



**Strathmore**  
UNIVERSITY

**THE CAUSAL RELATIONSHIP BETWEEN THE STOCK MARKET AND  
FOREIGN DIRECT INVESTMENTS; EVIDENCE FROM KENYA**

**TOBIKO ALLYN SIIMO**

**Student Number: 071567**

**A research project submitted in partial fulfilment of the requirements for the Degree of  
Bachelor of Business Science Actuarial at Strathmore University**

**School of Finance and Applied Economics  
Strathmore University  
Nairobi, Kenya**

**November, 2015**

**This Research Project is available for Library use on the understanding that it is copyright  
material and that no quotation from the Research Project may be published without proper  
acknowledgement**

## DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the Research Project contains no material previously published or written by another person except where due reference is made in the Research Project itself.

© No part of this Research Proposal may be reproduced without the permission of the author and Strathmore University

SIGNED.....*Allyn*.....

DATE.....*20<sup>th</sup> Nov 2015*.....

Allyn Tobiko,

071567.

This Research Proposal has been submitted for examination with my approval as the Supervisor.

SIGNED.....*Dan*.....

DATE.....*20 Nov 2015*.....

Dan Chirchir,

School of Finance and Applied Economics

Strathmore University

Table of Contents

<b>The Causal Relationship between Stock Market and Foreign Direct Investments</b> .....	0
DECLARATION .....	0
Abstract.....	ii
<b>Chapter 1; Introduction</b> .....	1
1.1 Background.....	1
1.2 Problem statement .....	2
1.3 Research Objectives .....	2
1.4 Research Question .....	3
1.5 Purpose of research .....	3
1.6 Hypothesis.....	3
<b>Chapter 2; Literature Review</b> .....	4
2.1 Introduction.....	4
2.2 Theoretical background .....	4
2.3 Theories to explain FDI.....	5
2.4 Theory to explain the stock market .....	6
2.5 Empirical Framework .....	6
<b>Chapter 3; Methodology</b> .....	12
3.1 Introduction.....	12
3.2 Data.....	12
3.3 Empirical models .....	12
3.3.1 Unit Root Tests.....	12
3.3.2 Granger Causality.....	13
<b>Chapter 4; Results and Findings</b> .....	15
4.1 Introduction.....	15
4.2 Descriptive statistics .....	15
4.3 Empirical Results.....	16
4.3.1 Unit Root Test Results .....	16
4.3.2 Granger Causality.....	18
<b>Chapter 5; Discussions, Recommendations and Conclusion</b> .....	20
<b>References</b> .....	21

## Abstract.

The paper aims at investigating the nature of the causal relationship between Foreign Direct Investments and the Stock Market index in Kenya. The relationship has proved to be significant enough to solicit an empirical relationship. The Granger Causality test as proposed by C. J. Granger in 1969 and later redefined by Toda and Yamamoto in 1995 is applied in the study. For the test to be conducted stationarity must be proven, therefore the study adopts 2 methods to test for stationarity; The Augmented Dickey-Fuller (ADF) and The Phillips-Perron tests. The panel data is for the period 1990-2014. Data on the Stock Market Index was obtained from the NSE website and data on Foreign Direct Investments will be obtained from the World Bank website. The results from the study showed no causal relationship between the 2 variables studied.

---

Keywords; Foreign Direct Investments, Stock Market Index, Granger Causality and Augmented Dickey-Fuller (ADF), Phillips-Perron

## Chapter 1; Introduction

### 1.1 Background

The stock market is an integral factor in any economy; it is one of the gauges of the performance of the economy. Movements in the stock markets can have a profound effect on the economy and its collapse can have adverse effects on the economy (Ajayi, Friendman, & Mehdian, 1998). It affects how much money is being deposited back into the economy and how much confidence consumers have in the stability of their income. (Granger, Huang, & Yang, 2000)

Emerging stock markets, which the Kenyan stock market falls under, have been characterized as: having higher expected returns (Stultz, 1999) (Henry, 2000), higher volatility (Harvey, Lundblad, & Bekaert, 2005), a low correlation with developed market returns (Bekaert, 1995) and a higher degree of predictability as compared to developed financial markets (Claesses, Stijn, Demirguc-Kunt, & Huizinga, 2001). This makes it subject to many empirical studies to analyze its reaction to the various macro-economic factors.

Foreign direct investment, a phenomena associated with integration of the economic market has been made possible through globalization (Dupasquier & Osakwe, 2006). FDI is defined as the fund flow between the countries in the form of inflow or outflow by which one can able to gain some benefit from their investment whereas another can exploit the opportunity to enhance the productivity and find out better position through performance (Dhiman & Sharma, 2013).

Many developing countries including Kenya need a large inflow of capital to address economic and infrastructural issues. Such issues include construction of roads and the promotion of the financial sector. FDI has a huge impact on the domestic country. Such impacts include; Technological transfer aiding to technological advancement of the domestic country, labor market expansion, infrastructural and economic development (OECD, 2002).

Financial markets, and in particular stock markets, have grown considerably in developing countries in the recent past. This can be attributed to globalization which has promoted better links among financial markets and greater participation of foreign financial firms around the world (Claessens, Daniela, & Schmukler, 2003). Developing countries have had better macroeconomic management, which has brought to the forth better macroeconomic fundamentals including higher economic growth, low inflation and a stable exchange rate (Ang, 2009).

The paper aims exploring the existence and characteristics of the relationship between long-term FDI and the Kenyan stock market using panel data for 20 years, 1990-2010. The paper empirically examines the link between the two variables in the long run. Should the link between FDI

and the Kenyan Stock Market prove to be relevant, it will be studied with a system of endogenous simultaneous equations where the key endogenous variables will be FDI and the Stock Market Index.

## 1.2 Problem statement

The impact and causality of Foreign Direct Investment and Economic Growth, which has both the stock market and the banking sector, as its proxy, has solicited a lot of empirical studies from many scholars. Internationally, studies by many scholars have found a positive and a bi-directional relationship between Foreign Direct Investments and the Stock Market (Adam & Tweneboah., 2009), (Soumare & Tchana, 2011), (Agbloyora, Abora, Adjasi, & Yawsonc, 2013), (Choong, Baharumshah, Yuzop, & Habibullah, 2010), (Ang, 2009).

