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THE ROLE OF NET EXPORTS ON ECONOMIC GROWTH IN USA

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We certify the thesis is satisfactory for the award of degree of Master of Economics

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DEDICATION

This study is dedicated to my supportive mother, Mrs. Faida and father Mr. Bishar, brother Mohammed, Abdulrahman and sisters Dilveen and Wan who been a source of inspiration to me during my whole life. I would like to express my deep feelings of gratitude towards my siblings and to the rest of the family for ever supportive of my academic endeavors. This is a glimmer of gratefulness for everything every member of my family has done for me. My mother's prayers are powerful and I owe all love, appreciation and gratitude to her.

ABSTRACT

The study analyses the role of net exports on economic growth in the USA. This was necessitated by the resounding economic resilience that has been experienced by the USA and assertions have pointed to net exports but have also attracted different assertions from other studies. As such the study sought to analyse the role of net exports on economic growth with regards to the USA. The study was conducted using secondary data collected from the 1970:Q1 – 2015:Q1 and was analyzed VECM and the result from the study showed that there is a long run cointegration between net exports and economic growth in the USA. Import levels and unemployment have been observed to be negatively related to economic growth.

Key words : Economic growth, Net exports, Gross Domestic Product, Imports, Unemployment.

ŐZ

Çalışma ABD'deki ekonomik büyüme üzerindeki net ihracatın rolünü analiz etmektedir. Bu ABD tarafından yaşanmıştır ve iddiaların net ihracatın işaret ediyorlar ama aynı zamanda diğer çalışmalardan farklı iddiaların çekmiştir kocaman ekonomik esnekliği gerektirdiği edildi. Böyle çalışmaya olarak ABD açısından ekonomik büyümeye net ihracatın rolünü analiz etmek istedi. S1 - 2015: Çalışma 1970 toplanan ikincil veriler kullanılarak yapılmıştır Q1 ve VECM analiz edildi ve çalışma sonucunda ABD'de net ihracat ve ekonomik büyüme arasında uzun dönemli bir eşbütünleşme olduğunu göstermiştir. İthalat düzeyleri ve işsizlik ekonomik büyümeye olumsuz ilişkili olduğu gözlenmiştir .

Anahtar kelimeler: Ekonomik büyüme, net ihracatın, Gayri Safi Yurtiçi Hasıla, İthalat, İşsizlik.

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LIST OF ABBREVIATIONS

ADF – Augemented Dickey Fuller Test

GDP – Gross Domestic Product

GFCF – Gross Fixed Capital Tormation

EX – Exports

IMP – Imports

UNEMP – Unemployment

PP – Phillips Perron

VECM – Vector Error Correction Model

CHAPTER ONE

1.1 Background to The Study

The economic growth rate of USA registered a level of -0.92% in December 2008, 3.88% in December 2014 and 2.93% in December 2015 estimates by Bureau of Economic Analysis (2015) revealed that the 1.5 percentage increase in economic growth in the third quarter of 2015 was as a result of positive contributions from non-residential fixed, residential fixed investments, personal consumption expenditure, state and local government spending. During the same period, the Bureau of Economic Analysis (2015) revealed exports had decelerated in the third quarter of 2015. Such a decline in exports is assumed to have not played a part to the increase in GDP.

On the other hand, various studies have been undertaken to determine what drives economic growth. A study done by Sun (1998) revealed that foreign direct investment has a positive contribution to economic growth. On the contrary, Aslanoglou (2002) used time series data from the period 1975 to 19995 to examine the impact of foreign direct investment economic growth in Turkey. The results from the study showed that foreign direct investment has an insignificant positive contribution to economic growth.

Fischer (1993) undertook a study to examine the determinants of economic growth. This study was based on a panel of nine developing countries. The results showed that there is non-linear relationship between inflation and economic growth at break points of 15% and 40% in spline regression. Studies on the role of net exports on economic growth are still underway as they try to establish what exactly drives economic growth. Meanwhile, the world economy has evolved significantly and with the prevalence of ongoing economic and financial crisis, most economies have learned a great lesson of not to depend on foreign direct investments and exports for source of funds. There is a greater need to establish how exports affect economic growth in the wake of a changing economic strategy.

Export-oriented industrialization is an economic and trade policy initiative that contends that the industrialization process can be enhanced by opening domestic firms to international competition. This is achieved through exportation of those goods the economy possess significant comparative advantages. Though this strategy has yielded significant benefits such foreign currency accumulation in most nations, it has also been subjected to a lot of critiques. The major critique being that the strategy may not yield intended results and research contends that it is the prime cause of the 2008 financial crisis and the one that rocked Asia in 1997.

The Prebisch-Singer hypothesis argues that the export-oriented growth strategy is ineffective when export prices are falling relative to import prices. Furthermore, products produced under the exports orientation programs are often said to lack diversity which hampers initiatives to promote economic growth. The application of export oriented strategies is asserted to be effective in developing economies but there are lot of developed economies such as China which are significantly benefiting from the strategy. China has become the world's largest exporter especially to Africa. On the other hand, United Sates of America's core exports are also consumed in China and are on the rise. According to the US-China Business Council (2015), the USA amassed a whooping total of US$120 billion from exports to China.

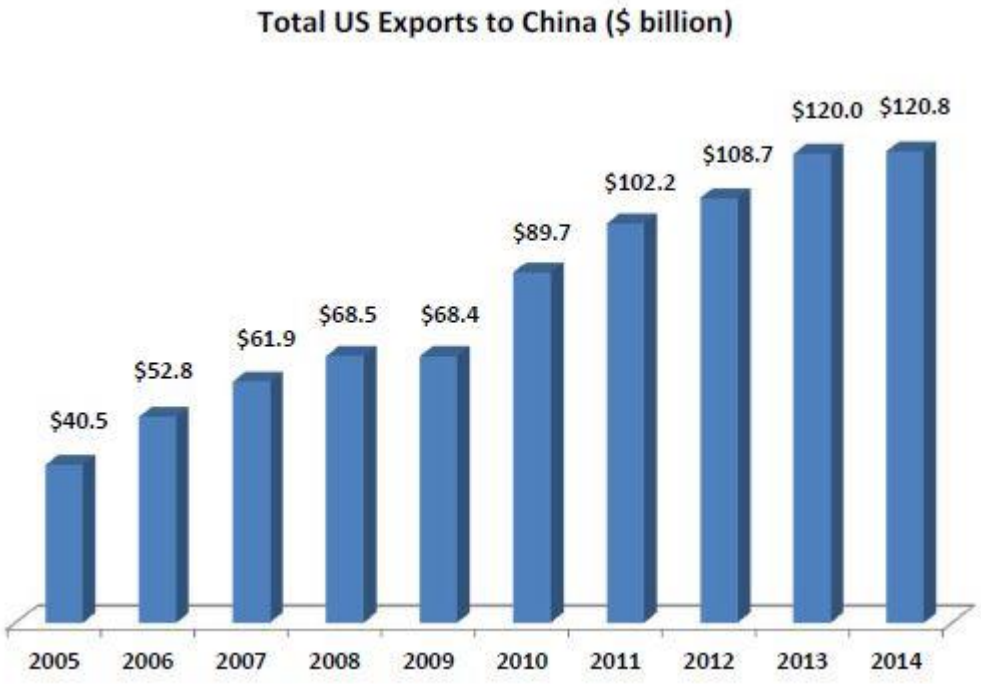


Fig 1.1: USA Exports to China (Source: US-China Business Council, 2015)

From fig 1.1 it can be noted that US exports to China have grown significantly from US$40.5 billion in 2005 to US$120.8 billion in 2014. The US-China Business Council (2015) further contends that USA exports to other countries have grown tremendously and are one of the major drivers of the USA economy. Canada, China and Mexico are the USA's top markets for USA products. Arguments have emerged as to what extent does the export oriented strategy beneficial especially when other nations are implementing and reaping huge rewards from contrasting policies such as the import orientated strategies.

However, exports have being said to contribute positively to balance payments and create employment opportunities. Further insights by Michaely (1977) contend that export led strategies result in incentives being offered to producers to produce quality goods that are competitive on the international market. In addition, Ngoc et al. (2003) contends that the export revenue provides the economy with the much needed foreign currency which can be used to procure essential capital goods. The benefits of export led strategies are not limited as researchers assert that exports help to promote intra-industry trade, help economies to trade on world market and as a result reducing the impact of external shocks

(Baiswal 1978; Balassa 1995 and Barro 1997). The above arguments are said to be evidenced by Latin American and Asian economies such as Brazil. Thus export led strategies are said to be the biggest contributor to the emergence of what is now known as the BRICS, that is, Brazil, Russia, India, China and South Africa.

Despite, all these contributions by exports, other studies have significantly argued that export promotion measures hinder an economy's productive capacity (Clarke and Kirkpatrick, 1992, and Crespo and Worz, 2003). The reason being that export promotion measures are detrimental to import growth. Thus the capacity of economies to acquire modern and cost efficient technology is constricted. Recommendations by Darrat (1987) outlined that exports are not an engine of growth but an indicator of an economy's productive capacity. This entails that the more productive the economy is the more goods for exports it will produce. As a result there is no consensus again about the role of net exports on economic growth.

1.2 Problem Statement

Most economic theories and empirical studies postulates that economic growth is as a result of domestic investments while others argue that net exports are an engine of economic growth as it brings in the much needed foreign currency to further finance the production of both capital and consumer goods. Other researchers such as Darrat (1987) argued that net export contributions are not significant enough to cause major changes in economic growth. This sentiment was echoed by who contends that Worz (2003) net exports are just an indicator of an economy's productive capacity. There is no consensus among the available studies about the nature of roles played by net exports towards promoting economic growth. Others argue that factors such as foreign direct investment and domestic capital formation are the major influencers of economic growth. This is in contrary to the Export Led Hypothesis which contends that exports promotion stimulates the economy into producing more goods and hence stretching the productive capacity of that economy. As a result, there is no common agreement as to the exact role played by net exports on economic growth. This study therefore seeks to examine the role played by net exports on economic growth.

1.3 Research Objectives

The main objective of this study is to identify the roles that net exports are playing on economic growth in the United States of America. Other objectives of this study are given below as follows;

- To determine the causal relationship between exports and economic growth in USA.
- To determine the extent to which net exports affect economic growth in USA.
- To explore possible ways policy initiatives can be harnessed so as simultaneously boost both net exports and economic growth.

1.4 Research Questions

Having established the above objectives, this study will seek to answer the following research questions;

- What are the roles that are being played by net exports on economic growth in the United States of America?
- What is the causal relationship between net exports and economic growth in USA?
- To what extent do net exports affect economic growth in USA?
- What are the policy initiatives can used boost both net exports and economic growth?

1.5 Hypothesis

This study seeks to test the following hypothesis;

- **H_o:** Net exports play a significant role on economic growth in USA.
- **H_1:** Net exports do not play a significant role on economic growth in USA.
- **H_0:** There is no causal relationship between net exports and economic growth in USA.

- **H_1:** There is a causal relationship between net exports and economic growth in USA.

1.6 Scope of The Study

The study is centered on analyzing the role of net exports on economic growth in the United States of America. The present study will dwell on United States of America because it is relevant to the objective of the study as one of the fastest growing economies in the world. The period of study will span from 1977 to 2014. This is because longer periods are so essential when dealing with time series data. The variables used are real GDP without exports, net exports, unemployment level, imports and real gross capital formation.

1.7 Significance of The Study

This study is of significant importance because a significant number of studies have focused on the role of FDI on economic growth in USA. Those that address the role of net exports on economic growth in the USA have depth problems. That is, they do not cover significant ground in explaining the role of net exports on economic growth. This is because of weak methodological approaches. Moreover, the Export led Hypothesis still plays a significant role in modern economies and considering the rate at which economic development has evolved, there is greater need to establish new facts based on such development to ensure that proposed recommendations are relevant to the time under consideration.

1.8 Organization of The Study

This study will be composed of six chapters. Chapter one is an outline of the problem and its setting and will encompass elements such as research objectives, research questions, hypothesis and significance of the study. Theoretical and empirical frameworks that address the current area of study will be reviewed in chapter two. Chapter three proceeds by looking at an overview of the macroeconomic environment in the United States of

America. It will also deal with previous and current economic growth and export strategies that have been availed by the USA, how they differ with the rest of the world and their effectiveness. Chapter four provides a detailed econometric methodology that will be used to analyse the role of net exports on economic growth, answer the research questions and test the hypotheses. Chapter five looks and analysis and presentation of empirical results while chapter six concludes the study by looking at policy recommendations, suggestions for future study and conclusions drawn from the study.

CHAPTER TWO

THEORETICAL AND EMPIRICAL LITERATURE REVIEW

2.1 Theoretical Underpinnings

The role of net exports on economic growth has its theoretical underpinnings based on the national income equation. The national income equation is based on the assertion that total output produced is a function of consumption (**C**), investment (**I**), government expenditure (**G**), exports (**X**) and imports (**M**). The national income approach further contends that total output can be expressed in a mathematical expression of the following nature;

Y = C + I + G + (X – M)…….. (1)

This equation can be differentiated with respect to Y, that is, **Y = dY / dt** giving the following form;

$$\frac{Y}{Y} = \frac{dC}{dY} + \frac{dI}{dY} + \frac{dG}{dY} + \frac{dNE}{dY} \quad \text{…… (2)}$$

Where, **NE** is net exports obtained by deducting imports from exports **(X – M)**

Based on equation 3, each element of the national income equation will exert difference impacts on economic growth denoted by (**Y**). Thus the role of net exports on economic growth can be estimated by the ratio, $\frac{dNE}{dY}$ **.** This ratio represent changes in economic growth attributed to changes in net exports. This mathematical expression can be used to determine the role of net exports on economic growth in the USA. Margaret et al (1999) produced a tabular form of this mathematical expression and this is shown in table 2.1.

