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THE IMPACT OF INTERNATIONAL TRADE ON KENYA'S ECONOMIC GROWTH

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Submitted in partial fulfillment of the requirements for the Degree of Bachelor of Business Science in Actuarial Science at Strathmore University

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NOVEMBER, 2016

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.

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

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LIST OF ACRONYMS AND ABBREVIATIONS

COMESA	Common Market for Eastern and Southern Africa
ECM	Error Correction Model
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
IMF	International Monetary Fund
ITC	International Trade Centre
KNBS	Kenya National Bureau of Statistics
MNC	Multinational Company
OEC	Observatory of Economic Complexity
OECD	Organization for Economic Co-operation and Development
VAR	Vector autoregressive Model
VEC	Vector Correction Model

CHAPTER 1

1.1 Background of the study

International trade is the exchange of goods and services across different countries that mainly involves the government of that country and usually represents a sizable amount of a country's gross domestic product. However, international trade is not the only contributing factor affecting the GDP of a country. The other factors that affect GDP include investments, government consumption, foreign direct investments, inflation rate, profit & capital gains and tax. The forecast for growth in sub-Saharan Africa is predicted to be positive due to its room for growth but is uncertain due to its political and institutional constraints (Global Economic Outlook, 2016) .

The question being asked is whether international trade (exports+ imports) affects growth. Trading activities lead to growth e.g. exchange of or trade of products such as capital goods and technological transfers help boost a country's GDP. These factors help a country establish their position in attracting investments. Through this demand and supply, many countries are able to attract new and different investors as well as improve the quality of their goods through increased competition.

Africa's export potential in other sectors other than the traditional ones (e.g. tourism) is fast growing (World Bank, 2016) . These non-traditional sectors include business services such as engineering and legal firms, are mostly overlooked. This may be because Africa is mostly known for possessing natural products and minerals such as oil. However Africa is seen to be an increasing exporter of goods but is more of an importers of services (United nations, 2016). This brings about a trading deficit.

Studies on trade and economic growth have been undertaken in the past. For example Zestos & Tao (2002) look at the causal relations between growth rates of imports, exports and the gross domestic product (GDP) of Canada and United States using the vector correction model (VEC).Li, Chen, San, & others (2010) look at the causal relationship between trade and GDP in East Asia. Doman (2013) looks at the causal relationship between trade and GDP growth in Togo. Some authors have stressed the positive effects of the export sector to the rest of the economy such authors include Feder (1983),Balassa (1978), and Bhagwati & Srinivasan (1978).

Economists have also constructed models that are solely based on explaining how trade through exports contributes to economic growth. This includes the Granger causality model that is used to establish the causal relationship between two variables that are co-integrated.

1.1.2 Kenya and International Trade

According to the ITC (International trade center), as at 2001, Kenya was a country that assumed a market oriented economy and has maintained a good political environment ever since. Kenya is a member of COMESA (Common Market for Eastern and Southern Africa) which offers a market for its goods among other countries such as Europe, Middle East and Asian countries. Among the advantages of COMESA includes free trade areas between the members, production of high quality goods that are affordable and provides a wider area for investments.

Kenya is at a stage where its economy can open up and attract favorable investments thus drawing in new partners who can be major players in contributing to the growth of the economy. In East Africa Kenya has had the most economic structural reforms that have contributed to the economic growth in the past decade(United nations, 2016). Kenya's growth is expected to rise by about 6.1% in 2016, a prediction by World Bank. Despite having these positive economic conditions e.g. a sound political environment, Kenya still faces a growing deficit in trade (Imports are more than exports) that can cause problems in the future. As at 2014 Kenya had a trade balance of about 12 billion US dollars (OEC, 2016). This trading deficit implies that Kenya is importing more than it's exporting. This might be an issue as the country risks facing the issue of too much debt.

A study on trade liberalization and economic growth in Kenya done by Githanga (2015), investigated the implications of trade openness in Kenya from 1967-2013.An empirical study was carried out and granger causality was used to find out whether trade liberalization can be used to give information about the economic growth of Kenya. However a negative relationship was found to exist between trade openness measure and GDP. The findings are that Kenya should better find ways to improve trade openness and encourage policies that do so.

1.1.3 Trade and Growth

Economic growth is the increase in the production of goods and services of the population over a given period of time. Economic growth is measured by gross domestic product (GDP). Economic growth can be attributed to the accumulation of productivity, technological innovation and physical capital. Low oil prices and a loose monetary policy in the US are favorable for Kenya's economy and the GDP is predicted to grow at 6.6% for 2016 and 7% for 2017 (Global Finance Magazine, 2016).

The relationship between trade and GDP is: GDP = Trade (Export -Import) + Investments + Consumer spending + Government spending. One of the leading economic indicators of 2016 according to KNBS (Kenya National Bureau of Statistics) is international trade.

According to the observatory of economic complexity, Kenya's major trading partners include Zambia, Tanzania, Uganda, Netherlands and United Sates while its top imports are from China, India, Japan and Malaysia. As at 2014 Kenya had seen an increase in its exports in the last five years at an annualized rate of 4.5% (OEC, 2016).The major exports from Kenya are tea, flowers and coffee.

The relationship between growth and trade is very unclear or difficult to prove. A study done by Muhoro & Otieno (2014) look at this relationship for the case of Kenya. The study investigated the export led growth hypothesis in Kenya and found that there was a unidirectional causality running from exports to economic growth. The idea behind this theory (export led growth) is that economic growth can be achieved through some advantages obtained from trade openness such as spread of technology and increased investment opportunities.

