

**EFFECTS OF TRADE OPENNESS ON ECONOMIC GROWTH AND INVESTMENT IN
KENYA**

FRANCIS ODHIAMBO MAORO

X51/85396/2016

**A RESEARCH PROJECT SUBMITTED TO THE SCHOOL OF ECONOMICS,
UNIVERSITY OF NAIROBI IN PARTIAL FULFILLMENT OF THE REQUIREMENT
FOR THE AWARD OF DEGREE MASTERS OF ARTS IN ECONOMIC POLICY
MANAGEMENT.**

2019

DECLARATION

I declare that this research project is my original work and has not been submitted for the award of a degree in any other university or institution

FRANCIS ODHIAMBO MAORO

SIGNATURE..... DATE.....

Reg No. X51/85396/2016

This research project has been submitted for examination with my approval as the University Supervisor.

DR. DANIEL ABALA

SIGNATURE..... DATE.....

DEDICATION

I dedicate this project to my parents who I spent the whole of my childhood with, Jack Ooko Maoro and Ruth Anyango of Gera Village. It is also dedicated to my children, Amanda, Natalie, Claude, and Lucy Chloe. I cannot forget my family: Brothers, Paul, Phelix, Bornphas, Austine and my only sister Mectrida Amondi.

ACKNOWLEDGMENT

I would first of all thank God for grunting me good health and faith during my Master's studies. I also thank my supervisor, Dr Abala, for the time and effort he in reviewing my work and giving constructive suggestions.

I would also like to sincerely thank the support of my family, dad Ooko Maoro, mum Ruth, wife Beryl, Brothers: Paul, Phelix, Bornphas, Austine and Sister Mectrida and most inspirational lecturers at undergraduate and post-graduate levels, Dr Odhiambo Sule, Dr Nyandemo, Dr Abala, Dr. Nyang`oro and Prof. Newton Kulundu. I also share the joy with my mentors, Dr. Tom Onyango and Brian Gakari. I will forever be grateful for your encouragement.

The views expressed in this project are my own and I solely bear the responsibility for any errors/or omissions.

TABLE OF CONTENTS

| | |
|--|------|
| DECLARATION..... | ii |
| DEDICATION..... | iii |
| ACKNOWLEDGMENT | iv |
| TABLE OF CONTENTS | v |
| LIST OF TABLES | vii |
| ACRONYMS..... | viii |
| ABSTRACT..... | ix |
| CHAPTER ONE | 1 |
| INTRODUCTION..... | 1 |
| 1.0 Background | 1 |
| 1.2 Evolution of Trade Policies and Economic Growth in Kenya: 1963-2018..... | 2 |
| 1.3 Statement of the problem | 5 |
| 1.4 Objectives of the study..... | 5 |
| 1.5 Significance and motivation of the study | 6 |
| 1.6 Scope of the study..... | 6 |
| 1.7 Organization of the study | 7 |
| CHAPTER TWO | 8 |
| LITERATURE REVIEW | 8 |
| 2.0 Introduction..... | 8 |
| 2.1 Theoretical literature..... | 8 |
| 2.2 Empirical literature | 10 |
| 2.3 Overview | 12 |
| RESEARCH METHODOLOGY | 14 |
| 3.0 Introduction..... | 14 |
| 3.1 Theoretical framework..... | 14 |
| 3.2 Empirical model..... | 16 |
| 3.3 Variable definition, measurement, and a <i>priori</i> expectation | 18 |
| 3.4 Data source | 20 |
| 3.5 Diagnostic tests | 21 |
| 3.5.1.1 Unit root test..... | 21 |
| 3.5.1.2 Multicollinearity test..... | 21 |
| 3.6 Estimation techniques..... | 21 |
| CHAPTER FOUR..... | 23 |
| EMPIRICAL FINDINGS AND DISCUSSION..... | 23 |
| 4.1 Introduction..... | 23 |
| 4.2 Summary Statistics | 23 |
| 4.2 Pre-Estimation Tests..... | 25 |
| 4.2.1 Trend Analysis | 25 |
| 4.2.2 Unit Root Test | 26 |
| 4.3 Post-Estimation Tests | 28 |

| | |
|--|----|
| 4.3.1 Co-integration Test | 28 |
| 4.3.2 Heteroscedasticity test | 29 |
| 4.6.3 Multicollinearity test | 30 |
| 4.7 Econometric Results | 30 |
| 4.7.1 Short and Long Run Effects of Trade Openness on Kenya’s Economic Growth | 30 |
| 4.7.2 Effects of Trade Openness on Kenya’s Investment | 34 |
| SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS | 37 |
| 5.1 Introduction | 37 |
| 5.2 Summary and Conclusion | 37 |
| 5.3 Policy Implications | 38 |
| REFERENCES | 39 |

LIST OF TABLES

| | |
|---|----|
| Table 1: Model 1 Variable Description | 18 |
| Table 2: Model 2 Variable Description | 19 |
| Table 3: Summary statistics | 24 |
| Table 4: Unit Roots Test | 27 |
| Table 5: Co-Integration Test | 29 |
| Table 6: Heteroscedasticity Test | 29 |
| Table 7: Multicollinearity Test | 30 |
| Table 8: Short and Long Run Results | 31 |
| Table 9: Effects of Trade Openness on Investment | 34 |

ACRONYMS

| | |
|---------|---|
| ADF | Augmented Dickey Fuller |
| CS-ARDL | Cross-sectional Dependence Autoregressive Distributed Lag |
| ECM | Error Correction Model |
| EPC | Export Promotion Council |
| EPZ | Export Processing Zones |
| ERS | Economic Recovery Strategy |
| GMM | Generalized Methods of Moments |
| IMF | International Monetary Fund |
| KNBS | Kenya National Bureau of Statistics |
| MUB | Manufacture under Bond |
| OLS | Ordinary Least Squares |
| R&D | Research and Development |
| SAP | Structural Adjustment Program |
| WDI | World Development Indicators |
| WTO | World Trade Organization |

ABSTRACT

The main motivation of this paper was to examine whether trade policy reforms initiated by the Kenyan government from 1980s, was successful in improving economic growth and investments in the economy. The paper aimed to establish the short run and long-run effects of opening up to trade on economic growth as well as on the investment levels in the country. The study analysed annual data from 1980 to 2017 gotten from World Development Indicators (WDI) and Economic Surveys from KNBS. The study adopted the Error Correction Model (ECM) for econometric analysis. It was found that opening up on trade has negative and significant effects on economic growth in both the short run and in the long-run. The study established that both real capital formation as well as human capital enhanced economic growth in Kenya in both short and long run. Concerning the effects of trade on investments, the study established that opening up for trade increases investment in the country. The policy implication and insights that can be drawn from these results is that policymakers ought to initiate policies that would ensure gains from opening up to trade are realized and that the readjustment costs faced by firms occasioned by liberalizing the Kenyan economy are minimized.

Keywords: Trade Openness, Economic Growth, Investment, Kenya

JEL Codes: F1, O4

CHAPTER ONE

INTRODUCTION

1.0 Background

Kenya has undergone a series of major trade policy reforms since the 1980s that have been aimed at driving the economic growth process in the country. The introduction of Structural Adjustments Programs (SAPs) in 1980s, the floating of exchange rates in late 1993's, and Kenya's commitment towards bilateral and multilateral trade integration are part of the key trade related policy initiatives that have been undertaken by the Kenyan government to tap into economic gains from opening up to trade.

Trade openness broadly considered as the ratio of the total of exports and imports to GDP is a significant contributor to economic growth process. In the neoclassical theory, opening up to trade is critical in promoting economic growth through its contribution to investment (Lee, 1995; Baldwin and Seghezza, 1996). This theory stresses that opening up for trade bolsters economic growth by enhancing the importation of important intermediate inputs required for production purposes (Lee, 1993). Trade openness, therefore, acts as a vehicle for providing entry of capital-intensive inputs that directly contribute to the economic growth process.