Table 2.1: Decomposition of the United States' growth for the periods 1959-83 and 1984-83

INDICATOR	Standard Deviation		Difference
	1959-83	1984-98	
GDP	4.4	2.2	-2.2
Consumer spending			
Goods	4.7	3.8	-0.9
Services	1.9	1.5	-0.4
Investment			
Residential	23.9	11.6	-12.3
Business	10.0	7.9	-2.1
Government Purchases			
Federal	7.5	7.2	-0.3
State and Local	4.1	2.1	-2.0
Net exports			
Exports	18.8	7.7	-11.1
Imports	17.8	7.8	-10.0

Source: Margaret, M et al. (1999)

Form the above table, it can be deduced that net exports having been positively contributing to economic growth. The margin of contribution however declined from a margin of 1% in the period 1959-1983 to -0.1 in the period 1984-1998. Possible reasons point to a decline in exports' standard deviation from 18.8 to 7.7. This is however insufficient for one to construct explanations upon which logical deductions can be made to explain the role of net export on economic growth in the United States of America. Theoretical concepts are a significant prerequisite of such explanations. Henceforth, this chapter will proceed to look at the theoretical concepts and frameworks that can be used to explain the role of net exports on economic growth in the United States of America.

2.2 Heksher-Ohlin Trade Theory

Hecksher (1919) and Ohlin (1933) contend that a country will produce and export goods in which it has a comparative advantage. As a result, this theory is centered on factor endowments in a country and outlines that trading activities are mainly determined but factor endowments available in one country. Consequently, trading patterns tend to revolve around changes in factor endowments and this ultimately poses effects on economic growth.

According to Hecksher (1919) and Ohlin (1933), differences in factor endowments are not a guarantee of high economic output. This is based on the notion that for factor endowments to pose significant changes to economic growth, there must be an element of returns to scale. Returns to scale affect an economy's productive capacity. Points where the economy is producing at constant returns to scale are associated with remedies that usually call for a decrease in input combinations. This is because continued increase in inputs will be yielding no changes to output. This is similar to decreasing returns to scale. On the other hand, increasing returns to scale require that there be a continued increase in inputs. The Hecksher-Ohlin theory is based on the following assumptions;

1. There are to economies producing two goods.
2. The two economies have access to the same production techniques.
3. Of the two products produced, one is capita intensive and the other is labour intensive.
4. There is perfect factor mobility within these two economies and it is limited within those national boundaries.
5. Perfect competition is prevalent within these economies.
6. There are constant returns to scale.
7. International trade is assumed to be free from taxes and transport costs.
8. All the available resources are being fully employed within these two economies.

The Hecksher-Ohlin theory provides a deeper distinction between capital intense and labour intensive production methods. The former is characterized by relatively large amounts of capital relative to labour while the former has more labour relative to capital.

This conditions are known as factor intensity. Factor intensity is determined by the costs of the factor of production and hence cheaper factor costs give rise to high factor intensity. On the contrary, factor abundance leads to cheaper factor costs. This gives rise to factor substitution. The concept of factor substitution assumes that one factor of production is substituted for another factor when its price increases relative to the other factor's price. For instance, an increase in capital costs can cause employees to engage in labour intensive production methods as they substitute capital for labour.

2.2.1 The Hecksher-Ohlin Theorem and International Trade

The Hecksher-Ohlin theorem posits that exports of goods will constitute those goods whose supply and use are cheaper and abundant. Alternatively, labour intensive economies will export more labour intensive products and capital intensive economies will export more labour intensive products. Thus this theory further asserts that comparative advantage is as result of factor abundance and factor intensity advantages. Hence, economies will export those goods in which they have a relatively high comparative advantages. Differences in the prices of exports is thus attributed to differences in comparative advantages.

2.2.2 The Hecksher-Ohlin Factor Equalization

The Hecksher-Ohlin contends that international trade will bring about factor price equalization. This is because differences in factor and input prices will initiate changes in quantity demanded and sold internationally. International trade is thus seen to cause high demand of those goods whose supply factor is intensive, abundant and cheaper. Demand will increase of cheaper imports causing the price of imports to increase and that of domestic goods to fall. Price adjustments due to changes in demand will settle at an equal level that matches demand and supply conditions in both economies. However, this is not true in reality and factor prices will never be equal. Furthermore, differences in production capacities and technological advances will stir mass production that further intensifies an increase in domestic competition which further drives prices downwards. Prices may increase on the international market when sold for exports but remain constant when sold in domestic markets.

The Hecksher-Ohlin suffers from a lot of complications that include the inability to incorporate transport costs and trade barriers which hinder factor equalization. The model further implies that nations that own huge amounts of resources will benefit more compared to those that own relatively small amounts of resources.

2.3 The Neoclassical Theory And The Export Led Hypothesis

The Neoclassical theory originated in a time when the world economy was suffering from problems of economic stagnation. Abedian and Standish (1992) justified the origins of the export-led growth strategy citing poor productivity capacity and lack of industrial competitiveness in most economies around the world. Furthermore, Abedian and Standish (1992) established that a lot of protective measures were hampering economic progress. As a result, great need arose to instill economic flexibility so as to resultantly attain productive levels were desired comparative advantages can be achieved. Krugman (1987) contrasts the idea of trade liberalization asserting that it affects production patterns and that the long term benefits are uncertain.

Insights by Cypher and Dietz (2004) revealed that are significant mutual gains that emanate from trade and can lead to an expansion in economic activity. Ultimately, it was established that specialization was the key to economic growth. Hence, it was advocated that economies engage in international trade of those goods in which both comparative and absolute advantage are high (Myint 1958). This was because specialization would further result wealth accumulation and an increase in social surplus.

Advocates of the export led hypothesis contend that the level of factor endowments and their marginal productivity were insufficient to guarantee sound economic performance. Szentes (2005) posits that an economy's growth rate is determined not only by the level of factor endowments but by income distribution, human capital and the level of technological progress.

2.4 The Supply Side Orientation

The supply side orientation offers great support for the adoption of export led strategies. Ideas by Adam Smith (1776) point to view that trade openness results in wealth accumulation and hence the need to promote exports. Srinivasan (2001) argues that only are exports an engine for growth but instead lead to an efficient allocation of resources. This idea was reinforced by Ram (1985) who postulated that a growth in export oriented industries will cause a shift of resources from areas where their total factor productivity is low to areas where their total factor productivity is high.

Melitz (2003) developed a trade model that portrayed the concept of efficient allocation of resources. In this model, Melitz (2003) assumes that there are firms of different sizes and with different productive capacities. Deductions form the model exhibit that poor performing firms will be driven out of the industry by high performing firms. Melitz (2003), further outlines that there is a welfare improvement that results from the reallocation of resources. It can be noted form this model that exports induced growth results in a new and productive structure.

The role of exports on economic growth was portrayed by productivity theory postulated by Adam Smith (1776). The productivity theory contends that an increase in exports will cause an expansion in market activities which further causes a shift in the economy's production possibility curve. The effect on economic growth is shown by the outward shift of the production possibility curve. Smith outlined that export expansion is associated with technological innovations, improvement in labour skills etc. Thus as the economy grows from an increase in exports, increasing returns to scale begin to set in and hence resulting in economic development. Bagwati (1988) also points to the idea that export oriented strategies will cause a breakdown in monopolies as more firms enter the enter market. This will cause an increase in competition and forces firms to improve both production methods and produced products. This is usually followed by investments in technology and labour improvements which are essential ingredients of economic growth.

The benefits of export oriented strategies are also assumed to extend to the capacity to acquire or import from the international market. This concurs with the ideas by Myint (1987), who established that exports lead to an expansion in economic activity which gives

the nation the capacity to import from other countries. The capacity to import stems from export revenue (foreign currency). Ideas by Myint (1987), suggest that export oriented strategies enable nations to utilize both unused and underutilized resources and this is usually followed by an increase in employment levels. Deeper insights tend to show that as attention shifts from domestic consumption to international supply, foreign direct investment (FDI) levels tend to increase as well. This is synonymous to the results established by Chung (2012) and Culem (1988) who found that there is a positive linkage between exports and foreign direct investment. The increase in foreign direct investment is the one that spurs economic growth. Empirical evidence holds especially when the increase in exports involves manufactured goods (Nayagam and Chung, 2012). The notion that export led strategies boost economic progress is triggered by technological advancements. The exposure of domestic firms to the international market will force them to produce products whose quality is of international standards. Moreover, exposure to international markets means increased competition and hence domestic firms are forced to innovate and improve both production and quality standards. Overally, the domestic economy benefits from the innovation as investments are poured in to achieve the desired improvements.

The benefits of export-led strategies are not limited to quality and innovation improvements but rather lead to economies of scale. Exports may trigger positive externalities which may extend within and outside the sector causing an increase inefficiency. Hence, domestic welfare rises and this is followed by increases in informational, managerial and technological spill. The Neoclassical theory in overall, contends that exports promote investment in human capital; and knowledge and is similar to the endogenous growth model (Marin, 1992). In conclusion, export oriented strategies result in an influx of capital, an improvement in both products, human skills and methods production, and produced output. The role of net exports on economic growth can expressed econometrically as follows;

$$Y = f(L, K, X) \quad \ldots\ldots (1)$$

In this case Y represent total output, labour is denoted by L while capital and exports are denoted by K and X respectively. The above function can be expressed in terms of growth rates as shown below;

$Y = \beta_0 + \beta_1 L + \beta_2 K + \beta_3 X$……. (2)

The elasticity of output Y is measured by the coefficients β_0, β_1, β_2, and β_3. The elasticity of capital cannot be easily estimated and hence has to be replaced by the capital investment ratio ($\Delta K/Y$). When the capital investment ratio is factored in, the model can be expressed as follows;

$Y = \beta 0 + \beta_1 L + \frac{dY}{dK} \times \frac{K}{Y} \times \frac{dK}{dK} + \beta_3 X$……. (3)

When dK is replaced by I the expression becomes;

$Y = \beta 0 + \beta_1 L + \alpha_2 \frac{dI}{dY} + \beta 3X$……. (4)

The marginal physical product of capital (MPP) is denoted by α_2. The above expression is represents a model that can be sued to estimate the role of net exports on economic growth. This model was supported by Ram (1985) who contends that the same model can be sued to estimate both the magnitude and direction of impact of exports on growth.

2.5 Limitations of The Export Led Hypothesis

In order for the export-led hypothesis to hold, economies must have attained a certain level of economic growth and development. The argument is based on the study by Dadaro (1991) which showed that there is a positive relationship that exists between economic development and exports composition. This argument proves that for the export-led strategies to yield successful results, it must be complemented by industrial efficiency (industrialization) and a certain level of economic development.

The other implication is that less developed economies are not in the position to enjoy from the export-led hypothesis until they have achieved a certain level of economic growth and development. Thus low developed countries can only enjoy from economies if the required level of industrialization has been achieved. There are however other

contrasting views which contend that benefits of adopting export-led strategies can be reaped irrespective of the level of economic development (Jurajda and Mitchell, 2003). Trade barriers and strict government intervention can stand as significant barriers to export expansion. Trade barriers and strict government intervention can limit and even prevent economies from fully enjoying from the benefits of export expansion.

2.6 The Role of Exports And The Kaldorian Growth Model

The Kaldorian Growth Model is a demand oriented model that contends that demand is an essential factor in determining the level of economic growth (Mill, 1844). In other words, long run output growth is said to be determined by the level of autonomous demand. This is compounded by international demand. According to Kaldor (1966), there is a positive relationship between productivity growth and output growth which can be expressed as follows;

$G_t = Yx_t$…… (1)

Where output growth is denoted by $\mathbf{G_t}$ and export demand by X_t. Kaldor (1966) asserts that growth is linearly related to exports which are also determined by the competitiveness of domestic prices relative to foreign prices and income ($\mathbf{G_f}$). Domestic competitiveness is usually evidenced by domestic inflation. A fall in domestic competitiveness is will cause an increase in inflation $\boldsymbol{\pi t-1}$.

$X_t = -\eta\pi_{t-1} + \delta\pi f + \epsilon G_f$…….. (2)

Inflation however tend to effect positive changes to the international market ($\boldsymbol{\pi f}$) while exports are assumed to be income elastic ($\boldsymbol{\epsilon}$). Thus exports are contend to be a function of domestic competitiveness measured by inflation, foreign competitiveness and positive effects of domestic inflation to the international traders and is expressed in equation (2).

$\pi_t = w + \tau - r_t$……... (3)

The competitiveness of exports in monetary terms, that is, price is denoted by $\boldsymbol{\pi_t}$ and is determined by changes in nominal wage inflation ($\mathbf{W}$), price mark-up ($\boldsymbol{\tau}$) and changes in the productivity of labour ($\boldsymbol{r_t}$).

$r_t = r_e + \lambda g_t$.....…….... (4)

Equation (4) denotes that there is a linkage between output growth and productivity growth and can be estimated using $\boldsymbol{\lambda}$ (Verdoorn coefficient). The idea behind λ is that it arises as a result of economies of scale. Labour productivity ($\boldsymbol{r_e}$) is assumed to be exogenously determined by other factors outside the model.

Using the above equations, it can be deduced that exports are determined by domestic competitiveness. The Kaldor equations further imply that output growth is positively related to exports growth rate, that is, an increase in export growth will pose positive effects on economic growth. The model implies that exports have multiple effects which extend throughout the economy by affecting labour productivity. Increases in economic growth are fostered by improvements in technology and increasing returns to scale.