Locally, the subject has also solicited empirical investigation from many scholars but it has not been extensive as the studies carried out internationally. The studies carried out by the scholars indicate a positive relationship between Foreign Direct Investment and GDP which they use as a proxy for Economic Growth (Abala, 2014), (Ngeny & Mutuku, 2014), (Nyaga, 2013).

It is quite evident that most of the studies conducted on the impact and causal relationship between Foreign Direct Investments and The Stock Market have been conducted in the context of foreign countries. Such studies may fail to bring out the board unique characteristics of the Kenyan market. This is despite the fact that the Kenyan Stock market has benefited immeasurably from Foreign Direct Investments through technology spillovers, high productivity and competitiveness (Abala, 2014), (Denisia, 2010).

The paper aims at making a number of contributions to the relevant literature. First, the paper seeks to investigate the relationship and direction of causality between FDI and the Stock Market in Kenya. Previous studies focused on other proxies for Economic Development such as GDP. Second, the sample of years under consideration in the study is larger than in the previous studies. Third, the paper aims at coming up with relevant conclusions that can be used by policy makers to make informed decisions for the economic growth of the country.

## 1.3 Research Objectives

The research aims on establishing the causal relationship between the Foreign Direct Investments and the Kenyan stock market (NSE index). It is expected that the research paper will help facilitate informed decisions, through provision of the much required knowledge on their causality and impact of the two variables studied.

#### 1.4 Research Question

The research question is; is there any causal relationship between FDI and the NSE 20 share Index?

#### 1.5 Purpose of research

The purpose of the research is to study the causal relationship between FDI and the Stock Market empirically. The below mentioned two expected hypotheses will indicate the causal effect and the relationship between these two variables. The relationships among the variables are recognized from the literature presented. The relationships will then be confirmed by measuring them against already existing models and techniques.

#### 1.6 Hypothesis

Null hypothesis; FDI and the NSE 20 Share Index do not have a causal or empirical relationship. Alternative hypothesis; FDI and the NSE all share index has a causal and an empirical relationship.

## Chapter 2; Literature Review

### 2.1 Introduction

Many empirical studies on the relationship between FDI and economic development have been carried out. The conclusion reached after the empirical studies is that the effects of FDI are complex and far-fetched in any economy. From a macro perspective, they are often regarded as generators of technology spillovers, employment, high productivity and competitiveness through Multi-National companies. For the least developed countries, FDI means higher exports, access to international markets and international currencies (Denisia, 2010).

In general, the literature on the relationship between FDI and the Stock Market which is often used as a proxy for economic development falls into two categories. The first category finds FDI efficient at spurring economic growth when certain conditions are met, one of which consists of a fairly developed financial sector (Alfaro, Chanda, Kalemle-Ozcan, & Sayek, 2004), (Hermes & Lensink, 2003). The second category provides evidence that well-functioning financial sector can attract Foreign direct Investments (Harvey, Lundblad, & Bekaert, 2005), (Levine, Loayza, & Beck, 2000), (Zervos & Levine, 1998).

### 2.2 Theoretical background

Theoretically, the causal relationship between FDI and Economic Development has been explained in terms of three phenomena. The first phenomena explained in the paper: 'Foreign Direct Investment and the Domestic Capital Stock', is that an increase in FDI net inflows increases the funds available in the economy and causes financial intermediation through financial markets or the banking system to boom. Desai & Foley (2005) further argue that companies involved in FDI are also likely to list their shares on the local stock market, as they generally originate from industrialized countries where stock market financing is a must for any company that wants to be taken seriously.

The paper; also puts forth the second phenomena. It argues that a relatively well-functioning financial market can attract foreign investors, who perceive such a market as a sign of vitality, openness on the part of country's authorities and a market-friendly environment. A relatively well-developed stock market increases the liquidity of listed companies and may eventually reduce the cost of capital, thus rendering the country attractive to foreign investment (Desai & Foley, 2005).

Thirdly, Rajan & Zingales (2003) in their paper; 'the great reversals: the politics of financial development in the twentieth century' and Kholdy & Sohrabian (2008) in their paper; 'Foreign direct investment, financial markets and political corruption', argue that more FDI reduces elites'

relative power in the economy and can force them to adopt market-friendly regulations that strengthen the development of financial markets.

### 2.3 Theories to explain FDI

#### **Production Cycle Theory of Vernon (1966)**

The theory developed by Vernon in 1966, and it aimed at explaining certain types of foreign direct investment made by U.S. to other nations especially the Western Europe in the period 1950-1970. This was the period just after the Second World War. The four stages of production as proposed by Vernon were: innovation, growth, maturity and decline (Vernon, 1966) (Jensen. & Thursby., 1986) (Krugman., 1979).

According to Vernon, in the first stage, innovation, new products were produced to meet local needs. Overproduction led to the mismatch of demand and supply leading to exportation of the goods to Western Europe. As more goods were being demanded by the Europeans, the European local companies began to produce the goods. This led to competition leading to the withdrawal of the US products in foreign markets. The theory suggests that after decline, poor countries only constitute their products. (Jensen. & Thursby., 1986) (Krugman., 1979) (Vernon, 1966).

#### **The Theory of Exchange Rates on Imperfect Capital Markets**

The theory has solicited a lot of work. Froot & Stein (1991) following a lot of empirical investigation, conclude that the exchange rate has a systematic effect on FDI. They further indicate that the correlation between FDI and the exchange rate is very different from that observed from other forms of capital inflows.

Further studies were conducted by Cushman (1985), (1988) where in both his studies, through empirical analysis, showed that real exchange rate stimulated FDI. He concluded that by every dollar appreciation, American FDI has reduced, by 25%.

#### **The Internalization Theory**

The theory seeks to explain the existence and functioning of multinational enterprises (Rugman & Verbeke, 2007). The having been developed by Buckley & Casson (2009), the theory tries to explain the growth of transnational companies and their motivations for achieving foreign direct investment.

## 2.4 Theory to explain the stock market

### **Efficient market hypothesis**

The theory was developed in the 1960's by Eugene Fama as his Ph.D. dissertation, (Fama E. , 1970), (Fama & French., 1988). The theory states that at any given time and in a liquid market, security prices fully reflect all available information. The EMH exists in various degrees: weak, semi-strong and strong, which addresses the inclusion of non-public information in market prices. This theory contends that since markets are efficient and current prices reflect all information, attempts to outperform the market are essentially a game of chance rather than one of skill.

