STOCK MARKET DEVELOPMENT AND ECONOMIC GROWTH IN UGANDA: A TIME SERIES ANALYSIS FOR THE PERIOD (1998Q1-2012Q4)

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TUMAINI BULERE

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Members of the Examining Committee:
Prof. Rolph van der Hoeven
Dr. Howard Nicholas

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Disclaimer:

This document represents part of the author's study programme while at the Institute of Social Studies. The views stated therein are those of the author and not necessarily those of the Institute.

Inquiries:

Postal address:

Institute of Social Studies
P.O. Box 29776
2502 LT The Hague
The Netherlands

Location:

Kortenaerkade 12
2518 AX The Hague
The Netherlands

Telephone: +31 70 426 0460
Fax: +31 70 426 0799

Dedication

To God Almighty and to my family and friends.

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List of Acronyms

ADF	Augmented Dickey fuller
ATS	Automated Trading System
BOU	Bank Of Uganda
CMA	Capital Markets Athority
GDP	Gross Domestic Product
GE	Government Expenditure
GFCF	Gross Fixed Capital Formation
IMF	International Monitory Fund
ISS	Institute of Social Studies
M2	Money and quasy money or money supply
MC	Market Capitalisation
SME	Small and medium Entreprises
TR	Turnover Ratio
UCE	Uganda Commodity Exchange Limited
USE	Uganda Securities Exchange
VAR	Multivariate vector autoregressive models
VECM	Vector Error Correction Model
VST	Value of Shares Traded total

Abstract

This research aims at examining the long run causal relationship between stock market development and economic growth in the context of Uganda, on the ground that Uganda Securities Exchange is still nascent and its contribution is not yet evident in the economy, yet many economist and researchers have accredited Stock markets for their important role in economic growth. Using quarterly data from 1998Q1 to 2012Q4, the study employed one bank (money supply) and three measures of stock market development namely Market Capitalization ratio to proxy market size, and total value of shares traded and Turnover ratio to proxy market liquidity, controlling for other factors that affect economic growth. To test for whether there exists a relationship between variables, the study applies Multivariate vector autoregressive models (VAR) and Vector Error Correction Models (VECM) to capture the short and long run dynamics of the relationship. The Johansen test of cointergration reveal that variables are cointergrated and the VECM reveals existence of long running relationship. The granger causality test results however were inconclusive showing no causality between stock market and growth in Uganda. Other factors may have contributed to the growth of the economy shown from the long running relationship between the variables.

Keywords

Stock market development, economic growth, Uganda.

CHAPTER ONE

1.1 Introduction

The role of financial markets in economic growth is historical in nature. It was first discussed by Shcumpeter (1911) in the early 1910s, he explained that credit markets provide finance to business enterprises who in turn use it to acquire new technology, which eventually boosts economic growth.

For so many years, the role of Stock Markets have been under looked as important components that enhance economic growth, instead bank-based financial institution were considered more instrumental in accelerating economic growth. This might have been so due of the discrepancies in the results obtained from various studies carried on this relationship, especially in the context of developing countries. The differences could be because most stock markets in developing countries are still nascent and small in size, more so the varying macroeconomic conditions could explain these inconsistencies.

The stock market in Uganda however is still nascent and small. The previous research on the effect of Uganda Securities Exchange (Uganda's Stock market) on economic growth by (Maghanga and Quisenberry 2015), found inconclusive results on this relationship, and recommended that USE be developed further so as to have a significant impact on growth of the economy. Uganda Securities Exchange, one of the newest Stock Markets in Africa, was established 1997, and became operational in 1998 with only 1 listings, a bond from East African Development Bank, with limited amount of trades per week. Today there are 16 listings of domestic and East African companies in the stock market. USE is still nascent and trading in Shares on the USE was still done manually, on a white board and markers up until July this year (2015) when the automated trading system (ATS) was launched. The major challenge of USE is limited number of listings and low market capitalization. Most Ugandan Private Sectors have a negative attitude towards listing on the stock market, as these fear to lose managerial control to shareholders, More so, private companies do not want to be pioneer in going public, they prefer bank loans as a source of capital to finance their businesses. Multinational companies are reluctant to issue shares in USE as these rely of own fund and less on alternative sources of funds (Bohnstedt et al. 2000). Despite low listings and market capitalization levels in USE, the turnover ratios are promising. In 2010 the Uganda Securities Exchange was the best performing stock exchange in Sab-Saharan Africa with an ALSI (All-Shares Index) return of 74% between January and November 2010

(Wikipedia 2015). The puzzle is whether the stock market development has had any impact on economic growth in Uganda.

There is increasing volume of literature (both theoretic and empirical) on the contributions of Stock markets on Economic Growth. The relationship between stock markets and economic growth are perceived and explained in different ways by different schools of thought. Whereas one school of thought argues that stock markets accelerate economic growth, another claims that it is economic growth that enhance stock market development. There are those research that argue that there is a dual-relationship, and other say stock markets do not have any effect on economic growth.

Arguments in favor of the positive contributions of stock markets to economic growth include, (Gurley and Shaw 1955) one of the first people to research on the relationship between financial markets and economic growth, argued that the role of the financial market is to move funds from surplus savers to deficit enterprises to finance their activities, hence improve trade. They viewed the financial market as a promoter of physical capital accumulation, which would eventually stimulate production and increase output, hence promoting economic growth. Levine and Zervos (1998) argued that Stock markets are considered very important sources of capital and creation of liquidity, hence more profitable investment and better allocation of capital which escalates long-term economic growth. Similarly, Raj, Rev Dr J Felix and Roy (2014) also attached importance to stock markets as being instrumental in causing growth. From their study of 8 Asian countries, from 1980 to 2010, applying granger causality test, revealed that stock markets promoted economic growth in the long-run. This was in line with the theory that stock markets enable capital accumulation and better resource allocation which promote long-term growth.

Chakraborty (2008) on the other hand established that its rather economic growth that causes stock market development. He carried a research to examine the relationship between financial development (stock market inclusive) and economic growth in India. His cointegration test show a long-run relationship among the variables, and the granger causality test showed that causality was running from Real GDP (a proxy for growth), to stock market capitalization (a proxy for stock market). This shows that economic growth leads to stock market development.

A number of scholars have argued that stock markets and economic growth inter-cause one another simultaneously, implying there is a dual-causality

between the two variables. (Luintel and Khan 1999), for example conducted a finance-growth link study, using a Multivariant Vector auto-regression (VAR) model in 10 countries including Greece, Srilanka, India, South Africa, Colombia, and so on, a bi-directional causality was found between total deposit liability and nominal GDP, representing financial development and economic growth respectively. Similarly (GC 2006) in his empirical study found that stock market fosters economic growth in Nepal and the reverse is true, implying there is a two-way causality among the variables from the period of 1988 to 2005.

The final school of thought is the one that argues that stock markets do not have any impact on economic growth. (Harris 1997), for example, performed a re-examination of a study carried out by Atje and Jovanovic (1993). His findings were that for the case of developing countries, stock markets were found to have weak effect on growth at best. Implying stock markets had an insignificant effect on economic growth.

1.2 Problem Statement

Economic growth in Uganda has fluctuated tremendously over the years. The country experienced unstable growth in the 1950. In the 1960s, growth was revitalized owing to the agriculture-led economic growth strategy adopted by the egalitarian regime after independence. Gross Domestic Product grew at 4.6% annually (Okidi et aI, 2004 p8). In the 1970, as well as mid-1980, political instability distorted the economy. The level of savings shrunk, there was human and physical capital flight, government expenditure was diverted from productive activities to war budgeting, this reduced productivity in the country. Eventually Gross Domestic Product declined by 40%, welfare worsened and the economy generally shrunk with in this period of political commotion, that is from 1971 to 1986, (Okidi et aI, 2004 p8).

After the turmoil in 1971 to 1979 during the regime of Idi Amin Dada that had hampered growth, followed a period of restoration of political and economic order in the 1980s. Uganda adopted programs of economic recovery that receive massive foreign support. However, the excessive expansionary monitory and fiscal policies along with civil unrest in the mid-1984 led to a setback in Uganda's economic performance. In May 1987, an Economic Recovery Program (ERP) was launched in Uganda, following a strong leadership commitment to reform Uganda and this receive considerable donor support from around the world. A series of Structural Adjustment Programs (SAP) followed the ERP geared majorly towards an investment driven growth, led by the private sector.

Economic Growth was rejuvenated with the increase of Foreign Direct Investment (FDI), growth of the private sector in industrial, agricultural, commercial and hotel sector, (Okidi et aI 2004 p8).

As a mechanism to ensure continuous growth of the economy and continuous financing and growth of the private sector, Uganda securities Exchange (USE) was founded in 1997. The main aim of the establishment of USE by the government was to provide a ground for raising funds for investment in long-term assets, mobilizing savings for investment and improving small companies' access to finance (Maghanga and Quisenberry 2015). But has the USE enhanced economic growth since its creation? A lot of studies have been carried out on the relationship between stock markets and economic growth. The debates are still ongoing as no conclusive stand can be taken as different studies have revealed different findings. These debates and arguments are the basis for this research aiming at finding what the relationship is in the case of Uganda. More so, most of empirical studies carried on this relationship are cross-country with limited country specific time series studies. For the case of Uganda, there are scarce studies carried on this relationship. Economic growth in Uganda has been on the rise since 1986, the study seeks to investigate if the Stock Market had a hand in this continuous growth.

1.3 Justification of the Research

Every country strives to attain increasing growth rates as this is viewed as a way to ameliorate standards of living, more revenue to the government, indication of political position and strength of a country, alleviates poverty, among other benefits accruing to a country as a result of economy growth. Therefore countries endeavor to exploit the various possible sources of economic growth. A number of studies have discovered that stock market development is an important promoter of economic growth in an economy. Earlier studies focused basically on the contribution of the banking sector in the economic growth, however, In the past decades, the world stock markets surged, and emerging markets were primarily accounted for a large amount of this boom (Demirgüç-Kunt and Levine 1996). This has propelled recent research therefore to assess the linkages between the stock markets and economic development. New theoretical work shows how stock market development might improve long-run economic growth and new empirical evidence supports this view. Demirgüç-Kunt and Levine (1996), Singh (1997) and Levine and Zervos (1998) find that stock market development is playing an important role in predicting future economic growth. This has propelled most developing countries to open stock Exchanges hoping to reap benefits of

financial sector development as much as the developed countries (Minier 2009). The puzzle is, whether the new stock exchanges also will have a positive and significant effect on economic growth in developing countries. There are several debates rising on the relationship between stock market development and economic growth which is the driving force behind this research. Some find a significant causal relationship between stock markets and economic growth, others do not find any substantial relationship especially on the contest of developing countries. Other economists suggest that there is need for better financial, institutional policies and so on, to be put forth in developing countries so as to extract full benefits that stock markets can offer to boost economic growth, among other debates as pointed out above. These debates are the reasons for undertaking this research so as to assess the relationship between nascent stock markets and economic growth in the context of developing countries, focusing on Uganda Securities Exchange (USE) in Uganda. More so, limited country specific studies have been carried on this relationship, as most studies are cross county. Scarce stock-market-growth link studies exist in the case of Uganda, which also motivate this study.

1.4 Research Objective

The main goal of the study is to assess the impact of Stock Markets Development on Economic Growth in Uganda. To achieve this, 2 objectives are set by the researcher:

- To investigate whether or not there is a relationship between stock Market and economic growth in Uganda.
- To establish the direction of causality between stock market and economic growth in Uganda,

1.5 Research Question

What is the impact of Stock Markets Development on Economic Growth in Uganda?

The main question is: What is the impact of Stock Markets Development on Economic Growth in Uganda. To explain this better, the researcher broke it into two questions:

- What is the relationship between stock Market and economic growth in Uganda?
- What is the direction of causality between stock market and economic growth in Uganda? This question intends to establish whether it is the

stock market development causes economic growth, or economic growth causes stock market development.

1.6 Research Hypothesis

There is a positive relationship between stock market an economic growth, and stock market development leads to economic growth in Uganda.

1.7 Limitations

The data was collected from dissimilar sources. The external sources (outside Uganda), required conversion, which may make it not very accurate. However the researcher endeavored to address the research questions and objectives and ensure that the study depicts the effects of stock market development on economic growth in Uganda.

1.8 Structure of the Paper

The rest of the paper will be organized as follows: Chapter 2 gives an overview on the characteristics and development of stock market in Uganda, as well as economic growth trend in Uganda. Chapter 3 provides theoretical and empirical evidence on stock market-economic growth relationship. Chapter 4 explains the research methodology. Chapter 5 discusses the empirical analysis and presentation of the findings. And finally chapter six concludes the research with by summarizing the results and provide recommendations.

Chapter 2: Overview of Uganda's stock market

2.1 Introduction

A financial market is a market where financial instruments and other fungible items are traded. It is an arrangement that brings buyers and sellers of financial instruments together for exchange purposes. Instruments such as bonds, stocks, commodities, derivatives, options, currencies and so on are traded here. Financial markets are used to raise both short-term and long-term finances. Uganda's financial market includes, foreign exchange market, commodity market, derivative markets, Money market and Capital market.

Foreign exchange Market. This is a market where different currencies are traded. In Uganda, the participants in the foreign exchange market are Bank of Uganda (BOU), which is the country's central bank, then the interbank markets or trade among commercial banks, forex bureau, and finally retail customers including all the end users or foreign exchange.

Commodity market. This is a virtual market that deals with trading of primary products but not manufactured products. This can be categorized in to soft commodities such as agricultural products like sugar, coffee and so on and livestock, and hard commodities like natural resources that are mined such as oil, copper, gold, and so on. The commodity market in Uganda is called Uganda Commodity Exchange Limited (UCE).

Derivative Market is one market which deals with trades in derivatives instruments. The value of these instruments are derived from their underlying assets or instrument like commodity, bonds and so on. However, ownership of which (derivatives) does not imply ownership of the asset. Derivatives are traded as a way of managing financial risks as well as fluctuations in the underlying instrument or asset' value. Derivatives instruments may take the form of options, future contracts or Swaps. The derivatives market may be the one of Over-the-counter or exchange-traded derivatives.

Money market is one where short-term debt instruments are sold and bought. This market offers short-term debt financing with a short maturity period of less than a year in most cases. The instruments traded, usually loans are liquid, yet with short maturities, therefore is considered as a safer way to invest.

Capital Market is a market where long-term financial instrument such as bonds and shares are traded. The capital market in Uganda is referred to as

Capital Markets Authority (CMA) and is comprised of two markets, the Bond market and Equity market also called stock market.

- **Bond Market** is a financial market where long-term debt instruments are sold and bought. Bond markets provide financing through bonds issuance. In Uganda, the major bonds are corporate bonds and government securities. The purchaser of which is assured of receipt of a specified interest rate during the life of the bond, and the principle at the due maturity date, by the issuer.
- **Stock Markets**. A stock markets are markets where shares of publicly quoted companies are traded. These shares may be issued by firms that are quoted on the stock exchange, government or as a way to raise fund for various proposes. The Ugandan stock market is called Uganda Securities Exchange (USE)

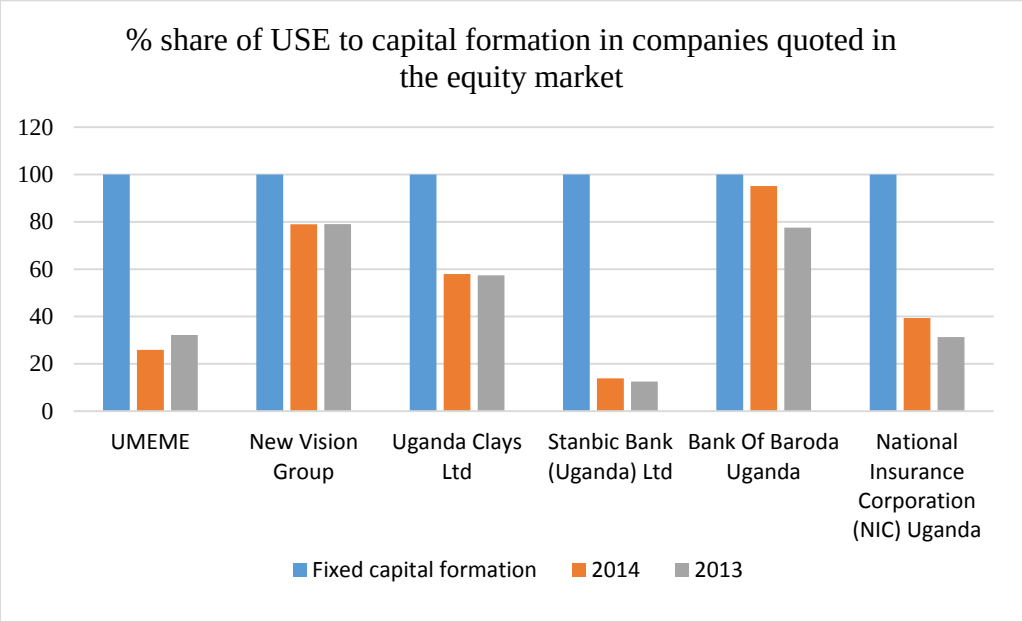
2.2 The stock exchange in Uganda (Uganda securities exchange)

Uganda Securities exchange, one of the newest Stock Markets in Africa, is the only stock exchange in Uganda. It was established in June 1997 as company limited by guarantee. USE was incorporated in Uganda under the Ugandan Companies Act. It became operational in January 1998 with only 1 listings, a bond from East African Development Bank, with limited amount of trading per week. USE operates under the jurisdictions of Uganda Capital Markets Authority (CMA) which then reports to Bank of Uganda. Uganda Securities Exchange is the central place for trading all companies' securities as well as and regulation of brokers' activities. From floating shares to the public, USE aids the public to invest in shares, and also enables the companies (private sector) as well as the government to raise funds to finance their activities. USE is also a member of ASEA (African Stock Exchange Association). The exchange works in collaboration with other East African Exchanges namely The Nairobi Stock Exchange in Kenya and Dar-a-salaam Stock Exchange in Tanzania and Rwanda securities Exchange in Rwanda, hoping to merge into one big East African Bourse as an attempt to attain full Financial Integration in the East African Community. USE is guided by the Uganda Securities Rules and Regulations 2003. Uganda Securities exchange is indeed very important especially given the role it plays in bringing investors and companies together, and enable companies raise capital, facilitate the trading process of trading in securities by investors and enforcing regulations.