2.7 Other Demand Oriented Theories And Export-Led Strategies

Other demand oriented theories sought to explain economic growth in relation to balance of payments. For instance, Lamfalussy (1963) formulated an open economy model that is constrained by balance of payments and sought to explain its implications on economic growth. Results of the model showed that an increase in exports triggers more investments which induces high productivity leading to a decline in export prices. The decrease in export prices will cause an increase in the demand for exports. This model however advocates that imports are necessary but should not be allowed to outweigh exports because if they do, a balance of payment problem will set in. Arguments in support of this model point to the fact that exports trigger a self-sustaining economic growth cycle, improve domestic productivity, lead to an increase in aggregate demand and they relieve balance of payment problems.

Further insights tend to show that export-led hypothesis as evidenced by the model by Lamfalussy (1963), which advocate for a devaluation of the domestic currency so as to promote more exports. This is because devaluation will cause domestic products to be cheaper on the international market and thus causing an influx of more foreign currency

which will offset the balance of payment problem. The study recommended diversification of exports so as to boost economic growth.

2.8 Empirical literature On The Role of Net Exports And Economic Growth

A significant number of studies have been put forward to explain the role of exports on economic growth. For instance, Kalaitizi (2013) employed the export-growth analysis in United Arab Emirates using time series data from the period 1980-2010. The analysis was based on the Johansen cointegration and the Two-step Engle Granger cointegration techniques. This techniques were backed by the Vector Autoregression Model and the results of the study showed that a long run relationship exists between primary exports, manufactured exports and economic growth. Granger causality results showed evidence of a positive linkage between economic growth and manufactured exports that runs from manufactured exports to economic growth.

A similar study was conducted by Ahdi et al. (2013) and it attempted to examine whether a linkage exist between exports and economic growth. The study was focused on South Africa and used time series data spanning from the period 1991-2011. Granger causality test were undertaken to determine if a long run relationship exists between exports and economic growth. The results showed that exports do not significantly influence economic growth. However, nonlinear causality tests exhibited proof that there is a linkage between economic growth and export and it runs in that order. Contrasting results were obtained when they tested the model by applying tests by Diks and Panchenko (2005) and showed that there is negative association between exports and economic growth.

A study by Kim and Lin (2009) took a different twist and analysed how export composition affect economic growth. The study focused on developing countries and results pointed to the idea that primary products that are meant for exports have no significant impact on growth. The reason suggested that export prices of primary products is prone to a lot of fluctuations. A significant relationship was discovered to exist between manufactured exports and economic growth.

Deeper insights of the role of exports on economic growth was uncovered by Abu al-Foul (2006) who examined the role of export-led strategies on economic growth in Jordan. The study covered the periods 1976-1997. Evidence revealed by the study showed strong support of export-led strategies and advocated for more policies to strengthen the role played by export-led strategies in Jordan. Policy initiatives were urged to focus on promoting investment and exports.

Abou Stait (2005) took a similar twist and analysed the impact of export-led strategies in Egypt. The difference being that the period of study ranged from 1977-2003 and a Vector Auto Regression model was used to estimate the model. The study sought to determine if cointegration exists between exports and economic growth and whether exports granger cause foreign direct investments. It was concluded that economic growth and exports are cointergrated and that exports granger cause foreign direct investments.

Studies have extended the role of export led strategies and have adopted Granger causality tests to determine the nature and direction between exports and economic growth. Of particular is a study by Awokuse (2003) which employed Granger causality tests to examine the role of export led strategies on economic growth in Canada. A VAR model estimation was used as further support of the obtained results which showed that exports do Granger cause economic growth in Canada. The relationship was observed to run from exports to economic growth.

It was argued that export alone are insufficient to explain changes in economic growth by Burrifge and Sinclair (2002). Burrifge and Sinclair (2002) therefore developed a model that can explain if a linkage exist between foreign direct investment, trade and economic growth in China. The data was cointergrated using the Johansen cointegration method and the results showed that a negative causality exist between foreign direct investment, trade and economic growth in China.

On the other hand, other studies sought to determine how the composition of exports affects changes in economic growth as a result of changes in foreign markets. Crespo, Cuaresma and Worz (2003) examined how changes in foreign markets affect the relationship between manufactured exports and economic growth. Results of the study showed that manufactured exports are price insensitive and that cyclical changes in the

international market does not impact the relationship between exports and economic growth.

A study by Shan and Sun (1998) proceeded to examine the impact of the export-led hypothesis on economic growth in Australia. A VAR model was used to estimate the model and the results of the study showed no evidence of positive roles played by the export-led hypothesis on economic growth in Australia. However, when the lag structure was varied, a unidirectional Granger causality was observed to exist between exports and economic growth.

Shan and Tian (1998) reexamined the export led strategy framework economic growth in Shanghai. Monthly time series data was used to examine the nature and direction of causality. A Vector Auto Regression model was used and results showed that exports Granger cause economic growth and that the relationship runs in a unidirectional way of that order.

Lie et al. (1997) analysed the relationship between trade openness and economic growth in the context of china. Quarterly time series data form the periods 1983, third quarter to first quarter of 1995 was used to estimate the relationship. Granger causality tests were conducted to determine if trade openness Granger causes economic growth. The results showed that there is a unidirectional causality that runs from trade openness to economic growth. As a result, it was recommended that more policies that open China to trade be availed.

Narayan and Smyth (2004) used a Vector Error Correction Model and the Johansen cointegration technique to examine if a linkage exist between real income, human capital accumulation and exports in China. Time series data from the period 1960-1999 was used in the analysis and the results showed evidence that real income and human capital accumulation are cointergrated. When and human capital accumulation was used a dependent variable, the results showed no evidence that human capital accumulation and real income are cointergrated. Chuang (2000) employed a similar analysis in the context of Taiwan and covered the period 1952-1995. The results showed that exports there is a unidirectional Granger causality that runs from human capital accumulation to economic growth. The results provided further weight to the export led hypothesis.

2.9 Chapter Summary

The role of exports on economic growth was observed to be explained theoretically by the Hecksher-Ohlin theory, the Neoclassical theory and the supply side orientation. It was evidenced from the employed theories that export promotion strategies have a positive effect on economic growth. The growth channels of export promotion pointed to an increase in employment of factors of production, improvements in productivity as a result of product and process innovation and an increase in foreign direct investment. Thus growth effect is contended to be emanating from positive changes in employment, technology and investment. Empirical literature has however diverged in consensus citing that the benefits from exports may not be significant enough to yield positive changes in economic growth or in investment. Suggested reasons suggested the presence of barriers and strict and lack of government regulation. The level of economic growth and development was also evidenced to be playing a significant role towards the effectiveness of exports in promoting economic growth.

CHAPTER THREE

OVERVIEW OF THE USA'S ECONOMIC POLICIES AND EXPORT STRATEGIES

3.1 Overview of The USA Economy

It is undebated that the USA is tops the world economy in both economic growth and development spheres and is ranked 1st in the world with China trailing behind. The USA's economy has a solid base that range from a well-diversified financial system to a highly advanced information and communications and production technology. These among other elements have compounded the USA's capacity to produce and acquire products worldwide. Despite the size of its population, which estimated to be 4% of the world population, it is reported that the USA accounts for 26% of the world's aggregate GDP. It is widely known and accepted that the United Sates dollar ($USD) is the widely traded currency in the world. Recent trends have indicated that the US dollar has continued to appreciate against major currencies in the world such as the Euro and the British Pound. Reports by Bloomberg (2015) showed that the Euro, Australian dollar and British Pound lost 0.09, 0.35 and 0.69 points respectively against the US dollar in the second week of January 2016.

Having undergone a severe financial crisis that racked economic havoc in the period 2007-2008 that saw people hoarding cash and a decline in interbank lending, the USA went into a recession. The USA's GDP slumped by 6% in the last quarter of 2008 which saw the Federal Bank of America bailing out banks and embarking of monetary expansion (BEA, 2010). Annual GDP dropped to -03% in 2008 and -2.8 in 2009 and spurred to 2.5 in 2010 (WDI, 2015).Despite, the upswings in economic performance, the USA's economy still continues to grow with annual growth rate of 3.25% being registered in December 2015 (Trading Economics, 2016). This has been coupled by a number of polies that seek to strengthen the economy and boost consumer confidence in both banks and the economy as whole. On the other hand, there a number of key factors that continue to drive the US economy and these are discussed in detail as follows;

3.2 US Growth By Sector

The US's private sector is a major pillar of the economy and contributes a significant share to the economy's output. Wholesale trade, technical services, scientific, professional, and finance and insurance provided much weight to the expanding US economy in 2015. The US's private sector accounts for a significant share of the USA's GDP compared to that of the public sector. It is evidenced in figure 3.1 that the private sector chipped in 6.2% of Real GDP in the third quarter of 2015 while contributions from the government slumped to -0.2% in the same year. It is exhibited that in overall the private goods have been a key driver of real GDP from the second quarter of 2014 to the second quarter of 2015 despite having dropped in Real Value contribution to real GDP in the first quarter of 2015. Private services' contribution rose to 5.5% in the second quarter of 2015. The increase in GDP to 3.9% in the second quarter of 2015 is contended to have been driven by 18 of the 22 industry groups (BEA, 2015). It can also be seen that private services are taking toll in the US economy and this is evidenced the prevalence of services such as managerial consulting, legal, engineering and accounting services. In 2012, a combined revenue of $1.5 trillion was grossed from the professional services industry while engineering and architectural services chunked $184.1 billion and $62.5 billion (Select USA, 2015).

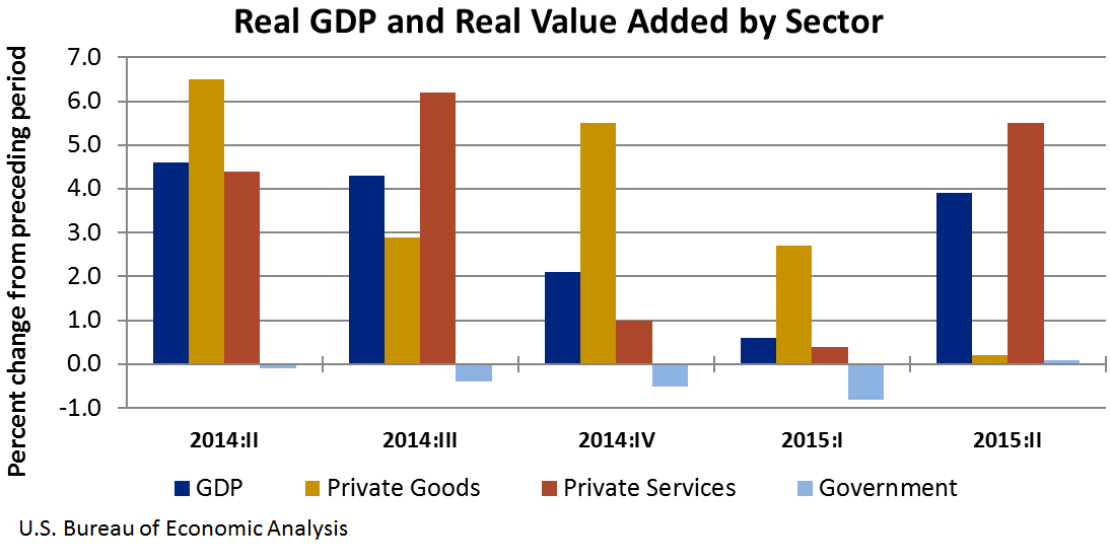


Figure 3.1 Real GDP and Real Value Added By Sector (Source: US Bureau Economics Analysis)

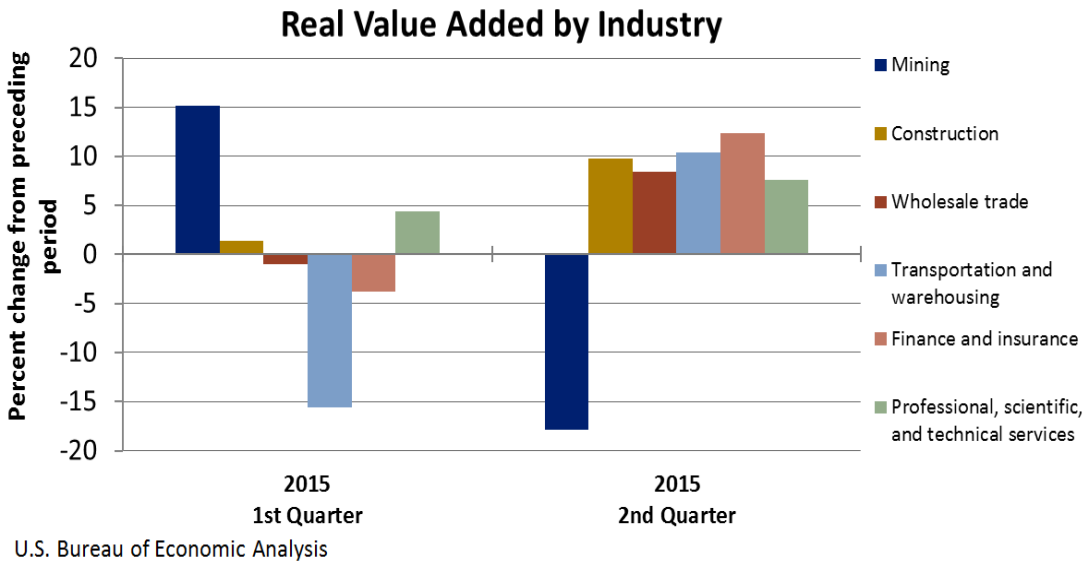


Figure 3.2 Real Value Added By Industry (Source: US Bureau Economics Analysis)

Contributions by the mining industry dropped from 15% in the first quarter of 2015 to -18% in the second quarter of 2015. Contributions from the construction, wholesale trade, transportation and warehousing, finance and insurance, and professional, scientific and technical services rose to 9.8%, 8.4%, 10.4, 12.4% and 7.6% respectively. The increases stemmed from improvements in factors such air transportation, gas and oil extraction, scientific research, architectural design and Federal Reserve Bank intermediation.