The endogenous growth theory further asserts that trade openness drives growth by promoting technological change and innovation (Romer, 1986). In this new growth theory, trade openness enhances technological transfer and innovation as a result of importing products embodied with high-level technology usually deficient in the least developed countries (LDC's). The importation of high-level technological products facilitates technological spill-overs that enhance the efficacy of research and development (R&D) in the country.

According to Wacziarg (2001), trade openness can also induce incentives for the countries to implement critical macroeconomic programs that ensure macroeconomic stability in the country. He argues that with an open economy, threats of capital flights by investors and also pressures from international trade agreements can also make the economies particularly LDC's to gain from trade. This is because virtuous macroeconomic stability policies that might have been induced by opening up to trade could favour economic growth and investment through reduced uncertainties. Further, it is averred that openness to trade can incentivize countries to undertake reform programs due to pressure to compete favourably in the international market thereby enhancing economic growth in the economies (Sachs and Warner, 1995). Now, in recognizing these theoretical gains from opening up to trade and the major trade reforms undertaken by Kenya since the 1980s, this paper sought to assess the effects of opening up to trade on the level of Kenya's investments and economic growth.

1.2 Evolution of Trade Policies and Economic Growth in Kenya: 1963-2018

The Kenyan government at independence inherited inward-oriented trade policies from the British colonial government. Kenya's inward-looking policies at the independence period were import substitution (IS) policies such as quantitative restrictions on imports and prohibitive tariffs on imported goods. The policies at the time were aimed at protecting local infant industries from cheap imported goods and to improve industrial development and the capacity of local industries. During this period, therefore, Kenya was a highly protective economy with limited imports from the international markets.

In 1971, the Kenyan government intensified its inward-substitution policies to protect local industries due to the prevailing oil prices and foreign exchange rate crises at the time. It is important to note that during these periods of inward-looking policies, Kenya's balance of

payments worsened in part caused by the oil crisis of 1973 arising from the Israeli war. Further, during this period, Kenya experienced significant decline in the shares of foods and beverages in total exports and a relative increase in value of exports of non-food industrial supplies and petroleum fuels. In particular, in 1977, the share of exports of food and beverages dropped from 65.6 percent of the total exports to an estimated 58.8 percent and 56.2 percent in 1978 and 1979 respectively. On the other hand, petroleum fuels increased their share from an estimated 17.3 percent in 1977 to an approximated 20 percent in 1979 (Economic Survey, 1980), thereby necessitating the need for the change of trade liberalization policies.

The efforts to liberalize Kenya's economy started during the period 1980s with the imposition of the SAPs¹ by the World Bank and IMF. SAPs aim was to promote and diversify Kenya's export to the international market, promote utilization of the domestic resources and create jobs for the Kenyan population. In March 1980, the Kenyan government secured the Structural Adjustment Loan, which was conditioned on Kenya opening its borders and promoting exports of non-traditional products (Odhiambo and Otieno, 2006). With the introduction of SAPS there was a remarkable improvement in the level of Kenya's external trade particularly in 1984 where the country experienced an increase on 19 percent in the value of exports (Economic Survey, 1985)

To further bolster Kenyan exports to the international market, in 1985, the Kenyan government introduced the manufacture under bond (MUB) incentives which allowed both local and international manufacturers domiciled in Kenya, to import raw materials used exclusively to produce exports tax-free and for the machinery and equipment to obtain 100 percent investment allowance. In 1992, the Kenyan government later formed the Export Promotion Council (EPC)

¹ Structural adjustment program, other than advocating for trade liberalization, championed for public sector reforms, privatization of parastatals, reduce a government's expenditure, and support of private enterprises such as the SMEs.

which was tasked with removing bottlenecks facing Kenya exporters and promote the development of Kenya's exports. The Council was to forge forward and outward looking trade policies and initiatives for the country.

Through concerted efforts of strengthening trade liberalization policies in the 1990s, Kenya further introduced the Export Processing Zones (EPZs) in 1990 that was tailored at attracting domestic and international investors to manufacture products for exports. Through the Export Processing Zones Authority (EPZA), the Kenyan authorities introduced a number of incentives aimed at attracting investors to the EPZs that included; accelerated depreciation, investment allowances, corporate tax holidays, exemption from stamp duties, and easier business registration environment culminating to reduced cost of doing business. It is important to note, Kenya's peak of policies of opening up to trade occurred during the period of 1994-1995 when Kenya became a party to the World Trade Organization (WTO) as one of its founding members. Joining the WTO implied that Kenya automatically became a signatory of several trade agreements that aimed at fostering trade liberalization and global integration.

Between 2003 and 2007, the Kenyan government initiated the Economic Recovery Strategy (ERS) that focused on promoting trade through a number of sector and commodity strategies that aimed at improving the performance of Kenyan exports in the international market. Specifically, ERS focused on improving incentive schemes for the manufacturers, strengthening partnerships with local actors, reducing the high transactions and cost of doing business as well as the improving infrastructure. These trade promotion policies were later bolstered by the enactment of Kenya's constitution in 2010 that underscores the importance of foreign policy in driving international trade.

1.3 Statement of the problem

Examination of the role of opening up to trade on growth has concerned economists for a long time. Evidence from studies on this area has been inconclusive and mixed. Some past studies indicate that opening up to trade accelerates growth (Dollar, 1992; Edwards, 1993; Herzer, 2013) while others point that opening up to trade dampens growth in an economy (Clemens and Williamson, 2001; Young, 1991). Of these studies, few have examined whether trade openness policies have different role on growth dynamics.

Disentangling trade effects into the short and long term is important because, in the shorter term, trade openness policies could influence economic growth negatively due to resource misallocation costs caused by opening up for the competitive products from the international markets. In the long term, opening up for trade could bring in efficiency gains through varied mechanisms such as knowledge accumulation and learning by doing.

1.4 Objectives of the study

The main objective of this paper is to determine the effects of trade openness on economic growth in Kenya since 1980.

The specific objectives:

- i. To determine the short and long run effects of trade openness on Kenya's economic growth.
- ii. To examine the effects of trade openness on Kenya's investments.
- iii. To infer policy from the study findings.

1.5 Significance and motivation of the study

This paper is critical in three main ways. First, Kenya embarked on a series of trade policy reforms since the period 1980s that warrants an empirical examination on whether the trade reforms had the intended effects on enhancing economic growth and investments. To further bolster the need for an empirical examination, from a global perspective, since 1980, there has been a continued surge in globalization efforts manifested through trade integration and trade liberalization policies around the globe, bolstered by the technological revolution.

Second, few studies in the literature of economics have disentangled the effects of trade openness into a long run and short-run effects. Disentangling the effects of short-run and long-run effects allowed us to examine whether trade openness leads to resource mobilization and reallocation in the short run or the spill-over effects and productivity gains in the long run. In the same vein, vast papers on this subject have looked at the effects of trade openness on growth from a cross-country perspective. This study focusses on an individual country. According to literature, an in-depth study of an individual country is a good approach for unravelling the link between opening up to trade and economic growth (Srinivasan and Bhagwati, 2001).

1.6 Scope of the study

The paper sought to analyse the role of opening up to trade economic growth and investments in Kenya using data obtained from WDI and economic surveys for the period 1980-2017. We choose the period 1980-2017 because it's during this time period that Kenya embarked on a series of trade reforms that aimed at spurring economic growth in the country. Contrary to 1960s and 1970s where Kenya had inward looking policies, in 1980 with the introduction of SAPs, Kenya's economy thereafter started to liberalize therefore warranting an assessment of the effects of opening up to

trade on economic growth and investment. On econometric aspects, the annual data from 1980-2017 is backed up because it is a long enough period to allow an assessment of the dynamic effects of trade on investments as well as on economic growth in Kenya.