2.3 Magnitude of USE finances on companies quoted on the exchange.

The major argument of the research is on the ground that stock markets provide capital to firms and these invest in production that increase output, hence economic growth. The table below shows how much of the total capital stock of 6 companies quoted on the exchange is from the equity market (Uganda securities exchange). This intends to show the magnitude of the contribution of the equity market to fixed capital formation of companies quoted on the exchange. The first bar is the total capital of companies, orange and grey are percentage value of stock that comes from the equity exchange in 2014 and 2013 respectively.

Gragh 1: Showing the share of capital stock from Equity market



Source: Various reports from listed companies

2.4 Trading System in Uganda Securities Exchange

Since its inauguration in the Ugandan market in 1997, Uganda securities exchange has been using the old tradition of Floor trading, manually, using markers and a white board. The trading stock officer rings a hand-bell (6 inch tall) and trading takes shape as licensed brokers/dealers (in red coats), shout out loud their orders and bargain for the best deals for their clients. In the Open Outcry Auction Trading System with verbal bids and offers, a transaction is made when orders (sell and purchase) are matched. Deals were executed on first come first serve basis, as this was manually performed. USE operated an Open Outcry Auction Trading system till mid-2015, when the Automated

Trading System was introduced in July 20th 2015 to keep pace with times, and catch up with other stock exchanges around the globe. And now trading is done online, with computers, no more shouting in the exchange. Here, prices determine queuing, not first come first served anymore. The market operations have also extended greatly. Previously trading was done for 2 hours, now trading hours have moved from 2 to 3 hours and soon 5 hours. Trading is performed in a way that, within the first thirty minutes, orders are placed, and the next thirty minutes are for auctions where clients compete on prices and quantities, then the system matches these orders automatically. The government of Uganda is supporting the development of USE and urging companies and the business community as a whole to seek long-term capital from USE, and the public to save and invest in USE shares. The introduction of the automated trading system is part of the country's bigger economic plan. The performance of USE is seen to improve after this innovation, since automated trading system is more efficient, cheaper, faster and less prone to errors. The automated trading system would improve accessibility of the exchange, and attract more foreign investment. The automated trading system enables clients to keep track of investments executions and if dissatisfied with the execution, one can switch brokers using that same account.

2.5 Clearing and Settlement System

Like many other Stock markets, Uganda Securities Exchange uses a Central Depository System for its clearing and settlement. A Central Depository System is an online book entry system which enables storage and transfer of securities ownership from one investor to another, without involving physical movement of the documents of title or certificates. On February 18th 2010, the first quarter of 2010, USE launched its Depository system and performed a series of training to USE staff and other stakeholders on how the securities depository system works.

In cooperation with other members of the East African Securities Exchange, Uganda Securities Exchange adopted the Inter Depository Transfer Framework, as a way to overcome the challenges that investors faced while carrying out cross-listing securities transactions. According to USE report (2014), a total of 50,598,824 shares have successfully been transferred using this platform.

USE is always on the move towards a quicker and better settlement time. There is more efficiency and speed in settlement especially with the adoption of the Automated Trading System. Before the introduction of the automated system, USE operated on a five days settlement period, but since the automation of the exchange, equity dealings have moved to 3 days settlement. It would take only three working days after purchase of shares to be settled and to have the shares available for trading in the exchange. Settlement is at 9:30 in the

morning on the third working day. Implying that, after 2 days, the shares are available for payment and at 9:30 in the morning on the third day, cash is paid. This has not only increased trading volumes, but also improved foreign participation.

2.6 Operations of USE (Market Segmentation)

USE operates through three market segmentation

- **The Main Investment Market Segment (MIMS).** This serves as the major market for large corporations searching for means to raise finances. Companies need to have a minimum net of assets worth 2 billion Ugandan shillings and hold a minimum share of 1 billion Uganda shillings. Due to the stringent eligibility criteria, only few well established companies are listed here such as Umeme ltd, DFCU group and Stanbic Bank. There are 16 companies listed on the MIMS, both local and East African companies.
- **The fixed Income Securities Market Segment (FISMS).** This market is specifically reserved for the companies and Investors who wish to trade in fixed income assets like corporate bonds, treasury bonds, preference shares and debenture stocks. Other short-term financial instruments like commercial papers, treasury bills may also be listed here. There are 39 government treasury bonds and 6 corporate bonds listed on the fixed income market segment of USE.
- **The Growth Enterprises Market Segment (GEMS).** In acknowledgement of the ultimate role of Small and Medium Sized Enterprises (SMEs) in driving economic growth in Uganda, USE launched the Growth Enterprise Market Segment. This was to provide a platform for these enterprises to raise capital. This has been very instrumental and beneficial to small and medium enterprises due to the much less-severe eligibility criteria.

2.7 Membership and Brokers of USE

Unlike other stock markets, the Securities Central Depository Agents in USE, are licensed to act as both investors and Broker/dealers. They are

- Crane Financial Services (U) Ltd.

- Baroda Capital Markets (U) Ltd.
- Equity Stock Brokers (U) Ltd.
- African Alliance (Uganda) Ltd
- Dyer & Blair (Uganda) Ltd
- UAP Financial Services Ltd
- Crested Capital
- CfC Stanbic Financial Services Ltd

2.8 Information dissemination in USE

In order to make a good investment decision, one needs to be well equipped with all possible information on investment opportunities available. A market is considered to be efficient if information on investment is easily accessible. Many investors look at the economic growth rates, stock market performance, listed company performance, government policies, and so on, in order to make informed decision on investing in companies' shares. In Uganda, information on investment in company shares may be obtained from various sources, including USE publications, brokers' research and companies' reports.

2.9 Regulations in the USE

Uganda Securities Exchange functions under well laid rules and regulations that guide all operations of the exchange. These were obtained from the USE (2003) rules and regulations and USE Trading rules (2015). A few amendments have been made over the years, but the basics remain intact.

Membership of brokers/dealer or investors is limited to those who are in possession of valid license issued by the authorities, to operate as broker/dealer or investor

Trading. Floor traders should be registered by the exchange so as to be granted access to the trading floor. Representation is authorized, however authorized representatives are not granted access to the trading floor, their duties are limited to passing orders from the investors to their clients.

Trading of listed securities commences at 9:00am and closes at 3:00pm daily. The orders are matched, priority being given the highest buy orders and lowest sell orders (USE 2015). USE operates on a first-in-first-out basis, for purchase and sell orders enters concurrently.

Executed trades can be amended or annulled on mutual agreement between the trading participants and an accord from USE.

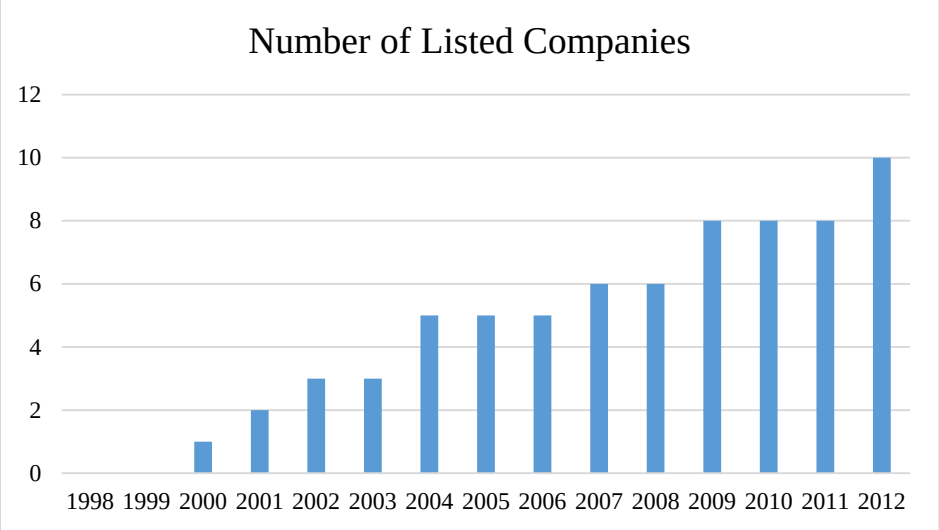
2.10 Characteristics of USE

Uganda Securities Exchange is still a nascent but fast growing equity exchange with a promising future. The researcher employed Market size and Market liquidity to measure stock market development as these are the major characteristic of stock market indicators in Uganda.

2.10.1 Market size. The number of listed companies and market capitalization are used to measure market size of USE. Both Number of listed companies and market capitalization in USE have registered continuous growth from the time of the opening of the exchange in 1998.

Listed domestic companies are the domestically incorporated companies listed on the country's stock exchanges at the end of the year. This indicator does not include investment companies, mutual funds, or other collective investment vehicles (World Bank Definition).

Table: Number of listed Companies in USE from 1998-2012



Source: USE and World Bank database

Market Capitalization, (also known as market value) is the share price times the number of shares outstanding. Listed domestic companies are the domestically incorporated companies listed on the country's stock exchanges at

the end of the year. Listed companies does not include investment companies, mutual funds, or other collective investment vehicles (World Bank Definition).

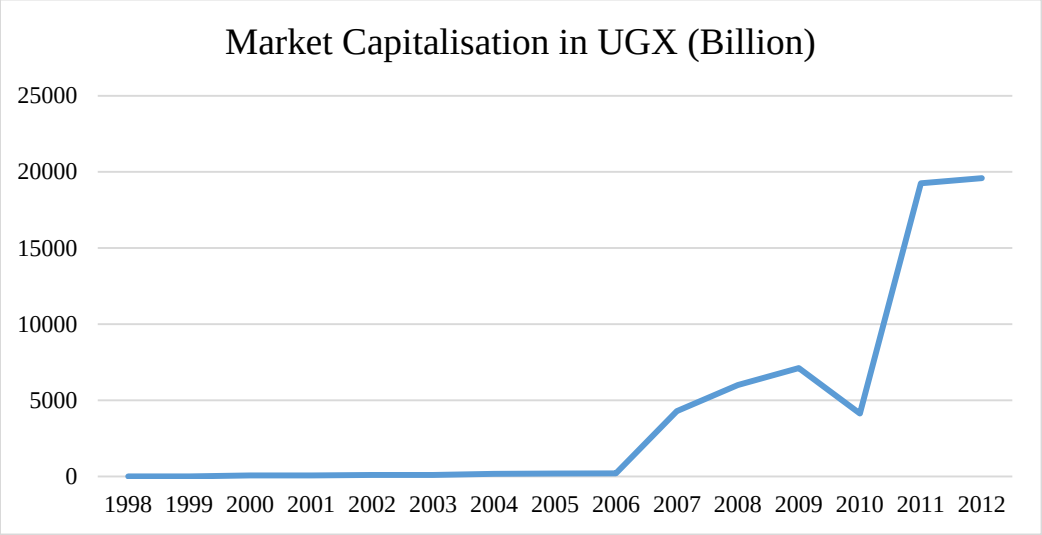


Table: Market Capitalization listed Companies in USE from 1998-2012

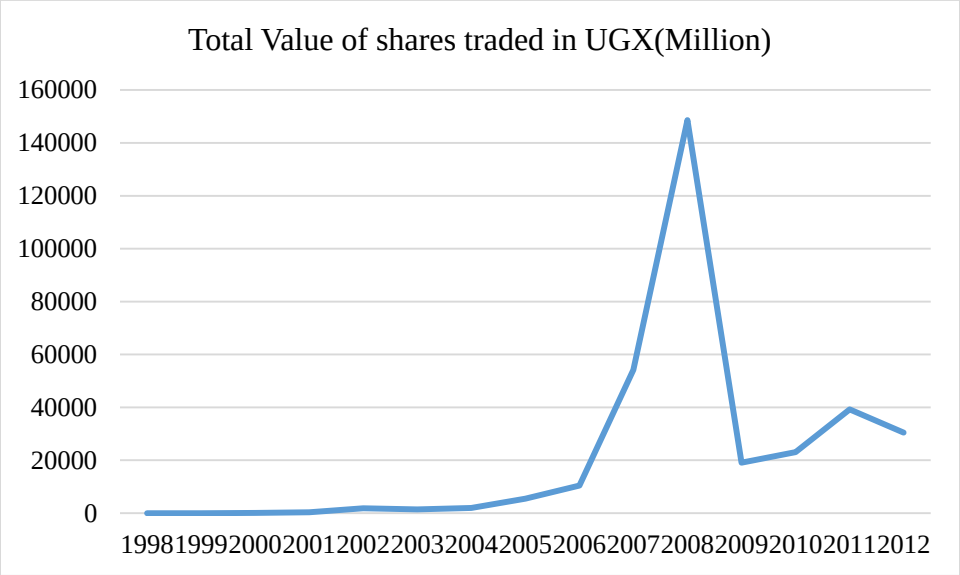
Source: Own compilation, USE and World Bank data

2.10.2 Market liquidity. Market liquidity is another measure of stock market development adopted by the researcher. Its represented by two variables namely, Total Value of Shares Traded and turnover ratio.

Total Value of Shares Traded

Stocks traded total value refers to the total value of shares traded during the period. This indicator complements the market capitalization ratio by showing whether market size is matched by trading. (World Bank Definition). The value of shares traded in Uganda had been rising until 2009 when it dropped considerably, and is picking up.

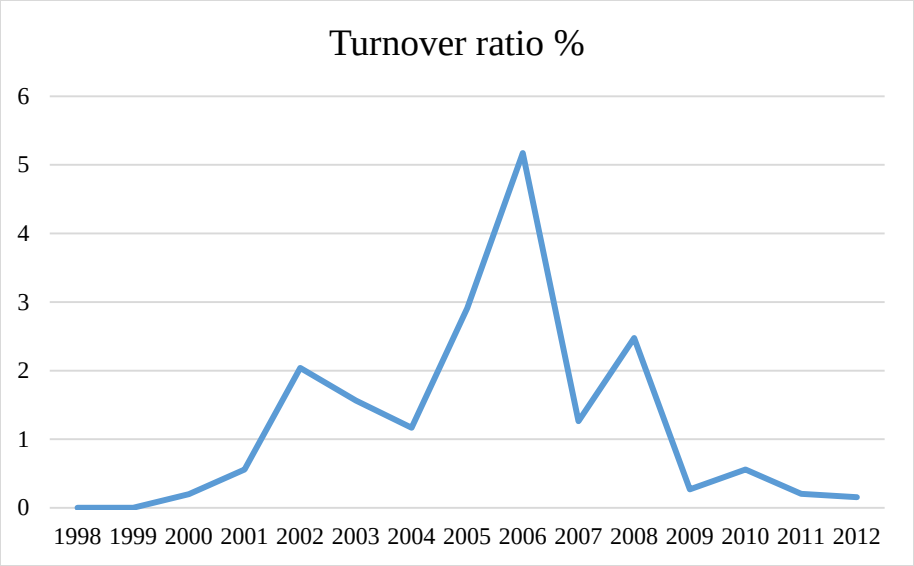
Table: Total Value of Shares Traded in UGX (Million)



Source: Own compilation, USE and World Bank data

Turnover Ratio. Stocks traded turnover ratio (%), refers to the total value of shares traded during the period divided by the average market capitalization for the period (World Bank definition).

Table: Turnover Ratio % from 1998 to 2012

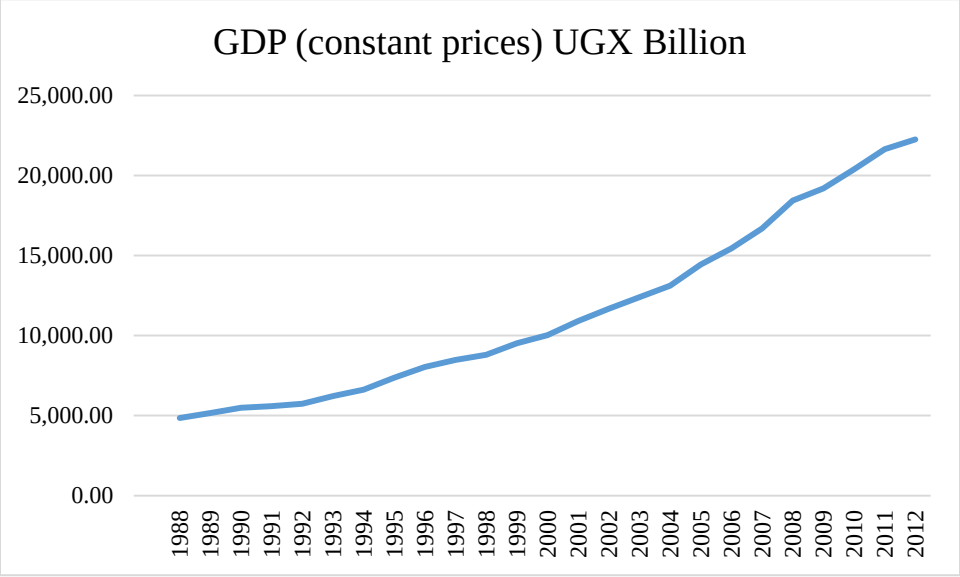


Source: Own compilation, USE and World Bank data

2.11 Economic growth in Uganda from 1988 to 2012

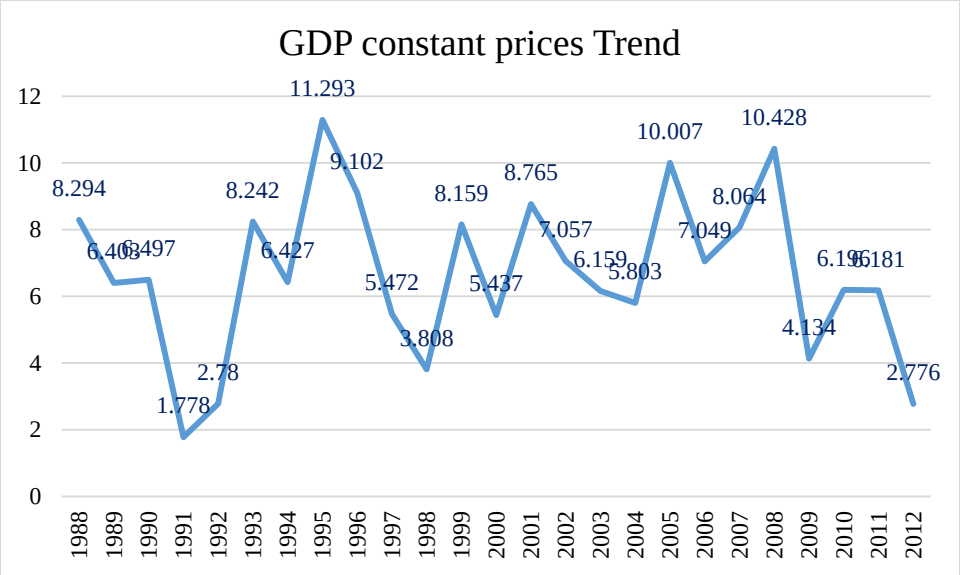
The rate growth rate of GDP constant price, also known as inflation corrected GDP or real GDP, has been rising steadily in Uganda within the period of 1988 to 2012. The overall trend is upwards, but in real terms, the trend is fluctuating as the tables a and b indicate, respectively.