The weak form of EMH assumes that current stock prices fully reflect all currently available security market information, past information. It contends that past price and volume data have no relationship with the future direction of security prices. It concludes that excess returns cannot be achieved using technical analysis.

The semi-strong form of EMH assumes that current stock prices adjust rapidly to the release of all new public information. It contends that security prices have factored in available market and non-market public information. It concludes that excess returns cannot be achieved using fundamental analysis.

The strong form of EMH assumes that current stock prices fully reflect all public and private information. It contends that market, non-market and inside information is all factored into security prices and that no one has monopolistic access to relevant information. It assumes a perfect market and concludes that excess returns are impossible to achieve consistently.

## 2.5 Empirical Framework

The research paper; 'Do macroeconomic variables play any role in stock market movement in Ghana?' established an indirect but strong relationship between FDI and the Ghana Stock market proxy by Databank Stock Index. The study was carried out using Johansen's multivariate cointegration test and the innovation accounting techniques where different macroeconomic parameters were studied. The macroeconomic variables studied include; inward foreign direct investments, interest rates, inflation and the exchange rate. The study used quarterly data within the period 1991-2006, (Adam & Tweneboah., 2009).

A study was conducted by Issouf Soumar'e and Fulbert Tehana Tehana on the causal relationship between foreign direct investment (FDI) and financial market development (FMD) using panel data from 29 emerging market over the 1994-2006 period. The two indicators of stock market development when a causality analysis was carried out, showed that FDI and stock mar-

ket development indicators positively impact each other at the same time. The study not only used the VAR system to assess the Granger-causality between FDI and FMD, but also a system of simultaneous equations was run using panel data (Soumare & Tchana, 2011). The study showed a bi-directional causality between FDI and the stock market.

Agbloyora et al. (2013) analyzed the causal relationship between financial markets and FDI in Africa in their paper; 'Exploring the causality links between financial markets and foreign direct investment in Africa'. They used the banking sector and the stock market as proxy to the financial market. The banking sector data was obtained from 42 countries covering the period 1970-2007 while the stock market data was obtained in 16 countries covering the period 1970-2007. Using the 2sls panel instrument variable approach, a causality relationship was discovered. From their study, they argue that a more advanced banking sector can lead to more FDI flows and a higher FDI flow can lead to the development of the domestic banking system. They further argue that better developed stock markets are more likely to attract more FDI and FDI flows can lead to the development of the domestic market, (Agbloyora, Abora, Adjasi, & Yawsonc, 2013).

A set of mixed results was obtained from research on the paper 'Empirical evidence on the causality relationship between Foreign Direct Investment & Economic Growth in Developing countries'. Having conducted the bivariate causality test, Zakaria (2009) found that in some countries FDI caused economic growth while in others he found a reverse causality between economic growth and FDI. His study further found that in developing countries, FDI did not have any impact on the economic growth while in developed countries, FDI had an impact on the economic growth. He concluded his study by stating that for a country to fully tap on the benefits of FDI, the country must implement policies that emphasize on the development of human resource and domestic financial markets.

Yusop et al. (2005) by applying the unrestricted error correction model (UECM) test in the paper; 'Foreign direct investment and economic growth in Malaysia: the role of domestic financial sector' aimed at studying the role of the domestic financial system in transferring technological diffusion embodied in FDI inflows in the Malaysian economy from 1970-2001. From the study, it was concluded that FDI would enhance economic growth more efficiently if the recipient country has a well-developed and well-functioning financial sector.

An empirical investigation on how the 3 types of private capital flow, FDI, Foreign Debt and Portfolio Investment, could promote growth in recipient developing and developed countries was conducted in the paper; 'Private capital flows, stock market and economic growth in developed and developing countries: a comparative analysis' The study was conducted in 51 countries, 19 developed and 32 developing. Having the assumption that the stock market might have been the most significant channel or leading institutional factor through which capital flows affect the economy, it was concluded that FDI had a positive impact on growth while both portfolio in-

vestment and foreign debt had a negative impact on growth (Choong, Baharumshah, Yuzop, & Habibullah, 2010)

Ang (2009) examined the FDI-growth nexus in Malaysia by controlling the level of financial development in the paper 'Financial development and the FDI-growth nexus: the experience of Malaysia'. The composite index was used as a proxy for financial development, using time series data from 1965 to 2004. The study found out that both financial development and FDI are positively related to real output and the impact of FDI on the Malaysian economy was strengthened by the level of sophistication of the financial system. The results from the study highlighted that FDI had no direct causal effect on growth but it stimulated economic growth through financial sector development. The research results indicated that economic growth causes FDI growth in the long-run, but no feedback relationship is observed.

By applying the panel co-integration and panel error correction models to analyze the direction of causality between FDI, financial development and economic growth in the paper; 'FDI, financial development, and economic growth: international evidence' Chun-Ping & Chien-Chang (2009) concluded that financial development indicators had a larger effect on the economic growth than FDI. The panel data was from 7 countries for the period 1970-2002. The study used the banking sector as a proxy for the financial sector.

An empirical analysis of the role of FDI in developing hosts economy using Pakistan as the reference country was conducted in the paper; 'The Role of FDI on Stock Market Development: The Case of Pakistan'. Raza et al. (2012) applied the Ordinary Least Square (OLS) method of regression with data for the period 1988-2009. Domestic savings, exchange rate and inflation were among the other variables included in the study. Their study indicated a positive relationship i.e. FDI had a positive relationship with the stock market. For the country to achieve the positive effects of FDI, it recommended that the volatility of exchange rate and inflation rate through monetary policies should be minimized and domestic saving encouraged.

The paper; 'Determinants of stock market development: evidence from advanced and emerging markets in a long span' analyzed the determinants of the stock market development in 30 advanced and emerging markets between the period 1960-2007 using FDI, remittances and bank credits to the private sector as explanatory variables (Evrin-Mandaci, Aktan, Kurt-Gumus, & Tvaronavičienė, 2013). With the application of SUR estimation in the study, it was discovered that all the variables studied had a positive effect on the stock market development. It was further recommended that the stock market in the countries covered in the studies would benefit if regulations that would remove the barriers like clumsy bureaucracy before the inflow of capital were to be eliminated.