Kenya's [1]GDP has been seen to be on the rise for a while (2006-2016) and is showing positive improvements so far. International trade is one of the key factors affecting gross domestic product and as such may have a positive or negative influence on the economy. The paper will refer to exports+ imports as international trade and how it can be linked to the GDP of the country.

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[1] Kenya's GDP Source: Trading economics.com

Studies that have linked trade to economic growth have shown that this relationship exists. They conclude that trade openness has a positive impact on growth. Such studies include Balassa (1978) and Jung & Marshall (1985) .These authors support the idea of trade leading to economic growth. Thirlwall (2000) suggests that trade leads to better infrastructure development and transfer of technology.

1.2 Problem Statement

Export led growth hypothesis postulates that exports cause economic growth. Various studies show that this hypothesis is true but no clear method has been provided and usually varies. This may be due to the fact that different time frames were used and that for the different countries there may be other factors that affect them separately .An example may be that the results of a developed country and those of a third world country such as Kenya may be different in regards to economic policies or the market they operate in. Also other factors such as the method (methodology) used to obtain the results may differ.

Kenya's exports have been on the decline since last year (World Bank, 2016).This implies that Kenya has seen a reduction in the number of exports that it has had over the past few months. By showing that exports are a key factor in the country's economic growth, the country can find ways to improve or change strategies regarding our outlook on the economy. Several studies have proved that this theory is indeed true (Muhoro &Otieno (2014), Zestos, & Xiangnan (2002) and Doman (2013)) and have been able to suggest policy recommendations that better improve the country's trading activities. An example of a policy recommendation by Muhoro & Otieno (2014) is that Kenya should have solid macroeconomic policies directed towards the export sector.

Muhoro & Otieno (2014) investigated the export led growth hypothesis in Kenya (1976-2011) and was in support that exports cause growth while controlling other variables that affect GDP (investments, household consumption, government consumption and Foreign direct investments).This study will apply the same variables in addition to inflation rate and capital. The paper applied dynamic time series techniques of Auto Regressive Distributed Lag and 2-Stage Least Squares while this paper will use a co-integration test, Granger causality test and a Vector Error Correction Model while adding any changes that may have occurred since 2011.

Soi, Koskei, Buigut, & Kibet (2013) also looked at international trade in Kenya and how it affects economic growth. A multiple linear regression model, Barro growth model, was used to establish the relationship between the variables then ordinary least squares method was applied. This paper will use unit root test, co-integration test, Wald tests and granger causality to establish the relationship between the variables. The main variables under consideration will also differ. The main variables used in the study was inflation rate, exchange rate, international trade, gross capital formation and GDP .This paper will use inflation rate, international trade, capital, foreign direct investment ,government consumption and GDP as the main variables.

1.3 Research Objective

The overall aim of this study is to examine the impact of international trade on Kenya's economic growth.

1.4 Research Questions

What is the impact of international trade on Kenya's economic growth?

1.5 Justification

International trade leads to the specialization of goods and services among countries. This offers the highest return of the product being traded. International trade has its advantages and among them is economic growth .Therefore it is important to make sure that trade is flourishing in a country. Kenya should be able to learn from its investors and try to benefit from its trading relations. Having the right resources and tools at hand Kenya should be able to form clear decisions and strategies about its trade relations with its partners and how it can benefit from such attachments. This study will add onto the existing knowledge on trade.

A country should focus on the investment opportunities presented and maximize on profit out of these opportunities. This implies that a country should be able to form clear strategies and sound policies that would benefit the economy. This study will educate on the effects of trade on the economic growth through looking at the

country's GDP. These findings will educate policymakers and other interested parties so as to form clear and sound policies that will attract investors, trade and more private capital. Therefore the findings on this study will benefit policy makers, local and international investors and the general public. Policy makers will be able to make the right decisions regarding tradable goods and services that would benefit the country.

CHAPTER 2

Literature review

2.1 Introduction

This chapter will look at the various economic theories of international trade. Some modern trade theories will be briefly mentioned. Then an empirical review will proceed to explain various past papers that have already dealt with the relationship between trade and GDP. Their findings and conclusions will be mentioned and how they carried out their research .A conceptual framework will then be developed to explain how the variables used in this study relate to each other.

2.2 Theoretical framework

2.2.1 International trade and economic growth theories

International trade is the exchange of goods and services between different countries involving individuals, companies and governments. In some countries, trade is usually a function of the gross domestic product which can be used to predict the performance of the economy. Some economists have tried to explain the concept of international trade. There are classical and modern theories of international trade.

The first theory of international trade is mercantilism. Mercantilism was developed around the 16th century and flourished for a while. Mercantilism is the economic theory that states that trade develops wealth, which is stimulated by positive balance of payments (Heckscher, 2013). The method used by nations of promoting exports through imposing restrictions on imports is called protectionism. According to Heckscher (2013) there are some countries such as China that promote exports of its country and restrict imports through protectionist policies.

The second theory of international trade is the theory of absolute advantage. According to Adam Smith, the theory of absolute advantage is the ability of individuals, countries or firms to produce greater amounts of goods, services or products given the same resources as its competitors(Schumacher, 2012). The disadvantage of this theory is that countries can produce more than one good efficiently therefore having advantages in more than one area. Through this advantage one can be able to benefit from trading activities.

The third theory is of the comparative advantage. According to Hunt & Morgan (1995), this is the theory which states that if countries specialize in the trading of goods that have a lower opportunity cost then there will be an increase in economic growth. This theory looked more at individual's living standards in a country. A comparative advantage enables a firm to sell goods at a lower price than its competitors and realize stronger sales margins.

