Amanulla, S., & Joy, S. (2009). Financial development and economic growth in Indian states; An examination. *International Research Journal of Finance & Economics*, 24, 117-130.

Adam, A. M., & Tweneboah, G. (2008). Macroeconomic factors and stock market movement: Evidence from Ghana. http://papers.ssrn.com/sol3papers/cfm?abstract_id=1289842

Adamopoulos A. (2010). Stock Market and Economic Growth: An Empirical Analysis for Germany. *Business and Economics Journal,* Vol. 2010: BEJ-1.

Adebayo A.S. (2016). The Evaluation of the Relationship between Market Capitalization and Macroeconomic Variables in Emerging Market. American Journal of Business and Society, 1(4), 183-188

Adjasi, C., & Biekpe, N. (2006). Stock market development and economic growth: The case of selected African countries. *African Development Review*, 18(1), 144-161.

Aghion, P., Comin, P.D., & Howitt, P. (2006). When does domestic savings matter for growth? NBER Working Paper # 12275

Ake, B., & Ognaligui, R.W. (2010). Financial stock market and economic growth in developing countries: The case of Douala Stock Exchange in Cameroon. *International Journal of Business and Management,* 5 (5), 82-88.

Ake, B., & Dehuan J. (2010). The Role of Stock Market Development in Economic Growth: Evidence from Some Euronext Countries, *International Journal of Financial Research,* Vol. 1, No. 1, pp. 14-20. [3]

Aldrich, H.E. (2008). Research Communications, Chapel Hill, NC: University of North Carolina.

Alemany, L., & Marti J. (2005). Unbiased Estimation of Economic Impact of Venture Capital Backed Firms, EFA 2005 Moscow Meetings Paper.

Al-Yousif, Y. K. (2002). Financial development and economic growth; another look at the evidence from developing countries. *Review of Financial Economics* 11, 131-150.

Amanja, D. M., & Morrissey, O. (2005) Fiscal Policy and Economic Growth in Kenya. (CREDIT Research Paper No. 05/06).

Amit, R., Brander, J., & Zott, C. (1998). Why do venture capital firms exist? Theory and Canadian Evidence. *Journal of Business Venturing, 1998, vol. 13, issue 6, 441-466*

Andreß, H. J (2017). The Need for and Use of Panel Data. *IZA World of Labour* 2017: 352. http://wol.iza.org/articles/the-need-for-and-use-of-panel-data. Retrieved: September 15, 2019

Anowor, O. F., & Okorie, G. C. (2016). A reassessment of the Impact of Monetary Policy on Economic Growth: Study of Nigeria", *International Journal of Developing and Emerging Economies*, 4(1), 82–90.

Arestis, P., Demetriades, P & Luintel, K. (2001), Financial Development and Economic Growth: The Role of Stock Markets, *Journal of Money, Credit & Banking,* 33, 16-41.

Asaolu, T. O., & Ogunmuyiwa, M. S. (2011). An Econometric Analysis of the Impact of Macroeconomic Variables on Stock Market Movement in Nigeria. *Asian Journal of Business Management,* 3(1), 72-78.

Atchulo, A. S., (2015). Business Case Analysis for Social and Environmental Initiatives: The Case of the Milton Keynes Electric Light Vehicle Infrastructure Project. PhD thesis. The Open University.

Atje, R. & Jovanovich, B. (1993). Stock Markets and Development, *European Economic Review,* 37(2-3), 632-40.

Azam, M., Haseeb, M., Samsi, A. B., Jimoh, O., & Raji, J.O. (2016). Stock Market Development and Economic Growth: Evidences from Asia-4 Countries. International Journal of Economics and Financial Issues, 2016, 6(3), 1200-1208. Retrieved from: http://www.econjournals.com [September 4, 2019)

Balassa, B. (1988). Public Finance and Economic Growth. Policy, Planning and Research Department. (Working Papers; Vol. 1, No. WPS 31).

Barro, R. J. (1991). Economic Growth in a Cross-Section of Countries. Quarterly Journal of Economics 106:2, 407–443.

Barro, R. J., & Sala-i-Martin, X. (1995). Economic Growth. McGraw-Hill.

Barro, R.J., & Redlick, C.J. (2011). Macroeconomic effects from government purchases and taxes. National Bureau of Economic Research (NBER) Working Paper No. 15369

Bayar, Y., Kaya, A., & Yildirim, M. (2014). Effects of stock market development on economic growth: Evidence from Turkey. *International Journal of Financial Research*, 5(1), 93-100.

Beakaert, G., & Harvey, C. R. (1997a). Emerging Market Volatility, *Journal of Financial Economics,* 43(1), 29-78.

Beakaert, G., & Harvey, C. R. (1997b). Capital Market Integration, Stock Markets and World Development, *Working Paper*, Stanford University and Duke University.

Beck, T., & Levine, R. (2003). Stock Markets, Banks and Growth: Correlation or Causality. *Policy Research Working Paper* 2670. World Bank: Washington D.C.

Bekaert, G., Garcia, M., & Harvey, C. R. (1995). The Role of Capital Markets in Economic Growth, *Catalyst Monagraph Series,* Catalyst Institute, Chicago, IL

Bencivenga, V.R., Smith, B.D., & Starr, R.M. (1996). Liquidity of secondary capital markets: Allocative efficiency and the maturity composition of the capital stock. Economic Theory, 7 (1), 19-50.

Berument, H., Inamlik, A., & Olgun, H. (2008). Inflation and Growth: Positive and Negative Relationship?, Journal of Applied Science, 8(2): 192-204, 2008

Bhaskaran S. (2012), Time series data analysis for long term forecasting and scheduling of organizational resources few cases. *International Journal of Computer Applications* (0975 – 8887) Volume 41– No.12.

Bhuiyan, R. (2008). The Effects of Monetary Policy Shocks in a Small Open Economy: A Structural VAR Approach. Queen's University, Kingston, Ontario, Canada.

Blaikie, N. (2000). *Designing social research: the logic of anticipation*, Cambridge, Polity Press.

Boubakari, A., & Jin, D. (2010). 'The Role of Stock Market Development in Economic Growth: Evidence from Some Euronext Countries,' *International Journal of Financial Research*, Vol 1(1), pp 14-20.

Brasoveanu, L., Dragota, V., Catarama, D., & Semenescu, A. (2008). Correlations Between capital market and development and economic growth: the case of Romania. *Journal of Applied Quantitative Methods*, 3(1), 64-67.

Buelens, F., Cuyvers, L., & Nieuwerburgh, S.V. (2006). Stock market development and economic growth in Belgium. *Explorations in Economic History*, *43*, 13-38. http://dx.doi.org/10.1016/j.eeh.2005.06.002. Accessed: June 02, 2019

Caporale, G.M., Howells, P.G., & Soliman, A.M. (2004). Stock market development and economic growth: The causal linkage. *Journal of Economic Development*, 29, 33-50.

Castro, D. F. F., & Hernández, D. C. P. (2006). The Economic Effects of Exogenous Fiscal Shocks in Spain: A SVAR Approach. (ECB Working Paper No. 647).