A research conducted by Acheampong & Wiawe (2013) in the paper 'Foreign Direct Investment and stock market development: Evidence from Ghana' examined the effect of FDI on the Ghanaian Stock Market. Using ARDL model and quarterly time series data from International Financial Statistics and Bank of Ghana from 1990 to 2010, a complementary hypothesis from the study was vindicated; FDI had positive impact on stock market development. Additionally, Inflation and Exchange rate having a positive impact on the stock market development and a bi-causal relationship between FDI and stock market development existing was also discovered.

Olugbenga & Obisesan (2015) assessed and documented the impact of foreign direct investments on the Nigerian stock market in the paper; 'Impact of Foreign Direct Investment on Nigerian Capital Market Development'. They carried out the Johansen co-integration test, which turned out to be absent, to analyze the data which was from the period 1970-2010. On running the OLS regression test, a positive relationship between FDI and the Nigerian stock market was observed. They finalized their study by recommending that the government and monetary agencies should put in measures to encourage FDI into the country since they have a positive effect on the stock market.

'Impact of foreign direct investment volatility on economic growth in Kenya: EGARCH Analysis' investigated the impact of FDI volatility on growth in Kenya using the time series data spanning 1970 to 2011. The relationship between FDI volatility and economic growth was estimated using the ordinary least squares method. From the study, the results suggested that FDI has a positive effect on growth whereas FDI volatility has a negative impact on growth. Further, Ngeny & Mutuku (2014) found out that trade openness is not FDI inducing, thus affecting growth negatively. However, it was stated that human capital endowment has a positive impact on growth. Although the overall effect of Foreign Direct Investment on economic growth is positive the volatility of capital flows may make it harder for the stable and predictable macroeconomic policies to be followed. Therefore, unstable inflows may dampen investment, hence affecting economic growth.

The paper, 'Foreign Direct Investment and Economic Growth: An Empirical Analysis of Kenyan Data' investigates the main drivers of real Gross Domestic Product growth in Kenya as well as those that drive the Foreign Direct Investment (FDI) in Kenya. It suggests that FDI is an important factor for economic growth as it provides the much needed capital, increases competition in the host countries and helps local firms to become more productive by adopting more efficient technology. This shows that human capital, government expenditure and openness of the economy are vital for the growth of the economy and therefore policies that can enhance these factors would be needed. From the study, the drivers of Foreign Direct investment have been shown to be the real GDP growth, low levels of indebtedness and improved infrastructural facilities. On running a series of empirical tests, the study was concluded by stating that there exists a positive relationship between FDI and Economic Growth (Abala, 2014).

The paper 'The impact of Foreign Direct Investment on Economic Growth in Kenya' concluded on there being a positive impact of Foreign Direct Investments on the Kenyan economy. The study explored the impact of Foreign Direct Investment on the Kenyan economy using GDP as a proxy for Economic Growth. The panel data was from 1982 to 2012. The Statistical Package for Social Sciences was used to analyze the data where descriptive analyses, frequencies and trend analysis, as well as inferential analyses involving Analysis of Variance (ANOVA) were employed to establish relationships between the variables (Nyaga, 2013).

For there to be FDI in a country, the macro-economic stability in the country is important. Among the macro-economic factors that have solicited a lot of empirical studies is inflation. Omotor (2010) found an inverse relationship between the stock market returns and inflation using the Nigerian market as his study. Similar documented findings have been found by other researchers (Choulhry, 2001), (Fama & Schwert, 1977), (Ronald, Richard, & Donald, 1980) and (Gultekin, 1983). Therefore to attract investors to invest in the local stock market the government must implement fiscal and monetary policies to stabilize inflation for the betterment of the financial sector especially the stock market.

The exchange rate which signifies the strength of a particular country's currency is another important macro-economic factor that needs to be addressed by the domestic country if the benefits attached to FDI are to be realized. By studying the effect of the exchange rate on the Karachi stock exchange, Aslam (2014) discovered that there existed an inverse relationship between the exchange rate and the stock market. Several other empirical studies carried out by other researchers have also had the same conclusion (Dimitrova, 2005), (Granger, Huang, & Yang, 2000) and (Ma & Kao, 1990). Therefore for the stock market to be at its optimal, the exchange rate should be stabilized.

Presence of a stable political environment is one of the factors that encourage the possibility of foreign direct investments, (Jensen, 2008). The paper puts across 3 risks associated with a volatile political environment that discourages foreign direct investments. The risks are: first, nationalization or expropriation of foreign assets and breach of contracts; second, policy instability and arbitrary regulation in FDI-related policies creating uncertain investment environments thereby hurting the profitability of foreign investments; and, third, war and political violence, including terrorist activities. Thereby for foreign investors to invest in the economy, political stability is one of the factors that the domestic country's government should ensure.

The causal relationship between FDI and the Stock Market has motivated voluminous empirical and theoretical literature focusing on both developed and developing countries. From the literature reviewed, it is clear that the use of Granger Causality and Johansen co-integration measures of causality have increasingly been preferred. This is because they are likely to produce con-

sistent estimates of parameters of interest and also they are less likely to breach the non-negative constraint. The study drew much relevance in the use of The Granger Causality Test as a measure of causality. Therefore the method was adapted in the study.

The main shortcoming of the literature reviewed is that most of the studies are conducted in foreign countries meaning they might fail to bring on board unique characteristics of the Kenyan market. Lack of such a study may imply that local policies may be formulated based on foreign ideas. This poses the risk of not addressing the Kenyan economic situation adequately. It was therefore imperative to conduct a further study to try and close these gaps especially doing a country specific study which is to bring out the actual issues in the Kenyan market especially on the causality relationship between FDI and the stock market.

## Chapter 3; Methodology

### 3.1 Introduction

This chapter sets out the methodology used to achieve the objectives and prove the hypothesis set out in chapter one. The succeeding section presents the data and the time frame that will be used in the study. The third section presents the empirical model specification.