3.3 USA's Economic Growth Pattern

Table 3.1: USA's Economic Growth Rates (2010-2014)

Year	Annual GDP growth (%)	% change
2010	2.5	
2011	1.6	-36.00
2012	2.3	43.75
2013	2.2	-4.348
2014	2.4	9.09
2015	2.2	-9.09

Source: Seeitmarket

The USA's economic growth rate has been revealing a staggered trend with a highest decline of -36% being registered in 2011 were annual economic growth rate fell from 2.5% to 1.6%. The highest positive gain was recorded in 2012 when annual GDP surged by 43.75% from 1.6% to 2.3%. It also evidence from the table that the USA's economic performance has been unstable as positive gains in annual GDP went to fall from a positive margin of 43.75% to a negative gain of 4.348% in 2013. It can further be deduced that the pattern in GDP is staggered as annual GDP continued to increase in 2014 by 9.09% and fell in 2015 by the same margin.

3.4 Overview of USA's Export Performance

The USA's has been exhibiting positive trends in export performance over the past 5 years with a highest increase in performance being recorded in 2013 in which $2.3 trillion revenue was grossed. The 2013 increase in export revenue represented a 44% surge in export margin compared to the 2009 figure of $1.29 trillion. Major contributors of the positive gains were as a result of increases in the export of both goods and services which accounted for $28.4 billion and $32.4 billion. Contributions from exports of goods and services continued to grow in 2014 and 2015 with averages of 10% and 10.4% respectively (USCBC, 2015). It is apparent that exports have been a key driver of the USA's economic performance and it estimated that exports contributions to annual GDP have averaged 30% since the period 2009 (USCBC, 2015).

Table 3.2: Top 10 USA's Exporting Destinations (Countries)

	Country	Total ($ billion)	Growth 2013-2014	Average Annual Growth 2005-2014
1	Canada	$241.6	4.1%	4.4%
2	Mexico	$231.3	6.0%	8.1%
3	China	$120.8	0.6%	12.9%
4	Japan	$64.1	2.2%	2.4%
5	United kingdom	$47.2	13.2%	3.6%
	Country	Total ($ billion)	Growth	Average Annual Growth 2005-2014
6	Germany	$46.8	3.5%	4.3%
7	South Korea	$43.5	7.0%	5.6%
8	Brazil	$41.2	-4.0%	12.1%
9	Netherlands	$39.4	0.2%	5.8%
10	Hong Kong	$38.6	-5.1%	10.6%

Source: USCBC (2015)

Possible reasons to this astonishing export performance was attributed to an increase in the number of export destinations. The number of USA's export destinations rose to 230 countries in 2013 (USCBC, 2015) and it include countries such Canada, Mexico, China and Japan. From table 3.2 it can be noted that Canada, Mexico, China and Japan topped the list of the USA's export destinations and accounted for $300 billion, $226 billion, $122 billion and $65 billion respectively. Average annual exports to China from the period 2005-2014 grew by 12.1% and were trailed by Hong Kong with a margin of 10.6%. Lowest annual growth in exports were to Japan and United Kingdom with annual growth rates that averaged 2.4% and 3.6% from the period 2005-2014.

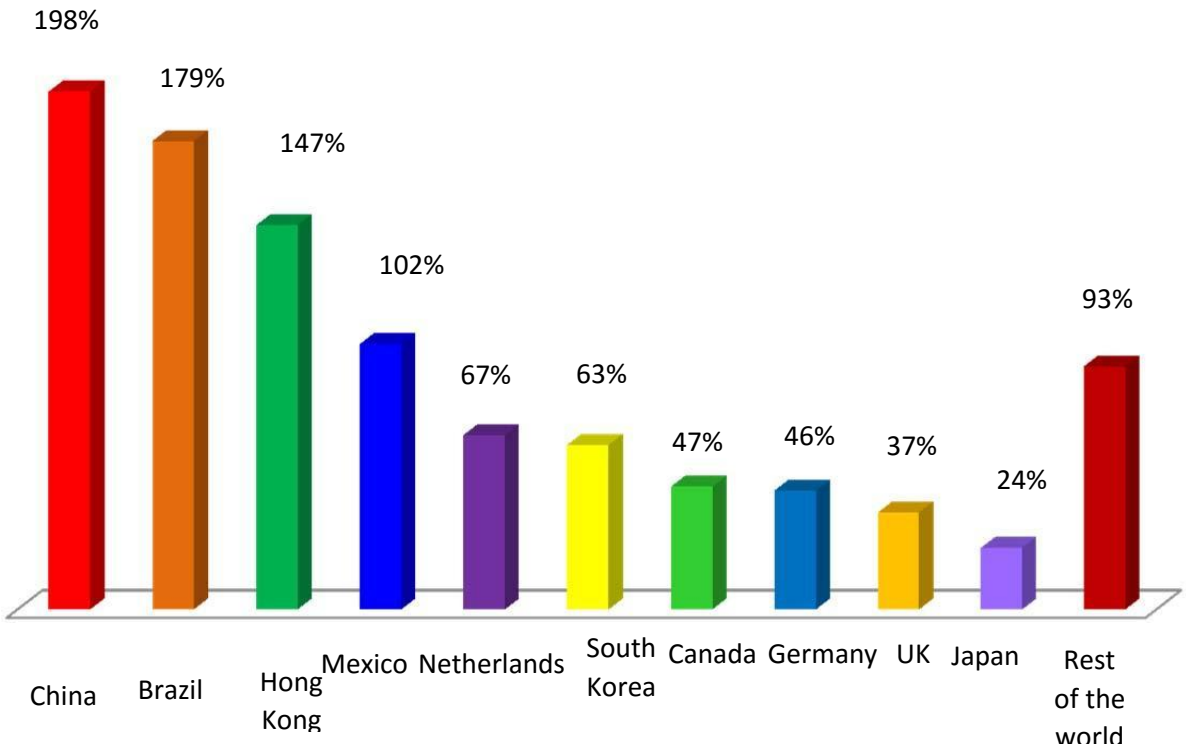


Figure 3.3: Top USA Export Markets In 2014 (Source: USCBC, 2015)

It is evidenced in figure 3.2 that China is the USA's top export market with a margin of 198% being export in 2014. Despite Canada accounting for 47% of the US's exports, Canada and China are the top US markets for exports which accounted for $300 billion and $226 billion respectively[1]. The USCBC (2015) reports that major products that ranked in high export revenue include chemicals, electronics and computers, crops and transportation equipment. Economic projections by USCBC (2015) hinted that China will emerge as the world's economic powerhouse within a space of 5 years overtaking the USA. This implies that export policies must therefore be shifted towards promoting trade between the USA and China. China's economic performance dominated the media fraternity when it emerged to be a major force of what is known as the BRICS[2]. Policy initiatives can further be strengthened to improve and boost trade with existing markets such as Mexico, Canada, Japan and South Korea.

[1] See table 3.2

[2] Countries that significantly grew in economic performance and were composed of Brazil, Russia, India, China and South Africa.

3.5 Trade Policies In The USA

Trade policies in the USA included tax incentives and other financial schemes that were designed to boost exporting firm's financial leverage. Such schemes and incentives were availed to existing and potential export firms in the USA on the conditions of a capacity to generate more revenue and create more jobs. Synonymously with bailouts, export schemes were availed to exporters of petroleum products and transport equipment. Exports of petroleum products and transport equipment have contributed significantly to the USA's GDP. The composition of petroleum products and transport equipment led growth is be shown in figure 3.4.

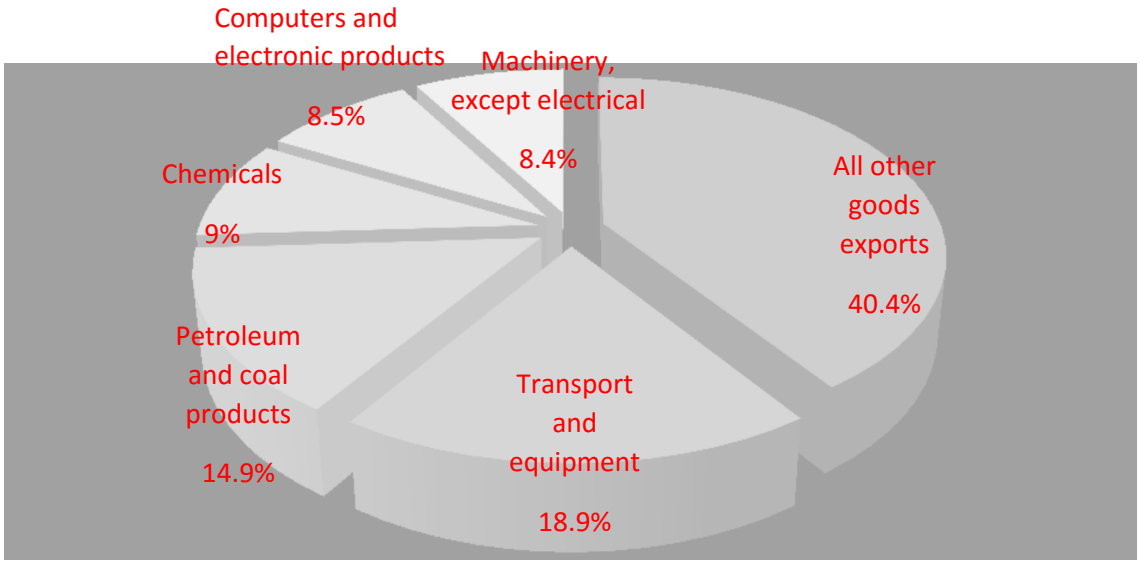


Figure 3.4: Export-led Growth Contribution By Product 2009-2013 (Source: USA Department of Commerce, 2014)

Export of transport equipment trailed second as a major booster of the USA's export growth led strategies and accounted for 18.9% of exports which represented a revenue of $98.6 billion. Export of transport equipment included aircrafts and aircraft spare parts, motor vehicle spare parts and cars. Increases in export revenue were also observed in petroleum and coal products and chemicals with margins of 14.9% and 9.0% and represented a total of $77.7 billion and $40 billion respectively (USA department of Commerce, 2014).

Export incentives and schemes availed by the US have shown evidence of paying off. This can be evidence by an increase in the number of merchandise exporters. According to the USA's department of Commerce (2014) the number of merchandise exporters rose from 276 643 in 2009 to 304 867 in 2012. Thus it can be argued that the prevailing export led strategies have significantly worked towards promoting and boosting US exports. This is also evidenced by size description of exporters as shown in figure 3.5.

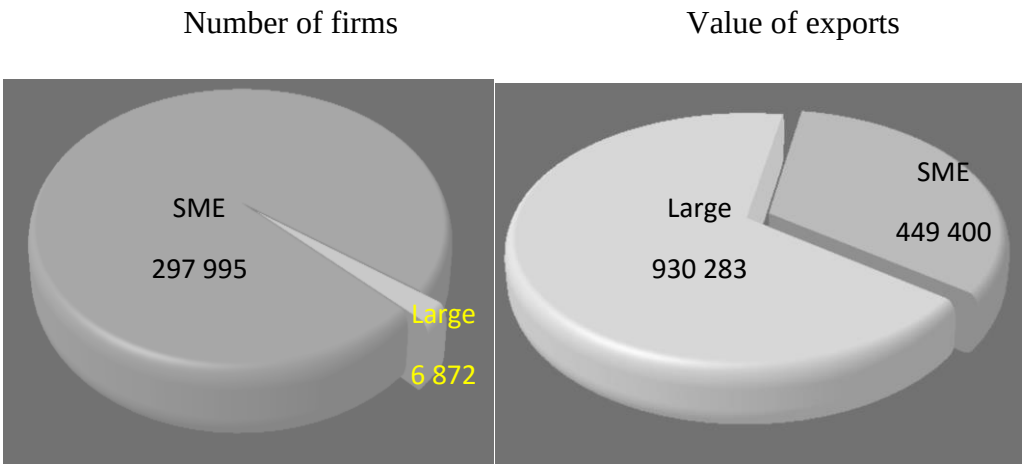


Figure 3.5: USA Exporters By Size of The Company, 2012 (Source: USA Department of Commerce, 2014)

During the period 2012, the number of exporters stood at 297 995 and was composed of small to medium enterprises (SME) while that of large firms was 6 872. Large firms however dominated in terms of grossed export revenue with a value of 930 283 compared to 449 400 of SME. The manufacturing industry does dominant in terms of the number of exporting firms in the USA but has a low value contribution when compared to other industries and sectors.

However, when compared to table 3.1 which showed the USA's annual GDP growth, it is apparent that exports though they have positively contributed to an improvement in the USA's economic performance, the margin of contribution is insignificant. During the same period 2009-2013, it evidenced by table 3.1 that the USA's economic performance has been unstable and staggered as positive gains in annual GDP went to fall from a positive margin of 43.75% to a negative gain of 4.348% in 2013.