Table a: Real GDP in Billion Ugandan Shillings



Source: IMF 2013, World Economic Outlook

Table b: Real GDP growth rates



Source: IMF 2013, World Economic Outlook

Chapter 3: Literature Review, Theoretical and Empirical Analysis

3. Introduction

A country is said to be growing when there is a continuous increase in goods and services produced over a long period of time. Economic growth may be referred to the long-term increase in a country's capacity to provide to its population increasingly variety of economic goods, (Kuznets 1973). He explains that his rising capacity may be majorly based on technology progress as well as institutions and ideology adjustments. Calculated as the percentage increase in Real GDP, we may therefore say that economic growth is the rate of change of output or income over time in an economy. It is the rise of Real Domestic Product per capita, which may be viewed as the efficient utilization of the available economic resources in a country to produce goods and services.

This chapter is broken into three parts. First is Theoretical framework, which will look at the direction and nature of causality between the stock market and economic growth. However due to scarcity of theory on this relationship, the study will look at the general theory of financial market development and economic growth. Second, are the empirical studies, and this section will contain different studies carried about on the relationship and causality between stock market and economic growth by different academicians. Then the last part does an assessment of the two (the theory and the empirical studies)

3.1. Theoretical literature

Numerous theories of growth have been developed over the years by different economists, explaining growth from a production function approach. When coupled with individual firm production (microcosmic theory) it explains how factor inputs and technology are important determinants of output in an economy. Changes in factor inputs like physical capital stock, human capital stock and labor as well as technology, influence changes in output of an economy. In order to explain the probable relationship between financial markets (stock market inclusive) and economic growth, macroeconomic growth models are discussed, as these endeavor to explain how an economy constantly increase production, Therefore the New Keynesian Growth theory, Neoclassical growth model and the Endogenous growth models are discussed. These are pointed out in order to appreciate the contribution of these theories in explaining the relationship between financial development and economic growth. More so, the review discusses the dynamics and varying contributions of banks verses financial markets in influencing growth.

Three types of growth theories (long-term economic growth), have attempted to explain how an economy may continuously boost GDP to enable economic growth to trend upwards. These are the New Keynesian, Neoclassical and endogenous growth theories.

New Keynesian Growth theory, as popularized from the work of Roy Harrold (1939, 1948) and Evsey Domar (1947), commonly referred to as **the Harrold-Domar model,** posits that the rate of technological change is exogenous and capital accumulation is vital in driving growth. In agreement with the Harrold-Domar model, (Bhagwati 1984), postulates that increase in resource availability is the solution to underdevelopment. The theory assumes fixed labor cost and capital, and the quantities of each also are fixed, make growth inadequate to sustain full employment. This point of view has been criticized by other economics.

The Neoclassical growth model

It was developed by Robert Solow and it is also known as the Solow growth model. The theory concentrates on three factors that promote economic growth, which are capital, labor and technology (technological advancement). The theory assumes diminishing marginal returns of factor inputs (labor and capita), where growth per unit labor increases with growth per unit capital at a diminishing rate. There will reach a point where both labor and capital will attain equilibrium state. According to this theory, economic growth would be attained with the sufficient amount of these factors (labor, capital and

technology). It assumes that in the absence of technological progress, or when technology is held constant while labor force rises at a steady rate, it will imply that the rising labor force will totally rely on the available capital stock for production. This lead to overuse of the capital stock, as every unit increase in labor force would cause more use of capital, hence diminishing return per every input. Production per capita will reduce, hence diminishing the level of output. Here aggregate output is a function of capital and labor where the production function shows constant return to scale, holding technological progress constant.

The theory forecasts a stead state of equilibrium, where in the absence of technical progress, growth would be constant, but growth is said to rise as technological progress takes place, due to its influence on Labor. It posits that when technological progress occurs, labor and capital need to be adjusted according.

This theory considers technology advancement as an exogenous factor which happens by chance, and it has the influence on growth, and in the absence of which (technological progress), growth would not continue. It is therefore criticized on the ground that long-run growth is determined by an exogenous factor (technological progress) which is outside the model.

Endogenous growth theory

Endogenous growth theory holds that economic growth is primarily as a result of endogenous factors other than external forces. Unlike the Solow model, the endogenous models considers technological progress as endogenous factor other than exogenous and it is also a significant determinant of economic growth in a country. According to Kuznets (1973), technological advancement is a permissive source of economic growth, it is only a necessary condition and not a sufficient condition for economic growth. The theory considers investment in technology, human capital and knowledge as important contributors to economic growth. Technological progress is said to arise through increase in savings and investment as well as population growth, Growth in per capita output is dependent on the rate of savings. These factors (savings, investment and population growth) are also influenced by the structural policies in an economy. Policy measures such as government subsidies for education expenditure and Research and Development, increase incentives to innovation and capital accumulation (physical capital and human capital) which would have an impact on the long-run growth rate of an economy. Positive externalities and spillover effects of a knowledge based economy would lead to

economic growth. Savings and investment are seen as avenues though which financial sector affects economic growth as this plays a major role in resource mobilization. This indicates how the endogenous growth theory explicates the relationship between financial sector and growth in the economy.

3.2 Causal link between stock market development and growth (theoretical)

A. Early views by Schumpeter (1911, 1934), and (McKinnon 1973) and others, explained that financial development is an essential component that would enhance economic growth. Whereas Lucas (1988) criticizes this stating that the importance of stock market to growth is overstated by the above mentioned scholars and he revealed that financial development is not a vital element of growth as this is instead a restraining factor to growth. In the same lens, Tachiwou (2009) explains that market liquidity in the stock markets may cause shift in investments by shareholders and investors who seek for greener pastures, this reduces the level of commitment of investment and this is considered a undesirable in the strive for economic growth attainment.

B. Challenging views

As advanced by Patrick (1966), three hypothesis (phenomena he called them) have been developed to explain the relationship between financial markets and economic growth.

Supply leading hypothesis

Financial development is said to positively influence economic growth through the supply of financial services by financial intermediaries. Such financial services include low cost investment information and opportunities which encourages better allocation of resources by savers and investors who would have a wider range to choose from and invest in more profitable alternatives which will boost economic growth eventually. Levine (2005) also agrees with this hypothesis.

Demand following hypothesis

On the other hand, the demand following hypothesis argues it is instead economic growth that accelerate development of stock market markets through the increasing demand for financial instruments which expedite development of the financial scheme. Robinson (1952) as cited in Levine (2005) supported this

hypothesis from his findings showing that growing enterprises need more finance (high demand for finance).

Feedback hypothesis

This hypothesis argues that stock markets and economic growth have a reciprocated relationship. It explains that while a country is still at a low stage of growth, stock markets are dormant and underdeveloped, and once growth kicks up, the financial market surges. Therefore growth spur stock market development. Yet Stock market development is also an important condition to boost economic growth.

C. Consensus view (Assessment)

Nieuwerburgh et al (2005) and Tachiwou (2009) both agree with the early view that stock markets need to build savings as well as allocate capital to profitable ventures and investment. Financial intermediaries do a better job in mobilizing savings (at a low cost), than individuals would have done, they added.

According to (Levine 1997), growth is sparked by financial development through technological advancement, savings rates as well as investment decision.

3.4 Theoretical Framework (Endogenous Growth model and Stock market)

This study is based on the endogenous growth model as the theoretical framework for study. It is traced from the work of Levine (1997) who created an endogenous growth model explaining that stock market boost economic growth through better resource allocation or increased firms' productivity. Stock markets are said to improve efficiency of firms though availing capital, which stimulates physical capital accumulation rates of firms. This eventually increase output. Levine (1997) also constructed an endogenous growth model to explain how stock markets contribute to economic growth. Here financial sectors skim through potential firms, identifying innovative and well performing firms and allocating finance to them for productive activities, with hopes of increasing profits. These firms eventually multiply outputs hence boosting economic growth.

3.5 Role of stock markets to the economy.

The channels through which Stock Markets impact Economy Growth

The endogenous growth theory has it that stock markets have a positive role in the economic growth of a country. According to Singh (1997), the stock market is anticipated to boost economic growth theoretically speaking through providing a channel to enhance domestic savings and boost investments, both in quantitative and qualitative terms. Levine and Zervos (1998) argue that "the stock market may be an avenue for generating domestic savings, as businesses and individuals may obtain supplemental financial instruments which may meet their risk preferences and liquidity". Generally speaking there has been a growing literature arguing in favor of the stock market as being vital in stimulating growth. They suggest that a well performing stock market can contribute to growth through various channels, including the following among others.

Liquidity

First is the stock market's ability to create liquidity (ease of converting investment into cash). Liquid stock markets boost investor's confidence as far as settlement and trades timing are concerned as it reduces the costs (Levine 1997). The stock market liquidity enables financing of long term projects that are high earning yet fulfilling investors' short-term commitments requirements. When the stock market is liquid, it enables employment of higher production techniques that are long-term and enables the enjoyment of economies of scale, which eventually stimulate economic growth (Boyd and Smith 1998). Yartey and Adjasi (2007) also credit stock market liquidity's ability to enhance growth through provision of increased motivation to acquire information about firms and help to improve corporate governance. Stock market liquidity reduces risk hazards and provides finances for long-term projects that take long to mature, yet with higher rate of return.

Mobilizing capital resources

Capital mobilization is one of the central role of stock markets in an economy. Individual savers may not fully fund a firm's activity, but may just buy a few shares according to his financial strength. The stock market accumulate small savings, pooling them together and making them available for lending to investors or firms to finance their activities (production), which eventually leads to economic growth as output increases.

Facilitating Risk diversification

Pooling of risk over various projects among several investors is one way of risk diversification that stock markets do. The risk could be liquidity or productivity

risk (Levine 1997). According to Levine (1997), the risk sharing function of the stock market which promotes risk diversification, optimizing savings as well as allocation of resources enhance economic growth. This is so because savers can easily have their assets sold quickly and with ease especially when the stock market is liquid. The stock market helps investors who usually invest in a single project or firm by identifying other plausible projects on their behalf as it is safer to invest in multiple projects in differing sectors. The stock market has the capability of identifying profitable investment projects on behalf of lenders and diversifying risks among these projects. Stock markets take time to evaluate funds and channel them (funds) to the most profitable and productive ventures. This ameliorates the quality of investment, hence a positive influence on economic growth (Ang and McKibbin 2007).

Information production and capital allocation.

Stock markets are applauded for their ability to bridge the gap between sellers and buyers of shares by providing the necessary information. Individual savers and investors as well as companies willing to sell shares would easily and cheaply access information form the stock market through pricing process by stock markets. Efficient Capital allocation may be efficiently done as firms requiring capital may have easy access to information regarding available capital from the equity market. Stock markets also boost investment by making it cheaper for savers to access reliable information regarding profitability of a project and possible project returns. Investors also acquire information to facilitate their decision making from the stock markets without having to spend on research (Yartey and Adjasi 2007). Stock prices exhibited in stock markets are a driving force to resource allocation. Investors are motivated to find out more about well-performing firms, as their share prices are shown in the stock exchange This eventually enables resources to be allocated in more profitable firms (Enisan and Olufisayo 2009). Ang and McKibbin (2007) point out that the stock market has the capability of identifying profitable investment projects on behalf of lenders and diversifying risks among these projects. Stock markets take time to evaluate funds and channel them (funds) to the most profitable and productive ventures. This ameliorates the quality of investment, hence a positive influence on economic growth.

Djoumessi (2009), argued that without participation of financial intermediaries, managers could stray from the objectives of the enterprise and this could lead to a collapse of the enterprise

Transmission path for monetary policy

Most of the time, the stock market is excluded as a transmission mechanism for monetary policy. However Yartey and Adjasi (2007) demonstrates that stock markets provide transmission mechanism through the effect of inflation on household equity holding. “Inflation impacts on the rate of expected return of shareholders and, as required rates of return change, it causes fluctuation in the share price. Firms act in response to these price changes by revising production and investment plans that in turn help to improve productivity and ultimately growth. In addition, the stock market provides a transmission mechanism when monetary policy lowers the returns for holding cash; by reducing the interest rate, the stock market provides an alternative investment option, which in turn stimulates higher economic growth” (Chizea 2012).

Monitoring managers and exerting corporate control

According to Yeh et al. (2008), through the voting and takeover mechanism, the stock market may exert control over managers. Through voting (proxy voting), even minority and small stockholders may influence managers, this is so because proxy voting give them power to exercise voting rights on behalf of other shareholders who delegated them to represent them in the shareholders reunion. The takeover mechanism ensures that managers make use of past investment (Yartey and Adjasi 2007). This perpetuates control over managers, as takeover threats keeps managers on check and at best behavior due to fear of loss of the firm in case they failed to maximize shareholder value. Djoumessi (2009) contended that without involvement of financial market (stock markets), managers would stray from the aims of the enterprise eventually would lead to a collapse of the enterprise.

3.6 Bank based and market based financial system

The endogenous growth theory stipulates that financial markets are necessary ingredients for economic growth. The question that has stimulated debates is which of the financial system promotes growth more than the other? Bank-based or market-based financial system, or are they substitutes. The financial system is classified into two, the bank-based financial system and the market-based financial system. The puzzle lies in which is most appropriate for growth, various views are given below. Myers and Majluf (1984) said that the decision lies entirely in the hands of the enterprises in need of financing. Most of which prefer own capital (internal resources) and then next on the preference list comes the external sources, that is banks and stock markets.

3.6.1 Bank based view of financial system

Arguments in support of this view all assert that bank-based in most optimal for growth of an economy owing to its ability to mobilize savings and the long-run relationship banks make with their clients which mitigate difficulties of information asymmetry (Levine 1997). Levine (1997)criticizes stock markets for their stringent listing conditions which are unattainable by small firms. Banks on the other hands offer them lower cost of capital. Banks are said to better option of finance to firms than stock markets on the basis of confidentiality. Most firms are unwilling to disclose all information to the public (for competitive reasons) in order to obtain funds, so the bank is a better alternative in such a case. According to Cameron (1993) bank-based system are most appropriate for developing countries.

3.6.2 Market based view of financial system

Many academicians have argued in favor of the market-based financial system as better for growth. Demirguc-Kunt and Haizinga (2000), for example asset that stock markets create competition which stimulates entrepreneurship, a potential promoter of growth. The major argument extended here is the market-based system's ability to efficiently mobilization and allocation resources, as well as ameliorate corporate control. Arestis *et.al (*2005), criticizes banks for the conservativeness and unwilling to share information, which hinders firms from taking part in the profitable investment. According to Chizea (2012), stock markets are more reliable Risk hedging. Investors may hedge against risk through price forecasting, and enterprises may evade risks by diversification (selling shares to risk-taking investors). Beck et al. (2000) sum up applauding the role of both financial systems to economic growth. They are more supplementary than substitute as far as their contributions to growth are concerned. A country with a well-developed financial system (both banks and stock markets) has a higher potential to grow faster that where the financial system is weak.

3.7 Empirical Literature review (Debates)

There are uncountable empirical studies that have been performed to establish the link between stock market development and economic growth. This debates escalated in the recent years as more and more significance is continuously being attached to stock market-economic growth association. This section of the chapter will review some of these studies, dwelling more on the endogenous growth theory context, since this theory (endogenous growth theory) consents to the idea that financial market development (stock markets inclusive) play a considerable role in the growth process of an economy.

Both cross-country research and single country time series empirical studies are reviewed in this chapter. This section also reviewed Different research performed on the link between stock markets and economic growth is various perspectives, such as in the context of developed countries, developing countries and Uganda.

Borrowing a leaf from the work of Demirguc Kunt and Levine (2008), we can classify the relationship between stock market and economic growth into 4 different categories of studies, that is: Cross-country, panel method, microeconomic studies and single country research.

Cross-country growth regressions. These form the majority of empirical studies ever conducted on financial market growth (stock markets) and economic growth. The carry out research on many countries using the same variables (stock market and economic growth), so as to explain comparatively how the two variables are related in different country situations. They use short period data sets which makes them relatively easier to investigate. To back up the arguments of the endogenous growth theory that points out that countries with well-developed financial system are more likely to experience increasing growth in the long-run through resource allocation, capital accumulation and efficiency stimulation, Rousseau and Wachtel (2000) as well as Beck and Levine (2004) also found a positive relationship between stock markets and economic growth in developed countries in the long-run. Atje and Jovanovic (1993) and Harris (1997) equally established that countries with well-functioning stock markets are associated with growth in the economy. On the other hand, cross-country study carried in 14 African countries by Adjasi, and Biekpe (2006), Enisan and Olufisayo (2009), show that only few countries experienced growth with the development of their stock markets. These researchers concluded that stock markets have more positive impact on economic growth in countries with high income levels as the case was found in South Africa and Egypt).