Chipaumire, G., & Ngirande, H. C. (2014). How stock market liquidity Impact economic growth in South Africa. *Journal of Economics*, 5(2), 175-192. https://doi.org/10.1080/09765239.2014.11884995. Accessed: September 07, 2019

Choong, C.K., Yusop, Z., & Soo, S. C. (2004). Foreign Direct Investment, Economic Growth and Financial Sector Development: A Comparative Analysis. *ASEAN Economic Bulletin*, 21, 278-289.

Cojocaru, L., Hoffman, S.D., Falaris, E.M., & Miller, J.B. (2015), Financial System Development and Economic Growth in Transition Economies: New Empirical Evidence from the CEE and CIS countries. *Working Paper Series* (WPS NO. 2015-04) University of Delaware, U.S

Creswell J.W., (2008). Research Design. Qualitative, Quantitative and Mixed Methods Approaches SECOND EDITION. SAGE Publications; International Educational and Professional Publisher Thousand Oaks London New Delhi.

Creswell, J. W., (2007). Qualitative Inquiry and Research Design: Choosing Among Five Approaches (2nd ed.). Thousand Oaks, CA: Sage.

Demirgüç-Kunt, A. & Levine, R. (1996), Stock Market Development and Financial Intermediaries: Stylized Facts, *The World Bank Economic Review,* 10 (2), 291-321

Davila, A., Foster, G., & Gupta, M. (2003). 'Venture Capital Financing and the Growth of Start-Up Firms', Journal of Business Venturing, 18, 689-708.

Dele, B. E. (2007). Monetary policy and economic performance of West African Monetary Zone Countries. University of Lagos, Nigeria.

Donatas, P., & Vytautas, B. (2009). The Short Run Relationship between Stock Market Prices and Macroeconomic Variables in Lithuania: An Application of the Impulse Response Function. Economics of Engineering Decisions, ISSN 1392–2785.

Engel, D. (2002). The Impact of Venture Capital on Firm Growth: An Empirical Investigation, Discussion Paper 02-02, ZEW (Center for European Economic Research.

Engel, D., & M. Keilbach, M. (2007), Firm Level Implications of Early Stage Venture Capital Investment: An Empirical Investigation*, Working Paper,* Max Planck Institute of Economics, Germany.

Enisan, A. A., & Olufisayo, A.O. (2009). Stock market development and economic growth: Evidence from seven Sub-Sahara African countries. *Journal of Economics and Business*, 61, 162-171. http://dx.doi.org/10.1016/j.jeconbus.2008.05.001

El-Wassal, K. (2013). The development of stock markets: In search of a theory. *International Journal of Economics and Financial Issues*, 3, 606-624.

EVCA (2002). Survey of the Economic and Social Impact of Venture Capital in Europe, Research Paper, EVCA (European Venture Capital Association).

Fatas, A., Mihov, I. (1998). The Effects of Fiscal Policy on Consumption and Employment: Theory and Evidence. Centre for Economic Policy Research.

Ferede, E., & Dahlby, B. (2012). The Impact of tax cuts on economic growth: Evidence from the Canadian Provinces, National Tax Journal, Vol. 65, issue 3, 563-94

Fink, G., Haiss, P. & Hristoforova, S. (2006). Credit, Bonds, Stocks and Growth in Seven Large Economies. *EI Working Papers / Europainstitut*, 70, Europainstitut, WU Vienna University of Economics and Business, Vienna.

Florida R., & Kenney M., (1988). "Venture Capital-Financed Innovation and Technological Change in the US. Research Policy 17 (3):119-37

Florida, R.L., & Kenney, M. (1988). 'Venture Capital, High Technology and Regional Development', *Regional Studies*, **22**(1), 33-48.

Freear, J., & Wetzel Jr, W.E. (1990), 'Who Bankrolls High-Tech Entrepreneurs?' Journal of Business Venturing, 5, 77-89.

Freear, J., Sohl, J.E., & Wetzel Jr, W.E. (1992), 'The Investment Attitudes, Behavior and Characteristics of High Net Worth Individuals', Frontiers of Entrepreneurship Research, Babson Park, Wellesley, MA: Babson College, pp. 374-387.

Friedman, M., &Schwartz, A. J. (1963). *A Monetary History of the United States. Princeton University Press*, Princeton.

Fry, M. (1995). *Money, Interest, and Banking in Economic Development*, 2nd ed. London: John Hopkins University Press.

Garcia, V., & Liu, L. (1999). Macroeconomic Determinants of Stock Market Development, *Journal of Applied Economics* 11, 29-59.

Gemmell, N., Kneller, R., & Sanz, I. (2014). Does the Composition of Government Expenditure Matter for the Long-run GDP levels? No. 3516. Working Paper Series, Victoria University of Wellington, Chair in Public Finance.

Gompers, P., & Josh Lerner J., (2001). The Venture Capital Revolution. *Journal of Economic Perspectives, Vol. 15, No. 2, (2001).* pp. 145-168

Granger, C. W. (1969). Investigating Causal Relations by Econometrics Models and Cross-spectral Methods, *Econometrica*, 37(3), 424-438.

Greenwood, J. & Smith, B. (1997). 'Financial markets in development and the development of financial markets', *Journal of Economic Dynamics and Control*, Vol. 21, pp 145-181.

Haque, M.E, & Yakob, N.A. (2018). Revisiting stock market development and economic growth nexus: The moderating role of foreign capital inflows and exchange rates.

Haque, M. E. (2013). Impact of stock market development on economic growth: An Evidence from SAARC Countries. *International Journal of Research in Commerce, Economics & Management,* 3(1), 15-20.

Haque, M.E., & Hossain, M.K. (2011), Impact of stock market development on economic growth: Evidence from SAARC countries. Eastern University Journal, 3(3), 1-13

Hameed, I., & Amen, U. (2011). Impact of monetary policy on gross domestic product (GDP). *Interdisciplinary Journal of Contemporary Research in Business*, vol. 3, No. 1

Hellmann, T. F., & Puri, M. (2000). The Interaction between Product Market and Financing Strategy: The Role of Venture Capital. *Review of Financial Studies* 13(4):959-84

Heppke-Falk, K. H., Tenhofen, J., & Wolff, G. B. (2006). The Macroeconomic Effects of Exogenous Fiscal Policy Shocks in Germany: A Disaggregated SVAR Analysis. Deutsche Bundesbank. (Discussion Paper No. 41).

Ho, S., & Odhiambo, N. (2012). Stock market development and economic growth in Hong Kong: An empirical investigation. *International Business & Economics Research Journal,* 11(7), 795-808.

Ihsan, I., & Anjum, S. (2013). Impact of money supply (M2) on GDP of Pakistan. Global Journal of Management and Business. Vol. 13, No. 6-C

Ikikii, S.M., &Nzomoi, J.N. (2013). An analysis of the effects of stock market development on economic growth in Kenya. *International Journal of Economics and Finance*, 5 (11), 145-151. http://dx.doi.org/10.5539/ijef.v5n11p145

Iqbal, Z., & Zahid, G.M. (1998). Macroeconomic Determinants of Economic Growth in Pakistan. The Pakistan Development Review 37:2, 125–148.

Jain, B.A. & Kini, O. (1995). Venture Capitalist Participation and the Post-Issue Operating Performance of IPO Firms. Managerial and Decision Economics, 16, 593-606. http://dx.doi.org/10.1002/mde.4090160603

Jafari, S. A., Alizadeh M., & Azizi K. (2006). Long-Run Relationship between Budget Deficit and Macroeconomic Performance of the Iranian Economy: A Theoretical and Empirical Analysis. Quarterly-Journal of the Economic Research 10:4, 25–46.