3.6 State Level Export Growth

Table 3.3: State Level Export Growth From 2009-2013

State	2009	2013	2009-2013 (Dollar change)	2009-2013 (% change)
United States	1 056 042 963 028	1 578 851 422 749	522 808 459 721	50%
Texas	162 994 740 450	279 694 916 153	116 700 175 703	72%
California	120 079 965 765	168 128 418 347	48 048 452 582	40%
Lousiana	32 616 451 452	63 079 100 473	30 462 649 021	93%
Washington	51 850 856 743	81 938 684 618	30 087 827 875	58%
Michigan	32 655 333 884	58 456 169 285	25 800 835 401	79%

Source: US Department of Commerce (2014)

The table above shows states that have the high margins of dollar change in the value of exports. Texas topped the list with a dollar change of 522 808 459 721 from 1 056 042 963 028 in 2009 to 1 578 851 422 749 in 2013. The percentage change was however 50% and was 43% lower than that of Louisiana which had a dollar change of 30 462 649 021. Texas was second on the list with a dollar change of 116 700 175 703 and the percentage change was 22% higher than that of Texas. Michigan trailed behind at the bottom with a dollar change of 25 800 835 401 and the percentage change was 29% higher than that of Texas.

US Department of Commerce (2014) outlined that goods export growth outweighed the 2009 figure and stood at an estimated total of $10 billion and was a combined total of 13 states. The growth in goods export growth was attributed to specialization at both state and product level. This was further compounded by the type of products that were exported. It is reported that coal and petroleum products accounted for 63% and 34% of

the total change in goods export growth and were combined totals of Louisiana and Texas (US Department of Commerce, 2014). On the other hand, the goods export growth in Michigan and Washington was mainly driven by transport equipment which accounted for 57% and 59% of the change in goods export growth.

3.7 Benefits of Export Promotion In The USA

Numerous benefits arising from exports can be identified to vary with country and level of economic growth and development. Thus what seems to be major benefits to one country may not be a major benefit to the other country. Despite the dynamic and muchly debated benefits of exports the following benefits were identified to be prevalent and emanating from exports in the USA.

3.7.1 Job Creation

The Hecksher-Ohlin theory posits that export promotion is usually followed by increases in the rate employment. According to the Hecksher-Ohlin theory, export promotion allows firms to specialize in the production of those goods in which they have a comparative advantage. In doing so, causes mass production. As the economy produces more goods and services for exports, employment of both factors of production tends to rise with the level of growth of exports. This was evidenced by the study by Melitz (2003) who established a positive association between employment and exports. This can be reinforced by table 3.4.

Table 3.4 Job Creation From Exports (millions)

	Total	**Goods**	**Services**
2009	9.7	6.0	3.6
2010	10.2	6.5	3.7
2011	10.9	6.9	4.0
2012	11.1	7.0	4.0
2013	11.3	7.1	4.2

Source: US Department of Commerce (2014)

It is evidenced that job creation form exports is exhibiting a positive linkage with exports. The total number of jobs that were created by exports rose from 9.7 million in 2009 to 11.3 million in 2013. Both exports of goods and services have been positively contributing to employment levels but at different rates. Contributions to the employment level from goods export rose from 6% in 2009 to 7.1 % in 2013 while that of service exports rose from 3.6% in 2009 to 4.2% in 2013. Much contribution is from the export of goods. Furthermore, the US Department of Commerce (2014) outlined that export paying industries are one of the highest paying industries in the USA with salaries that are 15-20% higher than those of service industries.

3.7.2 Attracting Investments

Export industries are lucrative investments especially for multinational corporations (MNCs) which may be established in another country so as to gain access to a particular resource of great value or that may offer them a competitive edge in the market. As a result, foreign direct investments can increase in sectors whose goods and services are in great demand on the international market. Culem (1988) found that there is a positive linkage between exports and foreign direct investment. This is because by entering international markets, domestic firms are exposed to more competition and hence have to innovate. Innovation allows firms to improve the quality of their products and lower production costs so as to remain competitive. The increase in investment has been a key contributor to economic growth in the USA.

3.7.3 Diversification

When domestic firms enter foreign markets, they are either directly or indirectly diversifying. Product diversification is of paramount importance because when other products are poorly performing, the net effects can be countered by exports. Thus this can have positive effects on the economy in times when the domestic economy is underperforming. This can be evidenced by the recession that took place in 2008 in the USA. The US's financial was under a crisis which saw banks and other financial institutions losing positive gains but the exporting firms continued to post positive gains.

3.7.4 Innovation

Innovation results in product improvements and improves the marginal productivity of both capital and labour. The reason stems from exposure to international competition. Myint (1987) established that exports can cause technological spillovers as they engage with international customers and firms. There is evidence that exporting firms in the USA are more technologically productive compared to non-exporting firms (Nayagam and Chung, 2012).

3.7.5 Benefits To Economic Growth

The benefits to economic growth are a combined effect of the other benefits. Nayagam and Chung, (2012) point to an improvement in productivity will causes an outward shift of the production possibility curve; Culem (1988) points to an increase in foreign direct investment while Melitz (2003) points to an increase in employment of factors of production. Both notions have direct effects on economic growth. Export oriented growth has been on an upward trend in the USA.

3.7.6 Foreign Currency

Exports rank in the much needed and scarce foreign currency. Revenue from exports has been contended to be a force that strengthens an economy's capacity to finance domestic production and further import goods and services from other countries. Studies however diverge on foreign currency related from exports. Culem (1988) asserts that exports result in an inflow of foreign currency while Nayagam and Chung, (2012) strongly contend that foreign currency inflows from exports is not significant. Despite, the different consensuses, it can be noted that the value of dollar change in exports in the USA has increased tremendously between the periods 2009- 2013.

3.8 Shortfalls of Export-Led Strategies In The USA

Culem (1988) and Nayagam and Chung, (2012) have shared different views on the benefits that can be reaped from exports. Shortfalls of export promotion strategies are contended to be an expense to domestic firms. It is strongly believed that there is a trade of between export promotion and imports. Export promotion strategies can be harmful

especially when they involve a devaluation of the domestic currency. This will hamper the economy's purchasing power and is evidenced by a reduction in imports. The idea of import restriction is not evident in the USA.

Export oriented strategies are accused of support of non-democratic systems and this is because most economic solutions are made by the government or responsible monetary authorities. Thus the public is not consulted on matters that involve exports. Legislation is just imposed and requires full compliance of members.

It is also apparent that export promotion strategies are prone to cultural problems. Export products may not be allowed to interfere with the importing country's cultural aspects. Most exports from USA especially when exported to Africa are considered to be posing infringing cultural standards. Moreover, it is impossible to export culture. Culture is usually made difficult to export and is coupled by language barriers.

Social welfare is affected when exports when policies are made with regards to economic benefits at the expense of social benefits. It is argued that governments make economic policy with the main thrust to gain economically. Thus social benefits are compromised in the process.

Export promotion is surrounded by political problems as politicians use taxes and other incentives to gain political influence. There is always a negative association between politics and economic progress. In conclusion, export promotion strategies can result in extinction of an economies resources. The rate at which resources are depleted is contended to be positively associated with export growth. In the USA, export promotion has been said to be associated with a deterioration in infrastructure. Thus export promotion can be said to be beneficial when the overall gains outweigh environmental problems.

3.9 Proposition To The USA's Export-Led Growth Strategies

It was advocated that there be an increase in the role played by Export-Import Bank in the USA. This was in consensus that export promotion strategies are beneficial to the USA's economy but need to be reinforced with policies that can allow domestics firms to boost their importing financial leverage.

The USA's Trade Representative needs to play a wider role in ensuring that barriers that hinder market access are removed. Such barriers have been thwarting US's export potential. It must also monitor and enforce stipulated statutes to ensure that export standards are not infringed.

There is also a gap that needs to be filled to ensure that the Foreign Export Service (FCS) is effective in executing its mandate. The FCS assist USA firms in locating export opportunities in other countries.

State and local governments must enact policies that help domestic firms compete on the international market. Thus more resources must be expended towards ensuring that domestic firm's export objectives are attained.

3.10 Summary

From the above analysis it can be deduced that export orientation strategies have resulted in a significant number of benefits to the USA's economies. The benefits ranged from an increase in employment, increase in investment, innovation to boosting economic growth. Top USA export markets were identified to be Mexico, Canada and China. The benefits of export towards economic growth have shown a staggered trend in the USA though positive contributions to economic growth were recorded. It can be concluded using the above analysis that export promotion strategies have a positive effect on the USA's economic growth but the margin of effect is not significant. Thus recommendations can be made advocating for further strengthening of export policies that are supplemented by the US government role to enforce, monitor and assist export firms.

CHAPTER FOUR

REASEARCH METHODOLOGY

4.1 Model Estimation

When conducting Vector Error Correction Model estimation using time series data, the variables must contain a unit root at levels but must be stationary at 1st difference. Such information can be provided through unit root tests such as the Augmented Dickey-Fuller Test (1979) and Phillips-Perron (PP) Unit Root Test (1988). The presence of a unit root signifies that the data is non-stationary. The model results are said to be 'spurious' results. It is in this regard that both the Augmented Dickey-Fuller Test (ADF) and Phillips-Perron (PP) will be used to test the variables for stationarity. This requires that an OLS be done using unrestricted regression.

$$Y_t - Y_{t-1} = \alpha + \beta t + (\rho - 1)\ Y_{t-1} + \sum_{j=1}^{p} \lambda_j \Delta Y_{t-j} \ldots\ldots\ldots\ldots (1)$$

And then, the restricted regression,

$$Y_t - Y_{t-1} = \alpha + \sum_{j=1}^{p} \lambda_j \Delta Y_{t-j} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Where, $\Delta Y_t = Y_t - Y_{t-1}$, then a standard F ratio is calculated to test whether the restrictions ($\beta=0$, $\rho=1$) hold. Then we compare this computed F value to the table value given by Dickey-Fuller. If the computed value is greater than the table value at certain level of significance we reject the null hypothesis of non-stationarity.

A VECM offers information about the existence of a short-run relationship between any two cointegrated variables. The focus of the VEC Model analysis is the one period lagged

error terms from the previously estimated cointegrating equations. These lagged terms provide an explanation of the short-run deviations from the long-run equilibrium. While testing the long-run dynamic relationship between model variables concerned, we may not make any a priory assumption of endogeneity and exogeneity of variables concerned. In such situation, Vector Auto-regression Model (VAR) can be used.

This model treats all variables systematically without making reference to the issue of dependence or independence. Moreover, a VAR model allows us to study the 'Impulse Response Function' and 'Variance Decomposition' for the variables. We have tried to apply all these techniques in this study.

4.2 Cointergration

Cointegration test provides information about the existence of a long-run equilibrium between the associations of an integrated series. The Johansen co-intergration approach provides a foundation for applying a VAR model (Engle and Granger, 1987). The notion behind the Johansen co-intergration approach requires that the

The maximum order of lags of the auto regressive be determined first using VAR lag selection criteria. The Johansen test provides information of the existence of cointegration using both the trace test and the Max- Eigen value. Identification of the number of cointergrating vectors is based on the comparison of the Max-Eigen value and the Trace test with the test statistics. Johansen, 1988 suggests that using the Eigen values of $\boldsymbol{\Pi}$ order from the largest to the smallest is for computation of trace statistics.

4.3 Granger Causality

The Granger causality test was performed so as to determine the lead-lag linkage that exists between economic growth and exports. Granger causality makes it possible to determine if current values of one variable can be explained by past values of the same variable. Given two variables X and Y, granger causality determines if X granger cause Y. That is if past values of X aid in describing Y. A 2-way exists when Y granger cause

X and X granger cause Y. According to Granger, (1969), is thus Y is said to be Granger-caused by X if the coefficients on the lagged Xs are statistically significant. The direction of causality can bet determine using the following expressions;

$$\Delta X_t = \sum_{i=1}^{n} \alpha_i \Delta Y_{t-i} + \sum_{j=1}^{n} \beta_j \Delta X_{t-j} + u_{1t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textbf{(1)}$$

$$\Delta Y_t = \Sigma_{i=1}^{n} \lambda_t \Delta Y_{t-1} + \Sigma_{j=1}^{n} \delta_j \Delta X_{t-j} + u_{2t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \textbf{(2)}$$

A two way causality exists when all regressions of ***X*** and ***Y*** coefficients are statistically significant from zero $(\sum \alpha i \neq 0)$ and $(\sum \delta j \neq 0)$ **(**Eagle and Granger, 1987**).** Expression 1 tests the null hypothesis that ***Y*** does not Granger cause ***X*** while expression 2 tests the null hypothesis ***X*** does not Granger-cause ***Y.*** This study will determine if a bilateral causality exists between economic growth and exports.

4.4 Speciation Tests

Specification tests such as serial correlation, heteroscedasticity and model recursive tests will be undertaken to determine the validity of the estimated model. Serial auto correlation exists when the error terms are correlated whereas heteroscedasticity occurs when the variance of the error terms is not homoscedastic. Serial correlation tends to affect the significance of the variables and high standard errors may be observed in the model. The same applies with heteroscedasticity, the difference being that high standard errors are common and the estimators are not efficient. Recursive tests are done so as to determine the stability of the model. If a model is to be employed for decision making process then it has to exhibit characteristics of stability.

4.5 Definition of Variables

4.5.1 Gross Domestic Product (GDP)

Gross domestic product is a macroeconomic indicator that provides information about the level of output that is produced within an economy. In this study, percentages changes in GDP were obtained from the FRBL and ranged from 1970:Q1 to 2015:Q2. This study attempts to identify the role of exports on economic growth. Thus GDP represents the

model independent variable. An analysis of the behaviour of GDP in the USA is illustrated in figure 4.1.