1.7 Organization of the study

The next section presents the review of literature which is divided into theoretical literature on trade, the empirical literature and the overview of the reviewed literature that summarizes the literature and indicates existing gaps in literature. This is followed by chapter three which outlines a theoretical framework, model specification, estimation techniques and diagnostic tests. The chapter further provides an outline of the type and source of data as well as measurements.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This section examines the growth theories that are critical in this study in the theoretical literature section. The empirical literature section presents a review of previous studies from other researchers and lastly an overview section that offers a summary of the previous literature and existing gaps on this subject.

2.1 Theoretical literature

The first theory of study is the neoclassical growth theory advanced by Solow (1956). With regards to this theory, capital and labour can freely be substituted to produce a composite good in the economy. In theory, the exogeneity of technological progress implies that government policies cannot influence the rate at which the economy grows. The theory further provides economic growth can be decomposed into its contributory sources i.e capital and labour weighted by their factor shares plus the residual.

Researchers linking trade to growth as per the arguments of the neoclassical theory have relied on economies of scale to link opening up to trade on growth (Lee, 1993). According to Bhagwati (1988), trade openness promotes economic growth by increasing specialization of the industry's leading to improved efficiency. Lee (1993) also argues that trade liberalization promotes growth by facilitating the importation of important intermediate inputs and capital required for production purposes in the least developed countries (LDCs). In the neoclassical theory, trade openness acts as a vehicle for providing entry of capital-intensive inputs essential for production directly contributing to the economic growth process.

The neoclassical growth theory, however, fails to provide an elaborate framework under which trade policy reforms can stimulate long-run economic growth. Young (1991) argues that the development of the endogenous growth theory provides the mechanism via which opening up to trade can endogenously promote long-run economic growth. The endogenous growth model endogenizes the technological progress in the model the variable that was missing in the neoclassical growth theory. According to Romer (1990), the 2018 Nobel Prize Winner, trade openness is a critical contributor to growth through technological progress. In this growth theory, trade openness enhances technological transfer and innovation as a result of importing products embodied with high-level technology usually deficient in importing countries. The importation of high-level technological products facilitates technological spillovers that increase the efficiency of R&D investments by eliminate

ing duplication of innovation (Rivera-Batiz and Romer, 1991). In this theory, trade openness also encourages knowledge transfer and accumulation and human capital development (Grossman, and Helpman, 1991).

Belloumi (2014) submitted that the main differentiating factor between the neoclassical growth theory is the technological function. He argues that while neoclassical assumes that technological function to be exogenous, the endogenous model assumes that technological progress comes about due to spill-overs and externalities with the main indication of the endogenous growth model is that changes in trade policies such as those that induce international trade and competition would endogenously affect long-run growth and investments.

2.2 Empirical literature

To begin with, a study by Trejos and Barboza (2015) studied the link between opening up to trade and economic growth in Asian economies from 1950-2010. The authors established that Asian countries with more trade openness experienced larger productivity gains as compared to less open countries. They concluded that openness to trade do not always promote growth and that opening up to trade was not critical driver of Asian growth miracle.

Sakya et al., (2015) studied the role of trade openness on income levels of hundred and fifteen developing economies from 1970 to 2009. They found established a long-run link between trade openness indicator and growth for 115 developing economies. In particular, they find opening up to trade enhanced income levels for the full sample in both the short-run and long-run. Their paper also examined whether the effects of trade openness differed across country's income group. They categorized the 115 developing economies into three subsamples based on country's level of income. The sub-sample results suggested that long-run cointegration relationship between trade openness and income levels exists only in countries with upper and lower-middle income. For assessing the link between opening up to trade and economic growth, Ulaşan, (2015) uses of Generalized Method of Moments (GMM) panel estimation technique to address the endogeneity concerns in trade openness and growth relationship. Ulaşan, (2015) applies both the differenced and system GMM in the study and observes that trade openness is not highly correlated with increased growth.

In studying the link between opening up to trade and income levels of ninety-one developing and developed economies from 1960 to 2008, the study by Herzer (2013) reveals on average, an enhancing role of opening up to trade on income levels. The study further looked at the effects of trade openness on income levels relies on the country's development status i.e developing or

developed country, institutional quality, enrolment to secondary education and business-labour regulations. The study found economies with better-educated population, higher quality institutions, and lower business and market regulation gained more on average from opening up to trade. The study used the dynamic OLS (DOLS) estimation technique that corrects for endogeneity, heterogeneity and serial correlation problem.

In an effort to assess the effects of trade on growth and growth volatility of 73 developed and developing economies from 1960-2011, Kim et al., (2016) used Cross-sectional Dependence (CS) Autoregressive Distributed Lag Panel model CS-ARDL. In the study, they found that opening up to trade promotes growth in short and long-run. The effects were found to be larger in the short-run. They further observed that while opening to trade reduces short-run growth volatility, it encourages growth volatility in the long-run.

Chang, et al., (2009) also studied the role of opening up on trade on economic growth for 22 industrial economies, 21 Latin American and Caribbean Countries, twelve Asian countries, eighteen Sub-Saharan Africa and nine Middle East and North Africa for the period 1960-2000. In the study, the authors find that opening up to trade enhances economic growth only if complementarity policies are put in place. Specifically, the study finds that gains from trade appear to be significant in countries with larger labour market flexibility, financial depth, educated population, macroeconomic stability (inflation), governance, good infrastructure and ease of doing business. The authors further find that the efficiency effects of opening up to trade have been much more pronounced in recent years in most countries due to increased move of instituting complementary policies that aid in tapping gains from trade liberalization.

In Kenya, Musila (2015) assessed the role of trade on economic growth and investment from 1982-2009. Musila (2015) observes that trade openness positively affected investments and economic

growth. However, by the use of trade-policy induced openness, the study finds that trade-induced measure of trade openness negatively affects investments and economic growth.

In yet another study, Menyah et al., (2014) exclusively examine the role of opening up trade on growth in twenty one countries in Africa from 1965-2008. The study findings indicate that opening up to trade does not positively and robustly impact the growth prospects of Africa economies. In particular, the study finds that trade liberalization measures undertaken by most African countries have contributed very little in supporting growth in African economies.

Still in African countries, Zahonogo, (2016) examines the role of trade on economic growth in 42 economies in the Sub-Saharan Africa from 1980-2016 employing a Pooled Mean Group estimation technique. The econometric findings indicated occurrence of a non-linear effect of trade openness on economic growth. In particular, the study finds that opening up to trade improves economic growth up to a threshold level that an enhanced level of opening up to trade induces a declining trend on growth. The implication of the Zahonogo, (2016) empirical result is that of a presence of a Laffer curve for trade in Sub-Saharan African countries.

2.3 Overview

Neoclassical growth theory provides that the principal engine of economic growth is through exogenous technical change and that trade policy reforms do not directly affect economic growth. In this theory, opening up to trade promotes economic growth through the investment channel, which is indirect. The theory provides that opening up to trade leads to accumulation of physical assets that lead to improved investments in the economy. It is, however, to noted that the neoclassical theory did not highlight theoretical framework for analysing the effects of trade policy reforms. With the development of the endogenous growth theory, trade policy reforms can

endogenously promote economic through diffusion of knowledge, policies that enhance research and development (Romer, 1990; Young, 1991).