Johansen, S. (1991). Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. *Econometrica*, 59(6), 1551–1580.

Johansen, S. (1995), *Likelihood-based Inference in Cointegrated Vector Auto-regressive Models,* Oxford University Press, Inc., New York.

Johansen, S., & Juselius, K. (1990), Maximum Likelihood Estimation and Inference on Cointegration with Applications to the Demand for Money, *Oxford Bulletin of Economics and Statistics,* 52(2), 169-210.

Keuschnigg C. (1998). Venture Capital: A Case for Investment Promotion. CEPR Discussion Paper Series No. 1887

Khabo, V. S. (2002). The Impact of Monetary Policy of the Economic Growth of a Small and Open Economy: The case of South Africa, Department of Economics, University of Pretoria.

Khabo V., & Harmse C. (2005). The impact of monetary policy on economic growth in a small open economy: The case of South Africa: *South African Journal of Economic and Management Sciences (SAJEMS*

King, R. G. & Levine, R. (1993a). 'Finance and growth: Shumpeter might be right', *Quarterly Journal of Economics,* 108: 717-37.

King, R. G. & Levine, R. (1993b). 'Finance entrepreneurship, and growth: theory and evidence', *Journal of Monetary Economics*, 32: 513-42.

Kneller, R. M. B., & Gemmell, N. (1999). Public Policy and the Government Budget Constraint: Evidence from the OECD. Journal of Public Economics 74, 171–190.

Korajczyk, R. (1996). A Measure of Stock Market Integration for Developed and Emerging Markets. World Bank Economic Review, 10 (2): 267-89

Kuwornu, J.K.M. (2012). Effect of Macroeconomic Variables on the Ghanaian Stock Market Returns: A Cointegration Analysis. Agris On-line Papers in Economics and Informatics, 4 (2): 1-12.

Landau, D. (1986) Government and Economic Growth in the LDC"s: An Empirical Study for 1960-1980. Economic Development and Cultural Change 35:1, 35–76.

Levine, R. (1991). Stock markets, growth and tax policy, *Journal of Finance*, 46(4):1445-1465

Levine, R., & Zervos, S. (1993). Looking at Facts: What We Know about Policy and Growth from Cross-Country Analysis. World Bank Policy Research Papers. (WPS 1115).

Levine, R., & Zervos, S. (1996), 'Stock market development and long-run growth', *World Bank Economic Review*, 10 (2): 223-39.

Levine, R., & Zervos, S. (1998). 'Stock markets, banks and economic growth', *American Economic Review*, 88: 537-57.

Levine, R. (1999). Law, Finance and Economic Growth. *Journal of Financial Intermediation,* 8(1), pp. 36-67.

Levine, R. (1997). 'Financial development and economic growth: views and agenda', *Journal of Economic Literature*, XXXV, 688-726.

Levine, R., & Renelt, D. (1992). 'A sensitivity analysis of cross-country growth regressions', *American Economic Review*, 82: 942-63.

Levine, R., & Zervos, S. (1996), 'Stock market development and long-run growth', *World Bank Economic Review*, 10 (2): 223-39.

Levine, R., & Zervos, S. (1998). 'Stock markets, banks and economic growth', *American Economic Review*, 88: 537-57.

Levine, R., & Zervos, S. (1998b). Capital liberalisation and stock market development, *World Development*, Vol. 26, pp 1169-1183.

Lucas, R. E. (1988). On the mechanics of economic development. *Journal of Monetary Economics*, 22(1), 3-42.

Maku, O. E. & Atanda, A. A. (2011). Determinants of stock market performance in Nigeria: Long-run analysis. *Journal of Management and Organizational Behaviour*, 1(3).

Mallik, G., & Chowdhury, A. (2001). Inflation and Economic Growth: Evidence from four South Asian Countries. Asia-Pacific Development Journal.

Masih, R., & Peters, S. (2010). A re-visitation of the savings-growth nexus in Mexico. Economic Letters, vol. 107, p.318-330

Mason, C.M. (2009a), 'Public Policy Support for the Informal Venture Capital Market in Europe', *International Small Business Journal*, **27**(5), 536-56.

Mason, C.M. (2009b), 'Venture Capital in Crisis?' *Venture Capital*, **11**(4), 279-85.

Masoud, N. & Hardaker (2012). *The Impact of financial development on economic growth: Empirical analysis of emerging market countries.* Studies in Economics and Finance, 29 (3). pp. 148-173. ISSN 1086-7376

McKinnon, R.I. (1973). Money and Capital in Economic Development. Brookings Institution, Washington, DC

Mead D.C., & Liedholm C., (1998). The Dynamics of Micro and Small Enterprises in Developing Countries

Mensah, F., & Wong, K.M. (2019). African Stock Market Developments and Economic Growth *Quarterly Review of Business Disciplines* – Volume 6 – Issue 2

Mertens, D. M. (1998). Research Methods in Education and Psychology: Integrating Diversity with Quantitative and Qualitative Approaches. Sage Publications.

Mukherjee, D. (2008). Comparative analysis of Indian stock market with international markets. *Great Lakes Herald*, 1(1), 39-71.

Mwebaze, T. (2002) Determinants of Economic Growth: a Panel Data of 60 Countries. Electronic Publication, Uganda Martyrs University, NKOZI, UGANDA. (http://www.fiuc.org/iaup/esap/publications/umu/paneldata.php)

Nabieu, G.A.A., & Barnor, C. (2016). The effect of stock market performance on economic growth in Ghana. International Journal of Financial Economics, Research Academy of Social Sciences, Vo. 5(1), P. 12-32

Naik, P.K., & Padhi, P. (2015). On the linkage between stock market development and economic growth in emerging market economies: Dynamic panel evidence. *Review of Accounting and Finance*, 14 (4), 363-381.

Ndako, U. B. (2008). Financial development, Economic growth and stock market volatility: Evidence from Nigeria and South Africa. *Australian Journal of Business and Management Research,* 2(2), pp. 20 – 30.

Nguyen, H. T., & Pham, V.D. (2014). Relationship between Stock Market Development and Economic Growth: Evidences from Canada and Australia. *International Journal of Economics and Finance; Vol. 6, No. 7; 2014.* http://dx.doi.org/10.5539/ijef.v6n7p1 Online: June 25, 2014. Accessed: September 05, 2019

Nkechukwu, G., Onyeagba, J., & Okoh, J. (2015). Macroeconomic Variables and Stock Market Prices in Nigeria: A Cointegration and Vector Error Correction Model Tests. *International Journal of Science and Research*, Volume 4, Issue 6, 717-724.

NVCA (National Venture Capital Association) (2009). National Venture Capital Association Yearbook, A Report Prepared by Thomson Reuters for National Venture Capital Association.

Nyasha, S., Odhiambo, N. M. (2017). Bank versus Stock Market Development in Brazil: An ARDL Bounds Testing Approach. *South East European Journal of Economics and Business,* 12 (1): 7-21

Ogedokun, M. O. (2001). Public Finance and Economic Growth: Empirical Evidence from Developing Countries. Discussion Paper No. 2001/72

Ogunmuyiwa, M. (2010). Investor's sentiment, stock market liquidity and economic growth in Nigeria, Journal of Social Sciences. 23. 63-67.