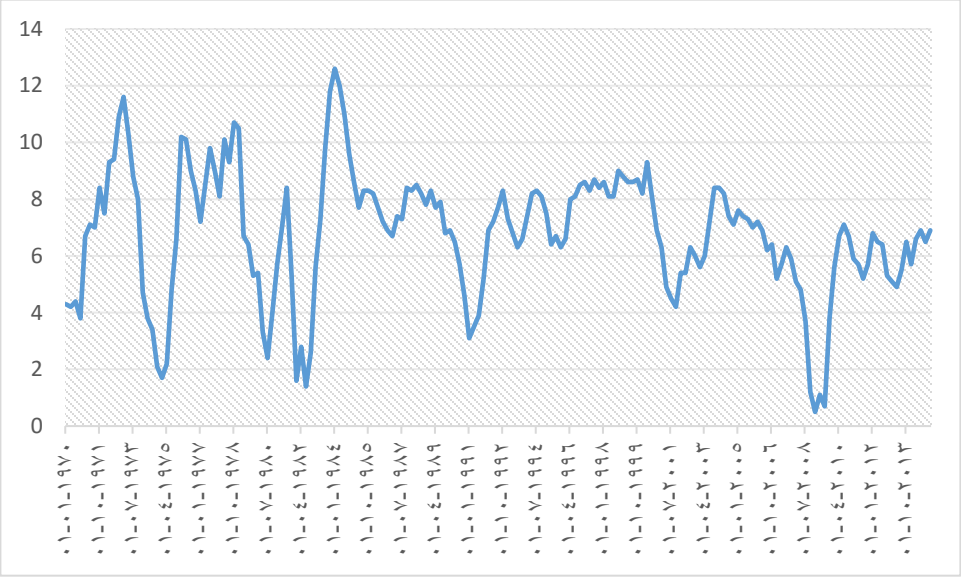


Figure 4.1: An analysis of the behaviour of GDP in the USA from 1970-2015 (Source: Computed using FRBL data)

Figure 4.1 shows that a staggering economic performance has been taking shape in USA with highest levels of economic growth being experienced in 1971, 1985 while lowest margins were observed in 1975, 1982, 1991, 2001 and 2009.

4.5.2 Gross Fixed Capital Formation (GFCF)

Gross fixed capital formation comprises of resident producers' purchases, less sales, of fixed assets during a given period plus certain additions to the value of non-produced assets realized by the productive activity of producer or institutional units. In this study GFCF was recorded in billions of chained US$. Pavalescu, (2007) conducted a study on the relationship between GFCF and economic growth and the study established that there is a positive linkage that exists between GFCF and economic growth. This study attempts to establish if such a result applies in USA.

4.5.3 Exports (EX)

Exports represents the value or amount of goods and services that are sold to other countries. In this, exports were recorded in billions of chained US$. Lee and Huang, (2002) employed a multivariate threshold autoregressive approach to examine the

relationship between exports and economic growth in East Asian countries. The results established strong support of a positive association between exports and economic growth. Suggested reasons contended that revenue inflows in the form of foreign currency reserves provide funding which is used to finance domestic production. The increase in domestic production is the force behind the expansion in economic growth. A positive expectation of the relationship between exports and economic growth is therefore anticipated.

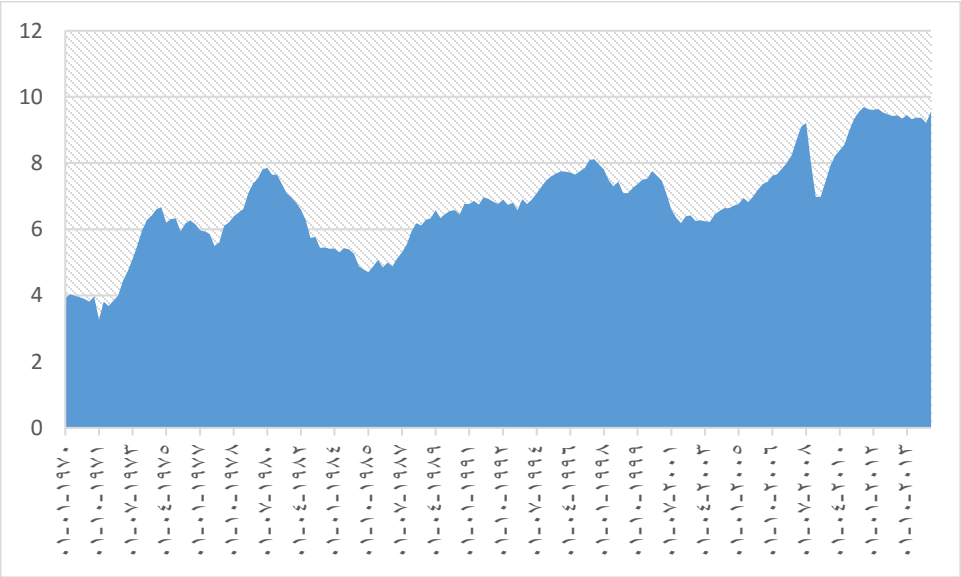


Figure 4.2 Export levels for the USA (Source: Computed using FRBL data)

It is evidenced above that exports in the USA have been on an upward trend with significant increases being recorded starting from the year 2010 onwards. It is in this regard that this study attempts to determine how such a trend relates to economic performance.

4.5.4 Imports (IMP)

Chained value of imports were registered in US$ and the period concern covered the 1st quarter of 1970 to the 1st quarter of 2015. Lee and Huang, (2002) strongly asserted that the level of exports and economic growth are related with the level of imports and can either be bilateral or unilateral. This study therefore sought to determine how such an association affects economic growth in the USA. Mishra, (2012) undertook a study to investigate the relationship between imports and economic growth and the results

established that there is a bilateral relationship that exist between imports and economic growth. The results by Lee and Huang, (2002) showed that the linkage can either be positive or negative. Thus this study seeks to determine the type of an association that exists between imports and economic growth in the USA.

4.5.5 Unemployment (UNEMP)

The association between unemployment and economic growth was subjected to a study by Habees and Rumman, (2012). The Habees and Rumman, (2012) revealed that there is a negative relationship that exist between imports and economic growth. It was further revealed that the channels through which unemployment affects economic growth is through production and income which translate to demand. The results showed that there is a strong linkage that exist between the level of exports and unemployment and has to be studied. It is this regard that the study will examine the relationship between unemployment and economic growth.

4.6 Data Sources

The data that was used in the estimation process was collected from the Federal Reserve Bank of St Louis and covered the first quarter of 1970 to the first quarter of 2015. The following description can be made about the variables.

Table 4.1 Variable Description

Data source	Time span	Variable	Expected relationship
FRBL	1970:Q1 – 2015:Q1	GFCF	(+)
FRBL	1970:Q1 – 2015:Q1	EXP	(+)
FRBL	1970:Q1 – 2015:Q1	IMP	(-/+)
FRBL	1970:Q1 – 2015:Q1	UNEMP	(-)

CHAPTER FIVE

DATA ANALYSIS AND PRESENTATION

5.1 Stationarity Test

Stationarity tests are an essential element of empirical analysis because they allow the detection of the presence of a unit root. When the utilized data has a unit root, the data is said to be non-stationary. Non stationary data negatively affect the reliability of the estimated model. In this regard the obtained results are said to be spurious. In this study, the Augmented Dickey Fuller Test and the Phillips Perron will be used to determine the presence of a unit root. Augmented Dickey Fuller test results presented in Table 5.1 show strong evidence of the presence of a unit root at levels but becomes stationary at first difference. Thus all the variables are said to be non-stationary at levels and stationary at first difference. Stationarity results are presented in table 5.1.

Table 5.1 Fisher-ADF test

Fisher-ADF test @ level						
Variables	**Intercept no trend**			**Intercept and trend**		
	Test Statistic	**Critical Value**	**Prob***	**Test Statistic**	**Critical Value**	**Prob***
GDP	-3.153139	-3.469451	0.0247	-3.274515	-4.013608	0.0741
GFCF	-0.022053	-3.466994	0.9545	-2.750638	-4.010143	0.2179
UEEMP	0.225250	-3.466786	0.9735	-2.270345	-4.009849	0.4475
IMP	0.698640	-3.466994	0.9919	-2.190528	-4.010143	0.4915
EXP	-1.566334	-3.466994	0.4977	-2.627994	-4.010143	0.2685
	Fisher-ADF Test @ Ist Difference					
Variable	**Intercept no trend**			**Intercept and trend**		
	Test	**Critical**	**Prob***	**Test**	**Critical**	**Prob***

	Statistic	Value		Statistic	Value	
GDP	-7.047426	-3.469451	0.0000*	-7.018618	-4.013608	0.0000*
GFCF	-5.948460	-3.466994	0.0000*	-5.952195	-4.010143	0.0000*
UNEMP	-13.62507	-3.466994	0.0000*	-4.010143	-4.010143	0.0000*
IMP	-6.899717	-3.466994	0.0000*	-7.050911	-4.010143	0.0000*
EXP	-9.383770	-3.466994	0.0000*	-9.354953	-4.010143	0.0000*
**** Rejection of null hypothesis of unit root at 1% level of significance.***						

Source: E-Views 8.0 iterations Results - Test of Stationarity

Phillips Perron tests results presented in table 5.2 have shown strong evidence in support of the Augmented Dickey Fuller Test results presented in table 5 that there is a unit root at levels but all the variables become stationary at first difference. It can thus be concluded that all the variables are perfect elements for conducting cointegration test. Cointegration test will be conducted using the Johansen cointegration test.

Table 5.2 Phillips Perron Stationarity Tests Results

Phillips Perrron test @ level						
Variables	**Intercept no trend**			**Intercept and trend**		
	Test Statistic	**Critical Value**	**Prob***	**Test Statistic**	**Critical Value**	**Prob***
GDP	-1.408290	-3.466786	0.3824	-2.510164	-4.009849	0.3019
GFCF	0.310436	-3.466786	0.9783	-2.519228	-4.009849	0.3186
UNEMP	0.022996	-3.466786	0.9586	-2.296161	-4.009849	0.4335
IMP	1.068241	-3.466786	0.9972	-1.922252	-4.009849	0.6388
EXP	-1.598202	-3.466786	0.4814	-2.549257	-4.009849	0.3043
	Phillips Perrron Test @ Ist Difference					
Variable	**Intercept no trend**			**Intercept and trend**		
	Test Statistic	**Critical Value**	**Prob***	**Test Statistic**	**Critical Value**	**Prob***

GDP	-9.588610	-3.466994	0.0000 *	-9.546843	-4.010143	0.0000*
GFCF	-6.091299	-3.466994	0.0000 *	-6.104259	-4.010143	0.0000*
UNEMP	-13.84737	-3.466994	0.0000 *	-13.88806	-4.010143	0.0000*
IMP	-6.752161	-3.466994	0.0000 *	-6.769483	-4.010143	0.0000*
EXP	-9.383770	-3.466994	0.0000 *	-9.354953	-4.010143	0.0000*
**** Rejection of null hypothesis of unit root at 1% level of significance.***						

Source: E-Views 8.0 iterations Results

5.2 Variable Lag Selection Criteria

Lag selection criterion provides methods that are used to determine the number of lags that will be used to conduct the Johansen cointegration test. The selection of the number of lags is based on the concept of selecting the selected lag that has the lowest possible value. According to table 5.3 both the Sequential Modified LR, Final Prediction Error and the Akaike Information Criterion have shown strong favour in support of 6 lags. The Johansen cointegration test will therefore be conducted using 6 lags.

Table 5.3 Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	244.8208	NA	4.30e-08	-2.772495	-2.681359	-2.735522
1	1869.578	3136.814	4.00e-16	-21.26680	-0.71998*	-21.04496
2	1925.961	105.5956	2.78e-16	-21.62960	-20.62711	-1.22290*
3	1964.104	69.23060	2.39e-16	-21.78155	-20.32338	-21.18998
4	1980.063	28.04352	2.67e-16	-21.67703	-19.76318	-20.90059
5	2014.976	59.33213	2.39e-16	-21.79163	-19.42210	-20.83033
6	2044.265	8.08186*	2.29e-6*	-21.84122*	-19.01601	-20.69505
7	2057.188	20.46792	2.67e-16	-21.70160	-18.42072	-20.37057
8	2075.893	28.54313	2.91e-16	-21.62882	-17.89226	-20.11292

5.3 Johansen Cointegration

Johansen Cointergration test will be employed so as to determine if a stable long run relationship exist between economic growth and exports, imports, unemployment and gross fixed capital formation. This will be made possible by use of Trace and Maximum Eigen Value test results provided by the Johansen Cointergration test.

Table 5.4 Johansen Cointegration Test

Unrestricted Co-intergration Rank Test (Trace Test)			
Hypothesized	**Trace**	**Sig. Level: 0.05**	
No, of CE(s)	**Statistic**	**Critical Value**	**Prob****
None*	85.21146	69.81889	0.0018
At most 1	42.41470	47.85613	0.1474
At most 2	24.15039	29.79707	0.1942
At most 3	11.07179	15.49471	0.2071
At most 4	0.888345	3.841466	0.3459
Trace test indicates 1 cointegration at the 0.05 level *** denotes rejection of the hypothesis at the 0.05 level**			
Unrestricted Co-intergration Rank Test (Maxmum Eigenvalue)			
Hypothesized	**Trace**	**Sig. Level: 0.05**	
No, of CE(s)	**Statistic**	**Critical Value**	**Prob****
None*	42.79675	33.87687	0.0033
At most 1	18.26431	27.58434	0.4733
At most 2	13.07861	21.13162	0.4450
At most 3	10.18344	14.26460	0.2002
At most 4	0.888345	3.841466	0.3459
Max-eigenvalue indicates 1 cointegration at the 0.05 level *** denotes rejection of the hypothesis at the 0.05 level**			

Source: Computed by Author (E-Views 8.0 iterations Results) Johansen Cointegration test

Trace statistic and Maximum Eigen value results exhibit that there is 1 cointegration equation at 5%. Thus it can therefore be concluded that exports, imports, unemployment and gross fixed capital formation are cointergrated at 5%. Alternatively, it can be said that a long run stable relationship does exist between exports, imports, unemployment and gross fixed capital formation.