Reviewed literature also indicates that some studies support of the conclusion that opening up for trade promotes economic growth and investment (See, for example, Bhagwati 1988); Lee, 1993); Lee 1995), while other papers indicate that opening up to trade does not always improve economic growth in and of itself (See, for instance, Chang, et al., 2009; Trejos and Barboza; 2015). In Kenya, the study by Musila (2015) finds trade openness depresses economic growth and investments in the country. This paper sought to add knowledge on this growing literature by examining the effects of Kenya's openness on investments and economic growth both in the short-term and long-term from 1980-2017.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

The theoretical underpinning of the paper, an econometric model adopted, data to be used, variables definition and measurements and lastly estimation technique together with model diagnostic tests are discussed in this chapter.

3.1 Theoretical framework

This paper followed the endogenous growth model that underpins the argument that economic growth is due to endogenously determined technological progress (Romer 1990). The theory provides the mechanisms through which government policies such as trade openness policies relate to economic growth. It further considers economic growth relies on the internally generated trade policies that significantly affect the progress of the economy.

The theoretical framework of this paper is therefore based on the production function with a non-decreasing return to scale stated as:

$$Y_t = f(A_t, K_t, L_t) \quad (1)$$

Where Y_t represents real GDP, K_t , capital stock, L_t labor force and A_t represents technology.

Following Strauss and Ferris (1996) and Trejos and Barboza (2015), we extend equation (1) by incorporating trade openness (ratio of the sum of exports and imports to GDP) and government spending through the technological progress parameter².

² According to Strauss and Ferris (1996), technological parameter is a function of government spending and trade openness of the economy. For our case, we only consider trade openness.

sizeable growth externalities across countries

$$A_t = f(Open_t, G_t) \quad (2)$$

Where $Open_t$ in this paper relates to trade openness and G_t government consumption. In the endogenous growth theory, technology in an economy is greatly influenced by its openness to trade. Opening up to trade improves a country's productivity through transfer of technological innovations, spread of dynamic positive externalities (Trejos and Barboza, 2015), promotion of entrepreneurship through learning by-doing (Romer, 1986) and importation of foreign technologies embedded in foreign goods and services that increases productivity in the importing country (Jin, 2004). According to Strauss and Ferris (1996), government consumption often affects technology progress in an economy since it tends to reduce the incentive to undertake investment by individuals as it is financed by taxes and thereby lower productivity growth.

We can, therefore, express our theoretical model linking trade openness and economic growth as:

$$Y_t = f(K_t, L_t, Open_t, G_t, Z_t) \quad (3)$$

Where Z_t relates to a set of control variables that influences economic growth as such as human capital, inflation, and interest rates as discussed in the empirical model section below.

As mentioned earlier, trade openness also affects a country's rate of investments since it is a contributor to the economic growth process. The link between opening up to trade and investment rates are always expressed through the flexible-accelerator model of investment.

Following Musila (2015), we can theoretically link the trade openness and rate of investments as:

$$Inv_t = f(Y_t, Open_t, x_t) \quad (4)$$

Where Inv_t relates to investment to GDP ratio, Y_t is real GDP, x_t is the set of controls that influences an economy's level of investments such as FDI to GDP ratio, inflation, interest rates and infrastructure proxied by telephone subscriptions per 100 people as discussed in the empirical model.

3.2 Empirical model

The first specific objective of this study was to estimate the effects of opening up to trade on economic growth in Kenya. To determine the effects, we introduced the natural logarithm to parameterise and normalize equation (3) and the error term on the equation to have the empirical model for estimation written as:

$$lnY_t = \beta_0 + \beta_1 ln k_t + \beta_2 open_t + \beta_3 ln h_t + \beta_4 Inf_t + \beta_5 govtgdp_t + \beta_6 int_t + \varepsilon_t$$

(5)

Where ln relates to the natural logarithm, y_t is the real GDP. $open_t$ is the trade openness indicator. Trade openness can enhance growth through improved channels of technological transfer, importation of intermediate inputs for production and learning by doing.

The variable h_t relate to human capital. This variable was measured by the secondary school enrolment rates. The variable captures the skills and technical know-how of a population and its ability to use and adopt to newer technology.

Another variable is Inf_t is the inflation variable. The variable gauges macroeconomic stability of a country's policies. The variable reflects government's role in providing sound macroeconomic programs and policies that enhance growth and absorption of positive gains from opening up to trade.

The variable $govtgdp_t$ stands for the government spending to GDP ratio. This variable is included because it is considered that increases in government consumption tend to negatively affect technology progress in an economy as it reduces the incentive to undertake investment by individuals (Strauss and Ferris, 1996). int_t variable denotes interest rates in the economy. Similar to inflation, this variable aims to capture the macroeconomic stability of an economy and macroeconomic policies that can enhance growth.

Notice that, to integrate the dynamic effects of opening up to trade on growth, we used the ECM model that separates short-run from long-run effects, presents the error correction term which enables us to test for cointegration relationship and the speed at which the short-run disequilibrium dissipates to a stable long-run equilibrium.

Now to determine the effects of trade openness on investments as a second objective, we also introduced the natural logarithm to parameterise equation (4) and the error term on the equation to have the equation written as:

$$Inv_t = \alpha_0 + \alpha_1 \ln Y_t + \alpha_2 \ln Y_{t-1} + \alpha_3 Open_t + \alpha_4 FDI_t + \alpha_5 FDI_{t-1} + \alpha_7 int_t + \alpha_8 infra_t + \varepsilon_t$$

(6)

Where \ln relates to the natural logarithm, Inv_t is the investment to GDP ratio, Y_t is real GDP growth rate, Y_{t-1} is lagged real GDP growth rate, $Open_t$ is trade openness, FDI_t stands for the FDI to GDP ratio, FDI_{t-1} stands lagged the FDI to GDP ratio and Inf_t relates to the inflation rate at time t, int_t is the interest rates and $infra_t$ is the infrastructure proxied by telephone subscriptions per 100 people. Similar to the approach by Musila (2015), this study includes the lagged values of real GDP and FDI to GDP ratio to capture the dynamism of the variables in the level of

investment in the economy and that fact that current year values of the variables do not necessarily contribute to current investment levels. Further, the ratio of FDI to GDP is included in our regression model since its one of the main mechanisms through which investment levels in the country are expanded.

3.3 Variable definition, measurement, and a *priori* expectation

Table 1: Model 1 Variable Description

| Variable | Variable Measurement and Description | <i>Apriori</i> expected sign |
|-----------------------------|---|---|
| Dependent variable | | |
| Real GDP | Measures the rate at which the economy grows overtime. | |
| Independent variable | | |
| Trade openness | It is expected that opening up to trade can stimulate growth via the promotion of technological change and innovation or importation of important intermediate inputs. Further, competition arising from trade can also contribute to proper allocation of resources in the economy. However, opening up to trade can also contribute to decline in economic growth because of its effects on increasing resource misallocation due to increased competition. | Indeterminate (+/-) |
| Human capital | Captured by secondary school enrolment. The variable captures the skills and technical know-how of a country's population and its ability to absorb advanced technology. | Positive |

| | | |
|-------------------------------|--|------------------------|
| Inflation | Measures macroeconomic stability in an economy | Indeterminate (+/-) |
| Government consumption to GDP | Captures the role of government expenditure and activities in the economy. Government consumption can affect economic growth since increased government consumption tend to have an effect on the incentive to undertake private investment by individuals since increased government consumption has a direct link to increased taxes | Indeterminate (+/-) |
| Interest rates | This variable captures the macroeconomic conditions and stability of the economy. | Negative (-) |

Table 2 presents the expected signs and variable definitions of the model in equation 6.