### 3.2 Data

Secondary data for the study was extracted from two sources. Data on the Foreign Direct investment was obtained from the World Bank Website while data on the Nairobi Stock Exchange was obtained from the Nairobi Stock Exchange website. I obtained data for 24 years from the period 1990-2014.

### 3.3 Empirical models

One econometric model is employed in order to examine the relationship between the Share Price Index and Foreign Direct Investment. The Granger causality test is performed to discover the nature of causality between Share Price Index and Foreign Direct Investment. However, the model requires that underlying variables must be stationary; thereby unit root tests are conducted first. The stationarity tests conducted in the study are; The Augmented Dickey-Fuller (ADF) and The Phillips-Perron tests.

#### 3.3.1 Unit Root Tests

The study will use the conventional unit root tests such as; Augmented Dickey-Fuller test (Dickey & Fuller, 1979) and Phillips-Perron test (Phillips & Perron, 1988). The unit root tests are used to test whether the data contains unit root, if it is non-stationary, or otherwise, stationary. A series is said to be stationary if the mean and auto co-variances of the series do not depend on the time factor. Any series that is not stationary then it is said to be non-stationary. A series is said to be integrated of order 'd' which can be denoted by  $I(d)$ , means that it has to be differenced 'd' times before it becomes stationary (Gupta & Paramati, 2013). Otherwise, if a series by itself, let say stationary at levels, without having to be differenced, then that is said to be  $I(0)$ . In the case of both ADF and PP tests, the null hypothesis of non-stationary (unit root) is tested against the alternative hypothesis of stationary (Gupta & Paramati, 2013).

For the **Augmented Dickey-Fuller (ADF)** tests (Dickey & Fuller, 1979); consider a simple AR (1) process:

$$y_t = \rho y_{t-1} + X_t \delta + \varepsilon_t \dots \text{Equation 1}$$

Where  $y_t$ , is the observed variable,  $X_t$  are optional exogenous regressors which may consist of constant or a constant and trend,  $\rho$  and  $\delta$  are parameters to be estimated, and  $\varepsilon_t$  is assumed to be white noise with zero mean and constant variance.

If  $\rho \geq 1$ ,  $y_t$  is a non-stationary series and the variance of  $y_t$  increases with time and approaches infinity, on the other hand if  $\rho \leq 1$ , then  $y_t$  is a stationary series.

On subtracting  $y_{t-1}$  on both sides of the equation, we get:

$$\Delta y_t = \alpha y_{t-1} + X_t + \varepsilon_t \dots \text{Equation 2}$$

Where  $\alpha = \rho - 1$

The null and alternative hypotheses can be written as;

$H_0: \alpha = 0$  ( $y_t$  is unit root)

$H_1: \alpha < 0$  ( $y_t$  is stationary)

The study is evaluated using the conventional  $t_{ratio}$  test for  $\alpha$ .

$$t_\alpha = \frac{\alpha^\wedge}{se(\alpha^\wedge)} \dots \text{Equation 3}$$

Where;  $\alpha^\wedge$  is an estimate of  $\alpha$  and  $se$  is the standard error.

The **Phillips-Perron test** (Phillips & Perron, 1988) incorporates an alternative (non-parametric) method for controlling serial correlation when testing for a unit root by estimating the non-augmented Dickey-Fuller test equation  $\Delta y_t = \alpha y_{t-1} + X_t + \varepsilon_t$  and modifying the  $t_{ratio}$  of the  $\alpha$  coefficient so that serial correlation does not affect the asymptotic distribution of the test statistic. The modified  $t_{ratio}$  is the same as that of ADF test for the asymptotic distribution of the PP test. The study uses (MacKinnon, 1966) lower-tail critical and  $p_{values}$  for this test.

### 3.3.2 Granger Causality

Granger (1969) proposed a model for measuring causality between random variables. The test is carried out to determine if past values of one random variable can help predict the future values of the other random variable. Causality is explained as; the question of whether  $y$  causes  $x$  is to see how much of the current value of  $x$  can be explained by past values of  $x$  and test whether adding lagged values of  $y$  can improve these estimates. It is inferred that  $x$  is Granger caused by  $y$ , if  $x$  can be predicted from past values of  $x$  and  $y$  than from past values of  $x$  alone (Granger C. J., 1969), (Paramati & Gupta, 2011).

The random variables that the study wishes to test are Foreign Direct Investment and the Share Price Index. The study wishes to analyze if the Share price index Granger causes Foreign Direct Investments in the country or whether Foreign Direct Investments Granger Causes the Share price index.

$$S.P = \sum a_j S.P_{t-j} + \sum b_j F.D.I_{t-j} + \varepsilon_t \dots \text{Equation 4}$$

$$F.D.I = \sum c_j F.D.I_{t-j} + \sum d_j S.P_{t-j} + \eta_t \dots \text{Equation 5}$$

Where S.P is the share price, F.D.I is the share price,  $\eta_t$  and  $\varepsilon_t$  are both error terms while  $a_j, b_j, c_j$  and  $d_j$  are factors that drive both Foreign Direct investment and the share price index.

(Granger C. J., 1969) And (Hossain & Hossain, 2015) highlight four different hypotheses that can be derived from the relationship between Foreign Direct Investments and Share Price index. The four hypotheses that can be formulated include;

- Unidirectional Granger-causality from the Share Price index to foreign direct investment i.e. the share price index can predict Foreign Direct Investment. In this case an increase in the Stock Price index increase foreign direct investments and vice versa. Therefore  $\sum b_j = 0$  and  $\sum d_j \neq 0$ .
- Unidirectional Granger-causality from Foreign Direct Investment to Share Price Index. In this case Foreign Direct Investments can predict the share price index. The growth rate of Foreign Direct Investments increases the prediction of the Stock Prices and vice versa. Thus  $\sum d_j = 0$  and  $\sum b_j \neq 0$ .
- Bidirectional (or feedback) causality. In this case so in this case both Foreign Direct Investment and the Share Price Index can predict each other. Thus,  $\sum d_j \neq 0$  and  $\sum b_j \neq 0$ .
- Independence between Foreign Direct Investments and the Share Price Index. In this case there is no Granger causality in any direction, thus  $\sum d_j = 0$  and  $\sum b_j = 0$ .