Okoro, A. S. (2013). Impact of monetary policy on Nigeria Economic Growth. Prime Journal of Social Sciences. Vol. 2 (2). Pp. 195-199.

Osakwe, C., I, & Ananwude, A. C. (2017). Stock Market Development & Economic Growth: A Comparative Evidence from Two Emerging Economics in Africa – Nigeria and South Africa. Archives of Current Research International, 11(1): 1-15, 2017.

Osaseri G., & Ifuero O. O. (2018). Impact of Stock Market Development on Economic Growth in BRICS. *International Journal of Financial Research*, December 28, 2018

Osei, V. (2005). Does the stock market matter in Ghana? A Granger Causality Analysis', *Bank of Ghana Working Paper* WP/BOG-2005/13. Accra, Ghana: BoG.

Owusu, E.L., & Odhiambo, N.M. (2014). Stock market development and economic growth in Ghana: An ARDL-bounds testing approach. *Applied Economics Letters,* 21(4), 229-234

Owusu, E. L., & Odhiambo, N. M. (2014). Financial liberalization and economic growth in Nigeria: an ARDL-bounds testing approach. *Journal of Economic Policy Reform*, 17:2, 164-177, DOI: 10.1080/17487870.2013.787803

Owusu, E. L.; & Odhiambo, N. M. (2015). Financial sector reforms and economic growth in Ghana: A dynamic ARDL model. *Contemporary Economics,* Vol. 9, No. 2, pp. 181-192

Oya, P. & Damar, H. (2007). *Financial sector deepening and economic growth*; evidence from Turkey, Topics in Middle Eastern & North African economies, Vol.9, Chicago.

Pagano, M. (1993) 'Financial markets and growth: an overview', *European Economic Review, Vol. 37, pp 613-622.*

Parhankangas A. (2012). The Economic Impact of Venture Capital. Handbook of Research on Venture Capital: Chap 6, Vol 2, Edward Elgar Publishing

Perotti, R. (2005). Estimating the Effects of Fiscal Policy in OECD Countries. (CEPR Discussion Paper Series, No. 4842).

Perron, P. (1989). The Great Crash, the Oil Price and the Unit Root Hypothesis. *Econometrica,* 57(6), pp. 1361-1401.

Perron, P. (1990). Testing for Unit Root in a Time Series with Changing Mean. *Journal of Business and Economic Statistics,* 8(2), pp. 153-162.

Pesaran, M, H., & Shin, Y. (1999). An Autoregressive Distributed-lag Modelling Approach to Cointegration Analysis, *Econometric Society Monographs,* 31, 371-413.

Pesaran, M, H., Shin, Y., & Smith, R. (2001). Bounds Testing Approaches to the Analysis of Level Relationship, *Journal of Applied Econometrics,* 16(3), 289-326.

Pezzuto I. (2008). Miraculous Financial Engineering or Toxic Finance? The Genesis of the U.S. Subprime Mortgage Loans Crisis and its Consequences on the Global Financial Markets and Real Economy. *SMC Working Paper*. *ISSN 1662-761X*. Issue: 12, 2008

Pezzuto I. (2012). Miraculous Financial Engineering or Toxic Finance? The Genesis of the U.S. Subprime Mortgage Loans Crisis and its Consequences on the Global Financial Markets and Real Economy. *Journal of Governance and Regulation.* Volume 1, Issue 3, 2012

Pezzuto I. (2013). Predictable and Avoidable. Repairing Economic Dislocation and Preventing the Recurrence of Crisis". Gower/Ashgate Publishing. UK

Rahman, M.M., & Salahuddin, M. (2010). The determinants of economic growth in Pakistan: Does stock market development play a major role? *Economic Issues*, 15, 69-86.

Rezk, E. (2005). Public expenditure and optimal government size in an endogenous growth model: an analysis of the Argentinean case, National University of La Plata.

Romer, C.D., & Romer D.H. (2010). The macroeconomic effects of tax changes: Estimates based on a new measure of fiscal shocks. America Economic Review: 763-801, http://www.aeaweb.org/articles.php?doi=10.1257/aer.100.3.763 Accessed August 10, 2018.

Romero de Avila, D., Strauch, R. (2003). Public Finance and Long Term Growth in Europe: Evidence from a Panel Data Analysis, Working Paper Series no.246, European Central Bank

Saba, K. & Ghulam, M. C. (2017). Effect of Stock Market Development on Economic Growth of Major South Asian and East Asian Economies: A Comparative Analysis. *Journal of Business Studies Quarterly*, 8(3)

Sahlman, W. & Gorman, M. (1989). What Do Venture Capitalists Do? *Journal of Business Venturing Vol (4): Issue 4, 231-248*

Schumpeter, J.A. (1911). *The Theory of Economic Development*. Harvard Univ. Press, Cambridge, MA

Sen, S. (2017). Shadow Banking in Emerging Economies like India. https://www.researchgate.net/publication/320700116_Shadow_Banking_in_Emerging Economies_like_India, accessed on December 4, 2019

Senbet, L., & Otchere, I. (2008). Beyond Banking: Developing Markets; African Stock Market. African Finance for the 21st Century High-Level Seminar Organized by the IMF Institute in Collaboration with the Joint Africa Institute. Tunisia, March 4-5.

Shan, J. Z., Morris, A. G., & Sun, F. (2001). Financial Development and Economic Growth: An Egg-and-Chicken Problem? *Review International Economics*, 9(3): 443–454

Shahbaz, M., Ahmed, N., & Ali, L. (2008). Stock market development and economic growth: ARDL causality in Pakistan. *International Research Journal of Finance and Economics,* (14), 182-195

Shaw, E. S. (1973). *Financial Deepening in Economic Development*. Oxford Univ. Press, London

Singh, A. (1997). Financial liberalization, Stock markets and economic development. *The Economic Journal*, 107:771-782.

Singh, A., & Weisse, B.A. (1998). Emerging stock markets, portfolio capital flows and long-term economic growth: Micro and macroeconomic perspectives. *World Development, Elsevier*, 26(4):607-622.

Sinha, D. (1998). Saving and Economic Growth in Thailand. https://ssrn.com/abstract=138645

Singh, T. (2010). Does domestic saving cause economic growth? Time –series evidence from India. Journal of Policy Modeling, Vol. 32, P.231 -253

Slife, B. D., & Williams, R. N. (1995). What's behind the research? Discovering hidden assumptions in the behavioural sciences. Thousand Oaks, CA: Sage Publications.

Stainton-Rogers (2006). 'Logics of Enquiry' in Potter, S. (ed.) *Doing Postgraduate Research* (2nd edn), Milton Keynes, The Open University.

Starr, M. A. (2005). Does money matter in the CIS? Effects of monetary policy on output and prices. *Journal of Comparative Economics*, 33(3), 441–461. https://doi.org/10.1016/j.jce.2005.05.006

Sudharshan, R. P., & Rakesh, G. (2011). An empirical analysis of stock market performance and economic growth: Evidence from India. *International Research Journal of Finance and Economics,* 7(3), 1-15.