Table 2: Model 2 Variable Description

| Variable | Variable Measurement and Description | |
|-----------------------------|--|--------------|
| Dependent variable | | |
| Investment | Measures capital accumulation in the economy overtime. | |
| Independent variable | | |
| Real GDP | Growth in GDP is expected to lead to increased capital accumulation in the country. | Positive (+) |
| FDI to GDP ratio | This variable is included because it's one of the main mechanisms through which investment levels in the country | Positive (+) |

| | | |
|--|--|---------------------|
| | are expanded. The sign of this variable is expected to positively contribute to capital formation in the economy. | |
| Trade openness | This captures the openness of the economy. The sign of the coefficient cannot be determined in advance since trade liberalization either can contribute to enhancing accumulation of capital due to the increased flow of investments or can lead to the reduction of investment levels particularly domestic investments due to competition caused by opening of the economy. | Indeterminate (+/-) |
| Inflation | Measures the macroeconomic stability of the country. | Indeterminate (+/-) |
| Interest rates | This variable captures the macroeconomic conditions and stability of the economy. | Negative (-) |
| Telephone subscriptions per 100 people | This variable is a proxy of the infrastructure level in the economy. Improved infrastructure in an economy tends to encourage investment levels | Positive (+) |

3.4 Data source

Secondary annual data ranging from 1980-2017 was analyzed in this paper. The study considers this period because its long enough for a time series analysis as well as because Kenya embarked on a series of trade openness measures during this period aimed at improving Kenya's trade performance and in turn economic growth. Data for most of the variables used in this study was

obtained from the WDI. Concerning secondary school enrollment, annual data were obtained from various economic surveys published by the KNBS.

3.5 Diagnostic tests

Time series regression analysis was employed in to examine the effect of opening up to trade on economic growth and investment in Kenya. In an effort to ensuring that econometric results obtained are robust and the model is well specified, we performed a number of pre-estimation tests to determine orders of integration of variables, heteroscedasticity as well as collinearity issues.

3.5.1.1 Unit root test

Prior to estimating the equation of interest, a unit root test must be conducted. This test is important because helps in identifying the stationarity or non-stationarity of a variable and trend as well as establishing the number of differencing that can be done to achieve stationarity. This would then inform the model to be used in the analysis. ADF technique was employed to test for non-stationarity. For robustness checks, we also conducted Phillips Perron test.

3.5.1.2 Multicollinearity test

Multicollinearity refers to the linear relationship between two explanatory factors in a regression model. Multicollinearity problem exists when there are highly linearly related associations between two or more explanatory variables. In this study, we used the Variance Inflation Factor (VIF) check multicollinearity across explanatory variables in the model.

3.6 Estimation techniques

We used the ECM to estimate the effects of trade openness on investments and economic growth. The choice of ECM model representation in our study is further important because of its advantages over the other traditional approaches. The ECM model does not require variables to be of the same order of integration. Further, ECM allows us to separate short-run from long-run

effects, presents the error correction term, which enables us to test for the co-integration relationship and the speed at which the short-run disequilibrium dissipates to a stable long-run equilibrium.

CHAPTER FOUR

EMPIRICAL FINDINGS AND DISCUSSION

4.1 Introduction

This chapter outlines the regression results, presents summary statistics, trend analysis, both pre and post estimation tests as well as the regression estimates of the model.

4.2 Summary Statistics

The summary statistics of the model variables are detailed in table 3. More specifically, the table provides the data observations based on the study years under consideration, the mean statistic which is used to indicate the average of the variable over the study period, standard deviation that measures the spread of the variable from the mean, maximum and minimum data points of the variables, skewness that is indicating of the relative flatness of the variable distribution and kurtosis that shows the degree of asymmetry.

Since trade openness is the independent variable of interest, the descriptive statistics show that the degree of openness stood at 0.555, with a maximum level of 0.729 and minimum level of 0.375. The implication of this statistic is that Kenya is fairly an open economy considering its openness indicator, on average being 55.5 percent compared to more open economy with an indicator of near 100 percent. The descriptive results also show that government spending to GDP ratio had the highest mean whilst the investment to GDP ratio had the least mean values of 107.8 and 0.00638 respectively. The standard deviation indicates the variation of the observations from the mean of the variables. In table, inflation had the highest standard deviation with 8.599, followed by government spending to GDP ratio.

On the skewness of the variables used in the model, summary statistics indicate that the except for the variables inflation and FDI to GDP ratio, the rest of the variables i.e log real GDP, trade

openness, log capital, secondary school enrolment, Government Consumption to GDP, interest rates and investment to GDP are not skewed and are normally distributed since the skewness values are either less

than +1 or lower than -1. Further, the results indicate that most of the variables have flat tails since the values are less than 3.

Table 3: Summary statistics

| Variable | Obs | Mean | Std.Dev. | Min | Max | Skewness | kurtosis |
|-------------------------------------|------------|-------------|-----------------|------------|------------|-----------------|-----------------|
| Log real GDP | 38 | 23.47 | 0.833 | 22.47 | 25.09 | 0.5931 | 1.938 |
| Trade openness | 38 | 0.555 | 0.0767 | 0.375 | 0.729 | 0.0933 | 3.848 |
| Log Capital | 38 | 22.00 | 0.655 | 21.19 | 23.20 | 0.6112 | 1.922 |
| Log Secondary school enrolment | 38 | 13.67 | 0.585 | 12.90 | 14.86 | 0.6769 | 2.252 |
| Inflation | 38 | 12.16 | 8.599 | 1.554 | 45.98 | 1.957 | 7.782 |
| Government Consumption to GDP | 38 | 107.8 | 5.434 | 95.22 | 116.2 | -0.5236 | 2.334 |
| Interest rates | 38 | 7.386 | 6.578 | -8.010 | 21.10 | 0.0859 | 2.809 |
| Investment to GDP | 38 | 0.00638 | 0.0137 | -0.0306 | 0.0407 | -0.0895 | 3.819 |
| FDI to GDP | 38 | 0.00732 | 0.00820 | 4.72e-05 | 0.0346 | 1.857 | 5.673 |

4.2 Pre-Estimation Tests

4.2.1 Trend Analysis

Trends of all of the variables used in this paper are presented in figure 1. The analysis shows an increasing trend for log real GDP, log capital and log of secondary school enrolment. Concerning the upward trend of the secondary school enrolment, the possible explanation is that in 2003 the Kenyan government initiated and implemented free primary education (FPE) programme where school fees and levies were abolished leading to enhanced access to education for all. Further, in the year 2012, the Kenyan government rolled out subsidized secondary education (SCE) which lessened the burden on households in financing secondary education and increased the rates of transiting from primary to secondary school.

Th trend analysis, however, indicates that the trade openness, investment to GDP ratio and FDI to GDP ratio have largely been stable over the study period. Concerning the inflation variable, trend analysis indicates that the inflation level in the country has been on a declining trend since 1998. This could be attributed to the considerations taken by the policymakers to combat inflation levels in the country, such as implementing inflation targeting rule. With regards to the telephone subscriptions per 100 people which has been used a proxy of infrastructure, trend analysis indicates a declining trend on the number subscriptions particularly from the year 2008. This decline could be explained by the increased penetration of mobile phones across the country.