The fourth theory is the factor proportions theory (Heckscher-Ohlin Theory). According to Heckscher & Ohlin (1956), there are two factors considered (labor and capital) that are used in the production of two final goods. A country that has a large labor force is able to produce goods that are labor intensive by using the cost effective means of available labor in the production process. A country with abundant capital will use a more capital driven means of production thereby producing capital intensive goods.

Lastly, Wassily W. Leontief in the 1950s developed a theory called the Leontief paradox which states that the country with the world's highest capital-per worker has a lower capital/labor ratio in exports than in imports. Leontief carried out tests in the United States in order to explain the Leontief paradox and found that it was exporting labor intensive goods rather than capital intensive goods even though the United States was well endowed with capital. He explained that an American worker could not be compared to the workers of other countries that have labor intensive goods. This was because the American worker had a higher productivity than the workers of other countries (Leamer, 1980).

Modern or firm-based trade theories

The firm-based theories evolved with the growth of the multinational company (MNC). The other theories were more on the lines of trade being between different countries that involved goods from different industries. However, there are situations where two countries can compete on the same good from the same industry. This is what is referred to as intra-industry trade (Markusen, 1995). Examples of these

theories include country similarity, product life cycle, Global strategic rival theory and Porter's national competitive advantage.

Models that link trade and GDP

Some authors like Balassa (1978) have pointed out the positive effects of export trade on a country's economic growth. According to Jung & Marshall (1985), growth of output causes growth of exports that then lead to economic growth. Economists have created models that explain how trade expansion leads to economic growth. Various models like the Granger causality models prove the issue of causality where one time series model can be used in forecasting another. Co-integration and ECM (Error Correction Models) aim to show a long-term relationship between two variables. Once this long-term relationship is developed, the granger causality can be established.

2.3 Empirical review

This section will examine past studies on trade and economic growth and how the different papers by different authors were able to show this relationship. Adam Smith was among the first people to stress the importance of trade on economic growth.

Thirlwall (2000), states that countries that have been more liberal in their trade policies have been able to have a better outcome in terms of growth performance. Through trade liberalism, opportunities open up that lead to better infrastructure development and most importantly expansion of the economy that leads to growth. Countries that have experienced faster growth as a result of trade were more due to trade openness and liberal trade regimes. An example of a country that has performed well due to trade policies such as trade openness includes South Korea (Thirlwall, 2000). However, they have also adopted export promotion and import substitution.

The static gains[2] from trade stem from the basic fact that countries are differently endowed with resources (natural and acquired) and because of this, the opportunity cost of producing products varies from country to country. Thirwall (2000) looks at theories that explain export-led growth through the principle of comparative

[2] Static gains in trade is measured by the increase in the level of utility or level of welfare when there is opening of trade between countries (Rodriguez and Rodrick,2001).

advantage. These include; the neoclassical supply-side model; the balance of payments constrained (Hicks super-multiplier) model and the virtuous circle model.

The neoclassical approach assumes that the export sector is more productive than the non-export sector. Thus the share export in GDP and growth of exports matters overall to the growth development sector. The effect of export performance in any country is going to take a considerable time to show its effect on the performance of the economy. Thirwall (2000) introduces the Feder model, which is believed to be the first to link growth and exports. Increased international trade allows the greater import of [3]capital goods which may not be produced domestically.

Some authors like Rodriguez & Rodrik (2001), point out that indeed international trade can lead to a significant impact on a country's performance. They look at trade liberalization and how a country's trade policies and orientation can cause a significant impact on the country's growth especially in the export sector. Rodriguez and Rodrick (2001) look at Latin America and Asian countries in the late 80s and early 90s. The result is that Latin America is less trade liberalized and does not engage in the export sector as much as Asian countries. Asian countries are more open in terms of their economic activities and are seen to be performing better than the Latin American countries. Those countries that are outer-orientated in terms of trade strategies are better performed than their counterparts.

Statistics showed, according to Rodriguez and Rodrick (2001) that Asian countries sported positive GDP growths which were higher than Latin American countries that had lower and even in some instances negative GDP growth. This led Rodriguez and Rodrick (2001) to believe that indeed trade leads to economic growth in a country.

Imports bring additional competition to local markets thus causing pressure on the prices of goods. Individuals would prefer cheaper affordable goods and would end up choosing the imported products over the local ones making people to lose business. However international trade can offer opportunities for innovation and technology transfer.

Zestos & Tao (2002) looked at the causal relationship between trade (exports, imports) and GDP of two countries (Canada and US). They applied time series data

[3] Capital goods are those that are used in the production of other goods and services.

for these two countries using data from (1948-1996) where the Granger causality tests were performed to determine the causal relationship. The Granger causality tests suggested that Canada had a more open economy than US which was more trade dependent.

A key empirical study is by Li, Chen, and San (2010). They looked at the causality of foreign trade on the growth of East China. They used unit root test, co-integration and VECM models to test this relationship using export data from 1981-2008 in China. Li, Chen, and San (2010) used the granger causality to prove that this relationship existed and their results were that there existed a long term effect of trade on GDP in China.

Muhoro & Otieno (2014) look at the export led growth hypothesis in the case of Kenya. They used time series data from 1971 to 2011 while using dynamic time series techniques of Auto regressive Distributed lag and 2 stage least squares. The variables used include; GDP, Export, Import, Household Consumption, Government Consumption, Gross Fixed Capital Formation and Foreign Direct Investment. The results indicated that there was unidirectional causality running from exports to gross domestic product. This implied that the export-led hypothesis can be supported by the Kenyan economy in the short run.

Soi, Koskei, Buigut, & Kibet (2013) look at the effect of international trade on Kenya's economic growth. The years under consideration was from 1960-2010.A multiple linear regression model, Barro growth model, was used to establish the relationship between the variables then ordinary least squares method was applied. The main variables used include; International trade, Economic growth, Exchange rate, Gross capital formation and Inflation. The results showed that exchange rate had no effect on GDP growth while Inflation had a negative but significant relationship with GDP. Government consumption had positive effect on GDP.