Criticism have been raised on cross-country type of study owing to the fact that it looks at many countries at a go, and studies these countries superficially, as it does not take into account different country's special economic situation prevailing. More so, the standards and accuracy of the econometrics technics are questioned. Gupta (1970) for example proved this by performing a similar study as Rahman (1968) but in 50 countries as opposed to 31 countries and the findings were different. Gupta (1970) found out different signs in of the coefficient of capital flows. Chizea (2012) invalidates the assumption that the cross-country econometric models are static, on the ground that they

demonstrate only one period relative structure. This model therefore is criticized for not looking in to the long run relationship between the variables in the model, as it only portray the short run dynamics of the variables.

Panel Technique Study. This is another type of technic employed by many in analyzing the relationship between stock market and economic growth. This is a much better option to the previous one as it takes in to consideration the impact of time in the model. Still using cross-country method, this technique employs time series data, seeking to establish a long term relationship among the variables under study. In the case of developed countries, in a panel data study carried by Wachtel (2000), Rioja and Valev (2004) and Beck and Levine (2004) findings were that a positive relationship existed between stock market variables and economic growth. Calderon and Liu (2003), found out a dual direction of causality, yet Christopoulos and Tsionas (2004), established a one way direction, running from stock markets to economic growth.

Despite its attempt to lessen the disadvantages of cross country method, panel technique is seen to be associated with omitted variable bias (heterogeneity) as it studies a country superficially, and it does not take into account country's specific effects, given different economic situation prevailing due to the use of many countries. This could make the results useless due to bias and inconsistencies in the estimates (Pesaran and Smith, 1995). More so, the results in such studies are not reliable for decision making by policy makers, as they cling more on differences among countries, instead of leaning more on differences within a country (Wachtel, 2003).

Microeconomic level studies. This technique endeavors to explore the various avenue in which financial sectors may impact economic growth. One of the channels through which stock market stimulates growth according to the endogenous growth theory is its ability to provide finances for productive activities to firms, this technique therefore exploits firm and industry data to see how the stock market affects firms and industry performance. Microeconomic level study fairly attempts to minimize the flaws of the other two techniques discussed above by given a deeper insights into mechanisms in which stock markets may affect growth of an economy. Examples of such studies include Rajan and Zingales (1998) who carried out a microeconomic level study to examine the causal effects of stock markets on economic growth and the mechanism of transmission of this effect. They found that stock market improve firm performance in countries with a well-developed financial system. This eventually enhance firm productivity and output levels, hence positive effect on economic growth. Similarly Levine (1997) also carried a used

a firm level data to examine the effects of financial development decisions of a firm to invest in expansion projects, and the findings revealed that well developed banks and stock markets are good for firm performance and decision making. Rajan and Zingales (1998), Beck and Levine (2004) also emerged with similar findings. Using microeconomic technique, Beck and Levine (2004) established that stock market capitalization had a positive and significant effect on economic growth. These studies all affirm the say that firms that depend on external finances, from banks, stock exchanges, and so on, have a higher potential to grow.

Chizea (2012), however, points out problems related to the microeconomic studies saying the data have specific endogeneity problems, as access variables are not determined exogenously and also the issue of determining the sample size and population, as these are hindered by time, cost, and relevance to the study.

Single country Time Series study. This is another type of technique used to analyze the relationship between stock market and economic growth. It focusses on a single country and analyses policies and institutional changes that may affect growth. This study is said to be more reliable in decision making because it looks at one single country and exploits in-depth information (historical in nature) which gives a better understanding of a country.

Various time series studies carried out usually control for other factors that affect economic growth so as identify the exact contribution of the financial markets to growth of the countries under studies, such factors as trade openness, government expenditure, inflation, education attainment, and on, are used as control variables.

Single Country Time series. This is the forth type of technique employed to study the relationship between financial development (Stock market) and economic growth. This method has been employed by many and seem to be a reliable technique for decision making by policymakers in an economy as it concentrates on one single country exploring the link between finance and growth in the boundary of one country. It examines policy and institutional changes occurring in an economy and how they are likely to affect growth. They primarily look at the long-term relationship between financial development and economic growth. They collect long-term data of the variables in study, that is long run growth and financial development. It is designed specifically to study a country in-depth (tailor-made) and understand historical dynamics of a

country. Many researchers like Patrick (1966), McKinnon (1988), Demetriades and Hussein (1996) and Arestis and Demetriades (1997), have argued in favor of the country specific series as opposed to cross-country regressions, on the ground that the former takes specific conditions (Governance, institutions and so on) of a country into consideration, rendering the technic much desirable for policy makers in decision making processes. Country specific research carried out, include among others Osei (2005), (Van Nieuwerburgh et al. 2006) and (GC 2006). These authors performed separate country study of Belgium and Ghana, and in both cases stock markets were found to have a positive association with economic growth, as per the endogenous growth theory. Other single country time series studies are those by Shahbaz et al. (2008) and Brasoveanu et al (2008) in Pakistan and Romania respectively, and yet again conquered with the endogenous growth theory that stock markets stimulate growth in the long-run. Asai & Shiba (1995) however, did not find any causal link between stock market and economic growth in Japan, using the same technique (country specific time series).

The flaws of this technique is that the finding may not serve other countries in decision making, this is because it is not easy to generalize studies that concentrated on a single country with different institutional, policy and financial system. Despite its flaws, single country time series is still preferred and recommended by many economists over the other types like cross-country and panel technique which are said to be prone to conceptual and statistical measurement problems (Levine and Zervos 1996).

In this study, a single country time series was used to establish the relationship between stock market and economic growth in Uganda. Other single country time series studies in both developed and developing countries as well as Uganda were reviewed and are explained below.

3.8 Empirical research on developed countries

This section contains a variety of empirical studies carried out on a single country using time series to analyze the relationship between stock market and economic growth in developed countries, using various time series methods.

Using a VAR model (Vector Autoregressions), Levine and Zervos (1996) endeavored to explain the relationship between stock market development and economic growth in Japan, They used multivariate specification with variables of stock market, interest rates, inflation rate and industrial production. Their

findings were that indeed there existed a relationship between stock market and the above mention macroeconomic variable, though the nature of causality was moving from economic growth, and other macroeconomic variables to stock markets. Therefore the increasing economic growth in Japan has stimulated the growth and development of the financial market (stock market). Using the same method, that is VAR model, with real GDP per capita as the dependent variable to proxy economic growth in UK, Levine and Zervos (1996) conquered that indeed financial markets accelerate the rate of economic growth in an economy (in this case the UK), and the direction of causality was from the financial market to economic growth, as opposed to economic growth to financial market growth as the case was in Japan, in the study by (Levine and Zervos 1996).

In agreement with the endogenous growth model, Levine and Zervos (1996) found a positive relationship between stock market and economic growth in Switzerland. The author employed Vector Auto-regression to analyze this relationship. Stock market variables like market capitalization, stock market volume as a ratio of GDP and stock volumes as a ratio of market value, were found to impact Real GDP (proxy economic growth) positively and significantly in Switzerland. In the case of Greece, Hondroyiannis et al (2004), used yet again Vector Auto-regression to examine the possible link between financial development (stock market and banks) and growth of the economy with monthly time of series of 14 years (1986 to 1999). The financial sector was found to have positive impact on growth, and growth also impacted the financial development positively, hence a two way relationship. Banks were found to have stronger effect on growth as compared to stock markets. This is exactly the opposite of the study in Australia were banks were found to have no influence on economic growth, but stock markets did boost growth. In this study, Thangavelu and Ang (2004), found that when stock market variables are employed, banks are seen to have no effect at all on growth, while stock markets affect growth even when banking sector variables are employed. The Australian banks are viewed as passive and not boosters of Australian economy.

Similarly, a research performed in Belgium by Van Nieuwerburgh et al. (2006) using Real GDP per capita to proxy growth and 5 different proxies of stock markets over a long period time series of 170 years (from 1830 to 2000), findings revealed that stock markets had long-run effect on growth and that stock market development had caused economic growth in Belgium especially within the period of 1873to 1935.

Another time series study was carried out by (Van Nieuwerburgh et al. 2006) in Korea, intending to establish the finance-growth relationship with a data set from1972 to 2002. The results revealed that indeed financial development enhance growth as per the endogenous growth theory. The study exhibited a one direction causality running from the stock market in Korea to economic growth in the same. Another one directional kind of causality was the one established by Van Nieuwerburgh et al. (2006), during the study of stock market growth relationship in Germany. With a time series data ranging from 1965 to 2007, using Vector error correction model, variables like GDP, stock over all price and bank lending rate, the researcher found a one direction of causality running from the stock market to economic growth after application of Johansen cointegration test to test if there is a relationship and the granger causality test to establish the direction of causality.

All the above reviewed studies have shown that indeed stock markets and financial markets in general have a positive effect on economic growth in developed counties. But, will the same story hold for the case of developing countries which have small and underdeveloped financial sectors, with new, small and illiquid stock markets. The next part presents empirical studies carried to examine the relationship between stock market and economic growth in developing countries.

3.9 Empirical study on developing countries

This section will discuss two empirical types of studies. First those that discuss the first research question, which is whether there is a relationship between stock markets and economic growth. Empirical research that established the effect of stock markets on economic growth are reviewed and discussed first. Then secondly, the literature that are in line with the second question which is what is the nature and direction of this relationship. Therefore empirical studies that explain the causal relationships between stock markets and economic growth are reviewed here.

In 2009, Van Nieuwerburgh et al, (2006) carried a study of Mauritius, endeavoring to establish the effect of the Mauritius stock market on its growth. Using a time series data from 1989 to 2006, for market size and liquidity, that is a market capitalization ratio and turnover ratio respectively, to proxy stock market development, and economic growth indicators like Human Capital and Foreign Direct Investment were studies. The findings validated the endogenous growth theory as it found that in both short run and long-run, stock market

development had a positive effect on economic growth of the country. The variables employed to proxy economic growth are not however the best choice to explain economic growth. GDP per capita growth rate, Real GDP, GDP, per capita GDP, and others would have been better representations of GDP, other than FDI and Human capital development.

In a time series study of India from 1981 to 2001, Van Nieuwerburgh et al. (2006) attempted to establish the relationship between stock market and economic growth, using Ordinary Least Square simple regression (OLS). The findings were that stock market was significantly related to economic growth before liberalization. A negative association between stock market and economic growth was established in the periods after liberalization. And for all the entire period of the study, the research found no relationship between stock market and economic growth in India. Criticisms can be raised on this study on the ground of the methodology adopted. Simply running the OLS test without carrying a stationarity test, may yield spurious regressions as R square may be high even if the variables are unrelated. More so, OLS simple regression, is not the appropriate technique to be employed in such kind of study with a small sample size of 21 observations (21 years), less than 25 observation, as it will not yield statistically significant analysis. More so, the breaking down of the study into before and after liberalization, further reduce the number of observation, and the reliability of the findings are questioned because of loss of the degree of freedom (Chizea 2012).

Another single country time series, by Nazir et al. (2010) in Pakistan revealed a positive contribution of stock market size (Market capitalization) and stock market liquidity (Value of shares traded), to economic growth of of the country over a period of 23 years, that is from 1986 to 2008. Van Nieuwerburgh et al. (2006), used Johansen cointegration test as well as vector error correction Model to establish the relationship between stock market and economic growth in Iran with a 12 years quarterly time series data. The finds found that in the shot-run, stock markets influenced economic growth, and economic growth enhanced stock market development in the long-run.

A bulk of recent empirical studies in developing countries have strived to investigate into the causal link between stock markets and economic growth, attempting to establish whether the stock market causes economic growth or whether its growth that causes stock market development. These studies include the following among others.

Osei (2005) predicted that stock market causes economic growth in Ghana, and his findings matched his prediction where stock market variables (market capitalization ratio and market capitalization) were found to granger cause Real GDP, a proxy for economic growth in Ghana. The researcher had employed a time series from 1991 to 2003), VAR model (Vector Auto-regressive), then used granger causality test (Granger's 1969 causality definition) to establish this causal relationship.

Similarly (Shahbaz et al. 2008) also found a causal link between stock market and economic growth in Pakistan. (Shahbaz et al. 2008) used an 35 years (1971-2006) annual time series data, and applied the Julius and Johansen co-integration tests to investigate this association. Once again in support of the endogenous growth model, found a positive association between these variables. The Autoregressive distributed lag (ARDL) bound testing and the granger causality test revealed a two directional causality, implying stock market caused growth and growth also caused stock markets. On a precise note, the dynamics of this bidirectional causality was that stock markets were seen to granger cause economic growth only in the short-run.

With the same aim of establishing the direction of causality between stock market variables and economic growth, (GC 2006) used an 18 years' time series data of Nepal from 1988 to 2005. The findings agreed with the endogenous growth theory. Not only did they find that there existed a relationship between stock market variables (market capitalization to GDP ratio, turnover ratio to market capitalization and turnover to GDP ratio) and GDP a proxy for economic growth, but also a causal relationship existed between these variables. This causal relationship moved from stock market to economic growth. The stock market was found therefore to granger cause economic growth in Nepal.

Kaplan (2008) carried out a related study on the relationship between stock market and economic growth in Turkey with quarterly data of 1987 to 2006. He used Johansen cointegration test along with granger causality, all with in a Vector Autoregressive (VAR) model framework. His cointegration findings exhibited a long-running relationship between stock markets and economic growth. The granger causality test revealed a one directional causality running from stock market to economic growth in the long-run. Stock market is said to have granger caused economic growth in Turkey with in the period of 1987 to 2006.

Unlike Kaplan (2008) who found a causal relationship between stock markets and economic growth in Turkey, Wang (2010) did not find any causal relationship between stock market and growth in China. In order to establish the volatility and causal relationship between stock market and economic growth, Wang (2010) used EGARCH model and LA-VAR model respectively. The results of the Engle-generalized autoregressive conditional heteroscedasticity model (EGARCH) indicated no causal link between market volatility and growth, yet a two direction association was demonstrated between stock market volatility and inflation volatility form the lag-augmented vector autoregressive (LA-VAR) Model.

On the other hand, Tuchinda (2011) also investigated the causal relationship between stock market and economic growth in the Agricultural and the non-agricultural sector in Thailand. He used different variables to proxy both economic growth and stock market. The study employed 4 proxies of economic growth, namely GDP at current price, GDP per capita, Real GDP and Real GDP per capita. To represent stock market, (Tuchinda 2011). Use market capitalization and turnover by volume. The feedback from the co-integration test revealed that the variables in question had a long-run relationship, and this causality was running from the stock market to economic growth, especially in the nonagricultural sector, as per the granger causality test.

In the same way, Odhiambo (2010), from his investigation of the causality in the stock market-growth relationship in South Africa, found a causal link between these variables, with a stronger causality running from stock market to growth, and valid results in the short-run as well as long-run. His choice of variables are similar to this research. He used market capitalization, value of traded stocks and turnover ratio to proxy stock market development, and used real GDP per capita for economic growth. He applied an Auto-regressive distributed lag (ARDL) bounds testing technique with yearly data from 1971 to 2007. Causality in this study varied according to the stock market variable chosen to proxy stock market. In the instance where market capitalization was used, economic growth was found to granger cause stock market, yet this was not the case when turnover ratio and value of traded shares were used to proxy stock market.

A recent single country time series study by Chizea (2012), investigated the stock market – growth relationship in Nigeria. He used market capitalization ratio to GDP (stock market size), traded shares value ratio to GDP and turnover ratio (stock market liquidity) as proxy for stock market development. And Real GDP per capita to proxy economic growth in Nigeria. Controlling for other

factors that affect economic growth like government expenditure, banking sector credit activity, capital stock, trade openness and political instability as a dummy variable, Chizea (2012), used a time series data from 1980 to 2007. The study used Multivariate vector autoregressive models (VAR) as well as Vector Error Correction Models (VECM). Johansen cointergration test and granger causality tests were performed, and the Findings the tests revealed that a short and a long running relationship existed between stock market variables and growth. A bidirectional causality was established, stock markets granger cause economic growth in Nigeria, similarly economic growth granger causes stock market development in the country.

Similarly, Vacu (2013) assessed the long-run association between stock market development and the growth of the South African economy, using quarterly time series data form 1990 first quarter to 2010 fourth quarter. He used market capitalization, turnover ratio and all share index as proxy for stock market and GDP as proxy for economic growth. The research employed Johansen cointergration test and found a long run relationship existing between the variables in study. The short run and long run dynamics were also captured using the Vector Error Correction Model (VECM). The stock markets effect on growth was found to be statistically weak. The Granger causality test revealed that causality ran from economic growth to stock market.

It is difficult and not appropriate to make a conclusive statement concerning the impact of stock markets and economic growth in developing countries, as different country studies reveal different roles and relationship between stock markets and growth, owing to difference in economic settings, policies and institutions, governance, political systems, to mention but a few.

3.10 Empirical study on Uganda

This part focuses on the empirical studies carried on the relationship between stock market development and economic growth in Uganda. However, not so many studies have been carried out on this relationship, could be because the stock market in Uganda Is not only new but also still small. A few found literature on this relationship are discussed below.

Maghanga and Quisenberry (2015) recently embarked on the journey to investigate how Uganda Securities Exchange (the stock market of Uganda) has impacted on economic growth. They used 25 years' time series, 12 and a half before the opening of the exchange and 12 and a half after the exchange was established using an Autogressive Distributed Lag (ARDL) bound testing. Market capitalization, value of shares traded and turnover ratio were used as

proxy for stock market and real GDP for economic growth. A correlation was established between economic growth and the stock market variables, but the granger causality test was inconclusive. This could be due to bet fact that the stock market in Uganda is still small and new. The criticism may arise from the methods used in the analysis which does not allow for the control of other factors that affect economic growth whose effect need to be controlled for in the equation.