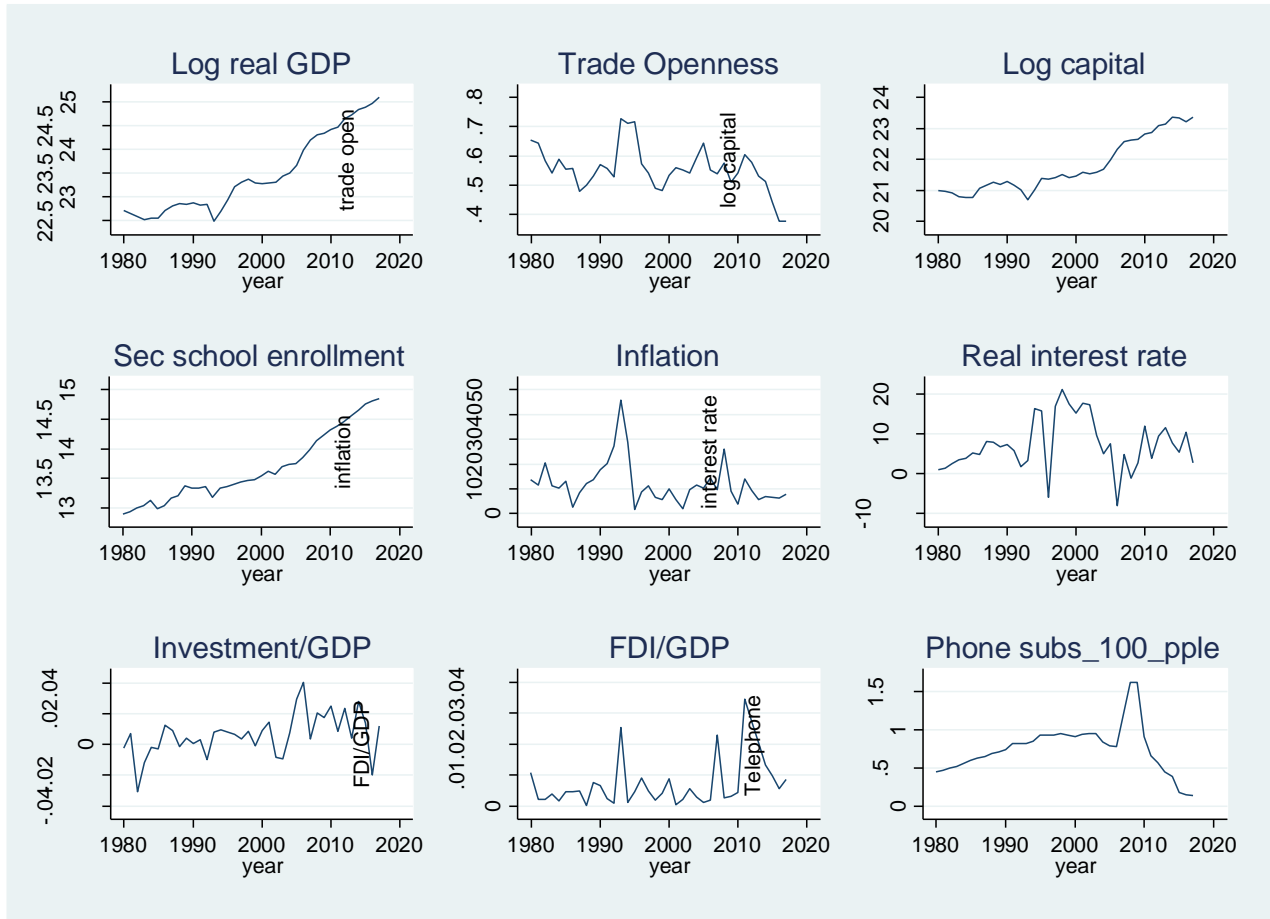


Figure 1: Trend Analysis of variables used in the analysis

4.2.2 Unit Root Test

Before analysing for the co-integration relationship in our model, we performed a unit root test to confirm the stationarity or lack of it thereof of the variables used in the model by employing both ADF and PP tests. This step is critical because it helps in identifying the number of differencing that should be done to achieve stationarity. The test results presented in table 4 establish that inflation, interest rates, investment to GDP and FDI to GDP ratios being stationary at level but log real GDP, trade openness, log capital, log secondary school enrolment and telephone subscriptions per 100 people are stationary at first differencing.

Table 4: Unit Roots Test

| | ADF | | PP | | Comment |
|--|----------------|------------|-----------|------------|----------------|
| | Test-statistic | | | | |
| | No trend | With trend | No trend | With trend | |
| Variables at level | | | | | |
| Log real GDP | -0.730 | 1.105 | 1.626 | -0.541 | Not stationary |
| Trade openness | -2.354 | -2.638 | -2.215 | -2.530 | Not stationary |
| Log capital | 0.453 | -1.894 | 0.560 | -2.022 | Not stationary |
| Log secondary school enrolment | 1.791 | -0.573 | 1.717 | -0.766 | Not stationary |
| Inflation | -3.273*** | -3.497*** | -3.495*** | -3.641*** | Stationary |
| Government Consumption to GDP | -1.666 | -3.490 | -1.650 | -3.243 | Not stationary |
| Interest rates | -4.180*** | -4.093*** | -4.180*** | -4.093*** | Stationary |
| Investment to GDP | -4.516*** | -5.323*** | -4.516*** | -5.323*** | Stationary |
| FDI to GDP | -3.333*** | -3.938*** | -4.390*** | -5.023*** | Stationary |
| Telephone subscriptions per 100 people | -1.291 | -0.659 | -1.576 | -1.227 | Not stationary |
| Variables at first difference | | | | | |
| D. Log real GDP per Capita | -3.335*** | -3.582*** | -3.372*** | -3.700*** | Stationary |

| | | | | | |
|---|---------------|-----------|-----------|-----------|------------|
| D. Trade openness | -5.941*** | -5.886*** | -5.941*** | -5.886*** | Stationary |
| D. Log Capital | -4.598*** | -4.755*** | -4.598*** | -4.755*** | Stationary |
| D. Log secondary school enrolment | -6.550*** | -7.179*** | -6.550*** | -7.179*** | Stationary |
| D. Government Consumption to GDP | -4.058*** | -3.994*** | -6.230*** | -6.138*** | Stationary |
| D. Telephone subscriptions per 100 people | -3.747 *** | -4.275*** | -3.778*** | -3.887*** | Stationary |

Note: D stands for differencing

4.3 Post-Estimation Tests

Prior to interpreting the econometric results, we performed several tests after the estimation to check for the appropriateness of the results obtained based on the regression model.

4.3.1 Co-integration Test

Since most of the variables were integrated of order one i.e I (1), we carried out test of co-integration using the approach by the Engle and Granger (1987). In this methodology, long-run estimation was conducted and then the lagged residual was predicted from the model. The predicted lagged residual was then analysed for unit root by the ADF. The outcome shown in table 5 shows that the error correction term i.e the lagged residual was stationarity at 5 percent signifying that presence of cointegrating relationship. This result therefore suggests used of the ECM for estimation purposes.

Table 5: Co-Integration Test

| | | Test statistic | Prob value |
|-----------------|------------|-----------------------|-------------------|
| ADF statistic | | -4.615 | 0.0010 |
| Critical values | 1 percent | -4.297 | |
| | 5 percent | -3.564 | |
| | 10 percent | -3.218 | |

4.3.2 Heteroscedasticity test

The heteroscedasticity problem which is occasioned by presence of non-constant variance of the error term was tested using Breush-Pagan-Godfrey technique. In this approach of testing, the null hypothesis asserts homoscedastic assumption. From the results in table 6, we fail to reject the null because the reported p-value is 0.4695 which is more than 1, 5 and 10 percent levels of significance implying that heteroskedasticity is not problem in our analysis.

Table 6: Heteroscedasticity Test

| |
|-------------------------------------|
| Ho: Constant variance |
| Variables: Fitted values of Log GDP |
| chi2(1) = 0.52 |
| Prob > chi2 = 0.4695 |

4.6.3 Multicollinearity test

This test was performed by examining the variance inflation factor (VIF) and the outcome are as presented in table 7. The outcome indicate that except for the log capital and log secondary school enrolment, all other independent variables are not correlated since their respective VIF values are lesser than 10. In this paper, however, despite two variables having higher VIF values, we proceeded with the analysis since existence of multicollinearity problem does not render the regression results biased. The estimates obtained would still be best, linear and unbiased.