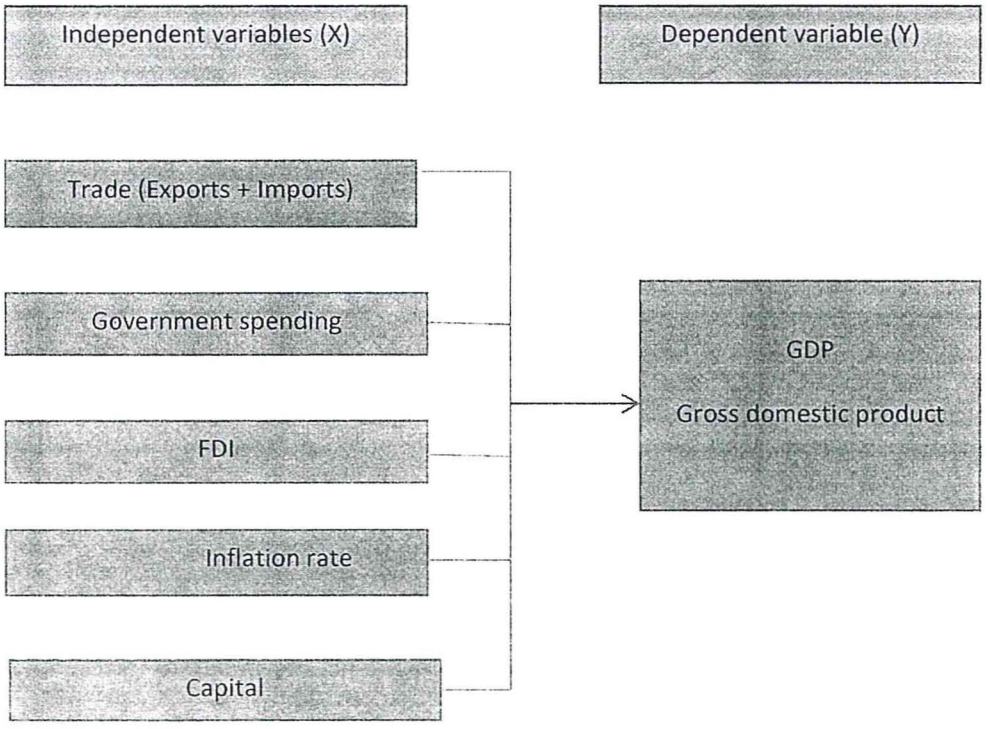
2.4 Conceptual framework

This study examines the impact of international trade on Kenya's economic growth. The assumption based on past studies is that trade can lead to economic growth. However, countries that practice favorable trade policies benefit the most. This study will examine the long-run relationship between trade and economic growth in Kenya. An empirical analysis will be used to test this long run relationship between trade and GDP and the variables used will include;

Dependent variable: GDP (Gross Domestic Product)

Independent variables: Trade (Import + Export), Inflation rate, Foreign direct investment (FDI), Government spending and Capital.

Figure 1: ***Conceptual model***



Trade is the sum of imports and exports and is represented as a percentage of GDP. GDP is represented in real terms (adjusted for inflation), this is the real value of goods and services produced in Kenya. Gross capital formation refers to the net increase in physical assets within the time under consideration (1966-2015).Gross capital formation is represented in real terms. Inflation rate is the increase in prices of commodities and a general fall in the purchasing power of money. Inflation rate in this study is represented as an annual percentage of consumer prices. Government spending represents the government's consumption, investment and transfer of payments. This is represented as a percentage of GDP. Foreign direct investment is net of outflows and inflows of foreign direct investment. This is represented in real terms and is the investments made by individuals in Kenya who have business interests in other countries.

The steps in the methodology that will be used are significant in establishing the relationship between trade and GDP. The first test will be the Unit root test. This is performed to determine if the data is stationary or has unit root. The next step will be determining the long-run relationship between GDP and trade through co-integration. The causality issue will then be determined after a long-run relationship has been developed. Once co-integration is established a VEC model can be constructed. When the variables are not co-integrated, a VAR model is used. This then later forms the basis for establishing a causality relationship using the granger causality test.

CHAPTER 3

Methodology

3.1 Introduction

The purpose of this research is to examine the impact of trade relations on Kenya's economic growth. The main aim is to find out whether or not, international trade help in the prediction of Kenya's GDP growth.

3.2 Research design

The research design used in this project is explanatory in nature. This is because this research aims to observe the relationship between trade and GDP. The research problem is whether trade causes economic growth. Other researchers have been able to prove that such a relationship exists and it can be measured (Makki & Somwaru, 2004). Most of these findings suggest that a country can employ reasonable trading policies which can be used to improve its economic growth. The main question asked is whether there is a relationship between trade and GDP. If such a relationship exists then it becomes a possibility to link trade to economic growth.

The method of analysis will be empirical analysis. First a unit root test must be performed to find out if the data has stationarity or has unit root. A co-integration analysis will then be carried out to test the long-run or short-run relationship between GDP and trade. VEC model is used when the variables are co-integrated while VAR model where there is no co-integration. This will then be used to prove causality between trade and GDP using the granger causality test.

3.3 Population and sampling

Population

The study is based on Kenya therefore the GDP and trade data, and any other relevant data, will be based on the Kenyan economy.

Data sampling

Data will be sampled based on tradable goods and services between Kenya and other countries (International trade).