The researcher therefore improved on this study by adopting the VAR model and controlling for other factors that affect growth in Uganda.

3.11 Assessment

In general, both theoretical and empirical literature suggest a positive contribution of stock markets to economic growth. The empirical literature however specifically speaking, revealed diverging results on both the relationship and the direction of causality between stock markets and economic growth, especially in developing countries. The inconsistencies are majorly attributed to the policies, financial structures and so on. It is therefore recommended that country policy makers exploit options that boost stock markets so as to enjoy full benefits that a well-developed stock market may yield to promote growth

When it comes to Uganda, limited country specific studies have been performed on the relationship between stock market and economic growth as most studies on this relationship are majorly pure cross-country regressions. It was therefore necessary to undertake this study.

CHAPTER 4: Research Methodology

4 Introduction

Just as Ghauri and Grønhaug (2005) highlighted, it is not simply about a set of methods chosen to be used in research, but rather about a smart planning of selection of relevant methods that will enable the researcher attain desired outcome. The variables used in the study and the nature of their relationship is

important in determining the type of methods to be selected for use in the study, (Ismail 2005). He explains two different forms of relationships that variables may have, that is cause and effect relationship and non-cause and effect relationship. For Cause and effect relationship, a quantitative research method may be employed since the study is more experimental. And for the no-cause and effect relationships, a qualitative research method is more suitable as the study is more descriptive. The researcher adopted quantitative method for this study because the variables have a cause and effect relationship.

The study focused on the relationship between stock market and economic growth in a single country (Uganda), and adopted a time series method, which is seem suitable for the study and may give a better insight into the relationship of these variables. Time-series study was also used with success by many other researchers like Tuchinda (2011), Chizea (2012), GC (2006), to mention but a few. The study used Johansen and VECM to analyze the relationship between stock market and economic growth in Uganda and then Granger causality test to establish the direction of causality between these variables. As explained by Tuchinda (2011) in VAR model specification, the study attempted to minimize omitted variable bias problems by controlling for other factors that may be considered to influence to economic growth. Such factors as Openness of the economy to international trade, government expenditure, Capital stock and financial sector were control variables. This was also used by Tuchinda (2011) but the difference is that this study controls more variables compared to that by (Tuchinda 2011) in Thailand.

The Cointegration test is testing the Null hypothesis, that there is no relationship between stock Market and Economic growth in Uganda. And the Granger causality test on the other hand looks at two hypothesis, first the Null hypothesis that stock market does not granger cause economic growth, and the second null hypothesis, that Economic Growth does not granger cause stock market development.

4.1 Data sources and collection methods and measurement

A time series data of 15 years was employed using quarterly data, from 1998Q1 to 2012Q4 to assess the relationship between stock market development and economic growth in Uganda. To measure of Stock market development, the researcher used Market capitalization to proxy stock market size and Total value of Stocks traded and Turnover Ratio as proxy for stock market liquidity. Then real per capita GDP is used as proxy for economic growth. Secondary

data was used and Primary data only supplemented secondary data. The researcher obtained the secondary data from Uganda Securities Exchange (USE), Capital Markets Authority (CMA), Bank of Uganda, IMF, World Bank, and also review of reports, journals and documents from these entities (Beck and Levine 2004).

4.2 Model specification and variable description

The model is in Log-linear form

$$LogY_t = a_0 + a_1 LogSM_t + a_2 LogGFCF_t + a_3 alogGE_t + a_4 logM2_t + \alpha_5 logXM_t + \varepsilon_t$$

Model specified per each stock market indicator

$$LogY_t = a_0 + a_1 LogMC_t + a_2 LogGFCF_t + a_3 alogGE_t + a_4 logM2_t + \alpha_5 logXM_t + \varepsilon_t$$

$$LogY_t = \beta_0 + \beta_1 LogVST_t + \beta_2 LogGFCF_t + \beta_3 alogGE_t + \beta_4 logM2_t + \beta_5 logXM_t + \varepsilon_t$$

$$LogY_t = \delta_0 + \delta_t LogTR_t + \delta_2 LogGFCF_t + \delta_3 alogGE_t + \delta_4 logM2_t + \delta_5 logXM_t + \varepsilon_t$$

From the model above,

Y represents **Economic growth**. In this study the annual rate of change in Real GDP per capita is used to proxy economic growth as was also used by other researchers (Levine et al. 2000) and (Beck and Levine 2004). Population growth was also put in consideration especially due to high growth rates of population in Uganda. GDP at constant price is employed so as to adjust for the effect of inflation on GDP, hence real GDP. The annual change in growth (growth rate) is used because it depicts how physical output has altered in any given year from previous the year's physical total output levels. This change could be positive (expansion in physical output), or negative (contraction in output). Since the study concentrated on Uganda alone in a time series trend, the data was collected in Ugandan local currency (Uganda shillings),

GFCF stands for **Physical Capital Investment**. The level of capital stock in an economy is seen as an important factor I the growth process in an economy, as it enhances production. Capital resources such as buildings, Machinery, equipment, plants, vehicles, inventories, among others, all contribute to production and growth. Therefore, Gross Fixed Capital Formation is used to proxy Physical capital investment.

GE represents **Government Expenditure ratio to GDP**. This is used as proxy for Macroeconomic stability. In Uganda, the government sector is considerably large and the researcher found it useful to include it in the model to proxy macroeconomic stability. This is in relation to other scholars such as Levine and Zervos (1996), Ghimire and Giorgioni (2009), who used government expenditure as a percentage of GDP to represent Macroeconomic stability. Others researchers like Barro and Sala-I-Martin (1995) however used government expenditure to proxy Political corruption.

M2 as a percentage of GDP. Money and quasy money indicate the level of money supply. This variable indicates the level of banking sector development's impact on the economy. This was included in the model to avoid bias due to omitted variables. Banking sectors are seem to have similar function as stock markets in economic growth. So if left out, growth may seem to be due to stock markets, yet actually banking sector may have had a hand in it, therefore the effect of banking is controlled. As proxy for financial sector development, the researcher used M2 as a percentage of GDP, since this shows the level of money supply (money and quasi money) in the economy.

XM stands for **Total trade ratio to GDP**, which is the value of **imports plus exports as fraction of real GDP per capita.** This variable is used to measure the degree of openness to international trade, which is an important element that spur growth in the economy, as openness exposes an economy to new ideas, technology also a larger international market encourages efficiency gains. Gallup et al (1998) as in Tallman and (Edwards 1993)Wang (1994) and (Edwards 1993).

SM represents Variable for Stock Market Development. Three variables were used to explain the relationship between stock market development and economic growth in Uganda. The variables depict both the size and liquidity of Uganda Securities Exchange, to see how each of these is linked to economic growth. Market capitalization is used to show the size of the stock exchange, and total value of shares traded and turnover ratio are proxies for stock market liquidity. By employing many variables to represent measures of stock market development, other than just one variable, is to make the test robust and to selection of size verses liquidity is to depict the exact way in which the stock markets has affected economic growth in the country. Each of the three variables is used separately in the model. The variables are:

MC representing **Market Capitalization Ratio**. This is an indicator is used to measure the size of the stock market in relation to the economy. Market

capitalization, being the total value of all shares outstanding, is calculated by multiplying the number of shares outstanding to the share price. Market capitalization ratio to GDP is obtained by dividing the market capitalization to GDP to find the ratio. Market size is believed to contribute to growth through capital mobilization and risk diversification in an economy (Nowbusting, 2009).

VST is **the Total Value of Shares Traded Ratio**. This variable measures the liquidity of the stock Market. Value of shares traded is obtained by from price of shares, times number of shares traded. Its ratio to GDP is obtained through dividing the total value of the shares traded to GDP. According to (Enisan and Olufisayo 2009) a liquid stock market (with high value of traded stock) attracts investors more and may have positive impact on growth in an economy.

TR is Turnover Ratio. This is the second liquidity measure of the stock market, which is the ratio of traded shares to market capitalization in a stock market. Turnover ratio is obtained by Value of shares traded over market capitalization. A high ratio may depict low cost, greater liquidity of the market and high efficiency, (Chizea 2012). He adds that an extremely high value traded to market capitalization may reflect inefficiency and exaggerated speculative trading.

$\boldsymbol{a_0}$ $\boldsymbol{\beta_0}$ and $\boldsymbol{\delta_0}$ are the constants. ε is the error term and t , the time trend. These account for unexplained random effects as well as omitted variables in the model.

First question: Methodology

In order to analyze the relationship between stock market and economic growth in Uganda, the researcher posed two question, intending to get clearer understanding of this link, using the same data from Uganda Securities Exchange and GDP, The question of whether or not there is a relationship between stock market development and economic growth in Uganda will be answered using an econometric framework, time series analysis is employed. It entails test for the proof of the existence of a relationship between the independent and dependent variables.

4.3 Estimation of the technics: Econometric framework

The econometric method suitable to answer the first question is Cointergration test. This is so because cointergration model helps to test the co-movement of the variables under study and as check for the long run equilibrium. However, preliminary tests are required before this cointegration tests are done. The data needs to be stationary for the model to be run so as to avoid spurious regression that may arise due to none stationarity of the data. A stationarity test is then required to test whether the data has unit roots or not. Many time series data are differenced once to make them stationary, since they tend to be integrated of order one.

The existence of cointergration (long-run association), implies that there could have been short run dynamics that drove the variables to equilibrium in the long-run. This calls for a test to establish the short-run dynamics. The Error Correction Model (ECM) is therefore specified to capture the long and short-run dynamics.

4.3.1 Stationarity Test

Dimitrios (2006), points out that, While performing econometrics estimations, it is necessary that the time series data for all the variables to be used, be stationary, and also integrated to the same order. This would help prevent spurious regression that is associated with nonstationary data, and distorts results. . "A time series is said to be stationary when its mean and variance do not vary systematically over time" (Gujarati 2004). In the same perspective, Brook (2008) states that stationary series has constant mean, variance and auto covariance at each lag. If the data is found to be non-stationary at level, then it is required to be differenced till the point where stationarity is attained.

In strict stationarity, the probability of distribution of variables are said to remain the same over time, meaning that the probability that variables will fall is exactly the same at present, past and in the future.

Weak stationarity is preferred as the strict stationarity is considered not viable. "A time series is said to be stationary (weak stationary) when its mean and variance do not vary systematically over time" (Gujarati 2004). If the data are converted to first difference, they may become stationary. A stationary time series contain stationary trend, while none stationary series contain stochastic trend, and this may fluctuate the movement of a series upwards or downwards due to random shocks (Enders 1995).

Since time series data contain trends, it is necessary to lose these trends before performing econometric analysis, one way to do so is by converting the data

into first difference, instead of keeping the data at level. Many scholars such as Granger and Newbold (1974) and Engle and Granger (1987), affirmed that most time series are nonstationary and need to differenced for stationarity to be attain in order to run econometric models. In this study, the researcher used Augmented Dickey-Fuller unit root test, to test for stationarity.

Augmented Dickey-Fuller (ADF) Unit root Test. This tests for the presence or absence of unit root in a series. It is an improved version of Dikey-Fuller test as it may handle larger and more complex dataset.

4.3.2 Cointergration Test

According to Gujarati (2004), two series are said to be cointegrated when they share a common stochastic trend, implying that there might be long-run relationship between the two series. Cointegration tests involves testing the co-movement of variables. When variables move together over time with a stable difference them, then we say the variables are cointegrated.

Cointegration test may be performed using Engle and Granger residual-based approach and Johansen test. Engle and Granger residual-based approach considers a one unique co-integration vector, and uses a simple Ordinary Least Square (OLS) to test the longrun equilibrium between variables at level. The omission of other variables may breed bias in the model. Though simpler to use, but the Johansen method is considered to be more reliable, since it considers more variables in the model. (Enders 2004) explains that, the two-step procedure employed in this test, involve carrying forward residuals from the first stage to the second stage, which is risky as error from the first stage would be carried to the next stage. The researched used the **Johansen method** for this study.

4.3.3 Vector Error Correction Model (VECM)

This is a restricted VAR which help to estimate the speed the dependent variable, in this case GDP returns to equilibrium after there are changes in the explanatory variables. VECM can only be applied if the cointergration test proves existence of a rough long-run relationship between the variables, so as to estimate the shot-run dynamics as well as the transitory aspect or long-run dynamics of the variables.

Methodology for Second research question

The second question sought to establish the direction of causality between stock market and economic growth. Is it stock market that causes growth or the other round? To answer this granger causality test is applied.

4.3.4 Granger causality test

Unlike other tests that simply identify the relationship between variables, Granger causality tests checks the causal relationship, This test is used to determine whether one time series may be used to forecast another. Granger (1969), points out that causality is said to exist between two variables when a variable ($X1$) Granger-causes (predicts) another variable ($X2$) better than that variable can predict itself.

"[T]he statement "yi causes yj" is just shorthand for the more precise, butlongwinded, statement, "yi contains useful information for predicting yj (in the linear least squares sense), over and above the past histories of the other variables in the system" (Diebold 2001, p254)
The test has the following pair of regression:

$$\text{SM}=a_1 \sum_{t=1}^{n} \beta_1 \, SM_{t-1} + \sum_{t=1}^{n} GDP_{t-1} + U_{1t}$$

$$\text{GDP}=a_2 \sum_{t=1}^{n} \beta_2 \, GDP_{t-1} + \sum_{t=1}^{n} SM_{t-1} + U_{2t}$$

Where SM is stock market development and GDP is economic growth.

The first equation shows that current SM is related to past values of GDP as well as past values of SM. And the second equation shows that the current GDP is related to past values of itself as well as past values of SM.
Granger causality test assumes that the 2 variables are stationary and that the error term need to be uncorrelated, also a careful selection of number of lags is important.

Chapter 5: Analysis and discussion of findings

This chapter discusses the findings on the relationship between Uganda securities exchange and economic growth in Uganda. First it establishes the link between stock market and growth and then the direction of causality.

5.1 Research Hypothesis

The endogenous growth theory postulates that there is positive relationship between financial market development and economic growth, and argues that stock markets boosts investment which promote economic growth. This study therefore tests the effectiveness of this theory by establishing whether there exists any relationship between Uganda securities exchange and economic growth, as well as identify the direction of causality in case of a relationship.

Three null hypothesis are were developed, the first (in line with the first research question) tests whether or not there is a relationship between stock markets and economic growth. The second and third (Second research question) test the direction of causality, does stock market cause growth or growth causes stock markets development, as seen below.

Null Hypothesis 1: There exists no relationship between Stock market and economic growth in Uganda

Null Hypothesis 2: Stock market does not granger cause Growth in Uganda

Null Hypothesis 3: Growth does not granger cause stock market in Uganda

To test these hypothesis, Johansen cointegration was carried out to establish, whether or not there is a relationship between stock market and economic growth in Uganda, and a granger causality test was performed to establish the direction of causality between these variables. But before these tests were run, preliminary tests which are prerequisites of these major tests were performed and their results are discussed below.

5.2 Correlation Analysis presentation

When explanatory variables in the model have correlation of sufficient magnitude to negatively impact the model especially beta weight (via standard errors and statistical significance levels associated with beta weight), we say there exists collinearity or multi collinearity. According to Gujarati (2004, p 342) "If multicollinearity is perfect in the sense of (exact linear relationship among variables), the regression coefficients of the X variables are indeterminate and their standard errors are infinite. If multicollinearity is less than perfect, as in (explanatory variable are inter-correlated but not perfectly), the regression coefficients, although determinate, possess large standard errors (in relation to the coefficients themselves), which means the coefficients cannot be estimated with great precision or accuracy".

A prior correlation analysis was carried out of the variables in order to detect multicollinearity problems and mitigate against the possible effects it could have on the study. Gujarati (2004), explained the existence of collinearity if the pair-wise correlation coefficient is high, and established a threshold of 0.5 and below to explain the acceptability of use of the variable in the model. The researcher therefore set a margin of below 0.5 (-0.5) to show weak linear correlation (positive or negative) between variables, hence higher degree of acceptability for use in the model due to weak possibility of multi-collinearity. Between 0.5 (-0.5) to 0.8 (-0.8) indicates a moderate collinearity and 0.8 to 1.0 strong multicollinearity and low acceptability to include the variables within the same models. There is no clear method to employ to eliminate multicollinearity, but expansion of observations, aggregating similar variables, and eliminating redundant variables from the equation, and so on, may reduce the problem of multicollinearity. However, variables need not to be eliminated from the model due to multicollinearity problems, because each explanatory variable has a special piece of information about the dependent variable.

Correlation Matrix of coefficients of variables used

	Y	*MC*	*VST*	*TR*	*GFCF*	*GE*	*M2*	XM
Y	1							
MC	0.86361	1						
VST	0.51772	0.51318	1					
TR	0.08387	-0.2388	0.25958	1				
GFCF	0.97835	0.82889	0.40731	0.01968	1			
GE	-0.373	-0.4575	-0.203	0.29798	-0.394	1		
M2	0.93402	0.74942	0.63746	0.25154	0.89075	-0.1508	1	
XM	0.95134	0.89072	0.70358	0.09835	0.91299	-0.3928	0.90989	1

From the table above, it is observed that all the variables are correlated to Economic growth. The stock market variables are also correlated to each other. Market capitalization ratio is positively correlated with the value of shares traded ratio, and negatively correlated with turnover ratio, implying that an increase in Market capitalization will reduce Turnover ratio.

5.3 Stationarity test Results and discussion

Stationarity test or unit root test is one of the conditions to be satisfied in time series data analysis to ensure accuracy and to avoid spurious regression. "A time series is said to be stationary when its mean and variance do not vary systematically over time" (Gujarati 2004). A Unit root test was carried out to check for stationarity. In order to avoid problems of autocorrelation as may arise from using Dickey-Fuller test, the researcher used Augmented Dickey-Fuller Unit root test.

The Null hypothesis is that, Unit root is present in the natural logarithm of the variable under test.

Alternative hypothesis is that there is No unit root.