5.4 VECM Estimation

According to the VECM estimation results it can be deduced that there is no long run causality that runs from economic growth to exports, imports, unemployment and gross fixed capital formation. Exports and gross fixed capital formation are positively related to economic growth. Table 5.4 shows the obtained VECM estimation result.

Table 5.5 VECM Estimation

Variables	Coefficient	Standard Error	T-Statistics
Constant	5.545787	-	-
LGFCF(-1)	0.740576	(0.28783)	[2.57300]
LEX(-1)	0.274382	(0.25442)	[1.07845]
LIMP(-1)	-1.030978	(0.41573)	[-2.47993]
LUNEMP(-1)	-3.030601	(1.57743)	[-1.92123]

Using the above results, the following expressions can be made about the estimated model;

$$\textbf{LnGDP} = 5.545787 + 0.740576\boldsymbol{LGFCF} + 0.274382\boldsymbol{LEX} - 1.030978\boldsymbol{LIMP} - 3.030601\boldsymbol{LUNEMP}$$

It can be noted that the relationship between economic growth and gross fixed capital formation is positive. This entails that a 1% change in GFCF will initiate a 74.06% increase in economic growth. Possible reasons point to the idea that increasing returns to scale are be reaped and there is an expansion in the economy's productive capacity which is causing an increase in economic growth. This is in support of the study done by

Pavalescu, (2007) and possible reasons suggest that the USA economy is spending or investing more towards projects that result in improvement in infrastructure and other capital related activities which foster economic growth.

The linkage between economic growth and imports can be observed to be negative and this is translating to a decline in economic growth by 1.03 units following an increase in imports by 1 unit. Study results by Habees and Rumman (2012) showed that the relationship between economic growth and imports can either be negative or positive. This suggest that the type of imports has a significant impact on economic growth. Producer goods are said to result in an increase in economic growth as compared to consumer goods.

Meanwhile the relationship between economic growth and exports is observed to be positive. This means that an increase in exports by 1% will initiate an increase in economic growth by 27.44%. This is in support of the study results obtained by Lee and Huang (2002) and it can be concluded that foreign currency inflows from exports is being positively used to finance growth related projects.

On the other hand, a negative association can be observed between economic growth and unemployment. Thus an increase in unemployment by 1 unit results in a decline in economic growth by 3.03 units. This is a further reinforcement to the study by Habees and Rumman (2012) which established that there is a negative linkage that exists between economic growth and unemployment. Unemployment is translating to a decline in income and productive capacity which manifest in the form of a decline in growth.

5.5 Error Correction Term Results (EC_{t-1})

The error correction was observed to be 0.4193 and this means that the speed at which the variables move towards long run stability or equilibrium is 41.93%. It is depicted in table 5.11 that both the error correction term and the VECM model are significant at 1%. The Durbin Watson statistic around the limit of 2 and this signifies the absence of serial correlation.

Table 5.6 Error Correction Results

Coefficient	-0.419313*
Prob.	0.0000*
Std. Error	0.095053
t-Statistic	-4.411371
R^2	0.4878
DW	2.054549
Prob (F-statistic)	0.0000*

** Indicates significance at 1% significance level*

5.6 Wald Test

Table 5.7 Wald tests short run VECM estimation results (Dependent Variable: LGDP)

Null hypothesis	**Test statistic**	**Value**	**df**	**Prob.**
Null Hypothesis: C(2)=C(3)=C(4)=C(5)=C(6)=C(7)= 0	Chi-square F-statistic	3.461 20.764	(6,142) 6	0.0032 0.0020
Null Hypothesis: C(8)=C(9)=C(10)=C(11)=C(12)=C(13)=0	Chi-square F-statistic	2.176 13.058	(6,142) 6	0.0487 0.0421
Null Hypothesis: C(14) =C(15)=C(16)=C(17)=C(18)=C(19)=0	Chi-square F-statistic	2.658 15.948	(6,142) 6	0.0179 0.0140
Null Hypothesis: C(20)=C(21)=C(22)=C(23)=C(24)=C(25)=0	Chi-square F-statistic	2.296 13.777	(6,142) 6	0.0381 0.0322
Null Hypothesis: C(26)=C(27)=C(28)=C(29)=C(30)=C(31)=0	Chi-square F-statistic	2.310 13.860	(6,142) 6	0.0370 0.0312
Source: Computed by Author (E-Views 8.0 iterations Results)				

This study used the Wald test to determine if there are short run relationships that span from gross fixed capital formation, exports, imports and unemployment to economic growth. Thus the Wald test will test the null hypothesis asserting that there exists no short run relationship that spans from the independent variables to the dependent variable. Wald test results are presented in table 5.13.

All the probabilities provided but Wald test results are less than 5% and thus we reject the null hypothesis of no short run relationship. It can thus be concluded that there is no short run relationship that runs from gross fixed capital formation, exports, imports and unemployment to economic growth.

5.7 Granger Causality Test

Table 5.8 Granger Causality

Null Hypothesis:	Obs	F-Statistic	Prob.
GDP does not Granger Cause EX	179	1.23757	0.2926
EX does not Granger Cause GDP		2.94805	0.0551
GFCF does not Granger Cause EX	179	1.71816	0.1824
EX does not Granger Cause GFCF		0.25614	0.7743
IMP does not Granger Cause EX	179	2.89706	0.0579
EX does not Granger Cause IMP		0.79629	0.4526
UNEMP does not Granger Cause EX	179	0.61748	0.5405
EX does not Granger Cause UNEMP		3.40326	0.0355
GFCF does not Granger Cause GDP	179	4.72429	0.0100
GDP does not Granger Cause GFCF		0.66555	0.5153
IMP does not Granger Cause GDP	179	8.96791	0.0002
GDP does not Granger Cause IMP		6.85845	0.0014
UNEMP does not Granger Cause GDP	179	0.81068	0.4462
GDP does not Granger Cause UNEMP		1.79667	0.1689
IMP does not Granger Cause GFCF	179	3.26366	0.0406
GFCF does not Granger Cause IMP		4.05057	0.0191
UNEMP does not Granger Cause GFCF	179	0.84782	0.4301
GFCF does not Granger Cause UNEMP		3.87577	0.0226
UNEMP does not Granger Cause IMP	179	4.26851	0.0155
IMP does not Granger Cause UNEMP		2.30975	0.1023

It can be noted that GDP and EX do not granger cause each other and hence the direction of causality is said to be bidirectional. The same can be said between GFCF and EX, unemployment and export, and imports and exports. The direction of causality is bidirectional. However, GFCF does granger GDP but GDP does not granger cause GFCF. Thus the directional of causality is said to be unidirectional and runs from growth. Imports however do granger cause growth and growth does granger cause growth imports. A bidirectional causality is said to exist. The same can be said for imports and GFCF, and unemployment and imports. Unidirectional causality exist between unemployment and GFCF, and unemployment and imports. The direction of causality runs from GFCF to unemployment and from unemployment to imports. It can be concluded that there is no causality between exports and economic growth.

5.8 Impulse Response

Table 5.9: Response of LGDP

Response period	LGDP	LEX	LGFCF	LIMP	LUNEMP
1	0.223937	0.000000	0.000000	0.000000	0.000000
2	0.175986	0.014428	0.060387	-0.001122	-0.034005
3	0.208744	-0.010424	0.074637	0.003740	-0.016214
4	0.155221	-0.035938	0.065198	0.017632	-0.027099
9	-0.044696	-0.077830	-0.016239	0.066487	-0.049778
10	-0.026815	-0.073098	-0.025702	0.033299	-0.055200

Note: Full description is shown in list of appendices

It can be noted in table 5.9 that exports, GFCF and unemployment have relatively high responsive effect to GDP while GDP has relatively high response effects on exports. GFCF, IMP and UNEMP have relatively low responsive effects on exports (table 5.10).

Table 5.10: Response of LEX

Response period	LGDP	LEX	LGFCF	LIMP	LUNEMP
1	0.012230	0.037666	0.000000	0.000000	0.000000
2	0.023039	0.040006	-0.002013	0.001164	-0.001280
3	0.024059	0.050276	-0.002171	-0.001354	0.005745
9	0.025600	0.048544	0.001754	-0.000550	0.024104
10	0.025461	0.048487	0.002202	-0.000181	0.025673

Note: Full description is shown in list of appendices

Table 5.11: Response of LGFCF

Response period	LGDP	LEX	LGFCF	LIMP	LUNEMP
1	0.007853	5.39E-05	0.012290	0.000000	0.000000
2	0.012710	-0.000642	0.015198	0.000511	-0.000343
3	0.016658	-0.000511	0.017687	0.000324	0.001706
4	0.016021	-0.000288	0.018838	0.001861	0.001418
10	0.006455	-0.008166	0.030876	0.010537	-0.005601

Note: Full description is shown in list of appendices

GDP has high responsive effect on GFCF while EX, IMP and UNEMP have relatively low responsive effect on GFCF (table 5.11). GDP has high responsive effect on IMP and other variables have relatively low responsive effect on IMP (table 5.12).

Table 5.12: Response of LIMP

Response period	LGDP	LEX	LGFCF	LIMP	LUNEMP
1	0.010111	0.005201	0.005373	0.018761	0.000000
2	0.022810	-0.001887	0.008465	0.015261	-0.000251
3	0.023540	0.002384	0.009734	0.013021	0.002709
4	0.021698	-0.002227	0.008627	0.012817	-0.001203
9	0.004441	-0.020235	0.009270	0.022893	-0.014064
10	0.002079	-0.019297	0.007460	0.022098	-0.017351

Note: Full description is shown in list of appendices

Table 5.13: Response of LUNEMP

Response period	LGDP	LEX	LGFCF	LIMP	LUNEMP
1	0.000824	-0.000502	0.000622	0.000376	0.006316
2	0.000546	-0.000629	0.000309	0.000242	0.005559
3	-0.000702	-0.000330	0.000446	0.000551	0.004986
4	-0.000415	-0.000765	0.000461	0.000192	0.005945
5	-0.000880	-0.000804	0.001030	0.000369	0.007311
6	-0.001664	-0.000952	0.000485	0.000820	0.007998
7	-0.001609	-0.001190	2.33E-05	0.000985	0.008669
8	-0.001839	-0.001055	0.000205	0.000631	0.008798
9	-0.001839	-0.000943	0.000494	0.000334	0.009028
10					
Cholesky Ordering: LGDP LEX LGFCF LIMP LUNEMP					

Table 5.13 shows that all the variables have relatively low responsive effect on unemployment.

5.9 Diagnostic Tests

5.9.1 Serial Correlation Test

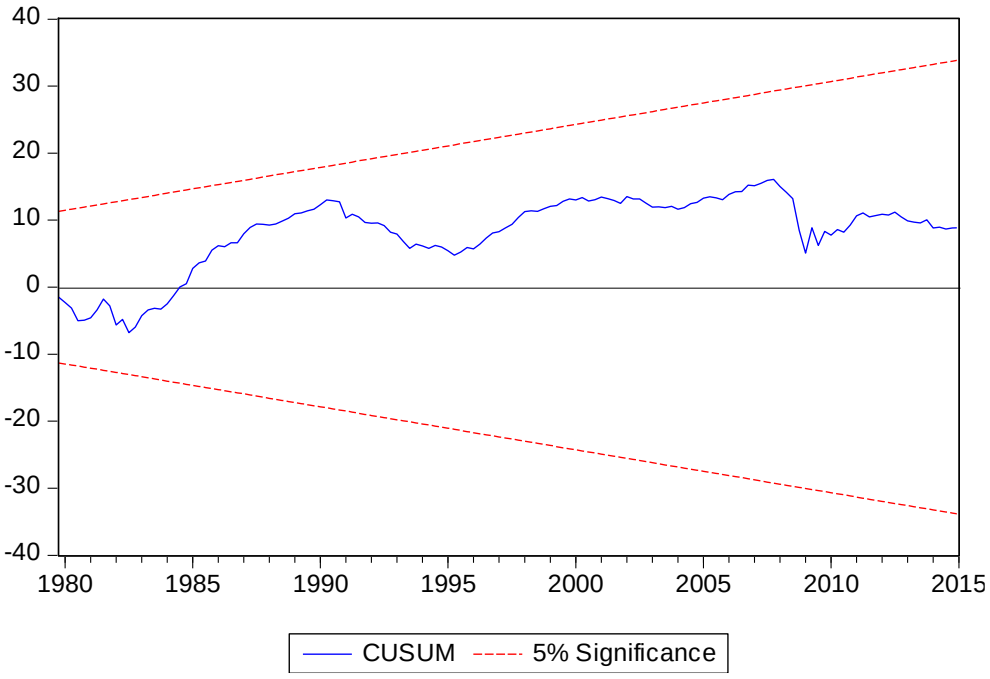
Serial correlation test was conducted using the Breusch-Godfrey Serial correlation LM test and sought to test the null hypothesis that there is no autocorrelation. Evidence provided in table 5.12 shows that the estimated model does not suffer from serial correlation evidence.