3.3.1 Data collection

Data collected on GDP, Exports and Imports will be retrieved from World Bank. Other variables affecting GDP include; FDI, Government spending, Capital and Inflation rate. The data for these variables will be retrieved from various sources like, OEC (Observatory of Economic Complexity) and World Bank from 1966-2015. Secondary data will be used in this study.

3.4 Data analysis

3.4.1 Relationship between the variables

In testing the relationship between the independent variables and GDP the following equation will be used;

$$LNGDP_t = \beta_0 + \beta_1 LNTRD_t + \beta_2 LNK_t + \beta_3 LNFDI_t + \beta_4 IRT_t + \beta_5 LNGC_t + \epsilon$$

Where;

GDP= Gross domestic product

FDI = Foreign direct investment

TRD =Trade (Exports + Imports)

K = Capital

IRT = Inflation rate

GC = Government spending

ϵ = Error term

Where FDI, Trade and GC are measured as a ratio of GDP

β_0 = Intercept

β_1-β_6= Unknown Parameters

The assumption is that the relationship between GDP growth and trade is positive. The model above is a linear equation in the parameters relating GDP growth and trade.

3.4.2 Unit root test

A unit root tests whether a time series variable is non-stationary or possesses a unit root. The result is either the variables have stationarity or possesses a unit root. The null hypothesis is generally defined as the presence of a unit root and the alternative hypothesis is stationarity. This study wants to establish a stationarity result. In our case x is trade which is the independent variable while y is GDP which is the

dependent variable. The Dickey–Fuller test is appropriate for the time series data where;

$$Y_t = \theta_{yt-1} + \epsilon$$

The unit root null hypothesis against the stationary alternative corresponds to;

H_0 $\Theta = 1$ against H_1: $\Theta < 1$

3.4.3 Co-integration test

Co-integration analysis is carried out in this research for testing whether or not there is a long term relationship between GDP and other independent variables. Co-integration will be useful when performing the causality test because it must be developed first to further prove the relationship between trade and GDP. The assumption is that X (Trade) is the independent variable, while Y (GDP) is the dependent variable.

3.4.5 VECM and VAR

A VECM (Vector Error Correction) model is used to show the long-run relationship between two time series variables. Vector Error correction model estimates the speed at which a dependent variable returns to equilibrium after a change in other variables.

A vector error correction model is carried out if co-integration is established between the variables. The error term is incorporated in the formula where VECM (P) (VECM with p lags);

$$\Delta X_t = \pi X_{t-1} + \sum_{i=1}^{p-1} \Phi i^* \, \Delta X_{t-i} + \varepsilon_t$$

Where, Φi^* ($k \times k$ matrix) and π are a function of Φ's.

$\pi = \Phi\text{-}1$

Δ = Differencing operator such that $\Delta X_t = X_t - X_{t-1}$

X_{t-1} = i^{th} lag value of X_t

ε_t = Error term

A VAR (Vector auto regression model) describes the evolution of some variables over a set of sample period as a linear function of its own past values.

A VAR is carried out if co-integration is not established between the variables. For a VAR model if one is asked for VAR (p) (VAR with p lags) of I (1) X's then;

$$X_t = \Phi_1 X_{t-1} + \ ... \ + \Phi_p X_{t-2} + \ \varepsilon_t$$

Where;

X_t = Stationary time series variable

X_{t-1} =Ith lag of X

$\Phi_{i(I=1,\ldots,p)}$ = A $K \times K$ time invariant matrix

ε_t = White noise with the distribution $\varepsilon \approx WN(0, \sigma^2)$.W is the wiener process

The hypothesis to be tested is;

H: $\Phi = 1 \rightarrow X_t \sim I(1)$ with drift

H: $|\Phi| = 0 \rightarrow X_t \sim I\ (0)$ with deterministic time trend

3.4.4 Granger causality test

The next step is to determine whether there is a causal relationship between trade and GDP. Causality assumes that one factor can lead another. For this part an equation from Dodaro (1993) who got it from Jung and Marshall (1985), who also got it from Granger (1988).

According to Granger (1988), if one had two variables X and Y and wanted to check if one precedes the other, lagged values of one variable would be used to predict the other variable. X is said to granger cause Y if its lagged values predict Y well. If Y at the same time is able to granger cause X then a bi-directional relationship exists between the two variables.

$$GY_t = \alpha + a_1 GY_{t-1} + a_2 GY_{t-2} \quad (1a)$$

$$GX_t = \beta + \ c_1 GX_{t-1} + c_2 GX_{t-2} \quad (2a)$$

$$GY_t = \ \alpha + a_1 GY_{t-1} + a_2 GY_{t-2} + b_1 GX_{t-1} + b_2 GX_{t-2} \quad (1b)$$

$$GX_t = \beta + c_1 GX_{t-1} + c_2 GX_{t-2} + d_1 GY_{t-1} + d_2 GY_{t-2} \quad (2b)$$

Hypothesis

Let Z1 and Z2 represent the two alternatives in the null hypothesis.

Z1=Trade does not granger cause GDP

Z2=GDP does not granger cause trade

This test looks into the bidirectional relationship between trade and GDP. The reason for testing this relationship is to be able to prove the causality relationship between trade and GDP.

CHAPTER 4

Data analysis and results

In this section the empirical analysis will be discussed and presented. The methods presented are in line with the earlier discussions and expectations.