The World Factbook (2018). The World Factbook. www.cia.gov, assessed on February 29, 2019

Timmons J.A., & William Bygrave W.D., (1986). Venture Capital's Role in Financing Innovation for Economic Growth. Journal of Business Venturing, 1, (2), 161-176

Uhlig, H. (2005). What are the effects of monetary policy on output? Results from an agnostic identification procedure. Journal of Monetary Economics, Vol 52, Issue 2, Pages 381-419

Vazadikis, A., & Adamopoulos, A. (2009). Stock market development and economic growth. *American Journal of Applied Sciences, 6(11), 1993-1941*

Wang, B., & Ajit, D. (2013). Stock Market and Economic Growth in China. *Economics Bulletin:* 33(1) 95-103

Wang, X. (2010). The Relationship between stock market volatility and macroeconomic volatility: evidence from China, *International Research Journal of Finance and economics,* ISSN 1450-2887 Issue 49.

Wetzel, W.E., Jr. (1983). 'Angels and Informal Risk Capital', Sloan Management Review 24(4): 23-34.

Wong, A., & Zhou, X. (2011). Development of Financial Market and Economic Growth: Review of Hong Kong, China, Japan, The United States and The United Kingdom. *International Journal of Economics and Finance,* 3(2), 111–115.

Wrightsman, D. (1976). An introduction to monetary theory and policy. New York: The Free Press. University of Michigan Press (digitized 2006).

Yartey, C. A. 2008. "Determinants of Stock Market Development in Emerging Economies: Is South Africa Different?" *IMF Working Paper*, BNo. 08/32.

Yartey, C. A. (2007). "Macroeconomic and Institutional Determinants of Stock Market Development in Africa," in Okpara, John, ed.," *Management and Economic Development in Sub-Saharan Africa: Theoretical and Applied Perspectives,*" (London: Adonis and Abbey Publishers).

Yartey, C. A. (2005). "Stock Market Development, Corporate Finance and Economic Growth in Africa," *PhD Thesis,* (Cambridge, UK: Faculty of Economics, University of Cambridge).

Yeh, Y., Shu, P., & Guo, R. (2008). 'Ownership structure and IPO valuation - evidence from Taiwan', *Financial Management*, Vol. 37, pp 141-161

Zapodeanu, D., & Cociuba, M. (2010). Linking money supply with the Gross Domestic Product in Romania. Annales Universitatis Apulensis Series Oeconomica, Vol. 1, issue 12, 50

Zhang, J. (2007). 'Access to Venture Capital and the Performance of Venture-Backed Start-Ups in Silicon Valley', *Economic Development Quarterly*, 21(2), 124-47.

Zucchi, K. (2013). Inflation's Impact on Stock Returns. http://www.investopedia.com/articles/investing/052913/inflations-Impact-stock-returns.asp. Accessed August 12, 2019.

APPENDICES

Appendix 1CC1A: Regression Results of Test Conducted in Eviews9.5 for sample Continents Combined – Model One

Dependent Variable: GGDP

Method: Least Squares

Date: 07/18/19 Time: 19:43

Sample (adjusted): 1996 2016

Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006198	0.002591	2.392634	0.0313
DMKT_CAP2GDP	0.000130	0.000109	1.199148	0.2504
DM2_GDP	-0.005787	0.000980	-5.906146	0.0000
DFDI_2GDP	0.003502	0.003260	1.074199	0.3009
DBREEIS_IDX	-0.031628	0.027774	-1.138785	0.2739
DMKT_CAP2GDP(-1)	0.000118	0.000127	0.928177	0.3690
GGDP(-1)	-0.047580	0.114379	-0.415983	0.6837

R-squared	0.858005	Mean dependent var	-0.000991
Adjusted R-squared	0.797151	S.D. dependent var	0.019878
S.E. of regression	0.008953	Akaike info criterion	-6.332517
Sum squared resid	0.001122	Schwarz criterion	-5.984343
Log likelihood	73.49143	Hannan-Quinn criter.	-6.256954
F-statistic	14.09922	Durbin-Watson stat	1.995470
Prob(F-statistic)	0.000032		

Appendix 2CC1B: Regression Results of Test Conducted in Eviews9.5 for sample Continents Combined – Model One (Simulation) – Panel Least Squares

Dependent Variable: GGDP
Method: Panel Least Squares
Date: 07/18/19 Time:18:43
Sample (adjusted): 1995 2016
Periods included: 22
Cross-sections included: 20
Total panel (balanced) observations: 440

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.021381	0.001945	10.99537	0.0000
DMKT_CAP2GDP	3.66E-06	3.64E-05	0.100619	0.9199
DSTK_TRD_TRN	-2.92E-05	3.82E-05	-0.762831	0.4460
DSTK_TRD_VL_2GDP	1.16E-05	4.56E-05	0.253984	0.7996
DLLISTED_COYS	-0.009450	0.013168	-0.717642	0.4734
DM2_GDP	-0.000740	0.000222	-3.333555	0.0009
DLGDP_P_CPT	1.011551	0.014831	68.20613	0.0000
D__GDSVNGS_2GDP	0.002496	0.000553	4.515521	0.0000
DFDI_2GDP	-0.000178	0.000287	-0.620577	0.5352
DTX2GDP	0.000769	0.000994	0.773621	0.4396
DINFLATN	-1.48E-05	1.51E-05	-0.983240	0.3261
DFRX	6.74E-05	5.00E-05	1.347792	0.1785
DBREES_IDX	-0.030780	0.020357	-1.511984	0.1313
GGDP(-1)	0.026286	0.013488	1.948822	0.0520

Effects Specification

Period fixed (dummy variables)

R-squared	0.951599	Mean dependent var	0.066450
Adjusted R-squared	0.947536	S.D. dependent var	0.139255
S.E. of regression	0.031896	Akaike info criterion	-3.976450
Sum squared resid	0.412037	Schwarz criterion	-3.651366
Log likelihood	909.8190	Hannan-Quinn criter.	-3.848204
F-statistic	234.1957	Durbin-Watson stat	1.694770
Prob(F-statistic)	0.000000		

Appendix 3CC1C: Regression Results of Test Conducted in Eviews9.5 for sample Continents Combined – Model One (Simulation) – Robust Least Squares

Dependent Variable: GGDP
Method: Robust Least Squares
Date: 07/18/19 Time: 21:30
Sample (adjusted): 1995 2016
Included observations: 440 after adjustments
Method: M-estimation
M settings: weight=Bisquare, tuning=4.685, scale=MAD (median centreed)
Huber Type I Standard Errors & Covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.012590	0.000585	21.52943	0.0000
DMKT_CAP2GDP	3.58E-06	1.09E-05	0.329725	0.7416
DSTK_TRD_TRN	-6.82E-06	1.14E-05	-0.599185	0.5490
DSTK_TRD_VL_2GDP	6.25E-07	1.38E-05	0.045141	0.9640
DLLISTED_COYS	-0.003554	0.004015	-0.885247	0.3760
DM2_GDP	-0.000152	6.87E-05	-2.205078	0.0274
DLGDP_P_CPT	1.060002	0.004083	259.5997	0.0000
D__GDSVNGS_2GDP	-0.000345	0.000170	-2.025929	0.0428
DFDI_2GDP	-1.49E-05	8.82E-05	-0.168955	0.8658
DTX2GDP	0.000194	0.000305	0.636260	0.5246
DINFLATN	-1.90E-05	4.67E-06	-4.082558	0.0000
DFRX	5.02E-05	1.55E-05	3.228740	0.0012
DBREES_IDX	0.004902	0.006243	0.785264	0.4323
GGDP(-1)	0.015367	0.003603	4.264447	0.0000