Table 7: Multicollinearity Test

| Variable | VIF | 1/VIF |
|--------------------------------|------------|--------------|
| Log Capital | 31.22 | 0.032033 |
| Log secondary school enrolment | 6.52 | 0.032511 |
| Government spending to GDP | 3.85 | 0.259909 |
| Inflation | 2.08 | 0.480875 |
| Trade openness | 1.98 | 0.504824 |
| Interest rates | 1.29 | 0.778042 |
| Mean VIF | 11.86 | |

4.7 Econometric Results

4.7.1 Short and Long Run Effects of Trade Openness on Kenya's Economic Growth

The regression results of the short and long run effects of opening up to trade on Kenya's economic growth are presented in table 8 as per the estimable equation 5. The results indicate that the adjusted R squared of the model is 99 percent suggesting that most of the variations in economic growth measured by the log of GDP is attributed to the independent variables in our model. The F

statistic further confirms that the model is a good fit since the F statistic is 609.41 and the probability value of 0.0000 implying that variables, trade openness, log capital, log secondary school enrolment, government consumption to GDP, inflation and interest rates have good joint explanatory power.

Table 8: Short and Long Run Results

| Long Run Results | |
|--------------------------------|-------------------------|
| Trade openness | -0.706*** (0.252) |
| Log Capital | 0.780*** (0.117) |
| Log Secondary school enrolment | 0.446*** (0.130) |
| Inflation | -0.00288 (0.00230) |
| Government Consumption to GDP | 0.00627 (0.00495) |
| Interest rates | -0.00523** (0.00236) |
| Constant | -0.00866 (0.816) |
| Observations | 38 |
| R-squared | 0.992 |
| Adjusted R-squared | 0.9900 |

Short Effects Results

| | |
|-----------------------------------|-----------|
| D. Trade openness | -0.969*** |
| | (0.250) |
| D. Log Capital | 0.702*** |
| | (0.162) |
| D. Log Secondary school enrolment | 0.415* |
| | (0.212) |
| D. Inflation | -0.00131 |
| | (0.00173) |
| D. Government Spending to GDP | 0.00671 |
| | (0.00488) |
| D. Interest rates | -0.00180 |
| | (0.00185) |
| Error correction term (ECT) | -0.545*** |
| | (0.193) |
| Constant | 0.00288 |
| | (0.0168) |
| Observations | 37 |
| R-squared | 0.704 |

*Notes: (i) Log real GDP is the dependent variable (ii) Standard errors in brackets (iii) D stands for differencing (iv) *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

The results establish that the error correction term (ECT) is negative and statistically significant at 1 percent level indicating the existence of a long-run cointegrating relationship. The adjustment

speed at which the short-run disequilibrium dissipates to a stable long-run equilibrium is 54.5 percent. The implication of this is that there's presence cointegrating relationship.

The econometric finding shows that opening up to trade reduces economic growth in Kenya in the long run. More specifically, the results demonstrate that improvement in the trade openness indicator by one unit reduces economic growth by 0.706 percent. Such findings were found by Musila (2015) where it was observed that opening up for trade reduces economic growth in Kenya. One possible explanation for this finding is that opening up to trade could create destruction where firms readjust their operations because of the new competition generated by trade (Iacovone, et al., 2013). According to Musila (2015), the negative effect of opening up for trade on Kenya's economic growth could be described by the increased cost of intermediate inputs for production purposes.

Concerning the capital variable, the results establish that capital has an enhancing role on growth in the long run. Specifically, the results establish that improvement in the capital by one percent increases economic growth by 0.78 percent. On secondary school enrolment, the study established that a one percent increase in secondary school promotes economic growth in Kenya by 0.446 percent. The inference that can be obtained from this finding is that improvement in human capital in a country significantly increases the economic growth process because improved level of schooling in an economy contributes to enhanced skills and technical know-how of a population and its ability to use advanced technology. Moreover, the study found that increase in interest rates reduces economic growth by 0.00523 percent holding all other factors constant.

On analysing the short run effects, results establish that in the short run, improvement in the trade openness indicator reduces economic growth by 0.969 percent. This result is indicative of the idea that in the short run, there are unavoidable short-run negative effects of opening up to trade on

economic growth despite the effects not being significant. Opening up to trade in the short run leads to creation of destruction where firms readjust their operations because of the new competition generated by trade (Iacovone, et al., 2013).

The findings also demonstrate that capital has enhancing effects on economic growth in the short run. In particular, the results show that increase in the capital by one percent increases economic growth by 0.702 percent. This finding is similar to those found by Musila (2015). Further, the econometric results also demonstrate that human capital measured by enrolment to secondary school significantly enhances economic growth process in short run. More specifically, the results show that a one percent increase in secondary school enrolment enhances economic growth by 0.415 percent.

4.7.2 Effects of Trade Openness on Kenya’s Investment

The regression results of the effects of trade openness on Kenya’s investment are presented in table 9 based on the estimation of equation 6. The results indicate that the R-squared of the estimated model is 51.1 percent suggesting satisfactory overall goodness of fit. The inference of this R squared is that 51.1 percent of the variations in the ratio of investment to GDP is caused by the independent variables.

Table 9: Effects of Trade Openness on Investment

| Explanatory variables | Investment to GDP |
|-----------------------|---------------------|
| Log real GDP | 0.285*** (0.102) |

| | |
|--|------------|
| L. Log real GDP | -0.268** |
| | (0.103) |
| Trade openness | 0.0689** |
| | (0.0331) |
| FDI to GDP | -0.391 |
| | (0.289) |
| L. FDI to GDP | 0.305 |
| | (0.261) |
| Inflation | 1.00e-04 |
| | (0.000265) |
| Interest rates | -0.000274 |
| | (0.000319) |
| Telephone subscriptions per 100 people | 0.0118* |
| | (0.00660) |
| Constant | -0.452** |
| | (0.184) |
| Observations | 37 |
| R-squared | 0.511 |

*Notes: (i) Investment to GDP is the dependent variable (ii) Standard errors are in brackets (iii) L stands for lag (iv) *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$*

In table 9, we observe that real GDP has enhancing effects on investments in Kenya. In particular, the regression results indicate that a one percent increase in real GDP rises investment to GDP ratio in Kenya by 0.285. However, the results indicate that lagged that real GDP reduces

investments in Kenya. In particular, the regression results provide that a one percent increase in lagged real GDP to 0.268 reductions in investment in the country. Further, the results suggest that rise in the number of telephone subscriptions per 100 people contributes to increased investment to GDP ratio by 0.0118 *ceteris paribus*.

Concerning the role of trade openness on investment, the regression results demonstrate that opening up to trade has a greater and positive effect on Kenyan investment. The results establish that a one-unit improvement in the trade openness indicator enhances investment levels in the country by 0.0689. The explanation of this finding is grounded on neoclassical growth theory which argues that opening up to trade acts as an investment channel by playing a crucial role in promoting build-up of physical capital in the economy (Lee 1995). It is further argued that opening up to trade increases investment since the production of investment goods tend to largely use imported intermediate inputs and that competition for machinery and capital equipment in the world market tend to depress the price of capital and as such enhances investment levels (Baldwin and Seghezza, 1996).

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Introduction

This chapter begins by summarizing the study and then gives the conclusions drawn. The summary and conclusion section is then followed by the policy implications of the study.