4.1.1 Unit root test

Table 1 ADF tests –Augmented dicky fuller test

	Critical values				Critical values			
		Level				1st Difference		
	t-statistic	1%	5%	10%	t-statistic	1%	5%	10%
LGDP	-2.2933	-4.1611	-3.5064	-31830	-4.7522	-4.1611	-3.5064	-3.1830
LTRD	-3.8314	-4.1611	-3.5064	-3.1830	-7.9180	-4.1658	-3.5085	-3.1842
LK	1.2903	-4.5167	-3.5043	-3.1818	-14.017	-4.1658	-3.5085	-3.1842
LFDI	-4.8773	-4.2191	-3.5330	-3.1983	-6.7171	-4.2733	-3.5578	-3.2124
IRT	-3.6543	-4.1567	-3.5043	-3.1818	-7.3452	-4.1658	-3.5085	-3.1842
LGC	-3.2461	-4.1567	-3.5043	-3.1818	-6.4847	-4.1611	-3.5064	-3.1830

The ADF (Augmented dicky fuller test) provides the t-statistics which are used to compare with the critical values to determine whether the data has unit root or is stationary. The critical values are determined at the 1%, 5% and 10 % level. The above table represents the critical values both at 1st difference and level.

From the ADF tests, government consumption, inflation rate, trade, capital and GDP are non-stationary at the level and must be differenced once to make them stationary. Foreign direct investment (FDI) is stationary at both level and at the first difference.

4.1.2 Co-integration test

This test is carried out to determine whether there is a long-run relationship between the dependent and the independent variables. The unrestricted co-integration rank test (trace), * represents rejection of the null hypothesis at the 0.05 level. Therefore the null hypothesis that there is no co-integration between the variables is taken into account.

Table 2 Unrestricted Co-integration Rank Test (Trace) and Maximum Eigenvalue

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.729837	122.6648	95.75366	0.0002
At most 1 *	0.602296	75.55052	69.81889	0.0162
At most 2	0.454857	42.35683	47.85613	0.1490
At most 3	0.330157	20.51538	29.79707	0.3886
At most 4	0.138225	6.089754	15.49471	0.6849
At most 5	0.020192	0.734358	3.841466	0.3915

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 *	0.729837	47.11430	40.07757	0.0069
At most 1	0.602296	33.19369	33.87687	0.0602
At most 2	0.454857	21.84145	27.58434	0.2286
At most 3	0.330157	14.42562	21.13162	0.3311
At most 4	0.138225	5.355395	14.26460	0.6965
At most 5	0.020192	0.734358	3.841466	0.3915

Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The trace test shows that when the null hypothesis states that there are no co-integrated equations, the null hypothesis is rejected. When the null hypothesis states that there is one co-integrating equation the hypothesis is rejected at the 5% level. However, when the null hypothesis states that there are at most two co-integrating equations then the null hypothesis is failed to be rejected. This means that there are at least two co-integrated equations and is what is being looked for. This means that there is a long-run relationship between the variables.

The Max- Eigen values test

Max-eigenvalue test indicates one co-integrating equation(s) at the 5% level. When the null hypothesis is; there exists no co-integrated equation, the null hypothesis is rejected because the Max-Eigen stats is greater than the critical value. When the null hypothesis is that there is utmost one co-integrated equation, fail to reject the null hypothesis. When null hypothesis is that there are utmost two co-integrated equations, the result is that we fail to reject the null hypothesis. This further proves the earlier results from the trace statistics.

Table 3 Normalized Co-integrating Coefficients (Standard Error in Parenthesis)

LGDP	LTRD	LK	LFDI	IRT	LGC
1.000000	-0.076321	-0.890617	0.180473	0.003099	1.712723
	(0.20552)	(0.02455)	(0.01609)	(0.00238)	(0.16285)

This table shows a negative or positive relationship between the dependent and the independent variable. In this case, trade and capital have a negative relationship with GDP in the long run. Foreign direct investment, inflation rate and government consumption show a positive relationship with GDP in the long run.

4.1.3 VECM test (Vector Error Correction Model)

The VECM results show the variables without the p-values and in order to know these probability values, a system equation was used to find out the co-integrating equation. These show the coefficients of the dependent and independent variables .The coefficient is the error correction term that shows the speed of adjustment toward equilibrium. This means the speed of adjustment of any variable towards the long-run equilibrium rate.

The VECM show the long and short run causality between the dependent and the independent variables. Here the residual of the co-integrating equation was derived when the dependent variable was GDP and when it was Trade (separately).

Table 4 VECM Model

Dependent Variable: D(LGDP)

Sample (adjusted): 1977 2015

Included observations: 36 after adjustments

D(LGDP) = C(1)*(LGDP(-1) - 0.525857034439*LTRD(-1) -
0.843154683172*LK(-1) + 0.172075432978*LFDI(-1) +
0.737975705164*IRT(-1) + 2.22946735989*LGC(-1) -
0.374943129738) + C(2)*D(LGDP(-1)) + C(3)*D(LGDP(-2)) + C(4)
*D(LTRD(-1)) + C(5)*D(LTRD(-2)) + C(6)*D(LK(-1)) + C(7)*D(LK(-2)) +
C(8)*D(LFDI(-1)) + C(9)*D(LFDI(-2)) + C(10)*D(IRT(-1)) +
C(11)*D(IRT(
-2)) + C(12)*D(LGC(-1)) + C(13)*D(LGC(-2)) + C(14)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.413948	0.182345	-2.270132	0.0333
C(2)	0.853958	0.330663	2.582566	0.0170
C(3)	0.196107	0.276790	0.708505	0.4861
C(4)	0.552896	0.246842	2.239881	0.0355
C(5)	0.381676	0.271499	1.405811	0.1737
C(6)	-0.127136	0.168894	-0.752756	0.4596