Robust Statistics

R-squared	0.791931	Adjusted R-squared	0.785582
Rw-squared	0.992226	Adjust Rw-squared	0.992226
Akaike info criterion	573.8712	Schwarz criterion	635.9724
Deviance	0.044606	Scale	0.008999
Rn-squared statistic	82499.67	Prob(Rn-squared stat.)	0.000000

Non-robust Statistics

Mean dependent var	0.066450	S.D. dependent var	0.139255
S.E. of regression	0.034429	Sum squared resid	0.504961

Appendix 4CC2: Regression Results of Test Conducted in Eviews9.5 for sample Continents Combined – Model Two

Dependent Variable: DMKT_CAP2GDP
Method: Panel Least Squares
Date: 07/18/19 Time: 21:13
Sample (adjusted): 1995 2016
Periods included: 22
Cross-sections included: 20
Total panel (balanced) observations: 440

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.011056	2.364956	0.850356	0.3956
DSTK_TRD_TRN	-0.343424	0.046839	-7.332003	0.0000
DSTK_TRD_VL_2GDP	0.740426	0.047998	15.42615	0.0000
DLLISTED_COYS	18.46604	15.60052	1.183681	0.2372
DDM_CRD__PRV_2GDP	0.658169	0.332870	1.977256	0.0487
DLGDP_P_CPT	17.77590	61.72789	0.287972	0.7735
D__GDSVNGS_2GDP	-0.180645	0.664137	-0.271999	0.7858
DFDI_2GDP	-0.458653	0.337421	-1.359288	0.1748
DTX2GDP	-1.109621	1.169857	-0.948510	0.3434
DINFLATN	-0.007075	0.017941	-0.394322	0.6936
DFRX	-0.039454	0.061048	-0.646290	0.5185
GGDP	-24.64115	58.18716	-0.423481	0.6722
DBREES_IDX	-18.96095	23.93876	-0.792060	0.4288
DMKT_CAP2GDP(-1)	-0.473562	0.038327	-12.35585	0.0000
DSTK_TRD_TRN(-1)	-0.117769	0.047060	-2.502507	0.0127

Effects Specification

Period fixed (dummy variables)

R-squared	0.569689	Mean dependent var	1.983500
Adjusted R-squared	0.532409	S.D. dependent var	54.94500
S.E. of regression	37.57172	Akaike info criterion	10.16866
Sum squared resid	570300.2	Schwarz criterion	10.50303
Log likelihood	-2201.105	Hannan-Quinn criter.	10.30057
F-statistic	15.28158	Durbin-Watson stat	2.128228
Prob(F-statistic)	0.000000		

Appendix 4BC1: Regression Results of Test Conducted in Eviews9.5 for Best Countries (Panel) – Model One

Dependent Variable: GGDP
Method: Panel EGLS (Period random effects)
Date: 08/20/19 Time: 16:07
Sample (adjusted): 1995 2016
Periods included: 22
Cross-sections included: 4
Total panel (balanced) observations: 88
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.057463	0.007631	7.529699	0.0000
DMKT_CAP2GDP	0.000128	6.00E-05	2.135246	0.0360
DSTK_TRD_TRN	-3.57E-05	0.000152	-0.235413	0.8145
DLLISTED_COYS	-0.150367	0.100049	-1.502938	0.1370
DM2_GDP	-0.001855	0.000977	-1.898884	0.0614
D__GDSVNGS_2GDP	0.009961	0.007219	1.379711	0.1717
DFRX	-0.115729	0.010295	-11.24078	0.0000
DINFLATN	0.005912	0.003045	1.941606	0.0559
DTX2GDP	0.006426	0.007079	0.907845	0.3668
DBREES_IDX	0.043191	0.092684	0.466000	0.6425
GGDP(-1)	0.185307	0.070536	2.627119	0.0104
DMKT_CAP2GDP(-1)	0.000122	5.48E-05	2.224451	0.0291

Effects Specification

	S.D.	Rho
Period random	0.000000	0.0000
Idiosyncratic random	0.052181	1.0000

Weighted Statistics

R-squared	0.714787	Mean dependent var	0.042793
Adjusted R-squared	0.673506	S.D. dependent var	0.090275
S.E. of regression	0.051583	Sum squared resid	0.202221
F-statistic	17.31523	Durbin-Watson stat	1.075779
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.714787	Mean dependent var	0.042793
Sum squared resid	0.202221	Durbin-Watson stat	1.075779

Appendix 5BC2: Hausman Test Results of Test Conducted in Eviews9.5 for Best Countries

Correlated Random Effects - Hausman Test
Equation: Untitled
Test period random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Period random	9.360719	11	0.5886

** WARNING: estimated period random effects variance is zero.

Appendix 6BC3: Regression Results of Test Conducted in Eviews9.5 for Best Countries (Panel) – Model Two

Dependent Variable: DMKT_CAP2GDP
Method: Panel Least Squares
Date: 08/20/19 Time: 16:13
Sample (adjusted): 1995 2016
Periods included: 22
Cross-sections included: 4
Total panel (balanced) observations: 88

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-15.58367	10.50878	-1.482919	0.1437
DSTK_TRD_TRN	-0.492775	0.241211	-2.042916	0.0458
DSTK_TRD_VL	0.923155	0.126504	7.297453	0.0000
DDM_CRD__PRV_2GDP	2.584501	1.076641	2.400522	0.0197
DM2_GDP	5.304679	1.377774	3.850180	0.0003
GGDP	48.32249	106.3419	0.454407	0.6513
D__GDSVNGS_2GDP	23.36359	10.53151	2.218445	0.0306
DFDI_2GDP	-2.058464	1.543515	-1.333621	0.1877
DTX2GDP	-27.41374	12.22194	-2.242994	0.0289
DINFLATN	2.855615	4.336893	0.658447	0.5129
DMKT_CAP2GDP(-1)	-0.492089	0.088957	-5.531786	0.0000

Effects Specification

Period fixed (dummy variables)

R-squared	0.791281	Mean dependent var	5.575250
Adjusted R-squared	0.675740	S.D. dependent var	116.0317
S.E. of regression	66.07291	Akaike info criterion	11.49468
Sum squared resid	244475.3	Schwarz criterion	12.39553
Log likelihood	-473.7660	Hannan-Quinn criter.	11.85761
F-statistic	6.848487	Durbin-Watson stat	2.098251
Prob(F-statistic)	0.000000		

Appendix 7US1: Regression Results of Test Conducted in Eviews9.5 for United States of America – Model One

Dependent Variable: GGDP

Method: Least Squares

Date: 09/08/19 Time: 16:45

Sample (adjusted): 1996 2016

Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.006523	0.002252	2.896939	0.0117
DMKT_CAP2GDP	0.000128	9.95E-05	1.286477	0.2191
DSTK_TRD_VOL	8.95E-05	4.34E-05	2.063945	0.0581
DM2_GDP	-0.005956	0.000984	-6.053908	0.0000
DBREEIS_IDX	-0.020033	0.025349	-0.790296	0.4425
DINFLATN	0.005313	0.005637	0.942601	0.3619
GGDP(-1)	-0.150202	0.133980	-1.121076	0.2811