The critical value at 5 percent is the base for guideline on unit root test. When the absolute value (not considering the sign) of the Test statistics is higher than the absolute value (ignoring the sign) of the critical value at 5 percent, we reject null hypothesis, we instead accept alternative hypothesis that there is no unit root. The results, performed using Stata, are discussed below.

Augmented Dickey-Fuller, Unit Root test at Level

Variable	ADF Test statistic at Level	1% Critical value	5% Critical Value	Implying
LogY	-1.480	-3.750	-3.000	Not stationary
LogMC	-2.466	-3.750	-3.000	Not stationary
LogVST	-2.095	-3.750	-3.000	Not stationary
LogTR	-1.507	-3.750	-3.000	Not stationary
LogGFCF	-1.422	-3.750	-3.000	Not stationary
LogGE	-1.481	-3.750	-3.000	Not stationary
LogM2	-1.981	-3.750	-3.000	Not stationary
LogXM	-1.261	-3.750	-3.000	Not stationary

The first Unit root test conducted was Augmented Dickey-Fuller Test at Level for each variable. And the results as shown in the table above, indicate that the variables are not stationary, because all the absolute values of the Test statistics, regardless of their signs were smaller than the values of the 5% critical value. This implies that there is a unit root at level, for each variable, hence not stationary.

Augmented Dickey-Fuller, Unit root test at first difference

Variable	ADF Test statistic at Level	1% Critical value	5% Critical Value	Implying
LogY	-4.167	-3.750	-3.000	Stationary
LogMC	-4.945	-3.750	-3.000	Stationary
LogVST	-3.441	-3.750	-3.000	Stationary
LogTR	-5.092	-3.750	-3.000	Stationary
LogGFCF	-5.754	-3.750	-3.000	Stationary
LogGE	-3.034	-3.750	-3.000	Stationary
LogM2	-5.523	-3.750	-3.000	Stationary
LogXM	-4.641	-3.750	-3.000	Stationary

Ho: The series have unit roots (not stationary)

Alt: The series have no unit root (they are stationary)

At first difference, the Test statistics of all the variables are more than critical value at 5%, therefore we reject the null hypothesis and accept the alternative hypothesis that there are no unit roots, indicating that the time series are stationary.

5.4 Cointegration Results and discussions (Findings to question 1)

From the lag selection criteria, the most appropriate lag was lag 1 due to inadequate number of observations. Three equations were used, but with similar model. This was so to avoid the problem of multicollinearity of variables. Each stock market variable was put in a separate equation. The first equation captured Market capitalization ratio along with other explanatory variables to determine their relationship with economic growth (Real GDP per

capita). The second model captures Total value of shares traded ratio, and the third captures Turnover ratio.

Johansen Cointergration test was performed using Eviews, and the results are discussed below.

Model 1: logY= f(logMC, logGFCF, logGE, logM2, logXM)

Hypothesis	Trace statistic	Critical Value at 5%	Maximum Eigen Value	Critical value at 5 %
R=0	107.3203	95.75366	34.75826	40.07757
R≤1	72.56204	69.81889	29.92768	33.87687
R≤2	42.63437	47.85613	16.64561	27.58434
R≤3	25.98876	29.79707	14.28511	21.13162
R≤4	11.70365	15.49471	7.333564	14.2646
R≤5	4.37009	3.841466	4.37009	3.841466

Model 2: logY= f(logVST, logGFCF, logGE, logM2, logXM)

Hypothesis	Trace statistic	Critical Value at 5%	Maximum Eigen Value	Critical value at 5 %
R=0	111.7264	95.75366	32.0448	40.07757
R≤1	79.68164	69.81889	28.20462	33.87687
R≤2	51.47702	47.85613	21.30588	27.58434
R≤3	30.17115	29.79707	14.18705	21.13162
R≤4	15.98409	15.49471	10.10918	14.2646
R≤5	5.874913	3.841466	5.874913	3.841466

Model 3: logY= f(logTR, logGFCF, logGE, logM2, logXM)

Hypothesis	Trace statistic	Critical Value at 5%	Maximum Eigen Value	Critical value at 5 %
R=0	112.0634	95.75366	34.45966	40.07757
R≤1	77.6037	69.81889	29.46106	33.87687
R≤2	48.14264	47.85613	15.87046	27.58434
R≤3	32.27218	29.79707	13.04781	21.13162
R≤4	19.22438	15.49471	13.02964	14.2646
R≤5	6.194742	3.841466	6.194742	3.841466

In all the three models, the Trace statistics indicate that the variables are cointergrated. The Maximum Eigen value show no cointergration.

Null Hypothesis: There is no cointegration among variables (Hypothesis zero)

Alternative hypothesis:

- There is at most 1 cointegartion between variables.
- There are at most 2 cointegartions among variables
- There are at most 3 cointegartions among variables
- There are at most 4 cointegartions among variables
- There are at most 5 cointegartions among variables

The guideline is that when the Trace statistics is more than 5 % percent Critical value, we reject the null hypothesis. In all the three equations, we see that the trace statistics are higher than the critical values at 5 percent, we can then reject the null hypothesis, because variables are cointegrated. Trace test indicates 2 cointegrating equations at the 0.05 level in the first model, 6 cointegrating equations at the 0.05 level in the second and third equation.

Also, when the maximum Eigen value is more than the critical value at 5 percent, we reject the null hypothesis. In all the three models, the Maximum Eigen values are less than 5 percent critical values, we then fail to reject the null hypothesis, we rather accept the null hypothesis that variables are not cointergrated.

Whereas the Trace statistics of the Johansen cointergration test showed that the variables are cointergrated, while the Maximum Eigen values showed no integration, the researcher preferred to go by the Trace statistics and proceeded to perform the Vector Error Correction Model (VECM) to establish the short-run and long-run dynamics of this relationship.

5.5 Vector Error correction model (VECM) results

Given that the variables are cointergrated as shown in the trace stastictics, it is important to establish the short run dynamics and long-run dynamics of this relationship, hence the Vector error correction model (VECM).

Data converted to first difference automatically.

Model 1

Variables	Coefficient	Standard Error	t-statistists	Probability
Ce1 (ECT)	.1158568	.1037246	1.12	0.264
D(LogY(-1))	4.003174	2.872939	1.39	0.163
D(LogMC(-1))	.0234224	.0188755	1.24	0.215
D(LogGFCF(-1))	-.716489	.575666	-1.24	0.213
D(LogGE(-1))	-.3020623	.2418979	-1.25	0.212
D(LogM2(-1))	.2685465	.2895379	0.93	0.354
D(LogXM(-1))	-.7636671	.5835005	-1.31	0.191
Cons	-.0341237	.0351795	-0.97	0.332

CE1 is speed of adjustment towards equilibrium or error correction term. From model one, the Error correction term also called the speed of adjustment is seen to be wrongly signed, that is to say it has a With a positive sign, implying that the error obtain has high possibilities of moving much further away from the equilibrium path as time goes on and on. Also the CE1 coefficient shows that 11 percent of the error produced in the previous period are corrected in the current period. The error term however is not statistically significant

Model 2

Variables	Coefficient	Standard Error	t-statistists	Probability
Ce1 (ECT)	.1301811	.0486303	2.68	0.007
D(LogY(-1))	-.6926643	.662248	-1.05	0.296
D(LogVST(-1))	-.0086246	.0096175	-0.90	0.370
D(LogGFCF(-1))	.0968385	.0754538	1.28	0.199
D(LogGE(-1))	.0629171	.0485094	1.30	0.195
D(LogM2(-1))	.0027261	.0661402	0.04	0.967
D(LogXM(-1))	.0158115	.0848038	0.19	0.852
Cons	.0021759	.0061619	0.35	0.724

From the table in model 2, the Error correction term is also wrongly signed, that is to say it has a With a positive sign, implying that the error obtain has high possibilities of moving much further away from the equilibrium path as time goes on and on. Also the CE1 coefficient shows that 13 percent of the error produced in the previous period are corrected in the current period. The error term however is not statistically significant

Model 3

Variables	Coefficient	Standard Error	t-statistists	Probability
Ce1 (ECT)	-.0205657	.5951318	-0.03	0.972
D(LogY(-1))	1.000361	1.162893	0.86	0.390
D(LogTR(-1))	-.0041918	.0163563	-0.26	0.798
D(LogGFCF(-1))	-.1281211	.6044159	-0.21	0.832
D(LogGE(-1))	-.0408792	.2478282	-0.16	0.869
D(LogM2(-1))	-.001036	.6414038	-0.00	0.999
D(LogXM(-1))	-.1368061	.1158568	-1.18	0.238
Cons	.0042136	.0189728	0.22	0.824

On the other hand, in model 3, the speed of adjustment (Error correction term) is signed correctly with the expected negative sign, implying that there is a tendency to move towards equilibrium path from given periodic disequilibrium. Error correction is therefore happening, though only 2 percent of the error generated from last period is being corrected this period. The error term however is not statistically significant.

Long run causality and short run causality

The guideline is that, there is Long-run causality if CE1 (ECT) is negative and significant (p-value less than 5%), then we say there is long run causality running from the independent variables jointly to GDP.

Long run causality model 1

For GDP, the CE1 coefficience is .1158568 (positive) and p-value is 0.264 (more than 5 %), so there is no long run causality running from Mc, GCFC, GE, M2 and XM jointly to GDP

Short run causality

Null hypothesis= No short run causality running from Mc to GDP

And when P value is more than 5%, we do not reject the null hypothesis, but rather accept the null hypothesis. So there is no short-run causality running from MC to GDP since p value is 21.5 percent (more than 5 percent). In all instances we accept the null hypothesis, no short-run causality moving from explanatory variables to Economic growth.

5.6 Granger Causality Test results (second question disused)

The cointergration results alone are not adequate enough to explain the relationship between stock markets and economic growth in Uganda. We need to establish the direction of this relationship, hence the causality test. Given that a relationship exists between stock market and economic growth as shown from the Johansen cointegration test from the trace statistics, we ought to examine the causation of this relationship. If stock market variables can predict economic growth in Uganda, more than growth can predict itself, the stock markets variables are said to granger-cause economic growth the reverse is true. The stock market is said to granger cause.

Stock market causes Economic Growth Null Hypotheis

Null Hypothesis for the causal relationship between Stock market variables and economic growth

Lagged (2 lagged) MC does not cause Y, alt: Lagged MC causes Y

Lagged (2 lagged) VST does not cause Y, alt: Lagged VST causes Y

Lagged (2 lagged) TR does not cause Y, alt: Lagged TR causes Y

Economic Growth Causes Stock market Null Hypothesis

Null Hypothesis for the causal relationship between Economic growth and stock market variables.

Lagged (2 lagged) Y does not cause MC, alt: Lagged Y causes MC

Lagged (2 lagged) Y does not cause VST, alt: Lagged Y causes VST

Lagged (2 lagged) Y does not cause TR, alt: Lagged Y causes TR

Stock Market causes Economic Growth				**Economic Growth causes Stock Market**	
Variable of Stock Market	**F-statistics**	**p-value**		**F-statistics**	**p-value**
MC	0.57365	0.5669		1.89065	0.161
VST	0.74846	0.478		2.81492	0.0689
TR	0.78097	0.4632		2.28923	0.1113

When probability is more than 5%, we fail to reject the null hypothesis, we rather accept the null hypothesis. In this case, all p-values of the three stock market variables are more than 5 percent. We can not reject the null hypothesis, rather we accept the null hypothesis. Therefore stock market, represented by its three variables, does not granger cause economic growth in Undanda.

Economic growth proxied by Real per capita GDP has p-values more than 5 percent, in all the three poxies of stock market development. We then yet again fail to reject the null hypothesis, but rather accept the null hypothesis that economic growth does not granger cause stock market development.

The granger causality results prove that there exist no causation between stock market and economic growth in Uganda. This is in line with the study by (Harris 1997), who re-examined a study carried out by Atje and Jovanovic (1993). His findings were that for the case of developing countries, stock markets were found to have weak effect on growth.

5.7 Summary of Findings

Despite the growth of the Ugandan economy within the study period, the stock market does not have a hand in this increasing growth rate of the economy. These results are in line with the idea of Arestis et al, (2001) that cross country regressions have exaggerated the effects of stock markets on growth, despite the fact that stock markets may have positive effect on economic growth. The study instead agree with the critics of stock market-growth link as argued by Singh as quoted by (Yartey and Adjasi 2007) that when it comes to developing countries, especially African countries, stock markets are passive and weak in performance, due to poor financial structures. This really questions the assumption by many that has conclusively posited that stock markets boost economic growth. It may simply be set as a rule of thumb, but needs to be looked at in different perspectives for better understanding of this relationship.

Chapter 6: Conclusions and Recommendations

6.1 Conclusions

The research sought to establish the relationship between USE and economic growth, and the direction of causality. The Johansen test proved that variables were cointerggrated, yet granger causality test showed no causality between stock market and economic growth in Uganda. These findings are in agreement with (Harris 1997), whom, from his re-examination of a study carried out by(Yartey and Adjasi 2007) found stock markets to have weak and insignificant effects on economic growth, in the case of developing countries.

The economy of Uganda has been growing steadily from 1988 as shown in the study. Despite the amelioration in economic performance of Uganda, shown by the Real GDP per capita growth and the overall GDP growth rates, it is not feasible to trace the contribution of the stock market in this raising economic growth This could imply that the economic growth in Uganda has been moved upwards by other factors that are economic growth players, other than the stock exchange. Uganda's economy seemed to growth faster after 1998, the year that USE was established. It is however disturbing to find no contribution of USE in this growth. This could be in support of the argument by(Harris 1997), that despite the fast growth of countries after opening stock exchanges, it is rather the efficient resource allocation rather than physical capital accumulation that may matter to increase output.

6.2 Recommendations

There is need for strong government intervention to foster the development of Uganda Securities Exchange so as to attract more investors, especially foreign investors. The government may intervene though bodies like Bank of Uganda (BOU), Capital Markets Authority (CMA) and the Ministry of Finance. This may enable the equity market to attract more foreign capital inflows and be able to contribute to the growth of the economy Baier et all (2004).
Being a member of the African Securities Exchange Association (ASEA) and East African Securities Exchange Association (EASEA), USE needs to make the most of these bodies so as to become more lively and vivacious.

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APENDICES

Appendix 1: Data used for Regression

Period	Real GDP per capita	Market Capitalisation % GDP	Total Value of Shares traded %GDP	Turnover Ratio %	Gross fixed capital formation %GDP	Gov't Expenditure % GDP	Money supply @ GDP	Export Improt % GDP
1998Q1	396,567.10	0.00	0.00	0.45	11.27	13.56	14.86	30.04
1998Q2	396,567.10	0.00	0.00	0.45	11.27	13.56	14.86	30.04
1998Q3	396,567.10	0.00	0.00	0.45	11.27	13.56	14.86	30.04
1998Q4	396,567.10	0.00	0.00	0.45	11.27	13.56	14.86	30.04
1999Q1	401,432.80	0.00	0.00	0.43	11.91	13.89	15.05	31.54
1999Q2	406,298.40	0.00	0.00	0.41	12.55	14.22	15.25	33.03
1999Q3	411,164.10	0.00	0.00	0.39	13.20	14.56	15.44	34.53
1999Q4	416,029.70	0.00	0.00	0.37	13.84	14.89	15.63	36.02
2000Q1	418,336.10	0.15	0.00	0.33	13.68	15.05	15.75	35.21
2000Q2	420,642.50	0.31	0.00	0.28	13.51	15.21	15.87	34.39
2000Q3	422,948.90	0.46	0.00	0.24	13.34	15.37	16.00	33.57
2000Q4	425,255.40	0.62	0.00	0.20	13.18	15.53	16.12	32.75
2001Q1	431,005.60	0.61	0.00	0.29	13.15	17.03	16.11	33.39
2001Q2	436,755.90	0.61	0.00	0.38	13.13	18.54	16.10	34.04
2001Q3	442,506.10	0.61	0.00	0.47	13.11	20.05	16.10	34.68
2001Q4	448,256.40	0.60	0.00	0.56	13.09	21.56	16.09	35.33
2002Q1	452,396.30	0.65	0.01	0.93	13.42	21.87	16.83	35.57
2002Q2	456,536.20	0.70	0.01	1.30	13.74	22.19	17.56	35.80
2002Q3	460,676.10	0.75	0.01	1.67	14.06	22.50	18.30	36.04
2002Q4	464,816.00	0.79	0.02	2.04	14.39	22.82	19.03	36.28
2003Q1	468,049.80	0.78	0.02	1.92	14.69	22.51	19.16	36.35
2003Q2	471,283.70	0.77	0.01	1.80	15.00	22.21	19.29	36.43
2003Q3	474,517.50	0.75	0.01	1.68	15.31	21.90	19.42	36.51
2003Q4	477,751.40	0.74	0.01	1.56	15.61	21.60	19.55	36.59
2004Q1	480,642.10	0.86	0.01	1.46	15.47	20.26	18.97	36.30
2004Q2	483,532.80	0.98	0.01	1.37	15.32	18.91	18.39	36.02
2004Q3	486,423.50	1.09	0.01	1.27	15.17	17.57	17.81	35.74
2004Q4	489,314.30	1.21	0.01	1.17	15.03	16.23	17.23	35.46
2005Q1	497,251.00	1.19	0.02	1.60	15.58	16.33	17.75	36.34
2005Q2	505,187.70	1.18	0.02	2.04	16.13	16.44	18.28	37.23
2005Q3	513,124.50	1.16	0.03	2.48	16.68	16.55	18.80	38.11
2005Q4	521,061.20	1.14	0.03	2.91	17.23	16.66	19.32	38.99
2006Q1	525,785.60	1.15	0.04	3.48	17.00	16.64	19.47	40.15
2006Q2	530,509.90	1.15	0.05	4.04	16.78	16.62	19.62	41.31
2006Q3	535,234.20	1.16	0.05	4.61	16.55	16.60	19.77	42.47
2006Q4	539,958.60	1.17	0.06	5.17	16.32	16.58	19.91	43.63
2007Q1	546,181.90	6.02	0.11	4.20	16.48	16.55	20.15	44.42
2007Q2	552,405.20	10.87	0.16	3.22	16.63	16.52	20.39	45.21
2007Q3	558,628.50	15.72	0.21	2.24	16.78	16.49	20.64	45.99
2007Q4	564,851.80	20.57	0.26	1.26	16.93	16.46	20.88	46.78