C(7)	-0.062774	0.146826	-0.427542	0.6731
C(8)	0.050291	0.026890	1.870289	0.0748
C(9)	0.070958	0.018299	3.877780	0.0008
C(10)	0.320590	0.348003	0.921225	0.3669
C(11)	0.568827	0.291383	1.952164	0.0638
C(12)	0.397425	0.359994	1.103977	0.2815
C(13)	1.222599	0.442695	2.761716	0.0114
C(14)	0.032762	0.022270	1.471122	0.1554

R-squared	0.654656	Mean dependent var	0.078645
Adjusted R-squared	0.450589	S.D. dependent var	0.128331
S.E. of regression	0.095122	Akaike info criterion	-1.582014
Sum squared resid	0.199060	Schwarz criterion	-0.966201
Log likelihood	42.47626	Hannan-Quinn criter.	-1.367079
F-statistic	3.208044	Durbin-Watson stat	2.241689
Prob(F-statistic)	0.007807		

When the dependent variable is GDP;

C (1) – This is the co-integrating equation when GDP is the dependent variable. This is our speed of adjustment towards long run equilibrium but it must be significant and the co-efficient sign negative. C (1) has a coefficient value of -0.413948 and the probability value is less than 5% showing it is significant. This means that there is a long-run causality running from the independent variables to the dependent variable (GDP).The independent variables has an influence on the dependent variable (GDP) in the long run.

C (1, 2, 3, 4….13) - Short run co-efficient

C (1) shows the long-run causality, meaning that there is a long run causality running from the five independent variables (Trade, Inflation rate, Capital, Foreign direct investment and Government consumption) to the dependent variable (GDP).This means that they have an influence on the dependent variable in the long run.

To test the short run causality, the Wald test restriction is used. Here we test the short run causality between the independent variables and the dependent variable. The independent variable that is required to be tested is trade. The null hypothesis is C (4) =C (5) =0 from table 5.

Causality from TRD to GDP (Short Run)

Table 5 Wald Test

Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	9.623511	(2, 18)	0.0014
Chi-square	19.24702	2	0.0001

Null Hypothesis: C(4)=C(5)=0

Null Hypothesis Summary:

Normalized Restriction (= 0)	Value	Std. Err.
C(4)	0.073459	0.018218
C(5)	0.034967	0.022939

Restrictions are linear in coefficients.

The probability value is significant, less than 5% meaning we reject the null hypothesis. This means that there is a short run causality running from trade to GDP. However the same cannot be said for when GDP is running to trade as the probability value is greater than 5%.

4.1.4 VAR Granger Causality/Block Exogeneity Wald Test

Table 6 VAR Granger Causality/Block Exogeneity Wald Tests

Sample: 1966 2015

Included observations: 36

Dependent variable: LGDP

Excluded	Chi-sq	df	Prob.
LTRD	13.28241	2	0.0013
LK	3.044617	2	0.2182
LFDI	4.508076	2	0.1050
IRT	3.371477	2	0.1853
LGC	0.710592	2	0.7010
All	25.42136	10	0.0046

Dependent variable: LTRD

Excluded	Chi-sq	df	Prob.
LGDP	4.419535	2	0.1097
LK	4.792941	2	0.0910
LFDI	6.776389	2	0.0338
IRT	9.262845	2	0.0097
LGC	3.420931	2	0.1808
All	25.00787	10	0.0053

Dependent variable: LK

Excluded	Chi-sq	df	Prob.
LGDP	10.89627	2	0.0043
LTRD	3.714979	2	0.1561
LFDI	5.699854	2	0.0578
IRT	0.943320	2	0.6240
LGC	4.284521	2	0.1174
All	21.02489	10	0.0209

Dependent variable: LFDI

Excluded	Chi-sq	df	Prob.
LGDP	1.168030	2	0.5577
LTRD	1.386831	2	0.4999
LK	1.693882	2	0.4287
IRT	1.214694	2	0.5448
LGC	1.725527	2	0.4220
All	10.37918	10	0.4079

Dependent variable: IRT

Excluded	Chi-sq	df	Prob.
LGDP	2.865400	2	0.2387
LTRD	3.530345	2	0.1712
LK	4.533193	2	0.1037
LFDI	0.564900	2	0.7539
LGC	5.279995	2	0.0714
All	14.83414	10	0.1382

Dependent variable: LGC

Excluded	Chi-sq	df	Prob.
LGDP	2.927787	2	0.2313
LTRD	0.164212	2	0.9212
LK	1.466454	2	0.4804
LFDI	1.736393	2	0.4197
IRT	4.283662	2	0.1174
All	14.45375	10	0.1533

Granger causality is used to identify the linkages between the variables .It specifies the null hypothesis that the independent variables granger do not cause the dependent variables.

Here the probability values (0.0013) for when GDP is the dependent variable, shows that trade does granger cause GDP. When trade is the dependent variable the probability value of GDP is 0.1097 proving insignificance as it is more than 5% and therefore shows that GDP does not granger cause trade.

4.2 Discussion

The objective of this study was to test if trade, represented as a percentage of GDP, has any impact on the Kenyan economic growth. Data from 1966 to 2015 obtained from World Bank was used to test this theory. The Johannsen co-integration test shows that there is a long-run relationship between the variables, i.e. independent and dependent variable in this case trade, capital, government consumption, foreign direct investment, inflation and GDP. This is further proven by the VECM test that shows long-run causality from the independent variables to the dependent variables. The same is seen for the short run causality running from trade to GDP and the same

cannot be said about the short run causality running from GDP to trade. Lastly the VAR Granger causality shows that trade granger causes GDP while GDP does not granger cause trade. This shows that there is a unidirectional relationship between trade and GDP.

The results are similar to other literature that showed that trade can be used to predict a country's growth (Muhoro & Otieno, 2014).Githanga (2015) was looking at trade liberalization and economic growth in Kenya and found that free trade leads to better economic performance in different channels .International trade promotes economic growth through technology transfer, increased exchange rate earnings, increased innovation and attracting investments.