When carrying out the test, the implied null hypothesis is that Share Prices does not Granger cause Foreign Direct Investment in the first regression equation and Foreign Direct Investments does not Granger cause the Share Price Index in the second regression equation. The test will be conducted within the framework of  $f$ -test. If the  $p$ -value of  $f$ -test is significant (i.e.  $\alpha < 0.05$ ) at the 5 % significance level, then the null hypothesis will be rejected.

## Chapter 4; Results and Findings

### 4.1 Introduction

The impact and causality of Foreign Direct Investment and the Stock Market index has solicited a lot of empirical studies from many scholars. Internationally, studies by many scholars have found a positive and a bi-directional relationship between Foreign Direct Investments and the Stock Market (Adam & Tweneboah., 2009), (Choong, Baharumshah, Yuzop, & Habibullah, 2010), (Ang, 2009). Locally, the subject has also solicited empirical investigation from many scholars but it has not been extensive as the studies carried out internationally. The studies carried out by the scholars indicate a positive relationship between Foreign Direct Investment and GDP which they use as a proxy for Economic Growth as opposed to the Stock Market Index (Abala, 2014), (Ngeny & Mutuku, 2014), (Nyaga, 2013).

The paper aims exploring the existence of the causal relationship between long-term FDI and the Kenyan stock market using panel data for 25 years, 1990-2014. Evidence from the empirical studies on the subject have been conducted internationally concluding that that there is a strong causal relationship between the 2 variables. The study aims on facilitating informed decisions, through provision of the much required knowledge on their causality and impact of the two variables studied

The study employs the Granger Causality as a measure of causality. The developed two hypotheses will aid in the rejection or acceptance of results obtained. To carry out the causality tests, stationarity must be proven. Stationarity will be proven by conducting 2 tests; Augmented Dickey Fuller (ADF) and the Phillips-Perron (PP) as done below.

### 4.2 Descriptive statistics

The data analysis showed the following results.

	FDI	SHARE_INDEX
Mean	1.44E+08	3056.660
Median	62096810	3116.810
Maximum	9.44E+08	5262.650
Minimum	5302623.	871.3400
Std. Dev.	2.25E+08	1339.421
Skewness	2.636119	-0.146831
Kurtosis	9.047481	1.910926
Jarque-Bera	67.05053	1.325332

Probability	0.000000	0.515475
Sum	3.61E+09	76416.49
Sum Sq. Dev.	1.21E+18	43057195
Observations	25	25

Table 1

### 4.3 Empirical Results

#### 4.3.1 Unit Root Test Results

The first step in the empirical analysis concerns the stationarity of the FDI and Share price index series; thus establishing the order of integration with or without a deterministic trend. For this, the Augmented Dickey Fuller (ADF) and the Phillips-Perron (PP) test have been performed for each series. These studies are conducted to tell whether regression can be done on the data or not. The rejection of the null hypothesis for both ADF and PP tests is based on the MacKinnon critical values. The results to the test have been presented below.

#### ADF Test;

The test indicates that for all series studied, the null hypotheses are rejected at a 5% confidence level. The results reflects that the study variables are either I (0), that is stationary in level or I (1), that is stationary at the first level of difference.

#### Share Price

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.399541	0.0023
Test critical values: 1% level	-3.752946	
5% level	-2.998064	
10% level	-2.638752	

Table 2

Null Hypothesis; Share Price has a unit root.

Confidence level implemented in the study=5%

The results from the tests carried out showed the series to be stationary at the first difference, I (1), refuting the claim that the series may be stationary at level. This was done assuming the series had an intercept without a deterministic trend.

FDI

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.696630	0.0000
Test critical values: 1% level	-2.669359	
5% level	-1.956406	
10% level	-1.608495	

Table 3

Null hypothesis; FDI has a unit root.

Confidence level implemented in the study=5%

Having no implied trend or intercept, the series was found to be stationary on the first difference I (1). The results on level had a more than 5% confidence level necessitating the differentiation of the series to the first order.

**Phillips-Perron Test;**

Share Index;

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-4.388774	0.0024
Test critical values: 1% level	-3.752946	
5% level	-2.998064	
10% level	-2.638752	

Table 4

Null hypothesis; Share Price Index has a unit root.

Confidence level uses in the study=5%.

The tests showed that the series was stationary on the first difference I (1). Further, an intercept C, was included in the stationarity equation. At level, it was found that the series had a unit root at level, therefore being stationary.

FDI;

	Adj. t-Stat	Prob.*
Phillips-Perron test statistic	-5.813713	0.0000
Test critical values: 1% level	-2.669359	
5% level	-1.956406	
10% level	-1.608495	

Table 5

Null hypothesis; Foreign Direct Investment has a unit root.

Confidence level uses in the study=5%.

The tests showed that the series was stationary on the first difference I (1). The tests did not include any implied trend or intercept in the stationarity equation. At level, it was found that the series had a unit root at level, therefore being stationary.

It is apparent from tables above that the results are statistically significant and less than critical values. So the results of all tests are consistent suggesting that the market is not a weak form of market efficiency. It recommends that the return series of all variable does not follow random walk model and the stock returns display predictable behavior.

#### 4.3.2 Granger Causality

The granger causality tests conducted will use the following equations when running the tests;

$$S.P = \sum a_j S.P_{t-j} + \sum b_j F.D.I_{t-j} + \varepsilon_t \dots \text{Equation 6}$$

$$F.D.I = \sum c_j F.D.I_{t-j} + \sum d_j S.P_{t-j} + \eta_t \dots \text{Equation 7}$$

Since the series are stationary, Akaike Information Criterion (AIC) and Schwars Information Criteria (SIC) are employed to find an appropriate number of lags. It is worth emphasizing that Granger causality test is very sensitive to number of lags included in the regression and that AIC and SIC are the two most common criterions employed in many previous research. According to AIC and SIC, the optimal lag is 2 and is consequently applied to the study variables.

Furthermore, since every variable has the same order of integration, we could proceed with employing the Granger causality Framework.

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
SHARE_INDEX does not Granger Cause FDI	23	2.14529	0.1460
FDI does not Granger Cause SHARE_INDEX		1.38987	0.2746

*Table 6*

Null hypothesis; Share Index does not granger cause FDI and vice versa.