Table 5.14. Breusch-Godfrey Serial Correlation LM Test Results

F-statistic	1.187483	Prob. F(2,15)	0.3080
Obs*R-squared	2.902505	Prob. Chi-Square(2)	0.2343

Source: Computed by Author (E-Views 8.0 iterations Results)

5.9.2 Stability Test



It can be observed that the model in within the stipulated bands and hence it is stable and it can thus be used for decision making and other policy related functions.

CHAPTER SIX

CONCLUSION, SUGGESTIONS AND RECOMMENDATIONS

6.1 Introduction

This study was undertaken with the main emphasis of analyzing the relationship between exports and economic growth. This was driven by the soaring export levels that are being experienced in the USA whereas economic growth has been on a steady path. Theoretical underpinnings assert that an increase in exports is linked to high levels of economic growth but the reverse was observed in the USA. Questions were therefore raised as to what is the exact role of exports towards economic growth and what causes the USA to favor export promotion strategies at the expense of import led strategies.

Other economies such as China have however benefited immensely from exports. Therefore this study sought to determine the channels through which exports can effect a change on economic growth. Such identified in this channels include imports, gross fixed capital formation and unemployment.

Empirical frameworks were employed to further enlighten understanding about the role of exports on economic growth. Such studies showed that growth from exports emanates from positive changes in employment, technology and investment. Empirical literature has however diverged in consensus citing that the benefits from exports may not be significant enough to yield positive changes in economic growth or in investment.

A VECM was used to analyse the relationship between exports and economic growth and the results of the study showed that there is a positive linkage that exist between them. The results further showed the existence of a negative association between economic growth and imports, and unemployment. It is in this regard that policy recommendations will be made.

6.2 Conclusion

It can be concluded that there is a positive relationship that exists between exports and economic growth in the USA and such a relationship is being contributed by the positive

influence of gross fixed capital formation. However, unemployment and import levels are standing as hindrances to economic growth.

6.3 Recommendations

The USA government is advised to increase investment or expenditure towards gross fixed capital formation. Such an increase will translate to improved infrastructure which is also a necessity for economic growth and development.

Measures can also be put in place to further increase export levels. This can be done through the use of export incentives and subsidies. Trade arrangements can also be made to eliminate trade barriers. This may also be reinforced by bilateral and multilateral trade agreements.

There is need to curb the negative impact that is being posed by imports. The negative association between imports and economic growth can be as a result of the effects of inflation. Therefore efforts must ensure that imports must not stimulate inflationary pressure. This may be done by heavily taxing consumer goods and providing incentives for the import of producer goods.

Much funds must be injected towards financing domestic production so as to boost the employment of both factors of production which include labour. Taxes on personal income and corporate income must not be so high to an extent that they discourage investment and people from seeking employment. Measures can also be adopted that promote FDI inflows especially in productive sectors of the economy.

6.4 Suggestions For Future Research

Model stability tests and other tests results have shown that this study provides good estimates of the relationship between exports and economic growth in the USA. However, future studies can incorporate the impact of inflation on growth and can encompass variables such as money supply and exchange rate.

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List of Appendices

Appendix 1: Johansen Cointegration Test Results

Date: 05/23/16 Time: 11:30
Sample (adjusted): 1971Q4 2015Q1
Included observations: 174 after adjustments
Trend assumption: Linear deterministic trend
Series: LGDP LGFCF LIMP LUNEMP LEX
Lags interval (in first differences): 1 to 6

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.218045	85.21146	69.81889	0.0018
At most 1	0.099646	42.41470	47.85613	0.1474
At most 2	0.072409	24.15039	29.79707	0.1942
At most 3	0.056846	11.07179	15.49471	0.2071
At most 4	0.005092	0.888345	3.841466	0.3459

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

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.218045	42.79675	33.87687	0.0033
At most 1	0.099646	18.26431	27.58434	0.4733
At most 2	0.072409	13.07861	21.13162	0.4450
At most 3	0.056846	10.18344	14.26460	0.2002
At most 4	0.005092	0.888345	3.841466	0.3459

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

Appendix 2: VECM Results

Vector Error Correction Estimates
Date: 05/23/16 Time: 11:35
Sample (adjusted): 1970Q3 2015Q1
Included observations: 179 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
LGDP(-1)	1.000000
LGFCF(-1)	-0.703659 (0.21757) [-3.23411]
LIMP(-1)	0.534389 (0.33120) [1.61350]
LUNEMP(-1)	1.675489 (1.40973) [1.18852]
LEX(-1)	0.900004 (0.22423) [4.01373]
C	-5.978584

Error Correction:	D(LGDP)	D(LGFCF)	D(LIMP)	D(LUNEMP)	D(LEX)
CointEq1	-0.369326 (0.05258) [-7.02354]	0.011038 (0.00339) [3.25946]	0.002696 (0.00547) [0.49284]	-0.000530 (0.00139) [-0.38178]	0.013391 (0.00836) [1.60121]
D(LGDP(-1))	0.118102 (0.07087) [1.66641]	0.004745 (0.00456) [1.03969]	0.045646 (0.00737) [6.19144]	0.003757 (0.00187) [2.00962]	0.018254 (0.01127) [1.61946]
D(LGFCF(-1))	5.831764 (1.47387) [3.95678]	0.311578 (0.09492) [3.28254]	0.303258 (0.15332) [1.97799]	-0.011183 (0.03887) [-0.28766]	-0.045836 (0.23441) [-0.19554]
D(LIMP(-1))	1.168663 (0.73802) [1.58351]	0.029563 (0.04753) [0.62199]	0.057617 (0.07677) [0.75050]	-0.029670 (0.01947) [-1.52422]	-0.127864 (0.11738) [-1.08936]
D(LUNEMP(-1))	-3.267264 (2.85120) [-1.14592]	0.107359 (0.18362) [0.58467]	-0.066273 (0.29659) [-0.22345]	-0.044060 (0.07520) [-0.58589]	-0.035118 (0.45346) [-0.07744]

D(LEX(-1))	0.088654	-0.048343	-0.207838	0.001419	0.133302
	(0.49992)	(0.03220)	(0.05200)	(0.01319)	(0.07951)
	[0.17734]	[-1.50153]	[-3.99661]	[0.10763]	[1.67658]
C	-0.105488	0.010404	0.008502	-0.000540	0.006477
	(0.02826)	(0.00182)	(0.00294)	(0.00075)	(0.00449)
	[-3.73333]	[5.71709]	[2.89270]	[-0.72499]	[1.44131]
R-squared	0.247599	0.344288	0.328673	0.040389	0.066189
Adj. R-squared	0.221353	0.321414	0.305254	0.006914	0.033614
Sum sq. resids	10.72207	0.044471	0.116022	0.007459	0.271204
S.E. equation	0.249675	0.016080	0.025972	0.006585	0.039709
F-statistic	9.433587	15.05170	14.03480	1.206547	2.031893
Log likelihood	-2.040181	488.8877	403.0618	648.6794	327.0682
Akaike AIC	0.101008	-5.384220	-4.425272	-7.169602	-3.576181
Schwarz SC	0.225654	-5.259574	-4.300625	-7.044956	-3.451534
Mean dependent	0.002773	0.015209	0.013061	-0.001038	0.004821
S.D. dependent	0.282947	0.019520	0.031160	0.006608	0.040393

Determinant resid covariance (dof adj.)	3.63E-16
Determinant resid covariance	2.97E-16
Log likelihood	1929.833
Akaike information criterion	-21.11545
Schwarz criterion	-20.40319

Appendix 3: Speed of Error Correction

Dependent Variable: D(LGDP)
Method: Least Squares
Date: 05/23/16 Time: 11:37
Sample (adjusted): 1970Q3 2015Q1
Included observations: 179 after adjustments
D(LGDP) = C(1)*(LGDP(-1) - 0.703659443567*LGFCF(-1) +
0.534389271044*LIMP(-1) + 1.67548867681*LUNEMP(-1) +
0.90000383196*LEX(-1) - 5.978584238) + C(2)*D(LGDP(-1)) + C(3)
*D(LGFCF(-1)) + C(4)*D(LIMP(-1)) + C(5)*D(LUNEMP(-1)) + C(6)
*D(LEX(-1)) + C(7)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.369326	0.052584	-7.023535	0.0000
C(2)	0.118102	0.070872	1.666407	0.0975
C(3)	5.831764	1.473867	3.956778	0.0001
C(4)	1.168663	0.738019	1.583513	0.1151
C(5)	-3.267264	2.851203	-1.145925	0.2534
C(6)	0.088654	0.499923	0.177335	0.8595
C(7)	-0.105488	0.028256	-3.733327	0.0003

R-squared	0.247599	Mean dependent var	0.002773
Adjusted R-squared	0.221353	S.D. dependent var	0.282947
S.E. of regression	0.249675	Akaike info criterion	0.101008
Sum squared resid	10.72207	Schwarz criterion	0.225654
Log likelihood	-2.040181	Hannan-Quinn criter.	0.151551
F-statistic	9.433587	Durbin-Watson stat	2.164282
Prob(F-statistic)	0.000000		

Appendix 4: Impulse Response Functions

Table 5.9: Response of LGDP

Response period	LGDP	LEX	LGFCF	LIMP	LUNEMP
1	0.223937	0.000000	0.000000	0.000000	0.000000
2	0.175986	0.014428	0.060387	-0.001122	-0.034005
3	0.208744	-0.010424	0.074637	0.003740	-0.016214
4	0.155221	-0.035938	0.065198	0.017632	-0.027099
5	0.032400	-0.074012	0.045003	0.051025	-0.054411
6	-0.025139	-0.083230	0.018048	0.067697	-0.059588
7	-0.050808	-0.095022	0.015093	0.099256	-0.054923
8	-0.067581	-0.093569	0.003520	0.081047	-0.063474
9	-0.044696	-0.077830	-0.016239	0.066487	-0.049778
10	-0.026815	-0.073098	-0.025702	0.033299	-0.055200

Table 5.10: Response of LEX

Response period	LGDP	LEX	LGFCF	LIMP	LUNEMP
1	0.012230	0.037666	0.000000	0.000000	0.000000
2	0.023039	0.040006	-0.002013	0.001164	-0.001280
3	0.024059	0.050276	-0.002171	-0.001354	0.005745
4	0.026850	0.050255	-0.002793	-0.001228	0.007665
5	0.028311	0.051723	-0.002555	-0.003480	0.010202
6	0.028797	0.049905	0.000635	-0.003613	0.012303
7	0.027758	0.049684	0.001769	-0.003080	0.018379
8	0.028407	0.048573	0.002235	-0.001253	0.021455
9	0.025600	0.048544	0.001754	-0.000550	0.024104
10	0.025461	0.048487	0.002202	-0.000181	0.025673

Table 5.11: Response of LGFCF

Response period	LGDP	LEX	LGFCF	LIMP	LUNEMP
1	0.007853	5.39E-05	0.012290	0.000000	0.000000
2	0.012710	-0.000642	0.015198	0.000511	-0.000343
3	0.016658	-0.000511	0.017687	0.000324	0.001706
4	0.016021	-0.000288	0.018838	0.001861	0.001418
5	0.016769	-0.001761	0.022453	0.002989	-0.001613
6	0.014380	-0.003278	0.027413	0.005168	-0.003148
7	0.012877	-0.005214	0.029271	0.008653	-0.003864
8	0.010744	-0.006742	0.029535	0.010179	-0.002936
9	0.008074	-0.007449	0.029311	0.011035	-0.003495
10	0.006455	-0.008166	0.030876	0.010537	-0.005601

Table 5.12: Response of LIMP

Response period	LGDP	LEX	LGFCF	LIMP	LUNEMP
1	0.010111	0.005201	0.005373	0.018761	0.000000
2	0.022810	-0.001887	0.008465	0.015261	-0.000251
3	0.023540	0.002384	0.009734	0.013021	0.002709
4	0.021698	-0.002227	0.008627	0.012817	-0.001203
5	0.021720	-0.008757	0.009241	0.013850	-0.005851
6	0.016385	-0.013715	0.011816	0.016656	-0.009511
7	0.011147	-0.016711	0.014542	0.019335	-0.012340
8	0.009034	-0.018717	0.012277	0.022988	-0.012247
9	0.004441	-0.020235	0.009270	0.022893	-0.014064
10	0.002079	-0.019297	0.007460	0.022098	-0.017351

Table 5.13: Response of LUNEMP

Response period	LGDP	LEX	LGFCF	LIMP	LUNEMP
1	0.000824	-0.000502	0.000622	0.000376	0.006316
2	0.000546	-0.000629	0.000309	0.000242	0.005559
3	-0.000702	-0.000330	0.000446	0.000551	0.004986
4	-0.000415	-0.000765	0.000461	0.000192	0.005945
5	-0.000880	-0.000804	0.001030	0.000369	0.007311
6	-0.001664	-0.000952	0.000485	0.000820	0.007998
7	-0.001609	-0.001190	2.33E-05	0.000985	0.008669
8	-0.001839	-0.001055	0.000205	0.000631	0.008798
9	-0.001839	-0.000943	0.000494	0.000334	0.009028
10					
Cholesky Ordering: LGDP LEX LGFCF LIMP LUNEMP					

NEAR EAST UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES

Economics Master's Program
Thesis Defence

THE ROLE OF NET EXPORTS ON ECONOMIC GROWTH IN USA

We certify the thesis is satisfactory for the award of degree of
Master of Economics

Prepared by

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