5.2 Summary and Conclusion

The main objective of this paper was to analyse the effects of trade openness on economic growth in Kenya since 1980. In particular, the study sought to assess the short and long run effects of trade openness on Kenya's economic growth as well as investments. The study used data from the WDI and the economic surveys from the KNBS for the period 1980 to 2017. The ECM was adopted as the preferred estimation technique because it allows the introduction of a dynamic set up that allows examination of short-run and long-run estimates. Further, the ECM approach tends to mitigate likelihood of estimating spurious regression while at the same time maintaining important long-run information without hindering lag structure of the model variables. The regression results established presence of a negative and statistically significant error correction term at 1 percent level suggesting a stable long-run relationship in the model.

Concerning the effects of opening up to trade on economic growth, it was established that opening up to trade has negative and statistically significant effects on economic growth in both the short run and the long run. The results also found out that capital and human capital increases growth in short and long run. Further, regression findings establish that increase in interest rates reduces economic growth in the long run.

Concerning the effects of opening up on trade in investment, the study established that opening up for trade significantly increases investment levels in the country. In the study, it was also found

that improvement in both growth and infrastructure levels as proxied by the number of telephone subscriptions per 100 individuals increases the level of investment in the economy.

5.3 Policy Implications

From the study, it is observed that even though opening up to trade increases investment levels in Kenya's economy, it has a negative effect on economic growth. The inference that can be obtained from this finding is that the effect of opening up to trade on investment appeared to be not large enough to promote economic growth in the economy via the investment mechanism. Based on this finding, therefore, policymakers should initiate programs and policies that would ensure gains from opening up to trade are realized and that readjustment costs faced by firms occasioned by liberalizing the Kenyan economy are minimized. However, despite the important policy recommendations emanating from the study findings, this study was limited in scope since it used a quantitative measure of Kenya's trade openness to assess the effect of opening up to trade on investment and growth and not actual trade liberalization measures such as tariffs and quotas. This study, therefore, recommends further research on this subject to use better approaches of measuring trade openness of an economy such as trade liberalization measures put in place by the governments.

REFERENCES

- Baldwin, R. E., & Seghezza, E. (1996). Trade-induced investment-led growth (No. w5582). National Bureau of Economic Research.
- Baldwin, R., Braconier, H., & Forslid, R. (2005). Multinationals, endogenous growth, and technological spillovers: theory and evidence. *Review of International Economics*, 13(5), 945-963.
- Barro, R. J., & Sala-i-Martin, X. (1997). Technological diffusion, convergence, and growth. *Journal of Economic growth*, 2(1), 1-26.
- Belloumi, M. (2014). The relationship between trade, FDI and economic growth in Tunisia: An application of the autoregressive distributed lag model. *Economic Systems*, 38(2), 269-287.
- Belloumi, M. (2014). The relationship between trade, FDI and economic growth in Tunisia: An application of the autoregressive distributed lag model. *Economic Systems*, 38(2), 269-287.
- Bhagwati, J. N. (1988). Export-promoting trade strategy: issues and evidence. *The World Bank Research Observer*, 27-57.
- Chang, R., Kaltani, L., & Loayza, N. V. (2009). Openness can be good for growth: The role of policy complementarities. *Journal of development economics*, 90(1), 33-49.
- Clemens, M. A., & Williamson, J. G. (2001). *A tariff-growth paradox? Protection's impact the world around 1875-1997*(No. w8459). National bureau of economic research.
- Dollar, D. (1992). Outward-oriented developing economies really do grow more rapidly: evidence from 95 LDCs, 1976-1985. *Economic development and cultural change*, 40(3), 523-544.
- Edwards, S. (1993). Openness, trade liberalization, and growth in developing countries. *Journal of economic Literature*, 31(3), 1358-1393.

- Frankel, J. A., & Romer, D. H. (1999). Does trade cause growth? *American economic review*, 89(3), 379-399.
- Grossman, G. M., & Helpman, E. (1991). Trade, knowledge spillovers, and growth. *European economic review*, 35(2-3), 517-526.
- Herzer, D. (2013). Cross-country heterogeneity and the trade-income relationship. *World Development*, 44, 194-211.
- Iacovone, L., Rauch, F., & Winters, L. A. (2013). Trade as an engine of creative destruction: Mexican experience with Chinese competition. *Journal of International Economics*, 89(2), 379-392.
- Jin, J. C. (2004). On the relationship between openness and growth in China: Evidence from provincial time series data. *The World Economy*, 27(10), 1571-1582.
- Kim, D. H., Lin, S. C., & Suen, Y. B. (2016). Trade, growth and growth volatility: New panel evidence. *International Review of Economics & Finance*, 45, 384-399.
- Kiriti-Nganga, T. (2015). Gender and trade liberalization in Kenya: The case of women retail traders.
- Lee, J. W. (1993). International trade, distortions, and long-run economic growth. *Staff Papers*, 40(2), 299-328.
- Lee, J. W. (1995). Capital goods imports and long-run growth. *Journal of Development Economics*, 48(1), 91-110.
- Lee, J. W. (1995). Capital goods imports and long-run growth. *Journal of Development Economics*, 48(1), 91-110.

- Levine, R., & Renelt, D. (1992). A sensitivity analysis of cross-country growth regressions. *The American economic review*, 942-963.
- Menyah, K., Nazlioglu, S., & Wolde-Rufael, Y. (2014). Financial development, trade openness and economic growth in African countries: New insights from a panel causality approach. *Economic Modelling*, 37, 386-394.
- Odhiambo, W., & Otieno, G. (2006). Trade policy reforms and poverty in Kenya: Processes and outcomes. *Background Paper (Geneva: CUTS Geneva Resource Centre)*.
- Pesaran, H., & Shin, Y. (1999). An Autoregressive Distributed Lag Modelling Approach to Cointegration “chapter 11. In *Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium*.
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, 16(3), 289-326.
- Rivera-Batiz, L. A., & Romer, P. M. (1991). International trade with endogenous technological change. *European Economic Review*, 35(4), 971-1001.
- Romer, P. M. (1986). Increasing returns and long-run growth. *Journal of Political Economy*, 94(5), 1002-1037.
- Romer, P. M. (1990). Endogenous technological change. *Journal of Political Economy*, 98(5, Part 2), S71-S102.
- Sakyi, D., Villaverde, J., & Maza, A. (2015). Trade openness, income levels, and economic growth: The case of developing countries, 1970–2009. *The Journal of International Trade & Economic Development*, 24(6), 860-882.

- Solow, R. M. (1956). A contribution to the theory of economic growth. *The quarterly journal of economics*, 70(1), 65-94.
- Srinivasan, T. N., & Bhagwati, J. (2001). Outward-orientation and development: are revisionists right? In *Trade, development and political economy* (pp. 3-26). Palgrave Macmillan, London.
- Strauss, J., & Ferris, M. E. (1996). A dynamic estimation of world productivity growth. *Applied Economics*, 28(2), 195-202.
- Trejos, S., & Barboza, G. (2015). Dynamic estimation of the relationship between trade openness and output growth in Asia. *Journal of Asian Economics*, 36, 110-125.
- Ulaşan, B. (2015). Trade openness and economic growth: Panel evidence. *Applied Economics Letters*, 22(2), 163-167.
- Wacziarg, R. (2001). Measuring the dynamic gains from trade. *The world bank economic review*, 15(3), 393-429.
- Young, A. (1991). Learning by doing and the dynamic effects of international trade. *The Quarterly Journal of Economics*, 106(2), 369-405.
- Young, A. (1991). Learning by doing and the dynamic effects of international trade. *The Quarterly Journal of Economics*, 106(2), 369-405.
- Zahonogo, P. (2016). Trade and economic growth in developing countries: Evidence from sub-Saharan Africa. *Journal of African Trade*, 3(1-2), 41-56.