The Granger-causality test is conducted to study the causal relationship between Foreign Direct Investments and the Kenyan stock market. The test assumes one important assumption; both series are stationary. From the results tabulated above, it can be concluded that the share index does not Granger cause FDI and vice versa. This is because the p-value is greater than 5% therefore refuting the rejection of the null hypothesis.

## Chapter 5; Discussions, Recommendations and Conclusion

The main purpose of this study was to empirically analyze the dynamic relationship between the Nairobi Stock Exchange Index and Foreign Direct Investments. The variables used in the study were non stationary at level, and stationary at first difference as shown by the ADF and Phillips-Perron tests. On running the Granger Causality test, the results showed no causal relationship in either direction, from Exchange rate to Stock index or vice versa. The results from the study contradict finding from other researchers such as Acheampong & Wiawe (2013), Ang (2009) and Agbloyora et al. (2013) who found a strong and bidirectional relationship between the two variables.

To benefit from FDI, the local economic market, the Stock Market should be operating efficiently. The study agrees with the findings to the paper 'Empirical evidence on the causality relationship between Foreign Direct Investment & Economic Growth in Developing countries'. The study suggested that in developing countries, FDI did not have any impact on the economic growth. The conclusion from the study is that for a country to fully tap on the benefits of FDI, the country must implement policies that emphasize on the development of human resource and domestic financial markets (Zakaria, 2009). I highly think the country should implement such policies to ensure that the economy benefits from Foreign Direct Investments.

The study was limited to the study of 2 variables in a period of 25 years in one country. The study can be conducted further by analyzing other economic variables such as the exchange rate, inflation and remittances. Further, the study can be conducted using other causality tests mechanisms such as by applying the Ordinary Least Square.

It can be concluded that the study did not find any causal relationship between the variables studied; Foreign Direct Investment and The Stock Market Index.

## References

- Abala, D. O. (2014). Foreign Direct Investment And Economic Growth: An Empirical Analysis Of Kenyan Data . *DBA Africa Management Review*, 62-83 .
- Acheampong, I. K., & Wiafe, E. A. (2013). Foreign Direct Investment and Stock Market development: evidence from Ghana. *International Journal of Finance and Policy Analysis.*, 362-380.
- Adam, A. N., & Tweneboah., G. (2009). Foreign direct investment and stock market development: Ghana's evidence. *International Research Journal of Finance and economics.*, 178-185.
- Agbloyora, E. K., Abora, J., Adjasi, C. K., & Yawsonc, A. (2013). Exploring the causality links between financial markets and foreign direct investments in Africa. *Research in International Business and Finance*, 118-134.
- Ajayi, R. A., Friendman, J., & Mehdiian, S. (1998). On the relationship between Stock Returns and Exchange Rates:Tests of Granger Causality. *Global Finance Journal*, 241-251.
- Alfaro, L., Chanda, A., Kalemle-Ozcan, S., & Sayek, S. (2004). FDI and Economic Growth:The role of Loal Financial Markets. *Journal of International Economics.*, 89-112.
- Ang, J. (2009). Financial development and the FDI-growth nexus: the Malaysian experience. *Applied Economics*, 1595-1601.
- Aslam, W. (2014). Relationship between stock market volatility and exchange rate: A study of KSE. *Journal of Public Administration, Finance and Law.*
- Aslam. W. (2014). Relationship between stock market volatility and exchange rate:a study of KCE. *Journal of Public Administration, Finance and Law.*
- Baker, M., Foley, C. F., & Wurgler, J. (2009). Multinationals as Arbitrageurs: The Effect of Stock Market Valuations on Foreign Direct Investments. *The Review of Financial Studies*, 337-369.
- Bekaert, G. (1995). Market Intergration and invetment barriers in emerging equity markets. *The world Bank economic Review*, 75-107.
- Buckley, P. J., & Casson, M. C. (2009). The internalisation theory of the multinational enterprise: A review of the progress of a research agenda after 30 years. *Journal of International Business Studies*, 1563-1580.
- Choong, C. K., Baharumshah, A. Z., Yuzop, Z., & Habibullah, M. S. (2010). Private capital flows, stock market and economic growth in developed and developing countries: a comparative analysis. *Japan and the World Economy*, 107-117.
- Choulhry, T. (2001). Inflation and Rates of Return on Stocks: Evidence from High Inflation Countries. *Journal of International Financial markets, Institutions and Money*, 75-96.
- Chun-Ping, C., & Chien-Chang., L. (2009). FDI, Financial Deveelopment and economic growth; International evidence. *Journal of Applied Economics*, 249-271.

- Claessens, S., Daniela, K. L., & Schmukler, S. L. (2003). *The future of Stock Exchange in emerging Markets-Evolution and Prospects*. The Brookings institution, Washington, D.C: Brookings-Wharton Papers on Financial Services.
- Claesses, Stijn, Demirguc-Kunt, & Huizinga, H. (2001). How does foreign direct investments affect domestic banking markets? *Journal of Banking and Finance*, 891-911.
- Cushman, D. O. (1988). Exchange rate uncertainty and foreign direct investment. *Weltwirtschaftliches Archiv*, 322-334.
- Cushman., D. (1985). Real Exchange Rate Risk, Expectation, and the level of Direct Investment. *Review of Economics and Statistics*, 297-303.
- Denisia, V. (2010). Foreign Direct Investment Theories:. *European Journal of Interdisciplinary Studies*, 103-110.
- Desai, M. A., & Foley, C. F. (2005). Foreign Direct Investment and the Domestic Capital Stock. *American Economic Review.*, 33-38.
- Dhiman, R., & Sharma, P. (2013). Impact of Flow of FDI on Indian Capital Market. *European Journal of Business and Management*, 75-81.
- Dickey, D. A., & Fuller, W. A. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of American statistical Association*, 427-431.
- Dimitrova, D. (2005). The Relationship between Exchange Rates and Stock Prices: Studied in a Multivariate Model. *Issues in Political Economy*.
- Dupasquier, C., & Osakwe, P. N. (2006). Foreign Direct Investments in Africa: Performance, Challenges and Responsibilities. *Journal of Asian Economics*, 241-260.
- Evrin-Mandaci, P., Aktan, B., Kurt-Gumuş, G., & Tvaronavičienė, M. (2013). Determinants of Stock Market Development: Evidence from Advanced and Emerging Markets in a long span . *Versalas: Teorija Ir Praktika (Business Theory and Practice)*, 51-56.
- Fama, E. (1970). Efficient Capital Markets: A Review of Theory and Empirical Work. *Journal of Finance*, 383-417.
- Fama, E. F., & Schwert, G. W. (1977). Assets returns and inflation. *Journal of Financial Economics.*, 11-46.
- Fama, E., & French, K. (1988). Permanent and Temporary Components of Stock Prices. *Journal of Political Economy*, 246-273.
- Froot, K. A., & Stein, J. C. (1991). Exchange rate and FDI: An imperfect market approach. *Quarterly journal of economics*, 1191-1217.
- Granger, C. J. (1969). Investigating Causal Relationships by Econometrics Models and Cross Spectral Methods. *Econometrica*, Vol. 37, 425-435.
- Granger, C., Huang, B., & Yang, C. (2000). A Bivariate Causality between Stock Prices and the Exchange Rate: Evidence from recent Asian Flu. *The Quarterly Review of Economics and Finance.*, 337-354.