R-squared	0.883439	Mean dependent var	-0.000991
Adjusted R-squared	0.833485	S.D. dependent var	0.019878
S.E. of regression	0.008111	Akaike info criterion	-6.529894
Sum squared resid	0.000921	Schwarz criterion	-6.181720
Log likelihood	75.56389	Hannan-Quinn criter.	-6.454332
F-statistic	17.68487	Durbin-Watson stat	1.529674
Prob(F-statistic)	0.000008		

Appendix 8US2A: Regression Results of Test Conducted in Eviews9.5 for United States of America – Model Two

Dependent Variable: DMKT_CAP2GDP

Method: Least Squares

Date: 09/09/19 Time: 06:49

Sample (adjusted): 1995 2016

Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-12.06639	9.604521	-1.256324	0.2296
DBREEIS_IDX	-56.53922	43.03628	-1.313757	0.2100
GGDP	10.21957	323.4231	0.031598	0.9752
DINFLATN	4.768679	7.193393	0.662925	0.5181
DFDI_2GDP	11.93409	5.417839	2.202740	0.0449
DSTK_TRD_TRN	-0.348287	0.062464	-5.575769	0.0001
DMKT_CAP2GDP(-1)	0.219191	0.206881	1.059504	0.3073
GGDP(-1)	313.2117	242.0034	1.294245	0.2165

R-squared	0.770947	Mean dependent var	3.480268
Adjusted R-squared	0.656420	S.D. dependent var	20.65997
S.E. of regression	12.10998	Akaike info criterion	8.101225
Sum squared resid	2053.123	Schwarz criterion	8.497967
Log likelihood	-81.11347	Hannan-Quinn criter.	8.194685
F-statistic	6.731596	Durbin-Watson stat	2.071450
Prob(F-statistic)	0.001282		

Appendix 9US2B: Regression Results of Test Conducted in Eviews9.5 for United States of America – Model Two (Simulation)

Dependent Variable: DMKT_CAP2GDP

Method: Least Squares

Date: 09/09/19 Time: 12:03

Sample (adjusted): 1995 2016

Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-23.72762	11.98624	-1.979571	0.0664
DBREEIS_IDX	-4.159379	38.73551	-0.107379	0.9159
DINFLATN	-2.773782	6.780612	-0.409076	0.6883
DDM_CRD__PRV_2GDP	-2.814372	2.471236	-1.138852	0.2726
GGDP	641.8437	283.5647	2.263482	0.0389
DMKT_CAP2GDP(-1)	0.177887	0.204673	0.869127	0.3985
DSTK_TRD_TRN	-0.258827	0.059106	-4.379022	0.0005

R-squared	0.715928	Mean dependent var	3.480268
Adjusted R-squared	0.602299	S.D. dependent var	20.65997
S.E. of regression	13.02890	Akaike info criterion	8.225589
Sum squared resid	2546.285	Schwarz criterion	8.572739
Log likelihood	-83.48148	Hannan-Quinn criter.	8.307367
F-statistic	6.300588	Durbin-Watson stat	1.787357
Prob(F-statistic)	0.001807		

Appendix 10ZA1 Regression Results of Test Conducted in Eviews9.5 for South Africa – Model One

Dependent Variable: GGDP

Method: Least Squares

Date: 07/17/19 Time: 14:03

Sample (adjusted): 1996 2016

Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.059958	0.029514	2.031503	0.0616
DMKT_CAP2GDP	-0.000183	0.000617	-0.297275	0.7706
D__GDSVNGS_2GDP	0.026481	0.038909	0.680597	0.5072
DBREES_IDX	1.829110	0.750814	2.436170	0.0288
DFRX	-0.111060	0.025088	-4.426860	0.0006
DTX2GDP	-0.083878	0.030150	-2.782043	0.0147
DGGDP(-1)	-0.362808	0.170490	-2.128033	0.0516

R-squared	0.692799	Mean dependent var	-0.008738
Adjusted R-squared	0.561142	S.D. dependent var	0.175459
S.E. of regression	0.116235	Akaike info criterion	-1.205202
Sum squared resid	0.189148	Schwarz criterion	-0.857028
Log likelihood	19.65462	Hannan-Quinn criter.	-1.129639
F-statistic	5.262132	Durbin-Watson stat	1.248582
Prob(F-statistic)	0.004980		

Appendix 10ZA2: Regression Results of Test Conducted in Eviews9.5 for South Africa – Model Two

Dependent Variable: DMKT_CAP2GDP

Method: Least Squares

Date: 07/17/19 Time: 10:40

Sample (adjusted): 1995 2016

Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-13.82546	14.09154	-0.981118	0.3432
GGDP	53.90588	52.19386	1.032801	0.3192
FDI_2GDP	7.643516	6.834357	1.118396	0.2822
DFRX	-6.484750	9.524535	-0.680847	0.5071
DBREES_IDX	-251.5990	275.7235	-0.912505	0.3769
D__GDSVNGS_2GDP	-16.82643	11.72392	-1.435222	0.1732
DMKT_CAP2GDP(-1)	-0.313629	0.212076	-1.478855	0.1613
DSTK_TRD_VL	2.391794	0.586436	4.078523	0.0011

R-squared	0.716632	Mean dependent var	6.225160
Adjusted R-squared	0.574947	S.D. dependent var	49.52699
S.E. of regression	32.28964	Akaike info criterion	10.06266
Sum squared resid	14596.69	Schwarz criterion	10.45940
Log likelihood	-102.6892	Hannan-Quinn criter.	10.15612
F-statistic	5.057950	Durbin-Watson stat	1.885645
Prob(F-statistic)	0.004885		

Appendix 11UK1A: Regression Results of Test Conducted in Eviews9.5 for United Kingdom – Model One

Dependent Variable: GGDP

Method: Least Squares

Date: 07/17/19 Time: 16:25

Sample (adjusted): 1996 2016

Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.004967	0.015020	-0.330705	0.7466
DSTK_TRD_VAL__GDP	-0.000463	0.000666	-0.695464	0.5000
D__GDSVNGS_2GDP	0.031975	0.020718	1.543314	0.1487
DINFLATN	0.006195	0.008094	0.765323	0.4589
DFRX	-1.692555	0.398995	-4.242042	0.0011
DBREEIS_IDX	0.386431	0.271009	1.425897	0.1794
DGGDP(-1)	-0.520385	0.189093	-2.752004	0.0175
DSTK_TRD_VAL__GDP(-1)	0.000361	0.000603	0.599237	0.5602
D__GDSVNGS_2GDP(-1)	-0.028282	0.019407	-1.457263	0.1707

R-squared	0.764668	Mean dependent var	-0.012053
Adjusted R-squared	0.607781	S.D. dependent var	0.095697
S.E. of regression	0.059933	Akaike info criterion	-2.493664
Sum squared resid	0.043103	Schwarz criterion	-2.046011
Log likelihood	35.18347	Hannan-Quinn criter.	-2.396512
F-statistic	4.873986	Durbin-Watson stat	1.580252
Prob(F-statistic)	0.007288		

Appendix 12UK1B: Regression Results of Test Conducted in Eviews9.5 for United Kingdom – Model One (Simulation)