2008Q1	574,604.10	20.83	0.33	1.57	17.27	16.18	21.56	49.15
2008Q2	584,356.50	21.09	0.40	1.87	17.62	15.90	22.25	51.52
2008Q3	594,108.90	21.36	0.47	2.17	17.96	15.63	22.93	53.89
2008Q4	603,861.30	21.62	0.54	2.48	18.30	15.35	23.62	56.26
2009Q1	605,106.80	21.73	0.42	1.92	18.96	14.53	22.64	54.62
2009Q2	606,352.40	21.83	0.30	1.37	19.62	13.72	21.66	52.98
2009Q3	607,597.90	21.93	0.18	0.82	20.28	12.91	20.68	51.34
2009Q4	608,843.50	22.04	0.06	0.27	20.94	12.10	19.70	49.70
2010Q1	613,163.90	18.91	0.06	0.34	20.79	12.55	20.51	48.76
2010Q2	617,484.30	15.77	0.06	0.41	20.63	13.00	21.31	47.82
2010Q3	621,804.70	12.64	0.05	0.49	20.47	13.45	22.12	46.88
2010Q4	626,125.10	9.51	0.05	0.56	20.31	13.91	22.92	45.93
2011Q1	630,576.60	17.48	0.06	0.47	20.36	14.36	22.80	47.44
2011Q2	635,028.10	25.46	0.07	0.38	20.40	14.82	22.67	48.95
2011Q3	639,479.70	33.43	0.08	0.29	20.45	15.28	22.54	50.46
2011Q4	643,931.20	41.41	0.08	0.20	20.49	15.74	22.41	51.97
2012Q1	643,114.80	38.74	0.08	0.19	20.71	14.82	21.91	52.19
2012Q2	642,298.30	36.08	0.07	0.18	20.93	13.91	21.41	52.40
2012Q3	641,481.90	33.41	0.06	0.17	21.15	12.99	20.90	52.62
2012Q4	640,665.40	30.74	0.05	0.16	21.37	12.08	20.40	52.83
1998Q3	396,567.10	0.00	0.00	0.45	11.27	13.56	14.86	30.04
1998Q4	396,567.10	0.00	0.00	0.45	11.27	13.56	14.86	30.04
1999Q1	401,432.80	0.00	0.00	0.43	11.91	13.89	15.05	31.54
1999Q2	406,298.40	0.00	0.00	0.41	12.55	14.22	15.25	33.03
1999Q3	411,164.10	0.00	0.00	0.39	13.20	14.56	15.44	34.53
1999Q4	416,029.70	0.00	0.00	0.37	13.84	14.89	15.63	36.02
2000Q1	418,336.10	0.15	0.00	0.33	13.68	15.05	15.75	35.21
2000Q2	420,642.50	0.31	0.00	0.28	13.51	15.21	15.87	34.39
2000Q3	422,948.90	0.46	0.00	0.24	13.34	15.37	16.00	33.57
2000Q4	425,255.40	0.62	0.00	0.20	13.18	15.53	16.12	32.75
2001Q1	431,005.60	0.61	0.00	0.29	13.15	17.03	16.11	33.39
2001Q2	436,755.90	0.61	0.00	0.38	13.13	18.54	16.10	34.04
2001Q3	442,506.10	0.61	0.00	0.47	13.11	20.05	16.10	34.68
2001Q4	448,256.40	0.60	0.00	0.56	13.09	21.56	16.09	35.33
2002Q1	452,396.30	0.65	0.01	0.93	13.42	21.87	16.83	35.57
2002Q2	456,536.20	0.70	0.01	1.30	13.74	22.19	17.56	35.80
2002Q3	460,676.10	0.75	0.01	1.67	14.06	22.50	18.30	36.04
2002Q4	464,816.00	0.79	0.02	2.04	14.39	22.82	19.03	36.28
2003Q1	468,049.80	0.78	0.02	1.92	14.69	22.51	19.16	36.35
2003Q2	471,283.70	0.77	0.01	1.80	15.00	22.21	19.29	36.43
2003Q3	474,517.50	0.75	0.01	1.68	15.31	21.90	19.42	36.51
2003Q4	477,751.40	0.74	0.01	1.56	15.61	21.60	19.55	36.59
2004Q1	480,642.10	0.86	0.01	1.46	15.47	20.26	18.97	36.30
2004Q2	483,532.80	0.98	0.01	1.37	15.32	18.91	18.39	36.02
2004Q3	486,423.50	1.09	0.01	1.27	15.17	17.57	17.81	35.74
2004Q4	489,314.30	1.21	0.01	1.17	15.03	16.23	17.23	35.46
2005Q1	497,251.00	1.19	0.02	1.60	15.58	16.33	17.75	36.34
2005Q2	505,187.70	1.18	0.02	2.04	16.13	16.44	18.28	37.23
2005Q3	513,124.50	1.16	0.03	2.48	16.68	16.55	18.80	38.11
2005Q4	521,061.20	1.14	0.03	2.91	17.23	16.66	19.32	38.99

2006Q1	525,785.60	1.15	0.04	3.48	17.00	16.64	19.47	40.15
2006Q2	530,509.90	1.15	0.05	4.04	16.78	16.62	19.62	41.31
2006Q3	535,234.20	1.16	0.05	4.61	16.55	16.60	19.77	42.47
2006Q4	539,958.60	1.17	0.06	5.17	16.32	16.58	19.91	43.63
2007Q1	546,181.90	6.02	0.11	4.20	16.48	16.55	20.15	44.42
2007Q2	552,405.20	10.87	0.16	3.22	16.63	16.52	20.39	45.21
2007Q3	558,628.50	15.72	0.21	2.24	16.78	16.49	20.64	45.99
2007Q4	564,851.80	20.57	0.26	1.26	16.93	16.46	20.88	46.78
2008Q1	574,604.10	20.83	0.33	1.57	17.27	16.18	21.56	49.15
2008Q2	584,356.50	21.09	0.40	1.87	17.62	15.90	22.25	51.52
2008Q3	594,108.90	21.36	0.47	2.17	17.96	15.63	22.93	53.89
2008Q4	603,861.30	21.62	0.54	2.48	18.30	15.35	23.62	56.26
2009Q1	605,106.80	21.73	0.42	1.92	18.96	14.53	22.64	54.62
2009Q2	606,352.40	21.83	0.30	1.37	19.62	13.72	21.66	52.98
2009Q3	607,597.90	21.93	0.18	0.82	20.28	12.91	20.68	51.34
2009Q4	608,843.50	22.04	0.06	0.27	20.94	12.10	19.70	49.70
2010Q1	613,163.90	18.91	0.06	0.34	20.79	12.55	20.51	48.76
2010Q2	617,484.30	15.77	0.06	0.41	20.63	13.00	21.31	47.82
2010Q3	621,804.70	12.64	0.05	0.49	20.47	13.45	22.12	46.88
2010Q4	626,125.10	9.51	0.05	0.56	20.31	13.91	22.92	45.93

Period	**Real GDP per capita**	**Marlet Capitalization %GDP**	**Total Value Shares Traded%GDP**	**Turnover Ratio%**	**Gross Fixed Capital Formation &GDP**	**Government Expenditure %GDP**	**M2(Money supply) %GDP**	**Export and Import%GDP**
1998 Q1	396,567.10	0.00	0.00	0.45	11.27	13.56	14.86	30.04
1998 Q2	396,567.10	0.00	0.00	0.45	11.27	13.56	14.86	30.04
1998 Q3	396,567.10	0.00	0.00	0.45	11.27	13.56	14.86	30.04
1998 Q4	396,567.10	0.00	0.00	0.45	11.27	13.56	14.86	30.04
1999 Q1	401,432.80	0.00	0.00	0.43	11.91	13.89	15.05	31.54
1999 Q2	406,298.40	0.00	0.00	0.41	12.55	14.22	15.25	33.03
		0.00	0.00	0.39	13.20	14.56	15.44	34.53

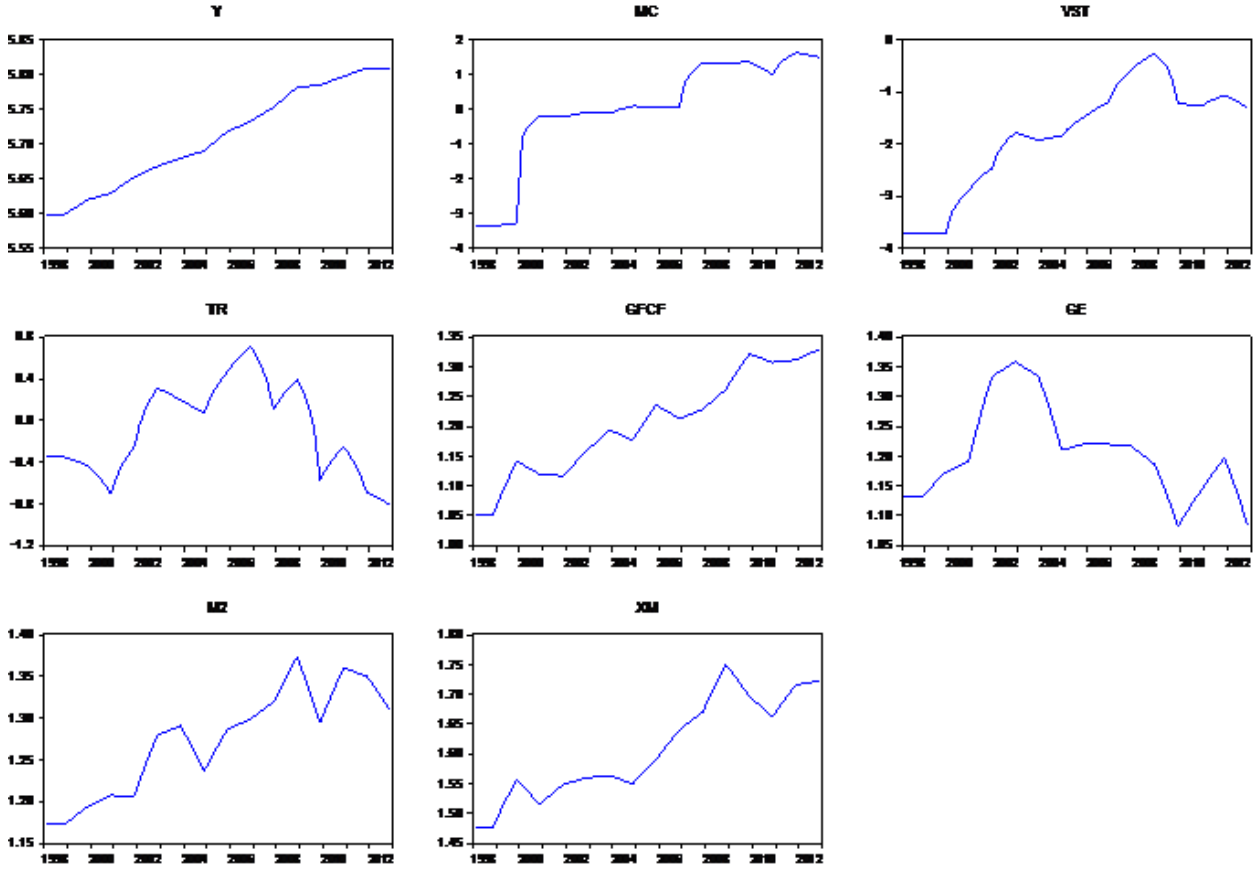
1999 Q3	411,164.10							
1999 Q4	416,029.70	0.00	0.00	0.37	13.84	14.89	15.63	36.02
2000 Q1	418,336.10	0.15	0.00	0.33	13.68	15.05	15.75	35.21
2000 Q2	420,642.50	0.31	0.00	0.28	13.51	15.21	15.87	34.39
2000 Q3	422,948.90	0.46	0.00	0.24	13.34	15.37	16.00	33.57
2000 Q4	425,255.40	0.62	0.00	0.20	13.18	15.53	16.12	32.75
2001 Q1	431,005.60	0.61	0.00	0.29	13.15	17.03	16.11	33.39
2001 Q2	436,755.90	0.61	0.00	0.38	13.13	18.54	16.10	34.04
2001 Q3	442,506.10	0.61	0.00	0.47	13.11	20.05	16.10	34.68
2001 Q4	448,256.40	0.60	0.00	0.56	13.09	21.56	16.09	35.33
2002 Q1	452,396.30	0.65	0.01	0.93	13.42	21.87	16.83	35.57
2002 Q2	456,536.20	0.70	0.01	1.30	13.74	22.19	17.56	35.80
2002 Q3	460,676.10	0.75	0.01	1.67	14.06	22.50	18.30	36.04
2002 Q4	464,816.00	0.79	0.02	2.04	14.39	22.82	19.03	36.28
2003 Q1	468,049.80	0.78	0.02	1.92	14.69	22.51	19.16	36.35
2003 Q2	471,283.70	0.77	0.01	1.80	15.00	22.21	19.29	36.43

2003 Q3	474,517.50	0.75	0.01	1.68	15.31	21.90	19.42	36.51
2003 Q4	477,751.40	0.74	0.01	1.56	15.61	21.60	19.55	36.59
2004 Q1	480,642.10	0.86	0.01	1.46	15.47	20.26	18.97	36.30
2004 Q2	483,532.80	0.98	0.01	1.37	15.32	18.91	18.39	36.02
2004 Q3	486,423.50	1.09	0.01	1.27	15.17	17.57	17.81	35.74
2004 Q4	489,314.30	1.21	0.01	1.17	15.03	16.23	17.23	35.46
2005 Q1	497,251.00	1.19	0.02	1.60	15.58	16.33	17.75	36.34
2005 Q2	505,187.70	1.18	0.02	2.04	16.13	16.44	18.28	37.23
2005 Q3	513,124.50	1.16	0.03	2.48	16.68	16.55	18.80	38.11
2005 Q4	521,061.20	1.14	0.03	2.91	17.23	16.66	19.32	38.99
2006 Q1	525,785.60	1.15	0.04	3.48	17.00	16.64	19.47	40.15
2006 Q2	530,509.90	1.15	0.05	4.04	16.78	16.62	19.62	41.31
2006 Q3	535,234.20	1.16	0.05	4.61	16.55	16.60	19.77	42.47
2006 Q4	539,958.60	1.17	0.06	5.17	16.32	16.58	19.91	43.63
2007 Q1	546,181.90	6.02	0.11	4.20	16.48	16.55	20.15	44.42
2007	552,405.	10.87	0.16	3.22	16.63	16.52	20.39	45.21

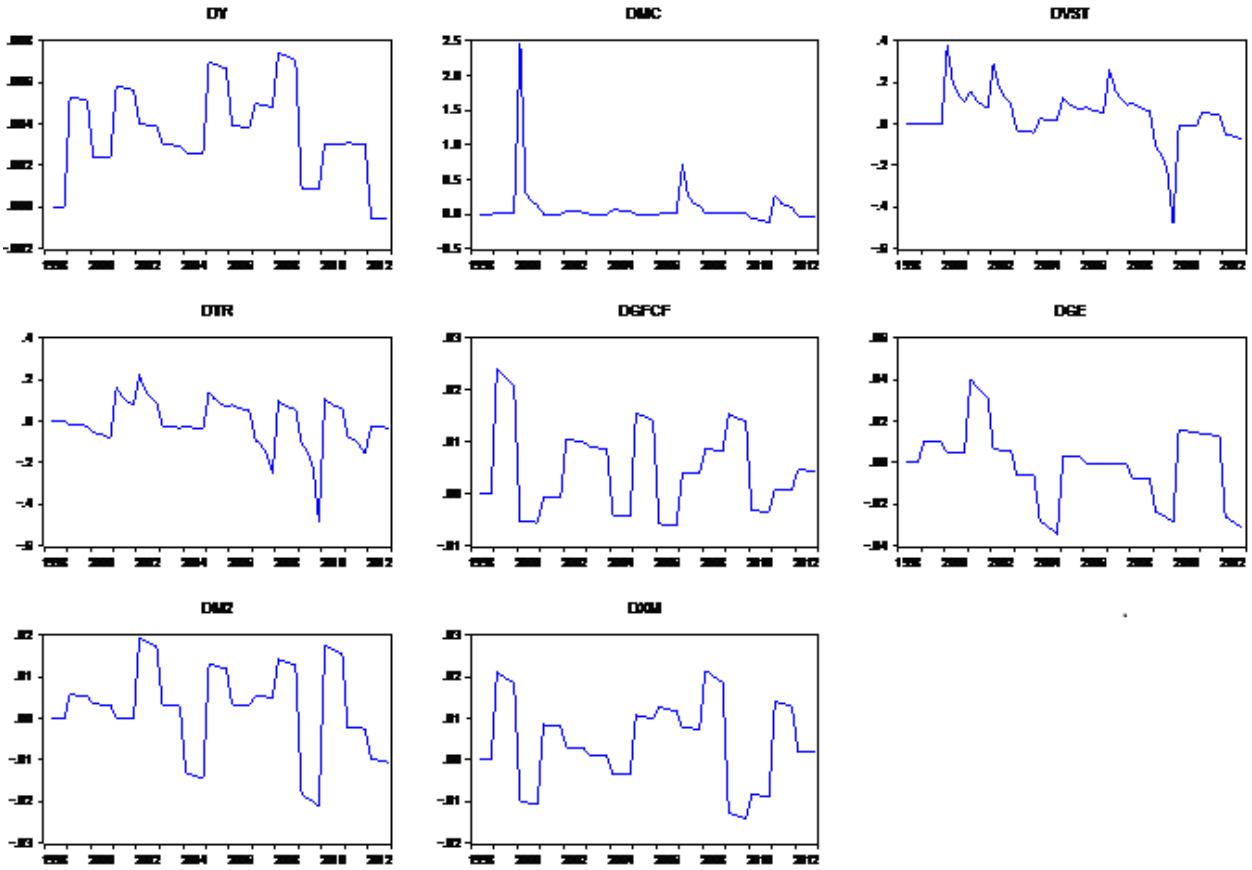
Q2	20							
2007 Q3	558,628.50	15.72	0.21	2.24	16.78	16.49	20.64	45.99
2007 Q4	564,851.80	20.57	0.26	1.26	16.93	16.46	20.88	46.78
2008 Q1	574,604.10	20.83	0.33	1.57	17.27	16.18	21.56	49.15
2008 Q2	584,356.50	21.09	0.40	1.87	17.62	15.90	22.25	51.52
2008 Q3	594,108.90	21.36	0.47	2.17	17.96	15.63	22.93	53.89
2008 Q4	603,861.30	21.62	0.54	2.48	18.30	15.35	23.62	56.26
2009 Q1	605,106.80	21.73	0.42	1.92	18.96	14.53	22.64	54.62
2009 Q2	606,352.40	21.83	0.30	1.37	19.62	13.72	21.66	52.98
2009 Q3	607,597.90	21.93	0.18	0.82	20.28	12.91	20.68	51.34
2009 Q4	608,843.50	22.04	0.06	0.27	20.94	12.10	19.70	49.70
2010 Q1	613,163.90	18.91	0.06	0.34	20.79	12.55	20.51	48.76
2010 Q2	617,484.30	15.77	0.06	0.41	20.63	13.00	21.31	47.82
2010 Q3	621,804.70	12.64	0.05	0.49	20.47	13.45	22.12	46.88
2010 Q4	626,125.10	9.51	0.05	0.56	20.31	13.91	22.92	45.93
2011 Q1	630,576.60	17.48	0.06	0.47	20.36	14.36	22.80	47.44
		25.46	0.07	0.38	20.40	14.82	22.67	48.95