- Gultekin, N. B. (1983). Stock returns and Inflation; evidence from other countries. *Journal of Finance*.
- Gupta, R., & Paramati, S. R. (2013). An Empirical Relationship between Exchange Rates, Interest Rates and Stock Returns. *European Journal of Economics, Finance and Administrative Sciences.*, 168-180.
- Harvey, C. R., Lundblad, C., & Bekaert, G. (2005). Does Financial Liberalization spur Growth? *Journal of Financial Economics.*, 3-55.
- Henry, P. B. (2000). Stock market liberalization, economic reform, and emerging market equity prices. *Journal of Finance*, 529-564.
- Hermes, N., & Lensink, R. (2003). Foreign Direct Investment, Financial Development and Economic Growth. *Journal of Development Studies*, 142-163.
- Hossain, M. K., & Hossain, A. (2015). An Empirical Relationship between Share Price and Economic Growth: New Evidence on Selected Industrialized Economies. *American Journal of Economics*, 353-362.
- Jensen, N. (2008). Political Risk, Democratic institution, and Foreign Direct investments. *Journal of Politics.*, 13.
- Jensen., R., & Thursby., M. (1986). A strategic approach to the product cycle. *Journal of international Economics*, 269-284.
- Kholdy, S., & Sohrabian., A. (2008). Foreign direct investment, financial markets and political corruption. *Journal of Economic Studies*, 486-500.
- Krugman., P. (1979). a model of innovation, technology transfer, and the world distribution of income. *Journal of political economy*, 269-266.
- Kwiatkowski, D., Phillips, P. C., Shin, Y., & Schmidt, P. (1992). Testing the Null Hypothesis of Stationarity against the Alternative of a Unit Root: How sure are we that Economic Time Series have a Unit Root. *Journal of Econometrics*, 159-178.
- Levine, R., Loayza, N., & Beck, T. (2000). Financial Intermediation and Growth: Causality and Causes. *Journal of monetary Economics*, 31-77.
- Ma, C. K., & Kao, G. W. (1990). On Exchange Rate Changes and Stock Price Reactions. *Journal of Business Finance and Accounting*, 441-449.
- MacKinnon, J. (1966). Numerical Distribution Functions for Unit Root and Co-integration. *Journal of Applied Econometrics*, 601-618.
- Ngeny, K. L., & Mutuku, C. (2014). Impact of foreign direct investment volatility on economic growth in Kenya: EGARCH Analysis. *Economics*, 50-61.
- Nyaga, N. B. (2013). *The impact of Foreign Direct Investment on Economic Growth in Kenya*.
- OECD. (2002). *Foreign Direct Investment for Development: Maximizing Benefits, Minimising Costs*.

- Olugbenga, A. A., & Obisesan, G. O. (2015). Impact of Foreign Direct Investment on Nigerian Capital Market Development. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 103-108.
- Omotor, D. G. (2010). Relationship between Inflation and Stock Market Returns: Evidence from Nigeria. *Journal of Applied Statistics*.
- Paramati, S. R., & Gupta, R. (2011). An Empirical Analysis of Stock Market Performance and Economic Growth: Evidence from India. *International Research Journal of Finance and Economics*, 134-148.
- Phillips, P. C., & Perron, P. (1988). Testing For a Unit Root in Time Series Regression. *Biometrika*, 335-346.
- Rajan, R. G., & Zingales, L. (2003). The great reversals: the politics of financial development in the twentieth century. *Journal of Financial Economics*, 5-50.
- Raza, A., Iqbal, N., Ahmed, Z., Ahmed, M., & Ahmed, T. (2012). The Role of FDI on Stock Market Development: The Case of Pakistan. *Journal of Economics and Behavioral Studies*, 26-33.
- Ronald, G., Richard, A., & Donald, L. R. (1980). The Effect of Inflation on Stock Prices; International Evidence. *Journal of Finance*.
- Rugman, A. M., & Verbeke, A. (2007). Internalization Theory and its Impact on the Field of.
- Soumare, I., & Tchana, F. T. (2011, May 27). *Social Science Research Network*. Retrieved from Causality between FDI and Financial Market Development: Evidence from Emerging Markets: [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1852168](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1852168)
- Stultz, R. (1999). Globalization, corporate finance and the cost of capital. *Journal of Applied Corporate Finance*, 8-25.
- Toda, H. Y., & Yamamoto, T. (1995). Statistical Inference in vector auto-regressions with possibly intergrated processes. *Journal of Econometrics*, 225-250.
- Vernon, R. (1966). International Investment and international trade in the product cycle. *Quarterly Journal of Economics*, 190-207.
- Yusop, Z., Soo, S. C., & Choong, C. K. (2005). Foreign Direct Investment and Economic Growth in Malaysia: The role of domestic financial sector. *Singapore Econ. Review*, 245.
- Zakaria, Z. (2009). Empirical evidence on the causality relationship between FDI & Economic growth in Developing countries. *Jurnal Ekonomi Malaysia*, 27-52.
- Zervos, S., & Levine, R. (1998). Stock Markets, Banks and Economic Growth. *American economic Review*, 537-558.