Dependent Variable: GGDP

Method: Least Squares

Date: 10/05/19 Time: 16:30

Sample (adjusted): 1996 2016

Included observations: 21 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.008775	0.012801	-0.685458	0.5086
DSTK_TRD_VAL__GDP	-0.000132	0.000576	-0.228931	0.8235
DLLISTED_COYS	-0.447314	0.196882	-2.271993	0.0464
D__GDSVNGS_2GDP	0.032744	0.017396	1.882274	0.0892
DTX2GDP	-0.010466	0.024104	-0.434218	0.6733
DFRX	-1.867187	0.352063	-5.303564	0.0003
DINFLATN	0.006831	0.006830	1.000201	0.3408
DBREEIS_IDX	0.510307	0.233294	2.187394	0.0536
GGDP(-1)	-0.450795	0.161080	-2.798571	0.0188
DSTK_TRD_VAL__GDP(-1)	0.000742	0.000692	1.072075	0.3089
D__GDSVNGS_2GDP(-1)	-0.040546	0.016766	-2.418301	0.0362

R-squared	0.864574	Mean dependent var	-0.012053
Adjusted R-squared	0.729148	S.D. dependent var	0.095697
S.E. of regression	0.049804	Akaike info criterion	-2.855757
Sum squared resid	0.024804	Schwarz criterion	-2.308626
Log likelihood	40.98545	Hannan-Quinn criter.	-2.737016
F-statistic	6.384102	Durbin-Watson stat	1.583489
Prob(F-statistic)	0.003565		

Appendix 13UK2A: Regression Results of Test Conducted in Eviews9.5 for United Kingdom – Model Two (Simulation)

Dependent Variable: DLLISTED_COYS

Method: Least Squares

Date: 10/05/19 Time: 16:35

Sample (adjusted): 1995 2016

Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.036095	0.022325	-1.616804	0.1319
D__GDSVNGS_2GDP	0.003393	0.024608	0.137866	0.8926
DFDI_2GDP	0.002637	0.004602	0.573145	0.5771
DINFLATN	0.012832	0.007475	1.716549	0.1117
GGDP	0.070481	0.234723	0.300274	0.7691
DSTK_TRD_VAL__GDP	0.000579	0.000708	0.818586	0.4290
DBREEIS_IDX	0.324986	0.315544	1.029924	0.3234
DLLISTED_COYS(-1)	0.065764	0.256131	0.256760	0.8017
GGDP(-1)	0.534937	0.265954	2.011389	0.0673
D__GDSVNGS_2GDP(-1)	-0.036485	0.023182	-1.573871	0.1415

R-squared	0.509242	Mean dependent var	0.002849
Adjusted R-squared	0.141173	S.D. dependent var	0.070486
S.E. of regression	0.065321	Akaike info criterion	-2.316038
Sum squared resid	0.051203	Schwarz criterion	-1.820109
Log likelihood	35.47642	Hannan-Quinn criter.	-2.199212
F-statistic	1.383550	Durbin-Watson stat	1.860634
Prob(F-statistic)	0.294198		

Appendix 14UK2C: Regression Results of Test Conducted in Eviews9.5 for United Kingdom – Model Two (Simulation)

Dependent Variable: DLLISTED_COYS

Method: Robust Least Squares

Date: 10/05/19 Time: 16:37

Sample (adjusted): 1995 2016

Included observations: 22 after adjustments

Method: M-estimation

M settings: weight=Bisquare, tuning=4.685, scale=MAD (median centered)

Huber Type I Standard Errors & Covariance

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-0.012721	0.007108	-1.789592	0.0735
D__GDSVNGS_2GDP	0.008335	0.007835	1.063850	0.2874
DFDI_2GDP	0.004293	0.001465	2.930079	0.0034
DINFLATN	0.012019	0.002380	5.049891	0.0000
GGDP	0.253066	0.074735	3.386167	0.0007
DSTK_TRD_VAL__GDP	0.000940	0.000225	4.171463	0.0000
DBREEIS_IDX	-0.232607	0.100469	-2.315222	0.0206
DLLISTED_COYS(-1)	0.310865	0.081552	3.811887	0.0001
GGDP(-1)	0.265007	0.084679	3.129538	0.0018
D__GDSVNGS_2GDP(-1)	-0.015123	0.007381	-2.048896	0.0405

Robust Statistics

R-squared	0.552841	Adjusted R-squared	0.217471
Rw-squared	0.971387	Adjust Rw-squared	0.971387
Akaike info criterion	55.61914	Schwarz criterion	76.17760
Deviance	0.008039	Scale	0.013326
Rn-squared statistic	175.4337	Prob(Rn-squared stat.)	0.000000

Non-robust Statistics

Mean dependent var	0.002849	S.D. dependent var	0.070486
S.E. of regression	0.082079	Sum squared resid	0.080843

Appendix 15HK1: Regression Results of Test Conducted in Eviews9.5 for Hong Kong – Model One

Dependent Variable: GGDP

Method: Least Squares

Date: 08/20/19 Time: 16:50

Sample (adjusted): 1995 2016

Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.046043	0.012628	3.646217	0.0026
DSTK_TRD_VL	0.000119	5.52E-05	2.156670	0.0489
DM2_GDP	-0.002632	0.000758	-3.472931	0.0037
DFDI_2GDP	0.000413	0.000696	0.594067	0.5619
DFRX	0.272699	0.509391	0.535345	0.6008
DBREEIS_IDX	0.016987	0.098477	0.172500	0.8655
GGDP(-1)	0.402259	0.157114	2.560299	0.0227
DSTK_TRD_VL(-1)	-2.83E-05	5.14E-05	-0.550042	0.5910

R-squared	0.674669	Mean dependent var	0.040854
Adjusted R-squared	0.512004	S.D. dependent var	0.046211
S.E. of regression	0.032282	Akaike info criterion	-3.753353
Sum squared resid	0.014589	Schwarz criterion	-3.356610
Log likelihood	49.28688	Hannan-Quinn criter.	-3.659892
F-statistic	4.147592	Durbin-Watson stat	1.689093
Prob(F-statistic)	0.011349		

Appendix 15HK2: Regression Results of Test Conducted in Eviews9.5 for Hong Kong – Model Two

Dependent Variable: DMKT_CAP2GDP

Method: Least Squares

Date: 08/20/19 Time: 16:55

Sample (adjusted): 1995 2016

Included observations: 22 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	92.57591	49.77447	1.859908	0.0840
GGDP	474.2721	1026.512	0.462023	0.6512
D__GDSVNGS_2GDP	-11.73802	32.30651	-0.363333	0.7218
DFRX	-1129.121	2741.075	-0.411926	0.6866
DSTK_TRD_VL	0.767201	0.256925	2.986086	0.0098
DBREEIS_IDX	-465.2150	482.2200	-0.964736	0.3510
DMKT_CAP2GDP(-1)	-0.557073	0.216031	-2.578670	0.0219
GGDP(-1)	-1554.750	949.8627	-1.636816	0.1239

R-squared	0.676590	Mean dependent var	36.20915
Adjusted R-squared	0.514884	S.D. dependent var	223.1858
S.E. of regression	155.4495	Akaike info criterion	13.20581
Sum squared resid	338303.6	Schwarz criterion	13.60255
Log likelihood	-137.2639	Hannan-Quinn criter.	13.29927
F-statistic	4.184092	Durbin-Watson stat	2.144697
Prob(F-statistic)	0.010951		

'' Faith is taking the first step even when you don't see the full staircase''

----------------------   Martin Luther King Jnr