2011 Q2	635,028.10							
2011 Q3	639,479.70	33.43	0.08	0.29	20.45	15.28	22.54	50.46
2011 Q4	643,931.20	41.41	0.08	0.20	20.49	15.74	22.41	51.97
2012 Q1	643,114.80	38.74	0.08	0.19	20.71	14.82	21.91	52.19
2012 Q2	642,298.30	36.08	0.07	0.18	20.93	13.91	21.41	52.40
2012 Q3	641,481.90	33.41	0.06	0.17	21.15	12.99	20.90	52.62
2012 Q4	640,665.40	30.74	0.05	0.16	21.37	12.08	20.40	52.83

Appendix 2: Augmented Dickey-Fuller, Unit Root test at level



Appendix 3: Augmented Dickey-Fuller, Unit Root test 1st difference



Johansen Cointergations Tests

Appendix 4: Johansen Test Model 1

logY= f(logMC, logGFCF, logGE, logM2, logXM)

Date: 10/28/15 Time: 13:27
Sample (adjusted): 1998Q3 2012Q4
Included observations: 58 after adjustments
Trend assumption: Linear deterministic trend
Series: Y MC GFCF GE M2 XM
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.450793	107.3203	95.75366	0.0063
At most 1 *	0.403093	72.56204	69.81889	0.0297
At most 2	0.249483	42.63437	47.85613	0.1417
At most 3	0.218308	25.98876	29.79707	0.129
At most 4	0.118774	11.70365	15.49471	0.1717
At most 5 *	0.072578	4.37009	3.841466	0.0366

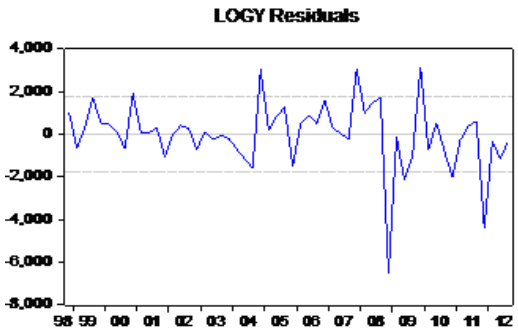
Trace test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

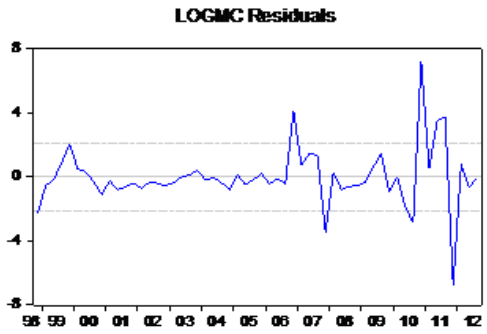
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

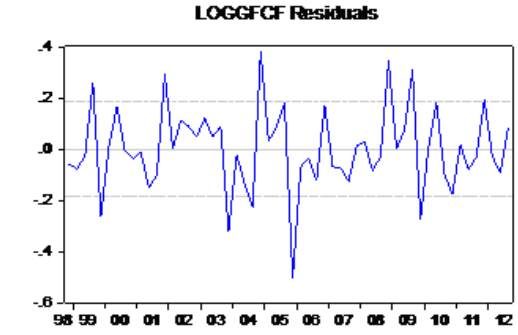
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.450793	34.75826	40.07757	0.176
At most 1	0.403093	29.92768	33.87687	0.1379
At most 2	0.249483	16.64561	27.58434	0.6105
At most 3	0.218308	14.28511	21.13162	0.3421
At most 4	0.118774	7.333564	14.2646	0.4505
At most 5 *	0.072578	4.37009	3.841466	0.0366

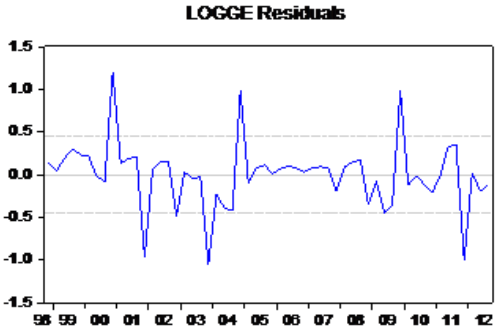
Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

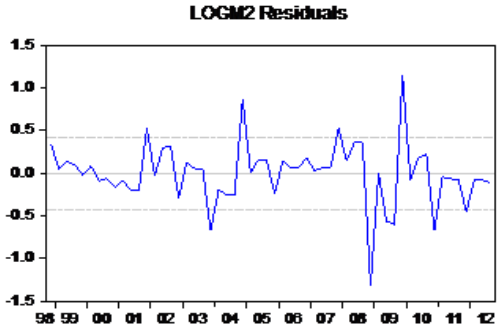
Appendix 5: Vector Error corection Residual graphs Model 1

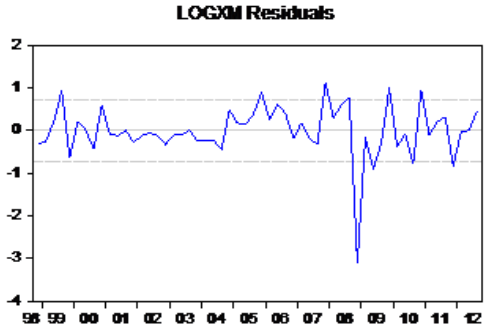












Appendix 6: Johansen test Model 2

logY= f(logVST, logGFCF, logGE, logM2, logXM)

Date: 10/28/15 Time: 13:30
Sample (adjusted): 1998Q3 2012Q4
Included observations: 58 after adjustments
Trend assumption: Linear deterministic trend
Series: Y VST GFCF GE M2 XM
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.424489	111.7264	95.75366	0.0025
At most 1 *	0.385094	79.68164	69.81889	0.0066
At most 2 *	0.307428	51.47702	47.85613	0.022
At most 3 *	0.216986	30.17115	29.79707	0.0453
At most 4 *	0.159952	15.98409	15.49471	0.0422
At most 5 *	0.096331	5.874913	3.841466	0.0154

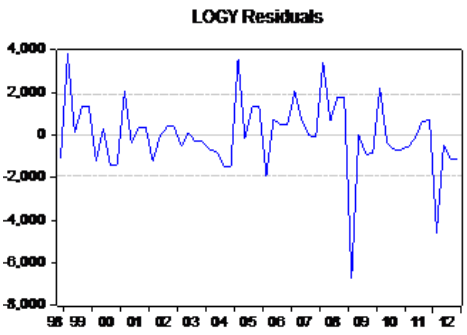
Trace test indicates 6 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

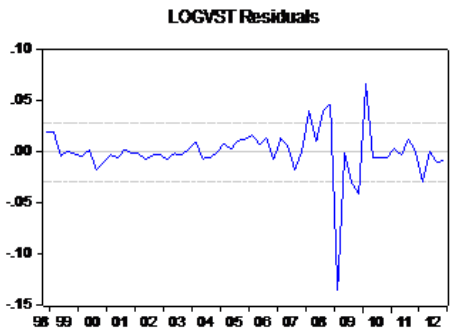
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

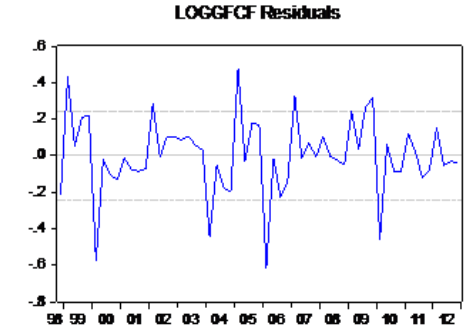
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.424489	32.0448	40.07757	0.3005
At most 1	0.385094	28.20462	33.87687	0.2042
At most 2	0.307428	21.30588	27.58434	0.2582
At most 3	0.216986	14.18705	21.13162	0.3499
At most 4	0.159952	10.10918	14.2646	0.2049
At most 5 *	0.096331	5.874913	3.841466	0.0154

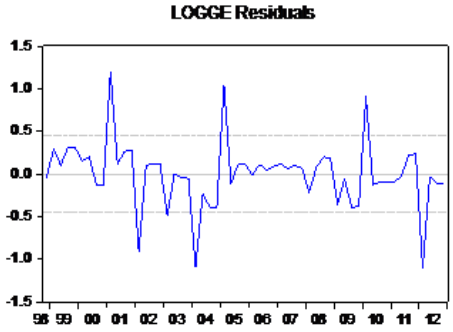
Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

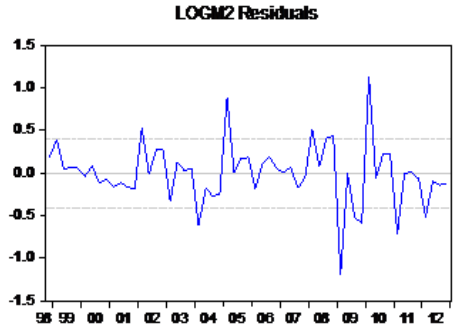
Appendix 7: Vector Error corection Residual graphs Model 2

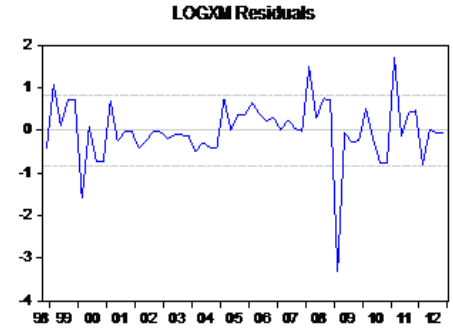

LOGY Residuals
4,000
2,000
0
-2,000
-4,000
-6,000
-8,000
98 99 00 01 02 03 04 05 06 07 08 09 10 11 12


LOGVST Residuals
.10
.05
.00
-.05
-.10
-.15
98 99 00 01 02 03 04 05 06 07 08 09 10 11 12


LOGGFCF Residuals
.6
.4
.2
.0
-.2
-.4
-.6
-.8
98 99 00 01 02 03 04 05 06 07 08 09 10 11 12


LOGGE Residuals
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
98 99 00 01 02 03 04 05 06 07 08 09 10 11 12


LOGM2 Residuals
1.5
1.0
0.5
0.0
-0.5
-1.0
-1.5
98 99 00 01 02 03 04 05 06 07 08 09 10 11 12


LOGXM Residuals
2
1
0
-1
-2
-3
-4
98 99 00 01 02 03 04 05 06 07 08 09 10 11 12

Appendix 8: Johansen test Model 3

logY= f(logTR, logGFCF, logGE, logM2, logXM)

Date: 10/28/15 Time: 13:31
Sample (adjusted): 1998Q3 2012Q4
Included observations: 58 after adjustments
Trend assumption: Linear deterministic trend
Series: Y TR GFCF GE M2 XM
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.447958	112.0634	95.75366	0.0024
At most 1 *	0.398272	77.6037	69.81889	0.0105
At most 2 *	0.239385	48.14264	47.85613	0.047
At most 3 *	0.201454	32.27218	29.79707	0.0254
At most 4 *	0.201203	19.22438	15.49471	0.0131
At most 5 *	0.1013	6.194742	3.841466	0.0128

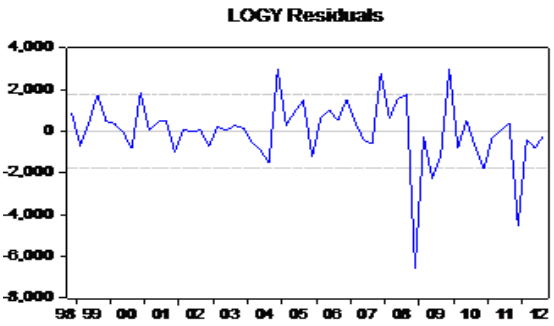
Trace test indicates 6 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

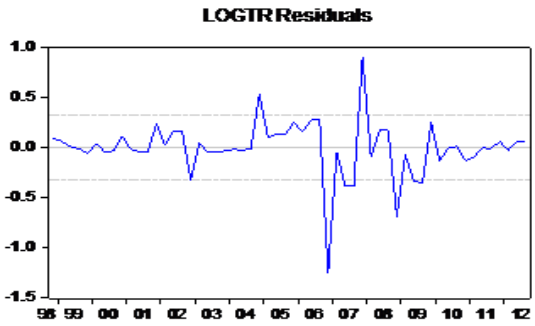
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

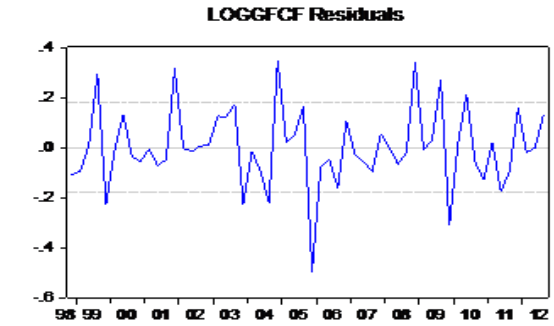
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.447958	34.45966	40.07757	0.1874
At most 1	0.398272	29.46106	33.87687	0.1539
At most 2	0.239385	15.87046	27.58434	0.6767
At most 3	0.201454	13.04781	21.13162	0.4478
At most 4	0.201203	13.02964	14.2646	0.0776
At most 5 *	0.1013	6.194742	3.841466	0.0128

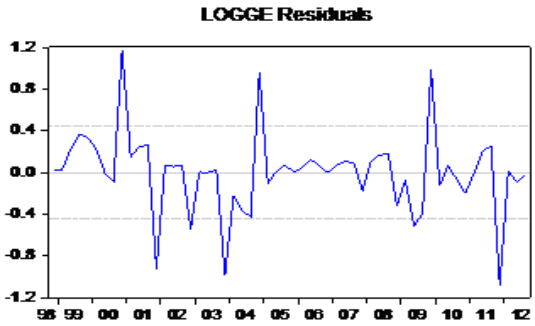
Max-eigenvalue test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

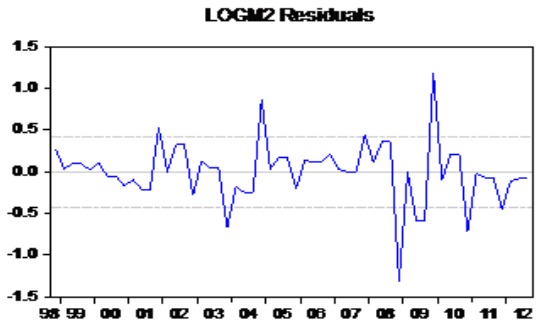
Appendix 9: Vector Error corection Residual graphs Model 3

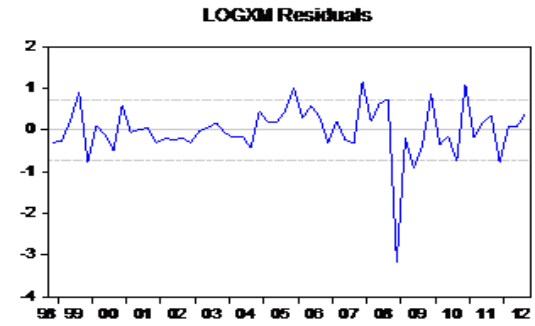












Appendix 10: Granger Causality test

Pairwise Granger Causality Tests
Date: 10/28/15 Time: 13:36
Sample: 1998Q1 2012Q4
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
MC does not Granger Cause Y	58	0.57365	0.5669
Y does not Granger Cause MC		1.89065	0.161
VST does not Granger Cause Y	58	0.74846	0.478
Y does not Granger Cause VST		2.81492	0.0689
TR does not Granger Cause Y	58	0.78097	0.4632
Y does not Granger Cause TR		2.28923	0.1113
VST does not Granger Cause MC	58	0.28315	0.7545
MC does not Granger Cause VST		0.26305	0.7697
TR does not Granger Cause MC	58	0.20595	0.8145
MC does not Granger Cause TR		0.28229	0.7552
TR does not Granger Cause VST	58	0.24061	0.787
VST does not Granger Cause TR		0.29114	0.7486