The adjusted r-squared is 0.45 (this is lower than the preferred r squared (> 0.60) while the r-squared is 0.65.This means that the independent variables are able to identify or describe the dependent variable (GDP) well. This shows an error term of 55%.This means that GDP can be explained by other unknown variables represented by the 55%. GDP can be explained by changes in trade, government consumption, capital, interest rates and foreign direct investment while other factors not included represent the 55%.

Wald tests according to Shan &Sun (1998) help develop linear restrictions on the parameters of a VECM model. However the Wald test does not follow its usual asymptotic chi-square distribution under the null. The lag structure for the test was determined for the VECM model by looking at the AIC values .The lag yielding the lowest AIC values was chosen.

Capital is seen to have a negative relationship with GDP as shown in the normalized co-integrating co-efficient in the long run. The Wald test carried out showed causality running from capital to GDP but did not prove correct in the case from GDP to capital. This means that there was no-short run causality running from GDP to capital. The probability value was significant at 0.01%

The same can be said for inflation rate, foreign direct investment and government consumption. Causality only runs from the independent variables (e.g. inflation rate, foreign direct investment, government consumption, capital and trade) to the dependent variable with their probability values being significant. They are seen to

have unidirectional relationships with GDP. This establishes that all the independent variables have a short run relationship with the dependent variable.

However, the VAR granger causality test supports some of the VECM results. The VAR granger causality null hypothesis is that the independent variables does not granger cause the dependent variables. The result of significance means that the null hypothesis can be rejected and thus supports the presence of causality. In the results, unidirectional relationship seems to exist between trade and GDP.

The advantage of using this method to test for granger causality according to Shan &Sun (1998) is its simplicity and ability to overcome many shortcomings of alternative econometric procedures. To prevent the issue of exogeniety, the VAR Wald tests restrictions was applied.

The results are in line with other literature in this area (Muhoro &Otieno, 2014); among others who support the theory that trade has a positive impact on a country's economic growth. However some variables did not display the same results but the general idea that trade granger causes GDP is proven to be true. The same statistical distributions and the corresponding estimation method have been applied in the causality test process.

CHAPTER 5

5.1 Summary and conclusion

The main purpose of this study was to find out the relationship between trade and economic growth in Kenya while using data from World Bank and KNBS. The assumption was that an increase in trade has a positive effect on economic growth. Specifically the paper looked at whether International trade had any effect on the country's gross domestic product while holding other factors constant (inflation rate, capital, government consumption and foreign direct investment).This paper implemented the granger causality, unit root tests, Johannsen's co-integration tests in testing out this relationship for Kenya using time series data from 1966-2015.

The Wald test can be seen to support the statement that there exists a short run causality running from trade to gross domestic product. The causality is seen to be unidirectional in the VECM tests meaning that short run causality runs from trade to GDP and not from GDP to trade. Trade granger causes GDP meaning that it has a positive effect on GDP for the period studied. Economic growth has also been positively been influenced by foreign direct investment and government consumption.

The objective of this study was to establish a relationship between trade and GDP .This paper found that there was indeed a positive relationship between trade and GDP in the long-run. Trade can be used to predict the economic growth of Kenya in the long run. These results are in line with other literature (Muhoro & Otieno, 2014). Muhoro & Otieno (2014) who found that there existed short run causality from trade to GDP in Kenya .They were able to prove unidirectional relationship between the two. This is in line with the results of the literature.

5.2 Recommendations

The study has established that there is a positive relationship between trade and economic growth. Kenya should therefore promote activities that encourage trading policies e.g. less restrictions on exports. The country should have solid macroeconomic policies directed towards the exports sector. According to the international trade Centre Kenya performs better than other sub-Saharan African countries in terms of international shipments and timeliness. However Kenya should improve on its customs, infrastructure and logistics in regards to imports and exports.

There are potential exports markets that can be explored to Kenya's advantage in economic integration blocks particularly the East African Community and Common Market for Eastern and Southern Africa. Kenya therefore needs to deepen its integration with regional economic blocks to increase its bargaining power and broaden its market.

As at 2015, reports by Tralac indicated that international trade had been growing in the previous years at a fast rate. International trade growth was seen due to the use of non-tariff trade measures and its growing popularity. Kenya should create regulatory regimes that help promote an environment for investment opportunities. With the coming elections next year, it is important that Kenya shows it's able to put up a peaceful front during elections. Kenya should be able to guarantee its investors and other key partners that their investments are safe.

Trade openness should be further promoted to increase trade. This means that the country should be less strict in their trading policies, exchange rates and exchange rate stability. Also the provision of good infrastructure has positive effects on trade and should therefore be looked into.

5.3 Limitation of the study

There are certain factors that were not included in this study. Variables such as exchange rates and tax income were not included as independent variables. These variables were not included in the study to avoid multicollinearity. Multicollinearity is a phenomenon where two or more predictor variables in a multiple regression model are highly correlated meaning that one variable can be predicted with another with a substantial degree of accuracy. Also there were other non- measurable factors that were not included in this study that affect GDP. These economic factors were not factored in the study and might have caused the results to not be as clear or accurate as it should have been.

The data used in this study was annual data and it would have been more preferable to obtain quarterly or semi-annual data to better prove the accuracy of the data. This would mean that the data points were not as sufficient as it might have been desired. There was also data missing in some years that would have hindered the accuracy of the data. Descriptive research is essentially static whereas the data maybe dynamic and this cannot be captured in the study.

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Appendix

Figure 2 ***Kenya's GDP***